Research Article

Avoidance Path of Foreign Exchange Risk Management for Overseas Construction Enterprises in China

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Foreign exchange risk management is the focus of overseas construction enterprise management. The quality of its management will affect the profitability of enterprises to a large extent. It is also an important index for comprehensive evaluation of its internal management. The foreign exchange management strategies of China’s overseas construction enterprises mainly include two ways: operational hedging and financial hedging. According to the data of overseas construction enterprises in China from 2011 to 2018, the empirical application shows that enterprises that use only financial hedging have a negative relationship with corporate profits. The better foreign exchange risk management strategy of enterprises should be a comprehensive foreign exchange risk prevention strategy, which mainly relies on operational hedging supplemented by financial hedging.

1. Introduction

Guan and Ma said, with the advance of “Belt and Road Initiative,” by the end of 2017, China has signed a free trade agreement with 11 countries and signed bilateral investment agreements with 56 countries en route. The total amount of investment in China has reached $51.1 billion for the relevant countries. China has signed 125 thousand new contracts with countries along the route, with a total contract amount of 279 billion US dollars. Chinese enterprises have established 52 economic and trade cooperation zones in the relevant countries [1]. With the development of economic globalization and the advance of “Belt and Road Initiative,” China’s domestic infrastructure market is relatively saturated. Many infrastructure enterprises in China regard “going out” as their fundamental strategy for sustainable development. Overseas markets provide broad prospects for Chinese enterprises. According to World Bank estimates, 90% of people and goods are transported by road to Africa alone, but the Africa’s investment in road construction and maintenance is seriously inadequate. If Africa invests $12 billion in road repair and maintenance, it could save $48 billion in economic losses [2]. This information shows the huge space of overseas capital construction market. Of course, the overseas capital construction market undoubtedly contains tremendous risks, such as political risk, economic risk, and market risk. Among all kinds of risks, exchange rate risk has become one of the risks that enterprises must pay close attention to because of its strong uncertainty, high frequency of fluctuation, and high degree of complexity. The more flexible RMB exchange rate mechanism and the “black swan” incident in the foreign exchange market in recent years have undoubtedly been further enlarged. How to continuously manage and control foreign exchange risk is a difficult problem for many overseas construction enterprises in China.

Eiteman et al. classified foreign exchange risk into three basic types: transaction risk, economic risk, and conversion risk [3]. Xiao and Xiao thought hedging is an important means of financial risk management [4]. According to the research of the International Swap Exchange and Exchange Association (ISDA) in 2009, 94.2% of the world’s top 500 companies use hedging to manage their price risk, interest rate risk, and exchange rate risk [5]. Srinivasulu [6] put forward for the first time that the strategies of enterprises facing exchange rate risk can be classified into two
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categories: financial hedging strategy and operational hedging strategy. Financial hedging strategy refers to the use of financial derivatives to adjust their risk exposure level. In order to prevent their risk positions, enterprises must purchase an opposite financial position in the financial market to avoid the risk fluctuations they may face. The use of financial hedging strategy can effectively avoid the exchange rate risk faced by the enterprises. The financial hedging strategy of exchange rate risk management of enterprises can achieve the goal by selecting a variety of financial products in a multilevel and comprehensive way. Operational hedging strategy refers to the use of strategies other than financial hedging to achieve the purpose of managing exchange rate risk, such as the international layout of production factors, risk sharing, and risk transfer [7]. For example, some overseas construction enterprises should deal with the exchange rate risk of overseas projects. In the new winning bid, it is necessary to clarify the claim clause of the currency depreciation when signing the contract. After the signing of the contract, the conditional item can also be insured as far as possible, so that the accounts receivable can be guaranteed and the project money can be fixed at a fixed exchange rate. This is a typical hedging strategy.

Smith and Stulz [8] put forward the risk hedging theory based on MM theory, which holds that hedging in an ideal perfect market cannot effectively reduce the risks that may be faced. But in reality, the ideal perfect market does not exist, which is why hedging is popular. The research by Boyer et al. showed that a company can be recognized as a continuous succession and integration of multiple businesses or links [9]. If there are no agency cost, adverse selection, information asymmetry, and other defects in the market, financial management means can help enterprises to achieve their project objectives. The lower transaction cost promotes the project reorganization and coordination among the business departments, so as to achieve the business goal of enterprise value-added. At present, no scholar has conducted in-depth theoretical research on hedging strategies of overseas construction enterprises to deal with exchange rate risk and guided enterprise risk management practice.

From the macrolevel, exchange rate fluctuations will affect national economic stability and political security. From the microlevel, exchange rate fluctuation will affect the return on investments and cash flow of enterprises. It has become an important research topic in the field of management and economics. With the acceleration of economic globalization and China’s “one belt and one road” initiative, China’s economic relations and economic contacts with the world are becoming increasingly close. In Central Asia, South Asia, and Africa, China’s international engineering contractors are becoming more active. However, many of these countries are characterized by political instability, low degree of marketization, and strict financial control. Most of their currencies are in the depreciation channel against RMB. This has greatly affected the cost and income of overseas construction enterprises in China. A large amount of exchange losses will not only affect the earnings of enterprises but also have a great impact on the healthy operation of the national economy. According to the statistics of authoritative departments, the foreign exchange receipts of export-oriented enterprises will fluctuate in the same direction about twice as much as the exchange rate [10]. Currently, the overall situation of foreign exchange assets management of overseas enterprises in China is not satisfactory: about 30% of the enterprises are level, about 50% are profit-making enterprises, and about 20% are loss-making enterprises [11]. The above analysis shows that exchange rate risk is unavoidable in the overseas business process. The key problem is how to manage exchange rate risk more reasonably and efficiently.

