

EMBEDDED OPTIONS AND THE ISSUE OF *GHARAR*: EMPIRICAL EVIDENCE FROM MALAYSIA

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Abstract

Despite its accelerating use in the financial market, embedded options receive contradicting opinions with regards to its permissibility based on Shari'ah principles. This study will examine the existence of the gharar element in the pricing of embedded options (warrants), especially in the case of mispricing. The Black Scholes Option Pricing Model (BSOPM), a robust set of methods, is used to analyze the pricing efficiency of warrants market and to detect any mispricing in warrants contracts in Malaysia. Looking from the perspective of an informationally efficient market, there seems to be a pricing inefficiency in the local warrants market in reference to its theoretical values. This mispricing of warrants indicate inefficiency in the warrants market and the element of gharar in a warrants contract is viewed from the mispricing detected in the study. Mispricing of warrants in the Malaysian market indicates speculative activities, and speculation is not allowed in Islam. Speculation is prohibited in Islam as it may contain excessive gharar (uncertainty) and maysir (gambling). These may then result in wealth accumulation at the expense of the jahil (ignorance) other parties'. This activity violates the concept of adl (justice), does not serve the concept of maslahah (public interest) and does not comply with maqasid al-shari'ah.

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1. Introduction

Risks are inevitable and very much synonymous with any financial deals. In this era of financial globalization, innovations in financial instruments facilitate better risks management through derivatives resulting in a more liquid and efficient capital market. The recent rapid growth in the volume of international trade and capital flows has increased stock market activity in the emerging market thus encouraging local and foreign interests in emerging derivative markets.² Derivatives, generally, are financial contracts whose values are derived from the values of other, more basic variables like commodities, foreign exchange, credit risk or other tradable assets with varied maturities (Hull, 2014),³ and derivatives have been gaining popularity in recent years. Derivatives provide hedging and low arbitrage opportunities and eventually assumes economic gains from risk shifting and efficient price discovery.⁴ Some most popular derivatives are forwards, futures, options and swaps. These are hedging tools used to protect firms against risks such as unfavorable interest rates and currency movements and also from fluctuations of the price of commodities and financial securities. Among the four tools, this study will be focusing on only one, which is the options contract.

Options are widely used in the conventional financial market and have, as their underlying, a number of assets such as interest rates, currencies, equities, commodities and indexes.⁵ In Malaysia, some risk management products within the options family are

² Sole, Mr Juan, and Andreas Jobst. Operative Principles of Islamic Derivatives: Towards a Coherent Theory. No. 12-63. International Monetary Fund, 2012.

³ Hull, John C. *Options, Futures, and Other Derivatives*. New Jersey : Pearson, 2014, p 1.

⁴ Jobst, Andreas. "Back to Basics-What Is Securitization?". *Finance and Development* 45, no. 3 (2008): 48.

⁵ Bacha, Obiyathulla Ismath. *Financial Derivatives: Markets and Applications in Malaysia*. Kuala Lumpur: Mc-Graw Hill, 2012.

embedded options, such as equity warrants and call warrants. Equity warrants basically differ from call warrants in term of the issuers of the underlying asset (shares) upon the exercise of the warrants and the maturity period. Equity warrants are normally issued by the company itself, whereas call warrants are issued by investment banks. The maturity for equity warrants is normally more than four years as compared to call warrants which is normally shorter than four years. According to the Securities Commission of Malaysia, “warrant is a quoted right, but not an obligation, to subscribe for new ordinary shares at a specified exercise price during a specified period of time”. Giving particular attention to equity warrants, these warrants “give the holder the right to subscribe for a given number of ordinary shares with the conversion ratio of 1 to 1 in the company at a predetermined exercise price within a specified time period” (Haron, 2006 p.7).⁶

Nevertheless, from the *shari'ah* viewpoint, the role of this embedded options, that is, equity warrants, is still in dispute. Many of the Islamic scholars do not accept the use of warrants because of the element of *gharar* (uncertainty), it encourages speculation similar to *maysir* (gambling), and there is also an element of *riba* (unjust payment or receipt of interest) where money alone is the primary subject of the transaction rather than the real assets.⁷ Speculation is not allowed in Islam (Al Quran, 2: 219; 5: 93) because the purpose is not related to fixing a cost or reducing losses. Islam forbids excessive speculations because they may result in wealth accumulation at the expense of other parties⁸ thus measures should to be taken to control speculative trading⁹. Speculation prohibited in Islam covers not only races, games of cards and gambling activities, but also many types of

⁶ Haron, Razali. "The Pricing Efficiency of Equity Warrants: A Malaysian Case". *The ICAFI Journal of Derivatives Markets* 3, no. 3 (2006): p7.

⁷ Sole, Mr Juan, and Andreas Jobst. 2012.

⁸ Helliari, Christine, and Abdulaziz Alsahlawi. "Islamic Derivatives". *Journal of Corporate Treasury Management* 4, no. 2 (2011) : 120-128.

⁹ Naughton, Shahnaz, and Tony Naughton. "Religion, Ethics and Stock Trading: The Case of an Islamic Equities Market". *Journal of Business Ethics* 23, no. 2 (2000): 145-159.

derivatives transactions.¹⁰ Additionally in Islamic society, every transaction should be based on a real asset, and money may not be traded for money as it resembles *riba*. These elements violate the fundamental principles of *shari'ah*. The uncertain valuation of this embedded options is not in harmony with the *maqasid al-shari'ah* (overall objectives of *shari'ah* principles). The *shari'ah* principles require that the profit generated be based on transparency and pre-determinability and the object characteristics are clearly stated as to ensure transparent transactions. All of these should be, from the *shari'ah* point of view, within the broad scope of *maslahah* (public interest) which is a recognised proof and basis of judgement in *shari'ah*.¹¹ The profit generated must not reflect exploitation from *jahl* (ignorance) for it is regarded as unacceptable if ignorance is manipulated for gains.

