Essays on the Role of Knowledge on Economic Growth, Banking Performance and the Institutional Emergence of Islamic Banks

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ESSAYS ON THE ROLE OF KNOWLEDGE ON ECONOMIC GROWTH, BANKING PERFORMANCE AND THE INSTITUTIONAL EMERGENCE OF ISLAMIC BANKS

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ABSTRACT

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Knowledge at every stage of history has played a substantial role to determine economic progress and wealth creation of societies and is central to economic and social development. By developing a critical perspective on the role of knowledge played in economic and institutional performance alongside developing and leading organisations as an institutional base this research responds to, and develops each of these aspects via three essays.

The first essay explores the relationship between a knowledge-based economy and economic performance in the GCC countries through empirical analysis within a political economy frame. After identifying the necessary pre-requisites to forming a theoretical framework for a knowledge-based economy in the GCC states, an empirical analysis is employed applying a quantitative methodology by constructing a knowledge economy performance through the Granger Causality modelling panel data tests of six GCC countries during 2006-2015, by following the World Bank's measurement method. The results show that GCC countries still possess insufficient local human capital and technology production to contribute to their economic performance, as they remain reliant on importing human capital and technology. Therefore, the lack of creative and highly-skilled human capital remains a significant barrier to developing knowledge-based economies and attendant transformation for the post-petroleum era in the region.

The second essay aims to evaluate the impact of intellectual capital of Islamic and conventional banks in terms of human capital, knowledge creation, and innovation processes on the financial performance of banks in the GCC countries by comparison with conventional banks in the realm of 'what ought to be' in an Islamic banking system regarding what constitutes an Islamic understanding of creating knowledge and human capital. Together with theoretical discussion, there are two empirical analyses which examine the relationship between intellectual capital and the financial performance of banks in the GCC states. An initial empirical section is based on assessing a Value Added Intellectual Coefficient (VAIC) model utilising a secondary data constituted panel of five GCC countries comprising 19 Islamic banks and 29 conventional banks covering the 2012-2016 period. A second empirical element conducts a disclosure analysis using a panel of five GCC countries examining 225 annual reports from 21 Islamic banks and 24 conventional banks covering the years - 2012-2016. The main finding of this essay is that being an Islamic bank is not significant for creating intellectual capital in banks, although knowledge creation, human capital, intellectual contribution provides prior issues intrinsic to the methodology of Islamic economics. This result, therefore, relates to the emergence process of Islamic banking institutions.

A third essay studies the role of knowledge on the emergence of Islamic banks as an institution by referring to the ontological source of Islamic economics through critical discourse analysis. The essay argues that the emergence process of Islamic banking institutions fulfils the criteria of institutional innovation or grafted institutions within the logic of conventional banks through a mimicking and mirroring process rather than constituting an organic emergence within the society. An exploration is offered detailing the organic emergence models of institutions through proposing a conceptual model. Further investigation highlights the conceptual framework of Islamic banking institutions via referral to ontological sources of knowledge in Islam. Insight developed here illuminates an authentic emergence of Islamic banking institutions towards becoming hybrid institutions or grafted institutions through mimicking and mirroring processes deployed by existing institutions. Conclusions suggest that Islamic banks can be considered as an institutional innovation rather than offering an alternative trajectory as types of organic emergence. Neither do Islamic banks provide alternative institutions to those currently existing. In fact, they personify the prevailing system typifying grafted institutions created via external pressure from national and international regulatory organisations.

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ADF: Augmented Dickey-Fuller (ADF)
AGEOP: Longevity of Banks being Operational
ANOVA: Analysis of Variance
CB: Conventional Banks
CEE: Capital Employed Efficiency
EDUINDEX: Education and Training Index
EIR: The Economic Incentive and Institutional Regime (EIR)
EU: European Union
GCC: Gulf Cooperation Council
GDP: Gross Domestic Product
HCD: Human Capital Disclosure
HCE: Human Capital Efficiency
IB: Islamic Banks
IBFI: Islamic Banks and Financial Institutions
ICD: Intellectual Capital Disclosure
ICDI: Intellectual Capital Disclosure Index
ICT: Information and Communication Technologies Infrastructure
IMF: International Monetary Fund
INOTECH: Innovation and Technologies Adoption
IT: Information Technologies
KAM: Knowledge Assessment Methodology (KAM)
KE: Knowledge Economy
KEI: Knowledge Economy Index
KI: Knowledge Index
LIBOR: London Interbank Offered Rate
MENA: Middle East and North Africa
OECD: The Organisation for Economic Co-operation and Development
OLS: Ordinary Least Squares
PCA: Principal Component Analysis
PLS: Profit and Loss Sharing
R&D: Research and Development
RCD: Relational Capital Disclosure
ROA: Return on Assets
ROAA: Return on Average Assets
ROE: Return on Equity
SCD: Structural Capital Disclosure
SCE: Structural Capital Efficiency
SWF: Sovereign Wealth Funds
TFP: Total Factor Productivity
TNRR: Total Natural Resources Rents
UAE: United Arab Emirates
UK: United Kingdom
UNDP: United Nations Development Programme
UNDP: United Nations Development Programme.
US: United States
USA: United States of America
VA: Value Added
VAIC: Value Added Intellectual Coefficient
VIF: Variance Inflation Factor
WB KEI: World Bank's Knowledge Economy Index)
WGI: World Governance Index
WTO: World Trade Organisation

