Customer Benefits on Bitcoin as a Medium of Exchange

Maryam Jameelah Hashim[1], Mohd Faizal Kamarudin[2], Nur Afizah Muhamad Arifin[3] and Mohd Rahim Khamis[4]

[1,2,3,4]Faculty of Business and Management, Universiti Teknologi MARA Selangor Puncak Alam Campus, Selangor

jamieniz@salam.uitm.edu.my[1]
mfk@salam.uitm.edu.my[2]
fizaarifin@salam.uitm.edu.my[3]
rahim474@salam.uitm.edu.my[4]

Abstract

Cryptocurrency is a digital currency that is powered by blockchain technology. One of it is bitcoin, a system that is digitally created and traded tokens to which value is assigned. The level of adoption of bitcoin has accelerated due to several fiscal crises that leads to financial crashes that have affected the lives of millions of people. This has created a demand for new kinds of niche money. Issues need to be closely discussed before it is fully accepted by customers as a medium of exchange. Even though bitcoin is used as a medium of exchange, there is still no specific guidance and benefits to the users. The issues concernedare whether the customers will get the benefits of privacy, lower transaction costs and freedom in payment. Therefore, the aims of this paper are to identify the relationship between transaction cost, privacy and digital payment as a benefit of bitcoin as a medium of exchange. This research will be conducted in Klang Valley area and the questionnaires will be disseminated directly to respondents. These respondents will be identified using probability simple random sampling. A regression analysis will be conducted comprising 200 observations in Klang Valley, Malaysia. Partial least square-structural equation (PLS-SEM) will be used. In the measurement model, reliability will be assessed by examining the Composite Reliability (CR), while validity will be assessed by convergent validity and discriminant validity. Subsequently, structural model testing with 500 re-samples was applied to test the hypothesized relationships between exogenous variables and endogenous variable. Digital payment and privacy are statistically significant towards the benefit of using bitcoin as a medium of exchange. It was found that the digital payment contributes the highest benefit to the customers followed by privacy. The results provide interesting insight into the determinants for the customers benefit using bitcoin. Although the findings show significant results customers should always decide the good and bad thoroughly before finalizing their decisions on the usage of bitcoin. Therefore, it is hoped that this study will enrich the growing literature on the subject and future research needs to explore on the benefits of using bitcoin among the real users. This study is expected to give guidelines to the policymakers on the implementation of bitcoin as a medium of exchange. It is also expected that the results may provide interesting insight into the determinants of customer benefits using bitcoin. Simultaneously, it will contribute to the elements of industry, innovation and infrastructure.

Keywords: Cryptocurrency, Bitcoin, Medium of Exchange, Partial Least Square

Introduction

The World has seen several fiscal crises during the last few years with a lot of governments having difficulties keeping their economies running efficiently and as a result there have been financial crashes that have affected the lives of millions of people. This has created a demand for a new kind of niche money, digital currency that is not controlled by governments (Pallas, 2012). Referring to Central Bank of Malaysia statement in The Star on Wednesday, 20 September 2017, Securities Commission issued a stern warning to investors putting money into crypto currencies and Bank Negara has now said it will be issuing its guidelines on the issue by year-end.Central Bank of Malaysia governor Tan Sri Muhammad

Ibrahim has been looking into the matter and the details, as the new form of currency has attracted a lot of attention around the globe. Although this crypto currency has been around since 2008, and first transaction was made only in 2010, generally most countries still have no idea what crypto currency is, and Malaysia is one of them.

The Central Bank of Malaysia last commented on crypto currencies more than three years ago when a statement was issued on Jan 2, 2014 saying that bitcoin was not recognised as legal tender in Malaysia, and that it did not regulate the operations of bitcoin. Even there is alerting from Central Bank of Malaysia, we can still see that a lot of Malaysians start to invest in the bitcoin, either buying it direct to their virtual account, mining it, and some of the business owners start to accept the payment by using bitcoin. When this happened, bitcoin started to regain the Central Bank of Malaysia's attention, to come up with proper guidelines on the usage of this crypto currency.

