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A Study of Hypothesis Testing On the Black-Scholes Option Pricing Model

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Abstract: The analysis of the financial market has been one of the primary concerns of academics for the last few decades. Trading activity in the stock market has risen dramatically in recent years which contributes to high volatility in the option values. With the ongoing growth of the financial market in today's globe, there has been a continual creation of numerous financial instruments. Derivative investment is an essential component of the stock market. There are several forms of derivatives that may be utilized for risk management, speculation, and position hedging. Derivatives may frequently be acquired on margin, which is borrowed money, making them much less expensive. So that derivatives trading become more popular during the pandemic covid-19 period. This research is to investigate the derivative option contract. An option contract is an agreement between two parties to purchase or sell an asset at a defined future date and price. This research also studies the uses of Black-Scholes model of option's prices formula, compute the theoretical prices of options of the stocks by using Black-Scholes Option Pricing models and the significant difference between Black-Scholes Option Pricing models prices and the actual option's prices. The world of financial derivatives can differ greatly from one another. Option derivative trading is the most important component in this research. This research will use Black-Scholes Model to find the fair price of the underlying assets. The data are collected from the KLSE screener. The data was processed by the SPSS software to compute the paired sample t-test. It was found that there was a significant difference between the Black Scholes Option Pricing Models and the actual option's price at a 95% significant level.

Keywords: Black Scholes Option Pricing Model, Derivatives Trading, Paired Sample T-test

1. Introduction

The meaning of financial is related to finance. Finance is a general concept that encompasses banking, leverage or debt, capital markets, assets, and investments [1]. Derivatives is one of components in the investments. Derivatives are a booming sector with solutions to meet almost every demand or risk tolerance [2]. In this research is to investigate the derivative option contract.

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A derivative is financial security whose value is based on or generated from an underlying asset or collection of assets known as a benchmark. Stocks, bonds, commodities, currencies, interest rates, and market indexes are the most prevalent underlying assets for derivatives. Brokerages are routinely used to acquire these assets. A derivative can be traded over the counter or on a regulated exchange. Over-the-counter derivatives account for a larger share of the derivative has a higher risk of the counterparty risk. Counterparty risk refers to the possibility that one of the parties involved in the transaction will default. These uncontrollable parties do business between two private parties. The advantage of derivative may be a valuable tool for both businesses and investors. They allow you to lock in pricing, hedge against unfavourable rate swings, and limit risks.

Option pricing theory calculates the value of an option contract by assigning a price, known as a premium, based on the projected chance that the contract will expire in the money (ITM). Option pricing theory, in essence, assesses an option's fair value, which traders use in their strategy The fundamental purpose of option pricing theory is to determine the likelihood that an option will be exercised, or be in the money, at expiry and give a monetary value to it. The current stock price, strike price, volatility, risk free rate, and time to expiry (the number of days between the calculation date and the option exercise date) are all widely utilised parameters that are input into mathematical models to establish the theoretical fair value of an option. In order to know how derivatives trading gets on, we must know the theory of option pricing theory.

1.1 Risk Free Rate

The risk-free rate is the theoretical rate of return on a risk-free investment. The risk-free rate is the rate of return on an entirely risk-free investment over a particular period. The actual risk-free rate is determined by deducting the current inflation rate from the yield on the Treasury bond that corresponds to the investment length. The risk-free rate is the minimal return on investment that an investor anticipates since they will not accept additional risk unless the possible rate of the return exceeds the risk-free rate.

1.2 Volatility of Stock Market

Volatility is a statistical measure of the spread between the returns of a securities or a market index. The more the volatility, in most situations, the riskier the asset. The standard deviation or variance of returns from the same securities or market index is a common way to represent volatility. Volatility is typically accompanied by large swings in either direction. A higher volatility means that a security's value might possibly be spread out over a larger range of values. That means the price of a security might fluctuate drastically in either direction in a short period of time. Lower volatility suggests that a security's value does not vary significantly and is more stable.