In the overseas engineering market, it is relatively difficult to make correct risk management decisions. Because in the face of different currencies and tax systems, there are also many uncertainties such as cross-border capital flows, economic levels, and political risks. It is based on the industry characteristics of overseas construction enterprises. However, financial hedging or operational hedging is more advantageous and efficient for them. The innovation of this study: in the past, most of the studies on the prevention of exchange rate risk focused on the regions with relatively perfect financial markets, and most of the methods used were hedging, futures, foreign exchange swaps, and other financial methods to prevent exchange rate risk. However, the reality is that most of the overseas construction projects in China are concentrated in the underdeveloped areas with imperfect financial markets, and many places have more control over foreign exchange outflow. Strictly, most of the traditional exchange rate risk prevention measures are difficult to play a role. This study focuses on the underdeveloped regions, and the samples are mainly concentrated in Africa and Asia. More attention is paid to the strategies of mainly operating hedging means, supplemented by financial hedging means to avoid the risk of exchange rate fluctuations. This study discusses the impact of foreign exchange risk hedging on the value of Chinese overseas construction enterprises, which to some extent make up for the lack of existing research.

2. Theoretical Analysis and Research Hypothesis
In recent years, with the improvement of risk management consciousness and internal control level in overseas construction enterprises, the research on risk management is gradually deepening, and some achievements have been achieved.

2.1. Research on the Role of Financial Hedging in Preventing Exchange Rate Risk. Xiao and Xiao believe that financial hedging has a positive effect on the promotion of corporate value [4]. Bartram et al. considered that the actual effect of financial hedging on 7292 companies in 48 countries was investigated. The results showed that 43.6% of enterprises used financial hedging to reduce their exchange rate risk exposure level by 11%, and their corporate value increased simultaneously [12]. Nance et al. believe that the
comprehensive use of foreign exchange swaps, foreign exchange futures, and other means can effectively reduce the cost of their financial difficulties, and thus achieve the goal of increasing the value of enterprises [13]. Guo used the data of 968 Chinese multinationals from 2007 to 2009 and found that using financial hedging can play a positive role in the value of Listed Companies in China [5]. Ho uses case study method to analyze hedging strategies of Chinese Overseas Construction Enterprises. Ho took Z Company of China as an example to study the current situation of foreign exchange risk management. Rui Ho came to the conclusion that financial hedging has no obvious effect on preventing exchange rate risk of overseas construction enterprises [14].

2.2. Research on the Role of Operational Hedging in Managing Exchange Rate Risk. To enhance their competitiveness and reduce operational risk, a series of overseas business strategy adjustments can enable the companies to play their operational allocation flexibility and effectively reduce exchange rate risk [15]. Choi and Jiang selected data of some multinational enterprises from 1993 to 2006 for empirical research. The research found that multinational enterprises have smaller risk exposure and more significant effect of reducing exchange rate risk exposure because of their stronger ability to allocate resources [16]. Choi and Prasad took American firms as samples, and analyzed the relationship between foreign exchange risk exposure level and individual operating variables. The empirical study shows that the internationalization breadth of firms is the most significant [17]. Pantzalis et al. argue that the greater the breadth of internationalization (i.e., the more data points an enterprise has overseas) will make its operations more flexible, because enterprises transfer resources (including production, marketing, etc.) between countries through networks (networks of exchanges between subsidiaries and parent companies or between subsidiaries and other subsidiaries) [18]. Research by Martin and Mauer shows that international operation capability is a key indicator of whether an enterprise has the ability to carry out hedging activities. Therefore, when studying the level of FDI and foreign exchange risk exposure, an enterprise considers that internationalization breadth is one of the important factors affecting its exchange rate risk [19]. Guay and Kothari found that under the premise of sharp fluctuations in the price of basic assets, hedging in exchange rate risk control may be better than financial hedging [20].

2.3. The Relationship between Financial Hedging and Operational Hedging. There are two main viewpoints on the relationship between financial hedging and operational hedging: substitution or complementarity.

The Foreign Exchange Manager of the Federal Maritime Commission (FMC) argues that financial hedging can buy time for companies to avoid risks, but in the long run, it is necessary to adopt operational hedging, such as purchasing and production, to restructure. Elliott et al. selected 88 multinational companies in the United States whose overseas earnings ratio was more than 20% between 1994 and 1997. The results show that the use of foreign currency debt and foreign exchange derivatives is positively related to overseas earnings, but the use of foreign exchange derivatives is inversely proportional to foreign currency debt, which shows that financial hedging and operational hedging are on guard. There is an alternative relationship in foreign exchange risk [21].