The level of adoption of bitcoin accelerating due to several fiscal crises during the last few years with a lot of governments having difficulties keeping their economies running efficiently and as a result there have been financial crashes that have affected the lives of millions of people. This has created a demand for new kind of niche money where various issues involved in implementing bitcoin as a medium of exchange such as regulation and policy. However, there is a scepticism of accepting the bitcoin as the medium of exchange due to the unclear benefit of this cryptocurrency. Theoretically, previous studies mentioned transaction cost, privacy and digital payment as a benefit of using Bitcoin. Hence, there is still lack of empirical evidence to support this statement.

This study is vital to identify the advantages and disadvantages of using bitcoin in Malaysia; How it is going to affect the Malaysian economy, and Malaysians individually. Therefore, the aim of this study is to determine the relationship between independent variables (namely transaction cost, privacy and digital payment) and the dependent variable (benefit of bitcoin).

Literature Review

Although Bitcoin has only recently become very popular, the idea and the technology behind the currency have been available since 2009. Bitcoin was created by one programmer, or a group of programmers who named themselves as Satoshi Nakamoto. According to Bar (2015), Bitcoin is online payments that can be made directly from one party to another using peer-to-peer electronic cash system which allows it to happen without going through any financial institution. Since 2008 where the invention of Bitcoin started, this virtual currency has functioned as an emerging digital phenomenon in the financial technology (Mai, Bai, San,Wang & Chiang, 2016). Bitcoin first appeared in January 2009; it was created by a computer programmer known with the pseudonym Satoshi Nakamoto. He invented an open source (its controlling computer code is open to public view), peer to peer (transactions do not require a third-party intermediary such as PayPal or Visa), digital currency (being electronic with no physical manifestation) (Elwell, Murphy & Michael 2015).

Bitcoin calls for an interdisciplinary between technology, economics and policy approach to explore the relationship between the usefulness, risks and usage (Hileman 2015). Abramova and Böhme (2016), summarizes the results from the literature review that link Bitcoin benefits along these three dimensions. From a technological perspective, the benefits are decentralization, faster transaction speeds and security (Ali, Barrdear, Clews and Southgate, 2014; Barber, Boyen, Shi and Uzun, 2012;Böhme, Christin, Edelman and Moore, 2015; Krombholz, Judmayer, Gusenbauer and Weippl, 2016; Nakamoto 2008; Zohar 2015; Van Alstyne 2014). Meanwhile for policy is transaction irreversibility (Barber et al. 2012; Beer and Weber 2014; Zohar 2015). Transaction irreversibility is when the money that is being transferred can be returned to the sender with the consent of the recipient.

According to Seng and Yew (2015) with just Internet access and a Bitcoin address, anyone can send and receive Bitcoin all over the world. Users obtain a Bitcoin address either by installing a suitable offline software client – on a computer or a smartphone – or using an online service. Whether online or offline, an electronic wallet is created where data are stored.With no third-party in-between, Bitcoin

transactions are supposed to be considerably cheaper to consumers compared to traditional payments systems such as PayPal and credit cards, which will charge consumers with significant fees for their role as a trusted third-party arbitrator to authorize any electronic transactions (Elwell et al.2015)

Elwell et al. (2015) said with a Bitcoin transaction there is no third-party intermediary. Buyer and seller will interact directly (peer to peer), but their details are encrypted, and no personal information will be transferred from one to another. However, unlike other fully anonymous transaction, there will be a transaction record. A full transaction record of every Bitcoin and every Bitcoin user's encrypted information is kept in the public ledger. Although the scale of Bitcoin usage has increased, it can still be considered small in comparison to any traditional electronic payments systems today, such as credit and debit cards. Paying through bitcoins providesthe users utmost freedom. Bitcoins can be sent to any person in any part of the world. No intermediaries in between are required. No bank holidays/strikes. No boundaries or borders, and with no transaction limit at all.

