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BURSA *SUQ AL SILA* FRAMEWORK ANALYSIS

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ABSTRACT

In Malaysia, *Tawarruq* was introduced in Islamic financial system to replace the *bai ai-inah* concept. Hence, *Tawarruq* is the most popular product in Islamic Banking and finance sector. The ideas of *Tawarruq* came from the classical perspectives of jurists that want to assist the development of Islamic economic, banking and finance and replacing the old concept which is clearly prohibited in Islam. Therefore, to overcome this issues and facilitate the implementation of *Tawarruq*, *Suq al-Sila'* (BSAS) was introduce in Islamic financial system. However, many scholars has discussed from a difference views about the implementation of *Tawarruq* and BSAS. This study refer to BSAS as a case study to complete this research. The objectives of this study is to understand the framework of BSAS, explain the types of commodities and specification of commodity authorizing by Bursa Malaysia Islamic Services (BMIS), participants in the BSAS platform and analyze issues that exist on the BSAS platform. Meanwhile, this research use the secondary data such as collect data from the sources from library and data from internet and primary data by interviewing Vice President, Bank Shariah Officer and Shariah Officer Hong Leong Islamic Bank to obtain primary data. This paper will explain in more detail the BSAS transaction flow and present the Shariah issues involved. The results of this study found that there are several aspects of the implementation of the BSAS platform that raise some Shariah issues. Therefore, this paper is expected to improve BSAS platform and *Tawarruq* principles. |

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1.0 INTRODUCTION

As a developing country, the emerging of Islamic financial system in Malaysia as a one of component to growth. As we know, Islamic financial system includes Islamic banking system, Islamic Banking Money Market, Takaful, and Islamic Capital Market. (B.N. Malaysia 2003). Nowadays, Islamic banking has globally known and considered as a viable alternative system that is able to meet the needs of the people through the products offered. (Mohamad, M.T. et.al., 2010). Islamic banking is also recognized as one of the fastest growing industries both domestically and internationally. In Malaysia, Islamic banking began as early as 1983. (B.N. Malaysia 1993). Various contracts were introduced and used in financing products and subsequently introduced in Malaysia like murabahah, al-ijarah thumma al-bai (AITAB), bai' bithamamin 'ajil (BBA) and bai' al-'inah. The development of innovative Islamic banking products proves that the Malaysian Islamic banking system is moving forward to compete with the conventional banking system. However, the bai 'al-'inah contract introduced in Malaysia has caused controversy among Middle East scholars. (Shaharuddin, A., t.t.) In Malaysia, bai 'al-'inah contracts have been approved by the Shariah Advisory Council, Bank Negara Malaysia but the majority of the ruling bodies in the Middle East do not approve this principle as it leads to usury. (Laldin, M. A. et.al. 2012). In fact, to fulfill Shariah requirements a tawarruq contract was introduced. The purposed to introduce a tawarruq contract is replace the bai 'al-'inah contract which received a negative reaction from the ruling body of the fatwa in the Middle East. (Ab. Ghani, A. M. dan Che Abdullah, A. S., 2006).

In fact there are some contracts that are the 'basic contracts' of local Islamic banking such as BBA financing 'replaced' with musyarakah mutanqisah, bai 'al-'inah and bai' al-dayn replaced with tawarruq. (M.A.M. Adil, 2012). Definition of tawarruq is to buy the goods on a profitable basis, and then resell them for cash to a third party for a price lower than the price they are for the purpose of obtaining cash. (Wizarah al-Awqaf wa al-Syu'un al-Islamiyyah, 1998). The implementation and launch of tawarruq contract, the banking sector needs a platform that helps to facilitate the tawarruq. Islamic banking in Malaysia has started using the London Metal Exchange (LME) platform to facilitate the implementation of tawarruq. However, there are Shariah issues in LME such as the existence of gharar elements in which the commodity traded in LME is actually sold to one or more parties, the existence of the metal traded in LME is also unclear which one belongs to the buyers which made LME purchases and also raised issues of identifying and benchmarking against commodities traded in LME, whether ownership overlap could trigger the issue of gharar. (Mohd Noor, A. dan Mahadi, N. F. 2010), (S.S Rayner, 1991). As example, BSAS was created as a platform to provide commodity trading transactions and also to address the Shariah issues inherent in the LME platform. According to Shamsul Akmal Ahmad, the name of the commodity trading platform is "Murabahah Commodity Exchange", but to make it a Bursa Malaysia product it is called the Suq al-Sila Exchange. The Suq al-Sila (السلع سوق بورصة) exchange is a combination of the Arabic words Bursah (platform), suq (market) and al-sila' (goods / commodities). (Sulaiman, S., 2013).

