

# Financial Derivatives and Their Application in Enterprises

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## ABSTRACT

With the opening of the financial market, the financial derivatives market has also encountered greater development opportunities. However, opportunities and challenges always coexist, so enterprises must use financial derivatives reasonably and correctly. This paper adopts the method of combining theoretical analysis with case analysis to introduce the types, risks, applicable mechanisms and typical application cases of financial derivatives in detail. In addition, through detailed descriptions of the theoretical underpinning, the reader could learn about the trading processes and profitability mechanisms of several major derivatives, as well as conducting immersive simulations through case studies. Through in-depth analysis and research, it is concluded that enterprises should actively invest in technology and resource support, use derivatives to control risks and realize enterprise value. Hedging, rather than random speculation, should be the first rule of thumb for companies using derivatives. It is hoped that the research of this paper can provide a good way for existing enterprises to use derivatives to avoid risks and help the financial derivatives market achieve steady development.

**Keywords:** *Financial derivatives, Risks, Application, Hedging, Speculation arbitrage.*

## 1. INTRODUCTION

Derivatives markets have become increasingly important in finance over the past few decades. Futures, Options trading are very active in many exchanges [1]. Derivatives trading is now the world's largest business, estimated at more than \$2.5 trillion a day and growing at about 14 per cent a year [2]. Nowadays, financial institutions routinely trade derivatives on and off the counter. Derivatives are incorporated into securities, used in capital investment projects or as incentives and rewards for corporate executives. In the current market environment, the knowledge of derivatives is a must for every financial practitioner [3].

Derivatives date back to the commercial origin of Mesopotamia in 4000 BC and later survived in canon law in Western Europe. Renaissance derivatives became mature and applied widely around the world in the 17th century. In 1865, the Chicago Grain Exchange introduced a standardized agreement for the earliest financial derivatives, "futures contracts", developed in human history, replacing the forward contracts used

since 1851. Today, derivatives act as major positions in many exchanges worldwide and are used in capital investment projects and salary returns for executives.

The purpose of this paper is to introduce some basic knowledge of derivative products, which is mainly divided into four parts:

- (1) *What are the types of derivative instruments*  
Forward, future and option.
- (2) *Types of risks existing in the company*
- (3) *How to apply different tools to various risks*

First, forward foreign exchange contracts can solve financing problems, help companies broaden financing channels, and avoid capital turnover risks. Meanwhile, through the futures contract to solve the price volatility risk of import and export products, avoid the company's foreign exchange risk. Moreover, speculative profits can be obtained through options to avoid market risks.

#### (4) *Enlightenment from the above analysis*

First, it is necessary to master the basic requirements and principles of using financial derivatives, face up to their high leverage and complexity. Secondly, companies need to attach importance to financial derivatives from the strategic level and provide sufficient technical and resource support. Finally, it is significant to understand that derivatives are used for hedging, not speculation.

This article is divided into six parts. First, it gives an overview of the history of derivatives and clarifies the four objectives of this article. Then it introduces the basic knowledge of futures, options and forward contracts in derivatives. The third part describes the company's several risks, divided into systematic risks and non-systematic risks. The fourth part explains the application of derivatives through several case studies. The last two parts are respectively optimistic prospects for the future development of derivatives, and the conclusion of the whole article, pointing out that we should be a more cautious and better use of derivatives

## **2. DERIVATIVE INSTRUMENTS**

A derivative is a product derived from a basic variable and can be traded on an exchange or over-the-counter market. The advantage of trading on an exchange is that traders do not have to worry about the creditworthiness of their counterparties. The clearing house solves this problem by requiring both traders to keep a certain margin at the clearing house to honor their covenants [4].

However, the complex design of exchange-traded contracts makes the valuation extremely complex, thus making exchange-traded derivatives have high inherent risk [5]. OTC transactions can allow small companies to trade without being required to go public. They can also be used for hedging, transfer trading risk, and leverage for business operations [6]. However, the downside of OTC trading is that it is riskier relative to exchange trading because of the lack of clearinghouses and, therefore, lack of transparency. Regulators do not know the exact nature and extent of the risk to increase the credit or default risk associated with each OTC contract. The speculative nature of the transactions resulted in a lack of integrity in the market [7].

There are three types of derivatives: forward contracts, futures and options.

