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Pricing with the American option on the futures of stock indices to hedge the risks of price Volatilities (Analytical study in Dubai Stock Exchange)

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Abstract
The study sample consisted of five decades of futures for a number of the trap data not listed on the Stock Exchange NASDAQ Dubai Stock Exchange for a period of (18/02/2018 until 16/03/2020) . And the worth mentioning that the selection of market Dubai Securities was a means and not an end, as the goal basically is to study the Iraq Stock Exchange and how it developed using these tools , but technical reasons associated with PG Yap scientific awareness needed for programs of futures options by companies on the one hand and by the dealers In the market on the other hand, this innovative hedging mechanism is not being used With it absent are the multiple advantages that can be brought by all parties, which start with the interests of the investor and how to hedge against the losses that may be caused to him, and by using a number of financial and statistical methods using a program EXCEL And (spss) In order to analyze the study variables and test their hypotheses, the study reached a number of conclusions, perhaps the most important of them (the results of financial and statistical analysis to study future options to hedge against stock price fluctuations have proven that changes in future contract indicators in the case of purchase options that most contracts are directly proportional, i.e. within the possibility of achieving Profit either in the case of selling options, that the majority of contracts are proportional to the inverse proportion, i.e. within the possibility of making a profit as well.) ,. Accordingly, the study came out with a number of recommendations, perhaps the most important of which is the necessity to rely on (the use of hedging options on the future to achieve returns and avoid losses using the model) Barone & Whaley)
Keywords: *Hedge, Futures Options, Prices Volatility Risks, the American option*

Introduction
The study problem revolves around several questions:

1. *Do you check purchase options contracts on future data returns the largest hedge case of actual returns to the market today for stock indices in the stock market? .*
2. *Do future sell options contracts achieve a greater return in case of hedging than the actual returns of the present market of stock indices in the stock market?*
3. *Do you check purchase options contracts on futures greater returns from selling options contracts on futures in the case of hedge indices in the stock market stock?*
4. *Is the model (Barone & Whaley Able to price options in the event that the US option is used on the futures of stock indices?*

Objectives of the study
1- The use of a strategy of hedging risks in price fluctuations by using two instruments of financial derivative instruments, namely options and futures.
2- Using options on the futures of stock indexes traded in buying and selling from companies that are included in the index, the study sample, in order to avoid many losses in the event of high and low prices.
3- The use of the idea of a new mechanism through mergers between the options and the futures and analytical study of a sample of contracts for future index Abu Dhabi on NASDAQ Dubai in Dubai securities markets in order to learn how to work options on futures in that sample , and the extent of its ability to Achieving the optimal hedge for investors, to get rid of the fluctuations that occur in the financial markets and protect their investments in a better way, as it is one of the most tools that have the ability to hedge the traded stock indices .

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4- Calculating the profits and losses that can be avoided by companies when using options on the future, by calculating the difference between losses in the event that this strategy is not used, and calculating profits when using these strategies.
5- A statement of the ability when using options on futures to avoid losses and increase profits for financial markets resulting from price fluctuations.
6- The possibility of applying these tools in the stock market and how to benefit from them.

Study hypotheses

- The first hypothesis: the use of purchase options when the prices of futures contracts rise to achieve returns or avoid loss upon implementation in the future.
- The second hypothesis: the use of put options when the prices of futures contracts are low, to avoid loss upon implementation in the future.
- • The third hypothesis: that a model (Barone & Whaley) He is accurate in pricing US options contracts on the futures of stock indices .

Literature review

1- The concept of options and their nature

Options are generally defined as "legal contracts that give their bearer the right, not the obligation, to buy or sell a specified asset at a specified price on or before a predetermined date" (Francis, 1991) The investor who buys a futures contract becomes obligated to implement the future contract on the date specified in the contract. As for the investor who buys an option, he has three cases in which he can act, which are: (Rose, 1999)

- If the option is executed on or before the date so that the option becomes valuable.
- Selling an option contract in the organized market for options before the execution date.
- Without value.

2- The characteristics of the options

- The type of principal asset subject to the contract must be determined, for example identifying a specific commodity, a fixed quantity, one of the known stock indexes, a specific currency, or a number of shares.
- In the contract there are two parties who liberate the option, who is the seller, who takes a short position, and the buyer who is the owner or holder of the option, and takes a long position. (Fischer, 1996)Here there is a difference between the option editor and the option seller, the option editor is the one who sold the option for the first time, and since the option is considered like securities that are traded in the financial markets in the form of subsequent deals, the one who performs those deals is the seller But most of the sources served two terms are (the editor and the seller) for the same purpose (Fischer, 1996)
- The contract must specify the validity and effective date of the option, that is, the maturity date on which the option expires and cannot be executed after this date. (Jones, 1996)
- Determine the price at which the underlying asset will be bought and sold, i.e., the execution price, regardless of the prevailing market price, which is determined upon concluding the contract.
- Determine the price of the option, that is, the amount of the bonus amount, and for the purpose of obtaining the option an amount of money must be paid for this right. (Samueis, 1995)

3- Types of options

In terms of m promise of implementation

- The American Option Contract: where the investor can implement the contract at any time within the period that extends from the beginning of the conclusion of the contract to the date specified for the end of the contract and has the right to buy or sell a specific amount of the basic asset at an agreed price in advance, (Ramadan, 1998).
- European option contract : gives the holder the right to purchase the existing basic contract and be replaced N to implement only the day the option expires, and the maturity date is himself the implementation date, if the implementation, (Bodie, 1998) .