Basically the concept of the BSAS platform began in 2005 and took two years to complete the BSAS platform, due to communication issues between Bursa Malaysia and Korea to produce the BSAS platform. In 2007 Bursa Malaysia collaborated with various parties such as Malaysia International Islamic Finance (MIFC), Securities Commission (SC), Bank Negara Malaysia (BNM), Malaysian Palm Oil Board (MPOB) and the Malaysian Palm Oil Filter Association (PORAM) to enable BSAS platform before entering the market. It was only in 2009 that BSAS officially started operations. Although the existence of the BSAS platform is intended to address Shariah issues, there are still some negative questions about the BSAS platform. Since its existence is still new to the market, the BSAS platform and tawarruq principles have not escaped criticism among researchers. This is due to the fact that the BSAS platform and the tawarruq contract are tricks to usury and involve gharar elements. In this regard, this study attempts to research into the BSAS framework in detail and make the BSAS platform a research sample as it is a platform that is beginning to gain prominence in the current market.

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2.0 LITERATURE REVIEW

Dusuki, A.W. et.al discussed BSAS by comparing the commodity murabahah in BSAS with the Jakarta Future Exchange Shariah Indonesia (JFX). At the beginning of the discussion, his opinions and views of classical scholars related to tawarruq. He pointed out the difference between the former tawarruq and the modern tawarruq today. Next, the researcher discusses several Shariah issues that arise in the implementation of BSAS and JFX in terms of commodities, ownership, delivery and supply (pre-delivery and arrangement). The researcher also discussed the comparisons of BSAS and JFX's performance areas including objectives, key features, underlying assets and contracts, participants, delivery receipts, shipping process payments, payments, trading terms, pricing, minimum transactions and regulatory bodies regulating BSAS and JFX. (Dusuki, A.W. et.al, 2013).

According to Mohd Noor, A. et.al study of Shariah principles of murabahah and tawarruq based on the commodity murabahah by discussing the tawarruq contracts that are permitted and not approved by the current fuqaha. Researchers also discuss that there are three problems that can lead to unauthorized transactions, but with the BSAS platform these issues can be mitigated and avoided. Among the issues discussed are commodity issues which include gharar issues, commodity prices, crude palm oil dilemmas, and expensive charges for commodity delivery. The next issue to be discussed is the implementation of contracts that many scholars have discussed on the trading of murabahah commodity markets and the issue of wakalah in murabahah commodity transactions. Besides that, it is a contract of sale whereby the involvement of a third party is to prevent riba and the contract of murabahah and bai' muajjal is the closing contract for the execution of the usury. Researchers have found that the BSAS platform offered by Bursa Malaysia has its own advantage to cover existing Shariah issues and is an alternative Islamic platform compared to conventional finance and banking. (Mohd Noor, A. dan Mahadi, N.F. 2010).

Hasan, A, focusing more on the lack of liquidity in financial institutions will be exposed to liquidity risks. In addition, the researcher lists liquidity management instruments that have been developed in the global Islamic financial system, including a list of countries using liquid instruments. Further, the researchers also mentioned the use of murabahah commodities in the liquidity management of Islamic financial institutions in Malaysia using tawarruq contracts. In addition, the authors state that the issue of non-negotiable instruments using commodity murabahah as a result of the debt resulting from the tawarruq transaction was accepted as untrustworthy by the majority of scholars, except at par and spot on, if the debt was in the form the money and the payment must also be in the form of money. Finally, the researchers acknowledge that there are various issues that still exist in the commodity murabahah but researchers acknowledge the need to create a good liquidity management requires the cooperation of all parties. The implementation of the commodity murabahah as an example illustrates the need to have instruments that are Shariah compliant and viable for use in managing liquidity in Islamic financial institutions. (Hasan, A. 2011)

According a study from Rudnyckyj, D., he was conducted on Islamic finance in Malaysia which is one of the major Islamic financial systems in Asia. Malaysia is a country practicing the Islamic financial hub and developing the Islamic financial growth starts from the country, expanding to the level of global level. Among others, the Malaysian government through Bursa Malaysia has launched the Suq al-Sila Exchange as a commodity trading platform dedicated to facilitate the liquidity management of the Islamic banking system worldwide. Hence, this platform will making agricultural commodities such as crude palm oil a basic asset to be a contract that complies with Shariah requirements. This contract is known as a murabahah contract. At the end of the study, the authors described Malaysia as "Wall Street Islam" as a global network of Islamic finance that meets market needs in Asia and the Middle East. (Rudnyckyj, D. 2013).

