

Discussion on the Role of Finance in Financial Innovation and Its Application

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Abstract: The ever-changing financial environment at home and abroad not only puts forward new requirements for financial engineering innovation, but also provides favorable conditions for its further development. Compared with traditional finance, financial engineering is a relatively new discipline, which plays an irreplaceable role in promoting financial innovation and development based on data analysis and operational research. The application of financial engineering can give full play to its great advantages, predict the risks involved in finance in advance and emphasize finance. The timeliness and expandability of management have obvious effect on preventing financial risks, and at the same time avoid the bad development of national finance. This paper discusses the problems faced by financial engineering in financial innovation, the application of financial engineering in financial innovation and the role of financial engineering in financial innovation.

Keywords: Financial engineering, Financial innovation, Problems, Application, Function.

1. Introduction

The international financial market is undergoing certain changes, and people have put forward new goals in the application and innovation of financial engineering. As a brand-new discipline, finance combines data analysis, mathematics, operations research and other disciplines. As a comprehensive discipline, financial engineering serves all aspects of the financial process, and it plays a very important role in financial innovation. It also applies information and data platform to financial risk prevention and control and financial management.

2. Overview of Financial Engineering

2.1. Concept of financial engineering

Engineering is a new financial discipline formed in 1980s. It integrates many disciplines such as computer science, engineering and finance, pays attention to the design and development of financial products and advocates financial innovation and development. Financial engineering in a broad sense includes all kinds of technical development and engineering means in the financial field, such as financial risk management, product design, price setting, etc. Narrow sense financial engineering optimizes and reconstructs financial products by using modern mathematical technology and calculation book technology, and then shows its advantages of marketization, personalization and simple and convenient operation [1].

2.2. Functions of financial engineering

The function of finance is mainly reflected in the following aspects: First, it promotes the financial market to be gradually improved. Thanks to the deepening of the openness of the financial market, the forms of financial business are becoming more and more diversified. New demands arising from continuous innovation and market development can no longer be met by traditional financial instruments. In particular, the market monopoly barrier is formed by the traditional financial system, which leads to fewer industries of financial participants and insufficient market power[2].

Product innovation has changed with each passing day since the introduction of financial engineering, which has promoted the diversified development of financial products, expanded the scope of financial business and effectively avoided financial risks. Because of this, we can lay a solid foundation for the progress of the financial market. The second is to meet the demand of financial cost control. Only by effectively controlling the financial operation cost can we attract more financial entities and improve the financial income. Engineering focuses on the analysis and application of data information, through which the financial cost can be reduced. The increase of financial cost is formally caused by the asymmetry of link information, which shows the fairness of the market[3]. Third, if we want to strengthen the flow of financial products, we need to rely on the development of financial engineering. In terms of financial product innovation, to meet the needs of different customers, the social funds that have entered the financial market at all will be attracted, which can improve the transaction rate of financial products. For example, under the background of securitization, real estate mortgage loans can be directly converted into securities with market liquidity, thus improving market liquidity, enhancing the vitality of the market and promoting the stable development of the financial market.

3. The Role of Financial Engineering in Financial Innovation

3.1. Financial engineering improves the micro-efficiency of financial institutions

With the wider application of financial engineering in the financial market, the competition in the financial market has increased year by year, and the competition among financial institutions has gradually stepped onto the stage, forcing enterprises related to the financial industry to enter the innovation stage one after another, so that the benefits of the financial structure become more and more obvious[4].

3.2. Financial engineering improves the efficiency of the financial market

With the continuous integration of financial engineering and financial innovation, it not only increases the scale of market transactions, but also increases the types of financial markets, and significantly improves the efficiency of financial markets. On the other hand, financial engineering makes the whole world's financial markets develop to the degree of integration, and new products derived from it give financial investors more and more convenient choices.

3.3. Financial engineering improves the efficiency of financial macro-control

Thanks to the help of financial engineering, the development of financial market and financial industry is changing with each passing day, especially in effectively controlling risks. The value created by financial engineering is also very helpful to the development of financial market. It not only builds a better social welfare system, but also strengthens the macro-control of finance[5].

