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Regulation of Virtual Currencies: Mitigating the Risks and Challenges Involved

Zalina Muhamed Zahudi[a], Radin Ariff Taquiddin Radin Amir[a]

[a]*Legal Department, Bank Negara Malaysia*

Abstract

The many types of virtual currencies that have been developed recently are due to the assessment of their users and proponents that financial systems require reform based on their mistrust in governments and financial institutions. To the users of virtual currency, its use in trade and commercial transactions suggests an attempt towards empowerment of consumers by by-passing the regulated currency regimes and intuitional regulations to create an open payments network – an Internet for money. This article makes an attempt to create awareness on what virtual currency is, in highlighting the differences between virtual currency and the national currency in circulation. This would include discussion on the interaction of virtual currency with the real economy and its risk to the real economy. Further, the article draws attention to consumer protection issues and the significant consumer risks associated with the use and ownership of virtual currency. An Islamic finance perspective on virtual currency is included, given Malaysia's dual financial system which support both conventional and Islamic finance. Finally, this article also draws attention to some of the possible regulatory challenges that virtual currency may create.

Keywords: Bitcoin, consumer protection, electronic money, fraud, Islamic finance, law, money-laundering, national currency, regulation, terrorist financing virtual currencies

1. Introduction

The many types of virtual currencies that have been developed recently are due to the assessment by their users and proponents that financial system reform is required, based on their mistrust in governments and financial institutions. To the users of virtual currency, its use in trade and commercial transactions suggests an attempt towards empowerment of consumers by by-passing the regulated currency regimes and institutional regulations to create an open payments network – an Internet for money.[1] For instance, unconventional monetary policies of central banks have led to fears of a "debasement", a loss of value in fiat money. This lack of trust cannot be separated from an ideological element. Using alternative currencies is a way of rebelling against the system. These are the concerns that motivate the founders and early adopters of virtual currencies. Virtual currency is a financial invention that has grown in number and popularity in recent years.

The objective of this article is to create awareness on what virtual currency is and to highlight the differences between virtual currency and national currency in circulation. An Islamic finance perspective is included, given Malaysia's dual financial system which supports both conventional as well as Islamic finance.[2] Finally, the article draws attention to some of the possible regulatory challenges that virtual currency creates.

2. What is virtual currency?

"Virtual currency", being a new financial innovation is not defined by statute in Malaysia. In general however, virtual currency refers to a digital representation of value that is not government-issued legal tender [3]. A virtual currency or virtual money has been defined in 2012 by the European Central Bank as "a type of unregulated, digital money, which is issued and usually controlled by its developers, and used and accepted among the members of a specific virtual community [4]. In 2014, the European Banking Authority

defined virtual currency as "a digital representation of value that is neither issued by a central bank or a public authority, nor necessarily attached to a fiat money or currency [5], but is accepted by natural or legal persons as a means of payment and can be transferred, stored or traded electronically" [6]. Examples of virtual currencies include Bitcoin, Litecoin, Stellar and so on. It was estimated that around 500 virtual currency schemes exist at the time the European Central Bank released its analysis on virtual currency scheme in February 2015.[7] Many virtual currency schemes exist for a short time and then fade away [8]. Premised on the above definitions, the following summarizes the characteristics of a virtual currency, which differentiates a virtual currency like Bitcoin from e-money, which is not virtual currency:

What is Virtual Currency? (e.g. Bitcoin)	**What is Not Virtual Currency? (e.g. e-money)**
Digital representation of value; Not backed by fiat money;	Digital representation of value; Backed by fiat money;
Does not represent fiat money;	Digital representation of fiat money;
Issued and controlled by its developers (private control);	Fiat money is issued and controlled by monetary authority;
Used and accepted among members of a specific virtual community Not regulated as "currency" by monetary authority.	Used and accepted as national currency Fiat money is regulated by monetary authority.