Forward contracts are very similar to futures contracts, the biggest difference being that forward contracts are not traded on an exchange and trade standard fixed assets. In addition, the two contracts are different in form. For forward contracts, the quality of commodities and the delivery date are all decided by both parties without strict standards. The deposit

payment and settlement time are different, and the participants are different. Forward contracts are typically transactions between financial institutions in the over-the-counter market. It is a contract to buy or sell a product at a specified time in the future at an agreed price [8].

Futures contracts are made on an exchange. The underlying assets of futures trading include a variety of commodities and financial assets. Commodities include pork, soup, wool, wood and so on. Financial assets include stock indexes, currencies. Financial media regularly publish futures prices, determined by the supply and demand of assets [9].

Options are divided into American options and European options. An American option means that the option holder has the option to exercise the option at any time before the expiration date. European option means that the option holder can only choose to exercise the option at the expiration date. Unlike the forward contracts, it does not require buying or selling the underlying asset, but it does require paying a fee to own the option [9].

If the spot price rises, then buying the call option may be profitable. Once the price rises above the exercise price and exceeds the number of paid royalties, the deal becomes profitable.

If the spot price falls, then buying the put option may make a profit. A trading profit is made once the price falls below the exercise price by more than the royalty paid.

## **3. TYPES OF RISKS EXISTING IN COMPANIES**

Systematic risks are caused by external factors, which are the risk factors facing the whole financial market, such as the economic cycle and national macroeconomic policies. These risks, also known as non-diversification of risk, cannot be offset by diversification.

Unsystematic risk occurs within an industry or a company, contrary to the systemic risk caused by external factors. It is a diversifiable risk and can be offset by diversified investments [10].

Systematic risk includes interest rate and Exchange risk, while unsystematic risk includes credit, financial, management, and liquidity risks.

### **3.1. Systematic risks**

#### **3.1.1. Interest risk**

Interest rate risk refers to the possibility that the uncertainty of the market interest rate change causes losses to enterprises [11]. Such risks often suffer

because of the high sensitivity of corporate debt or investments. As interest rates rise, lenders will raise credit card and loan rates, making it cheaper for businesses to get the money needed. At the same time, the inability to repay the risk of the rate hike could reduce bank lending.

Interest rate fluctuations may affect different companies differently, but almost every company is affected by interest rate fluctuations. Generally, the impact of interest rate on a company depends on the choice of financing methods : (1) capital structure; (2) a combination of fixed and floating rates; (3) A combination of short-term and long-term debt [11].

### *3.1.2. Exchange rate risk*

Exchange rate fluctuations may bring companies either opportunities or losses. The fluctuations in foreign exchange rates may affect corporate costs and profits, cash flow and market value, especially for those with multinational, multi-currency businesses [12].

## *3.2. Unsystematic risks*

### *3.2.1. Credit risk*

Credit risk stems from the possibility of default by counterparties of loans, which was also an important cause of the financial crisis in the early 2000s. Credit risk, also known as default risk, refers to the possibility that the borrower, the issuer of securities, or the other party of the contract violates or fails to perform the contract terms, resulting in losses to investors or counterparties. OTC derivatives and OTC derivatives involve different credit risks because of different settlement methods [13].

### *3.2.2. Management risk*

Management risk refers to the deviation of management level caused by information asymmetry, misjudgment and mismanagement in the management operation process. It can be divided into four parts: the quality of managers, organizational structure, corporate culture, management process. If the management problems occur, irreparable losses will be caused to the enterprise and managers [14].

### *3.2.3. Liquidity risk*

Liquidity risk includes asset liquidity risk and liability liquidity risk. The former is when an asset is not collected in time to meet subsequent debt payments. Liability liquidity risk refers to the risk of loss caused by the impact of external and internal factors [15].

## **4. THE EFFECT OF FINANCIAL DERIVATIVES ON ENTERPRISES**

### *4.1. The origin of financial derivatives*

In the 1970s, after the collapse of the Bretton Woods system, the fixed exchange rate system transformed into the floating exchange rate system. Frequent fluctuations of the exchange rate and the wave of financial liberalization brought exchange rate risks and interest rate risks to countries. To meet the need for hedging in the financial market, financial derivatives have been developed to deal with the exchange rate and interest rate problems [16]. Furthermore, the role of financial derivatives is more diversified.