3.4. Effectively alleviate the asymmetry of financial information

For the financial market, information asymmetry is related to the vital interests of financial subjects. As the shareholders of the company, they need to know more about the company information than the creditors of the company. A correct market judgment just needs these economic information to be analyzed. Therefore, by setting up an appropriate incentive mechanism, the disadvantages of information asymmetry can be effectively alleviated, thus realizing the effective allocation of resources. Because of this, when designing the "signal display" mechanism, financial engineering should increase the comprehensive analysis and mastery of financial information without violating the relevant confidentiality principles. For example, by designing tradable shares, it can ensure that at some point in the future, when the issuer's share price is lower than a certain set price, the holder can sell this part of shares to the issuer at the preset price, thus achieving the effect of protecting the rights and interests of the holder. By setting a preset price, investors get an "economic signal"[6].

3.5. Transfer and redistribution of financial risks

Where there is a market, there will be risks. This is an eternal truth. Different market participants have different understandings and requirements for risks. Higher risks are usually accompanied by higher returns. Compared with those who like to challenge risks, their profits are made in price fluctuations by participating in market transactions, which makes them more willing to take high risks, while those who are risk averse seek to evade and transfer risks. For those whose market behavior is basically risk neutral, it is not affected by risk[7]. On this basis, financial engineers can optimize risks and design financial derivatives. Those who avoid risks reduce or transfer risks by paying fees. The effective way to reduce risks is for the insured to pay insurance premiums to insurance companies. Therefore, risk analysis and transfer is an important foundation for financial engineering innovation and financial products in the financial market.

4. Problems of Financial Engineering in Financial Innovation

4.1. There are fewer rational hedgers in the financial market

In recent years, with China's enterprise reform and system transition into the deep water area, many problems have been exposed in domestic enterprises, such as imperfect management system, imperfect market operation order, and irregular governance structure. These problems not only hinder the vigorous promotion and wide application of financial engineering, but also lead to a large number of rational hedgers in China's domestic financial market. Only when enterprises maintain self-sufficiency in capital flow can their potential and competitiveness in the market be fully exerted. When a company responds to the impact and challenges of the market, the important factors that affect the company's development are controlling financial risks and hedging amount. This is also of great significance for the better development of financial engineering and its application in financial innovation[8].

4.2. Lack of talents related to financial management

At present, the distribution of financial management talents in China presents a pyramid structure, with more middle and low-level financial management talents, while the number of truly experienced and high-end financial management talents is scarce[9]. The number of senior financial management talents with good market experience and operational business will be greatly increased with the acceleration of China's financial market development in the future. However, at present, our country has not paid enough attention to the construction of financial engineering education system, except that the financial engineering major in colleges and universities has not formed a mature training mode. Therefore, at the present stage, colleges and universities focus on the teaching of theoretical knowledge, and there are not many practical opportunities for students majoring in finance, or there are no practical opportunities at all, and the combination of theory and practice is relatively rare. In addition, the traditional teaching methods are still tried, and the innovative consciousness is not established in the talent cultivation.

5. Application of Financial Engineering in Financial Innovation

The essence of finance refers to the whole financial service system which adopts the method based on relevant financial principles, combines specific financial problems and characteristics, and considers the interests of all parties to meet financial needs. Therefore, swaps, options, bill issuance instruments and forward interest rate agreements meet the needs of customers to refine financial products and avoid financial risks in the period of financial innovation to a certain extent. But at the same time, we should also realize that the market competition is increasingly fierce and the financial risks are also increasing. How can financial engineers effectively design effective products according to specific conditions, how to improve the liquidity of financial products, and how to cultivate the trading market of financial products? For this reason, we need to scientifically decompose and evaluate various risks faced by customers, so as to realize the effective balance and reorganization of the relationship

between risks and benefits, and clarify and standardize them through legal contracts, so as to truly improve the financial engineering construction[10].

5.1. The application of stripping and hybridization in financial engineering

Creating a brand-new risk-benefit relationship is the key of financial engineering, and stripping, decomposition and hybridity are the common features of financial product development. The coupon of the national bonds removed from the principal was sold separately, and then SRITPs were created, while SRITPSWAP was created by merging SRITPs with swaps. Financial products contain interest-paying government bonds, which can reap fixed interest from the appearance, but in fact, investors can't easily get a return from them[11]. The reason is that interest-paying government bonds have very high transaction costs, so they generally can't invest their interest. Secondly, interest rates are generally uncertain, which hinders investors' investment activities. Therefore, the "TIGR" introduced by Merrill Lynch in 1982 replaced the interest-paying national debt with zero coupon bond, which successfully made up for the shortcomings of the interest-paying national debt.