3. What are the differences between virtual currency and national currency?

Unlike the Malaysian Ringgit, the U.S. Dollar and other central bank or monetary authority-issued currencies [9], virtual currency does not have a physical coin or note associated with their circulation. While virtual currency can function as a unit of account, store of value, and medium of exchange, they are not widely used or accepted. Some virtual currencies can only be used within virtual economies (for example, within online role-playing games) and may not be readily exchanged for currencies issued by central banks. Other virtual currencies may be used to purchase goods and services in the real economy and can be converted into cash through virtual currency exchanges (venues where the virtual currencies are traded).[10]

4. Comparison: National currency v. virtual currency

A national currency (or loosely referred to as "money") is issued by the central bank or monetary authority of a particular country and recognised as legal tender[11] guaranteed by the issuer. For example, Bank Negara Malaysia (BNM) stands ready to purchase Malaysian RM at face value (likewise, the Bank of England as in the case of the British Pound and the European Central Bank as in the case of the Euro). On the other hand, virtual currencies are not issued or guaranteed by a central bank or monetary authority. Let us look at Bitcoin as an example. Bitcoin are not issued by an issuer and therefore is not institutionally guaranteed.[12] No institution 'prints' or issues Bitcoin and no single organisation controls its distribution. Virtual currency such as Bitcoin is not the same as national currencies and the 'coins' cannot be equated to physical cash (i.e. fiat money).

5. Is virtual currency, electronic money?

There is a distinction between the definition and the terminology of "virtual currency" and "electronic money" and it is important to understand the difference between the two. Electronic money or e-money refers to the digital representation of fiat money and is considered as "money". Countries, including Malaysia regulate the issuance of e-money[13]. E-money is fiat money that is stored electronically in digital wallets or accounts[14]. But e-money is still part of the fiat money system in a way that virtual currency such as Bitcoin is not. Summing up what has been explained above, perhaps, the most simplistic explanation of virtual currency is provided by the Financial Action Task Force (FATF)[15]:

> "Virtual currency is a digital representation of value that can be digitally traded and functions as:

(1) a medium of exchange; and/or
(2) a unit of account; and/or
(3) a store of value,

but does not have legal tender status in any jurisdiction. It is neither issued nor guaranteed by any jurisdiction, and fulfils the above functions only by agreement within the community of users. Virtual currency is distinguished from fiat currency. It is also distinct from e-money, which is a digital representation of fiat currency used to electronically transfer value denominated in fiat currency." [16]

6. What's "wrong" with virtual currencies then?

If virtual currencies are not issued by central banks or monetary authorities and as such, are not recognised as legal tender, nor form part of the fiat money system and not regulated, why then is it necessary for one to be aware of this "product" created by a group of IT programmers or developers (as in the case of Bitcoin)?

While these virtual currencies offer some benefits, they also pose risks to the financial system as well as the general public. Virtual currencies used within limited virtual economies, as explained earlier, do not pose major risks but the use of open-flow virtual currencies[17] may pose major risks to the financial system and the general public.

Virtual currencies have been associated with illicit activities and security breaches, raising possible regulatory, law enforcement and consumer protection issues. Some alternative currencies can be used for tax evasion, because fiscal administrations have not yet developed means of controlling transactions based on those currencies. Obviously, this attracted criminals. Bitcoin became famous in the press when the FBI announced the seizure of Silk Road in October 2013, a website that used the virtual payment system to sell illegal drugs. Silk Road 2.0, its follower, had less media attention despite impressive results. According to the FBI, as of September 2014, Silk Road 2.0 was generating sales of at least approximately USD8 million per month and had approximately 150,000 active users. Like its predecessor, it "operated exclusively on the "Tor" network (a hidden Internet) and required all transactions to be paid for in Bitcoin in order to preserve its users' anonymity and evade detection by law enforcement (Hassan, 2014). The volatility of the pricing of virtual currencies, such as Bitcoin is also of great concern. In June 2014, Bitcoin reached a high of USD674.00 per unit which has since slide down to around USD230.00 per unit in June 2015.[18] As a result of these risks, the open-flow virtual currencies have received considerable attention from financial regulatory and law enforcement agencies.

7. What are the possible regulatory challenges that virtual currency creates?

The following are some of the possible risks that are associated with the use of virtual currencies. They are by no means, exhaustive and were compiled as a list of possible areas which may require further research and examination.

