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Knowledge Economy's Role in Solidification of Finance Sector in UAE

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ABSTRACT: The present research has utilized SmartPLS software for structural equations modelling by analysing 379 response sheets. The outcome would help assess the proposed model based on pillars of knowledge economy, which will supplement in gauging its impact on effectiveness of Islamic finance sector in UAE. Listed are the major independent constructs of the proposed model, i.e. innovation driven climate, human resources, ICT infrastructure, and institutional regime. The dependent construct covers Islamic finance sector effectiveness. The research also highlights the connecting link between these varied constructs by revealing significant prediction of knowledge economy by the mentioned variables with respect to Islamic finance sector. 58.7% of variance was noted with the proposed model.

Keywords: Knowledge economy; Islamic finance sector; innovation-driven climate; human resources; ICT infrastructure.

I. INTRODUCTION

As per the conducted literature survey, countries around the world have been wanting to overcome "impulsive laziness" that accompanies endowment of national resource. With the end of Oil economy era, a sustainable developmental strategy needs to be adopted, especially by Arab countries whose economy depended on oil productions. The authors focused on developing knowledge economy as an alternative developmental model. According to the UAE Vision 2021, knowledge economy has taken a major place within the major four thematic areas of work [1].

The Islamic finance is therefore justified considering its cross applicability to even non-Islamic global territories as well as increasing reputation as a benchmark for the Arab World. Obviously, the Islamic Economic Indicators will be stronger in Islamic geographical regions. It also remains at the heart of the Arab world as the present study focuses on UAE and regional countries with high dependence on Oil and Gas. The current work contributes the most to UAE and other countries in the Islamic world, thus Islamic Economy as the main dependent variable to which the contribution of knowledge economy is being assessed.

The current research aims at investigating the role of knowledge economy in augmenting effectiveness of Islamic finance sector in UAE.

II. LITERATURE REVIEW

A. Finance Sector of Arabic Countries

When we talk of Islamic economic system we land up on its banking system, which plays a significant part in managing the countries' economy. Some of the key sectors which assists in measuring the finance activities of Islamic Finance system are Commercial Banks, Takaful, Waqf, Islamic Funds, Crowd funding, Sukuk Arrangers, and so on.

This assertion has been proved by the Global Islamic Economy Reports published by Thomson Reuters in 2017. Settling of Islamic Finance is not rightly justified. This is because the Islamic Finance Market has the least global share of 1.27%. As per the suggested report, Iran holds the highest rank in commercial trading ($329 billion in assets), which is followed by Saudi Arabia ($300 billion), Malaysia ($174 billion), and finally, UAE ($127.3 billion).

As per the statistics, UAE and Gulf Cooperation Council (GCC) region have experienced economic surplus in the past; however, this margin has now been converted to an increased deficit from 2.7% to 5.2%. This has marked an expansion of Finance of these Islamic states into East of Asia and African countries.

B. Knowledge Economy

Innovation-Driven Climate (IC). It is defined as the capability to create novel and value-adding advantages. Some climates are supportive and some are hampering to creative ideas. It is also described as the existence and ability of universities, research centers, private entities, and think tanks to utilize the ever accumulating global knowledge, and apply it based on the local needs to create new knowledge. In order for the whole process to be fruitful, it is crucial to have public support due to many reasons, first, the government can withstand initiatives which are not profitable immediately; second, innovations that are sponsored by the government are easily assimilated into the public domain compared to those of private sector; and finally, innovations of the government are oriented towards social needs compared to the more constrained priorities of private-sector innovation. As for this study, Islamic finance as an important part of the UAE economy, it is the intention to examine the impact of innovation climate on Islamic finance sector effectiveness, as stated in the following hypothesis:

H1. Innovation-driven climate significantly has a positive impact on Islamic finance sector effectiveness.