The identities of the users will remain anonymous, although all bitcoin transaction details are displayed publicly on the blockchain. Because payments can be made without including personal identification information, Bitcoin provides inherent security against identity theft. Additionally, there is no risk of being charged twice or of fraudulent charges being assessed to your wallet, thanks to the blockchain, which monitors unique coin addresses and eliminates the possibility of paying multiple people with the same bitcoin. Bitcoin doesn't offer the complete anonymity of cash but is certainly a far more private experience than making online payments or transactions using debit or credit cards.

Methodology

This research will be conducted in a government and three private sectors in Klang Valley. Structured questionnaires will be used as the research instrument to collect data from the respondents. The first part of the questionnaires relates to the respondents' profile. The second part is a measurement of transaction cost, privacy, digital payment and benefit of bitcoin as a medium of exchange. All the items in the second parts used a five-point Likert scale (1 means "strongly disagree" and 5 means "strongly agree"). These respondents will be identified using probability simple random sampling. The sample size of the respondents for this study will be calculated using G-power software, whereby the minimum sample size required will be determined. A total of 300 respondents are expected to participate in this study. Since the model had a maximum of three predictors (for the dependent variable benefit of bitcoin), the effect size was set as medium (0.15) and the power needed was 0.80. Across the social sciences, convention specifies 80 percent as the minimum acceptable power (Gefen et al., 2011). The sample size required was 77. Hence, the data collected was slightly larger than the required number. A total of 100 respondents participated in this study which accounted for 50% response rate and this was considered satisfactory (Sekaran & Bougie, 2010). To investigate the benefits of using bitcoin, partial least square-structural equation (PLS-SEM) will be used. Subsequently, the research model will be validated using Smart PLS 3.2.6. The analysis using PLS is divided into two stages: measurement model and structural model. Measurement model involves the assessment of the reliability and validity of the measures. In the measurement model, reliability will be assessed by examining the Composite Reliability (CR), while validity will be assessed by convergent validity and discriminant validity. Once the measurement model is done, structural model testing with 500 re-samples will be applied to test the hypothesized relationships between exogenous variables and endogenous variable.

The association between the exogenous variables and endogenous variable is illustrated in Figure 1.
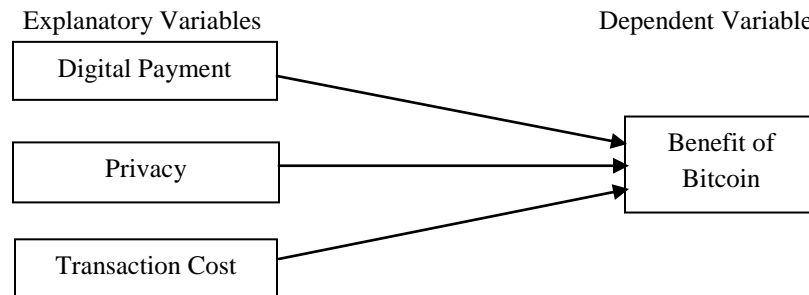

Figure 1: Conceptual Framework

The benefit of bitcoin is the dependent variable of this study. Meanwhile, there are three explanatory variables that can be associated with the dependent variable. These variables comprise digital payment, privacy and transaction cost. Therefore, the hypotheses developed for this paper are as follows:

H1: Digital payment is positively related to benefit of bitcoin
H2: Privacy is positively related to benefit of bitcoin
H3: Transaction cost is positively related to benefit of bitcoin