In terms of the nature of the contract

- The first type: buying options Call Option: In this type of options there are two parties, the first buyer of the option , a party who has the right to buy a certain number of shares of a company or a particular entity from the other party, and is determined by a certain period of time to the end of the option, at a specified price at the beginning of the conclusion of a contract option, either The other party is the option editor who sells this right to the other party, and there is nothing tangible in the purchase option with the holder, unless it is implemented, and he has no direct right to obtain the profits when distributing them, and he has no relationship with the facility, (Hindi , 2002,).
- The second type: a put option Put Option a put option is a contract that gives the right to sell a specific or specified amount of the underlying asset within a specified period and at a predetermined price, which is binding on the option writer. (Howells, 2000)

In terms of the type of the main asset

- Stock Options (Stock Options): Stock options are contracts on a number of shares for companies listed in the financial markets, and they are the most popular types of options at all and are traded in options markets around the world and are sometimes called ownership options. (Chance, 1998)
- Stock index options: - The index options are the right to buy or sell a stock price index according to a base of shares, which depends on measuring market indicators, and does not measure an index for one company's shares. (Mayo, 2001), and also depends on the price level of shares and be the writer of an option portfolio of shares of T type, and spacious.
- Currency Options: The aim of these contracts to get rid of the risk of fluctuations in currency rates in the future and give the right to buy Obea a certain type of currency during the period and the specific price in advance and by type of option if the US or Ur and Pia , (Sundaram , 1995).
- Interest rate options: - where there is an interest rate that is agreed upon upon implementation and the settlement process is carried out in cash by calculating the difference between the interest rate prevailing in the market and the interest rate upon implementation (Shaqiri, 2012).
- Goods Options: - the option of goods is a legal contract allows the holder the right to purchase a limited Obea of a particular commodity as a commodity or the amount of oil Awalzhb wheat or rice for a fixed premium at a specified price on or before the date of Mahdd.onzera the many advantages offered by commodity options.

The most important factor that affects the price of the option

1. *The price of the basic asset*: - When the execution price is fixed, the increase in the existing price in the market leads to an increase in the probability of implementing the option if it was a buy option and vice versa if it was a selling option because it has become desirable. The value of the option will also increase, so there is a direct relationship between the asset price and the value Option (Thygerson, 1993).
2. *Remaining time to expiration*: - Whenever the time is longer for the end of the option the higher the time value can Astv the d owner of the option of that time period in the case of the rise for the option of the US purchase, as well as for the decline in the case of sale option. (Chance: 2004)
3. *Risk-free interest rate*: The higher the risk-free interest rate, the higher the purchase option price, and the put option price moves in reverse with the interest rates. Thus , the increase in interest rates makes the selling option less attractive.(Chance, 1998)
4. Price fluctuation: - One of the factors that significantly affect the value of the option is fluctuation in prices. The more the price fluctuation of the shares or the existing one, this leads to an increase in the value of the option. And that the impact of the volatility of the stock price in the purchase option has the same effect in the sale option. (Al - Rubaie ,2011)
5. *execution price*: - all the decreasing rate of implementation is there is a great opportunity to make a profit and increase the value of the option, but if the execution price is high will reduce the opportunities to make a profit is buying less the value of the option, but for the option of selling in the fact that quite the opposite, (Thygerson, 1993).

Informative coverage of how to use futures and their types

Futures concept and nature: - Valmstqublaat defined as contracts concluded between the buyer and seller and that the agreement during which the sale is another in a particular end of a certain period and the price is determined between the parties. (Fisher, 1996) A future contract is an agreement between two parties to buy or sell an underlying asset at a specific time in the future at a specific price, and unlike futures contracts, futures contracts are usually traded and traded on the commercial stock exchange,(Hull, 2007)

The parties dealing in futures contracts markets: The main parties that deal in the futures market are hedging of risks from buyers and sellers, as well as speculators from sellers and buyers who seek to achieve profits, and the sellers and buyers may be themselves speculators and hedge against risks at the same time and there is a mediator. Between buyers and sellers, the settlement house is called (Al-Janabi 2006)

4- Characteristics that are characterized by contracts for future

1- The presence of fluctuations in prices, i.e. prices that are not fixed. If there is no fluctuation in prices, interest in them will decrease.