Lim and Heli studies show that financial hedging and diversification are more complementary than substitutive [22]. Hagelin selected 101 companies listed in Sweden for data analysis. The results show that 67% of enterprises using foreign exchange derivatives also use foreign currency debt, whereas only 32% of enterprises without financial derivatives use foreign currency debt. His research shows that there may be a complementary relationship between financial derivatives and foreign currency debt [23]. Kim et al. compared multinational companies with overseas (subsidiary) revenue. The results show that pure export-oriented enterprises with single business content have a strong tendency to use financial derivatives. The conclusion is that both operational hedging and financial hedging can reduce exchange rate risk exposure and increase enterprise value, but for avoiding foreign exchange risk, operational hedging is more effective, and its hedging effect is more than five times that of financial hedging. Therefore, he believes that there is a complementary relationship between financial hedging and operational hedging [24]. Ho also believes that China’s MNCs should establish flexible exchange rate risk control mechanism based on market changes and their own characteristics. It is considered that overseas construction enterprises should pay attention to the role of hedging when guarding against exchange rate risk, because the financial hedging effect is not very obvious [14]. Campello et al. pointed out that financial hedging can greatly reduce its financing costs from external channels and increase its negotiating position in the lending relationship. Therefore, financial hedging can avoid the restriction of investment terms on the company, improve the investment ability and other channels to achieve the purpose of increasing enterprise value [25]. Cater et al. tested the impact of financial hedging and operational hedging on exchange rate risk of 208 American multinational corporations from 1994 to 1998. The research shows that decentralized companies measured by business breadth and depth have a lower level of risk exposure, and the comprehensive use of operational hedging and financial hedging can reduce foreign exchange risk exposure [26]. Allayannis et al. studied the impact of 720 large nonfinancial companies listed on the New York Stock Exchange from 1990 to 1995 on corporate value by using financial hedging tools. They found that the use of foreign exchange derivatives can increase corporate value by an average of 4.87%. However, their research also pointed out that the effect of single means is not obvious, and that hedging strategies are only related to financial hedging. Only when applied in a slightly comprehensive way can the value of the enterprise be increased [27]. Puranandam believes that the comprehensive analysis of cost and income is the “cornerstone” of modern risk management. Risk prevention strategy is to choose the best strategy among different hedging tool strategies (either the lowest cost, the greatest benefit, or
both). In order to avoid short- and medium-term exchange rate risks, foreign exchange derivatives such as options or futures contracts can be chosen. However, the transaction cost of such foreign exchange derivatives is relatively high and their role in the long run is not obvious. Therefore, in order to avoid exchange rate risk in the long run, we should consider using business strategy [28].

In conclusion, when many scholars study the role of financial hedging and operational hedging in managing exchange rate risk, their conclusions are quite different. Most scholars put forward multiple perspectives and attach them with evidence to prove the scientific nature of their research. The reasons for this result are still the choice of research perspectives, different industries and different markets, and the hedging tools and hedging methods adopted. There are also big differences. Domestic research in this area is mostly focused on the impact of hedging on corporate value, and a more in-depth research is not much. Therefore, based on the data of construction enterprises listed in China from 2011 to 2018, this study empirically tests the relationship between financial hedging and operational hedging, hedging strategy, personnel quality, and composition.

2.4. Theoretical Analysis. Referring to the model of Hankins [29], this study points out that when overseas construction enterprises face the problem of choosing hedging strategy of exchange rate wind. The following limitations should be made for the study:

- Limitation 1: the strategy of hedging exchange rate risk for an overseas construction enterprise is financial hedging ($B_1$) and operational hedging ($B_2$).
- Limitation 2: there are positive costs in both methods of avoiding exchange rate risk.
- Limitation 3: the two hedging strategies can hedge the type of foreign exchange risk exposure exactly the same.
- Limitation 4: the promotion of corporate value depends only on the correctness of the choice of foreign exchange risk hedging strategies (which may not be the case).

Based on the above four conditions, we can obtain:

$$ V = -\theta \left( \sigma (B_1, B_2) \right) - C_1 (B_1) - C_2 (B_2). \quad (1) $$

$V$ is the value of hedging, $\theta$ is the coefficient of risk cost, $\sigma$ is the function of hedging tool combination, $B_1$ is the level of hedging tool usage, and $C_i$ is the cost of hedging tool usage. As it is assumed that all the promotion of enterprise value comes from risk hedging, $-\theta (\sigma (B_1, B_2))$ represents risk hedging income.

Zou shows that both operational and financial hedging strategies have higher fixed cost [30]. Therefore, it is further assumed that the following linear cost functions exist:

$$ C_i (B_i) = F_i + c_i B_i. \quad (2) $$

Among them, $F_i$ is the fixed cost generated by the use of hedging means and $c_i$ is the marginal cost of the use of hedging means.

In addition, no matter what hedging method is used, there will be cost constraints, assuming that the following constraints function exists:

$$ F_1 + c_1 B_1 + F_2 + c_2 B_2 \leq Q (\theta). \quad (3) $$

Among them, $Q (\theta)$ represents the cost constraints of hedging, which is a function of risk cost. Using the multiplier method, according to Formula (1), the first-order partial derivative is equal to zero and is connected with (3)

$$ \frac{\partial V}{\partial B_1} = -\theta \left( \frac{\partial \sigma}{\partial B_1} \right) - c_1 - \lambda (c_1) = 0, \quad (4) $$

$$ \frac{\partial V}{\partial B_2} = -\theta \left( \frac{\partial \sigma}{\partial B_2} \right) - c_2 - \lambda (c_2) = 0, $$

$$ F_1 + c_1 B_1 + F_2 + c_2 B_2 - Q (\theta) = 0. \quad (5) $$

So, we can obtain

$$ \frac{\partial \sigma / \partial B_1}{c_1} = \frac{\partial \sigma / \partial B_2}{c_2}. \quad (6) $$

Formula (6) shows that if both financial hedging and operational hedging are used at the same time, then the marginal cost of both is equal to the marginal income, and the hedging income will be maximized.