(a) **Interaction with and impact to real economy**

Even though virtual currencies are not national currencies, they can perform the same function as conventional money, i.e. transferring value between parties. Virtual currencies can be exchanged for goods and services and can be converted into fiat money (cash) in exchanges to Malaysian Ringgit or other foreign currencies, and to the users, this can be argued to be almost identical to normal foreign currency exchange.

Even though there are many kinds of virtual currencies schemes that have failed, new schemes continue to grow, a testament to the power of the concept[19]. The use of these virtual currencies interacts with the real economy, which may result in a risk to the real economy and the financial system if the usage of virtual currencies is not regulated from the perspective of monetary and financial stability[20]. Digital currencies such as Bitcoin could threaten the economy if they became widespread. In the most extreme case, Bitcoin's decentralised payment system and finite supply could

make central banks obsolete, create huge economic risks and trigger deflation. Even if the currency were fairly limited, significant volatility in value could threaten financial stability (Aldrick, 2014).

(b) **Consumer protection**

A major focus of concern regarding virtual currencies is the issue of consumer protection. Traditional payment systems afford consumers protection against a variety of risks. Virtual currencies have the potential to expand consumer choice and spur new technology development and investment. However, since virtual currencies are subject to limited regulation due to the structural aspects of the virtual currency ecosystem, many such consumer protections are currently absent. The significant consumer risks associated with the use and ownership of virtual currency is summarized below[21].

Consumer Risks

Loss or theft	• Virtual currency can be lost through a security breach, user error, or a technological failure at a virtual currency wallet or exchange. Once lost, virtual currency typically cannot be regained.
Fraud or unauthorised use	• Generally, virtual currency can be spent by anyone in possession of the associated ownership credentials. Transactions in most currencies are not reversible, even if the result of fraud or unauthorized use.
Transaction processing error	• In the event that a payment is misdirected, an incorrect amount is transferred, or a transaction is not completed in a timely manner due to an error by a virtual currency wallet, exchange, or processor, in most currencies the transaction is not reversible, the error is not correctible, and the consumer has no recourse against the wallet, exchange, or processor.
Failure of a wallet or exchange	• No insurance mechanism exists to make accountholders whole in the event that a virtual currency wallet or exchange operator fails and accounts become inaccessible.
Inadequate disclosures	• Wallets and exchange operators have no obligation to provide disclosures to consumers related to service fees or charges associated with virtual currency transactions, the volatility and unregulated nature of the virtual currency ecosystem, or any of the other risks described in this table.

A significant consumer risk associated with the use and ownership of virtual currency is the risk of the virtual currency being lost or stolen. This is where the virtual currency can be lost or stolen through a security breach, user error, or a technological failure at a virtual currency wallet or exchange. Once the virtual currency is lost, it cannot be regained. Fraud or unauthorized use is another factor for consideration. Unlike a currency with legal tender status, the issuer (i.e. the central bank) will be able to guarantee the face value of the currency.

Generally, virtual currency can be spent by anyone in possession of the associated ownership credentials. However, transactions are not reversible, even if there is fraud or unauthorized use[22]. Any processing error while transacting the virtual currency such as misdirected payment, incorrect amount being transferred, or when a transaction is not completed in a timely manner due to an error, are also not reversible[23] and the consumer has no recourse against the wallet, exchange, or processor.

Unlike the insurance depository schemes, which exist in most countries under the banking systems[24], no insurance mechanism exists to protect the consumer in the event the wallet or exchange operator fails and accounts become inaccessible. With the lack of a regulatory framework, wallets and exchange operators have no obligation to provide disclosures to consumers on service fees or charges associated with virtual currency transactions. The value of virtual currencies is also subject to volatility which can make them unattractive as a store of value due to the lack of price stability[25]. The irreversibility of virtual currency transactions is also a concern to consumers.

(c) **Crime watch: fraud, money-laundering and terrorist financing**

The nature and multi-functionality of virtual currencies means that there is a risk of them being used for fraudulent purposes. Due to the upswing in new criminal activities in connection with virtual currencies, legislative and regulatory frameworks need to be updated and adapted in response to these new challenges, particularly with respect to the fight against fraud, money laundering and terrorist financing.

When it comes to perpetrating fraud, the anonymity provided by virtual currencies allows fraudsters to collect money without leaving a footprint of the transaction. This is similar to a cash-based transaction, but one conducted on the Internet without the criminal and the victim ever meeting face-to-face.