2- Appropriate information must be provided about market prices, because there is a close relationship between the money market prices and the futures market prices

3- The existence of a large money market and trading in goods with fixed markets in terms of cash 0

4- The existence of a wide supply of the asset or commodity so that no specific party can control or influence the price

5- A good design of the contract, the contract must include all aspects

6- Strong support from the stock market

7- No regulatory obstacles or barriers

8- The availability of contracts related to the price and the difference in the underlying asset, for example, the Chicago Authority trades in the future of the European dollar and treasury bills, and that there is a relationship between these two types that helps speculate with differences.

(Options over Futures): Defines options over futures (Futures on Options) That it is a contract that gives its holder the right, not the obligation, to take a position in a specified futures contract at a specified price (the option's execution price) on or before a predetermined date. (Blank, 1991) Futures options can be defined as

agreements between a buyer and seller that grant the contract holder the right to buy or sell a futures contract at a specified price, on or before the expiration date, in exchange for a specific premium ((Rose, 1997) As indicated (Bodie , 2008) It gives its holders the right to buy or sell a specified futures contract using the option's execution price as a future price, which is a slightly complicated process and since the options are binding on one side in the options contract, which is the editor's side. On the other hand, receipts contracts are binding on both sides (Francis, 1991) It was the unilateral binding of options that generated the need for the two different types of options (buy and sell) in order to cover all potential deals).Reilly, 2000). And considered options on the futures of the most important tools that help business planning, they allow investors and risk managers to identify and minimize price risk (CBOT, 2003). Options over futures are among the most successful innovations "in the financial markets. These tools combine many of the most attractive characteristics of both options as well as futures." Chance, 1998It is a financial engineering tool .Financial Innovations (Relatively recent (Dubofsky, 1992).

Methodology

1. **Financial methods**

a) Risk-free rate of return, symbolized by (RF).

b) Use of (Barone & Whaley) For the purpose of pricing US options. The pricing of the US purchase option is according to equation (1)

$$F^*-E=Ce(F^*,T;E)+\{1-e^{-rt}\,N[d1(F*)]\}F*/q\_2\ldots\ldots\ldots(1)$$

Where the (F*) Price futures critical (critical) that if increased the price of futures above, the option should be implemented immediately.

The formula pricing option of selling the US is calculated by equation (2)

$$EF^{**}=pe(F^{**},T;E)-\{[-d1(F**)]\}F**/q\_1\ldots\ldots(2)$$

Where the (F **) Price futures critical (critical) that if dropped the price of futures plasticity, the option of selling should be implemented immediately.

c) Beta coefficient (Beta), and abbreviated by the symbol (i). According to the equation (3)

$$(\beta_i)=\left(\frac{\delta y}{\delta x}\right)pim\ldots\ldots\ldots\ldots\ldots\ldots(3)$$

Results

1- Examining the implementation of futures options by employing hedging with the US option for futures contracts: Analytical coverage

Table No. (1) Shows the contracts for the purchase option through hedging the US option for futures contracts

Sequence and dates of contracts	Execution price	The index is at the highest contract value	Buy option premium	No return without hedging	Return on hedge	Option formula
First decade	4436	4939	120.8849	503	382.115	ITM
Second decade	4820	4993	57.27319	173	115.73	ITM
A to hold the third	4957	5434	82.50986	477	394.491	ITM
A to hold the fourth	5034	5108	63.73204	74	10.27	ITM
A to hold the fifth	4976	5135	29.42668	159	129.57	ITM
Total			704.3992	2842	2137.601	

Table (1) shows the contracts for the study sample, which consist of five contracts for the futures of Abu Dhabi stock indices for a number of companies listed on Nasdaq Dubai.

As this table shows the US buying options, it is noticed in the first contract for the US purchase option for the futures contract for the stock indices for the year 2018 : that there is a clear increase in the value of the Abu Dhabi Futures Index on the Nasdaq Dubai Stock Exchange, as it reached the highest value of the contract (4939) Compared with the price at the beginning of the contract (execution price) of its value)4436), And since the hedging strategy used can be used in the event of an increase in prices during the period of concluding the contract, and that the purchase option used is the American way,

And in the second decade of the US purchase option for the futures contract of 2018 : as it is noticed that there is a clear increase in the value of the Abu Dhabi Futures Index on Nasdaq Dubai, as it reached the highest value during the term of the contract (4993(When using the US method, compared to the previously agreed execution price of the amount)4820), In this case, the hedging strategy used can be used as a result of the price increase during the contract period, and that the option is within the possibility of making a profit (IMT), It is possible to implement and benefit from that increase in the index value throughout the contract period, and the total difference between the implementation price and the highest value of the index has reached173(And after subtracting or not the value of the purchase option premium for execution or not of which it is worth)57.27319(So the net profit achieved through the use of options on the futures of this contract)115.73It is considered a good investment environment for investors to achieve profits and avoid or limit losses, as well as benefit from the favorable movements of the index.