Furthermore, formula (5) is derived, and formula (6) is substituted for formula (7):

$$ B_2^* = \frac{Q (\theta) - F_1 - F_2 - B_1 (\partial \sigma / \partial B_1)}{\partial \sigma / \partial B_2}. \quad (7) $$

Among them, $B_2^*$ is the level of operational hedging when returns reach maximize. It can be seen from formula (7) that the level of operation hedging strategy used by enterprises in order to maximize their own profits is determined by their own budget constraints and the maximum operational hedging available at present, and the ratio of marginal effect between financial hedging instruments and operational hedging instruments. From the previous theoretical analysis, it can be concluded that the use of financial hedging tools can hedge the exchange rate risk to a certain extent, but many residual risks have accumulated. Therefore, when enterprises face higher exchange rate risk, the ratio of marginal effect between financial hedging instruments and operational hedging instruments will be reduced accordingly. In this case, for the sake of maximizing profits, enterprises will reduce the scale of the use of financial instruments, or even reduce it to zero. They will also recover the fixed cost of using financial hedging tools. When enterprises achieve maximum benefits, the hedging strategy will become

$$ B_2^* = \frac{Q (\theta) - F_2}{c_2}. \quad (8) $$

Formula (8) shows that when the risk is extremely high, it will depend on the maximum operational hedging level available.

From the following theoretical analysis, we can see that financial hedging strategies and operational hedging...
methods have significant differences in the effectiveness and durability of foreign exchange risk hedging. Many experts and scholars have also proved that the risk hedging function of financial hedging means is effective only in the short term, but not in the long term [31].

2.5. Research Hypothesis

Hypothesis 1. Under the same other conditions, both financial hedging and operational hedging can reduce risks, but operational hedging has better effect and longer impact.

Of course, the conclusion of formula (7) is reached under strictly limited conditions. It requires that the types of risk exposure are exactly the same, while only considering the degree of foreign exchange risk exposure, but in practice, risk exposure is very difficult to be exactly the same. Therefore, there is still considerable controversy in the field of financial hedging and operational hedging. This has also led to a debate about whether financial hedging and operational hedging are complementary or alternative relationships. Pantazalis et al. proved that there are differences between financial hedging and operational hedging in dealing with foreign exchange risk. Financial hedging will have some effect in dealing with transaction risk in the short term, but in the long run, operational hedging should be used to effectively deal with foreign exchange risk. Through the observation of practice, we can see that the hedging exposures of the two are not entirely the same. Both hedging methods have hedging effect, and there is complementary relationship between them [18]. Lim and Heli’s studies show that financial hedging and operational hedging are more complementary than substitutive [22]. According to Garfinkel and Hankins, the hedging effect of financial hedging instruments on foreign exchange risk is obviously worse than that of operational hedging instruments. Financial hedging strategies can only hedge part of foreign exchange risk, but operational hedging is different. It can hedge all foreign exchange risks faced by enterprises. Operational hedging can cover all the risks that financial hedging can hedge. Therefore, their research holds that there is an alternative relationship between them, which only shows that operational hedging can replace financial hedging [32]. Kim et al.’s research shows that not only can business hedging increase corporate value but also companies that often use business hedging strategy are generally reluctant to use financial hedging. This study shows that there is a substitutive or complementary relationship between the two strategies [33].

Hypothesis 2. Under the same other conditions, there is an impact between financial hedging and operational hedging, but the complementary or alternative relationship is uncertain.

What kind of impact will the operational hedging and financial hedging have on the corporate profits is also the focus of this study? Zhang and Sun think that financial hedging can enhance the export earnings of enterprises but cannot significantly improve their corporate profits. The use of financial hedging can reduce the volatility of corporate profitability to some extent, but its effect is not obvious [34]. Dong thinks that the operation of hedging can directly enhance the profitability of enterprises, and the negative effect of financial hedging is greater than the positive effect, which will reduce the profitability of enterprises to a certain extent [35]. The above analysis shows that the operational hedging may have a positive impact on corporate profits, but the financial hedging will have the opposite effect. So we propose Hypothesis 3.

Hypothesis 3. Under the same other conditions, the operational hedging can improve the profitability of enterprises, but its financial hedging has a negative impact on the profitability of enterprises.

Business hedging is relatively simple and easy to operate. As long as we have the right idea, we can hedge and prevent the exchange rate risk. However, the financial hedging behavior of enterprises is subject to the development of the financial market, the volatility of the financial market, the quality of personnel, and other factors such as improper operation will be shown as negative effects on the profits of enterprises.

3. Research Design and Data Sources

3.1. Sample Selection and Data Source. The empirical research object of this study is the listed companies in Shanghai and Shenzhen, the two cities in China. This study selects listed A share construction companies (including A + B and A + H) from overseas construction income from 2011 to 2018. To ensure the scientific and rationality of the empirical results, the data obtained in this study are processed as follows: (1) overseas construction revenue of selected companies accounts for more than 5% of their total revenue. This is to ensure that the research is meaningful because the overseas income is too low, and the exchange rate risk of the company is not obvious. Its hedging meaning and hedging means are not obvious. (2) According to the “one belt and one road” plate in the flush software, the deletion is selected, while the integrity of the data is selected, and the overseas construction income of the “building decoration” plate is selected. After eliminating duplicate enterprises, the samples with missing values of individual main variables were excluded. A total of 47 companies (329 sets of data) were selected as the samples in this study.