DECLARATION

I hereby declare that none of the materials in this thesis have been submitted in support of an application of another degree qualification in this or any other university. This thesis is the result of my own original work, conducted under the supervision of Professor Mehmet Asutay of Durham University Business School, Durham University.

STATEMENT OF COPYRIGHT

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The ideas presented by my academic predecessors, demand to be rediscovered and expanded in order to reinvigorate the values, norms, and roles within society through ontology and epistemology, because there are so few new ideas in this globalising world. Therefore, I would like to thank all the scholars from the past to the present for the entire corpus of knowledge, and hope that in some small way, I too, have contributed to its betterment.

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Erhan Akkas
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Durham

Dedication

To my dearest wife, Betül, and

lovely son, Mahmud Kerim,

I dedicate this thesis.

CHAPTER 1

INTRODUCTION

1.1. BACKGROUND

Knowledge acquisition and dissemination has always been a substantial determinant of economic progress and wealth creation as well as being the main thrust of economic and social development throughout history. Knowledge creation has been a vital source in the shift observed in the economies and wealth of developed countries, particularly within technology-based sectors, which provide competitiveness to advanced economies in financial, technological and commercial spheres. Therefore, in the new forms of economy, knowledge has become merchandised and commercialised as a source for economic progress and wealth along with new emerging channels for its acquisition and dissemination. However, before discussing the impact of knowledge on economic and social development, it is important to explain how knowledge affects the emergence of economic and social institutions, which is one of the main factors in economic progress.

It is important to go beyond superficial understandings by delving into sources of knowledge in an attempt to identify and examine its ontological and epistemological basis regarding the extent to which it is revealed or humanly-acquired. This discussion leads to a methodological debate relating to the case of modern institutions through epistemological and ontological exploration in revealing the authenticity of the source of knowledge. In addition, such exploration is necessary to identify the authenticated sources of institutions to uncover whether they are the product of prevailing knowledge from existing institutions through mirroring and mimicking, revealing either an 'institutional innovation' or 'emergent pattern'. While legitimacy necessitates that institutions should emerge from the ontologically determined social formation of societies, institutional innovation suggests that innovated institutions are bound to existing institutions in terms of their organisational structure, human capital, and product development, with the exception of their operational forms. Therefore, although institutions have their own ontology and epistemology within their historical path, culture, values, and

norms, they may relinquish their basis and mimic other forms. To this end, they cannot go beyond existing institutions although they have, in origin, authentic knowledge to develop a structure within their historical path and culturally or religiously constituted knowledge base.

Citing the case of Islamic banks, as a new form of banking, these institutions follow the historical trajectories of existing institutions to keep abreast of the modern financial system by incorporating alterations to their forms while adhering to existing structures. Therefore, these institutions morally and intellectually do not extend beyond existing institutions in terms of applied knowledge. Islamic banks, therefore, are considered as part of institutional innovation or an emergent pattern rather than being 'emergent' or organic institutions, although they are offered their own ontological and epistemological sources as knowledge, and a historical path fitting into their culture, norms, and values to proclaim their institutions. Furthermore, a bank develops from capitalist modes of production, while Islamic banks emerged via mimicking conventional banking's institutional logic. Conventional banks, as an original form, do not allow Islamic banking to be practised according to a religiously determined basis to develop their structure and intellectual capital due to their embeddedness into the market economy.

From this perspective, issues surrounding the use of knowledge and human capital development need to be the main agenda of Islamic institutions, such as Islamic banks, because the importance of knowledge and human development is accentuated in Islam. As in the current structure characterised by hybrid institutions, the Islamic component to Islamic banking is not significant in terms of its application to knowledge and human capital development, particularly, intellectual capital.

Along with the role of knowledge on emergent institutions, as part of the observed change in the functions of knowledge, each segment of the global economy including people, firms, organisations, banks, and financial institutions have been affected by such transformation. Therefore, knowledge creation has become a prime objective for countries to develop their institutions and to transform economies to knowledge-based systems to manage economic growth and development. For example, Gulf Cooperation Council (GCC) countries, namely Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and United Arab Emirates (UAE), have aimed to diversify their current resources into knowledge-based sources of wealth generation in preparation for the post-petroleum era. Additional to the role of knowledge for the emergence of institutions, the effects of knowledge creation on the economic and financial performance of sectors and the performance of national economies forms the foundation of academic debate

for this research. In other words, the process of knowledge creation affects the institutional structure of organisations which affects the sectorial performance and national economic performance. Therefore, the source of knowledge is at the centre of economic and financial performance at both sectorial and national level, which constitutes the basis for academic exploration in this research.

