European Journal of Innovation in Nonformal Education (EJINE)
Volume 3 | Issue 7 | Jul - 2023 ISSN: 2795-8612

Ways to Improve the Option Market Based on the Concept of Financial Engineering

Saipnazarov Sherbek Shaylavbekovich, Ph.D
Tashkent State University of Economics, Associate Professor of the "Taxes and Insurance" Department,
sherhardcore87@gmail.com

A B S T R A C T
The article discusses the basic concepts and scope of financial engineering in the options market. The description of the main price models of options as tools of financial engineering is given. The prospects for the development of this direction in the modern financial market are outlined. The basic concepts of the derivatives market are presented, what are financial instruments, how they work and how they can be used to increase capital.

A R T I C L E I N F O
Article history:
Received 28 May 2023
Received in revised form
28 Jun 2023
Accepted 29 Jul 2023

Keywords: financial engineering, option, derivative instrument, risk, securities market, price models.

Introduction.

The main share of the source of income, which the world receives more and more through the operations of the banking system, comes through the securities market. As a key factor in this, a new concept in the world financial market can be assessed by the fact that, through the widespread use of the concept of financial engineering, an increase in the performance of options in the securities market is achieved. In world practice, the earnings they earn through the options market have maintained a trend of growth from year to year.

The issue of expanding the participation of the options market, increasing the income it receives through them, remains relevant. This situation is causing the need to pay close attention to scientific approaches to further improving the activities of developing countries in the securities market when taking their place in the world option market. In particular, the conduct of research on the creation of a financial engineering system in the options market in the analysis of the activities of each option after global economic changes after the pandemic conditions is causing an increase in the country's income in the stock market.

The spread of financial innovation is considered to be associated with the rapid development of securities markets. Derivative financial products-means are based on fundamental financial relations-credit, shares, bonds, etc.

This market is characterized not only by an increase in quantitative parameters, but also by changing quality indicators (complicating the internal structure of financial instruments, improving practical technologies).

Derivative securities are the most flexible instruments in the financial market, as they allow market participants to respond more efficiently to the changes that occur.

Analysis of literature on the topic.

One of the new areas of economic knowledge is financial engineering, which is the design of financial

instruments and financial technologies for managing a portfolio of securities. The essence of financial engineering is to create new financial products and services that are used by financial institutions to redistribute money resources, risks, liquidity, income and information in accordance with the financial needs of customers and changes in the macro and microeconomic situation. [1].

Financial engineering is the process of creating (designing and introducing into the market) new varieties of bonds and other financial instruments, taking into account the needs of liquidity (form), profitability issuers and investors, maintaining the required level of financial and other risks [2].

History of financial engineering in 1997, professors M. Shoulz and F. Black begins at the moment when he was awarded the Nobel Prize in economics for his work in the field of option valuation. M. Shoulz was first published in may 1973 by M. The shoulders model became a journal of Political Economy, a de facto standard for evaluating derivatives in financial markets worldwide [3]. Currently, Uzbekistan is considered relevant by the fact that theoretical ideas should be developed about the mechanisms for creating and using financial engineering.

R.U.Kolb, in his monograph" finansovie derivative", researched Export-import Operations with derivatives using futures as well as the risk management issue arising in the process of securities transactions and formulated a number of scientific conclusions. In his opinion, it is possible to increase the investment attractiveness of bonds, while preventing a decrease in the Real value of export receipts by concluding Option Contracts [4]. Z.According to vorobeva, it is advisable to use the following methods of financial engineering in the bond market [5]:

- method of combining multiple financial instruments into one financial product;
- method of decomposing bonds;
- method of using currency swap operas;

A derivative product as an economic phenomenon, an option tool is a relationship that arises from the agreement of participants aimed at performing any function of derivatives based on the asymmetry of the rights and obligations of two participants in the transaction.The difference according to the basics of the option (shares, currency, interest, goods, etc.) is [6].

The relevance of the study is determined by the sharp growth of the options market. Currently, the total volume of futures and options sales amounted to more than 3583068 contracts [7].

Taking into account the high ones, we can say that the development of the option market not only develops economics, but also acquires an important value in the financing of corporate structures.

Research methodology

The article uses the methods of systematic analysis, grouping, induction-deduction, logical and comparative analysis, abstract-logical thinking, statistical and factor analysis. The data of this study was obtained from official sources to study the long-term prospect of financial engineering concepts in the option market, relying on the results obtained by renowned economic scientists on a comparative analysis of scientific theoretical views on the role of services in the development of the economy, generalization of foreign experiments and achievements in our country.

Analysis and results

The independently developing part of the market consists of futures options, swaps options. Options in futures contracts provide a wide range of opportunities spot for risk insurance (hedging) in the spot and futures markets, as well as allowing operations with high returns, low costs and limited risks. Option markets provide a wide range of opportunities for investors, a convenient risk management tool, an opportunity to generate unlimited income with limited risks, and much more.

The main factors that determine the price of an option:

- The price of the main value (current and executed).
- Time before execution.

- Base price volatility (average quadratic deviation of daily price fluctuations per year).

Биржа бозорида опционлар сотиб олиш нархларида сотилади. Опцион сотиб олиш нархларига премиум ва транзакция харажатлари киради. Моделларни яратишда назарий битим учун қўшимча харажатларни (мукофотдан ташқари) ҳисобга олиш ҳақидаги саволга жавоб бериш керак ҳисобланади [9]. Опционнинг назарий нархини аниқлаш опционларни лойиҳалашда энг муҳим қадамдир. Тасдиқланган методологияга қарамай, опционлар нархини аниқлашнинг турли усуллари мавжуд. Молиявий инжинирингда ишлатиладиган опцион нархларининг иккита асосий расмий модели мавжуд.