Since this embedded options is a financial asset dependent on the value of its underlying asset, the sale of the underlying asset must also adhere to the *shari'ah* principles. The underlying assets must be *shari'ah* compliant in the sense that they do not involve prohibited core activities like financial services based on *riba* (interest), *maisir* (gambling) and gaming, manufacturing or selling of non-*halal* products or related products, any activities containing an element of *gharar* (uncertainty) like conventional insurance, entertainment activities which are non-permissible according to *shari'ah*, manufacturing or selling of tobacco-based products or related products, stockbroking or share trading in non-*shari'ah* compliant securities and other activities that are not agreeable with *shari'ah* principles.¹² Not just that they must be *shari'ah* compliant, the underlying assets must currently exist in their physical, sellable form and the seller should have legal ownership of the asset in its final form.¹³

¹⁰ Metwally, Mokhtar Mohammed. "Economic Consequences of Applying Islamic Principles in Muslim Societies". *International Journal of Social Economics* 24, no. 7/8/9 (1997): 941-957.

¹¹ Bacha, Obiyathulla Ismath. (1999): 9-25.

¹² Securities Commission Malaysia. www.sc.com.my/

¹³ Obaidullah, Mohammed. "Financial Options in Islamic Contracts: Potential Tools for Risk Management". *Islamic Economics* 11 (1999): 3-26.

When most of the scholars prohibit the use of embedded options as it contains the element of *gharar*, the Islamic Investment Study Group of the Securities Commission of Malaysia concluded that, in the case of warrants, when they are traded in the secondary market, the price will be reflective of the market forces of demand and supply; hence, the *gharar* elements in this contract can be eliminated. Therefore, in response to that statement, this study intends to investigate whether or not there is the element of *gharar* in equity warrants contract since most Islamic scholars reject the conventional warrants on the basis of *gharar* and that warrants are transacted for speculative gains.¹⁴ Massive speculation activities in the trading of warrants has been reported repeatedly in the literature. For instance, Powers and Xiao (2014)¹⁵ in their study on warrants listed in the China market found that investors were paying a premium on warrants to fulfill their speculation on the derivatives. Previously, Powers, Xiao and Yan (2009)¹⁶ reported that since the inception of warrants in August 2005, trading in the Chinese warrants market has been extremely active. It appeared that trading in equity warrants then was independent and isolated and often seemed disconnected from the trading of the underlying shares. They also documented that warrants market prices consistently and persistently deviated far from their fundamental values, and financial institutions made a profit of \$3 billion by exploiting the mispricing.

Similar evidence is also found in Liu, Zhang, and Zhao (2014).¹⁷ They recorded that the speculative activities in the warrants market in China grabbed the attention of investors and caused them to trade more speculatively in the underlying stocks. They found that turnover and return volatility of the underlying stocks were positively associated with the warrants' unexpected turnover and price deviation

¹⁴ Obaidullah, Mohammed. "Islamic Risk Management: Towards Greater Ethics and Efficiency". *International Journal of Islamic Financial Services* 3, no. 4 (2002): 30-48.

¹⁵ Powers, Eric, and Gang Xiao. "Mispricing of Chinese Warrants." *Pacific-Basin Finance Journal* 30 (2014): 62-86.

¹⁶ Powers, Eric, Gang Xiao, and Hong Yan. "Convenience Yield and The Chinese Warrants." University of South Carolina working paper (2009).

¹⁷ Liu, Yu-Jane, Zheng Zhang, and Longkai Zhao. "Speculation Spillovers". *Management Science* 61, no. 3 (2014): 649-664.

from their fundamental values. During the 1990s, there were a total of 14 warrants in the China market. However, the issuance of warrants was abolished later by the regulator due to rampant speculation and market manipulation. Warrants were then reintroduced to the China market in 2005 following reform of listed companies.¹⁸ Aitken and Segera (2005)¹⁹ in their studies on warrants listed in the Australia Stock Exchange indicated that the volatility of the underlying stock was higher in the post-event period of warrants listing and suggested that warrants encourage speculation in the underlying spot market.

Thus, looking at the evidences reported by certain studies on warrants mispricings used for speculative gains which indirectly implies the existence of *gharar*, this study sees the demand in investigating the existence of the *gharar* element in warrants pricing especially in the case of mispricing. The Black Scholes Option Pricing Model (BSOPM), a robust set of methods, is used to analyze the pricing efficiency of the warrants market and to detect any mispricing in warrants contracts in Malaysia. Then the mispricing detected will be analyzed with regards to the issue of *gharar* in order to determine the status of warrants from the *shari'ah* perspective. This issue will be looked into from the perspective of the informationally efficient market.

The rest of this study is organized as follows: the literature review covering past studies on warrants mispricing and warrants/options from the Islamic perspective, the outline of the methodology of the BSOPM employed in determining the existence of mispricing in warrants, the discussion and analysis of the finding in relation to the issue of *gharar* and the conclusion of the study.

¹⁸ Chang, Eric C., Xingguo Luo, Lei Shi, and Jin E. Zhang. "Is Warrant Really A Derivative? Evidence from the Chinese Warrant Market". *Journal of Financial Markets* 16, no. 1 (2013): 165-193.

¹⁹ Aitken, Michael, and Reuben Segara. "Impact of Warrant Introductions on the Behaviour of Underlying Stocks: Australian evidence". *Accounting & Finance* 45, no. 1 (2005): 127-144.