1.2. KNOWLEDGE AS A SOURCE OF A NEW ECONOMIC PARADIGM AND THE EMERGENCE OF INSTITUTIONS: PROBLEM STATEMENT

The integration of global financial and capital markets in the past few decades has affected the financial systems of developed and developing countries in various ways, which has led to economic development via increased saving and financial accumulation in the economic sphere (Harb and Al-Awad, 2005). However, in recent years, with the development of endogenous growth and new institutional economic theories, among other factors, creation and accumulation of knowledge is considered as a crucial driver of economic performance. Therefore, many countries aiming to attain and benefit from this new economic paradigm, have attempted to facilitate the requisite infrastructure to develop their financial systems, industry, communication sectors and education as a prerequisite for securing a knowledge-based economy (OECD, 1996). A knowledge-based economy paradigm is considered to be as one of the main engines driving economic growth and development, which requires high-levels of human capital, high-quality educational provision, innovation, high-tech industry and strong financial systems (Poorfaraj *et al*., 2011). Such a transformation of the economy requires a science-oriented developmentalism, but in essence, it involves a revolution of the mind and determining future investment for these countries (Ulrichsen, 2012).

Since this study mainly relates to the GCC states, which presently rely on generating the majority of their wealth from petroleum, knowledge economy objectives necessitate strategic development plans for the post-petroleum period to secure a new economic paradigm sustaining wealth generation. Since 2000, the GCC nations considering transformation of their economic and financial systems recognise a need to develop a knowledge-based economy due to its high-returns, and essential development of human capital and economic performance (Ulrichsen, 2012). Such objectives are considered essential for the future of the GCC region, as these countries do not possess alternative economic development strategies for sustaining their economies and societies in the future.

With GCC states remaining heavily reliant on petroleum and petroleum driven financial accumulation, including international investment to sustain their societies, such an economic paradigm may not be able to support such societies in the medium to long-term and therefore, transformation into knowledge-based economies are considered a way forward (Ulrichsen, 2012). Whereas, a knowledge-based economy can be centred on high-tech industry as a product of a post-industrial economy, GCC economies have not experienced industrialisation except for a few examples in the petrochemical industry in Saudi Arabia (Ewers and Malecki, 2009), while strategising to advance into a post-industrial society related knowledge economy.

Despite GCC countries not experiencing an industrial transformation, they depend on the tertiary sector; with large financial accumulations and wealth derived from the oil industry, providing comparative advantages in hydrocarbons, accruing as a result exorbitant privileges in a globalising environment. Therefore, to these economies a knowledge-based paradigm is the natural progression to ensuring growth via enhancing and expanding human capital, technological bases and developing innovation systems (Ewers and Malecki, 2009; Ulrichsen, 2012). GCC countries, possessing a large financial foundation have become important players in the global financial system, essential to financing their potential transformation into a knowledge-based economy. Thus, the process of devising a knowledge-based economy, in this study, is assessed as a potential growth and development strategy for the GCC countries, which is explored through financial, political and social determinants in this study.

After investigating the role of knowledge on economic development in the GCC countries within a political economy framework, the role of knowledge on the intellectual capital performance in the Islamic banking sector is examined through its sectorial aspects, which are an emerging success. Intellectual capital (related to knowledge-based sources) of firms, corporations and banks has become important to enable these organisations to develop a competitive edge within a knowledge economy framework. Banks, for example, are, directly, considered as knowledge-based organisations through their key resources, which are intangible and of an intellectual nature.

The increasing wealth in the GCC countries during the 1970s, led to the emergence of the Islamic banking sector, which also essentialises knowledge-based sources in the sector and the region. Therefore, intellectual capital in the form of the "possession of knowledge and experience, professional knowledge and skills, good relationships and technological capacities" (Nawaz and Haniffa, 2017: 131) gives the organisations competitive advantage in the

knowledge-based economy era. As a result, continuing from a state-based knowledge economy to an institutional knowledge economy, this research aims to evaluate the impact of intellectual capital created by Islamic and conventional banks on the financial performance of GCC countries by revealing the role of knowledge on sectorial dynamics in the case of Islamic banks through knowledge economy paradigms.

After exploring both macro and micro impacts of knowledge accumulation via empirical studies, the role of knowledge to the emergence of Islamic finance is also explored as a theoretical query within institutional innovation as part of 'emergence theory.' Along with successful financial transformation, the rise of Islamic banking and financial institutions can be scrutinised through the concept of the emergence of institutions and innovative institutional theoretical frames to explore the extent to which such development constitutes an organic emergence or institutional innovation as a dominant strategy in the formation of Islamic banks and financial institutions.

