Acceptance of Gold as an Alternative Currency: An Empirical Validation of Adoption of Innovation Theory

Muhammad-Bashir Owolabi Yusuf*, Ahamed Kameel Mydin Meera, Gairuzazmi Mat Ghani, Turkhan Ali Abd Manap and Mousa Larbani

ABSTRACT

This study aims to examine the determinants of gold dinar adoption in Kelantan, Malaysia by using an extended adoption model which consists of seven factors: relative advantage, triability, result visibility, result demonstrability, anxiety, facilitating conditions, and trust. Survey data collected from gold dinar adopters in Kelantan were used to identify the components of the gold dinar adoption and its determinants. Structural equation modeling technique was employed to test whether the hypothesised model fits the data collected. This study finds that all the indicators have good loading on their factors, suggesting that they measure what they were supposed to measure. All the factors except 'trust' are found to influence the adoption of the gold dinar. Thus, the adoption of gold dinar would depend more on its embedded benefits, religious link and the removal of impediments attached to it and not necessarily, the trust which users may place in issuing authorities.

Keywords: Adoption Model, Alternative Currency, Gold Dinar, Kelantan, Structural Equation Modeling
JEL Classification: P49, C8

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1. Introduction

August 12, 2010 saw the successful launching of the gold dinar (gold currency) in the state of Kelantan, Malaysia. This made Kelantan the first state in Malaysia to issue gold dinar as an alternative currency. During the launch, the state government mentioned that it was ready to pay 25 per cent of the salary of any interested worker in gold dinar. In relation to that, more than 1000 business entities agreed to accept the gold dinar in their business transactions. A number of banks also agreed to safe keep the gold dinar (The Star Online, 2010).

The idea of using the gold dinar was first mooted by the then-Prime Minister, Tun Dr Mahathir Mohamad, in the early 2000's, after many Asian countries suffered losses due to currency attacks by speculators during the East Asian financial crisis (Meera & Larbani, 2004). The idea for the possible use in multilateral trade settlement was presented to the Organisation of the Islamic Conference (OIC) countries. In line with that, Malaysia's gold mint was set up in anticipation of a likely adoption. However, the effort could not be implemented due to the lack of support from member countries of the OIC (Vadillo, 2010). The failure to implement the gold dinar by the Federal government, was noted by the Kelantan state government which absorbed the idea in 2006 and its effort culminated in the 2010 official launching of the currency (Vadillo, 2010).

This introduction of the gold dinar in Kelantan was perceived to be an innovation among the world's monetary system. This is because after the demise of the official Islamic dinar with the fall of the Ottoman Empire in 1925, for a period of close to one century, the gold dinar was not used anywhere in the world as currency (Meera & Larbani, 2004). Yet, people were enthusiastic about adopting the new dinar as currency. Like any new innovation, implementing the gold dinar as currency would also be subjected to a number of contributing factors (Rogers, 1995; Venkatesh, Morris, Davis, & Davis, 2003). These include its perceived relative advantages over existing techniques, the challenges involved in adopting the concept, the facilitating conditions involved, and its result demonstrability.

A survey was conducted to collect data and to test the contribution of each of the adopting factors which could lead to the eventual adoption of the gold dinar in the state of Kelantan, Malaysia. Using empirical data to evaluate the determinants of the adoption of gold dinar in Kelantan, this study may also be the first of its kind to use the adoption model in studying currency adoption. Specifically, the objectives of this study are:

1. To profile the socioeconomic characteristics of gold dinar users in Kelantan;
2. To identify the components of the dimensions of gold dinar adoption in Kelantan; and
3. To identify the contribution of each of factors that can lead to the adoption of the gold dinar in Kelantan.

Expanding on the objectives, this study thus, aims to answer the following research questions:

1. What are the demographic characteristics of gold dinar users in Kelantan?
2. What are the components of dimensions of the gold dinar adoption in Kelantan?
3. What factors determine the adoption of the gold dinar in Kelantan?

The arrangement of this paper is as follows: section 1 introduces the paper, section 2 presents the literature review, section 3 looks at the methodology used, section 4 presents the findings, section 5 discusses the findings and section 6 concludes the paper.

2. Literature Review

2.1 Diffusion of Innovation Theory

Rogers (1995) defines an innovation as an idea, practice, or object that is perceived as new by an individual or other unit of adoption and diffusion as the process by which an innovation is communicated within a social system, and adopted or rejected by its members. Diffusion of Innovation Theory is one of the most prevalent and permanent theories of innovation acceptance behaviour. It has been applied at both individual and organisational levels (Rogers, 2003). Diffusion of Innovation Theory serves as a theoretical framework for the acceptance of innovation (Dillon & Morris, 1996). It views innovation as being transferred through a certain medium over time and in a specific social system (Rogers, 1995). Rogers (2003) suggests the following attributes of an innovation that can impact on its rate of adoption.

These attributes are: (1) Relative advantage - The degree by which an innovation gives an improvement beyond the one it supersedes or the extent to which it is perceived to be better than the present practice; (2) Facilitating conditions - The degree by which a person believes

that the required resources exist to support the use of innovation; (3) Anxiety - The difficulties attached to learning, understanding, and using of an innovation or the risks associated with its use and understanding; (4) Trialability - The degree by which an innovation can be put into trial before committing resources to its use or the extent to which the innovation can be experienced on a limited basis; and (5) Result visibility - The degree by which the innovation results and gains are visible to potential adopters. To improve the predictive power of the Diffusion of Innovation Theory, Karahanna, Straub, and Chervany (1999) and Barnes and Huff (2003) suggest including the trust factor into the model.

2.2 Proposed Model and Research Hypotheses

The theoretical model proposed for this study comprises of seven exogenous constructs (i.e., relative advantage, trialability, result visibility, result demonstrability, anxiety, facilitating condition, and trust) and one endogenous variable (i.e., adoption of gold dinar). Figure 1 below illustrates the hypothesised research model and the key relationships to be tested.