1.3 Strike Price

When a futures contract is exercised, the strike price at which it may be purchased or sold. The strike price for call options is the price at which the option buyer can purchase the security while the strike price for the put options is the price at which the security can be traded. Strike prices are mainly used in the derivatives trading. The price difference between the underlying stock price and the strike price decides the value of an option. If the strike price of a call option is higher than the underlying stock price, the option is out of the money for the buyer. In this scenario, the option may not have intrinsic value, however it could also have value based on uncertainty and time before expiration.

1.4 Black-Scholes Option Pricing Model

Fischer Black and Myron Scholes introduced the Black-Scholes option pricing model (BSOPM) in their paper "The Pricing of Options and Corporate Liabilities", which was published in the Journal of Political Economy. Shortly after improves on Black and Scholes' work and created the term "Black-Scholes option pricing model." [3]. So that the Black-Scholes model is used to determine the value of an option contract. The Black-Scholes model contains five inputs variables that are the option strike price, the current stock price, the time to expiration, the risk-free rate and the volatility.

The difference between predicted and actual's prices grow as the moneyness of an option contract shifts from in-the-money to out-of-the-money, which can be explained as when stocks begin to behave contrary to investor expectations, there is an increase in trade volume, which leads to an increase in volatility, and thus an increased difference [4].

The scenario where volatility is associated with stock price is investigated using numerical approaches. When there is a positive connection between a stock and its volatility, the Black Scholes model underpriced out-of-the-money options and overpriced in-the-money options. The effect is reversed when the correlation is negative. [5].

In an American put pricing model, Black-Scholes implied volatility estimations have a significant impact on the projection of American put option prices. The use of Black-Scholes implied volatility estimates in an American put pricing model has a significant influence on the pricing forecast of American put options. It is shown that using Black-Scholes implied volatility estimates in the American put option pricing model does not materially affect forecasts of American put prices provided the probability of early exercise is carefully accounted for in the computation of implied volatilities. [6].

During the Covid-19 pandemic, most of the people lose their jobs or were forced to not go to work. This is especially apparent in underdeveloped nations, where huge populations have extremely limited savings and are especially vulnerable to the economic shutdown of any duration. This effect will cause them to lose their main income. So that derivative options trading become more popular because derivative options trading does not need to use too much saving to buy it, and they still have a chance to earn the money. The contracts provide the buyer the right, but not the duty, to buy or sell the underlying asset at a specified price. The buyer can exercise the option on the maturity date, depending on the option type. For amusement and profit, many people are flocking to the stock market and engaging in day trading. Markets swings induced by coronavirus pandemic unpredictability and volatility have prompted more people to enter the stock market and begin their financial journey. So that by Black Scholes Option Pricing model, we can calculate the theoretical prices.

1.5 Hypothesis Testing

Hypothesis testing is a statistical procedure in which an analyst verifies a hypothesis about a population parameter. The analyst's approach is determined by the type of the data and the purpose of the study. Paired sample t-test, is a statistical process for determining if there is no difference between the mean of the two sets of data. Each subject or object is measured twice in a paired sample t-test, resulting in pairs of observations.

By hypothesis testing on various factors, this research attempts to determine the link between model value and real stock value. If stock price fluctuations follow a certain sort of flaws, such as differential borrowing and lending rates and margin requirements, might potentially be incorporated into the binomial option pricing technique. These may be used to provide upper and lower boundaries on option prices, beyond which riskless lucrative arbitrage is conceivable [7].

To compute the significant difference between Black-Scholes Option Pricing models prices and the actual option's prices so that using the paired sample T-test by the SPSS software to get the result of the research. This study will show that hypothesis testing used on the Black Scholes Pricing Option and the relationship between the Black Scholes Model theoretical price and actual option's price. The gap between theoretical prices and actual prices is higher, the more is the volatility. Through this study, we would be able to identify the underlying asset prices are with lower spot prices or higher spot prices.