2. LITERATURE REVIEW

2.1 *Warrants and Warrants Mispricing*

The introduction of equity warrants has impacted the local stock market significantly since the market has started to offer derivative instrument to investors. There are two types of warrants issued in Malaysia: the equity warrants and call warrants. Warrants, as mentioned above are essentially an embedded option with features like an option.²⁰ So, equity warrants can be put into the family of a call option. However, there are some criteria that differentiate the nature of options with warrants. In the event of exercising the warrants, the issuing company satisfies the exercise by delivering new shares to the warrants holder. As a consequence, the number of shares outstanding in the company increases even though concurrently the assets, cash flows and other operating fundamentals remain fixed. As such, this event reduces the value of the share price, which leads to ownership dilution. This is the main difference between warrants and options, even though warrants belong to the family of call options, the exercising of options never bring about changes to the number of shares outstanding and to stock prices; thus there is no dilution effect. For the maturity period, warrants have longer maturity than options. Normally, warrants maturity in Malaysia varies from 5 to 10 years while options have a maturity of less than a year.

When the actual market prices are similar or are only slightly different from the theoretical prices, they are considered as fairly and efficiently priced. MacBeth and Merville (1979)²¹ tested on the BSOPM and found evidences of mispricing in the US options market. Kuwahara and Marsh (1992)²² followed a similar pattern when they reported discrepancies between the BSOPM value of

²⁰ An option contract should at the very least specify the following five features: the type of option (call or put), the underlying asset, the exercise price or strike price, the maturity or expiration date and the exercise style (American or European style).

²¹ MacBeth, James D., and Larry J. Merville. "Tests of The Black-Scholes and Cox Call Option Valuation Models". *The Journal of Finance* 35, no. 2 (1980): 285-301.

²² Kuwahara, Hiroto, and Terry A. Marsh. "The Pricing of Japanese Equity Warrants". *Management Science* 38, no. 11 (1992): 1610-1641.

Japanese equity warrants and the observed market price. Chung, Liu and Tsai (2014)²³ investigated the efficiency of warrants prices based on warrants in the Taiwan market. They supported the Fama (1970)²⁴ holding statement that arbitrageurs are the key factor to the efficiency of a warrants market. An efficient market will cause an immediate and complete reaction to the valuable information. The existence of arbitrage opportunities means a lack of efficiency in the market. In a perfect market, the prices of options and the underlying asset must simultaneously reflect new information on the asset prices. Byoun and Park (2009)²⁵ detected the existence of significant arbitrage activities in the Korean market, thus concluding that the information flow between the options market and the underlying stock market in Korea may not be efficient, also came to a similar conclusion when they detected the existence of the exploitable arbitrage in Taiwan.²⁶

Most studies on warrants pricing documented mispricing in relation to the theoretical values computed using the BSPOM²⁷. Haron (2006),²⁸ who employed BSOPM, found pricing deviations in warrants pricing for the trading period of 100 days in 2004, thus concluding that there was pricing inefficiency in the Malaysian warrants market then. Yip and Hooy (2012)²⁹ also documented pricing inefficiency in the Malaysian market based on BSOPM

²³ Chung, San-Lin, Wen-Rang Liu, and Wei-Che Tsai. "The Impact of Derivatives Hedging on The Stock Market: Evidence from Taiwan's Covered Warrants Market". *Journal of Banking & Finance* 42 (2014): 123-133.

²⁴ Fama, Eugene F. "Efficient Capital Markets: A Review of Theory and Empirical Work". *The Journal of Finance* 25, no. 2 (1970): 383-417.

²⁵ Byoun, Soku, and Hun Young Park. "Arbitrage Opportunities and Efficiency of An Option Market at Its Initial Stage: The Case of KOSPI 200 Options in Korea". *Research in Finance* 25 (2009): 269-301.

²⁶ Chung, San-Lin, Wen-Rang Liu, and Wei-Che Tsai. (2014): 123-133.

²⁷ Liu, Ming-Hua, and Nanda K. Rangan. "The Information Content of The Implied Volatility of Retail Equity Option Market". In *Proceedings of Macao International Symposium on Accounting and Finance*. 2011.

²⁸ Haron, Razali. (2006): 6-22.

²⁹ Yip, Yen-Yen, and Chee-Wooi Hooy. "Call Warrant Listing and the Behavior of its Underlying Spot Market: Some Evidence from Bursa Malaysia". *Journal of Asia-Pacific Business* 13, no. 3 (2012): 287-298.

during January 1998 to December 2005, in line with Haron (2006)³⁰. Chang et al. (2013)³¹ found that warrants in China market were much over-priced compared with the theoretical prices derived from the BSOPM. Powers, Xiao and Yan (2009)³² and Powers and Xiao (2014)³³ found mispricing in the warrants traded in the China market and investors were paying a premium to trade warrants for speculation purposes. Yip and Hooy (2012)³⁴ found inefficiency when they studied the volatility of the warrants market in Malaysia during the period of January 2006 to May 2010 using regression.

2.2 Warrants/ Options from the Islamic Perspectives

2.2.1 Al-Khiyar

Warrants/options are acceptable when its validity is based on the concept of *al-khiyar*. Al-Zuhayli (2003)³⁵ documented a number of *khiyar* that provide the contracting parties the choice to proceed and carry on with the contract or terminate it. The parties to the contract must be reasonably certain and informed about the values being exchanged, and the implications of the contract. Any uncertainty or the absence of relevant information, termed as *gharar*, should be carefully observed and avoided for a valid contract. *Al-khiyar* reduces *gharar* and makes it acceptable. Moreover, *al-khiyar* options have a 'reassessment' or 'cooling-off period' over which they can proceed or terminate the contract.³⁶ *Fiqh* literature documented several categories of *khiyar*. Among others are *khiyar al-shart* (stipulation condition), *khiyar al-ru'yah* (inspection), *khiyar al-'ayb* (discovery of a defect) and *khiyar al-ta'yin* (the selection option). Of these, *khiyar al-shart* is acknowledged as the most suitable alternative to

³⁰ Haron, Razali. (2006): 6-22.