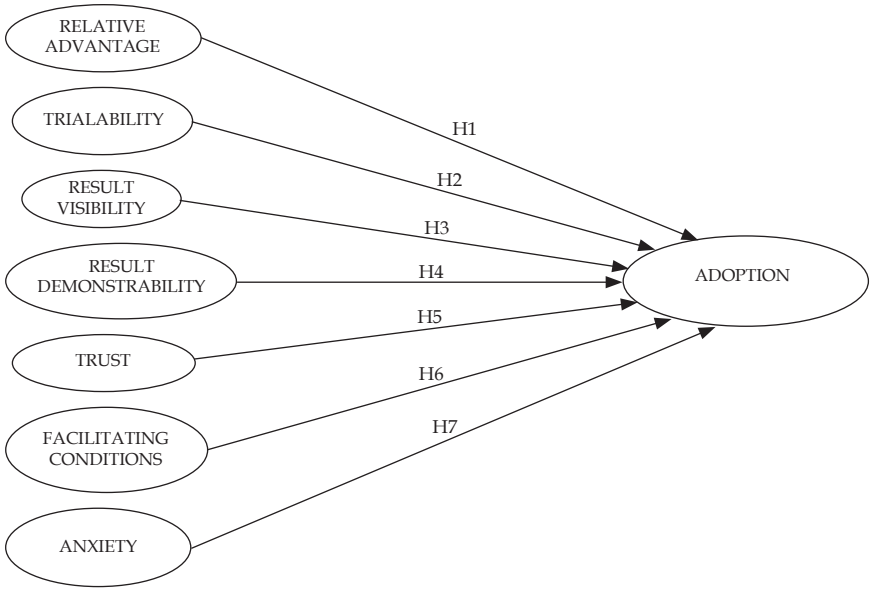

Figure 1: The Hypothesised Model for Determinant of Dinar Adoption in Kelantan

2.2.1 Relative Advantage

Relative advantage is the extent by which an innovation is seen to be better than the idea it replaces. This degree may be measured in economic terms but other important factors like social status, convenience, and contentment may also be considered. It does not matter so much if an innovation has a great deal of objective advantage because what is important is whether or not an individual perceives the innovation as advantageous. The greater the perceived relative benefit of an innovation, the more rapid its rate of adoption will be. Gold is believed to have many advantages as money (Fine, 1981). At the individual level, gold serves to preserve wealth. It has often been quoted that "With an ounce of gold a man could buy a fine suit of clothes at the time of Shakespeare, in that of Beethoven and Jefferson, in the Depression of the 1930s" (Forbes, 1998, p. 50-51). Given its stability, gold investors can pursue better downside protection against short term under performance risks and potentially, take advantage of the best performance during any given time period. Through such means, gold invariably also serves the function of risk management (Jastram, 1977; Mundell, 1997). Therefore, this study proposes that:

H_1: Relative advantage of using gold dinar will have a positive effect on its adoption.

2.2.2 Trialability

Trialability refers to the extent by which an innovation may be experimented with on a limited basis before adoption. New ideas that can be tried on an instalment plan will generally be adopted more quickly than innovations that are not divisible (Rogers, 2003). An innovation that can be tried represents less uncertainty to the individual who is considering it for adoption as he/she can learn its usefulness on a gradual basis. Gold dinar is a completely different form of money from which people are used to; thus, people would require time and the right avenue to be able to master its usage before total adoption. Fortunately, during the launching of the gold dinar in 2010, the issuing authority promised to provide the avenue for interested parties to use gold for certain religious activities like the fulfillment of *zakat* and other Islamic religious rites (The Star Online, 2010). Based on the premise that the opportunity to try an innovation on an instalment basis can enhance its adoption, it is thus, emphasised that using gold dinar on a limited basis

for religious obligations like *zakat* fulfillment and other Islamic religious rites would provide potential adopters the opportunity to trial-run the new currency. Such opportunities are expected to boost the rate of gold dinar adoption. For this reason, this study hypothesises that:

H_2: Trialability of using the gold dinar will have a positive effect on its adoption.

2.2.3 Result Visibility

Result visibility is the degree by which the results of an innovation are apparent to others. The easier it is for individuals to see the results of the implementation of an innovative idea, the more likely they are to adopt it. Such visibility can stimulate discussion of the new idea as friends and neighbours of an adopter may request for innovation-evaluation information about it (Rogers, 2003). In addition, the role a leader plays in introducing the idea is also very important as his/her influence can enhance the adoption of the innovation on a widespread basis (Parisot, 1997). Therefore, if respected and influential opinion leaders in a community can argue for and demonstrate the application of gold dinar as being advantageous, its adoption rate is more likely to increase positively. Further, the more charismatic the person serving as a role model is, the bigger the chance that the gold dinar would be adopted by a greater number of people. Among all the states in Malaysia, Kelantan is perceived to be an Islamic state (Salleh, 1999) and gold dinar has a direct link with Islam. In this regard, it would be an advantage if the religious leaders can also disseminate and propagate the idea of the new currency as seen in the case of Nik Abdul Aziz Nik Mat, the then-Chief Minister of Kelantan, a respected Muslim scholar revered for his knowledge and religious devotion, who supported the use of the gold dinar (Salleh, 1999). From the above factors discussed, it can be seen that all these combined factors are expected to have a positive impact on the adoption of the gold dinar within the state. Therefore, this study posits that:

H_3: Result visibility of using the gold dinar will have a positive effect on its adoption.

2.2.4 Result Demonstrability

Result demonstrability is the ease with which the-know-how and usefulness of an innovation can be communicated although not all new

inventions can be communicated. The ability to demonstrate the know-how and usefulness of an innovation can enhance its adoption among potential users (Lawson & Samson, 2001; Heskett, 2007). In the case of the gold dinar, the easier the efforts required to master and demonstrate the use and benefit of the new currency, the more its adoption will be. Thus, this study hypothesises that:

H_4: Result demonstrability of using the gold dinar will have a positive effect on its adoption.

2.2.5 Anxiety

Anxiety is the degree by which an innovation is perceived as difficult to understand and use. Some innovations are readily understood by most members of a social system while others are more complicated and may be adopted more slowly (Rogers, 1995). As such, new ideas that are simple to understand are likely to be adopted more rapidly than innovations that require the adopter to develop new skills and understandings (Rogers, 2003). The adoption of the gold dinar in the present world has peculiar risks attached to it apart from those enumerated in literature. Yusuf, Meera, and Mat Ghani (2013) identify five challenges of adopting the gold dinar. The first of these is the physical risk involved. Buying gold bars and coins exposes the investor to the risk of loss and theft and costs are involved to mitigate such risks. For example, the investor may have to ensure the safe transportation of gold, safe keeping of the gold whether in a personal safe or a safe deposit box. The latter measure incurs rental fees. The second challenge lies in the exchange risks where the exchanges of gold and futures are traded. The third challenge is the volatility of the price of gold which can be subjected to market fluctuations. The fourth challenge is the political risk involved because gold investing means that the government can change laws and regulations that may have an impact on gold investment. Governmental interventions can happen in the country of the investor or in another country and both activities could impact on the gold price whether as supply and demand or market volatility. Political risks may take different forms including prohibition of gold ownership, nationalisation of gold mines or fixing of gold prices. The fifth challenge is gold scam which is linked to the buying of fake gold instead of the real precious metal. Therefore, this study posits that:

H_5: Anxiety of using the gold dinar will have a negative effect on its adoption.