Human Resources (HR). It is concerned with a well-educated, creative, and highly talented workforce, as the prospect of generating products and services that are based on knowledge is higher. However, it is a difficult mission to create knowledge economies based

on knowledge outputs in countries that have high portion of its workforce as fragile human capital. The way to generate a creative human capital is through the development of a strong educational infrastructure. Due to the globalized world, it is the economies with more developed human capital that gains the highest rewards because the boundaries of the market of ideas are minimal. As for this study, considering Islamic finance as an important part of the UAE economy, it is the intention to examine the impact of human resources on Islamic finance sector effectiveness. Consequently, the following hypothesis is proposed:

H2. Human resources significantly has a positive impact on Islamic finance sector effectiveness

ICT Infrastructure (ICT). A strong ICT network assists in flourishing of the knowledge economy system [28,29]. The economic aspects of ICT are universal across all sectors: as they signify a rewarding sector in its own in addition of being an important contribution in other's products and services selling and marketing. With respect to economic development, ICT forms the foundation of building a modern industrial economy. It has the prospective to produce bountiful leading industries more easily because its requirements for operationalization and acquisition of ICT are unpretentious in comparison to those of traditional methods that includes the Islamic finance sector as well. Based on this, the third hypothesis has been stated:

H3. ICT infrastructure significantly has a positive impact on Islamic finance sector effectiveness

Institutional Regime (IR). IR deals with the regulatory and economic environment which leads to free flow of knowledge, in addition to supporting investment in ICT and encouraging business ideas. In this regard, governments should remove political and market distortions which hinder the resource efficiency utilization which is considered crucial for flourishing of a knowledge economy. Essentially, it is tremendously clear from the accumulating evidence that relates that a better government yields more prosperous societies. Below id the proposed hypothesis:

H4. Institutional regime significantly has a positive impact on Islamic finance sector effectiveness.

III. RESEARCH METHODOLOGY

A. Proposed Research Model: An Overview

Impact of pillars of the knowledge economy on the finance sectors of Islamic countries has been the prime objective of the current study. As mentioned, four hypotheses have been stated with respect with UAE.

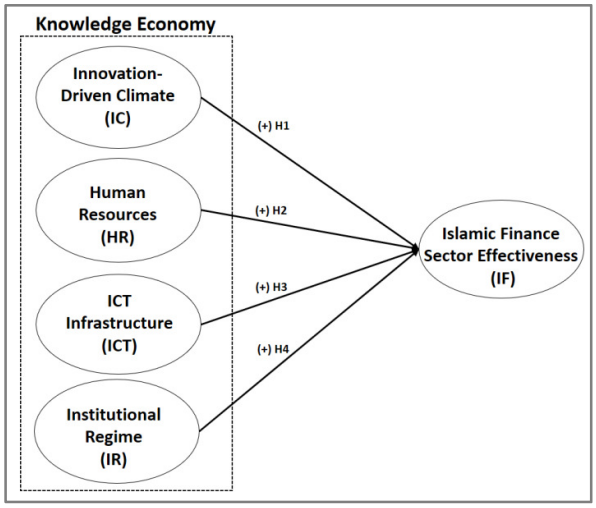


Fig. 1. Schematic diagrm of the proposed model.

B. Instrument Development

The development of an instrument for this study included a 24-item questionnaire, and based on the knowledge economy literature, the study applied a multi-item Likert scale [2]. Constructs were measured using a Likert scale which recommended in the previous studies, with 7 being 'Strongly Agree' and 1 being 'Strongly Disagree'. Given the fact that the respondents were Arabic-speakers, it is required to have the questionnaires translated from English to Arabic in a precise way. Thus a back translation was applied, which is a procedure widely used in a cross-cultural survey [3]. Previous studies were used to get a validated to measure the variables (Appendix A). The items were taken into consideration following the guidelines stated, and this was done for each construct.

C. Collection of Data

The data was collected by delivering a self-administered questionnaires 'in-person' from April 2017 until August 2017 to government employees. Total samples were 600 questionnaires, of which 423 returned back with 379 having complete responses. According to Tabachnick & Fidell [4] and Krejcie & Morgan [5], the sample size was seen as sufficient. Compared to the relevant literature the 70.5% response rate is considered very good [6]. The number of the deleted questionnaires was 44 including a 31 missing data cases of more than 15% of the questions, and 3 cases as outliers, and 10 cases that have a straight lining.