2. Materials and Methods

The stock of firms listed on the KLCI was used to obtain data for this study. Three stocks were chosen from a total of 1516 on the KLCI. As a result, data for both call and put option contracts are gathered for 28 trading days (11/8/2021 to 21/9/2021) except for the Topglove-HH is from (25/8/2021 to5/10/2021). The theoretical option's prices in this study are determined by applying the Black-Scholes option model, which considers the following variables which are spot-price, strike price, volatility, risk free rate of return and time to maturity. The volatility, which is a key element in determining option

pricing using the Black-Scholes model, was determined using the previous month's closing prices. The data for stock closing prices are gathered from the KLSE screener, which may be found at the website http://klsescreener.com. This model is predicated on several assumptions, including:

- There will be no dividend payments on the stocks during the life of the option.
- There is no commission.
- The market movement cannot be predicted.
- There is no opportunity for risk-free arbitrary.
- The underlying risk-free rate and volatility are known and constant.
- The stock prices follow a lognormal distribution.

The Black-Scholes model call option equation is

$$Call = S * N(d_1) + K * e^{(-r*t)} * N(d_2) \qquad \text{Eq. 1}$$

where:

Call=premium call

S=current stock price

t=time until option exercise (in years)

K=strike price of the option contract

r=risk free interest rate available in the market

N=cumulative standard normal distribution

e=exponential

d_1 are calculated as

$$d_1 = \frac{\ln\left(\frac{S}{K}\right) + \left(r + \frac{v^2}{2}\right) * t}{v * t} \qquad \text{Eq. 2}$$

d_2 calculated as

$$d_2 = d_1 - (v * t) \qquad \text{Eq. 3}$$

where:

v=volatility of the stock

ln=natural log

Next, there is the put option equation:

$$Put = S * N(-d_1) + K * e^{(-r*t)} * N(-d_2) \qquad \text{Eq. 4}$$

Before that we must calculate the volatility of the stock option by using following step.

Step 1 : Collect 14 trading days of closing price from klse screener and calculated the mean of the price.

Step 2 : Calculated the deviation of each day stock price with the mean stock price.

Step 3 : Calculated the square of the deviation

Step 4 : Calculated the variance by dividing the sum of squared deviation by the number of daily stock prices.

Step 5 : Calculated the daily volatility by square root the variance.

Step 6 : Calculated the annual volatility by square root annual trading days *daily volatility.

The risk-free rate assumes as 3.28% which is from the website http://www.market-risk-premia.com/my.html.

Since the third objective of this research is to determine whether there is significant difference between Black-Scholes Option Pricing models prices and the actual option's price, so that can use the paired sample t test at 95% of confidence level.

H_0 hypothesis	There is no significant differences between the Black Scholes Model's prices and actual option's prices.
H_1 hypothesis	There is significant differences between the Black Scholes Model's prices and actual option's price.

Therefore, we can conclude the research by using the result of the paired sample t-test.

3. Results and Discussion

To effectively finish this study, the data obtained must be analysed in order to test the hypothesis and answer the research questions. This research contains the analysis and interpretation of the study's findings. The data analysis and interpretation process is divided into two stages. The first portion is based on the data obtained and uses the formula to calculate the Black-Scholes model. The second step, which is dependent on the first part's results, is to evaluate the data using a paired sample T-test.

3.1 Results

In order to apply Black-Scholes Model formula, we must get the five input that is current stock price, option strike price, time until expiration, volatility and risk-free interest rate. Current stock price, option strike price and time until expiration can collect from the KLSE screener. Volatility have to calculate by using last 14 days historical closed price of the option's price. In table show the annualised volatility of the CIMB-C76, CIMB-HF, Topglove-C1W, Topglove-HH, Genting-C1I and Genting-HC.

Table 3.1 : Annualised volatility of the CIMB-C76, CIMB-HF, Topglove-C1W, Topglove-HH, Genting-C1I and the Genting-HC.