For example[26], fraudsters might set up a fake e-commerce site that accepts payment in virtual currency, then shut down the site and have access to the funds collected in any country whatsoever, without leaving behind the slightest trace of any transaction. The risk of money laundering is higher since the operation is divided into three stages –

(i) purchasing virtual currency with cash;
(ii) setting up an e-commerce site from which fictitious purchases of goods are made from a number of computers using virtual currency; and
(iii) collecting often large sums of money, which can then be exchanged for legal tender.

The use of a virtual currency can render Internet-based money laundering techniques even more opaque. Examples of this include online gaming, fraudulent e-commerce transactions, online auctions or fake projects listed on foreign crowd funding sites.

8. Can Islamic finance accommodate virtual currencies?

How would Islamic finance and Shariah principles apply to virtual currencies? Will virtual currencies be treated in equal terms to fiat money? Many may be well aware of the continuing debate on the use of fiat money in Islamic finance but this debate goes beyond the scope of this article. Suffice to say it is generally acceptable that Islamic finance today operates within the international monetary system, albeit with certain specificities which are peculiar to Islamic finance.[27]

Money in the form of gold and silver were used during Prophet Muhammad's (pbuh) time, with the gold dinar and the silver dirham as currency to measure the value of goods or services for sale and purchase. From the Shariah perspective, the hadith of Prophet Muhammad (pbuh)[28] sets out the Shariah rule on the six commodities (including gold and silver) as *ribawi* items (items which may attract *riba*'[29]) if they are exchanged with similar commodities, has been generally accepted as governing the use of commodities or money as the medium of exchange. This hadith mentioned gold and silver as *ribawi* items and that the exchange of *ribawi* items must be done in equal quantities (if the exchange is between the same items, e.g. gold with gold, or silver with silver) and on spot basis.[30] As such, the above rule applies to the gold dinar and silver dirham, which were used as currency at that time.

Over time, the use of gold and silver as currency has been replaced by fiat money in the form of national currencies. Since national currencies are also used as a measure of value and medium of exchange, they are also classified by contemporary Islamic scholars as *ribawi* items and hence the rules relating to *ribawi* items apply to them.[31] Electronic currencies are another permutation of fiat money and arguably the rules relating to *ribawi* items apply to them. This follows that since the rules set out in the hadith above also arguably applies to virtual currencies if they are also used as a measure of value and medium of exchange and recognised and accepted by a community of users as money/currency by way of custom (*'urf*). This view appears to be supported by an entry on JAKIM's *e-fatwa* in which a JAKIM *fatwa* research fellow examined the issue on the use of Bitcoin as a medium of exchange for Islamic transactions.[32] JAKIM's research findings are inconclusive. According to the research, the use of Bitcoin as a currency can be viewed from both the *fiqh* (Islamic jurisprudence) and *iqtisad* (Islamic economics) perspectives.

The *fiqh* perspective appears to suggest the possibility of technically accepting the use of virtual currencies like Bitcoin on the following basis:

(i) Bitcoin is a type of electronic money with no physical form. *Qabd* (possession) can only take place through a "constructive possession", and the rules stipulate that upon exchange, the receiver of Bitcoin must have the right to fully utilize the Bitcoin that he receives.

(ii) As a type of currency, the rules relating to *bay al-sarf* (sale of currency) will apply to Bitcoin if the transaction involves the exchange of currency with currency or the purchase of *ribawi* items such as gold and silver and spot payment must be made.

However, from the *iqtisad* perspective, the research found Bitcoin not suitable to be regarded as a currency. The important characteristics of currency are that it must have a stable value and can be used as a measurement for other types of assets. Even though Bitcoin may be considered as a currency, it is not regulated by any central bank or monetary authorities like legal tender. Since there is no regulation, failed Bitcoin transactions may cause financial loss to its users. Bitcoin is also a currency which is not backed by any asset. As such, Bitcoin is susceptible to uncertainty and speculation (*gharar*) and the price may fluctuate greatly.