Another researcher, Sulaiman S. mentioned the role of BSAS from liquidity management perspectives. The researcher also discussed the implementation of BSAS and support of various parties. He also discusses the uniqueness of BSAS, which involves combining physical asset trade with virtual applications across borders, and accessible from around the world. The basic assets of BSAS are crude palm oil and polythelyne (plastic resin). The mechanism of the BSAS transaction is also discussed as well as the Shariah issues that are gaining ground in his research. BSAS also received various awards to further strengthen the local and global markets. (Sulaiman, S. 2013). Researcher Dusuki, A.W. has focused on the study of the Commodity Murabahah Program (CMP) as one mechanism for liquidity needs and investment

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opportunities for Islamic Financial Institutions. He also studied several Shariah issues related to contracts used in the CMP, known as a tawarruq contracts. He cited views from all four of the well-known sects as well as the ruling Majma' Fiqh Islami in 2003 banning the use of the tawarruq munazzam contract or the tawarruq masrafi. Subsequently, his review of the concept of liquidity management adopted in Islamic financial institutions, further discussion of the concept and method of operation of liquidity management based on Islamic approach. His further research on the concepts, structures and mechanisms of the CMP and he also commented on the decision of the Shariah Advisory Council (MPS) of the Securities Commission and the Bank Shariah Advisory Council of Bank Negara Malaysia to officially confirm bai 'al-'inah and tawarruq would be used for liquidity management purposes. (Dusuki, A. W. 2007)

3.0 METHODOLOGY

In this qualitative study, three methods were applied for data collection to lead the BSAS as one of paradigm platform and tawarruq contract. Initially, the first method used by using library sources to obtain as much as information for instance books, articles, journals, magazines and scientific studies who are related to the issues of BSAS and implementation tawarruq. Besides that, to access a variety of information, several resource centers have been visited such as UIAM, ISRA and INCEIF libraries. In the other hand, this research also conducted a subsequent semi-structured interviews with the latest primary information related to the operation of the BSAS platform in BMIs and the financing of products based on tawarruq contract in several Islamic banks. Some of the respondent were interviewed directly such as Mr. En. Shamsul Akmal Ahmad (Vice President of BSAS, Alternative and Islamic Markets), Ms Aziah Aziz (Shariah Officer of Bank Rakyat) and En. Asharul Huzairi Mohd Mansor (Shariah Officer of Hong Leong Islamic Bank). All respondents also cooperated in providing financing contracts using the principles of tawarruq, BSAS documentation and everything related to the study.

4.0 FINDINGS AND DISCUSSION

4.1 Participants and BSAS Platform Framework

The commodities traded in BSAS are in accordance with the tawarruq contract and compliance with Shariah standards guidelines. In view of that, the operation of BSAS platform requires the participation of affiliates, among the affiliates involves in the BSAS transaction are Bursa Malaysia, Islamic Banking and commodity providers. Bursa Malaysia established BMIS, its own subsidiary to facilitate the business and assured it runs efficiently. BMIS is responsible for controlling BSAS platform, obtaining commodity suppliers, maintaining BSAS and seeking Islamic banking as a BSAS platform customer. The supervision and monitoring of the BSAS platform starts from commodities being placed in the market up to the commodity is finally transferred to the final buyer. This monitoring is supported with an electronic system developed by Bursa Malaysia. Since BSAS was launched in 2009, there were 78 Islamic Banking participants including local and foreign institutions on the BSAS platform. While for commodity suppliers, BMIS finds local commodity suppliers at the same time facilitating commodity supplier's trade in the market.

4.2 Commodities Offered at BSAS

There are 4 major commodities traded on the BSAS platform. It aims to diversify trading commodities and meet the demands of Islamic banking. BSAS also plans to diversify Shariah-compliant commodities including cars, air-conditioning units, oil, copper and aluminum. Below are the commodities offered at BSAS:

1. Crude palm oil (MSM)
2. Plastic Resin (plastic resin)
3. RBD Olien
4. Wood

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Commodities that have been approved by the BMIS must include:

- i. BMIS quality specifications
- ii. The commodity supplier must ensure that the commodity offered must be kept at a designated location
- iii. The BMIS determines fees and payments to commodity providers
- iv. The supplier may appoint a supplier agent to carry on the transaction activities at BSAS provided:
 - a) Proposal to sell approved commodities
 - b) Selling commodities to traders through the commodity house system
 - c) Purchase of BMIS approved commodities
 - d) Issue documents, if physical delivery is required
- v. The commodity delivery document must contain the following details:
 - a) Specified location
 - b) Date of assessment, if any
 - c) A statement showing the commodity has been approved and meets the specifications for shipment
 - d) Any other details as stated by BMIS