### *4.2. Hedging and speculation arbitrage*

Hedging is when an investor buys or sells the actual goods on the spot market and sells or buys the same number of futures contracts on the futures market. Under the domination of the supply and demand relationship, the price trend of the spot and futures markets is generally the same. However, since investors operate in the opposite direction in two markets, they could avoid risks and reduce losses through hedging.

Speculation and arbitrage refer to that investors take advantage of the price difference in different periods to buy low and sell high. According to the interest rate, exchange rate or price risks that investors encountered, they profit by frequent buying and selling derivatives to speculate.

### *4.3. Function of financial derivatives*

The good use of derivatives is beneficial for companies to achieve more effective risk control, reducing the risk of enterprises at the same time. Moreover, idle funds can be effectively used for enterprises and society, while risks can be controlled, transaction efficiency can be improved, and resource allocation ability can be optimized.

### *4.4. Cases study of financial derivatives*

Since the 2008 financial crisis, the world economy has been in a state of recovery. In recent years, with the rise of global protectionism and the impact of COVID-19, corporate risk management has become an important work. According to the research of BARTRAM et al. [17] more than 60% of companies in the international financial market have used financial derivatives for risk management. The research of Zhang Qian et al. [18] displays that more than 62% of listed companies in China use financial derivatives, and the proportion has a significant upward trend. For China, reasonable regulation of the use of financial derivatives can promote the construction of the financial market and

drive enterprises to effectively use financial derivatives to solve their own difficulties.

The high leverage of financial derivatives and complexity, as well as its trading problems such as nonstandard information opaque in the process of operation, determines its while avoiding risk, and there is a huge risk, combined with China financial market itself is not perfect, so most enterprise use derivatives to achieve the hedging function. Only a few larger powerful capital, fault tolerance of high rate of the enterprise to realize the function of the speculative arbitrage through financial derivatives. Therefore, the enterprise shall be an efficient use of derivatives and actively explore maximize the value of derivatives [19]. Through the elaboration of financial derivatives value effect on the company-specific case, this article tries to help other companies provide a learning path and realize the value of optimization.

#### *4.4.1. The case of the Vanke group*

Financing difficulty is a problem that most enterprises will encounter in the process of operation [20]. Still, Vanke group has solved this problem to a certain extent by using forward foreign exchange contracts.

Vanke Group, using its own foreign debt quota to foreign banking institutions to apply for a loan, at the same time entrust domestic bank financing guarantee institutions do Foreign Banks to Vanke group set up the special account for external debt in the lending, at the same time, the same period Vanke and signed with banking institutions within the territory of the deadline of forwarding foreign exchange contracts, and determine the amount of the purchase of foreign exchange in the future Vanke can use overseas loans to make an investment or fund allocation in China, buy foreign exchange according to the agreed amount and forward exchange rate when the contract expires, and repay the cash to the overseas bank.

Through forward foreign exchange contracts, Vanke borrows foreign funds for domestic investment, which, on the one hand, solves the situation of domestic financing difficulties, expands financing channels for enterprises and increases the domestic capital flow. On the other hand, forward foreign exchange contracts can lock in borrowing costs, carry out risk control and hedge funds for enterprises.

#### *4.4.2. The case of Jiangxi Copper*

Jiangxi Copper is one of the largest production bases of copper products in China. Due to its great demand for raw materials, it needs to purchase a large number of copper products in domestic and foreign markets to meet production requirements. Foreign exchange risks

will also affect purchasing from foreign markets, which will directly affect copper prices and company profits. In short, it will bring changes in raw material prices and inconvenience to the company's production and operation activities.

In this regard, Jiangxi Copper's solution is to establish a long position in the futures market, buy the corresponding number of futures contracts in the futures exchange, and close the position after the expiration of the contracts to reduce or avoid the risk of raw material price fluctuations. But sometimes due to differences in the international environment, may make the futures market, the price of raw materials at home and abroad after the conversion, and even to the point of buying high and selling low Jiangxi copper, the solution is based on the total annual production and operation plan to determine the required raw materials, to use in the total amount divided by the number of futures contracts agreed trading days, got a plan Then use the planned quantity minus the actual quantity of raw materials delivered every day to get a difference, the difference is the Jiangxi copper industry needs to build futures positions in the futures market that amount.

In this way, Jiangxi Copper can not only avoid the uncertainty caused by the exchange rate risk of international procurement, but also balance the purchasing quantity of raw materials, reduce the related risks caused by the price fluctuation of raw materials, and make preparations for the company's production and operation.