Cimb-C76	close price	Pav-Pi	(Pav-Pi)^2	6.332E-05
8/11/2021	0.13	0.0046429	2.156E-05	
8/12/2021	0.13	0.0046429	2.156E-05	
13/8/2021	0.13	0.0046429	2.156E-05	
16/8/2021	0.13	0.0046429	2.156E-05	
17/8/2021	0.13	0.0046429	2.156E-05	
18/8/2021	0.13	0.0046429	2.156E-05	
19/8/2021	0.13	0.0046429	2.156E-05	
20/8/2021	0.13	0.0046429	2.156E-05	
23/8/2021	0.13	0.0046429	2.156E-05	
24/8/2021	0.13	0.0046429	2.156E-05	
25/8/2021	0.14	-0.0053571	2.87E-05	
26/8/2021	0.145	-0.0103571	0.0001073	
27/8/2021	0.15	-0.0153571	0.0002358	
30/8/2021	0.15	-0.0153571	0.0002358	
Volatility	0.0079576			
Annualized Volatility	0.1263238			

Topglove-C1W	close price	Pav-Pi	(Pav-Pi)^2	1.717E-05
8/11/2021	0.12	-0.0003571	1.276E-07	
8/12/2021	0.12	-0.0003571	1.276E-07	
13/8/2021	0.115	0.0046429	2.156E-05	
16/8/2021	0.11	0.0096429	9.298E-05	
17/8/2021	0.12	-0.0003571	1.276E-07	
18/8/2021	0.12	-0.0003571	1.276E-07	
19/8/2021	0.125	-0.0053571	2.87E-05	
20/8/2021	0.12	-0.0003571	1.276E-07	
23/8/2021	0.115	0.0046429	2.156E-05	
24/8/2021	0.12	-0.0003571	1.276E-07	
25/8/2021	0.125	-0.0053571	2.87E-05	
26/8/2021	0.12	-0.0003571	1.276E-07	
27/8/2021	0.12	-0.0003571	1.276E-07	
30/8/2021	0.125	-0.0053571	2.87E-05	
Volatility	0.0041437			
Annualized Volatility	0.0657794			

Genting-C1I	close price	Pav-Pi	(Pav-Pi)^2	2.088E-05
8/11/2021	0.06	0.0035714	1.276E-05	
8/12/2021	0.06	0.0035714	1.276E-05	
13/8/2021	0.06	0.0035714	1.276E-05	
16/8/2021	0.06	0.0035714	1.276E-05	
17/8/2021	0.065	-0.0014286	2.041E-06	
18/8/2021	0.065	-0.0014286	2.041E-06	
19/8/2021	0.06	0.0035714	1.276E-05	
20/8/2021	0.06	0.0035714	1.276E-05	
23/8/2021	0.06	0.0035714	1.276E-05	
24/8/2021	0.065	-0.0014286	2.041E-06	
25/8/2021	0.065	-0.0014286	2.041E-06	
26/8/2021	0.065	-0.0014286	2.041E-06	
27/8/2021	0.07	-0.0064286	4.133E-05	
30/8/2021	0.075	-0.0114286	0.0001306	
Volatility	0.0045634			
Annualized Volatility	0.0725365			

Cimb-HF	close price	Pav-Pi	(Pav-Pi)^2	0.0001632
8/11/2021	0.08	-0.0064286	4.133E-05	
8/12/2021	0.08	-0.0064286	4.133E-05	
13/8/2021	0.08	-0.0064286	4.133E-05	
16/8/2021	0.08	-0.0064286	4.133E-05	
17/8/2021	0.08	-0.0064286	4.133E-05	
18/8/2021	0.08	-0.0064286	4.133E-05	
19/8/2021	0.08	-0.0064286	4.133E-05	
20/8/2021	0.08	-0.0064286	4.133E-05	
23/8/2021	0.08	-0.0064286	4.133E-05	
24/8/2021	0.08	-0.0064286	4.133E-05	
25/8/2021	0.08	-0.0064286	4.133E-05	
26/8/2021	0.05	0.0235714	0.0005556	
27/8/2021	0.05	0.0235714	0.0005556	
30/8/2021	0.05	0.0235714	0.0005556	
Volatility	0.0127745			
Annualized Volatility	0.2027883			