BMIS is scrutinizing suppliers that be capable of trading large quantities of commodities. The major commodity traded in BSAS is MSM, and among other trader are Felda Plantation, IOI Plantation, and Sime Darby Plantation including several multi-national plantation companies like Wilmar International Limited. As for the plastic resin commodity, BMIS has offered four types of plastic resins for sale at BSAS namely Polythelin (Ul Prospector, tt), LDPE (Exxon Mobil Chemical, tt), HDPE (Ceresana, tt) and Master Batch (Made-In- China.com, tt). In addition, the plastic resin suppliers for the BSAS platform are Riomax Company, Lon Dah Company and Win Long Company.

The next commodity offered on the BSAS platform is RBD Olién. The BMIS needs to work with PORAM, for the reason that PORAM is one of the associations with the crude palm oil refinery that produces Olién RBD commodities. The production of Olién RBDs has to be through distillation, purification and removal of odors and commodities that have an expiry date and cannot be stored for long. (Ibrahim. K. 2009). The fourth commodities offered in BSAS are wood commodities. Trading of timber commodities in BSAS is a special request from Islamic banking in Kuwait. These commodities are offered in two types, namely hardwood and softwood. Most of the timber commodities are from Sabah. The timber commodity supplier having received approval from the SC does not require any other institution to operate. This is because demand for these commodities is small and specific from Kuwait alone and there is no demand from the local market

5.0 CONCLUSION

5.1 Commodity Position

The commodity positioning dispute within the BSAS platform raise a criticism over the existence of gharar over MSM commodities. Researchers have found that on the supply side, MSM commodities is constantly flowing whether it is pumped in or pumped out of the MSM tank before being traded on BSAS platform. This indicates that the MSM position is indeterminate in the tank provided. According to AAOIFI guidelines, it can be categorized as bai 'al-mausuf fi dhimmah (imaginary object sale). In the view of the fuqaha jurors, the contract of sale of imaginary objects is not allowed. In order to avoid the sale of bai 'al-mausuf fi dhimmah, the buyer should ensure that the commodity is fully identified. In the purchase of a commodity, the buyer of the commodity should be aware of the type, specification, nature and quality of the commodity. If the buyer does not know the specification of the commodity, then there will be an element of gharar and dispute over ownership of the commodity. It is important that in the event of any damage or loss to the commodity, the buyer will be solely responsible.

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Therefore, in order to avoid gharar the commodity, BMIS has taken the initiative to address the issue by tagging the commodity and issuing a certificate containing complete information on the MSM commodity traded in BSAS. The information includes information on bid numbers, date of the commodity issued at BSAS, date of valuation, product code, unit, amount, currency value, price and transaction type. Thus, the element of gharar in MSM commodity on BSAS platform can be minimize because of each completed sales transaction, all data is detailed and recorded so that no major issues arise.

5.2 Double Commodity Ownership

The author next concern on Shariah issues is the dual ownership of commodities traded in BSAS. The issue of multiple ownership of commodities especially MSM commodities comes from Islamic banking in the Middle East. They believe that there is a double ownership of the commodities on sale. This double ownership means uncertainty (gharar) of which one belongs to us and perhaps the commodity sold to us is another person's right. However, this issue has been clarified by the BMIS to Islamic banking in the Middle East, using the method of benchmarking up the ownership of the commodity and obtaining approval from the Shariah Advisory Council of Bank Negara Malaysia.

6.0 CONCLUSION

As a conclusion in this study, elements gharar was found in several situations in the implementation of BSAS. However gharar exists in this situation and can be minimalized by this BSAS implementation and also have a different opinions from Islamic scolars. Despite of that, researchers recommend that the MSM and RBD Olien commodities be replaced with other commodity that are physically more stable to avoid elements of gharar in transaction.