#### *4.4.3. The case of Roche Holdings*

In 1991, Roche holding common 10-year dollar could have 8.65% according to borrow, used for business investment But to reduce the cost of financing, Roche holding hybrid securities issuance of \$1 billion, is a bull market spreads debt this mixed by a 10-year bond (annual interest rate of 3.5%) and a group of three-year option certificate. Warrants give the investor a put option at a low price (sFr70 or less); when the share price is higher (more than 100 Swiss francs) to the issuer when call options, investors have the highest returns. Three years later, the company's share price rose to 125 Swiss francs, company to exercise warrants, from investors bought authority cards, for investors to maximize returns. In addition, Roche holdings by 3.5% annual interest rate of financing reduce the financing cost.

The bull market spread warrants of Roche Holding not only reduce the financing cost for the company but also help the company to obtain profits, harvest the funds needed for acquisition, but also maximize the interests of investors and realize the value of financial derivatives, which has played a significant role in the development of the company [21].

## 5. INSPIRATION AND PROSPECT

Through the good use of financial derivatives, to a certain extent, can bring positive benefits for the company.

First of all, from the perspective of the internal effect of enterprises, the company, through the financial hedge risk control, to improve enterprise value and the optimization of resource allocation structure, can from the enterprise internal organization structure, reduce costs further and increase revenue [22].

Secondly, from the perspective of external effects of enterprises, if all enterprises can skillfully use financial derivatives to reduce interest rate risk, exchange rate risk and market risk, it can significantly reduce the overall volatility risk of social and economic activities and enhance the stability of social and financial order. However, the problems existing in the application of financial derivatives cannot be ignored. The use cost of derivatives is high. Small enterprises do not have the ability and resources to use them, and enterprises with insufficient strength may suffer losses due to insufficient investment. In addition, if the return of using derivatives for hedging is even less than that of ordinary risk management, enterprises will abandon it because of higher costs [23]. Therefore, to promote the prosperity and development of China derivatives market, these important problems must be solved.

Although China financial derivatives market started late, and it exists some deficiencies. Still, with the development of financial liberalization and economic integration, more and more enterprises trust the derivatives business. It can be foreseen that China financial derivatives market will be further opened in the future, and more enterprises will be attracted to enter the derivatives market through institutional and policy reforms, such as lowering the hedging threshold and increasing fiscal and tax support for enterprises [24]. In addition, under the theme of deregulation and regulation, while opening the market, the government will also strengthen the supervision of the trading behavior of the derivatives market entities. There will also be more professional and stricter regulatory measures for the relevant information disclosure system, whether there is excessive speculation, unfair competition, etc. It is believed that with the support of the international economic environment and the government, the derivatives market will achieve leapfrog development.

## 6. CONCLUSION

This paper summarizes the norm of the derivatives market development, using theoretical analysis and case analysis, introducing the main types of derivatives, company risk, and company can apply the approach of

derivatives risk aversion. Not only in theory based on the detailed description, make readers aware of several main derivatives trading processes and mechanism of profit. In addition, through specific case analysis, it provides examples for companies to refer to and learn about the application of derivatives, to enhance the value effect of derivatives on companies.

Through systematic analysis, the main conclusions of this paper are as follows: First, even if there are different opinions about the utility of derivatives, unreasonable use will indeed bring great risks, but compared with the risks existing in the company, derivatives can still play a positive role in risk control. Second, reasonable use of derivatives is conducive to the value of the company promoted, boost overall efficiency, and even benefit the upgrade of industrial structure and resource allocation optimization. Third, many cases illustrate the use of derivatives need to match the qualified technical support, resources support and financial support, etc., do not have sufficient conditions for the company should be careful to use derivatives. Fourthly, the primary function of derivatives should be hedging to carry out reasonable risk avoidance to minimize losses and increase returns. Any derivatives transaction with risk exposure should be carefully considered or directly abandoned.

The limitation of this article is mainly manifested in not enough in-depth research and analysis, failed to deeply analyze the derivatives of theoretical and practical. It is hoped that through in-depth research and thinking, the general applicability of derivatives can be mastered in the future. The practicality of derivatives can be implemented to the maximum so that companies with various sizes and financial strength and technical strength can control their risks through financial derivatives. At the same time, the risk of derivatives itself will be reduced, and the stability of the derivatives market and social economy will be enhanced because the value of financial instruments can only be realized when they really play a role at the company level.

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