An Economic Analysis of the Use of Derivative Financial Instruments in Insurance Institutions

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Abstract

The transformation of the development form of the insurance market, to a certain extent, will lead to social and economic changes, combined with the actual analysis of the demand, put forward the analysis and research on the economics of the use of derivative financial instruments of insurance institutions. According to the current research direction of economics and the operation status of insurance institutions, the first basic insurance market environment analysis, combined with market changes, control analysis of the use of insurance derivatives of financial instruments economic changes in the characteristics of the trend study, the use of multi-level approach, the construction of multi-level insurance derivatives of financial instruments using the economics of the analysis model, as a basis for the eventual hedge control processing methods to achieve the economics of multi-dimensional analysis, for the subsequent derivatives of financial instruments. On the basis of this, we finally realize the economic analysis through the hedge control processing method, which provides reference basis and theoretical reference for the subsequent use of derivative financial instruments.

Keywords

Insurance Institutions, Financial Analysis, Derivative Financial Instruments, Practical Use, Economic Analysis, Economic Comparison

1. Introduction

The use of derivative financial instruments in the insurance industry will have a direct impact on social development and economic changes in interest rates, exchange rates, inflation rate fluctuation risks, and so on. The current insurance institutions and forms have fully proved the characteristics and use value of derivative financial instruments. Relevant staff effectively use the scale advantages

of insurance institutions in the use of derivative financial instruments, make full use of the efficient and flexible characteristics of derivative financial instruments, rationally construct various investment portfolios, and hedge risks for specific personalized debt products, highlighting the economic advantages of insurance institutions in the use of derivative financial instruments and providing reference and theoretical reference for economic development (Ovcharov & Matveev, 2021). In this regard, we propose an economic analysis of the use of derivative financial instruments in insurance institutions. There are a lot of derivative financial instruments in insurance institutions, from the traditional savings-type and protection-type products to gradually change to protection-type and investment-type products, which is more and more profound for the development of the social economy. At this stage, some regulatory agencies and insurance companies in China are actively innovating and constructing derivative financial instruments, and carrying out economic analysis on their use in different social environments to strengthen the derivative products from multiple angles. At this stage, some regulatory bodies and insurance companies in China are actively innovating and constructing derivative financial instruments, and carrying out economic analyses on their utilization in different social environments to strengthen the degree of innovation of derivative products from various angles and further improve the comprehensive competitive strength of insurance companies. In fact, due to their own characteristics and development advantages, the derivative financial instruments of insurance institutions are widely used to hedge risks and reduce profit fluctuations, and the scale of transactions is constantly increasing (Bartling et al., 2021). However, due to the changes in the insurance derivatives market and the adjustment of people's needs, the high complexity, and difficulty in recognizing the motives and adaptability of the derivatives themselves are gradually revealed, and the risk management effect of the derivative financial instruments is often unsatisfactory (Djambakieva, 2021). If external insurance organizations and stakeholders are unable to accurately identify the motives of derivatives and use them inappropriately, it will not only lead to a significant reduction in the quality and transparency of the current information, but will also hinder the current economic upturn, prevent stakeholders from making accurate and effective decisions, and extend the asymmetry of the internal and external information economic problems, which will affect the insurance market's investment decision-making. Efficiency improvement, risk increase, and forecast accuracy decrease (Fu et al., 2022). Therefore, this time, starting from multiple directions, we will realize multidimensional and dynamic economic analysis without using derivative financial instruments of insurance institutions in the social environment, design a relatively fair social background, and combine the characteristics of insurance derivative financial instruments to design a more flexible and changeable economic research and analysis structure, so as to obtain the most accurate and reliable analysis data and information, and push related industries to a new development step (Gruzinskaya, 2021).