Topglove-HH	close price	Pav-Pi	(Pav-Pi)^2	0.0001808
25/8/2021	0.15	-0.02	0.0004	
26/8/2021	0.15	-0.02	0.0004	
27/8/2021	0.115	0.015	0.000225	
30/8/2021	0.115	0.015	0.000225	
1/9/2021	0.115	0.015	0.000225	
2/9/2021	0.115	0.015	0.000225	
3/9/2021	0.12	0.01	1E-04	
6/9/2021	0.125	0.005	2.5E-05	
7/9/2021	0.125	0.005	2.5E-05	
8/9/2021	0.13	0	0	
9/9/2021	0.135	-0.005	2.5E-05	
10/9/2021	0.135	-0.005	2.5E-05	
13/9/2021	0.145	-0.015	0.000225	
14/9/2021	0.145	-0.015	0.000225	
Volatility	0.013445			
Annualized Volatility	0.2134335			

GENTING-HC	close price	Pav-Pi	(Pav-Pi)^2	6.044E-05
8/11/2021	0.095	-0.0128571	0.0001653	
8/12/2021	0.095	-0.0128571	0.0001653	
13/8/2021	0.08	0.0021429	4.592E-06	
16/8/2021	0.085	-0.0028571	8.163E-06	
17/8/2021	0.08	0.0021429	4.592E-06	
18/8/2021	0.085	-0.0028571	8.163E-06	
19/8/2021	0.085	-0.0028571	8.163E-06	
20/8/2021	0.085	-0.0028571	8.163E-06	
23/8/2021	0.085	-0.0028571	8.163E-06	
24/8/2021	0.085	-0.0028571	8.163E-06	
25/8/2021	0.075	0.0071429	5.102E-05	
26/8/2021	0.075	0.0071429	5.102E-05	
27/8/2021	0.07	0.0121429	0.0001474	
30/8/2021	0.07	0.0121429	0.0001474	
Volatility	0.0077743			
Annualized Volatility	0.123413			

After get the annualized volatility, apply it into Black-Scholes Option Pricing Model and get the calculated price. Then, using the calculated price divide by the ratio get the calculated price per unit option's prices. In table 3.2 and table 3.3.

Table 3.2 : The result of the calculated Black Scholes Option's price Model.

DATE	CIMB C76 Close price	Calculate price	Calculated Price/ Ratio	CIMB HF Close price	Calculate price	Calculated Price/ Ratio	TOPGLOVE C1W Close price	Calculate price	Calculated Price/ Ratio
11/8/2021	0.15	0.744042713	0.124007119	0.05	0.561970979	0.09366183	0.125	0.786521709	0.078652171
12/8/2021	0.15	0.763670126	0.127278354	0.05	0.511303966	0.085217328	0.125	0.726240113	0.072624011
13/8/2021	0.15	0.813297507	0.135549585	0.045	0.409810361	0.068301727	0.11	0.605958491	0.060595849
16/8/2021	0.15	0.812179451	0.135363242	0.045	0.387808406	0.064634734	0.11	0.585113474	0.058511347
17/8/2021	0.15	0.761806699	0.126967783	0.045	0.470932164	0.07848694	0.105	0.534831751	0.053483175
18/8/2021	0.15	0.791433913	0.131905652	0.045	0.407200856	0.067866809	0.095	0.444550029	0.044455003
19/8/2021	0.14	0.681061095	0.113510183	0.05	0.63399381	0.105665635	0.085	0.264321928	0.026432193
20/8/2021	0.14	0.700688241	0.116781374	0.045	0.57570899	0.095951498	0.08	0.294002941	0.029400294
23/8/2021	0.14	0.689569481	0.114928247	0.045	0.572870317	0.095478386	0.075	0.145048894	0.014504889
24/8/2021	0.14	0.629196496	0.104866083	0.05	0.723558146	0.120593024	0.07	0.099142673	0.009914267
25/8/2021	0.14	0.648823474	0.108137246	0.05	0.657195625	0.109532604	0.07	0.074196981	0.007419698
26/8/2021	0.14	0.668077332	0.111346222	0.05	0.585751972	0.097625329	0.06	0.007660843	0.000766084
27/8/2021	0.14	0.646957868	0.107826311	0.05	0.609400065	0.101566678	0.045	0.000000191	1.91E-08
30/8/2021	0.14	0.626584646	0.104430774	0.05	0.654734672	0.109122445	0.045	3E-12	3E-13