In the third decade for the US purchase option for the futures contract for the year 2019 : - It is also noted that there is a clear increase in the value of the Abu Dhabi Futures Index on Nasdaq Dubai, as it reached the highest value of the contract (5434(Compared to the execution price that was agreed upon at the beginning of concluding the contract at a value)4957Therefore, the hedging strategy used can be used when prices increase during the contract period, so the option is within the possibility of making a profit (IMT), Then it is possible to implement and benefit from that increase in the value of the index throughout the period of concluding the contract, so the total difference between the predetermined execution price and the highest value of the index that was chosen in light of the method of the ordering option is the adult (477(And after subtracting the amount of the purchase option premium paid to the editor)82.50986(So the net profit achieved through the use of options on the futures of this contract is equivalent to)394.491Therefore, the investment environment in this case is good for investors, and it achieves profits for them and avoids losses, as well as taking advantage of the favorable movements of the index .

The fourth decade for the US purchase option for the futures contract for the year 2019 : It appears from this contract that there is a clear increase in the value of the Abu Dhabi Futures Index on Nasdaq Dubai, as the highest value of the contract was tested (5108(According to the US method options compared to the predetermined execution price, which amounted to)5034Therefore, the hedging strategy used can be used when prices increase during the term of the concluded contract, so the option is within the possibility of making a profit (IMT), It is possible to implement and benefit from this increase in the value of the index during the contract period, so the total difference between the implementation price and the highest value of the index is74(And after subtracting the value of the purchase option premium of which it is worth)63.73204(So the net profit achieved through the use of options on the futures of the contract)10.27It will be a good investment environment for investors, and it will achieve profits for them and avoid losses, as well as benefit from the favorable movements of the index .

As for the fifth decade for the US purchase option for the futures contract for the year 2020 : Table 4 shows the data of this contract that there is a clear increase in the value of the Abu Dhabi Futures Index on Nasdaq Dubai, where the highest value of the contract reached (5135(According to the US option method, compared to the predetermined execution price and amount)4976Therefore, the hedging strategy used can be used when prices rise during the contract period, and that the option is within the possibility of making a profit (IMT), It is possible to implement and benefit from this increase in the value of the index during the contract period, so the total difference between the implementation price and the highest value of the index is159(And after subtracting the value of the purchase option premium of which it is worth)29.42668(So the net profit achieved through the use of options on the futures of this contract)129.57Therefore, the investment environment is appropriate and available for investors to achieve profits and hedge them from losses if they are in the undesired direction.

Table No. (2) shows the contracts for a put option through hedging the US option for futures contracts

Contracts	Execution price	The lowest value of the contract	Sell option premium	No return without hedging	Return on hedge	Option formula
First decade	4436	4436	99.46689	0	)99.47(	OTM
Second decade	4820	4676	186.2278	(144)	)42.23(	OTM
A to hold the third	4957	4741	166.3445	(216)	49.656	ITM
A to hold the fourth	5034	4925	190.264	(109)	(81.264)	OTM
A to hold the fifth	4976	3321	266.9814	(1655)	1388.02	ITM
Total				(4235)	2399.43	

Table (2) shows the contracts for the put option through the employment of hedging the US option for futures contracts

As for the first contract for the US sale option for the futures contract for the year 2018 : - It turns out that there is no less than the execution price in the value of the Abu Dhabi Futures Index on Nasdaq Dubai in that decade, as it reached the lowest value of the contract (4436(Compared with the price at the beginning of the contract (execution price) which is also worth)4436), And since the hedging strategy used can be used in the event of low prices throughout the term of the contract, and that the selling option used is the American method, meaning the possibility of implementation at any time

During the life of the option, so the put option is outside the possibility of making a profit (OMT Therefore, it is not possible to implement and benefit from this contract because there is no decrease in the value of the index during the period of the contract, so the total difference between the execution price and the lowest value of the index in the case of sale in the present market is (0(In the case of hedging, the value of the sale option premium agreed upon and paid in advance shall be subtracted to the editor and whose value is)99.47Then the net loss realized through the use of options on the futures is the amount of the premium only

Which is (99.47The option is left without implementation, and it is noticed through the use of hedging options on futures that the amount of loss is specified and cannot be exceeded by more than the amount of the bonus paid to the editor at the beginning of the contract conclusion.

As for the second decade of the US selling option for the futures contract for the year 2018 : - It was found that there is a clear decrease in the value of the Abu Dhabi Futures Index on Nasdaq Dubai, as it reached the lowest value of the contract (4676(Compared with the price at the beginning of the contract (execution price) of its value)4820), And since the hedging strategy used can be used when prices drop throughout the contract term, but nevertheless, the option is outside the possibility of making a profit (OMT However, the sale option can be executed and benefit from the decrease in the index value during the contract period for the purpose of reducing or reducing the loss represented by the option premium paid in advance to the option editor, and the loss reached in the present market through direct selling, which can be measured from the difference between the price Implementation and the lowest value of the index (144(As for when hedging after subtracting the value of the sale option premium of its value)186.2278(So there will be a net loss realized when using options on the future for this contract)42.23) Here it notes that , despite the decline in the index values because they occurred the loss represented the bulk of the amount of the premium paid at the beginning of the contract , so be a good investment environment for investors to limit or to reduce the portion of the loss (option premium).

