The Case Study Used to Analyze How to Use Financial Derivative to Hedge Foreign Exchange Risk

Manqi Zhong

School of Chengdu University of Technology, Chengdu, China

zhong.manqi@student.zy.cdut.edu.cn

Abstract. In recent years, the economic cooperation between China and the rest of the world has gradually expanded, and the volume of import and export has been rising year after year. Foreign trade has become an important source of benefits for many enterprises. And after the reform of Chinese exchange rate system in 2015, the RMB exchange rate changes more frequently and the range is relatively large. In this context, many Chinese enterprises with foreign trade are facing the pressure brought by exchange rate fluctuations. This means that if an enterprise fails to reasonably manage foreign exchange risks, it may suffer serious exchange losses and thus affect the normal operation of the company. This paper taking China Southern Airlines Group Co., Ltd. and Fuyao Glass Industry Group Co., Ltd. as examples to analyzes how these two enterprises use financial derivatives to hedge foreign exchange risks to help them reduce losses or increase profits and evaluate the hedging effect of these financial derivatives. At the end of the article, the author also puts forward some relevant suggestions.

Keywords: Foreign exchange risk, financial derivative, risk hedging.

1. Introduction

1.1. Research Background

Since July 21, 2005, China started the reform of RMB exchange rate mechanism and adopted the floating exchange rate system, which made many enterprises with foreign-currency-denominated debts and more foreign business face more challenges in foreign exchange risk management [1]. According to the publicly disclosed data of listed companies in Shanghai and Shenzhen, in 2017, as many as 2,926 listed companies in Shanghai and Shenzhen suffered exchange losses, and the loss amount was as high as 17.3 billion yuan. Since then, how to effectively manage foreign exchange risk has been widely concerned and studied by Chinese enterprises.

Foreign exchange risk is the possibility of an increase or decrease in value due to unanticipated changes in foreign exchange rates in the economic activities of holding or using foreign exchange [2]. The exchange risk issue is closely related to international trade, especially foreign trade enterprises because they have a large amount of import and export business or their import and export business involves a large amount of money. Therefore, managing foreign exchange risk is particularly important for enterprises with foreign trade.

Over time, global foreign trade companies have developed various methods of managing foreign exchange risk. But the use of financial derivatives to hedge foreign exchange risk is more widely used. This method mainly includes the use of foreign exchange swaps, foreign exchange forwards, futures, options and swaps contracts to hedge the risk of depreciation of the domestic currency, so as to reduce the loss of enterprises caused by the devaluation of the domestic currency [3].

1.2. Case Companies Background Introduction

This paper will take China Southern Airlines Group Co., Ltd. (hereinafter referred to as China Southern Airlines) and Fuyao Glass Industry Group Co., Ltd. (hereinafter referred to as Fuyao Group) as examples to study how enterprises use financial derivatives to hedge foreign exchange risks and their hedging effects. And suggestions on how to hedge foreign exchange risk more effectively.

As one of the four major airlines in China, China Southern Airlines has the largest number of transport aircraft and the densest route network in China, with its route network covering 1,057

destinations around the world, connecting 179 countries and regions [4]. In addition, China Southern Airlines has a very large amount of foreign currency liabilities [5]. As a result, China Southern Airlines needs to carry out many RMB and foreign currency conversion transactions, which also makes China Southern Airlines face greater foreign exchange risks and exchange losses. According to reports, by June 2022, China Southern Airlines had a net loss decrease (or increase) of 304 million yuan for every 1% rise (or depreciation) in the RMB exchange rate against the US dollar. Therefore, it is representative that China Southern Airlines is chosen to study financial derivatives to hedge foreign exchange risks.

Also, Fuyao Group is an enterprise dedicated to the production and sales of automotive glass, its share in the global automotive glass market is more than 28% [6]. With the continuous expansion of Fuyao Group, different functional departments have been established in various regions of the world, and the business scope is also expanding. Therefore, it is also very representative to study how Fuyao Group uses financial derivatives to hedge foreign exchange risks.