Findings

During the analysis level, the Structural Equation Modelling (SEM) Partial Least Squares (PLS) approach (Wold, 1975) was applied by using the SmartPLS 3.5.6 software (Hair et al., 2011). SEM allows the construction of latent variables (Gefen et al., 2000), while SmartPLS is used basically for path modelling and visualizing of latent variables. Compared to CB-SEM (covariance-based SEM), it is obvious that in this study the PLS-SEM approach is more effective in measuring relatively minimal sample size since PLS-SEM estimates only one latent block at a time and that the sample size only needs to be large enough to estimate that one block (Peng and Lai, 2012). Also, PLS-SEM is seen to be an appropriate method of analysis because this research is exploratory and inductive, in which the data do not meet normality assumptions, i.e. non-normality data set (Hair et al., 2011). For the 100 cases in this study satisfying the requirement for a sound PLS analysis, three exogenous (independent) variables and one endogenous (dependent) variable were employed. In this study, the two-stage approach (Anderson and Gerbing, 1988) starting with the measurement model (i.e. deals with the relations between measurement items) was evaluated first, thereafter the structural model (i.e. deals with the relations among latent constructs) were examined through bootstrapping resampling method with 5000 subsamples.

Common method variance analysis

Given that the data in this research were collected from a singular basis, i.e. self-administered questionnaire, and thus considered self-reported, Common Method Variance (CMV) is a possible concern (Podsakoff et al., 2003). To diminish the extent of CMV that can occur in the study, Podsakoff et al., (2003) suggested this is done by adding the first principal component (marker variable) as the control

variable on all dependent variables. If by adding this factor does not influence significant variance change in any of the dependent variables, this suggests no substantial common method bias. Based on the test, the results revealed that CMV is not an enormous obstacle since the R^2 change before adding the marker variable and after adding the marker variable is less than 10% (R^2 = 81.3% without marker variable and R^2 = 82.5% with marker variable).

Analysis of Measurement Model

The measurement model of PLS analysis consisted of internal consistency (reliability), convergent and discriminant validity of the instrument (Wixom and Todd, 2005). The criteria for the constructs of measurement test are: all items loadings should be greater than 0.7 – indicates greater shared varied between a construct and measures than error variance (Barclay et al., 1995), the composite reliability should be at least 0.7, while the AVE (Average Variance Extracted) should be at least 0.5 (Hair et al., 2010), which indicates that on average, a latent variable is able to explain more than half of the variance of its indicators. Item reliability specifies the correlations of the items with their respective construct that is indicated by the item's loading (Chin, 1998). Composite reliability represents the variance shared among a set of observed variables that measure an underlying construct (Fornell and Larcker, 1981). As for the validity testing, the convergent validity reflects whether anitem measures a latent variable that it is supposed to measure (Urbach and Ahlemann, 2010), while the AVE evaluates the amount of variance that a construct captures from its indicators compared with the amount due to measurement error (Fornell and Larcker, 1981).

Table 1: Result of Measurement Model

Constructs	Items	Factor Loadings	CR	AVE
Benefits of Bitcoin	BOB1	0.906	0.951	0.829
	BOB2	0.914		
	BOB3	0.928		
	BOB4	0.894		
Digital Payment	FDP1	0.910	0.946	0.816
	FDP2	0.920		
	FDP3	0.847		
	FDP4	0.933		
Transaction Cost	LTC1	0.755	0.879	0.648
	LTC2	0.684		
	LTC3	0.875		
	LTC4	0.888		
Privacy	P1	0.856	0.916	0.732
	P2	0.862		
	P3	0.814		
	P4	0.888		

Note: Composite reliability (CR) = (square of the summation of the factor loadings)/{(square of the summation of the factor loadings) + (square of the summation of the error variance)}; Average variance extracted (AVE) = (summation of the square of the factor loadings)/{(summation of the square of the factor loadings) + (summation of the error variance)}.