Derivative financial instruments are an important direction of financial development in recent years, and their use can effectively hedge risks and improve the return of portfolio. As a professional institution of risk management, insurance institutions can better meet the risk management needs of customers by using derivative financial instruments. However, the use of derivative financial instruments also brings certain risks, such as market risk and credit risk, so insurance institutions need to be cautious when using derivative financial instruments. At present, many insurance institutions have begun to use derivative financial instruments for risk management. For example, some insurance companies buy stock index futures or options to hedge the risks caused by stock market fluctuations. In addition, some insurance companies also use derivative financial instruments to improve the return of their portfolios, such as selling put options to obtain additional income. However, the use of derivative financial instruments also needs to consider its risks. For example, if the market is unfavorable, derivative financial instruments may bring greater losses. Therefore, when using derivative financial instruments, insurance institutions need to conduct risk assessment and control to ensure that the risks are within the tolerable range, and carefully assess and control the risks.

2. An Economic Analysis of the Use of Insurance Derivative Financial Instruments

2.1. Environmental Analysis of the Basic Insurance Market

In recent years, the globalization trend of financial markets has become increasingly obvious, and international financial cooperation and exchanges have been continuously strengthened. In this context, insurance institutions can effectively avoid external risks such as exchange rate risk and interest rate risk by using derivative financial instruments to adapt to the increasingly complex and changeable market environment. With the continuous evolution of the financial market and the continuous progress of technology, the types and functions of derivative financial instruments are also enriched and improved, providing more choices and possibilities for insurance institutions (Kuzheliev, 2021). However, there are also many uncontrollable problems, which are summarized as follows: the risks of insurance derivative financial instruments (established risks and potential risks), the frequent changes in market economy, the dynamic and static economic changes of derivative financial instruments and so on. In view of the above situation, this paper analyzes the basic insurance market environment from many angles. In the process, leverage economy comparison research method, micro-level and multi-level derivative financial instruments economic change practice and hedging control are adopted, with the financial derivatives of current insurance institutions as the basic guidance, multi-angle expansion, integration with the trend of economic market change and concrete analysis. The first is the environment demand extraction. At present, with the growing demand of investors for risk management, insurance institutions need to provide more risk

management services. Derivative financial instruments, as an effective risk management tool, can help insurance institutions meet this demand, and at the same time provide more investment choices for customers (Kirillova, 2021). For example, through the use of interest rate derivatives, insurance institutions can lock in future investment returns, thereby reducing the impact of interest rate fluctuations. In addition, derivative financial instruments can be used to optimize asset portfolios and improve asset quality. Therefore, the market demand for derivative financial instruments will continue to grow, providing more development opportunities for insurance institutions (Liu, 2021). Specific types of demand are shown in Figure 1 below.

In conjunction with Figure 1, the design and validation study of the demand structure for the analysis of the economic environment for the use of financial derivatives in insurance organizations is realized. Subsequently, based on the changes in this demand, the current supply of the insurance market is determined and the actual fluctuations in the general economic situation are analyzed. On the supply side of the market, financial institutions are the main providers of derivative financial instruments (Nechyporenko, 2021). These institutions innovate and develop derivative financial products to meet the needs of different customers. To name a few: banks, securities companies, insurance companies, etc. are actively exploring and innovating in the field of derivative financial instruments and have launched a series of competitive products and services. In addition, with the rise of Internet finance, some emerging financial technology companies have also begun to get involved in the field of derivative financial instruments, further enriching the market supply (Pesta, 2022). In order to gradually achieve the balance and stability of the economy of the economy. In this process, the market price has played a regulatory role. When the demand in the insurance market increases, the price rises, thus stimulating the increase of supply; When the insurance market is oversupplied, the price falls, thus restraining the demand growth. This insurance market mechanism can effectively promote the rational allocation and utilization of corresponding derivative financial instruments and realize the setting and allocation of the economic analysis environment (Ushanov, 2021).
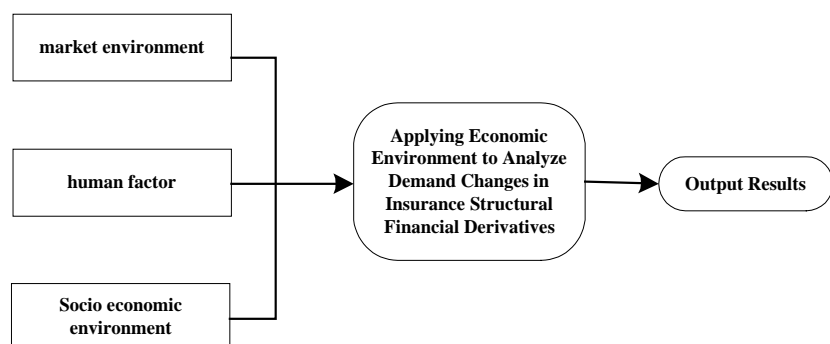