2.2.6 Facilitating Conditions

This construct refers to the extent by which an individual believes that the required resources to use an innovation are in place to support its usage. This definition includes behavioural control in the theory of planned behaviour and adaptability as stated in the original innovation diffusion model (Davis, Bagozzi, & Warshaw, 1989; Ghalandari, 2012; Venkatesh & Davis, 2000; Venkatesh et al., 2003). Extant literature has shown that the provision of facilitating conditions for an innovation can affect its use whether directly or indirectly (Thompson, Higgins, & Howell, 1991; Taylor & Todd, 1995). Gold dinar adoption requires facilities that will enhance its usage such as provision of equipment for easy identification of pure gold, security, safe storage, and a conducive environment that enables its usage in transactions. Thus, it is believed that the provision facilitating conditions for the use of gold dinar will greatly enhance its adoption. This study therefore, posits that:

H_6: Facilitating conditions of using the gold dinar will have a positive effect on its adoption.

2.2.7 Trust

According to the Oxford Advanced Learner's Dictionary (2010), trust is the belief that somebody/something is good, sincere, honest, and it will not try to harm or trick another person/thing. Trust can reduce social anxiety and perceived uncertainty in transactions by increasing the expectations of a positive outcome and perceived certainty concerning the anticipated action of the trustor (Luhmann, 1979; Grabner-Kraeuter, 2002; Gefen, 2004). In the social exchange environment, any business transaction that occurs involve parties that do not have a total control mechanism to check on opportunistic behaviours. Thus, they are not able to complete the legal protection that can protect them in the complex social environment of mass uncertainty. To facilitate a better reward from such economic activities, people thus, try to avoid risk and reduce this social anxiety through trust (Wu & Chen, 2005; Li, Valacich, & Hess, 2004).

The concept of trust has been well studied in many fields. For many years, research focus has been on user's acceptance of innovation and the factors that predict such an acceptance (Dillon & Morris, 1996). These

predictors of acceptance include perceived ease of use of an innovation, perceived usefulness, attributes of the innovation and self-efficacy of the user. However, many researchers have also realised the significance of trust as a subjective perception that can affect acceptance. They have thus added trust to various acceptance models such as Technology Acceptance Model and the Theory of Planned Behaviour (Adewale, Yusuf, Kameel, & Mat Ghani, 2012; Wu & Chen, 2005). This addition has improved the prediction of the models and increased the understanding of user acceptance (Li et al., 2004). Every monetary system, right from time immemorial, is based on the issue of trust as is supported by the issuing authority. Therefore, it is very important to know the role trust plays as the antecedent of acceptance, in this case the gold dinar, in the local government in Kelantan. Hence, this study proposes that:

H_7: Trust in the issuing authority of gold dinar will have a positive effect on its adoption.

3. Methodology

3.1 Sampling Unit and Data Collection

This study surveyed individuals in Kelantan who used gold dinar as currency. Only those who were 20 years old and above were selected as they would be old enough to take responsibility for their actions of transacting using gold dinar as currency in Kelantan. Convenience sampling was used to select the respondents. Data for this study were collected by three trained enumerators together with the researchers in Kelantan in 2011 during the first gold dinar trade fair. The enumerators and researchers were stationed at various booths at the fair to distribute the questionnaires to selected respondents who attended the fair and intended to transact using gold dinar. The respondents completed and returned the questionnaires to the enumerators during the fair.

3.2 Measurement Instrument

The items in the survey questionnaire used to measure each of the concepts were adapted from prior studies. These items were revised to fit this study which surveyed the use of gold dinar among adopters. The constructs' items and their sources are presented in Table 1 below.

Table 1: Constructs Items and Their Sources

Constructs	Definitions	Sources of instruments
Relative advantage	The extent to which gold dinar is perceived as being better than the fiat money being replaced.	Rogers (1995; 2003); Adewale et al. (2012); Yusuf et al. (2013)
Trialability	The extent to which gold dinar may be experimented with on a limited basis before adoption.	Rogers (1995; 2003)
Result visibility	The degree to which the result of adopting gold dinar is apparent to other people to see.	Masrom and Hussein (2008)
Result demonstrability	The ease with which the know-how and usefulness of gold dinar can be communicated.	Masrom and Hussein (2008)
Anxiety	The degree to which gold dinar is perceived by the potential adopters as difficult to understand and use.	Bailey and Pearson (1983); Igbaria, Parasuraman, and Baroudi (1996); Yusuf et al. (2013)
Facilitating conditions	The degree to which a person believes that the required resources exists to support the use of gold dinar.	Thompson et al. (1991); Triandis (1980)
Trust	The belief that the promise of another can be relied on and that, in unforeseen circumstances, the other will not betray the trust repose in them.	Paine (2003)
Adoption	A person's readiness to adopt/ use gold dinar	Davis et al. (1989)

3.3 Questionnaire Development

The questionnaire items were translated from English to Malay to make it accessible to all the respondents. The questionnaire consists of two sections. The first section consists of items that measure the respondents' perceptions about the hypothesised factors that determine the adoption of gold dinar in Kelantan. Responses were based on a 5-point Likert scale, of "1" - strongly disagree, "2" - disagree, "3" - neutral, '4' - agree, and "5" - strongly agree. The second section gathers the demographic information of the respondents.

A total of 400 questionnaires were distributed to individual respondents and a total of 300 were returned. The effective response rate was 75 per cent. Eight responses were excluded from further analysis due to non-conformity to the requirement (criteria) to be used as samples and excessive missing data. Therefore, the final sample size was 292 respondents.

3.4 Instrument and Scaling of Measurement

As noted earlier, this work adapted questionnaire items from existing literature. This study also included some indicators/dimensions that were peculiar to gold dinar. Table 2 presents each construct and its indicators. Since the survey instrument consisted of both new and modified questions, exploratory factor analysis (EFA) was carried out to ensure that the items measured their designated constructs, and that they have high reliability. This study obtained factor analysis of each of the constructs to remove poorly loaded items before carrying out the reliability test since high reliability does not mean that the items are measuring the same thing (Hair, Anderson, Tatham, & Black, 2010). The initial questionnaire items for the latent variables in the model consisted of 49 manifest indicators out of which four were excluded (Table 2). This is in line with Muthen (2001) who suggests conducting EFA in a confirmatory factor analysis (CFA) framework to confirm a more concrete nature of the structural model.

This study used principal component analysis (PCA) of the factor extraction technique with varimax rotation technique to extract maximum variance from a data set with few orthogonal components, and it was found to be suitable for variable reduction before performing the CFA. The factor loadings of each item on their constructs are shown in Table 2. Only items with factor loading of 0.7 and above with communality above 0.5 are used in the analysis (Hair et al., 2010).