Table 1 depicts the reliability and validity assessment of the measurement model. In this study, the loadings for each item were above threshold value of 0.7. The results also indicated that the composite reliability of all constructs exceeded the 0.7 ceiling, which ranged from 0.879 to 0.951. This indicates that the measurement model is judged reliable (Fornell and Larcker, 1981). Subsequently, the validity of the measurement model based on its convergent and discriminant validity was examined. The analysis confirmed adequate convergent validity of the measures, with AVE values surpassing the recommended level of 0.5 (ranging from 0.648 to 0.829). Thus, it can be construed that the measurement model possesses convergent validity. Discriminant validity is confirmed when no item should load more highly on another construct than it does on the construct it intends to measure. In this study, the discriminant validity was assessed by differentiating the AVE of each individual construct with shared variances between it and all the other constructs (Fornell and Larcker, 1981). Thus, the square root of AVE must be higher than the correlation between two factors (Barclay et al., 1995). This validity required a higher value of square root of the AVE of each construct then the correlation value between this construct and all other constructs. From Table 2, the square root of the AVE scores for constructs of benefits of bitcoin (0.829), digital payment (0.816), transaction cost (0.648) and privacy (0.732) were greater than the correlation scores between each construct and all other constructs. The analysis results indicated acceptable construct discriminant validity. This indicates the presence of discriminant and convergent validity of the measurement model. Based on the estimated parameters, it can be concluded that the measurement model is reliable and valid.

Table 2: Discriminant Validity of Constructs

Fornell Larcker				
Constructs	Benefit	Digital Pymt	Privacy	Trans Cost
Benefit	**0.911**			
Digital Pymt	0.888	**0.903**		
Privacy	0.839	0.856	**0.856**	
Trans Cost	0.765	0.829	0.742	**0.805**

Note: Diagonals (in bold) represent square roots of average variance extracted (AVE), while off-diagonal represent correlations

Analysis of Structural Model

In this study, the structural model indicates the causal relationships among constructs in the model. It was estimated via the bootstrapping approach (using 5000 resamples), which estimated standardized coefficients (β) to determine the strength of the hypothesized relationship and R2 value to determine the predicting power of the model was incorporated. Table 3 depicts the results of the hypothesized model test, demonstrated with the variance explained (R2 value) of the dependent variable, path coefficients (beta and significance) and t-value of the paths. Result shows that, digital payment has a positive and significant relationship with benefits of bitcoin (β= 0.59, p< 0.05), leading support to H1. As for privacy, it is shown that it has a positive and significant relationship with benefits of bitcoin (β= 0.286, p < 0.05), which supported H2. Unfortunately, as for the transaction cost, H3 was found to be unsupported, as the path between transaction cost and benefits of bitcoin (β= 0.064, ns). The results thus support H1 and H2, while H3 is not supported. In addition, the R2 by the exogenous latent variables (digital payment, privacy and transaction cost) in the measurement model was also examined. As explained by Cohen (1988), the R2 value ranges from zero to one (e.g. 0.26 specifies substantial, 0.13 specifies moderate and 0.02 specifies weak) for endogenous latent variables (i.e. benefits of bitcoin). Overall, it can be concluded that the measurement model was able to explain a rather substantial amount (81.3%) of the variance in benefits of bitcoin.

Table 3: Summary of Structural Model

Hypotheses	Path	Std Beta	Std Error	T Statistics	P Values	Confidence Interval		Decision
						5.00%	95.00%	
H1	Digital Pymt -> Benefit	0.59	0.12	4.914	0.000***	0.403	0.793	Significant
H2	Privacy -> Benefit	0.286	0.103	2.774	0.003***	0.113	0.452	Significant
H3	Trans Cost -> Benefit	0.064	0.063	1.011	0.156 n.s	-0.042	0.16	Not Significant

Note: Std. Beta = standardised beta, Std. error = standard error, t-statistic are computed through bootstrapping procedure with 100 cases and 5000 samples; ns – not significant. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, one-tailed.