As for the third decade of the US selling option for the futures contract for the year 2019 : It is evident that there is a clear decrease in the value of the Abu Dhabi Futures Index on Nasdaq Dubai, as it reached the lowest value of the contract (4741(Compared to the predetermined execution price of its value)4957), So the strategy used hedging can be used at lower prices during the contract period, and that the option of selling Bastak as long as the US option contracts Almst QB lei, so this option is within the possibility of making a profit (IMT), And it is possible to implement and benefit from the decline in the index value throughout the contract period, so the total difference between the execution price and the lowest value of the index is216(In the present market, either in the case of hedging and after subtracting the value of the purchase option premium of its value)166.3445(So the net profit achieved through the use of options on the futures of this contract)49.656Therefore, an investment environment is available for investors, as it achieves profits for them and avoids losses, as well as taking advantage of the favorable movements of the index.

The fourth decade for the US selling option for the futures contract for the year 2019 : It is noticed that there is a clear decrease in the value of the Abu Dhabi Futures Index on Nasdaq Dubai, as it reached the lowest value of the contract (4925(Compared with the price at the beginning of the contract (execution price) of its value)5034), And since the hedging strategy used can be used when prices drop during the contract period in the case of a put option, nevertheless it is noted that the option is outside the possibility of making a profit (OMT(However, it is possible to implement and benefit from this decrease in the value of the index throughout the contract period, in the present market the loss amounted to)109(This is through the difference between the execution price and the lowest value of the index according to the American option, as the lowest price is chosen at any time during the contract period, but when hedging, the value of the sale option premium is subtracted in exchange for obtaining the hedging instrument with futures options of the value of which is) 190.264(So the net realized loss of the contract)81.264It is noticed that the loss in the present market is considered a profit in the future market, so the loss has been reduced from190.264 to me 81.264 Therefore, it is a good investment environment for investors to limit or reduce losses.

The fifth decade for the US selling option for the futures contract for the year 2020 : - It is noted that there is a significant and clear decrease in the value of the Abu Dhabi Futures Index on Nasdaq Dubai, as it reached the lowest value of the contract (3321(Compared with the price at the beginning of the contract (execution price) of its value)4976), And since the hedging strategy used can be used when prices drop during the contract period, and the selling option used is in the American way, so the option is within the possibility of making a profit (IMT), It is possible to implement and benefit from the decrease in the value of the index throughout the contract period, so the difference between the predetermined implementation price and the lowest value of the index is1655(In the present market, as for hedging, the value of the option premium can be subtracted, which is worth)266.9814(So the net profit realized as a result of using options on the futures

of the contract is)1388.02Therefore, it is a good investment environment for investors, as it achieves profits for them and avoids losses, as well as can benefit from the movements favorable to the index. It is noticed that there is a very large decline in that decade and that the reason for this decrease is due to the emergence of the Corona pandemic and its impact on the global economy that affected most countries of the world It also notes the effectiveness of hedging using options on the futures and hedging avoiding large losses from future price fluctuations. It also notes the effectiveness of hedging by using options on the futures and hedge avoiding large losses and future price fluctuations. The result in the case of non-hedging (the present market) is a loss of amount (4235) as for when hedging from price fluctuations by choosing to sell the US to futures contracts, the result was a profit 2399.43.

2. Risk measures chi a Rat contract futures (sensitivity indicators)

In this topic ,Greek female teachers will be employed) Parameters Greeks. This is to define and measure futures options contracts whose usefulness is focused in diagnosing the concept of portfolio sensitivity that is formed as a result of the main asset related to changes in market conditions, which occur as a result of fluctuations in prices and result in a change in the share price only, and this is reflected in stock indices .To measure the different dimensions of the risk of futures options contracts, the five Greek parameters can be used, which are based on the basic function of hedging the portfolio, which consists of the basic assets of the main risks surrounding it) (Ieentvaar : 2003) (Kurla : 2011) And these five Greek parameters are :

1- Delta (Delta) through the equation below, related to the parameter Delta, it is possible to find a measure of the sensitivity of the option contract price to the basic share price, as shown below:

So that

Represents the first mathematical derivative

When any change in the price of the contract occurs, whether in the case of buying or selling, it causes an increase or decrease in the amount of one unit of the share price, and that the main use of the change (delta) is to form a hedged position, that is, to estimate the number of options for the required future contracts that provide Full coverage of ordinary shares, and in most cases, the share price is unstable as it fluctuates between high and low and is much higher than what is required to calculate ( ) movements described as very simple, this fluctuation is another type of risk that is difficult to measure by Delta, and to overcome this The problem can be used another parameter called gamma (Gamma) It is symbolized by a symbol .

2- Gamma (Gamma**)**

The gamma parameter (Gamma) to measure the size of the expected change in a parameter) (For any option contract is available on futures contracts for stock indices, where the parameter takes the following form:

So that

Constant value equal to (3.1415927)

When you get any change in the contract price in both cases the case of purchase or sale case, cause a rise of p or m decline may be a Rh and one unit of the stock price .