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REFERENCES

- Ab. Ghani, A. M. dan Che Abdullah, A. S. (2006). Tawarruq: Konsep dan Aplikasi dalam Kewangan Islam. Dalam Ab. Ghani, A.M. dan Mansor, F, *Dinamisme Kewangan Islam di Malaysia* (p. 128). Kuala Lumpur: Penerbit Universiti Malaya.
- Aznan Hasan (2011), “ Penggunaan Komoditi *Murabahah* Sebagai Instrumen Pengurusan Kecairan di Dalam Institusi Kewangan Islam”, *Muzakarah Penasihat Syariah Kewangan Islam 2011 Kali Ke-6*, 3 Oktober 2011, Hotel Istana Kuala Lumpur, Malaysia.
- Dusuki, A. W. (2007) Commodity *Murabahah* Programme (CMP): “An Innovative Approach to Liquidity Management”, *Paper Published in Journal of Islamic Economics, Banking and Finance, Volume 3, No.1: 2007*.
- Dusuki, A.W., Ali, M.M dan Sandrego, D.Y. (2013), The Application Of Commodity *Murabahah* In *Bursa Suq Al-Sila* Malaysia Vis-À-Vis Jakarta Future Exchange Shariah Indonesia: A Comparative Analysis, *ISRA Research Paper, (No. 49/2013)*.
- Ibrahim. K (2009), “*Analisis Pola Pergerakan Harga Komoditi Olein di Pasar Fisik Jakarta dan Pasar Fisik Rotterdam*”(Tesis Sarjana, Fakulti Pertanian, Institut Pertanian Bogor, 2009).
- Laldin, M. A. et. al. (2012). Fatwas in Islamic Banking: A Comparative Study between Malaysia and Gulf Cooperation Council (GCC) Countries. *ISRA Research Paper (31/2012)*, 18.
- Mohamad, M. T., Sulaiman @ Mohamad, A. A. dan Borhan, J. T. (2010), Analisis Pengaruh Risiko Terhadap Prestasi Keuntungan Perbankan Islam Di Malaysia, *Persidangan Kebangsaan Ekonomi Malaysia ke V (PERKEM V)*, Jilid 1 (2010) 247-255.
- Mohd Noor, A. dan Mahadi, N.F. (2010), A Review Of Commodity *Murabahah* Transaction As Offered By Bursa Malaysia: A Critical Analysis From Fiqh Perspective, In: *Langkawi International Conference Islamic Economics Finance And Banking, 13-15 December 2010*, Kolej Uniersiti Insaniah, Kedah.
- Rudnyckyj, D. (2013), “From Wall Street to Halal Street: Malaysia and the Globalization of Islamic Finance”, *The Journal of Asian Studies*, 72, h. 831-848, 14 Oktober 2013.
- S.S Rayner (1991), The Theory of Contract in Islamic Law: A Comparative Analysis with Particular Reference to the Modern Legislation in Kuwait, Bahrain and The United Arab Emirates (*London: Graham & Trotman Ltd*), h.133.
- Sulaiman, S “*Bursa Suq al-Sila*’: Platform Pengurusan Kecairan Tunai”, laman sesawang JAKIM. Dicapai pada 13 Julai 2013, <http://www.islam.gov.my/muamalat/artikel/bursa-suq-al-sila-platform-pengurusan-kecairan-tunai>.
- Wizarah al-Awqaf wa al-Syu’un al-Islamiyyah(1998), *al-Mawsu’ah al-Fiqhiyyah*, Jil 14, Kuwait: Wizarah al-Awqaf wa al-Syu’un al-Islamiyyah, h.93.
- Bank Negara Malaysia, dicapai pada 27 Jun 2013 <http://www.bnm.gov.my/files/publication/ar/bm/2003/cp05.pdf>
- Shaharuddin, A. “The Bay’ al-Inah Controversy in Malaysian Islamic Banking”. Dicapai 22 Januari 2013, <http://www.kantakji.com/fiqh/Files/Markets/p118.pdf>
- M. A. M. Adil (2012), “*Maqasid Syariah dalam Perbankan Islam*”. Dicapai pada 26 Jun 2013, http://www.utusan.com.my/utusan/info.asp?y=2012&dt=0216&pub=utusan_malaysia&sec=Bicara_Agama&pg=ba_03.htm.

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Ul Prospector (t.t), *Polyethylene*. Dicapai pada 19 March 2014, <http://plastics.ides.com/generics/27/polyethylene-pe>.

Exxon Mobil Chemical (t.t), *LDPE Resin*. Dicapai pada 21 March 2014, <http://www.exxonmobilchemical.com/Chem-English/brands/polyethylene-ldpe-resins-blown-cast-extrusion-film.aspx?In=productsservices>.

Ceresana (t.t), *Market Study: Polyethelene-HDPE*. Dicapai pada 21 March 2014, <http://www.ceresana.com/en/market-studies/plastics/polyethylene-hdpe/>.

Made-In-China.com (t.t), *PVC Resin Plastic Auto Parts Green Masterbatch*. Dicapai pada 21 March 2014, <http://colormasterbatches.en.made-in-china.com/product/yKTJvewdpHcC/China-PVC-Resin-Plastic-Auto-Parts-Green-Masterbatch.html>.

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