Figure 1. Graphical representation of the demand structure for the analysis of the economic environment for the use of financial derivatives in insurance structures.

2.2. Study of Trends in the Characterization of Economic Changes in the Use of Insurance Derivative Financial Instruments

After the analysis of the basic insurance market environment, next, based on the current periodic application of derivative financial instruments of insurance institutions, the characteristics of economic changes are extracted and their corresponding changing trends are analyzed. In order to ensure the authenticity and reliability of the results of this analysis and verification, based on the actual situation of financial derivatives of insurance institutions and the corresponding market conditions, we set up multiple cycles to conduct practical research and obtain data, information and data, which can be used as a reference and theoretical reference for the later research on the characteristics and trends of economic changes in the use of insurance derivatives. Information asymmetry is one of the main reasons for the formation of economic changes in the process of the use of derivative financial instruments, but the risks of various derivative financial instruments have both commonality and individuality.

In a general sense, the risks of derivative financial instruments are characterized by virtuality, contractuality, leverage, systemicity, and concealment, the main characteristics of virtual nature derivative financial instruments. As a virtual nature of capital, it is through capital concentration and capital agglomeration to achieve the scale of capital and socialization, and promote the development of productive forces; on the other hand, it has with the real economy relatively independent of the laws of motion and operating rules, derivative financial instruments transactions with a certain degree of fraudulent and speculative, increasing the uncertainty of the financial market, and then mislead the allocation of resources. This part can be compared and analyzed with the dual virtual change characteristics of the use of derivative financial instruments, as shown in Table 1 below.

Combined with Table 1, realize the comparison and analysis of the double virtual change characteristics of the use of derivative financial instruments, and subsequently, in turn, based on the part of the monetary capital that stays in this

Table 1. Comparative analysis of the characteristics of double dummy movements in the use of derivative financial instruments.

Name of dual virtual change characteristic indicators used in derivative financial instruments	Characteristics of changes in the first stage	Characteristics of changes in the second stage
Market constraints	Capital + Market + Personal Assets	Capital + Market + Personal Assets + Social Environment
Fluctuation ratio difference	2.16	3.22
Virtualization Mean	20.55	24.36
Characteristic change stage	Data collection stage + dynamic analysis stage	Dynamic analysis stage + comparison stage
Weight value	11.02	13.01

kind of securities capable of generating interest in order to obtain the ultimate profit, so that the transaction is often manifested as a pure capital game, to control the change of the virtual characteristics of the situation. Second is the insurance derivative financial instrument using economic changes in the characteristics of the contract. Because of the information asymmetry between insurance institutions and insurance traders, the party with an information advantage may have adverse selection and moral hazard behavior, which will damage the interests of the party with an information disadvantage. The adverse selection and moral hazard in the application of financial derivative transactions make the allocation of resources deviate from Pareto optimality, thus aggravating the risk degree of financial and economic markets and promoting the bubble of the economy. The current economic change trend is relatively strong.