2. Literature Review

In recent years, the fluctuation of RMB exchange rate has become more frequent because of China's choice of floating exchange rate system. Therefore, in the current situation of expanding foreign trade, it is urgent and important to solve the exchange loss caused by exchange rate fluctuations. Although there have been a lot of studies on how to solve the risks caused by exchange rate fluctuations, the research on the use of financial derivatives to hedge exchange losses remains controversial. Through case studies of China Southern Airlines and Fuyao Group, this paper aims to illustrate more vividly whether financial derivatives can effectively hedge exchange losses and whether there are some defects in this method.

Liang Yan et al. demonstrated in their research that it is very important for enterprises to establish a good risk assessment system in order to better play the role of financial derivatives in hedging foreign exchange risks. If an enterprise can reasonably estimate the future exchange rate fluctuations through the risk assessment system and use enough financial derivatives, namely the amount covered by financial derivatives is enough to make up for the losses caused by exchange rate fluctuations, the enterprise is more likely to make profits from the use of financial derivatives. However, Grant and other scholars also discussed the issue from multiple perspectives. They believed that financial hedging could not effectively help enterprises avoid exchange losses caused by exchange rate fluctuations. According to the collected data, although many scholars have conducted various studies on the use of financial derivatives to hedge foreign exchange risks, there are also deficiencies in these studies.

3. Analyze the Two Companies' Use of Financial Derivatives

3.1. How Does China Southern Airlines use Financial Derivatives to Hedge Foreign Exchange Risk

3.1.1. Financial derivatives used by China Southern Airlines

In recent years, China has adopted a floating exchange rate system. Although the country has taken measures to maintain the stability of the exchange rate against the US dollar, the RMB exchange rate against the US dollar has fluctuated frequently. This makes China Southern Airlines face the risk of huge exchange losses.

Accordingly, China Southern Airlines created a distinct management system for the foreign exchange hedging business to reduce the possibility and magnitude of foreign exchange losses [7]. This system creates a perfect foreign exchange hedging stop loss mechanism to prevent excessive losses caused by incorrect risk assessments and substantially reduces the possibility of exchange losses brought on by management personnel using foreign exchange speculation for the company.

China Southern Airlines has entered into foreign exchange forward contracts through the system's management, allowing the business to pay the agreed price or exchange rate when the payment is due in the event of frequent exchange rate fluctuations [8]. In this manner, China Southern Airlines can swap at a higher rate when the RMB depreciates, so as to minimize the exchange losses.

Moreover, cross-currency swap arrangements are another way China Southern Airlines manages its foreign exchange risk [8]. These contracts, unlike the foreign exchange forward contracts, enable China Southern to trade debt funds with financial institutions in various currencies, at the same interest rate, in the same amount, and at a specified time, minimizing losses from interest rate changes. Like this contract, China Southern Airlines also used an interest rate swap contract. As can be seen from the disclosure statements of China Southern Airlines in 2015 and 2016 (see Table 1), China Southern Airlines signed interest rate swap contracts with a nominal amount of $581 million and $527 million respectively in these two years, but these contracts only covered a small amount of risk exposure and could not protect against all the risks brought by exchange rate changes.

Table 1. Interest rate swap usage of China Southern Airlines in 2015 and 2016

	2015	2016
Nominal amount (Hundred million dollars)	5.81	5.27
Converted exchange rate	6.4895	6.9429
Convert into RMB (Hundred million yuan)	37.70	36.59
The effective portion of cash flow hedging gains and losses (Hundred million yuan)	0.06	0.1
Lease payment payable (Hundred million yuan)	494.08	535.27
Interest payable on finance leases (hundred million yuan)	2.69	3.72

(Data Source: China Southern Airlines 2016 Annual Report)

Before 2014, China Southern Airlines also experimental to enter several foreign exchange options contracts in an effort to minimize exchange losses and maximize exchange profits [9]. These contracts permit China Southern to purchase a specific quantity of foreign currency at a specified exchange rate, enabling it to exercise its rights to protect itself from losses if the RMB depreciates and forfeit its rights to profit if the RMB appreciates. But China Southern Airlines later chose not to use the tool widely.