Conclusion and discussion

All data from the result acquired shows an encouraging relationship existing between the independent variableswith the dependent variable and there are substantial influences on the consumer. From the survey, most of the consumers, choose to pay only for the cost of goods without additional charges. They also prefer to choose no third party that can monitor any of their transaction. Since bitcoin is something new in our country, most of the consumers want to pay by using bitcoin because it has no transaction limit and it gives consumer utmost freedom to do so. Bitcoin also hasits own safety key when consumers want to make any transaction. Only buyer and seller know about the transaction without any third-party intervention and monitoring to say that all the transactions are completely anonymous and private. With all the above-mentioned advantages of Bitcoin, it is explaining why the consumers have chosen and considered bitcoin to become the currency of the future.

Limitations and suggestions for future research

As for all research, several limitations have been identified in this study that would guide future researchers to explore the cryptocurrency in a more effective way. First, the research was cross-sectional in nature, which may only be applicable in the short term. To address this problem, future researchers need to carry out a longitudinal study to observe how different elements affect the investment in cryptocurrency (bitcoin specifically) over time. In addition, the predictors might have different influence in the short term and in the long term and, therefore, a further research would be very useful in measuring such dependencies. Second, the size of this study is curtailed by a small sample of only 100 employees in one state, which is in Kuala Lumpur only. Future researchers should examine and use a bigger sample size coming from not only Malaysia but throughout several countries that would deliver a more vigorous test of the hypotheses. Third, this study could be broadened and replicated in other areas including other types of cryptocurrency investments besides bitcoin to expand the generalization of the research findings. This is because the sample focused mostly on bitcoins questions, and this restricts the validity of the research to aninvestment in one state in Malaysia. Hence, more studies are needed to approve the generalizability of the findings of the present study. Lastly, future research is recommended to analyze the relationships by cooperating demographics as mediating or moderating variables, such as gender or age, and to provide more thorough information on factors affecting the benefits of bitcoin.

References

Abrell-Vogel, C., &Rowold, J. (2014). Leaders' commitment to change and their effectiveness inchange - a multilevel investigation. *Journal of Organisational Change Management, 27*(6), 900-921.

Aggarwal-Gupta, M., Vohra, N., &Bhatnagar, D. (2010). Perceived organisational support and organisational commitment: the mediational influence of psychological well-being. *Journal of Business and Management, 16*(2), 105-124.

Ahmad, R. S., N. (2015). Fringe benefits and organisational commitment: the case of Langkawi hotels. *Tourism Review, 70*(1), 13-23.

Ajay, S., & Bintu, G. (2015). Job involvement, organisational commitment, professional commitment, and team commitment - a study of generational diversity. *Benchmarking: An International Journal, 22*(6), 1-36.

Akintayo, D. I. (2006). *Influence of leadership orientation and managerial effectiveness on organisational commitment among church members in Oyo State, Nigeria.*, University of Ibadan.

Ali, R., Barrdear, J., Clews, R., and Southgate, J. (2014). "Innovations in Payment Technologies and the Emergence of Digital Currencies," *Quarterly Bulletin 204 Q3* (53:4), pp. 262-275.

Anderson, J.C. and Gerbing, D.W. (1988) 'Structural equation modeling in practice: a review and recommended two-step approach', Psychological Bulletin, Vol. 103, No. 3, pp.411–423.

Barber, S., Boyen, X., Shi, E., and Uzun, E. (2012). "Bitter to Better — How to Make Bitcoin a Better Currency," in *Financial Cryptography and Data Security*, A. Keromytis (ed.), Lecture Notes in Computer Science 7397, Berlin Heidelberg: Springer, pp. 399-414.

Barclay, D., Higgins, C. and Thompson, R. (1995) 'The partial least squares (PLS) approach to causal modeling, personal computer adaptation and use as an illustration', Technology Studies, Vol. 2, No. 2, pp.285–309.

Beer, C., and Weber, B. (2014). "Bitcoin – The Promise and Limits of Private Innovation in Monetary and Payment Systems," *Monetary Policy & The Economy* (4), pp. 53-66.