³¹ Chang, Eric C., Xingguo Luo, Lei Shi, and Jin E. Zhang. (2013): 165-193.

³² Powers, Eric, Gang Xiao, and Hong Yan. (2009).

³³ Powers, Eric, and Gang Xiao. (2014): 62-86.

³⁴ Yip, Yen-Yen, and Chee-Wooi Hooy. (2012): 287-298.

³⁵ Al-Zuhayli, Wahbah. *Financial Transactions in Islamic Jurisprudence*. Translated by El-Gamal M.A. Translation Vol 1, Damascus. Dar al-Fikr, 2003.

³⁶ Helliari, Christine, and Abdulaziz Alsahlawi. (2011) : 120-128.

the conventional warrants/options as claimed by Kamali (1997)³⁷, Obaidullah (1999)³⁸ and Al-Amine (2008)³⁹. *Khiyar al-shart* (option of stipulation) is an option within a certain period after the agreement made by both contracting parties during which either party may decide to cancel, implying that the contracting parties are given some time to evaluate the benefits of the contract. The argument in favor of the validity of *khiyar al-shart* is based on an authentic hadith,

A man (Hibban ibn Munqidh) complained to the Prophet (pbuh) that he was a victim of frequent cheating in sales. The Prophet advised him, "When you conclude a sale, say, there must be no fraud" (Sahih al-Bukhari, 1422:3:65).

Corresponding to the above hadith, Al-Bayhaqi reported the following addition to it:

"Then you may reserve for yourself an option that lasts for three nights. If you are pleased, keep it; and if you are displeased, return it" (Al-Bayhaqi, 1344:5:273).

Kamali (1997)⁴⁰ put forward a firm stand in favor of the option contract that granting an option, exercising it over a period of time or charging a fee for it bear nothing that is objectionable. It is permissible (*mubah*) and Kamali⁴¹ claims that it is simply an extension of the basic liberty that the Quran has granted.

However, in objection, Hasan (1986)⁴² argues that, the maturity of the option contract must not exceed three days as per

³⁷ Kamali, Mohamad Hashim. "Islamic Commercial Law: An Analysis of Options". *The American Journal of Islamic Social Sciences* 14, no. 3 (1997): 17-37.

³⁸ Obaidullah, Mohammed. (1999): 3-26.

³⁹ Muhammad al-Amine, Muhammad al-Bashir. *Risk Management in Islamic Finance: An Analysis of Derivatives Instruments in Commodity Markets*. Leiden: Brill, 2008.

⁴⁰ Kamali, Mohamad Hashim. (1997): 17-37.

⁴¹ *ibid*

⁴² Hasan, Ahmad Muhayyuddin. "Amal Sharikat al-Istithmar al-Islamiyyah fil suq al-Alamiyyah". *Al-Dar al-Saudiyyah lil-Nashr wal Tawzi*, (1407H/1986): 268-271.

khiyar-al-shart (with the exception of the Hanbali school), and if it is beyond three days, it is unacceptable. Hasan⁴³ also claims that the option contract is oppressive and unjust since the buyer of an option will benefit more than the seller.

2.2.2 *Bai-al-urbun*

Another opinion on the validity of warrants/option is based on the *bai al-urbun* concept. "A *bai al-urbun* contract is a predetermined sale contract that involves a penalty for cancellation. A *bai al-urbun* can be used for hedging transactions, but not for speculation and protects the cost against adverse future price movements, but also allows the buyer to benefit from forward price movements".⁴⁴ Kamali (1997)⁴⁵ describes *al-urbun* as an earnest money which the seller takes from the buyer with the understanding that it becomes part of the price in the event that the sale is ratified, but that it will belong to the seller in the event the buyer fails to ratify his initial agreement. In validating the *urbun*, Imam Ibn Hanbal relied on the report of Nafi' ibn Harith (ra),

*Caliph 'Umar's officer in Makkah states to the effect that he bought from Safwan Ibn Umayyah (r.a.) a prison house for the Caliph 'Umar (r.a.) for four thousand dirhams on the condition that if the Caliph approved of it, the deal would be final; otherwise, he (Safwan) would be given four hundred dirhams (that is about ten percent of the actual price as compensation).*⁴⁶

In a sale of this kind, the buyer asks the seller to reserve the goods for him and agrees not to ask for the deposit to be returned if he changes his mind. Elgari (1993)⁴⁷ also argues in support of transactions in options by referring to the framework of *bai al-urbun*.

⁴³ *ibid*

⁴⁴ Helliari, Christine, and Abdulaziz Alsahlawi. (2011) : p 122.

⁴⁵ Kamali, Mohamad Hashim. (1997): 17-37.

⁴⁶ Ibn Qayyim, *Ilam al-Muwaqqiin an Rab al-Alamin* 3, p 389.

⁴⁷ Elgari, Mohamed Ali. "Towards an Islamic Stock Market". *Islamic Economic Studies* 1, no. 1 (1993): 1-20.

Following the Ibn Hanbal school of *fiqh*, the argument supporting this type of sale is based on the *athar* (practices of *sahabah*) which is reported in al-Bukhari from Ibn Sirin:

“A man told the operator of a caravan, I would like to join your passengers, but if I do not depart with you on a certain day, you were entitled to a sum of one hundred dirhams. When he did not depart on the set date, he willingly agreed to comply with the condition”.