M. Schulz's price model

European stock koll classic formula for calculating option prices to determine the fair price of an option at a discount:

* continuous

$$C = SN(d1) - Ee^{-r_f T}N(d_2)$$

* discrete

$$C = SN(d_1) - Er_f^{-T}N(d_2)$$

The proportions presented apply to:

$d_1 = \frac{lnln\frac{S}{E} + (r_f + \frac{\sigma^2}{2})T}{\sigma\sqrt{T}}$ узлуксиз ва

$d_1 = \frac{lnln\frac{S}{E} + (lnln\, r_f + \frac{\sigma^2}{2})T}{\sigma\sqrt{T}}$ дискрет чегирма;

$d_2 = d_1 - \sigma\sqrt{T}$, here *C*- option price; *E*- purchase price of the stock; *T*- option duration in years; *rf* - risk-free interest rate per year; *cm* - standard deviation of the values of the profitability of shares for the period per year; *N*(*d*)- cumulative standard normal probability distribution; *d*[and *d*2 - standardized normal variables. [10]

Blacka-Schulz's formula assesses the "fair value of an option" using the previous value of shares and applies in the "ideal state" of the Securities and options market:

- The short-term rate is determined over time and becomes constant.
- During the term of the option, dividends on the main shares are not paid.
- The movement of the stock price is random over time, and there is a supply difference in proportion to the square of the stock price. Thus, the price of shares is distributed in such a way.
- " Use of options" Europe";
- Non-availability of operational costs;
- The possibility of borrowing to buy shares;
- Lack of fines for short sales;

In this formula, the investor's willingness to take risks does not directly affect the value of the option.

Despite very broad conditions and limitations, Blacka-Shoulza found the formula to be widely used and disseminated in analytic and computational problems. Changes in exchange trading created the necessary conditions for the emergence and development of a new model and algorithm for calculating the theoretical price in option trading – the binomial model for determining the price of options presented in 1979 [11].

Binominal option price model

The Binominal model can be considered as the distribution of the sum of random variables, each of which takes one of two values: *1 C* probability *p* or 0 with probability *q*=(1-*P*)$_2$.

We give the general formulas for the Binomial distribution:

$$C = S \cdot \emptyset(a; n; p') - E \cdot e^{-rT} \cdot \emptyset(a; n; p')$$

Here ∅ binominal function or distribution function in the discrete period;

a– non-negative infinite numbers in a small increasing series;

$ln\ ln\ \frac{E}{Sd^n} \cdot\ (ln\ ln\ \frac{u}{d})^{-1}$ and

u- possible factors are the downward / upward movement of prices or the increase or decrease in the cost of the base;

n - number of discrete periods before option expiration; *r* - interest factor, risk-free interest rate on loans before the option expires $p = \frac{r'-d}{u-d}$

(where r^ ' is the percentage coefficient of one $p' = \frac{u}{r}p$

The Binominal model uses a hypothetical risk-free portfolio that generates interest income at money market rates to determine the option price. This model implies the absence of other changes in its pure form.

The basic assumption of the binominal model for option prices is that the options market is efficient, meaning that speculators cannot make excessive profits from the combination with the main tool and option when buying or selling them at the same time [12].

Meeting the large-scale needs of customers in profitability, liquidity and risk management is a key element, ensuring the reallocation of monetary resources by the stock market for excellent investment purposes, the results of the design of new financial products. The models described above are the starting point for the development and modification of formulas and algorithms for determining the option value with the futures base, with the exception of futures based on an experimental decision.

In this version of the calculation, when the option is executed, not only the futures price is deducted, but also the current futures rate for the received time point. The nature of the transitional economy of Uzbekistan and the lack of investments and its high risks in the context of the problematic financial sector indicate that financial engineering should accompany every step in the development of the securities market, strengthening its investiture potential and introducing new financial products into the market. The use of financial engineering is also due to the fact that financial markets have an innovative character. Financial innovations are also required by the modern economy, which is exposed to high risks and constantly updates its product and technological base [13]. The use of derivative financial instruments makes it possible to develop new parameters that do not contradict current legislation in the interests of investors and issuers.

Conclusions and suggestions

1. The basic concepts of financial engineering are considered,and the use of securities through options makes it possible to more flexible design of innovative financial products in the modern financial market.
2. As financial engineering tools, the main price models of options are analyzed, which makes it possible to create new parameters of financial instruments.
3. A situation arises when a cheaper way to solve foreign financial issues is necessary, in which a change in the structure of the investment portfolio, a replication of the stock index, sales without coverage, a decrease in the value of borrowing funds can be introduced.
4. The situation when a specific combination of Risk and profitability occurs, the chunonchi, guaranteed return of the entered capital, creates an opportunity to achieve non-standard dependence on Market Variables, to enter new markets.

List of literature used

1. Black F., Scholes M. The Pricing of Options and Corporate Liabilities / The Journal of Political Economy. – (1973). – V. 81. – № 3 (May). – P. 637–654.
2. Фельдман А.Б. Производные финансовые и товарные инструменты. – М. Экономика, (2008). – 486 с.
3. Cuthbertson K., Nitzsche D. Financial Engineering: Derivatives and Risk Management. – N.Y.: John Wiley & Sons, (2001). – P. 40–45.
4. David O.F. Fischer Black // HeriotWatt University. – (2007). – April. – P.
5. Stolyarov G. The Black Scholes Formula: Practice Problems and Solutions // The Actuary's Free Study Guide for Exam. – (2008). – P. 30–42.