Further, the EFA was conducted factor by factor with restriction so as to extract one factor from the items. This is then used to represent the latent variable since some of them might be measuring more than one construct. The adequacy and suitability of the latent constructs for the EFA as shown by their KMO (all above 0.5) and Bartlett's test (all highly significant) together with the factor loading of each of the indicators is presented in Table 2. The factor loadings represent each of the latent variable's level of construct validity. According to Hair et al. (2010), the entire factor loading should be more than 0.50 which means that 25 per cent of the total variance is accounted for by the factor. For

this to be valid, loadings must exceed 0.70 in order for the factors to account for 50 per cent of the variance that can assess the fit between a construct and its indicators (Byrne, 2010). Based on this criterion, it can be seen that the instrument of the study exhibited the required validity as is presented in Table 2 below.

Table 2: Result of the EFA of the Adoption Constructs

Construct	Indicators	Factor loadings	Communality	Cronbach's Alpha
Adoption				
KMO: 0.636	O1	0.846	0.715	0.710
Bartlett's Test:	O2	0.841	0.707	
X^2(184.202; 3) = 000	O3	0.697	0.486	
Relative advantage				
KMO: 0.909	A1	0.750	0.562	0.916
Bartlett's Test:	A2	0.732	0.536	
X^2(1719.523; 45) = 000	A3	0.779	0.607	
	A5	0.675	0.456	
	A6	0.738	0.545	
	A7	0.802	0.644	
	A9	0.755	0.570	
	A10	0.758	0.574	
	A11	0.770	0.593	
	A12	0.894	0.720	
Trialability				
KMO: 0.652	Ee1	0.842	0.710	0.826
Bartlett's Test:	Ee2	0.882	0.777	
X^2(248.627; 3) = 000	Ee3	0.750	0.562	
Result visibility				
KMO: 0.689	G1	0.869	0.756	0.810
Bartlett's Test:	G2	0.887	0.786	
X^2(309.324; 3) = 000	G3	0.797	0.636	

Result demonstrability				
KMO: 0.702	H1	0.990	0.984	0.766
Bartlett's Test: $X^2(475.965; 6) = 000$	H2	0.867	0.760	
	H3	0.911	0.835	
	H4	0.888	0.836	
Anxiety				
KMO: 0.897	D1	0.682	0.465	0.970
Bartlett's Test: $X^2(1902.235; 45) = 000$	D2	0.722	0.521	
	D4	0.693	0.480	
	D5	0.641	0.411	
	D6	0.792	0.627	
	D7	0.840	0.705	
	D8	0.837	0.701	
	D9	0.847	0.718	
	D10	0.770	0.593	
	D11	0.755	0.569	
Facilitating conditions				
KMO: 0.747	K1	0.788	0.621	0.911
Bartlett's Test: $X^2(596.403; 10) = 000$	K2	0.815	0.665	
	K3	0.765	0.586	
	K4	0.761	0.578	
	K5	0.710	0.504	
Trust				
KMO: 0.958	N1	0.874	0.718	0.731
Bartlett's Test: X2(3414.203; 55) = 000	N2	0.878	0.771	
	N3	0.888	0.789	
	N4	0.904	0.818	
	N5	0.914	0.835	
	N6	0.912	0.832	
	N7	0.907	0.822	
	N8	0.809	0.792	
	N9	0.903	0.816	
	N11	0.824	0.678	

3.5 Data Cleansing

As noted above, all the eight cases that were missing completely at random were excluded from the analysis. The test for normality shows that both the skewness and kurtosis are below one, and this indicates a mild skewness, a situation that is acceptable in social research. The trimmed means and the means of the independent variables in the data are very close (less than 0.1) and this indicates that the outliers have no serious effect on the data. A test for common method bias was also carried out by using Harman's single factor test. The result shows that 34.77 per cent of the total variance explained was obtained. This shows that no single factor accounted for the majority of the covariance among the variables (Krishnan, Martin, & Noorderhaven, 2006; Steensma, Tihanyi, Lyles, & Dhanaraj, 2005). This result therefore, shows that the data are not suffering from common method bias.

3.6 Data Analysis and Hypotheses Testing

The data collected were analysed through descriptive statistics to summarise the patterns seen in the responses of cases in the sample. The hypotheses of this study were examined through the use of Structural Equation Modeling Technique (SEM). SEM is a modeling technique that has the ability of handling a large number of dependent and independent variables simultaneously. SEM is different from other multivariate techniques because it is useful when any endogenous variable becomes an exogenous variable in the relationship string (Byrne, 2010). There are two other important reasons why SEM is superior to other methods of statistical analyses for this research. The first reason is the need to use multiple observed variables that can better understand the area of scientific inquiry (Schumacker & Lomax, 2004). The second reason is that other methods of analysis are based on observed measurement only whereas SEM can combine both observed and unobserved variables (Byrne, 2001). SEM as a technique has become important in confirming theoretical models that utilises a quantitative approach.

4. Results and Discussions

4.1 Demographic Characteristics of the Respondents

As shown in Table 3 below, more than half of the respondents (52 per cent) are below 30 years of age and only 10 per cent are aged 50 years and above. Gender distribution shows that 58 per cent are males and

Table 3: Demographic Distribution of Respondents

	Frequency (N)	Percentage (%)
Age		
20-30	150	52.1
31-40	70	24.3
41-50	39	13.5
51 and above	29	9.9
Gender		
Males	168	58.3
Females	118	41.0
Ethnic Background		
Malay	279	95.9
Chinese	7	2.4
Others	5	1.7
Religion		
Islam	284	98.3
Buddha	2	0.7
Christian	3	1.0
Income (Malaysian Ringgit)		
<3000	154	54.4
3001-5000	73	25.8
5001-10000	42	14.8
>10000	14	4.9
Education		
Standard 6	6	2.1
High school	78	27.9
Diploma	64	22.9
Degree	132	47.1
Political Affiliation		
BN	31	14.3
PAS	127	58.5
PKR	8	3.7
AKIM	4	1.8
Others	47	21.7

42 per cent females. Majority are Malays (95.9 per cent), 2.4 per cent are Chinese and the remaining 1.7 per cent are others. Out of this figure, 98.3 per cent are Muslims, 0.7 percent Buddhist and 1 per cent Christians. More than half (54 per cent) of the respondents earn less than Malaysian Ringgit 3,000 per month while only 4.5 per cent have monthly income above Malaysian Ringgit 10,000. 70 per cent of the respondents have education at diploma level and above, with only 2 per cent having primary school education.

In terms of political affiliation, more than half of the respondents are supporters of Parti Islam Se-Malaysia *(*PAS) (58.5 per cent) followed by Barisan Nasional (BN) (14.3 per cent) and the remaining 30 per cent supported other political parties such as Parti Keadilan Rakyat (PKR) and Parti Keadilan Islam Malaysia (AKIM). This is a confirmation of the dominance of the PAS political party in Kelantan. The demography also revealed that the respondents belong to various occupation categories (not shown in Table 3) encompassing civil servants, lecturers, businessmen, teachers, pensioners, housewives, farmers and others. The demographic profiles of the respondents are further tabulated in Table 3 above.