Subsequently, there is the leverage and systemic nature of the use of insurance derivative financial instruments to characterize economic changes. Derivative financial markets are considerably larger than, or even far removed from, the primary markets for insurance, and the risks of their insurance are dramatically amplified in the primary financial instruments. Trading in insurance derivative financial products requires a very small initial net investment, and thus participants can trade huge amounts with only a small amount of margin. In other words, preservationists can find safe havens for huge financial assets with less capital, and speculators can make huge gains in this way. The systematic nature of insurance derivative financial instruments has a strong coverage nature and requires that the economically controllable risk ratio be calculated first, as shown in Equation (1) below:

$$D = \left(1 + a - \sum_{t=1}^{} \aleph t + q\right)^2 \times at \tag{1}$$

In the above formula, D denotes the economic controllable risk ratio, a denotes the economic variation margin, $\aleph$ denotes the default effect coverage, t denotes the insurance input capital, and q denotes the controllable cost. The calculation of the economically controllable risk ratio is realized in conjunction with the current test. Subsequently, within the controllable range, the risk characteristic trend control is carried out to reduce the complexity of traditional financial instruments themselves. From various perspectives, the above insurance derivative financial instruments are used to analyze the trend of economic changes in different market environments and to obtain the corresponding change data and information.

2.3. Constructing a Multilevel Model for Analyzing the Economics of Using Insurance Derivative Financial Instruments

After analyzing the trend of economic changes in the use of insurance derivative financial instruments, next, according to the actual economic analysis needs, a multi-level economic analysis model of the use of insurance derivative financial instruments is constructed. Insurance derivative financial instruments are finan-

cial contracts based on specific events or variables (such as interest rates, exchange rates, stock prices, etc.) that may occur in the future. The value of these contracts depends on the financial position of the insurance company and the future performance of the particular event or variable. Constructing a multi-level analytical model of the economics of insurance derivative financial instruments usage can help to better understand this complex financial instrument, assess its risks and potential returns, and make more informed decisions.

The first is the design of the basic layer, which mainly includes the basic characteristics, application direction, and initial economic control objectives of insurance derivative financial instruments. This part is the basic condition of the structure. In the process, we can analyze the potential economic benefits and risks of the use of insurance derivative financial instruments in combination with contract types, underlying assets, and settlement methods. The second is the risk layer: this layer includes an analysis of the financial position of the insurance company and the future performance of specific events or variables. By assessing the risk of these factors, the potential benefits and risks of the contract can be more accurately predicted at multiple levels, as shown in **Figure 2** below.

Combined with **Figure 2**, the design and validation analysis of the risk structure of the economic analysis model for the use of insurance derivative financial instruments at multiple levels is realized. Next, based on the current actual situation of the use of insurance derivative financial instruments, the economic analysis is realized from multiple perspectives. The third is the strategy layer: this layer includes the choice of investment strategy. Investors can choose different investment strategies, such as hedging, arbitrage, speculation, etc., according to their risk preferences and investment objectives. Through the model, insurance organizations can access and manage the risks associated with insurance derivative financial instruments, which to a certain extent helps to ensure that the organization maintains a sound financial position in the face of market uncertainty; the next layer is the investment decision processing, where the model can help insurance companies to make smarter investment decisions.
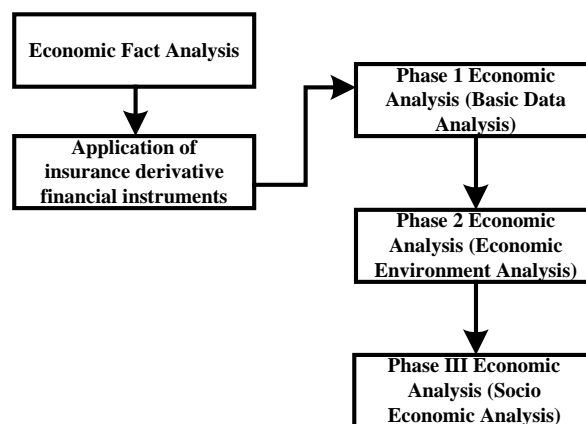

Figure 2. Illustration of the risk structure of insurance derivative financial instruments in multiple tiers using economic analysis models.