The sample period is 2011–2018. This is mainly due to the fact that after the 18th century, the domestic economy has entered a “new normal” unlike the past political and economic environment. The fluctuation of the two-way RMB has increased. Enterprises are also facing more complex and uncertain exchange rate risks than in the past.

Data collected from listed companies, industry information, and exchange rate information are collected from SINA Finance, WIND information, and FLUSH Database.

3.2. Definition of Variables

3.2.1. Dependent Variable

(1) Enterprise risk is expressed by RISK, using the method of Dong [36] for reference. Specific
3.2.2. **Explanatory Variable.** To better study the impact of financial hedging and operational hedging on exchange rate risk, the following main explanatory variables are selected based on the study of Aabo and Ploeen [37]:

1. **Financial hedging (HC):** This indicator shows the proportion of financial derivatives purchased by the enterprises in their overseas sales revenue, and reflects the extent to which enterprises use financial hedging. Large enterprises in the United States during the period of 1994–2009 were taken by Chen and King [38] and Aabo and Ploeen [37] as research samples; the results indicated that the extent of financial hedging can be analyzed by the proportion of the number of financial derivatives purchased by enterprises to their total overseas income (or long-term assets). Given that the data of overseas long-term assets of many enterprises are not released, the availability of data is not strong. In addition, most overseas projects of overseas enterprises in China are concentrated in less-developed countries and regions; thus, the maintenance of assets is not good, and the situation of false listing of assets is serious due to different considerations. In view of these two considerations, overseas sales revenue indicator data can be easily obtained. Therefore, this indicator, financial hedging, is selected.

2. **Operational hedging (FE):** The index is calculated by the number of foreign currencies owned by enterprises. According to the research of Prashant and Chris, the more dispersed the number of foreign currencies, the more the number of countries that have foreign currencies abroad, the higher the degree of internationalization of enterprises, the wider the scope of their operations, and the more dispersed they are affected by the external exchange rate. Therefore, FE is inversely proportional to foreign exchange risk, that is, the more diversified foreign currencies enterprises own, the more internationalized they are, and the lower their exposure to foreign exchange risk [39].

3.2.3. **Control Variable.** In this research, the following variables are introduced to control and observe the empirical results in order to prevent other factors from affecting the results.

1. **Depth of hard currency holding (FD):** The index is calculated by the proportion of international hard currency held by enterprises to the money funds owned by enterprises. The stronger the ability of firms to hedge against international hard currencies (such as the dollar, the euro, the pound, and the euro). It is easier for hard currency to carry out financial hedging. On the contrary, the currencies of developing and underdeveloped countries are more difficult to hedge because of their low popularity. Therefore, the stronger the hard currency holdings in the exchange rate, the less it is affected by the fluctuation of exchange rate. Therefore, in theory, the depth of hard currency holdings (FD) should be inversely proportional to the foreign exchange risk, that is, the more concentrated the hard currency holdings, the lower the exposure of the company to foreign exchange risk.

2. **Operational breadth (OE):** The index is expressed by the natural logarithm of the number of countries involved in overseas branches. The more decentralized an enterprise’s overseas branches are, the lower the cost of exchange rate fluctuations in converting each overseas branch to another. Therefore, the operational breadth (OE) is inversely proportional to the foreign exchange risk, that is, the more decentralized the branches established abroad, the lower the exposure level of foreign exchange risk.

3. **Operation depth (OD):** This indicator represents the total number of branches in the two countries with the largest number of branches overseas, divided by the total number of branches overseas. If enterprises set up overseas branches more centralized, their overseas branch conversion costs will be higher, and the revenue will be lower accordingly. Therefore, in theory, the depth of operation (OD) should be proportional to the foreign exchange risk, that is, the more concentrated overseas branches, the more exposed enterprises are to foreign exchange risk.

4. **SIZE:** This index can be expressed by the total assets of the enterprise. The practice of enterprise management shows that large enterprises have stronger ability to resist risks because they have more resources, so they take natural logarithm to eliminate deviations.

5. **Overseas income ratio (OVERSEA):** The index is expressed by the enterprise’s overseas income/total income.

6. **The proportion of financial personnel (FPR):** This index is used to reflect the total proportion of enterprise financial personnel.

7. **The proportion of people above master’s degree in the company (MR):** This index is used to reflect the proportion of enterprise personnel with master’s degree or above.

3.3. **Model Design.** According to the above analysis and research ideas, this research constructs the following econometric model:
Formulas (9) and (10) are established to test the effects of financial hedging, operational hedging, and the relationship between financial hedging and operational hedging:

\[
RISK_{i,t} = \beta_0 + \beta_1 HC_{i,t} + \beta_2 FE_{i,t} + \beta_3 FPR_{i,t} + \beta_4 HC_{i,t}FPR_{i,t} + \beta_5 FE_{i,t}FPR_{i,t} + \beta_6 FD_{i,t} + \beta_7 OVERSEA_{i,t} + \beta_8 OE_{i,t} + \beta_9 OD_{i,t} + \beta_{10} SIZE_{i,t} + \epsilon,
\]

(9)

\[
RISK_{i,t} = \beta_0 + \beta_1 HC_{i,t} + \beta_2 FE_{i,t} + \beta_3 MR_{i,t} + \beta_4 HC_{i,t}MR_{i,t} + \beta_5 FE_{i,t}MR_{i,t} + \beta_6 FD_{i,t} + \beta_7 OVERSEA_{i,t} + \beta_8 OE_{i,t} + \beta_9 OD_{i,t} + \beta_{10} SIZE_{i,t} + \epsilon.
\]

(10)

Considering the impact of long-term risk and formulas (9) and (10), all explanatory and control variables use data with three lags.