While some contenders in the field support the formation of the current institutional nature of Islamic banking and finance, others centre their critique on processes involving the Islamisation of Western knowledge through *fiqh*. It should be noted that the source of knowledge in Islam is based on revealed knowledge that is Islamic epistemology. From this perspective, Islamic economics has its own knowledge base expressed through the ontology of Islam and axioms derived from *Qur'an* and *Sunnah*. These in the form of Islamic moral and *Shari'ah* principles provide authenticity rather than artefact knowledge. Furthermore, some contenders such as Ashraf (1985) argue that articulation of knowledge and concepts should begin with Islamic ontology and epistemology rather than mimicking Western theories. This process can be explored through Portes' (2010) institutional emergence theory based on cultural norms and values. Therefore, Islamic disciplines including Islamic economics and finance are expected to emerge through Islamic ontology and epistemology along with Muslim cultures, norms, and values. The last paper explores the emergence of institutions in the sphere of Islamic knowledge as an attempt to understand current tensions in Islamic banking and finance in the form of '*Shari'ah* compliant finance *vs* Islam based finance.'

In sum, knowledge development in Muslim societies such as in the GCC is underdeveloped, which is evidenced in the empirical work conducted in Chapter 2 at macro level and in Chapter 3 at institutional or banking level. As the empirical studies in these chapters utilised the available knowledge set which is mainly a product of Enlightenment ontology.

Underperformance of the GCC countries and banks including Islamic banks in terms of knowledge and intellectual capital, respectively, evidenced in the studies, which can perhaps be explained by the differences in the institutional logic of Enlightenment and Islamic knowledge. In other words, ontologically different societies (the GCC) and institutions (Islamic banks) are forced to develop knowledge within institutional logic of Enlightenment philosophy yet their belief system requires a different institutional logic as expressed by Islamic ontology. Therefore, Chapter 4 essentialises the importance of knowledge in Islam and Muslim societies through organic emergence of institutions such as Islamic banks whereby it identifies as to what should be the knowledge stricture and relevant institutional logic of knowledge development so that consistenct between thinking (Islam) and action (conventional) can be overcome. Therefore, this research explores the impact of knowledge on three different areas through empirical and conceptual frames, as the rise of knowledge and its effect on economy has led to investigating knowledge in detail from different aspects, including political economy and sectorial analysis to theoretical solutions.

1.3. RESEARCH AIMS AND OBJECTIVES, RESEARCH QUESTIONS AND RESEARCH METHODOLOGY

Based on the articulation provided above, in general, the aim in this study is to evaluate and assess the development of a knowledge economy and its impact on the GCC economies (macro level) and on the GCC Islamic and conventional banks level in the GCC countries, alongside exploring the emergence of Islamic banks through a conceptual discussion. In doing so, political economy, the intellectual capital of Islamic banks, and the emergence of institutions through a knowledge-based economy in the case of Islamic banks is explored.

In fulfilling these aims, the following objectives are developed:

(i) to explore a theoretical framework for a knowledge-based economy and development strategy in the GCC countries;

(ii) to examine the efforts being made in the GCC countries towards a knowledge-based economy driven model by assessing its development in relation to various benchmarks;

(iii) to empirically investigate the role of knowledge on the intellectual capital performance of Islamic banks to facilitate the sustainability of a knowledge-based economy in the Islamic banking sector;

(iv) to explore the role of knowledge on the emergence of Islamic finance as an institutional innovation by making references to the ontological source of knowledge in Islamic economics.

In relation to the established aims and objectives, the following main research question is developed:

(Q1) What is the relationship between a knowledge-based economy and economic performance in the GCC countries?

(Q2) Have the GCC countries been able to transform into a knowledge-based economy with the financial accumulation they have made?

(Q3) To what extent does current intellectual capital as a knowledge source utilised by Islamic banks lead to a knowledge-based economy in the GCC countries to enhance financial development?

(Q4) What is the source of knowledge operationalised by Islamic banks and financial institutions as an institutional innovation?

With regard to research methodology, this research utilises empirical methods alongside conceptual models. As part of quantitative empirical research, the aim of this research is to examine and assess the knowledge-based economy with the help of financial, political and social determinants. The quantitative data for the research is assembled from the World Bank's Knowledge Economy Index, Financial Development and Structure Database of the World Bank, and World Value Survey, Orbis Bank Scope (Bankscope), and the annual reports of banks. After establishing the results and presenting the findings, in order to develop a clearer understanding of the findings, an interpretative method is used to give further meaning to the results. The qualitative research in this study aims to respond to the third research aim through developing a conceptual model in evaluating and exploring the institutional emergence of Islamic banks and the role of knowledge.