5.2. Use financial engineering to promote its application of indexation and securitization

And interest rate income is one of the two factors that financial products pay more attention to, and interest rate is an important factor that directly determines and affects financial products. Through in-depth analysis, the fluctuation of interest rate has a great impact on traditional financial products, so this kind of product has a weak anti-risk ability, and the advantage of avoiding risks is also insufficient. Based on financial engineering, we should expand financial products and effectively apply financial instruments to stocks. In this way, financial products will not change greatly due to the change of interest rate. When the interest rate changes, financial products can use indexation to offset market fluctuations, which can make financial products and even financial markets run stably. Meanwhile, in the field of financial engineering, some fixed assets can be converted into securities through a series of legal operations. In this way, the vitality of the financial market can be enhanced, the flow of assets in the financial market will become smooth, and the activity of the financial market will be greatly improved[12].

5.3. Application of margin system in financial engineering

For traditional financial products, the financial leverage is generally insufficient, and it is difficult to obtain large financial support and customer group guarantee in market expansion. Therefore, the use of the margin system is particularly important, and it can be used to make up for the inefficient financial leverage. The margin system in finance can exert its leverage effect. In addition, the margin system will also reduce the requirements on the reserve level of financial institutions, and more funds will be attracted by it to flow into the social and financial markets, which undoubtedly plays an important role in the smooth operation of the financial system and expands the business scope of financial products. At the same time, the application of margin system can also restrict the access of financial market and restrict

speculation, which is also of great significance to the stability and supervision of the whole financial market order. The application of security deposit in financial engineering can maximize leverage, improve the liquidity and activity of financial market, and control the risks of financial market, thus making the whole financial market healthy.

5.4. Application of externalization of business statement in financial engineering

With the deepening of financial supervision, financial institutions have launched many financial products with the help of financial engineering. Of course, these products are not included in the balance sheet. Doing so can not only make financial institutions realize their desire to make profits, but also improve their asset responsibility structure. Therefore, people recognized this innovative financial product. In 1981, in order to realize currency exchange with the World Bank, IBM finally established a series of simple and standardized exchange procedures through constant standardization, thus reducing the transaction cost, expanding the financial market and promoting the development of financial products.

6. Optimization Development Strategy of China's Financial Engineering

6.1. Build a sound financial market environment

The orderly development of financial engineering requires us to establish a scientific market operation mechanism on the premise of a standardized financial environment to better help the development of financial engineering. Because of historical reasons, China's financial market started relatively late, but this way also brought us certain development advantages. We can learn advanced ways and methods, learn from the successful experience of developed countries, and at the same time start from China's national conditions to build a new financial system in line with China's development, so as to better improve China's market structure.

6.2. Accelerate the reform of modern enterprises and innovate the thinking of financial development

The innovative application of engineering needs the further deepening of enterprise reform, which urges enterprises to reposition their financial roles and create a standardized and rational competitive environment, so as to improve the development vitality of enterprises. In addition, we can also learn from the experience of financial engineering in western countries, and we should also develop investment banks in combination with China's national conditions, strengthen the research and development of financial products by operating investment banks, and fully display the role of banks as innovative subjects. In this way, the innovative energy efficiency of financial instruments can be improved, more flexible and convenient financial products can emerge as the times require, and the product needs of different market participants can be met. At the same time, the financial industry should strengthen the cultivation of financial engineers, promote financial innovation through the innovation of talents, and lay the foundation for the development of financial engineering.

7. Conclusion

To sum up, if the financial market wants to develop steadily and last for a long time, it needs financial engineering to innovate and improve the financial market constantly, and create good financial products and systems through a good financial order to ensure the better development of China's financial industry. At the same time, China still needs to continue to optimize financial engineering. For example, to provide a good financial market environment; Promote financial market reform; Accelerate the innovation of modern enterprises; Innovating the concept of financial development, etc. will promote the faster and better development of China's financial industry.

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