4.2 Measurement Model

A confirmatory factor analysis was conducted on the 292 samples collected through Structural Equation Modeling in AMOS (Version 18), using Maximum Likelihood (ML) estimation (Byrne, 2010). The measurement model of the seven latent constructs revealed that the overall data model fit was χ^2 (758) = 1817.766, p < .001. The high significance of the model is an indication of misfit between the covariance matrix of the observed data and the implied covariance matrix of the model. Following the recommendation of Byrne (2001; 2010) and Hair et al. (2010) who say that at least one absolute fit index and one incremental fit index be used in addition with the chi-square and its associated degree of freedom, this study assesses the Normed Chi-Square (CMIN/DF), the Comparative Fit Index (CFI) and the Root Mean Square Error of Approximation (RMSEA).

The fit indices, CFI of 0.881 (below the threshold of 0.9), CMIN/DF of 2.398 (within the recommended ≤ 3 cut-off point) and RMSEA of 0.069 (within the recommended ≤ 0.08) were found to be inappropriate, especially for CFI that was below the threshold (Byrne, 2001; 2010; Hair et al., 2010). All the loading values of the observed variables of the model were above 0.50 except H_1, showing that they were all statistically

significant. However, the overall fit of the model showed that the model did not fit the data well.

Because of the inappropriateness of the data to the hypothesised model, a search for a model that fits the data better was carried out. An examination of all the indicators showed that none of them has a

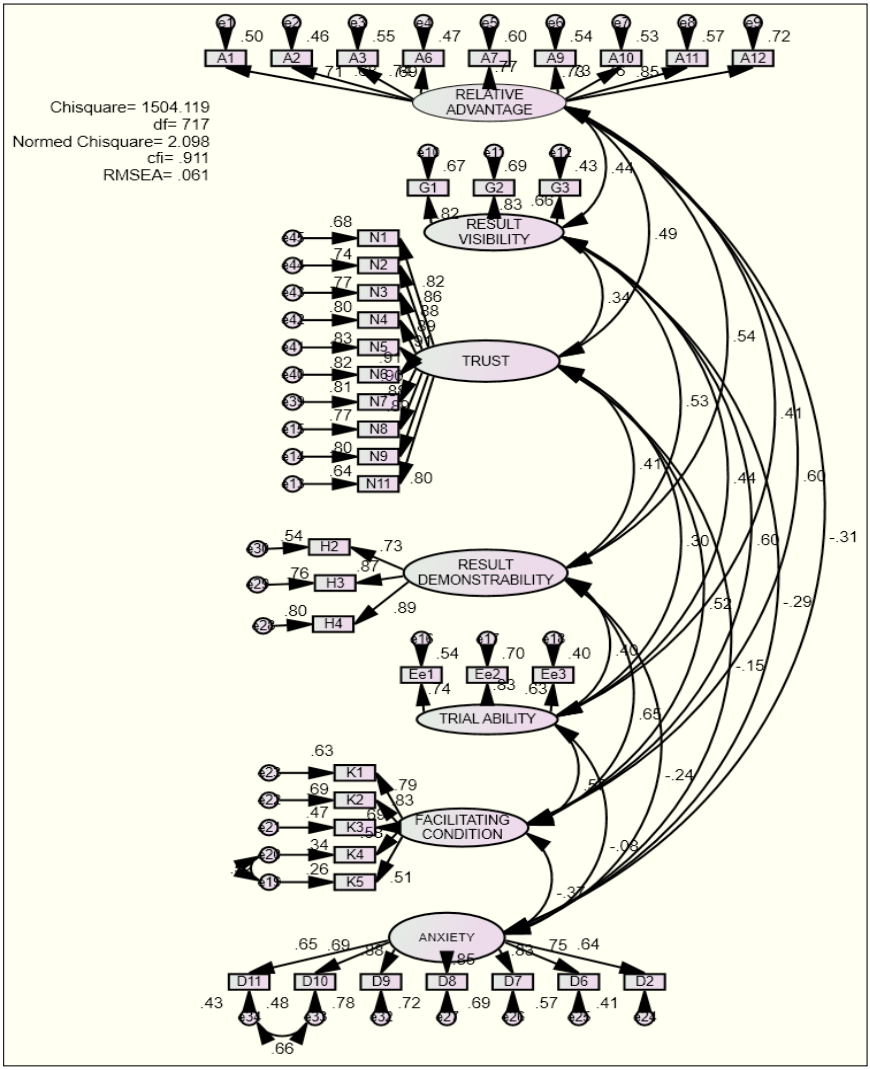

Figure 2: The Revised Measurement Model

serious problem except for H_1; however, its exclusion did not change the model fit. The Post-Hoc Modification Index (MI) was used to identify a more parsimonious model. The examination showed that there were correlations between errors (e33 & e34) of indicators D10 and D11, and that of K4 and K5 (e19 & e20) of the constructs, anxiety and facilitating condition. A plausible explanation for these occurrences is the high possibility of respondents answering these questions in a similar manner hence, the correlation of the errors. The model was estimated again after freeing the two inter-correlations among the four errors as suggested by the parameter of Modification Indices.

Figure 2 shows the revised model. The goodness of fit indices showed the overall fit of the revised model to be consistent with the data. All the fit indices showed that the revised model fitted the data. The Normed Chi-Square (CMIN/DF) is 2.098, below the recommended cut-off point of 3 for χ^2/df to reflect a good model fit. Also the Comparative Fit Index (CFI) of 0.911 and the Root Mean Square Error of Approximation (RMSEA) of 0.061 indicates that the data fit the revised model well (Byrne, 2001; Hair et al., 2010). Furthermore, all the parameter estimates are also statistically significant (Figure 2). They all show logical signs with no offending estimates. The variance explained by the 40 observed indicators as shown by the squared multiple correlations (SMC) provided reasonable values, which range from 0.263 (K5) to 0.330 (N5). The revised model, therefore, better suited the data as compared to the originally hypothesised model. All the correlation between the constructs, except for the one between anxiety and trialability, were also found to be significant and having the expected signs.

4.2.1 Convergent and Discriminant Validities

Another important condition in assessing the fit of a confirmatory factor analysis of a hypothesised model (measurement model) is testing its convergent and divergent validities. This is to ascertain that there are no cross-loadings, every indicator measures what it is assigned to measure and the constructs are distinct from one another. The results of the convergent and divergent validities are presented in Table 4. The criteria for establishing the convergent validity are that the Critical Ratios (CR) should be greater than 0.7 and the Average Variance Explained (AVE). For discriminant validity, both MSV and ASV must be lesser than AVE. All these conditions are satisfied by the data which established the convergent and divergent validities of the measures in the study (Table 4).