Since this research is constituted through three essays, the following section identifies the research aims, objectives, research questions and research methodology for each of the essays.

Essay 1: *Searching for the Knowledge Economy and Economic Performance Nexus in the GCC Countries: An Empirical Analysis*

The aim of this paper is to assess the current state of a knowledge economy and its impact on the economic performance in the GCC region by exploring conceptual definitions of a knowledge-based economy.

The following objectives are developed:

(i) to explore the meaning and determinants of a knowledge-based economy;

(ii) to construct a model for a knowledge-based economy by reference to the political economy of the GCC countries;

(iii) to empirically assess the GCC's position and performance on the World Bank's Knowledge Economy Index WB KEI;

(iv) to examine the nexus between a knowledge-based economy performance and economic performance in the GCC countries.

In line with the aims and objectives of this first essay, the following research questions are developed:

(Q1) What is the development trajectory of a knowledge-based economy in view of the economics and financial realities of the GCC and, therefore, how appropriate is it for the GCC economies?

(Q2) What is the relationship between the knowledge economy and the economic performance in the GCC region?

With regard to research methodology and methods applied within this essay focus rests on examining and assessing the relationship between a knowledge-based economy and economic performance. Quantitative methodology examines causality, where present, between the knowledge-based economy and economic performance in the GCC countries for the period of 2006-2015. Moreover, because of the specific position of the GCC countries being rentier economies, this study aims to examine the relationship both of GDP (*per capita*) and total natural resources rents (TNRR) and knowledge-based economy indicators in the GCC countries in order to make a distinction between GDP and natural resources-based revenues. Although

there are number of studies exploring this relationship through a causality analysis as presented in Appendix A, these studies are limited to relate to the GCC countries because of data availability related issues. However, this study aims to take the discussion a step further by exploring the causality relationship in the GCC countries by collating broad data for sampled countries. Therefore, this essay employs the Granger Causality modelling with panel data to examine the causality relationship between a knowledge-based economy pillar and economic performance in the GCC states.

As detailed previously in Chapter 2, interpolation and extrapolation methods were applied to generate the missing data determining a knowledge-based economy. As a second step, to ensure empirical robustness, Principal Component Analysis (PCA) is used to produce a single index for the knowledge-based economy rather than taking an average summation of data for each GCC state. After the data clearing steps, certain econometric methods were conducted, including a unit root test in the form of Levin *et al*., (2002), Im *et al*., (2003) and Breitung (2000) analysis, panel co-integration tests were applied to decipher pre-testing conditions. Lastly, according to pre-testing results, the Granger causality was utilised in order to determine the casual direction confirming any existing relationships among variables.

Econometric challenges within this empirical chapter include the following factors: Firstly, knowledge economy indexes were released by the World Banks only for 1995, 2000, and 2012. Thus, this dataset is constructed by considering the pillars of a knowledge economy following the same method and procedures of the World Bank for the rest of the years by applying statistical methods to complete the Knowledge Assessment Methodology (KAM) of the World Bank, thereby bringing it up to date. Secondly, collecting data for the GCC countries is quite difficult and takes more time because of being rentier states of these countries.

Essay 2*: Intellectual Capital Formation and Financial Performance of the GCC Islamic and Conventional Banks as a Reflection of Knowledge Economy: An Empirical Analysis*

This essay aims to evaluate the impact of intellectual capital of Islamic banks in the form of organisational human capital, values and attitudes of the actors in the knowledge creation and innovation process applied by GCC countries to determine their financial performance.

The following objectives are correspondingly developed:

(i) to explore the theoretical formation of intellectual capital by essentialising Islamic intellectual capital formation through Islamic ontology and epistemology.

(ii) to identify the intellectual capital performance level of Islamic and conventional banks in the GCC countries;

(iii) to empirically investigate the role of knowledge on the intellectual capital performance of Islamic banks to facilitate the sustainability of a knowledge economy in the Islamic banking sector.

In relation to the defined aims and objectives of this particular paper, the following research questions are developed:

(Q1) What is the impact of Islamic ontology and epistemology in developing intellectual capital for the sustainability of Islamic banking institutions?

(Q2) What is the extent and volume of intellectual capital developed by Islamic banks and conventional banks in the GCC countries?

(Q3) To what extent does the intellectual capital as a knowledge source determine the financial performance of Islamic and conventional banks in the GCC states?

(Q4) What is the impact of intellectual capital disclosure performance on financial performance of Islamic and conventional banks in the GCC region?

Research methodology applied to this essay within Chapter 3 is based on a qualitative and quantitative study exploring the intellectual capital performance of banks in the GCC countries when compared to conventional and Islamic banks for the period of 2006-2016, assessing secondary data collected from the annual reports of banks, the Orbis Bank Scope, the World Bank, and the Knowledge Economy Index, manually estimated in Chapter 2.