IV. ANALYSIS OF DATA AND RESULTS

PLS and SEM-VB was implemented for research model evaluation using SmartPLS 3.0 software [7]. Two-stage analytical method [8,9] was used that consisted of: (i) measurement model assessment (measures each construct)and (ii) structural model assessment (it states the relationship between structural model and its variables [10,11].
Precision of the assessment model was seen to be high for PLS-SEM method, as SEM offers simultaneous analysis [12,13].

A. Descriptive analysis

Table 1 shows the mean values along with SD values. The responses were evaluated on basis of a 7-point Likert Scale numbered from 1 ((strongly disagree) to 7 (strongly agree). Highest mean value of 4.9 was scored by human resources with SD value of 1.17. Whereas the lowest mean score was presented by Islamic finance sector effectiveness resources (4.63) with 1.22 SD.

B. Measurement Model Assessment

Construct reliability and validity were used for measurement model testing. The Cronbach's alpha coefficients values varied within 0.729 to 0.872 which was more than 0.7 [14]. Furthermore, for testing construct reliability, the values of all the composite reliability were between 0.822 to 0.909, which exceeded 0.7 [15-17]. Table 1 exhibits satisfied construct reliability values.
The factor ,loading technique was used for assessing the Indicator reliability. Similar indicators are hold upon by the construct and indicated by high loadings, especially for values more than 0.5 [9]. Table 1 presents high factor loading for all items.
Average variance extracted method was used for assessing the Convergent validity, with values between 0.501 to 0.670, which exceeded the recommended value of 0.50 [11] (Table 1).

Table 1: Mean, standard deviation, loading, cronbach's Alpha, CR and AVE.

Constructs	Item	Loading (> 0.5)	M	SD	α (> 0.7)	CR (> 0.7)	AVE (> 0.5)
Innovation-Driven Climate (IC)	IC1 IC2 IC3 IC4 IC5	0.880 0.904 0.864 0.774 0.641	4.80	1.33	0.872	0.909	0.670
Human Resources (HR)	HR1 HR2 HR3 HR4 HR5	0.760 0.784 0.821 0.712 0.699	4.90	1.17	0.813	0.870	0.572
ICT Infrastructure (ICT)	ICT1 ICT2 ICT3 ICT4 ICT5	0.802 0.835 0.769 0.780 0.689	4.73	1.23	0.835	0.883	0.603
Institutional Regime (IR)	IR1 IR2 IR3 IR4 IR5	0.774 0.691 0.699 0.613 0.682	4.71	1.15	0.729	0.822	0.501
Islamic Finance Sector Effectiveness (IF)	IF1 IF2 IF3 IF4	0.759 0.804 0.768 0.694	4.63	1.22	0.751	0.843	0.573

Note: M=Mean; SD=Standard Deviation, α= Cronbach's alpha; CR = Composite Reliability, AVE = Average Variance Extracted.

- The measurement used is seven-point scale ranging from 1 (strongly disagree) to 7 (strongly agree).
- All the factor loadings of the individual items are statistically significant ($p < 0.01$).

Table 2 presents outcome of discriminate validity by cross loading and Fornell-Larcker criterion [9]. In this study, the indicators' outer loadings on a construct exceeded all its cross-loadings with other constructs, and hence, the cross loading criterion had satisfied the requirements.

Table 3 presents discriminant validity results using Fornell-Larcker criterion. It was found that the square root of the AVEs on the diagonals (bold) are larger than correlations between constructs (corresponding row and column), indicating strong association between them when compared to other constructs [18,19]. According to Hair and others. (2017), a good discriminant validity is observed. Furthermore, the exogenous constructs have a correlation of < 0.85 [20], thus showing satisfactory results.

Table 2: Results of discriminant validity by the cross loading.