Table 4: Convergent and Divergent Validities

	CR	AVE	MSV	ASV	FAC CON	REL ADV	RES VIS	TRUST	RES DEM	TRIAL	ANX
FAC CON	0.816	0.478	0.425	0.312	0.692						
REL ADV	0.917	0.551	0.356	0.223	0.597	0.742					
RES VIS	0.817	0.601	0.361	0.204	0.601	0.441	0.775				
TRUST	0.970	0.765	0.270	0.152	0.520	0.489	0.341	0.874			
RES DEM	0.873	0.697	0.425	0.229	0.652	0.536	0.526	0.413	0.835		
TRIAL	0.781	0.546	0.320	0.156	0.566	0.413	0.437	0.299	0.396	0.739	
ANX	0.906	0.583	0.141	0.068	-0.375	-0.305	-0.289	-0.155	-0.244	-0.075	0.764

FAC CON = Facilitating conditions, REL ADV = Relative advantage, TRUST = Trust, RES VIS = Result visibility, RES DEM = Result demonstrability, TRIAL = Trialability; ANX = Anxiety.

4.3 Analysis of the Structural Model

The hypothesised model (Figure 1) was evaluated using AMOS version 18.0 based on the following indices: the Chi-Square Test, the Comparative Fit Index (CFI), and the Root Mean Square Error of Approximation (RMSEA). In addition, the path coefficients were assessed for statistical significance at $p < 0.05$, and practical significance at path loading of ≥ 0.20.

As indicated in Figure 3, the Chi-square test is significant, χ^2 (872, N=292) = 1735.868, p <0.001[1]. Nonetheless, the results yielded acceptably high goodness-of-fit indices. The result indicates that the hypothesised model fits the observed data well. This result is established with a Normed Chi-Square (CMIN) value of 1.991 which is well below the cut-off value of 5, often indicated as the benchmark in SEM literature. The CFI of 0.909 is also higher than the minimum recommended value (0.9) and the RMSEA value of 0.058 is below the 0.08 cut-off point. All these show a good fit of the model (Byrne, 2001; 2010; Hair et al., 2010).

4.3.1 Results of the Hypotheses Testing

This study developed seven hypotheses that are represented by the corresponding path as shown in Figure 3, with their respective path

[1] This indicates a bad fit. In SEM, Chi square test non-significance is expected, i.e., p>.05. However, Mueller and Hancock (2008) noting the susceptibility of chi-square to sample size, recommend the use of the CMIN instead.

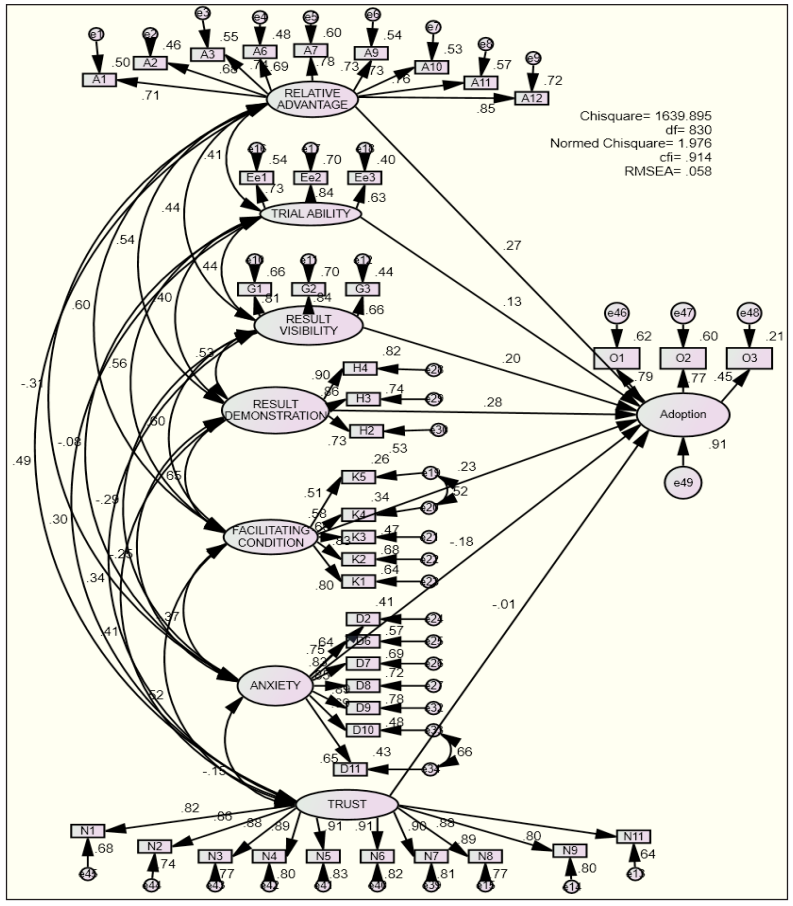

Figure 3: Structural Model of Gold Dinar Adoption

loading values. Five of the proposed hypotheses exhibit positive relationships while the remaining two show negative relationships with the adoption of the gold dinar. The empirical results of structural regression show that six out of the seven hypotheses are supported. The hypothesis that is unsupported is H_7 which posits a positive relationship between trust and the adoption of the gold dinar.

H_1 involves relative advantages of adopting gold dinar. The more the perceived benefits accrued to an individual by adopting the gold dinar as compared to the existing fiat currency, the more their likelihood

of adopting the new currency. This relationship is posited to be positive. The claim is supported at the 95 per cent confidence level with path loading of 0.27 and *t*-score of 4.662.

H_2 hypothesises a positive effect of giving people the opportunity of experimenting the gold dinar on a trial basis (trialability). The argument is supported as the path loading is 0.13 with a *t*-score of 2.250 ($p < 0.05$).

H_3 claims positive explanatory relationship between result visibility and the adoption of the gold dinar. The result shows that the hypothesis is supported at 95 per cent confidence interval with path loading of 0.20 and *t*-score of 3.360 ($p < 0.05$).

H_4 hypothesises the effects of result demonstrability which is the individual's ability to demonstrate the use of the gold dinar that will lead to more people adopting it. Thus, H_4 hypothesises a positive relationship with the adoption of gold dinar. This hypothesis is supported by the data with path loading of 0.28 and *t*-score of 4.552. This is also statistically significant at 95 per cent confidence level ($p < 0.05$).

In H_5, anxiety is the only explanatory variable which is hypothesised to have a negative relationship on the adoption of gold dinar. It is posited that the more the anxiety and difficulty attached to the use of gold currency the less would be people's willingness to embrace it in their day-to-day transaction. The hypothesis is also supported with the expected negative sign. The corresponding path loading is -0.17 with a *t*-score of -3.589 at 95 per cent confidence level ($p < 0.05$).

H_6 posits a positive explanatory relationship between the effects of having in place the facilitating conditions that can aid the use of gold dinar and its adoption. This hypothesis is also supported by the data with path loading of 0.23 and *t*-score of 2.565 at 95 per cent confidence level ($p < 0.05$).