Formulas (11) and (12) are established to test the impact of financial hedging and operational hedging on firm performance:

\[
PRMARGIN_{i,t} = \beta_0 + \beta_1 HC_{i,t} + \beta_2 FE_{i,t} + \beta_3 FPR_{i,t} + \beta_4 HC_{i,t}FPR_{i,t} + \beta_5 FE_{i,t}FPR_{i,t} + \beta_6 FD_{i,t} + \beta_7 OVERSEA_{i,t} + \beta_8 OE_{i,t} + \beta_9 OD_{i,t} + \beta_{10} SIZE_{i,t} + \epsilon,
\]

(11)

\[
PRMARGIN_{i,t} = \beta_0 + \beta_1 HC_{i,t} + \beta_2 FE_{i,t} + \beta_3 MR_{i,t} + \beta_4 HC_{i,t}MR_{i,t} + \beta_5 FE_{i,t}MR_{i,t} + \beta_6 FD_{i,t} + \beta_7 OVERSEA_{i,t} + \beta_8 OE_{i,t} + \beta_9 OD_{i,t} + \beta_{10} SIZE_{i,t} + \epsilon.
\]

(12)

All explanatory variables and control variables in formulas (11) and (12) taking into account short-term factors use data with a lag of one period.

To further test whether financial hedging and operational hedging are complementary or substitutive, Formulas (13) and (14) are established:

\[
RISK_{i,t} = \beta_0 + \beta_1 HC_{i,t} + \beta_2 FE_{i,t} + \beta_3 HC_{i,t}FE_{i,t} + \beta_4 FD_{i,t} + \beta_5 OVERSEA_{i,t} + \beta_6 OE_{i,t} + \beta_7 OD_{i,t} + \beta_{10} SIZE_{i,t} + \epsilon,
\]

(13)

\[
PRMARGIN_{i,t} = \beta_0 + \beta_1 HC_{i,t} + \beta_2 FE_{i,t} + \beta_3 HC_{i,t}FE_{i,t} + \beta_4 FD_{i,t} + \beta_5 OVERSEA_{i,t} + \beta_6 OE_{i,t} + \beta_7 OD_{i,t} + \beta_{10} SIZE_{i,t} + \epsilon.
\]

(14)

The data used in formulas (13) and (14) are current data. In order to test the sensitivity, formulas (15) and (16) were established. Meanwhile, FRP and MR indexes were deleted to reduce the possible influence of human factors:

\[
TTM_{i,t} = \beta_0 + \beta_1 HC_{i,t} + \beta_2 FE_{i,t} + \beta_3 HC_{i,t}FE_{i,t} + \beta_4 FD_{i,t} + \beta_5 OVERSEA_{i,t} + \beta_6 OE_{i,t} + \beta_7 OD_{i,t} + \beta_{8} SIZE_{i,t} + \epsilon,
\]

(15)

\[
EPS_{i,t} = \beta_0 + \beta_1 HC_{i,t} + \beta_2 FE_{i,t} + \beta_3 HC_{i,t}FE_{i,t} + \beta_4 FD_{i,t} + \beta_5 OVERSEA_{i,t} + \beta_6 OE_{i,t} + \beta_7 OD_{i,t} + \beta_{8} SIZE_{i,t} + \epsilon.
\]

(16)

4. Empirical Results and Analysis

4.1. Regression Results and Analysis

(1) Research on the impact of financial hedging and operational hedging on corporate profitability. Next, the multivariate regression analysis of relevant data is carried out. First, the results of PRMARGIN are analyzed, as shown in Table 1. The H1 and H2 in Table 1 show that the use of financial risk hedging (HC) has a negative effect on corporate profitability. There are three reasons: First, the development of China’s financial derivatives
market is relatively later than that of developed markets abroad, and the starting point is low. The use of financial hedging tools to control exchange rate risks requires a long learning process. It may show volatility for corporate earnings performance and may also show negative impact in the initial stage of application. Second, due to the limitation of the industry, construction enterprises cannot be equipped with too many professional financial personnel, and the lack of staffing will undoubtedly magnify the financial hedging risk, once the risk control is inappropriate, it will undoubtedly affect the profitability of enterprises. Third, developed countries can also rely on social mechanisms to help business management risks, such as private financial services and insurance brokers and government welfare projects, which cannot be achieved only by individual resources. Therefore, in developed countries, people actively respond to exchange rate risk by creating and investing new companies and developing new products, while emerging countries are at a disadvantage in this respect. From H1 and H2 in Table 1, we can also see that the use of operational hedging (FE) means has a positive impact on the profitability of enterprises, that is to say, the use of operational hedging means to prevent exchange rate risk is more effective. It can be seen from H1 and H2 that the result of the transfer item is significantly positive, which indicates that the higher proportion of financial personnel and high-quality personnel will play a positive role in the operation of financial hedging and operational hedging. This may be because financial personnel and high-quality personnel will play a "subtle" role in the normal and reasonable hedging operation of enterprises, proving Hypothesis 6 and H7 hypothesis. From the perspectives of hard currency holdings depth index (FD) and overseas income ratio index (OVERSEA), firms with more hard currency and higher proportion of overseas income will have a positive impact on corporate performance, but the results are not significant. From the perspective of OE, enterprises with more overseas locations are beneficial to their profitability, but the results are not significant in H1. The results of business breadth index (OD) are not significant. In terms of SIZE, large-scale enterprises do not have a positive impact on their profitability. Maybe the reason is that the difficulty of management and control of large enterprises is more difficult than that of small enterprises, and small enterprises have the advantage of "small boats turn around" to a certain extent [15].