	IC	HR	ICT	IR	IF
IC1	**0.880**	0.499	0.466	0.521	0.446
IC2	**0.904**	0.510	0.505	0.554	0.496
IC3	**0.864**	0.476	0.503	0.522	0.467
IC4	**0.774**	0.446	0.517	0.437	0.451
IC5	**0.641**	0.519	0.581	0.597	0.579
HR1	0.425	**0.760**	0.495	0.589	0.583
HR2	0.436	**0.784**	0.350	0.616	0.481
HR3	0.542	**0.821**	0.515	0.694	0.605
HR4	0.416	**0.712**	0.348	0.551	0.482
HR5	0.491	**0.699**	0.440	0.587	0.419
ICT1	0.443	0.380	**0.802**	0.461	0.498
ICT2	0.504	0.439	**0.835**	0.516	0.508
ICT3	0.360	0.371	**0.769**	0.387	0.390
ICT4	0.592	0.503	**0.780**	0.605	0.580
ICT5	0.558	0.517	**0.689**	0.610	0.458
IR1	0.515	0.674	0.433	**0.774**	0.507
IR2	0.536	0.607	0.419	**0.691**	0.524
IR3	0.341	0.544	0.379	**0.699**	0.454
IR4	0.418	0.426	0.537	**0.613**	0.496
IR5	0.455	0.523	0.577	**0.682**	0.415
IF1	0.437	0.462	0.445	0.542	**0.759**
IF2	0.584	0.520	0.583	0.579	**0.804**
IF3	0.393	0.511	0.491	0.471	**0.768**
IF4	0.420	0.593	0.396	0.510	**0.694**

Key: IC: innovation-driven climate, HR: human resources, ICT: ICT infrastructure, IR: institutional regime, IF: Islamic finance sector effectiveness

Table 3: Results of discriminant validity by Fornell-Larcker criterion.

	Factors	*1*	*2*	*3*	*4*	*5*
		HR	IC	ICT	IF	IR
1	HR	**0.756**				
2	IC	0.610	**0.818**			
3	ICT	0.574	0.643	**0.776**		
4	IF	0.689	0.612	0.637	**0.757**	
5	IR	0.605	0.658	0.673	0.692	**0.694**

Note: Diagonals represent the square root of the average variance extracted while the other entries represent the correlations.
Key: IC: innovation-driven climate, HR: human resources, ICT: ICT infrastructure, IR: institutional regime, IF: Islamic finance sector effectiveness.

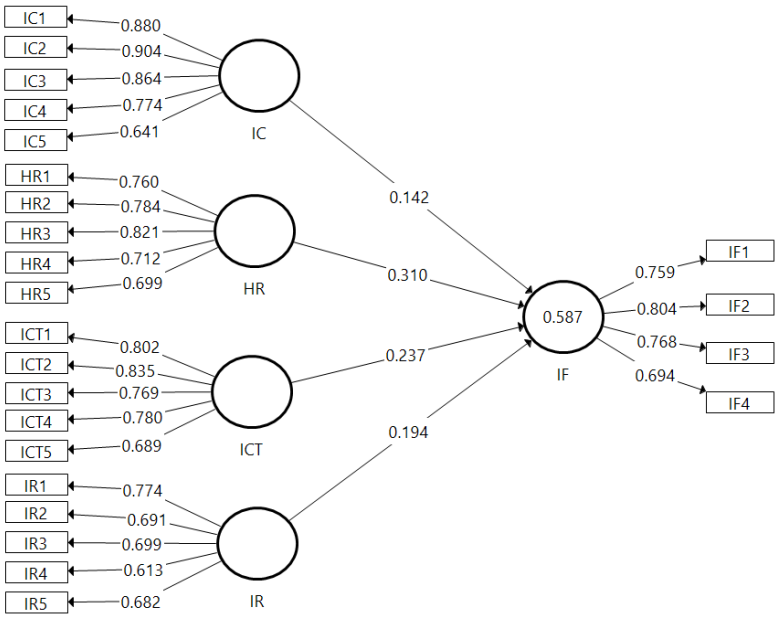
C. Structural Model Assessment

The structural model can be tested by computing beta (β), R^2, and the corresponding t-values via a bootstrapping procedure with a resample of 5,000 [9], taking into account the effect size (f^2) and predictive relevance (Q^2). However, the p-value shows effect's existence, and the effect size do not show it [21].