H_7 is the only hypothesis unsupported and one with a wrong sign. H_7 claims that trust would have a positive effect on the adoption of the gold dinar in Kelantan. The path loading is -0.01 (contrary to the expected positive sign), with a *t*-score of -0.241 ($p < 0.05$). Interestingly, this is one of the constructs that was not originally part of the adoption model but was included because of the importance of trust in the issuing authority of the currency and it was expected to improve the predictability of the model. Despite its theoretical importance, it is not supported by the data collected in this study.

Another useful statistic revealed by the structural regression analysis is the value of R^2. In this research work, seven regression analyses were carried out: (1) From relative advantages to adoption,

(2) from triability to adoption, (3) from result visibility to adoption, (4) from result demonstrability to adoption, (5) from anxiety to adoption, (6) from facilitating condition to adoption, and (7) from trust to adoption. The path coefficients are 0.27, 0.13, 0.20, 0.28, -0.17, 0.23 and -0.01 respectively.

Table 5 summarises the estimates, standardised path loading values, standard errors and *t*-scores for each of the relationships. The six significant constructs jointly explain 91 per cent of the variance of adoption (R^2 value) of the gold dinar in Kelantan. Thus, it could be seen that the dependent variable in the regression is well explained by the independent variables (1) to (6).

Table 5: Path Loadings and T-Scores Value for the Model

Independent Variable to Dependent Variable	Estimate	S.E	*t*-score	Standardised estimates	Hypothesis
Relative advantage ⟶ Adoption	.304*	.066	4.629	0.27	Supported
Trialability ⟶ Adoption	.131**	.058	2.250	0.13	Supported
Result visibility ⟶ Adoption	.166*	.049	3.360	0.20	Supported
Result demonstrability ⟶ Adoption	.235*	.052	4.551	0.28	Supported
Anxiety ⟶ Adoption	-.175*	.048	-3.589	-0.18	Supported
Facilitating conditions ⟶ Adoption	.309**	.121	2.565	0.23	Supported
Trust ⟶ Adoption	-.011	.047	-.241	-.01	Not-Supported

* $p < 0.01$, ** $p < 0.05$

5. Discussions of the Findings

The first research question focusing on the indicators (see the Appendix) of the adoption of the gold dinar in Kelantan was addressed based on the measurement model output. All the indicators have factor loadings of 0.5 and higher, the threshold for good loadings (Byrne, 2010) (Figure

3), and with critical ratios more than 1.96 implying that they are all statistically significant.

An examination of the indicators of the construct, relative advantage, shows that the indicators, "*gold dinar eliminates inflation tax*", "*gold dinar allows me to conform well to my religion*" and "*gold dinar eliminates riba*", have the highest factor loadings in that order. From Figure 3 above, it is observed that the indicator that has the highest loading on the factor, relative advantage, is the one that has to do with "*elimination of inflation tax by gold dinar*". This is expected as the preservation of wealth is one of the five basic principles of *maqasid al shariah* in Islam. It is a religious duty to protect one's wealth. As it is known in economics, inflation is an indirect tax by the government due to an increase in the amount of money in circulation that erodes the purchasing power of the initial currency in the system (Bagus, Howden, & Gabriel, 2014). Adopting the gold dinar will thus, remove the arbitrary power of the government in printing more money, thereby, preserving the people's wealth. This is followed by two other indicators that have to do with Islam and the elimination of *riba*. All these underscore the importance of religion in the adoption of the gold dinar in Kelantan. Using the gold dinar as a form of asset diversification has the lowest loading of the factor. This shows that if people have their way, they would not be interested in hoarding the gold dinar (Yusuf et al., 2013; Saleem, 2009).

On the factor of anxiety, the indicators on "*fear of paper money driving out gold dinar in circulation*", "*volatility of gold price in response to dollar*", and "*running-out of the gold dinar in circulation*" have the highest loadings in that order. Each of these three threats has a significant implication on the currency. The indicators with the highest factor loading is "*paper money driving away gold dinar*"; it is a well-established principle in economics that bad money drives away good money in circulation (Gresham's law) due to legal tender laws (Platt, 1973). People consider the gold dinar as good money, and since it is in circulation with the Malaysian Ringgit (bad money), a legal tender in Malaysia, the fear is that people may want to hoard the gold dinar as a form of investment so as to hedge against inflation or even future financial crisis rather than it as a currency. The next two indicators which are invariably related to the first indicator are "*volatility of gold price*" and "*running-out of the gold dinar in circulation*". As noted in the literature review, many things affect the dollar price of gold. All these things can make it difficult to fix the dollar worth of the gold dinar. Hence, rather than serving as a measure of value, the gold dinar itself introduces uncertainty into the system.

The indicator with the lowest loading is the "*fear of Federal Government in Malaysia proscribing the use of the gold dinar*". This is unexpected as one would expect this indicator to have the highest loading since the first and major obstacle in the introduction of the gold dinar encountered was from the Federal Government that had attacked it based on the issue of legal tender (Yusuf et al., 2013). Nonetheless, this indicator has the lowest factor loading under challenges.

On the factor of trust, the indicators "*having confidence in the government skill, government's ability to accomplish*" and "*government having a sound principle*" top the list. As noted earlier, people's trust in the currency issuing authority is very important. In this analysis, the people of Kelantan were confident that the government has the expertise to introduce and implement gold dinar currency in the state. The subsequent indicators with the highest factor loadings on trust are "*government ability*" and "*possession of sound judgement*". All these items are very important for a successful implementation of a currency be it real or fiat money. The indicator with the lowest loading on this factor is "*fair and just treatment by the government*".

In terms of the factor of facilitating conditions, indicators such as "*availability of assistance with any difficulty*", "*possession of required knowledge*" and "*presence of necessary resources to use the gold dinar*" have the highest factor loadings respectively. Being a new form of money, users need enabling situations to use it comfortably. In their own rating, "*availability of a person (group of people) to put them through whenever they encounter problem(s) using gold dinar*" has the greatest contribution among the indicators of facilitating conditions in their adoption of the gold dinar. The next important indicator on this construct is "*the possession of required knowledge by the users to implement the new currency*". This is highly important since the adopter needs to understand how the system works in order to be able to sustain it. Having people that facilitate the conditions is necessary but being able to use it without much help from others is important. Thus, the knowledge of its usage is important. "*Availability of resources to use the gold dinar*" has the third highest loading on this factor. This is also important since the use of the currency requires facilities in place to facilitate it. The indicator with the lowest loading is "*compatibility of the gold dinar with the existing fiat currency*". This is expected since the gold dinar and Malaysian Ringgit are different from each other.