Contrastingly, Salehabadi and Aram (2002)⁴⁸ when comparing an option with *bai-al urbun*, argue that option is different from *bai-al urbun* where an option premium is not a part of the selling price while *bai-al urbun* is a part of the selling price. The *urbun* (deposit) will be taken by the seller as compensation for terminating the sales agreement and this practice is prohibited by Rasulullah p.b.u.h. This is based on a hadith reported by Al-Baihaqi that Amr ibn Shu‘ayb narrated from his father, who narrated from ‘Amr’s grandfather, that Rasullullah (pbuh) had ordered not to conduct sales through *urbun*.⁴⁹ Moreover, all schools except the Hanbali prohibit *bai-al urbun* (Obaidullah, 2002).⁵⁰ The majority of the classical Muslim jurists, like ‘Abd Allah ibn ‘Abbas, Hasan al-Basri, al-Thawri, al-Awza‘i and al-Layth ibn Sa‘d, maintain that *urbun* is not permitted in Islam. This view supports the views from the scholars of Hanafi, Maliki and Shafi‘i. Modern and contemporary Muslim jurists, al-Shawkani, al-Siddiq Muhammad al-Amin al-Darir and al-Shaykh Mujahid al-Islam al-Qasimi, also seem to maintain the same opinion.⁵¹ Usmani (1996)⁵² states that an option contract when viewed as a

⁴⁸ Salehabadi, Ali, and Mohammad Aram. "Islamic Justification of Derivative Instruments". *International Journal of Islamic Financial Services* 4, no. 3 (2002): 11-17.

⁴⁹ Al-Baihaqi, *Al-Sunan Al-Kubra*, Beirut : Dar Al-Fikr, p. 559.

⁵⁰ Obaidullah, Mohammed. (2002): 30-48.

⁵¹ Amanullah, Muhammad. "Sale By Non-Refundable Deposit (Arabun) and Its Contemporary Implementations". *Jurnal Fiqh* 5, no. 1 (2008): 1-22.

⁵² Usmani, Mufti Muhammad Taqi. "Futures, Options, Swaps and Equity Investments". *New Horizon* (1996): 10.

promise is acceptable, nevertheless, charging a fee and trading them are unacceptable.

2.2.3 *Gharar*

Gharar in this study refers to the uncertainty existing in relation to the price of the warrants upon exercising them. The warrants pricing has been evidenced to be highly speculative as discussed earlier and speculation violates the fundamental *shari'ah* as this may result in wealth accumulation at the expense of other parties. *Gharar* is divided into two categories, *gharar fahish* (excessive *gharar*) and *gharar yasir* (minor *gharar*). Scholars derive that if *gharar fahish* is found in a trading transaction or investment, it will affect the validity of the contract.⁵³

On the ground of *gharar*, another standing on the non-permissibility of warrants/options is by Obaidullah (2002)⁵⁴ where he stresses that the majority of the Islamic scholars reject the conventional options for they involve *gharar* and are transacted for speculative gains. The prohibition is based on an authentic hadith of the Prophet (pbuh) narrated by Muslim, Abu Dawud, Al-Tarmizi, Al-Nasai and Ibn Majah on the authority of Abu Hurayrah (r.a.), that the Prophet had forbidden *gharar* sales. Though there is no verse in the Qur'an to proscribe *gharar* explicitly, vanity (*al-batil*) is forbidden in many verses:

“And do not eat up your property among yourselves for vanity, nor use it as bait for the judges, with intent that ye may end up wrongfully and knowingly taking a little of (other) people’s property” (Al-Baqarah:188).

“O ye who believe! Eat not up your property among yourselves in vanity; but let there be amongst you traffic and trade through mutual good will; nor kill (or destroy) yourselves; for verily God hath been to you Most Merciful!” (An-Nisa:29).

⁵³ Islamic Financial System. Principles and Operations, Kuala Lumpur : ISRA, 2011, p 67.

⁵⁴ Obaidullah, Mohammed. (2002): 30-48.

A number of Quranic interpreters agree that the word ‘vanity’ above means *gharar*.⁵⁵ Al-Saati⁵⁶ also quoted Ibn Al-Arabi’s explanation that vanity (*al-batil*) is unlawful because it is prohibited by *shari’ah* such as usury and *gharar* and the acts which are forbidden by *shari’ah* are considered as vanity such as theft, dishonesty, gambling and *gharar* contracts. Having no consensus on its definition, *gharar* is said to be the result of *jahl* (ignorance), inadequate information and a lack of transparency. Therefore, on these grounds, options are not permissible for not being in harmony with the *maqasid al-shari’ah* (overall objective of *shari’ah* principles) and obviously very far from the concept of *adl* (justice) that should prevail in all exchange contracts (Anwar and Tahir, 1995)⁵⁷ as emphasized in the Qur’an (An-Nisa’:29).

2.2.4 *Shari’ah Advisory Council (SAC), Securities Commission of Malaysia*

Despite those apparent objections from the scholars, for the case in Malaysia, the SAC regards derivatives, being a hedging instrument, as creating *maslahah* to the investor and the economy in general. Validated on the basis of *hikmah al-tashri’iyyah* (creating *maslahah*) and *’urf al-iqtisadi al-khas* (common practices specifically occurring in economic activities), its permissibility is justifiable if used purely for hedging purposes. Nevertheless, if it is speculative in nature, then the *shari’ah* ruling should be imposed. There is benefit (*maslahah*) in genuine hedging activities, but the costs associated with potential pure speculative derivatives trading cannot be ignored. The SAC has also announced that embedded options (equity warrants) are classified as *shari’ah* approved securities as long the underlying assets are *shari’ah* compliant. The SAC also agrees that warrants have fulfilled the requirement of *mal* (property) which satisfies the concept of *haq maliy* (rights on assets with financial value) and *haq*

⁵⁵ Al-Saati, Abdul Rahim. "The Permissible Gharar (Risk) in Classical Islamic Jurisprudence". *Islamic Economics* 16, no. 2 (2003) : 3-19.