In addition, the use of Bitcoin may also raise other possible Shariah concerns. Virtual currencies which operate on the basis of anonymity may be used in the trade of illicit goods and services. The issuer of virtual currency, such as Bitcoin cannot be identified, and the exchanges where the currencies are traded are not regulated by regulatory authorities. Hence, virtual currencies may be used for illicit activities such as dealings in narcotics, money laundering, terrorist financing or such other activities which are prohibited by Shariah.[33]

The above risk factors may persuasively influence a *fatwa* on the use of virtual currencies. On the understanding that the harm caused by the use of virtual currencies outweighs its benefits, the Shariah authority or Islamic religious authority in a given jurisdiction may issue a *fatwa* on the basis of the objectives of the Shariah (*maqasid al-Shariah*), which promotes the protection of religion, life, intellect, lineage and wealth. In such a situation, the Shariah authority or the religious authority may contemplate on prohibiting the use of virtual currencies premised on *maslahah* (public interest) or *sad dharai'*, that is, blocking the means which can cause harm to society, especially from the consumer protection and prevention of crime point of view. This Shariah approach is subjective and qualitative in nature and would depend upon the interpretation of what constitutes 'public interest' or 'harm to society' in particular jurisdictions.

A robust regulatory framework, should regulators allow the regulated use of virtual currencies may address the above concerns. Nevertheless, it is incumbent upon the Shariah authority in Islamic finance in a given jurisdiction to issue a *fatwa* on the use of virtual currencies from the Shariah perspective.

9. To regulate or not to regulate?

The discussion above highlights the following interrelated key points of the article:

(a) virtual currency can be identified by its characteristics. It is a digital representation of value which is not regulated or controlled by the government and is used and accepted in a specific virtual community. It is different from e-money;

(b) widespread use of virtual currency can pose risk to monetary and financial stability if left unregulated;

(c) if left unregulated, the general public will be exposed to risk due to the absence of consumer protection;

(d) use of unregulated virtual currency may pose challenges in terms of fraud, money laundering and terrorist financing; and

(e) the Islamic finance potentials of virtual currency have not been fully explored.

Hence, the pertinent question now is "to regulate or not to regulate?" The writers are of the view that virtual currencies should be regulated because the death of one currency will see the rebirth of others – and this will continue to pose regulatory concerns.

Efforts towards regulating virtual currency are now taking place worldwide. In the USA, FinCEN[34] issued the Virtual Currency Guidance, which describes the circumstances in which persons engaged in

virtual currency transactions are classified as money transmitters for purposes of the Bank Secrecy Act ("BSA")'s implementing regulations. FinCEN categorizes many virtual currency exchanges, wallet operators, and miners operating in the United States as money transmitters and those entities are required to comply with the BSA's know-your customer and anti-money laundering requirements. FinCEN is the only U.S. federal financial regulator to take an official position with respect to virtual currency regulation. Outside the context of financial regulations, the Internal Revenue Service (the "IRS") issued guidance in 2014, stating that virtual currencies are treated as property for federal tax. State financial regulators in New York, Texas, and Washington have also provided guidance regarding treatment of virtual currencies under state law[35].

The People's Bank of China prohibited merchants from accepting Bitcoin as payment and prohibited payment processors from converting Bitcoin into Yuan. The Canadian agency responsible for combatting money laundering stated in late 2013 that virtual currency exchanges were not subject to existing anti-money laundering regulations, but in mid-February 2014, the Canadian government announced plans to expand the scope of such regulations to account for virtual currencies. Finland regulates virtual currencies as commodities, while Sweden taxes them as assets of the same class as fine art[36].

In March 2014, the Monetary Authority of Singapore issued a press release stating its intention to regulate virtual currency intermediaries to address concerns over money laundering and terrorist financing risks. The regulatory strategy will be modelled on that for money changers and remittance agencies through the verification of customers' identities and the reporting of suspicious transactions (Loke, 2015).