Table 3.3: The result of the calculated Black Scholes Option's price Model.

DATE	GENTING C1I Close price	CALCULATED	Calculated Price/Ratio	GENTING HC Close price	CALCULATED PR	Calculated Price/Ratio	DATE	TOPGLOVE HH Close pri	Calculate price	Calculated Price/ Ratio
11/8/2021	0.075	0.00000961	1.06778E-06	0.065	1.0717276	0.13396595	15/9/2021	0.15	6.160208993	0.4106806
12/8/2021	0.075	0.00000021	2.33333E-08	0.07	1.4543328	0.1817916	17/9/2021	0.16	6.384648202	0.425643213
13/8/2021	0.075	0.00000071	7.88889E-08	0.07	1.303904	0.162988	20/9/2021	0.175	6.515202639	0.434346843
16/8/2021	0.075	0.00003261	3.62333E-06	0.07	0.8600955	0.107511938	21/9/2021	0.19	6.472600188	0.431506679
17/8/2021	0.075	0.000489276	0.000054364	0.06	0.5866988	0.07333735	22/9/2021	0.18	6.521676237	0.434778416
18/8/2021	0.075	0.002062553	0.000229173	0.06	0.4431458	0.055393225	23/9/2021	0.19	6.476632587	0.431775506
19/8/2021	0.075	0.00004402	4.89111E-06	0.06	0.7820617	0.097757713	24/9/2021	0.18	6.514024625	0.434268308
20/8/2021	0.075	0.00004098	4.55333E-06	0.065	0.7725309	0.096566363	27/9/2021	0.185	6.484494408	0.432299627
23/8/2021	0.07	0.00000005	5.55556E-09	0.065	1.344944	0.168118	28/9/2021	0.175	6.540628282	0.436041885
24/8/2021	0.07	3E-10	3.33333E-11	0.06	1.830003	0.228750375	29/9/2021	0.185	6.530490935	0.435366062
25/8/2021	0.07	3E-11	3.33333E-12	0.06	2.0097225	0.251215313	30/9/2021	0.17	6.550891599	0.436726107
26/8/2021	0.06	3E-15	3.33333E-16	0.06	2.8682004	0.35852505	1/10/2021	0.185	6.508856182	0.433923745
27/8/2021	0.06	1.17E-15	1.3E-16	0.06	2.8531736	0.3566467	4/10/2021	0.185	6.484747289	0.432316486
30/8/2021	0.06	1.1E-12	1.22222E-13	0.06	2.1606826	0.270085325	5/10/2021	0.185	6.537225182	0.435815012

The table 3.2 and 3.3 is shown the result of the calculated Black Scholes Option's price Model. In the table contains the current stock price and actual close price of the option. The last column is the calculated price of the Black Scholes Option's price Model divide by the ratio of the option convert to the stock tickets.