This essay is based on two separate empirical models to evaluate the relationship between financial and disclosure performance. An initial empirical model applied within this study comprises 19 Islamic banks and 29 conventional banks from GCC states. As variables, this part consists of returns on average assets (ROAA) as dependent variables; structural capital (balance between equities and long-term liabilities); human capital (staff expenses); capital employed (balance between current assets and current liabilities) as independent variables, and some other

control variables. Furthermore, in this empirical paper, panel data based on Pulic's value added intellectual coefficient method (VAIC) is used to measure the intellectual capital performance by conducting ordinary least squares regression analysis (OLS) after testing the data for heteroscedasticity and multicollinearity.

As for the second empirical model in this essay (detailed in Chapter 3), the sample is composed of 21 Islamic banks and 24 conventional banks in the GCC countries with the objective of examining the intellectual capital disclosure performance of Islamic and conventional banks through annual reports spanning from 2012 to 2016. Therefore, VAIC is measured through intellectual capital disclosure in this empirical model rather than annual financial data of the sampled banks as conducted in the first empirical model of this chapter. This essay determines whether inconsistencies exist between annual financial data and intellectual capital disclosures of the banks in terms of VAIC. In constituting the disclosure index, the empirical analysis uses 43 disclosure items for conventional banks, and 53 items for Islamic banks to distinguish the nature and implications of Islamic banks. As above, OLS and essential verification tests, such as, heteroscedasticity and multicollinearity tests are also utilised in conducting the empirical analysis.

Essay 3: *Constructing the Emergence of Islamic Finance as an Institutional Innovation: An Exploration in Knowledge-Led Institutionalisation*

This essay aims to examine the development of institutionalisation within Islamic banking by applying the emergence theoretical framework to identify the nature of its materialisation, to determine whether it takes an organic or authentic appearance, or an emergent pattern in the form of an institutional innovation.

The following objectives are developed:

(i) to evaluate the organic development of institutions through a gradual manner of emergence based on ontological and epistemological sources of a society;

(ii) to explore the formation of Islamic banks by referring to the ontological source of knowledge embodied by the axioms of Islamic moral economy;

(iii) to assess the current nature of Islamic banks embedded into the market system, which has been produced by the Islamisation of knowledge and *fiqh* process to determine whether they represent emergence science or emergent patterns.

In line with the aims and objectives of this paper, the following research questions are developed:

(Q1) How do institutions emerge in an embedded manner through the social formation (value system, norm, and roles) of a particular society?

(Q2) How do institutions define whether they are organically emerged or innovated?

(Q3) Can knowledge be considered as a base for organic emergence?

(Q4) What is the source of knowledge of Islamic banks and financial institutions?

(Q5) How much do Islamic banks and financial institutions represent and yield the results of an Islamic social formation?

Concerning research methodology, the third essay in Chapter 4 uses an interpretivist approach as research philosophy to examine the emergence of Islamic finance assessing the authenticity of a knowledge-based economy on Islamic ontology and epistemology. Thus, conceptual framework is developed and subjected to normative research philosophies through deductive analysis of the constructed models. Using an interpretivist approach helps to understand the differences between the emerged institutions and social actors in society. This helps to evaluate the understanding of the emergence of Islamic banks by comparing its connection to existing institutions, namely, conventional banks, as a part of the qualitative research methodology based on the source of knowledge of these institutions.

In this chapter, therefore, as a foundation of Islamic economics' methodology, *tawhidi* methodology and complementarity axioms comprise the nature of Islamic knowledge as a core of Islamic ontology and its epistemological articulation. Hence, Islamic epistemology is pursued to constitute and give meaning to an Islamic order and its constituents of systems, such as, Islamic economics. Consequently, the deductive method is introduced as an architectural frame for the reconstruction of the emergence process of the institutions as an organic or authentic institution based on the reliable scientific or divine knowledge deriving from their ontology and epistemology. Thus, this method provides the heuristic aspects of the study in order to reveal an axiomatic construction of the model through articulating the Islamic paradigm of knowledge and developing a *Qur'anic* methodology based on a *tawhidi* understanding along with historical Islam addressing the *Sunnah* as sources of knowledge and its application to systems.

1.4. RESEARCH RATIONALE AND SIGNIFICANCE

The significance of a knowledge economy through its relationship with financial, political and social developments, provides new opportunities for countries or regions to use their wealth in an effective manner, to strategize for their future economies while advancing towards a post-industrial society. As mentioned earlier the GCC countries are reliant on their petroleum and financial accumulations, having not experienced industrialisation, while noting it is essential for them to move into knowledge-based economies, as the only available option for self-sustainment. Therefore, it is presumably expected that due to the financial accumulation they have amassed, the GCC states can transform their economies into knowledge-based systems. In line with this, a knowledge-based economy-economic performance nexus within a financial development model is considered as an important research area for the GCC countries.