Hypotheses Tests. Figure 2 and Table 4 depict the structural model assessment, showing the results of the hypothesis tests, with 4 out of the 4 hypotheses are supported. Innovation-driven climate, human resources, ICT infrastructure, and institutional regime significantly predict Islamic finance sector effectiveness. Hence, H1, H2, H3, and H4 are accepted with ($\beta = 0.310$, t= 4.030, p <0.05), ($\beta = 0.142$, t= 2.509, p <0.01), ($\beta = 0.237$, t= 3.784, p <0.001), and ($\beta = 0.194$, t= 2.220, p <0.01)respectively.

The strength of the relationship between exogenous and endogenous constructs are measured by the standardised path coefficients, which in this case show that the direct effects of innovation-driven climate on Islamic finance sector effectiveness is much stronger than the influence of other variables.

Fifty-nine percent of the variance in Islamic finance sector effectiveness is explained by innovation-driven climate, human resources, ICT infrastructure, and institutional regime. The values of R^2have an acceptable level of explanatory power, indicating a substantial model [19,22]. Effect sizes (f^2) was examined in this research. The effect size f^2 ascertains the impact of an exogenous latent construct (whether substantial, moderate, or weak) on an endogenous latent construct.



Key: IC: innovation-driven climate, HR: human resources, ICT: ICT infrastructure, IR: institutional regime, IF: Islamic finance sector effectiveness

Fig. 2. PLS algorithm results.

It is suggested that the change in R^2 value is assessed [9]. The f^2 value of 0.35 indicates large effects, 0.15 indicates medium effects, and 0.02 indicates small effects [22]. Table 4 displays the f^2 results, indicating four small effect sizes relationships.

In assessing the predictive relevance of the proposed research model, this study had applied the blindfolding procedure.This procedure should be employed on endogenous constructs with a reflective measurement only (Hair and others., 2017). According to Hair and others. [9], a particular endogenous construct of the proposed model has predictive relevance if the value of Q^2 exceeded 0. In this study, all Q^2 values were greater than 0, and hence, it can be concluded that the proposed model has an adequate predictive relevance (refer to Table 4). Relative measure of predictive relevance is indicated by Q^2 values of 0.35 for large, 0.15 for medium, and 0.02 for small. The exogenous construct in this study was found to have medium predictive relevance.

According to O'brien, the existence of multicollinearity poses a problem as it indicates overlapping of the variance that the exogenous constructs explain in the endogenous construct. Therefore, it cannot justify each variance in the endogenous variable. Variance inflation factor (VIF) is commonly used as a measurement of the degree of multicollinearity. There is an issue if the value is > 10 [23-25].

Table 4: Structural path analysis result.

Hypothesis	Relationship	Std Beta	Std Error	t-value	p-value	Decision	R^2	f^2	Q^2	VIF
H1	IC→IF	0.310	0.077	4.030	0.000	Supported	0.59	0.024	0.315	2.083
H2	HR→IF	0.142	0.057	2.509	0.006	Supported		0.080		2.932
H3	ICT→ IF	0.237	0.063	3.784	0.000	Supported		0.065		2.098
H4	IR→ IF	0.194	0.087	2.220	0.013	Supported		0.025		3.638

Key: IC: innovation-driven climate, HR: human resources, ICT: ICT infrastructure, IR: institutional regime, IF: Islamic finance sector effectiveness

Importance-Performance Map Analysis (IPMA)