3- Vega (Vega)

The primary use of the vega parameter is to measure the price of the futures option contract for the available variables in the degree of volatility of the basic stock price according to the following mathematical equation:

When you get any change in your contract price in both cases, whether the case of purchase or sale case, cause a rise of p or m decline may be a Rh and one unit of the stock price. That is, there is a direct relationship between the price of the option contract and the degree of volatility, as the lower the degree of volatility of the stock price available, the lower the price of the option contract and vice versa .

4- Theta (theta)

This parameter is used to measure the sensitivity of the price premium of the available future option for the duration of the time period, so that if the available option expires , then the time value of that option becomes equal to zero . That is, there is an inverse relationship between the price of the available futures option contract and the time (t). The theta parameter is calculated by the following mathematical formula:

5- Ru (Rho)

The Ru teacher focuses on measuring the impact on the price of contract option futures available to changes that occur in interest rates, as the price of a contract change option available Bmekd a t single unit due to changes in interest rates by one unit, find Ru parameter can be through the following mathematical equations:

- Parameter RU value when buying a stock index futures option

- Parameter RU value when selling equity indices futures option

Measuring the risk of the option of buying contracts of futures available

Table No. (3) Shows the measurement of the risk of buying option for the available futures contracts

Contracts	Delta	Gamma	Vega	Theta	Rho
The first decade	0.05451757	0.003890314	243.8541	1.007397	60.15826
Second decade	0.7993388	0.00861092	657.1246	100.8092	968.3575
The third decade	0.5352664	0.01225852	979.725	55.41947	665.1884
A fourth decade	0.7629071	0.009154813	760.7935	97.65055	964.9178
Fifth decade	0.9613736	0.001904561	157.0004	143.4426	1204.453

In the first contract of futures options , the value Delta Equal to (0.05451757), which indicates that the price of the call option contract increases by (5%) when the share price changes by one unit . But in the second decade of buying options futures contracts it is noticed that the value Delta Equal to (0.7993388), which indicates that the price of the call option contract increases by (80%) when the share price changes by one unit . While valuableDelta In the third decade , the futures contract purchase options decreased to (0.5352664), which explains that the price of the call option contract increases by (54%) when the share price changes by one unit , and this is what supports the fluctuations of stock prices, sometimes rising and at other times decreasing .. But in the fourth decade for options to buy futures contracts it is noted that the value Delta It rose from its predecessor, reaching (0.7629071), which indicates that the price of the call option contract for futures contracts rose by (76%) when the share price changed by one unit. Whereas in the fifth decade for options to buy futures contracts the value increased Delta Substantially from its predecessor as it reached (0.9613736) , which shows that the price of the purchase option contract increase by 96% when the change indicators of a share by a single unit . P notes from the foregoing that Delta My direct proportionality is proportional to the stock prices and indices.

While the values of gamma (Gamma(Which is concerned with measuring the magnitude of the expected change in the delta parameter)Delta), Where he notes details of the results of gamma values (Gamma(As shown in the above table : In the first contract for futures contract purchase options, it is noticed that Gamma) Gamma(It measures the magnitude of the expected change of the delta parameter) Delta) Worth (0.003890314), but in the second decade of options for the purchase of futures contracts noted that the size of the amount of change expected parameter delta (Delta) Equal to (0.00861092), either in the contract third options for the purchase of futures contracts in the gamma (Gamma(It measures the magnitude of the expected change of the delta parameter) Delta(Which is equal to (0.01225852) , but in the fourth decade for futures contract purchase options, it is noticed that Gamma (Gamma(It measures the magnitude of the expected change of the delta parameter) Delta) Which my Sawi (0.009154813), and finally in the contract V options for the purchase of futures contracts that measure Ka what (Gamma(The magnitude of the expected change of the delta parameter (Delta) By (0.001904561) ,. It is known that parameter values (Vega) It specializes in finding price sensitivity as a result of the change in the degree of volatility of the stock price available, as it is noticed that the stock indices for future options sometimes rise and at other times decrease, as he notes the details of the results of the values (Vega) As shown in the table above : as the

While in the first contract for options to buy futures contracts, it is noticed that the amount of the value is a parameter (Vega) it was equal to (243.8541). This means measuring the price of the futures option contract for the available variables in the degree of volatility of the basic share price, while in the second decade for options to buy futures contracts, a parameter value increased (Vega) Equal to (657.1246) and that this rise and fall is evidence of stock price fluctuations, and thus the stock indices in the Abu Dhabi Nasdaq Dubai market. Therefore, hedging was used against the risks of price fluctuations , but in the third decade for options to buy futures contracts , the amount of a parameter increased) Vega) To (979.725), while in the contract fourth options for the purchase of futures contracts was the amount of value parameter (Vega) Equal to (760.7935) as the parameter value increased) Vega) From its predecessor by more than)738) , And finally in the fifth decade for futures contract purchase options, it is noticed that the amount of the value is parameter (Vega) Ka Net v Sao j (157.0004) That is, it decreased from the previous one, meaning that the measurement of the futures option contract price of the available variables in the degree of volatility of the basic share price decreased in this decade and from the results shown in the above table it is noticed that there is a clear direct relationship between the price of the call option contract for futures contracts and the degree of volatility in the share price .