By evaluating the potential benefits and risks of contracts, insurance institutions can determine the most appropriate investment strategy, minimize the risk of using financial instruments, and improve the overall framework of economic analysis and the comparison structure of models. Generally speaking, the construction of multi-level insurance derivative financial instruments using an economic analysis model can evaluate and manage risks more accurately, formulate more sensible investment strategies, and develop new insurance products to meet customers' needs. However, the application of models also faces a number of challenges, such as data needs, technical requirements, and regulatory compliance. With the advancement of technology and the improvement of regulations, we have reason to believe that these challenges will be gradually overcome and the application of insurance derivative financial instruments will become more widespread and deeper.

It should be noted, however, that the standards for the analysis of multi-level insurance derivative financial instruments using economic analysis models are not fixed, but based on the economic risks of insurance derivative financial instruments, the current economic analysis structure is improved and optimized from both macro and micro levels. Macro mainly focuses on the analysis of fair competition market environment and perfect trading system, such as setting up a systematic clearing network in the exchange, managing and supervising a series of fund transfer activities of derivative financial instruments trading from the signing of the contract, clearing to delivery, and effectively implementing the daily settlement system to ensure the full liquidity of the market between the insurance trading day and the delivery day. It is also necessary to improve the guarantee structure of the insurance derivative financial market and standardize the management conditions of the model itself in order to prevent and reduce risks. At the micro level is the setting and detailing of model links and processes, as shown in Figure 3 below.

Based on Figure 3, we have refined and adapted the economics of insurance derivative financial instruments at multiple levels of the micro-level. Immediately, in conjunction with the current needs of economic analysis, the model is utilized to formulate contingency strategies and plans for the provision of "risk reserves" for derivative financial instruments, so that the relevant risks can be reflected to a certain extent within the model promptly, which facilitates the monitoring of risks and strengthens the authenticity and reliability of the results of the economic analysis.

2.4. Hedge Control Treatment Realizes Economic Analysis

After completing the construction of the multi-level economic analysis model of insurance derivative financial instruments, next, based on the actual economic situation, the economic analysis is finally realized by hedging and controlling. Hedging control, as a risk management strategy, aims to offset possible risks by conducting two or more reverse transactions at the same time. This strategy has
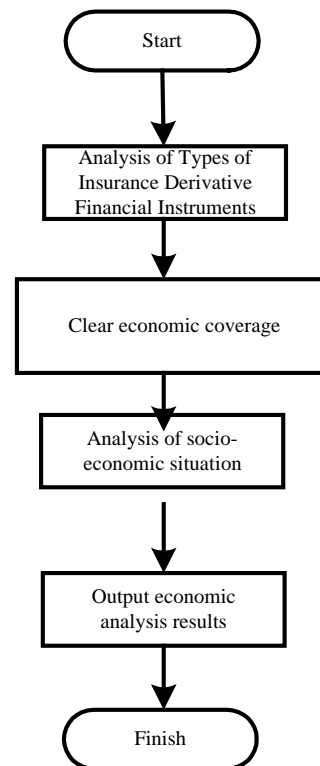
Figure 3. Micro-level multi-layer illustration of the breakdown of the economic aspects and processes of the use of insurance derivative financial instruments.

important applications in economic analysis, especially in financial derivatives markets and commodity markets. In this paper, the hedge-handling treatment is realized for economic analysis and is discussed in depth in terms of definitions, principles, methods, and applications. An operation that reduces or eliminates potential risk by simultaneously trading in reverse on two or more related markets or assets. Its core principle lies in the effective management of risk by adjusting positions in different markets or assets. In practice, the key to hedge control lies in accurately measuring risks, selecting appropriate hedging instruments, determining appropriate hedging ratios, and continuously monitoring market dynamics. First of all, it is necessary to determine whether the insurance derivative financial instruments are suitable for static hedging mode or dynamic hedging mode according to the current standards and scope of application of insurance derivative financial instruments. Static hedging refers to the establishment of a one-time reverse position based on current market conditions and risk exposures to lock in future gains or protect existing investments. The advantage of this method is that it is simple and easy to implement, but the disadvantage is that it ignores the risks that may arise from changes in market dynamics. However, it is necessary to calculate the controllable spread of the reverse position, as shown in Equation (2) below:

$$H = \sum_{u=1} cu + \frac{u^2}{W} \times \iota g \qquad (2)$$

Equation (2): H denotes the controllable difference of the reverse position, c denotes the average value of the hedge, u denotes the number of hedges, W denotes the risk controllable ratio, ι denotes the static conversion ratio, and g denotes the average value. Combined with the current controllable difference of the reverse position, as the constraint limitation standard of static hedging, adjusting the applied standard according to the current characteristics of the insurance derivative financial instruments, based on the hedging situation, conducting economic analysis from multiple perspectives, and obtaining the results of the static economic treatment. Next, is the dynamic hedging auxiliary analysis method. Dynamic hedging refers to the constant adjustment of hedging positions according to market dynamics in order to adapt to market changes and reduce potential risks. This approach has the advantage of being able to monitor insurance market dynamics and adjust strategies in real-time but requires a higher level of skill and more sophisticated analytical modeling. Compared with the static hedging approach, the coverage of dynamic hedging is a bit larger, and the target of economic analysis is clearer and more specific than the analysis of the use of insurance derivative financial instruments.

Hedging control is one of the important methods to realize economic analysis, which is widely used in financial derivatives market and commodity markets. By accurately measuring risks, selecting appropriate hedging tools, determining appropriate hedging ratios, and continuously monitoring market dynamics, economic analysis is carried out, and dynamic comparisons are made from multiple economic research angles to help investors reduce or eliminate potential risks and achieve investment goals. However, the hedging process also faces some challenges, such as market volatility, lack of liquidity, and other issues, requiring investors to respond flexibly according to the actual situation. In the future, with the continuous development of the financial market and the advancement of risk management technology, hedge control processing will have more application scenarios and broader development space. After the above analysis and practical research, the final conclusion can be drawn as follows: the use of derivative financial instruments in insurance institutions and the practice of the implementation of the most direct relationship with the changes in the economic market, and with the changes in the market risk or potential risk, the return on financial derivatives will also be greatly affected, and there is a positive relationship between the two, the trend of change is relatively more regular, with the actual value of the research and learning significance.

3. Concluding Remarks

Based on the above analysis, it is the economic analysis and verification research on the use of derivative financial instruments by insurance institutions. The application of insurance derivative financial instruments is relatively extensive and changeable, and there are great risks in the use of interest rates, exchange rates, inflation rate fluctuations, etc. Therefore, this time, a multi-dimensional and

dynamic economic analysis is realized for the use of derivative financial instruments of insurance institutions in different environments and social backgrounds. Derivative financial instruments of insurance institutions usually use insurance funds and stocks, bonds, funds, overseas assets, infrastructure, etc. to convert financial value and ideology, so in the process of using them, they will not only have an impact on investors' funds but will also prompt who economy to appear to a greater or lesser extent to promote. Recently, the overseas listing and internationalization operation of insurance institutions also make the sensitivity of insurance financial derivatives increased significantly, using multi-level, multi-objective, multi-structure for the economic correlation factors are not captured and analyzed, combined with recent years, the integration and competition development trend of the financial fields such as banking, insurance, securities, etc., to summarize the characteristics of the current market changes as well as changes in the law, to strengthen the further innovation of derivative financial products. In addition to economic analysis, we fully utilize the auxiliary analysis of forward foreign exchange contracts, forward interest rate agreements, interest rate swaps, interest rate futures, options, and various currency futures, etc., reasonably construct the combination and application of various derivative products of the insurance institutions, make substantial progress in analysis and innovation, continuously strengthen the risk-resistant capability of the derivative financial instruments of the insurance institutions, actively study the application of derivative products, and promote the improvement of the comprehensive competitive strength of the insurance industry. The comprehensive competitive strength of the insurance industry will be enhanced.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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