⁵⁶ *ibid*

⁵⁷ Anwar, Muhammad, and Sayyid Tahir. "An Islamic Perspective on Capital Markets and Islamic Securities in Malaysia". *The Pakistan Development Review* (1995): 865-878.

tamalluk (ownership rights) principles.⁵⁸ This resolution follows the Maliki, Shafi'i and Hanbali schools and some jurists of the Hanafi school of the later generation have accepted that warrants is something that can be possessed and benefited from and can be transferred to anyone, either by getting money for it or for free.⁵⁹

2.2.5 Jeddah Fiqh Academy Resolution

The Jeddah Fiqh Academy in its Seventh Session in Jeddah, Saudi Arabia in 1992 has ruled in Resolution No: 63/1/7, that "Options contract as currently applied in the world financial market are a new type of contract which does not come under any of the *shari'ah* nominated contracts. Since the object of the contract is neither a sum of money nor a utility or a financial right which may be waived, then the contract is not permissible in *shari'ah*. As these contracts are primarily prohibited, their handling is also prohibited". Despite being 23 years since the resolution, it is still being used by the Jeddah Fiqh Academy and not being countered by any new *fiqh* resolution, although the business risk and financial risk are getting more advanced and sophisticated over the years.

3. DATA AND METHODOLOGY

This study covers a period of six years from January 2006 to December 2012 on 183 outstanding equity warrants as at December 2012. In order to ensure a certain level of liquidity, the warrants under study was listed for at least 3 years in the market, therefore the warrants whose inception were in 2011 and 2012 are excluded in this study. Thus, after considering the three years minimum listing, only 73 warrants were analyzed out of the 183 warrants. The daily closing prices of the underlying and warrants are employed starting from January 2006 to December 2012.

The BSOPM was applied in determining the theoretical price of warrants traded during the study period. The use of BSOPM to value warrants was also adopted by other researchers (see, Chung,

⁵⁸ Securities Commission Malaysia. www.sc.com.my/

⁵⁹ Obaidullah, Mohammed. (2002): 30-48.

Liu and Tsai, 2014⁶⁰; Chang et al., 2013⁶¹; Powers and Xiao., 2014⁶²). This model was originally designed to value options; however, due to some similar characteristic in options and warrants, the BSOPM is widely used to measure warrants price provided with some adjustment done due to the dilution effect. After the theoretical warrants price was examined, this study analyze the degree of mispricing in warrants. This was done by comparing the actual market price of warrants with the theoretical price derived from the BSOPM.

3.1 *The Black-Scholes Option Pricing Model (BSOPM)*

This study employed the BSOPM developed by Black and Scholes (1973)⁶³. This model has been widely used in the literature to estimate the theoretical price of warrants as it offers a robust and reliable result.

The designated formula for option valuation are as follows:

$$C = S.N(d_1) - K e^{-rt} .N(d_2) \tag{1}$$

$$d_1=(\ln(S/K)+ [r+ (\sigma^2/2)]t)/(\sigma \sqrt{t}) \tag{2}$$

$$d_2= d_1 - \sigma\sqrt{t} \tag{3}$$

where, C = call value derived from BSOPM; S =daily closing price of the underlying asset; K = exercise price of the warrants; t =time to expiration (as % of year) for period of trading; r =risk free interest rate; e^{-rt} =exponential function of r and t ; $N(.)$ =cumulative standard normal distribution function; $\ln(S/K)$ = natural logarithm of S/K ; σ = volatility of the underlying asset as measured by standard deviation; Annualized σ = daily volatility ($\sigma \times \sqrt{240}$).

⁶⁰ Chung, San-Lin, Wen-Rang Liu, and Wei-Che Tsai. (2014): 123-133.

⁶¹ Chang, Eric C., Xingguo Luo, Lei Shi, and Jin E. Zhang. (2013): 165-193.

⁶² Powers, Eric, and Gang Xiao. (2014): 62-86.

⁶³ Black, Fischer, and Myron Scholes. "The Pricing of Options and Corporate Liabilities". *The Journal of Political Economy* (1973): 637-654.

One of the main differences between options and warrants is that in the event of exercise of the warrants, there is an increasing number of shares outstanding, thus the dilution effect takes place. Thus, theoretical value derived from the BSOPM is adjusted to integrate with the dilution effect following the warrants conversion.⁶⁴

$$W_A = N / ((N / Y + M)) C \quad (4)$$

where, W_A = theoretical value of warrants after dilution effect; C =call value computed using BSOPM; N =number of shares currently outstanding; M = number of warrants issued; Y = conversion ratio of 1:1.

To determine the degree of mispricing in warrants, the following is applied:

$$\% \text{ Daily mispricing} = \left(\frac{W_P - W_A}{W_A} \right) \times 100 \quad (5)$$

where; W_P =actual closing market price of warrants and W_A = theoretical price of warrants after dilution effect.

$$\% \text{ Mean Daily Mispricing} = \Sigma \% \text{ Daily Mispricing} / \text{Number of observations.} \quad (6)$$

To determine the significance of mean daily mispricing, t-statistic is employed to test the hypothesis H_0 :Mean Mispricing =0.