In Malaysia, BNM has yet to regulate the use of virtual currencies. On 2 January 2014, BNM issued a statement on Bitcoin stating that the central bank does not regulate the operations of Bitcoin and that the public is advised to be cautious of the risks associated with the usage of such digital currency.[37] However if the need arises, the authors are of the view that arguably BNM already has the necessary powers to do so pursuant to the Foreign Exchange Administration (FEA) provisions under the Financial Services Act 2013 (FSA) and the Islamic Financial Services Act 2013 (IFSA).[38] Under the FSA/IFSA, virtual currencies such as Bitcoin may be considered as a medium of exchange for payment of goods and services. In particular, subsections 213(1) FSA / 225(1) IFSA defines "payment" as an "act of transferring to, or placing to the credit of, a person, ringgit, foreign currency, financial instrument, gold, other precious metals or other valuable consideration as the case may be, whether under an obligation or otherwise is very general and includes any form of "valuable consideration". As Bitcoin has been used in certain private arrangements or transactions as private means of payment for goods or services, Bitcoin can be argued to have value that confers pecuniary measurable benefit to a person who accepts it and this falls within the ambit of "valuable consideration", and therefore within the purview of the definition of "payment" under the FSA/IFSA.

At this point, it is still too early to see the impact on the future of virtual currency on any regulatory frameworks that have been put in place. There are still too many debates on the regulatory procedures that are taking place currently. For the time being, the legal uncertainty therefore remains and the stakes for speculation on the outcome have only risen. In the meantime, public interest in virtual currencies and media coverage thereof has been fading compared to a couple of years ago.

10. Conclusion

Virtual currency is still a largely uncharted and unsupervised area, and so far, no protections are likely available to the consumers that become involved with virtual currency if something goes wrong. One certainty is that all virtual currencies should be approached with extra caution. In any case, it would be difficult, if not impossible to stop virtual currencies from being "produced" and regulating them may be the way forward. However, regulators must ensure what type of regulatory regime is suitable to regulated virtual currency, and how best to protect consumers. Recent events, from software glitches, hackings and exchange shutdowns to cases of outright fraud, highlight the speculative and risky nature of virtual currency. As with any financial product, consumers need to do their research, understand the hazards and know who they are dealing with when it comes to owning these "electronic assets". Until then…. *caveat emptor*![39]

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[1] This may be viewed as protest, anti-establishment, or even a "punk" attitude towards controls exercised by the state. C.f. Cade Metz, 2015.

[2] Central Bank of Malaysia Act 2009 [Act 701] at Section 27.

[3] Central Bank of Malaysia Act 2009 [Act 701] at Section 63 provides that only currency notes and coins issued by BNM shall be legal tender in Malaysia. ("Black's Law Dictionary 8th Edition," 2004), at p.915 defines "legal tender" as "money approved in a country for the payment of debts, the purchase of goods, and other exchanges for value".

[4] C.f. *Virtual Currency Schemes* October 2012.

[5]"Black's Law Dictionary 8th Edition," 2004 at p.1027 defines "fiat money" as paper currency not backed by gold or silver. "Fiat money" has also been defined as currency that a government has declared to be legal tender, but is not backed by a physical commodity. The value of fiat money is derived from the relationship between supply and demand rather than the value of the material that the money is made of. Historically, most currencies were based on physical commodities such as gold or silver, but fiat money is based solely on faith. "Fiat" is the Latin word for "it shall be". C.f. *"Definition of 'Fiat Money'" 2016.*

[6] C.f. *EBA Opinion on Virtual Currencies, EBA/Op/2014/084, July 2014, 2014.*

[7] C.f. *Virtual Currency Schemes - A Further Analysis*, 2015.

[8] For examples there are various write up, questioning whether Bitcoins has a future since it first came to prominence over 6 years ago, many questions whether Bitcoin be a long-lasting trend, or will it die out and its popularity fade away. For example, c.f. Roger Ver Q&A | 'The Most Focused Man In Bitcoin' Talks Comparative Advantage, 7 September 2015.

[9] Also known as conventional currency.

[10] One example of these is Bitcoin, which was developed in 2009. Bitcoin and similar virtual currency systems operate over the Internet and use computer protocols and encryption to conduct and verify transactions.

[11] In the case of Malaysia, only currency notes and coins issued by BNM are considered as legal tender. C.f. section 24 of the repealed Central Bank of Malaysia Act 1958 [Act 519], and section 63 of the Central Bank of Malaysia Act 2009 [Act 701].