3.1.2. The effect of China Southern Airlines using financial derivatives to hedge foreign exchange risks

Table 2. Hedging of financial derivatives of China Southern Airlines from 2015 to 2019 (Unit: RMB million)

Items	2015	2016	2017	2018	2019
(1) Exchange gain or loss	-5,702	-3,267	1,790	-1,742	-1,472
Hedging income:					
(2) Exchange forward contract	0	0	0	0	31
(3) Cross currency swap contracts	7	0	64	44	187
(4) = (1) + (2) + (3) Financial hedging result	-5,695	-3,267	1,854	1,698	1,254

(Data Source: China Southern Airlines 2019 Annual Report)

According to the hedging situation of financial derivatives of China Southern Airlines from 2015 to 2019 shown in Table 2, the foreign exchange loss of China Southern Airlines has been reduced to some extent after the use of financial derivatives. But there is still a large amount of exchange loss.

This is because the management mechanism of foreign exchange risk hedging established by China Southern Airlines is strictly forbidden to choose foreign exchange hedging instruments with complex structures [4]. But the effect of single financial derivatives hedging foreign exchange risk is relatively weak. Therefore, China Southern Airlines still has a large amount of exchange losses. Additionally, because China Southern Airlines uses financial derivatives very cautiously [10], the quantity invested

in hedging instruments is insufficient to offset the exchange loss. And in the case of RMB depreciation has been predicted, China Southern Airlines still did not use financial instruments to hedge [7, 11]. Consequently, there is still a significant currency loss.

3.2. Comparative Analysis of Fuyao Group and China Southern Airlines Using Financial Derivatives

Compared with China Southern Airlines, Fuyao Group has done a better job in hedging foreign exchange risk by using financial derivatives. The reasons are multiple.

First, Fuyao Group identified three types of foreign exchange risks: transaction risk, translation risk and economic risk. And use different financial derivatives to hedge different types of foreign exchange risks. For example, when Fuyao Group has the risk of foreign exchange transaction, it is when there is the loss caused by the difference between the amount of the accounts in settlement and the amount of the accounts in foreign currency due to the exchange rate changes [12]. Fuyao Group will choose to use foreign currency borrowing as a financial derivative. In this way, Fuyao Group will convert the uncertain foreign exchange risk into a certain borrowing rate cost, so that the impact of foreign exchange waves on Fuyao Group will be greatly reduced.

Second, Fuyao Group uses a wealth of financial derivatives, not only traditional foreign currency loans and forward foreign exchange contracts, but also the introduction of options, a financial derivative with higher risk management efficiency. More specifically, Fuyao Group also used foreign exchange options contracts, which are highly professional and highly leveraged financial derivatives. It grants Fuyao Group a high degree of autonomy [13], allowing it to choose whether to exercise the right based on the actual circumstances of exchange rate fluctuations, helping the company get the maximum benefit. Another reason why this method is better is that if Fuyao Group fails to effectively predict future exchange rate changes, then Fuyao Group will only lose the exercise fee. In contrast, China Southern Airlines is not as adept at using options as Fuyao Group and has barely used option contracts since 2017.