4. FINDING AND ANALYSIS

4.1 Warrants Mispricing

This study found substantial mispricing in the 73 warrants ($p=0.01$) traded within the period of 2006-2012. This study confirmed the previous finding by Haron (2006) and Yip and Hooy (2012) that

⁶⁴ Dubofsky, David A. *Options and Financial Futures: Valuation and Uses*. New York: McGraw-Hill, 1992, p 68.

warrants market in Malaysia are not efficiently priced. The deviations in pricing between the theoretical values derived from the BSOPM and the actual prices traded indicated pricing inefficiency in the Malaysian warrants market. The study revealed that 30 out of the 73 warrants (41.10%) were overpriced during the period understudy. The mean daily overpricing ranged from 5.45% to 132.18% with LBICAP-WA and OSKVI-WA recorded the highest and lowest mean overpricing by 132.18% ($p=0.01$) and 5.45% ($p=0.01$), respectively. On the other hand, 39 warrants (53.42%) were underpriced with the mean daily underpricing ranged from 5.18% to 86.45%. LIONCOR-WB is the most underpriced warrants at mean daily underpricing by 86.45% ($p=0.01$), followed by ASDION-WA by 72% ($p=0.01$) with IJMLAND-WA, the least underpriced by 5.18% ($p=0.01$). Although most of the warrants were found to be mispriced (underpriced or overpriced), four warrants (5.48%) recorded insignificant mispricing with the market prices sharing close to the BSOPM theoretical values. LATEXX-WA was found to be the most efficiently priced with only 0.10% deviation from its theoretical value, followed by SEG-WA (0.78%), TGOFFS-WB (2.55%) and FAJAR-WA (4.63%). All were significant at $p=0.01$. Thus, the study concludes that there are significant mispricing (underpricing or overpricing) recorded on Malaysian warrants during the period understudy (refer Table 1 for the descriptive statistics of warrants mispricing).

Table 1: Descriptive Statistics of Warrants Mispricing

No.	Equity Warrants	Mean (%) ($H_0: B_i=0$)	Maximum (%)	Minimum (%)	Observations (N)
1	LBICAP-WA	132.18***	321.51	-14.69	1521
2	TRC-WA	120.19***	215.02	45.18	796
3	EAH-WA	107.21***	271.46	29.51	1579
4	GPACKET-WA	99.73***	475.76	6.67	795
5	MPCORP-WB	94.51***	376.23	10.06	607
6	GRANFLO-WA	90.51***	211.33	0.48	620

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7	HEXAGON-WA	78.27***	695.93	-67.04	743
8	HOVID-WA	75.11***	670.78	-35.18	1123
9	FRONTKN-WA	43.90***	120.86	-35.72	644
10	JADI-WA	41.68***	155.95	7.89	778
11	PERDANA-WA	40.50***	137.45	-20.40	1708
12	HUBLINE-WA	39.05***	107.92	9.05	768
13	GADANG-WA	33.01***	99.40	-29.67	884
14	MASTEEL-WA	26.20***	49.33	6.47	989
15	PJDEV-WC	24.99***	69.68	-24.83	1586
16	NOTION-WA	24.58***	99.25	-64.85	812
17	REDTONE-WA	21.92***	66.57	-12.84	654
18	HWGB-WB	20.01***	50.75	-19.93	668
19	CENTURY-WB	19.57***	49.25	-11.50	1555
20	TIGER-WA	12.96***	73.77	-41.69	903
21	KYM-WA	12.14***	41.69	-19.25	1538
22	IRIS-WB	12.04***	51.70	-30.92	639
23	LBS-WA	11.94***	86.64	-60.55	979
24	YUNKONG-WA	11.34***	43.63	-38.10	782
25	IRCB-WA	10.87***	34.25	-21.46	885
26	HUNZPTY-WB	6.86***	45.65	-25.49	845
27	UNISEM-WA	6.43***	84.18	-32.17	770
28	SALCON-WA	5.74***	67.15	-46.49	845
29	IJMLNT-WA	5.57***	44.82	-16.33	709
30	OSKVI-WA	5.45***	60.38	-42.72	553
31	FAJAR-WA	4.63***	24.60	-43.96	881
32	TGOFFS-WB	2.55***	92.13	-50.13	1677
33	SEG-WA	0.78***	25.95	-17.12	579
34	LATEXX-WA	0.10***	55.99	-29.09	1125
35	IJMLAND-WA	-5.18***	41.40	-35.33	1031

36	KPJ-WA	-6.15***	48.32	-20.91	694
37	DIGISTA-WA	-7.31***	38.61	-51.21	994
38	GAMUDA-WD	-7.55***	15.95	-31.53	1636
39	MLAB-WA	-8.92***	43.41	-34.75	807
40	PANTECH-WA	-9.10***	23.76	-38.12	717
41	WCT-WB	-11.81***	80.13	-49.86	1148
42	ASIAEP-WB	-17.75***	11.74	-44.49	672
43	HEVEA-WB	-20.21***	6.63	-41.10	1607
44	BORNOIL-WB	-20.97***	16.75	-62.32	929
45	HARVEST-WA	-22.68***	26.89	-58.25	1634
46	MEDIA-WB	-23.50***	21.10	-40.07	674
47	IJM-WC	-23.78***	1.66	-43.66	1766
48	SPSETIA-WB	-24.70***	7.79	-55.25	1179
49	CRESNDO-WA	-25.13***	1.44	-67.99	526
50	YTLPOWR-WB	-25.41***	-12.63	-49.95	1098
51	RAPID-WA	-27.22***	27.76	-53.13	1562
52	FFHB-WB	-28.04***	27.79	-80.11	1558
53	DIJACOR-WA	-28.05***	20.49	-43.17	692
54	BIOSIS-WA	-30.06***	1.43	-52.58	738
55	PA-WA	-32.01***	39.31	-69.89	1588
56	GUNUNG-WB	-33.90***	-2.03	-54.93	620
57	DPS-WA	-34.12***	40.32	-74.69	713
58	HLSCORP-WA	-35.34***	200.18	-87.40	1592
59	MTOUCHE-WB	-36.57***	15.26	-64.66	643
60	ZECON-WA	-38.28***	10.50	-88.13	760
61	BTM-WA	-39.12***	32.55	-58.13	1554
62	BJASSET-WA	-39.96***	11.32	-69.14	1614
63	ENGTEX-WA	-41.68***	7.71	-64.50	835
64	FCW-WB	-43.31***	6.89	-75.58	1632