Financial development is expected to contribute to the transformation to a knowledge-based economy in order to drive growth and sustainable wealth for the post-petroleum period in the face of diminishing petroleum generated wealth in the GCC region. However, in this process, the discussion about a knowledge-based economy can emerge in specific sectors, such as, the banking and financial sectors of the GCC states. Considering that the GCC countries have played a prominent role in the emergence and the sustainability of Islamic banking, it is important to examine how Islamic banking-based capital has facilitated the knowledge-based economy related to intellectual capital in these institutions, applying technology, research and development, the use of information and communication technologies, and education and training. All these dimensions of a knowledge-based economy can be related to the ontological and epistemological sources of knowledge, namely Islamic ontology that is one of the most important dimensions in the formation of a knowledge-based economy in both economic and financial systems. Therefore, this research has evaluated the level of intellectual capital as a reflection of a national knowledge-based economy, whereby, the debate on a macro-level knowledge economy is examined through micro or organisational levels through to intellectual levels.

This research, therefore, develops from the ontological and epistemological sources of a knowledge-based economy by conceptually defining it and its impact on the economic performance of the GCC countries; the intellectual capital formation and its impact on financial performance of Islamic and conventional banks; and the impact of knowledge on the emergence of Islamic banks as an institutional innovation. However, this study recognises that regardless

of macro and micro level under-performance of a knowledge economy, the intellectual capital contribution of Islamic banks is a result of hybridity as the political economies of the GCC countries and the operational nature of Islamic banks has diverged from the ontological sources of Islam, which should be the core source of knowledge development for Muslim societies. Therefore, this study attempted to constitute the formation of Islamic banks in a normative sense through the ontology determined social formation within an emergence debate by demonstrating that Islamic banks do not fully represent the Islamic social formation and they are hybrid institutions. The analysis concluded that Islamic banks are only emergent patterns in the sense they only use Islamic metaphors within the capitalist institutional logic. This implies that Islamic banks do not fully square with Islamic ontological foundations, but are the results of divergence from knowledge sources, primarily the *fiqhi* process of *Shari'ah* compliancy. The result is divergence from authenticity.

As previously outlined, this research aims to examine the impact of knowledge on a developing macro economy, banking sector and the institutional emergence of Islamic banks. The reason underpinning why this research is considered necessary is explained by a personal curiosity investigating the sources behind observed welfare in GCC states. Considering this question has enabled observations that the GCC countries are not only driven by petroleum revenues but political and institutional paradigms which all need to be improved through new economic policies, such as a knowledge-based economy. However, the academic research on the Gulf region through a structured political economy perspective is sparse, which has triggered enquiry into the political economy of the Gulf countries. The starting point has been the examination of the economic progress of the region detailed within a master's dissertation which examined the sovereign wealth fund investments of the GCC countries. This constituted a first step in developing academic insight on the GCC's political economy. Furthermore, as a second step, that study was extended to include the newly-discovered value of a knowledge economy into the economic diversification policies of the GCC states. As the observation has indicated that to transform their economies, the GCC countries focussed on instituting a knowledge-based economy in different sectors, namely, education, manufacturing, and financial sectors, with the need to develop knowledge taking centre stage within their economic growth and development policies.

When examining the academic material, it was realised that an assessment of knowledge both in macro (economy) and micro (institutional) levels is required in a GCC context. At an institutional level, the Islamic financial sector attracted attention because it is here that a leading

role was played in the emergence of Islamic finance during the 1970s as a new mode of banking. Thus, the intention is to examine the intellectual capital performance of Islamic banks in the region which can further the research objectives outlined above at an institutional level while presenting a well supportive conceptual framework detailing the results of empirical analysis. In order to ensure a rigorous academic process and analysis on the region in detail, travel was undertaken to the GCC countries, including a prolonged three-year period of residence in Qatar.

Within such an academic inquiry-based research and personal investigation, the conceptual and empirical underpinnings of this study can be considered as a potential contribution to the field by fulfilling a particular gap in comprehending politico-economic basis to knowledge development within GCC states.

1.5. AN OVERVIEW OF THE RESEARCH

Following the introductory chapter, *Chapter 2: 'Searching for the Knowledge Economy and Economic Performance Nexus in the GCC Countries: An Empirical Analysis'* aims to define a knowledge-based economy and its components by referring to the World Development Indicators and a knowledge economy benchmarking tool, namely, Knowledge Assessment Methodology (KAM), which was developed by the World Bank. This elicits the current state of knowledge-based economies and attendant historical backgrounds in order to explore the knowledge-based economy as it is materialising within GCC states. In addition, certain measures and benchmarks were identified defining a knowledge-based economy in the GCC countries. Therefore, this essay is developed through an empirical modelling and rethinking of the knowledge-based economy in the GCC region. In establishing the narrative, the second section in Chapter 2 discusses the political economy of the GCC arena in order to articulate the dynamics of the zone. The chapter also presents a historical background on the knowledge economy and identifies it through the World Bank's KAM. Following on from this procedure, processes and results of econometric modelling based on the Granger Causality are presented. Analysis focuses on the causality between a knowledge-based economy and economic performance in the GCC region, as determined through knowledge economy indicators. The section concludes that, in general, knowledge economy indicators hitherto did not affect the economic performance of the GCC countries, despite developing many economic policies on knowledge transfers to manage efficient diversification in these states for the post-petroleum era. However, the impact of these indicators, in particular, policies on education, on economic performance can only be observed as part of a longitudinal project and, therefore, this study