3.3. The Disadvantages of Using Financial Derivatives to Hedge Foreign Exchange Risks

However, the use of financial derivatives can indeed reduce the loss caused by the foreign exchange risk of the enterprise, but sometimes the use of financial derivatives not only cannot hedge the foreign exchange risk but will bring greater losses to the enterprise. For instance, the currency swap contract signed by China Southern Airlines in 2017 and the currency swap used by Fuyao Group in 2017 both resulted in losses of 64 and 18.7622 million yuan, respectively [10, 13]. In addition, this method of hedging foreign exchange risks relies heavily on the enterprise's exchange rate evaluation system. If the enterprise predicts that the future exchange rate will decrease, but the actual exchange rate increases, it will also bring adverse effects to the enterprise. Some researchers also show that hedging through the foreign exchange market may be an inappropriate tool to protect against foreign exchange risks [14]. They agree that the help provided by hedging is illusory because the final exchange rate is always the same, the real forward spot rate [14]. They believe that to effectively combat foreign exchange risks, it is necessary to know the nature and exact source of risks, and then take corresponding measures in the market where foreign exchange risks arise. Thus, the use of financial derivatives to hedge the effect of foreign exchange risk is doubtful.

4. Conclusion

In conclusion, this piece uses China Southern Airlines and Fuyao Group as examples, to demonstrate how to use financial derivatives to hedge foreign exchange risks to decrease the company's exchange losses or increase its exchange benefits. The most popular financial instruments for hedging foreign exchange risks are currency swaps, forward foreign exchange contracts, and option contracts, with option contracts having the best results.

By comparing the use of financial derivatives to hedge foreign exchange risks by China Southern Airlines and Fuyao Group, it is found that the use of financial derivatives to hedge foreign exchange risks has the best effect. Moreover, enterprises should also identify three types of foreign exchange risks more specifically and use different financial derivatives to hedge according to their causes.

However, the actual situation shows that financial derivatives cannot always be a good hedge against foreign exchange risk, and sometimes it will bring more serious losses for enterprises. This is because this method of hedging foreign exchange risk largely depends on whether the enterprise can accurately evaluate the future exchange rate changes, if not, it will cause more serious losses. Therefore, in the future, more studies are needed to illustrate the advantages and disadvantages of using financial derivatives to hedge foreign exchange risks for enterprises.

References

[1] Liang Yan. Research on Foreign Exchange Risk Management of State-owned listed Airlines. Shanghai jiaotong university, 2018.

[2] Yao Lin. Analysis of foreign exchange risk and management countermeasures of overseas power station investment projects. Market in China, 2016, 883(16): 176-177.

[3] Ito T, Koibuchi S, Sato K, et al. Exchange rate exposure and risk management: The case of Japanese exporting firms. Journal of the Japanese and International Economies, 2016, 41: 17-29.

[4] Wu Xutong. Case study on foreign exchange Risk Management of China Southern Airlines. Chinese Academy of Fiscal Sciences, 2017.

[5] Wang Qingyuan. Study on the Influence of RMB Exchange Rate Fluctuations on the risks of aviation enterprises. Guangdong University of Foreign Studies, 2017.

[6] Li Yunqian. Fuyao group, foreign exchange risk management research. Shanghai university of finance and economics, 2020.

[7] Li Peipei. Research on Chinese airlines' exchange rate Risk Management Based on GARCH-VaR Model -- Take China Southern Airlines as an example. Lanzhou University, 2018.

[8] Jin Xinmei. Foreign exchange risk coping strategy and effect evaluation. Jiangxi Normal University, 2021.

[9] Xiang Daiyou. Research on the Investment Practice and Deepening Strategy of Corporate Financial Derivatives -- Taking China Southern Airlines Co., LTD as an example. Friends of Accounting, 2012, 410(14): 58-61.

[10] Yan Yuxi. A Study on Foreign exchange Risk Management of Airlines - A case study of China Southern Airlines. Chinese management informatization, 2021.

[11] Huang Pengfeng. Case Study on Exchange Rate Risk Management Strategy of China Southern Airlines. Liaoning University, 2017.

[12] Sun Chenhong. Comparative Study on Foreign exchange Risk and Management Effect of manufacturing Enterprises. Zhejiang industry and commerce university, 2021.

[13] Ruan Senju. Fuyao group, foreign exchange risk hedging strategy and the effect research. Zhejiang industry and commerce university, 2022.

[14] Grant R, Soenen L A. Conventional hedging: an inadequate response to long-term foreign exchange exposure. Managerial Finance, 1991, 17(4): 1-4.