[12] Bitcoin are mathematically generated by computers in a network which executes difficult number crunching tasks, a procedure known as Bitcoin "mining". The mathematics of the Bitcoin system were set up so that it becomes progressively more difficult to "mine" Bitcoin over time, and the total number that can ever be mined is limited to around 21m.
C.f. *"The Economist explains - How does Bitcoin work?," 2013).*

[13] Malaysia regulates the issuance of e-money. Under the Financial Services Act 2013 [Act 758] (FSA) and the Islamic Financial Services Act 2013 [Act 759] 2013 (IFSA). E-money is a designated payment instrument and an issuer that wants to issue e-money needs to be approved by the Bank. C.f. section 9, 11 and Schedule 1 of the FSA and IFSA, and the Financial Services (Designated Payment Instruments) Order 2013 [P.U. (A) 202] and the Islamic Financial Services (Designated Islamic Payment Instruments) Order 2013 [P.U. (A) 2018].

[14] In Malaysia, the most common example of e-money scheme is the Touch n' Go scheme, a form of e-money stored in a payment card.

[15] The Financial Action Task Force (FATF) is an inter-governmental body established in 1989 by the Ministers of its Member jurisdictions. The objectives of the FATF are to set standards and promote effective implementation of legal, regulatory and operational measures for combating money laundering, terrorist financing and other related threats to the integrity of the international financial system. C.f. *"Financial Action Task Force: Who We Are," 2016*.

[16] Definition provided in the FATF Report - Virtual Currencies, Key Definitions and Potential AML/CFT Risks (June 2014). C.f. *FATF REPORT Virtual Currencies Key Definitions and Potential AML/CFT Risks, June 2014*, 2014.

[17] In an "open-flow" virtual currency system, virtual currencies can be used to purchase both real and virtual goods and services, as well as be readily exchanged for government-issued currency (i.e. national currency). C.f. Nellen, 2013.

[18] As traded on Bitfinex (a virtual currency exchange). C.f. "Cyrpto Currencies Trading Platform on BITFINEX," 2015. For pricing, c.f. "Bitcoin Price Index Chart," 2015 and "Currency Converter - BTC to USD," 2015.

[19] Bitcoin is an example of the resiliency of the ideas driving virtual currency. Over the years, it has endured several crashes in the Bitcoin prices, but has recovered. In fact, country like the USA has even shut down virtual currency Liberty Reserve after an investigation showed it was used almost exclusively by criminals around the world to launder money. And yet, virtual currencies continue to exist and grow. C.f. Zeiler, 2013.

[20] The European Central Bank (ECB), argued that price stability could be affected where virtual currency (in general) substantially modify the quantity of money, have an impact on the velocity of money, the use of cash, and/or influence the measurement of monetary aggregates, and where there is an interaction between the virtual currency and the real economy. Virtual currency could have an impact on price stability and monetary policy if they affect the demand for the central bank's liabilities and interfere in the control of money through open market operations. According to the ECB, wide acceptance of virtual currency could have a substitution effect on central bank money, thereby reducing the need for cash needed to conduct the transactions generated by nominal income, reducing the central bank balance sheets and their ability to influence the short-term interest rates. C.f. *Virtual Currency Schemes* October 2012.

[21] C.f. *White Paper - Virtual Currency: Risks and Regulation*, 2014.

[22] Some virtual currency companies do not identify their owners, provide phone numbers and addresses, or even specify the country in which they are located. If a consumer trusts a company to hold their virtual currencies and something goes wrong, the company may not offer the kind of help the consumer would expect from a bank, debit card, or credit card provider. In fact, some virtual currency companies disclaim responsibility for consumer losses if funds are lost or stolen. C.f. "CFPB Warns Consumers About Bitcoin - CFPB Now Accepting Complaints on Virtual Currency Products and Services, 11 August 2014," 2014.

[23] C.f. "Bitcoin - Some things you need to know," 2009-2016.

[24] Such as the establishment of Perbadanan Insurans Deposit Malaysia (PIDM) in the case of Malaysia. PIDM is a Government agency established in 2005 with the role to administer the Deposit Insurance System (DIS) and the Takaful and Insurance Benefits Protection System (TIPS) to protect depositors and owners of Takaful certificates and insurance policies in the event of a member institution failure.