(2) Research on the response effects of financial hedging and operational hedging. Regression analysis of enterprise risk can be found in Table 2.

From the regression results of H3 and H4 in Table 2, we can see that financial hedging (HC) and operational hedging (FE) can effectively reduce the risks that enterprises may face in the long run, and the results are remarkably effective. The results validate Hypothesis 1. From the financial personnel ratio index (FPR) and high-quality personnel ratio index (MR), moderate financial staffing and high-quality personnel team have a strong positive effect on the prevention of long-term risks of enterprises. The results are remarkably effective at the level of 1%, which is consistent with the conclusions of Zhang et al. [40]. From the results of the transfer items in H3 and H4, we can see that moderate financial staffing and high-quality personnel team can make appropriate choices for corporate financial hedging behavior and operational hedging behavior in the long run, and then play a role of risk prevention and control. Hypothesis 6 and Hypothesis 7 are proved. From the perspective of Operational Width Index (OE), diversification plays an effective role in the long-term risk prevention of enterprises, and the results are remarkably effective. From the perspective of depth of operation (OD) indicators, too much focus on a market will undoubtedly magnify the risks

### Table 1: The impact of financial hedging and operational hedging on the profitability of enterprises.

| Variables | PRMARGIN |
|-----------|-----------|
|           | H10       | H11       |
| Intercept | 0.357**   | 0.356**   |
|           | (0.004)   | (0.004)   |
| HC (−1)   | −0.063*** | −0.042**  |
|           | (0.006)   | (0.028)   |
| FE (−1)   | 0.046***  | 0.037**   |
|           | (0.010)   | (0.050)   |
| FPR (−1)  | 0.905*    |           |
|           | (0.090)   |           |
| MR (−1)   |           | 0.269*    |
|           |           | (0.056)   |
| HC*FPR (−1) | 0.061*   |           |
|           | (0.093)   |           |
| FE*FPR (−1) | 0.035**  |           |
|           | (0.048)   |           |
| HC*MR (−1) |           | 0.011*    |
|           |           | (0.096)   |
| FE*MR (−1) |           | 0.014*    |
|           |           | (0.086)   |
| FD (−1)   | 0.013     | 0.011     |
|           | (0.342)   | (0.270)   |
| Overseas (−1) | 0.25*    | 0.36      |
|           | (0.071)   | (0.347)   |
| OE (−1)   | 0.012     | 0.011**   |
|           | (0.375)   | (0.021)   |
| OD (−1)   | −0.033    | −0.032    |
|           | (0.485)   | (0.508)   |
| Size (−1) | −0.012**  | −0.011*   |
|           | (0.032)   | (0.065)   |
| Year      | Yes       | Yes       |
| Observation value | 282       | 282       |
| F         | 1.59      | 1.28      |

*Note. P values are provided in parentheses; *significant at 10% level; **significant at 5% level; ***significant at 1% level.*
that enterprises may face. The regression results of SIZE and H3 are not significant. The regression results of H4 show that large enterprises are more effective in dealing with long-term risks, and the results are effective at 5% significance level.

(3) The test of the relationship between financial hedging and operational hedging is shown in Table 3. From the regression of H5 in Table 3, it can be seen that the impact of financial hedging on corporate profits is negative, while the way of operating hedging will have a positive effect on corporate profitability, and the results are significant. This is consistent with the results of the previous verification. In addition, the cross-product terms from HC and FE are positive, and the coefficients are larger than those of HC and FE. Therefore, it can be seen that the comprehensive use of the two methods will have a positive impact on the profitability of enterprises. Financial hedging and operational hedging are complementary. This result is consistent with Dong’s research conclusion in 2016 [36]. From the regression of H6 in Table 4, we can also know that hedging (FE) can effectively reduce the risks faced by enterprises, but the results of financial hedging are not ideal. The possible reasons lie in the imperfection of the current financial system and the lack of financial professionals. The regression results of H6 also show that the comprehensive use of the two

Table 2: The response effect of financial hedging and operational hedging.

| Variables     | Risk 1 | Risk 2 |
|---------------|--------|--------|
| Intercept     | 2.784* | 2.312* |
| (0.097)       | (0.089)|        |
| HC (-3)       | −0.026*| −0.031*|
| (0.041)       | (0.054)|        |
| FE (-3)       | −0.225*| −0.182*|
| (0.071)       | (0.051)|        |
| FPR (-3)      | −70.453***|
| (p ≤ 0.001)   |        |
| MR (-3)       | −0.494*|
| (0.066)       |        |
| HC*FPR (-3)   | −0.412*|
| (0.056)       |        |
| FE*FPR (-3)   | −2.85* |
| (0.093)       |        |
| HC*MR (-3)    | 0.516  |
| (0.375)       |        |
| FE*MR (-3)    | 0.829* |
| (0.074)       |        |
| FD (-3)       | 2.062  |
| (0.203)       |        |
| Overseas (-3) | 0.102* |
| (0.086)       |        |
| OD (-3)       | 0.489**|
| (0.039)       |        |
| Size (-3)     | 0.060  |
| (0.312)       |        |
| Year          | Yes    |
| Observation value | 282  |
| F             | 2.73   |

Note. P values are provided in parentheses; *significant at 10% level; **significant at 5% level; ***significant at 1% level.