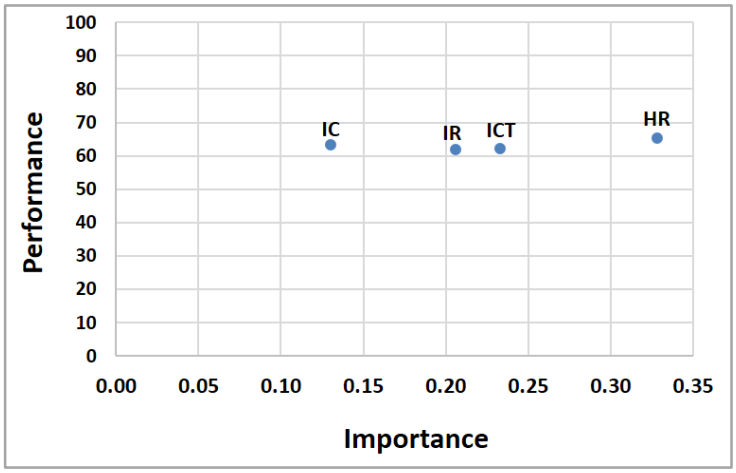
IPMA was employed as a post-hoc PLS procedure in this study, with the Islamic finance sector effectiveness used as the outcome construct. According to Hair and others. [9], the IPMA provides an estimation of the total effects corresponding to the importance of predecessor constructs in affecting the target construct (Islamic finance sector effectiveness);the average latent variable scores correspond to their performance, whereas the index values' (performance scores) calculation was achieved by rescaling the scores of the latent

constructs to within a range from 0 (lowest performance) to 100 (highest performance) (Table 5) [26].

Table 5: IPMA for Islamic finance sector effectiveness.

Latent constructs	Total effect of the construct *Islamic finance sector effectiveness* (Importance)	Index values (Performance)
Innovation-Driven Climate (IC)	0.13	63.19
Human Resources (HR)	0.33	65.22
ICT Infrastructure (ICT)	0.23	62.28
Institutional Regime (IR)	0.21	61.97

The scores for total effects and index values were plotted on a priority map (refer to Figure 3). It can be observed that human resources is a very important factor in determining the Islamic finance sector effectiveness due to its relatively higher importance value compared to other constructs in the proposed model. There is a gap between the importance of factors for determining Islamic finance sector effectiveness, which possess similar performance. IPMA aims at identifying the predecessors with high importance and low performance [9].



Key: IC: innovation-driven climate, HR: human resources, ICT: ICT infrastructure, IR: institutional regime

Fig.3. IPMA (Priority Map) for Islamic finance sector effectiveness.

V. DISCUSSION

Based on the proposed model, this study improves the understanding of the role played by knowledge economy in terms of innovation driven climate, human resources, ICT infrastructure, and Institutional regime in predicting Islamic fincance sector effectiveness among employees in government sector who are using islamic finance services in the United Arab Emirates, and highlights relevant implications. The discussions are further detailed in the following.

The study found that innovation driven climate positively affects the effectiveness islamic finance sector among employees in government sector who are using islamic finance services in the United Arab Emirates, this is supported by previous studies. It is explained by the fact that The more global investors are willing to invest in the UAE, royalities and license fees for new companies are minimal, research and development financed sufficiently, and easiness to start a business, the more islamic finance sector is expanding by facilitating new investments, encouraging new start-ups, and contribute to the research & development of new products and services.

Likewise, it was found that human resources positively affects the effectiveness osislamic finance sector among employees in government sector who are using islamic finance services in the United Arab Emirates, this is supported by previous studies [27]. It is explained by the fact that the more progress to improve literacy rate of UAE nationals above 15 years old, tertiary enrolment, professional and technical UAE workers availability, in addition to having an adequate amount of training for employees in the public sector and being able to preserve brilliant minds from migration. The more Islamic finance sector is expanding by utilizing the educated workforce facilitating new investments, encouraging new start-ups, and contribute to the research & development of new products and services.

Similarly, the results revealed that ICT infrastructure significantly influence the effectiveness osislamic finance sector among employees in government sector who are using Islamic finance services in the United Arab Emirates, this is supported by previous studies. It is explained by the fact that the more the internet penetration rate, UAE smart government services, mobile networks services, The more Islamic finance sector is expanding by utilizing new technologies such as mobile banking, internet banking, and contribute to the research & development of new products and services.

Finally, institutional regime was found to significantly influence the effectiveness of Islamic finance sector

among employees in government sector who are using Islamic finance services in the United Arab Emirates, this is supported by previous studies. It is explained by the fact that the more it is easier to generate capital and investments for businesses, government install a tax-free sectors, intellectual capital is guaranteed. The more Islamic finance sector is expanding by benefiting from regulations in place, and contribute to the research & development of new products and services.