65	GBH-WA	-48.77***	-20.15	-68.90	723
66	WWTKH-WB	-55.97***	16.12	-89.51	760
67	MTOUCHE-WA	-57.83***	86.85	-84.23	1563
68	FUTUTEC-WA	-62.61***	37.23	-78.27	652
69	RALCO-WB	-62.90***	-49.64	-80.70	713
70	WAHSEONG-WA	-65.58***	-46.53	-78.74	1075
71	FIAMMA-WB	-68.82***	-57.12	-84.67	800
72	ASDION-WA	-72.00***	-29.76	-84.32	970
73	LIONCOR-WB	-86.45***	-46.59	-91.48	1539

Notes:

- 1) The mean mispricing refers to the mean differences between the warrants' daily theoretical prices (BSOPM) and actual daily market prices of warrants during the respective periods.
- 2) Test of hypothesis of $H_0: B_i=0$ is based on t-statistic with each warrant's mean mispricing is significant at 1% significance level.

4.2 *The Issue of Gharar*

In relation to the permissibility of the warrants contract, with regards to the issue of *gharar*, as discussed earlier, this issue receives differing arguments among Islamic scholars. The permissibility of warrants contract is generally denied by a majority of scholars on the basis that it involves excessive *gharar* (Amanullah, 2008)⁶⁵ and is primarily transacted for speculative gains (Haron, 2006⁶⁶; Powers, & Xiao, 2014⁶⁷; Powers, Xiao, & Yan, 2009⁶⁸; Liu, Zhang, & Zhao, 2014⁶⁹; Aitken & Segera, 2005⁷⁰). *Gharar* is said to be the result of *jahl*, inadequate information and a lack of transparency. Based on the

⁶⁵ Amanullah, Muhammad. (2008) : 1-22.

⁶⁶ Haron, Razali. (2006): 6-22.

⁶⁷ Powers, Eric, and Gang Xiao. (2014): 62-86.

⁶⁸ Powers, Eric, Gang Xiao, and Hong Yan. (2009).

⁶⁹ Liu, Yu-Jane, Zheng Zhang, and Longkai Zhao. (2014): 649-664.

⁷⁰ Aitken, Michael, and Reuben Segara. (2005): 127-144.

Efficient Market Hypothesis, a market is said to be efficient with respect to an information set if the price fully reflects that information set (Fama, 1970)⁷¹. Therefore, inadequate information and a lack of transparency imply market inefficiency in disseminating information and this is reflected by the price deviations in the warrants market detected in this study. Price deviations are the results of speculations due to inadequate information released to the market participants. Warrants, as an embedded option, are often used for speculation, not to protect the value of the underlying assets but to gain from the increase in value of the underlying asset. The use of this instrument to speculate the future prices of the underlying asset due to random fluctuation in prices has led to random gains and losses which resemble *maysir*, a game of chance or gambling, is the cause for objection in Islam.⁷² When speculation is used to transfer wealth from one party to another, it would amount to a zero-sum game, akin to gambling, which is strongly prohibited in Islam.⁷³ Therefore, this study claims that there is an element of excessive *gharar* in the event of the substantial average daily mispricing in the warrants market as a result of speculative activities due to the informationally inefficient market.

5. CONCLUSION

This study investigated warrants pricing of 73 Malaysian equity warrants traded within the six-year period by employing the BSOPM. Results show deviations of pricing where 94.52% (69 out of 73) of the warrants traded were mispriced in reference with their theoretical values. This mispricing of warrants indicate inefficiency in the local warrants market. Therefore, based on the argument above and the extent of mispricing revealed in the analysis, this study found the element of excessive *gharar* in warrants contract when viewed from the perspective of pricing inefficiency in the market. Mispricing of warrants in the Malaysian market indicates speculative activities and speculation is not allowed in Islam. Speculation prohibited in Islam covers not only races, games of cards and gambling activities, but

⁷¹ Fama, Eugene F. (1970): 383-417.

⁷² Obaidullah, Mohammed. (2002): 30-48.

⁷³ Tarek, El Diwany. *The Problem with Interest*. London: Kreatoc Zest, 2003.

also many types of derivative transactions. Speculation may contain *gharar* and *maysir* which are all prohibited in Islam and measures should to be taken to control speculative trading. Islam forbids these because they may result in wealth accumulation at the expense of other parties. This activity violates the concept of *adl*, does not serve the concept of *maslahah* and does not comply with the *maqasid al-shari'ah*.

For risk management purposes, information must be truthful, clear and transparent. Instead, the opposite happened when the managers dabbled with incorrect and false information and manipulated that information. This led to mismanagement of risk and inadvertently caused other risks to also emerge in the financial system. Hence, the principle of the prohibition of *gharar* is to ensure the fullest acceptance and satisfaction of the parties involved in risk management. This acceptance can only be achieved through certainty, full knowledge, full disclosure and transparency of information about the object of the contract. With the compliance of the principle of prohibition of *gharar*, the injustice and exploitation among the contracting parties can then be avoided.

Findings from this study reveal that Islamic financial engineering needs to come up with an instrument which is at par, if not better, than the existing conventional instrument for risk management that complies with the *shari'ah* principles, does not violate the *maqasid* and can offer and accommodate risk management without allowing any speculations that may lead to wealth accumulation of one party only. An instrument which may be an adaptation of the concept of *khiyar al-shart* and is perhaps parallel with the concept of *bai-al-urbun* discussed earlier, not just replicating the existing conventional innovations and merely adapting it to the Islamic atmosphere.