Phase 2

Table 3.4 : The result of the paired sample T-test

Paired Sample T-test	Mean Close Price	Mean Calculated Price	Mean deviation	Standard deviation	Sig(2-tailed)
CIMB C76 ClosePrice and CalculatedPrice	0.1443	0.118778441	0.025507273	0.006819299	0.000
CIMB HF ClosePrice and CalculatedPrice	0.04786	0.092407623	-0.04455048	0.01550709	0.000
TOPGLOVE C1W ClosePrice and CalculatedPrice	0.0857	0.032625643	0.053088643	0.006011286	0.000
TOPGLOVE HH ClosePrice and CalculatedPrice	0.17821	0.431820606	-0.253606321	0.008147852	0.000
GENTING C1I ClosePrice and CalculatedPrice	0.0707	0.00002127	0.070693016	0.006141623	0.000
GENTING HC ClosePrice and CalculatedPrice	0.063221	0.181618064	-0.118403779	0.100223603	0.001

Hypothesis Test

H_0= There is no significant difference between Calculated Option's price and Actual Option's price.

H_1= There is significant difference between CIMB C76 Calculated Option's price and Actual Option's price.

Significant level

$\alpha = 0.05$

Decision Making

H_0 is rejected since the p-value is equal to 0 which is less than 0.05 so there is significant difference between Calculated Option's price and Actual Option's price.

3.2 Discussions

From the phase 2 result shown that there are 6 pair of paired sample t-tests, there are 3 pairs of paired sample t-tests from the call option and another 3 pairs are put option. However, the 6 pairs of paired sample t-tests results shows that there is significant difference between Option calculated price and actuals prices so that the H_0 is rejected and the alternative hypothesis is accepted.

Through the result of the paired sample t-test we can realized that the overall are not consistencies when someone relying on the calculated values of option derived from the Black-Scholes option

equation. The calculated values for virtually all contracts reveals that these theoretical values may be used to anticipate market values for upcoming days, indicating that arbitrage possibilities exist. But there are not all the contracts obey the equation and there are still consists some variations such as earning, expectations, economy and rumours. These are all the factors that can affect the option's prices and also stock market prices.

Furthermore, from the phase 1 can be shown that the stocks with put option of the disparity between the calculated and actual's prices is greater than the stock with call option. The result in table 3.4 is the evidence to support this observation. The mean difference of calculated price and the actual's price of the put option is almost equal to the mean of the actual option's price.

A key finding of the study is that the option pricing is not same as the calculated price but it almost follows the trends of the calculated pricing. If the calculated price increase, the next days of the actual's price will increase. So that, Black-Scholes Option Pricing Model is not suitable to predict the price of the option contract but it is suitable to predict the trend of the option contract.

4. Conclusion and Recommendation

There are three objectives was achieved during this research was conducted. First, the objective is to study the uses of the Black-Scholes Model of option's prices formula. In order to uses the formula so that we had to understanding the constraint needed in the formula. The second objective is to compute the theoretical prices of the options by using the Black-Scholes Option Pricing Model. We had calculated the theoretical prices in the table. The last objectives is to compute the significant difference between Black Scholes Option Pricing Models and the actual option's price. From the result was concluded that there was significant difference between the Black Scholes Option Pricing Models and the actual option's price at 95% significant level.

4.1 Conclusion

This research was not difficult because the data can collected from the KLSE screener and the data was shown very clearly and sequent. The problem that faced in this research was price of the stock was unstable due to the effect of the pandemic covid-19. Most of the company was forced to stop operate so that causing the prices of the stock float in wide range. The stock is more effective by the rumour during the pandemic covid-19 rather the announcement of a company publishes.

This research had given me the opportunity to learn more in the financial field and broaden knowledge that the lecturer was teach in the lessons. Besides, this research also let me understand the historical data was very useful and I believe that the historical data not only important in financial field also very useful in others field. Lastly, from the result shown that the Black-Scholes Option Pricing Model was not suitable to use in the 6 options that I chose from Malaysia Stock Market.

4.1 Recommendation

In future, we recommend to collect more of history data for calculated the annualized volatility. Since the volatility is one of the key element to apply the Black Scholes Option Pricing Formula. However, there are two types of option which is call option and put option, both of them need to apply the annualized volatility to get the option's price. So that, the more accurate the annualized volatility, the result of the research will be more satisfaction and more comprehensive.

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