Böhme, R., Christin, N., Edelman, B., and Moore, T. (2015). "Bitcoin: Economics, Technology, and Governance," *Journal of Economic Perspectives* (29:2), pp. 213-238.

Chin, W.W. (1998) 'The partial least squares approach for structural equation modeling', in Marcoulides, G.A. (Ed.): Modern Methods for Business Research, Lawrence Erlbaum Associates Publishers, Mahwah, NJ, pp.295–336.

Cohen, J. (1988) Statistical Power Analysis for the Behavioral Sciences, Lawrence Erlbaum, Mahwah, NJ.

Dirk G. Baur (2015), UWA Business School1 . *Bitcoin: Medium of Exchange or Speculative Assets?*Experiences with Bitcoin Security and Privacy," in *Financial Cryptography and Data Security*, Lecture Notes in Computer Science, Berlin Heidelberg: Springer.

Fornell, C. and Larcker, D.F. (1981) 'Evaluating structural equation models with unobservable variables and measurement error', Journal of Marketing Research, Vol. 18, No. 1, pp.39–50.

Gefen, D., Straub, D.W. and Boudreau, M.C. (2000) 'Structural equation modeling and regression: guidelines for research practice', Communications of the Association for Information Systems, Vol. 4, No. 1, pp.1–78.

Hair, J.F., Black, W.C., Babin, B.J. and Anderson, R.E. (2010) Multivariate Data Analysis, Prentice-Hall, Englewood Cliffs, NJ.

Hair, J.F., Ringle, C.M. and Sarstedt, M. (2011) 'PLS-SEM: indeed a silver bullet', The Journal of Marketing Theory and Practice, Vol. 19, No. 2, pp.139–152.

Hileman, G. 2015. "The Bitcoin Market Potential Index," in *Financial Cryptography and Data Security, 2nd Workshop on Bitcoin Research*, M. Brenner, N. Christin, B. Johnson, and K. Rohloff (eds.), Lecture Notes in Computer Science 8438, Berlin Heidelberg: Springer, pp. 92-93.

Krombholz, K., Judmayer, A., Gusenbauer, M., and Weippl, E. 2016. "The Other Side of the Coin: User

Mai. F, Bai. Q, Shan.Z, Wang. Z and Chiang. H.L (2016). From Bitcoin to Big Coin: *The Impact of Social Media on Bitcoin Performance*

Nakamoto, S. 2008. Bitcoin: A Peer-to-Peer Electronic Cash System.

Podsakoff, P.M., MacKenzie, S.B., Lee, J.Y. and Podsakoff, N.P. (2003) 'Common method biases in behavioral research: a critical review of the literature and recommended remedies', Journal of Applied Psychology, Vol. 88, No. 5, pp.879–903.

Robert Pallas, 2012. *Bitcoin Security.*

Scott Schuh (2015). *U.S. Consumers' Adoption and Use of Bitcoin and other Virtual Currencies*

Tan Boon Seng, Institute of Singapore Chartered Accountants & Low Kin Yew, Nanyang Technological University (2015). *Bitcoin: Its Economics and Financial Reporting*

Urbach, N. and Ahlemann, F. (2010) 'Structural equation modeling in information systems research using partial least squares', Journal of Information Technology Theory and Application, Vol. 11, No. 2, pp.5–40.

Van Alstyne, M. 2014. "Why Bitcoin Has Value," *Communications of the ACM* (57:5), pp. 30-32.

William J.Luther (2015) , *Bitcoin and the Future of Digital Payments*

Wixom, B.H. and Todd, P.A. (2005) 'A theoretical integration of user satisfaction and technology acceptance', Information Systems Research, Vol. 16, No. 1, pp.85–102.

Zohar, A. 2015. "Bitcoin: Under the Hood," *Communications of the ACM* (58:9), pp. 104–113.