As for the theta parameter theta Which specializes in measuring the sensitivity of calculating the price of options for holding futures during periods different time , through the results shown in the table above notes that there is an inverse relationship between the contract price and time dealing in some Ala s and d . Q , in the first contract for options to purchase futures contracts, it is noticed that the value theta It is equal to (1.007397) as this result indicates a mismatch with the theory in terms of the existence of an inverse relationship between the contract price and time , but in the second decade for options to buy futures contracts it is noticed that the value of theta It is equal to (100.8092) as this result indicates a mismatch with

the theory in terms of the existence of an inverse relationship between the contract price and time , and also in the third contract for options to buy futures contracts, it is noticed that the value of theta Equal to (55.41947) . This result indicates a mismatch with the theory in terms of an inverse relationship between the contract price and time, but in the contract fourth options for the purchase of futures contracts noted that the value of theta Equal to (97.65055) . This result indicates a mismatch with the theory in terms of an inverse relationship between the contract price and time, as well as in the contract V options for the purchase of futures contracts noted that the value of theta It is equal to (143.4426), where this result indicates a mismatch with the theory in terms of the existence of an inverse relationship between the contract price and time .

As for the value of the parameter R (Rho) That employ to calculate the affected contract price change winning interest rate , through the results shown in Table (1) notes that the amounts of Ru parameter values) Rho (Through options contracts for futures as shown below : In the first decade of options for the purchase of futures contracts noted that the value of Ru) Rho) Equal to (60.15826 ,(And also in the second contract for options to buy futures contracts, it is noticed that the value of R) Rho) Equal to (968.3575 ,(And in the third decade for futures contract purchase options, it is noted that the value of R) Rho) Equal to (665.1884)As for the fourth decade for options to purchase futures contracts, it is noted that the value of R (Rho) Equal to (964.9178 ,(And in the fifth decade for futures contract purchase options, it is noted that the value of R) Rho) Equal to (1204.453 (Since the interest rate is not fixed but variable in all the duration of the periods of time under study , so the value of Ru) Rho(Affect effectively in the contract price.

4. Measuring the risks of selling options contracts of available futures contracts

Table No. (4) shows the measurement of the risk of selling options for futures contracts

Contracts	Delta	Gamma	Vega	Theta	Rho
The first decade	-0.9336777	0.003890314	243.8541	-129.4133	-1044.498
Second decade	-0.1888564	0.00861092	657.1246	-44.43324	-231.3821
The third decade	-0.452929	0.01225852	979.725	-92.79345	-568.6517
Fourth decade	-0.2252881	0.009154813	760.7935	-53.84391	-288.088
Fifth decade	-0.02682162	0.001904561	157.0004	-8.097358	- 34.11661

Through the results presented in Table (4) it is noticed that the delta values (Delta) It is classified according to the following:

In the first contract for options to sell futures contracts, it is noted that the value of (Delta(Equal to (-0.9336777), which indicates that the price of the available contract decreases approximately by (93%) when the share price changes by one unit , and in the second contract for options to sell futures contracts is a value (Delta(B) the amount of (-0.1888564), which indicates that the price of the available contract decreases approximately by (19%) when the share price changes by one unit , and in the third decade the options for selling futures contracts became valuable (Delta) Equal to (-0.452929), which indicates that the available contract price decreases approximately by (45%) when the share price changes by one unit , and in the fourth decade for options to sell futures contracts the value is (Delta) Equal to (-0.2252881), which indicates that the price of the available contract decreases approximately by (23%) when the share price changes by one unit , and finally in the fifth decade for options to sell futures contracts was a value) Delta) V Sawi (-0.02682162) showing that the contract price is available almost reduced by (2.7%) when the stock price changed by one unit ,

As for the value of gamma (Gamma (Q) It is known that it focuses on measuring the magnitude of the expected change in the delta parameter. Delta Consequently , and through the results presented in Table (2), it is possible to present the values of gamma during the various contracts as follows : In the first contract for options to sell futures contracts, it is noticed that the value of gamma (Gamma(It measures the magnitude of the expected change of the delta parameter equal to)0.003890314(, And in the second contract for options to sell futures contracts, it is noticed that the value of gamma) Gamma(It measures the magnitude of the expected change of the delta parameter and its value) 0.00861092(, And in the third contract for options to sell futures contracts, it is noted that the value of gamma (Gamma) Measures the magnitude of the expected change of the delta parameter equal to)0.01225852(, And in the fourth decade for options to sell futures contracts it is noticed that the value of gamma (Gamma) It measures the magnitude of the expected change of the delta parameter, which amounted to)0.009154813(As for the fifth contract for options to sell futures contracts, it is noticed that the value of gamma) Gamma(Measures the magnitude of the expected change of the delta parameter by)0.001904561) .