Table 3: Test of the relationship between financial hedging and operational hedging.

| Variables     | PRMARGIN | RISK  |
|---------------|----------|-------|
| Intercept     | 0.467*** |
| (0.005)       |        |
| HC            | −0.001*  |
| (0.061)       |        |
| FE            | 0.043*** |
| (0.010)       |        |
| HC*FE         | 0.163*   |
| (0.080)       |        |
| FD            | 0.102*** |
| (0.001)       |        |
| Overseas      | 0.720    |
| (0.141)       |        |
| OE            | −0.711*  |
| (0.060)       |        |
| OD            | 0.053*   |
| (0.079)       |        |
| Size          | −0.029***|
| (0.008)       |        |
| Year          | Yes      |
| Observation value | 282  |
| F             | 2.76     |

Note. P values are provided in parentheses; *significant at 10% level; **significant at 5% level; ***significant at 1% level.

Table 4: Sensitivity test results of the impact of financial hedging and operational hedging on corporate profitability and risk.

| Variables     | TTM | EPS |
|---------------|-----|-----|
| H16           |     |     |
| HC            | −0.023*|
| (0.073)       |     |
| FE            | 0.580***|
| (0.005)       |     |
| HC*FE         | 0.786***|
| (0.004)       |     |
| FD            | 0.308***|
| (0.014)       |     |
| Overseas      | 0.640|
| (0.231)       |     |
| OE            | −0.623*|
| (0.048)       |     |
| OD            | 0.037*|
| (0.086)       |     |
| Size          | −0.036***|
| (0.003)       |     |
| Year          | Yes |
| Sample size   | 282 |
| F             | 3.26 |

Note. P values are provided in parentheses; *significant at 10% level; **significant at 5% level; ***significant at 1% level.
methods can reduce the business risks faced by enterprises. The results are significant and effective at the level of 10%. It further proves that the two methods are complementary. This result is consistent with Guo’s research in 2013 [41].

4.2. Sensitivity Test. To ensure the reliability of the empirical conclusions in this study, different calculation methods are used to test them. Profitability is tested by net sales interest rate, which reflects the ratio between net profit and sales income, and is used to express the profitability of an enterprise. Risk is tested by price-earnings ratio. It is derived by dividing the share price of an enterprise by its earnings per share (EPS). It can reflect the current risks faced by an enterprise to a certain extent. Table 4 controls the effect of heteroscedasticity based on the regression results of net sales interest rate and price-earnings ratio.

From Table 4, we can see that the effect of financial hedging on corporate earnings is not good, but the effect of risk prevention is better. Operational hedging is more effective and significant for enterprise profit and risk prevention, and the conclusion is still robust, indicating that Hypothesis 1 is still reliable. In addition, we can see that the combination of HC and FE will have a positive impact on the profitability of enterprises. Financial hedging and operational hedging are complementary, which also shows that Hypothesis 3 is still reliable.

There is no substantial difference between the robustness test results and the above conclusions, so the empirical conclusions are more robust.

5. Conclusion and Enlightenment

5.1. Main Conclusions. This study focuses on the financial hedging and operational hedging of enterprises, the impact of corporate composition on the profitability and risk prevention of enterprises, and the relationship between financial hedging and operational hedging. The data of 2011–2018 of overseas construction enterprises listed in China are selected as research samples. The empirical results show that (1) There is a negative relationship between financial hedging and profitability. To test the validity of the conclusion, the sensitivity test is conducted again with net sales interest rate as a dependent variable. The negative relationship is still valid, and it is more significant in general. To test the validity of the conclusion, we use P/E ratio to test the stability of the conclusion. The negative relationship is also established, and it is more significant in general. (2) There is a positive relationship between hedging and profitability, and it is also significant after stability test. The result of hedging is negatively related to enterprise risk, which has also been tested by stability and is more significant. (3) The empirical results prove that financial hedging and operational hedging are complementary. That is to say, using two means at the same time will make enterprise risk prevention more advantageous. (4) Empirical results show that the higher proportion of financial personnel and master’s degree or above in enterprises will have a positive impact on financial hedging and operational hedging. This result has a certain guiding significance for the optimal allocation of personnel in overseas construction enterprises and the choice of hedging strategies for foreign exchange risks.

5.2. Enlightenment. This study provides the following enlightenment for overseas construction enterprises to exchange rate risk management: China’s overseas construction enterprises should give priority to operational hedging when undertaking exchange rate risk management. A comprehensive foreign exchange risk prevention strategy should be formulated, with operational hedging as the main means and financial hedging as the supplement. There are two main reasons for the formulation of this strategy: firstly, the currencies of developed countries are freely convertible currencies, and financial hedging can effectively reduce foreign exchange risk exposure, but for our overseas construction enterprises, the situation of foreign exchange risk is much more complex (our financial derivatives market is not perfect, there are few types of transactions, small-scale transactions, and few participants in the market). Under the condition that financial hedges are limited, the use of operational hedging to cope with the foreign exchange risks that enterprises may face becomes the only way for the development of enterprises. Second, from the empirical results of this research, the strategy of comprehensive use of business and financial means is of positive significance to the improvement of enterprise risk management and profitability.

Data Availability

The data used to support the findings in this study are included within the manuscript.

Conflicts of Interest

The authors declare that there are no conflicts of interest.

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