With regards to the constructs, trialability, result demonstrability and result visibility, the indicators that have the highest loading on

the respective factors are "*being able to use the gold dinar on a trial basis*", "*being able to demonstrate the evil of not using gold dinar*" and "*visibility of using gold dinar in the state*". The Kelantan state government allows people to experiment on the use of the gold dinar by allowing it to be used for paying religious dues and giving others like interested civil servants the option of collecting up to twenty five per cent of their salary in gold dinar. This condition was scored high by the respondents on the construct that measures trialability. On the result demonstrability construct, the respondents rank their "*ability to demonstrate the evil inherent in using fiat money*" above all other indicators for that factor. "*Visibility of using gold dinar in Kelantan state/community*" has the highest loading under result visibility construct.

According to the path coefficients, all the links from the latent variables leading to adoption except that of the trust are statistically significant and show the expected signs. The constructs with significant path coefficients are: relative advantage, trialability, result visibility, result demonstrability, anxiety and facilitating conditions. This is in line with empirical findings that have used adoption model to study various types of adoption in the past. However, with the path coefficient of -0.01, the link from trust and the adoption of the gold dinar is not statistically significant and it exhibits an unexpected sign. The plausible reason to explain this may be that trust has no impact on the adoption of the dinar or that the path link between the two is different from the one specified in the model of this study.

6. Conclusion

The main aim of this study is to examine the determinants of gold dinar adoption in Kelantan, Malaysia using an extended adoption model. The model consists of seven factors: relative advantage, triability, result visibility, result demonstration, anxiety, facilitating conditions, and trust. From the findings, indicators that proxy the factors are all statistically significant as per the response of users in the study sample. Thus, it may be said that the indicators measured the dimension ability of the constructs. The study achieves its three designed objectives.

The first objective of profiling the socioeconomic characteristics of gold dinar users is achieved by using descriptive statistics. It is observed that majority of the respondents have education above diploma level and over 50 per cent earned less than Malaysian Ringgit 3,000 per month. Finally, the descriptive statistics reflect the fact that users engage in all

sorts of activities ranging from private to public employment and the activities cut across the political divides in the state.

The objective of finding the components of gold dinar adoption is achieved through the measurement model. The study finds that all the indicators measuring different constructs are statistically significant at 95 per cent level of significance. Without undermining the loading of the components on their respective constructs, it is discovered that items such as, "*gold dinar eliminates inflation tax*", "*fear of paper money driving out gold dinar in circulation*", "*availability of assistance with any difficulty*", "*confident in the government's skills*", "*being able to use the gold dinar on a trial basis*", "*being able to demonstrate the evil of not using gold dinar*", *and "visibility of using gold dinar in the state",* have the highest loadings on the factors relative advantage, anxiety, facilitating conditions, trust, trialability, result demonstrability and result visibility. All these indicators have profound implications on the adoption of the gold dinar.

The third objective focusing on the dimensions of gold dinar adoption is achieved by the analysis of the structural model. This study finds that six out of the seven constructs specified to influence the adoption of the gold dinar are statistically significant and they exhibit correct signs. These factors are relative advantage, triability, result visibility, result demonstrability, anxiety, and facilitating conditions. All are significant at 95 per cent level of confidence interval. However, the construct of trust, is found to be not significant in this study, and it exhibits a wrong sign. The likely reason of its occurrence may be that trust has no impact on the adoption of dinar or the path link between the two is different from the one specified in the model.

Overall, this study has contributed to knowledge in four different ways. The first is the use of an adoption model to study currency adoption (gold dinar). The second is the extension of a traditional adoption model by adding more constructs. The third contribution of this study is the identification of components of the gold dinar adoption. Finally, this study has empirically validated the adoption model in the context of gold dinar adoption. However, it should be noted that this is one of the earliest studies on this subject and as such more studies need to be done to validate the findings.

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Appendix

Constructs and Their Indicators

Construct		Indicators
Adoption	O1	Giving that I have access to gold dinar I will use it.
	O2	I intend to perform my future transaction with gold dinar.
	O3	I have tried gold dinar.
Relative advantage	A1	Using gold dinar helps to preserve wealth.
	A2	Using gold dinar gives an opportunity for asset diversification.
	A3	Using gold dinar to me means freedom.
	A4	Unlike paper money the value of gold dinar is constant.
	A5	Gold is freely convertible anywhere in the world.
	A6	Gold dinar is an attractive alternative asset.
	A7	Gold dinar allows me to conform better to my religious dictates.
	A8	Paper money is bad.
	A9	Gold dinar prevents financial crisis.
	A10	Gold dinar eliminates currency war.
	A11	Gold dinar eliminates *riba*.
	A12	Gold dinar eliminates inflation tax.
	A13	Gold dinar eliminates complexities of paper currency.
Trialability	Ee1	Before deciding to use gold dinar I was able to properly try one out.
	Ee2	I was allowed to use gold on trial basis (e.g. for *zakat*) long enough to master how to use it.
	Ee3	The state provides means to try gold dinar before the general usage.
Result visibility	G1	I have seen what others do by using gold dinar in my community/state.
	G2	Gold dinar is very visible in my community/state.
	G3	The result of using gold dinar is apparent to me.
Result demonstrability	H1	I find it difficult telling others about the result of using gold dinar.
	H2	I can easily communicate to others the consequences of using gold dinar.
	H3	I believe I could demonstrate to others the evil of not using gold dinar.
	H4	I feel at easy selling the idea of gold dinar to others.

Anxiety	D1	I feel apprehensive using gold dinar.
	D2	I feel I could lose part of my wealth if Federal Government proscribe gold dinar.
	D3	I am always afraid of legal tender law.
	D4	I am afraid people will hoard gold dinar.
	D5	I am afraid of collecting fake gold dinar.
	D6	I am afraid nobody may wish to collect gold dinar from me.
	D7	I am scare gold dinar may run out of circulation.
	D8	I am afraid dollar price of gold dinar may make it volatile.
	D9	I am afraid paper money may drive gold dinar out of circulation.
	D10	I am afraid federal government may confiscate my gold dinar.
	D11	I am afraid federal government may not allow states to use gold dinar.
Facilitating conditions	K1	I have the resources necessary to use gold dinar.
	K2	I have the knowledge required to use gold dinar.
	K3	Gold dinar is compatible with other form of money I use.
	K4	A specific person (or a group) is available for assistance with difficulty I experience with gold dinar.
	K5	There are incentives for using gold dinar in my state/ community.
Trust	N1	This government treats people like me fairly and justly.
	N2	Whenever this government makes an important decision, I know it will be concerned about people like me.
	N3	This government can be relied on to keep its promises.
	N4	I believe that this government takes the opinions of people like me into account when making decisions.
	N5	I feel very confident about this government's skills.
	N6	This government has the ability to accomplish what it says it will do.
	N7	Sound principles seem to guide this government's behavior.
	N8	This government does not mislead people like me.
	N9	I am very willing to let this government make decisions for people like me.
	N10	I think it is important to watch this government closely so that it does not take advantage of people like me.
	N11	This government is known to be successful at the things it tries to do.