As for a teacher (Vega) Focuses on measuring the value of price sensitivity as a result of the change in the degree of volatility of the share price , and through the results shown in Table (2) that refer to the parameter)Vega) And how much is shown:

Q in the first decade of options for the sale of futures contracts noted that the value of (Vega) Amounted to (243.8541), and in the second decade of options for the sale of futures contracts noted that the value of (Vega) T. Sawi (657.1246), and contract third options for the sale of futures contracts noted that the value of (Vega) Amounted to (979.725), and in the contract fourth options for the sale of futures contracts noted that the value of (Vega(Equal to (760.7935), and in the fifth decade for options to sell futures contracts it is

noticed that (Vega) Price sensitivity measures the result of the change in the degree of volatility of the share price, which amounted to (157,000).

From the results shown in the above table, it is noted that there is a clear direct relationship between the price of the option and the degree of volatility.

As for a teacher theta it focuses on measuring the sensitivity of the contract price during the extended time yeh different, through the results shown in Table (2) came theta parameter results as follows:

It is noted in the first contract that options for selling futures contracts were valuable theta Equal to (-129.4133) and this indicates that there is a match with the theory in terms of the existence of an inverse relationship between the contract price and time , and in the second decade the options for selling futures contracts were valuable theta Equal to (-44.43324) and this also indicates that there is a congruence with the theory in terms of the existence of an inverse relationship between the contract price and the time , and in the third contract the options for selling futures contracts were valuable theta Equal to (-92.79345) This indicates that there is a congruence with the theory in terms of an inverse relationship between the contract price and time , and in the fourth decade the options for selling futures contracts were valuable theta Equal to (-53.84391) and also there is a match with the theory in terms of an inverse relationship between the contract price and time , and finally in the contract V options for the sale of futures contracts for the value of theta Equal to (-8.097358) This indicates that there is a match with the theory in terms of the existence of an inverse relationship between the contract price and time .

The parameter RU (Rho) To focus on measuring the affected contract price as a result of a change in the interest rate, according to the results shown in Table (2), can be arranged Ru parameter values (Rho) According to the following:

Q in the first decade of options for the sale of futures contracts noted that the value of Ru (Rho(Equal to)-1044.498(As for the second contract for options to sell futures contracts, it is noted that the value of R) Rho(Equal to)-231.3821) , And in the third contract for options to sell futures contracts, it is noted that the value of R (Rho(Equal to)-568.6517), And in the fourth decade for options to sell futures contracts, the value of Ro (Rho(Equal to)-288.088Finally , in the fifth decade for options to sell futures contracts, it is noticed that the value of R (Rho(Equal to)- 34.11661), It is known that interest rates are not fixed , but variable during the tide of under study , so the teacher Ru (Rho) Will affect effectively to the contract price

Conclusions

1. It seems that hedging with futures options is the closest tool to explaining the process of hedging the risks of fluctuations in stock prices, whether hedging is the option of buying or selling.
2. The results of the financial and statistical analysis to study future options to hedge against stock price fluctuations have proven that changes in futures contract indicators in the case of purchase options are that most contracts are directly proportional, meaning within the possibility of making a profit, but in the case of selling options, the majority of contracts are proportional to an inverse proportion, i.e. within the possibility of making a profit as well. .
3. Demonstrated the results of a study of hedge options futures in the case of the use of purchase options at higher futures contract prices to achieve returns or avoid loss when future implementation, and inference on it through the returns achieved for most of the contracts or reduce losses if the price direction is desirable, and this is evidenced by the first hypothesis To study.
4. The results of the study of hedging with futures options in the case of using selling options when the prices of futures contracts decreased, achieving returns or avoiding loss when executing in the future, and this is inferred through the returns achieved for most contracts or reducing losses if the prices were in the unwanted direction, and this is what has been proven A hypothesis for the second study.
5. Based on the results of the analysis of all futures contracts, the five study sample for companies listed on the Abu Dhabi Stock Exchange, Nasdaq Dubai, proved in practice that the model (Barone & Whaley) It is accurate in pricing US options contracts on the futures of stock indices, and this is what the third hypothesis proved .
6. The necessity to rely on futures options to hedge against price fluctuations and obtain returns or reduce losses to a minimum if the prices are in the unwanted direction in both cases (the option to buy or sell), especially in inefficient financial markets such as the Iraq Stock Exchange , and because these tools are among the Financial engineering tools that provide investors with security in the financial markets, and even contribute to the hedging process and instill confidence among investors when using them.
7. The need for companies, especially in inefficient financial markets, to use options tools on futures contracts to achieve returns or reduce losses to a minimum. Especially when using the US option model in the pricing process.
8. The need to educate the Iraqi investment community, through workshops and seminars, of the full practical dimensions of using financial derivative tools in general and options for futures in particular, and their role in the growth of companies and the development of the economy as a whole.
9. The necessity of subjecting dealers in the Iraq Stock Exchange is to intensive scientific courses in the field of analyzing and evaluating investment in ordinary shares with a focus on financial derivative tools, because

upgrading the professionalism and professionalism of market participants is the basic condition for improving market efficiency and its future growth.

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