[25] The exchange rate of Bitcoin to U.S. dollars in 2013 fell as much as 61% in a single day. In 2014, the value of Bitcoin has dropped by as much as 80% in a single day. C.f. *"CFPB Warns Consumers About Bitcoin - CFPB Now Accepting Complaints on Virtual Currency Products and Services", 11 August 2014.*

[26] C.f. *Regulating Virtual Currencies - Recommendations to prevent virtual currencies from being used for fraudulent purposes and money laundering*, June 2014.

[27] The use of fiat money in Islam is a contentious *Shariah* issue. Some scholars like Sheikh Imran Hosein look at the current financial system's use of fiat money as not compatible with *Shariah*. C.f. Hosein, 2007.

[28] Romanized acronym from Arabic: صلى الله عليه و آله وسلم, which means "Peace be upon him".

[29] *Riba*' or usury is prohibited by *Shariah*.

[30] *Ribawi* items are those items which attracts *riba'* (usury) and specific rules apply to them. Prophet Muhammad (Peace Be Upon Him) related by 'Ubadah ibn al-Samit, narrated by Muslim as follows: "(*Exchange of) gold for gold, silver for silver, wheat for wheat, barley for barley, dates for dates, salt for salt (shall be) in equal quantities and hand to hand (spot). If they differ in type, you may trade in them as you wish provided it is hand to hand (without deferment on either side*)."

[31]*Resolutions and Recommendations of the Council of the Islamic Fiqh Academy 1985-2000*, 2000. C.f. resolution issued at the 3rd conference in Amman, Jordan on 11-16 October 1986 – Resolution No. 21 (9-3) concerning Shariah rules governing paper money at p.34. The Council of the Islamic Fiqh Academy resolved "paper money is real money, possessing all characteristics of value, and subject to Shariah rules governing gold and silver vis-a-vi *riba*, *zakah*, *salaam* and all other transactions". This allowed the use of fiat money and that the application of Shariah rules relating to *ribawi* items apply to fiat money.

[32] C.f. "Q & A Bersama Felo Penyelidik Fatwa - Hukum Penggunaan Bitcoin Sebagai Medium Untuk Bermu'amalat.," 2014.

[33] C.f. Daniels, 2014 on use of virtual currency in black market narcotics. C.f. Bryans (2014) on money laundering. On terrorist financing, it has been reported that virtual currencies have been used to finance extreme or terrorist groups who claim to be associated to Islam, such as ISIS. C.f. Harman, 2015.

[34] Financial Crimes Enforcement Network (FinCEN) – FinCEN is a bureau of the U.S. Department of the Treasury. The Director of FinCEN is appointed by the Secretary of the Treasury and reports to the Treasury Under Secretary for Terrorism and Financial Intelligence. FinCEN's mission is to safeguard the financial system from illicit use and combat money laundering and promote national security through the collection, analysis, and dissemination of financial intelligence and strategic use of financial authorities. C.f. "About FinCEN," 2016.

[35] The New York Department of Financial Services ("NYDFS") held hearings on virtual currency issues in early 2014 and announced that it is accepting license applications and proposals from virtual currency exchanges located in New York. However, NYDFS has not adopted regulations or issued official guidance on virtual currency exchanges, and it remains unclear what NYDFS considers to be the scope of its regulatory authority or what criteria it will use to review license applications. The Texas Banking Department issued a supervisory memorandum providing that virtual currencies are not subject to state currency exchange licensing,

but that the exchange of sovereign currency for virtual currency through a third party or an ATM will generally constitute money transmission and that such exchangers or ATM operators must comply with state registration requirements. Finally, the Washington Department of Financial Institutions ("WDFI") has stated that virtual currencies are a means of transmitting money or its equivalent value, and that companies engaged in transmission of digital currency may contact WDFI for a determination of whether they are subject to license requirements. C.f. *White Paper - Virtual Currency: Risks and Regulation, 2014.*

[36] C.f. *"Regulation of Bitcoin in Selected Jurisdictions", 2014)* for more information on other countries' regulation on Bitcoin.

[37] C.f. "Statement on Bitcoin, 2 January 2014."

[38] C.f. Financial Services Act 2013 [Act 758] and the Islamic Financial Services Act 2013 [Act 759].

[39] (Latin) 'Let the buyer beware!'