VI. IMPLICATIONS, LIMITATIONS AND FUTURE DIRECTIONS

Evidence and findings in this area have rendered deserving attention to Islamic Economy. This is important to revive the theoretical discourse on the area and portray the increasingly globalization of Islamic Economics. Most importantly, the study placed Islamic finance beyond any barrier of language and religion. Another important implication of the study lies in the assessment of knowledge requirements of the various Islamic finance Sectors. Establishing all knowledge economy indicators as valid antecedents of Islamic finance Sector. Knowledge economy as an input in any given model has been established with acceptable levels of reliability and validity. This implies further investigations can build on this instrument and indicators which were originally defined based on the World Bank knowledge economy pillars [27].

One last area worth mentioning is the scarce number of studies that focus on the application of knowledge economy to the public sector in general. Researchers have highlighted this gap and the urgency with which this gap needs to be addressed. Even though Islamic Economy does not reside solely in the public domain, data is collected principally from workers in the Federal arm of UAE Government. Empirical evidence is therefore established with some contribution to closing the gap.

As for future directions, a second-order construct must be assessed for its interrelationship with the variables of Knowledge Economy and Islamic Economics for the sake of validity. In the course of assessing validity, structural equation modelling.

VII. CONCLUSION

The first study objective dealt with contribution of the knowledge economy in order to strengthen the islamic finance Sector aiming at its constant and sustainable growth. It is established that a good economic incentive system & institutional regime, an effective and highly proficient innovative system, and a highly educated & skilled labour force, are fundamental to the development and strengthening of the Islamic finance sector in UAE. It must be emphasized that for these four objectives, all four Knowledge Economy Indicators individually strengthen Islamic finance sector. However, in pursuing the strengthening of any Islamic finance sector, key considering on the inter-relatedness and relevance among the Knowledge Economy Indicators is fundamental. Regardless of various constraints to the study, the results have been encouraging, as it has managed to throw some lights on a new perspective. This study proposed a model which include innovation driven climate, human resources, ICT infrastructure, and institutional regime as independent variables and Islamic finance sector effectiveness as the dependent variable. The results revealed that all of the four hypotheses are significant. The independent variables significantly explain 58.7% of Islamic finance sector effectiveness. The implications of this study have been deliberated, some directions for future research have been suggested.

APPENDIX

Appendix A

Instrument for varibles

Varible	Measure
Innovation-Driven Climate (IC)	IC1: Foreigners are compelled to invest into UAE IC2: Royalties and license fees payment for companies established are moderate for the businesses IC3: There is enough allocation to Research and Development in the country IC4: Innovations in Manufacturing and trade sectors are poised to drive the economy forward IC5: Starting up a business is very easy
Human Resources (HR)	HR1: Literacy Rate of UAE Nationals above 15 years has made significant progress over the years HR2: Tertiary Enrolment of UAE nationals has made satisfactory progress over the past few years HR3: Availability of professional and technical workers among the UAE National population is highly satisfactory HR4: Staff Training in the Federal Ministries is adequate to prepare the employee HR5: Educated UAE Nationals do not travel abroad
ICT Infrastructure (ICT)	ICT1: Telephone penetration among the UAE population is highly satisfactory ICT2: TV penetration among the UAE population is highly satisfactory ICT3: Newspaper penetration among the UAE population is highly satisfactory ICT4: International Call Cost is very low, especially in North America ICT5: The UAE Smart Government is really working
Institutional Regime (IR)	IR1: It is easy to generate capital and investments for business in UAE IR2: Tax and tax-free sectors installed by the Government are favourable to all IR3: It is easy to protect something intellectual you have produced yourself (intellectual property) IR4: Interest rates from banks to do business are moderately in shape IR5: Businesses are free to compete and this boosts productivity
Islamic Finance Sector Effectiveness (IF)	IF1: Islamic Finance Institutions that exist are enough IF2: Islamic Finance in UAE is adequately controlled IF3: I often read news articles and observe events on Islamic Finance issues IF4: The Government performs Zakat and a number of charity projects that I know

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