within the restrictions of the research time-frame did not locate a positive and significant impact.

Chapter 3: 'Intellectual Capital Formation and Financial Performance of the GCC Islamic and Conventional Banks as a Reflection of Knowledge Economy: An Empirical Analysis' aims to evaluate the impact of intellectual capital developed by Islamic and conventional banks in the form of organisational human capital, incorporating values and attitudes of the actors through human capital, structural capital, and capital employed in the knowledge creation and innovation process in the GCC banking industry to enhance financial development. The empirical analysis in this chapter benefits from applying the VAIC model and disclosure analysis. The chapter presents a conceptual inquiry by giving intellectual capital formation and performance in firms and institutions such as articulating conceptual definition, essentialising Islamic intellectual capital formation through detailing Islamic ontological and epistemological backgrounds, and reviews the literature to constitute a conceptual framework to the study. Furthermore, in this chapter, an Islamic understanding related to the creation of knowledge and human capital is articulated by referring to the modern banking system and its reflection on intellectual capital. This approach assists with the presentation of paradigms related to intellectual capital concerning the realm of 'what ought to be' in an Islamic banking system, whereby, an Islamic understanding of knowledge and human capital is presented to evaluate the modern understanding and Islamic approach.

Following on from this background and conceptual discussion, a broad literature review of empirical studies is presented before conducting empirical analysis. Intellectual capital performance of Islamic and conventional banks and their impact on banks' performance assessed through two different empirical models based on VAIC model and disclosure analysis in the form of descriptive inferences and econometric results are presented. The empirical analysis in this chapter concludes that being an Islamic bank is not significant for the financial performance of banks when its intellectual capital performance in correlation to their financial performance is compared to conventional banks. In fact, being an Islamic bank has a negative impact on financial performance in terms of accruing intellectual capital, although this study found that Islamic banks, descriptively, have a higher intellectual capital score than conventional banks.

Chapter 4: 'Constructing the Emergence of Islamic Finance as an Institutional Innovation: An Exploration in Knowledge-Led Institutionalisation' attempts to assess the emergence of Islamic

banking to determine whether it is an organic emergence or an emergent pattern in order to demonstrate whether Islamic finance is an institutional innovation by itself. In this study, the emergence model is explained by discussing authentic emergence and institutional innovation concepts within the frame of the axiomatic formulation of Islamic economy to explain its methodology. In this sense, there are two scenarios to examine the constructed model: first scenario is based on Portes' emergence of institutions model within the social formation of a society; while the second scenario relates to the concept of institutional innovation within the normative, socially constructed, and culturally embedded process. These two scenarios are detailed through the concept of emergence within their respective philosophical aspects and emergent patterns. Following this, these two scenarios and emergence theory is merged to construct a frame through the concept of isomorphic institutions by enunciating the notion of mimicking, mirroring, and hybridity.

After presenting the theoretical discussion and literature review, divine knowledge of Islamic economics derived from Islamic ontology and epistemology, which is critically discussed through the paradigm of Islamisation of knowledge and the axioms of Islamic moral economy to bring out the source of knowledge of the current Islamic financial institutions and its authenticity. In the last section, the authentic process of emergence of Islamic financial institutions is elucidated thorough the conceptual model developed. This helps to discover whether Islamic banks are emergent patterns in the form of institutional innovation or not. Therefore, this essay concludes that Islamic banks are not constituted by Islamic ontology and epistemology in their emergence process as they mimicked existing institutions through a *fiqh* process. Therefore, Islamic banks are not authentic nor do they represent an organic emergence, evolving as a product of institutional innovation while becoming a part of a contemporary knowledge-based economy.

CHAPTER 2

SEARCHING FOR THE KNOWLEDGE ECONOMY AND ECONOMIC PERFORMANCE NEXUS IN THE GCC COUNTRIES: AN EMPIRICAL ANALYSIS

2.1. INTRODUCTION

Knowledge, either implicitly or explicitly, has always been an important determinant of economic progress and wealth creation throughout history. It is argued that the knowledge economy has led to a positive shift in the economic performance and wealth generation in developed countries, as a knowledge economy is characterised by technology-based industries using information and communication -considered a sign of development. Initially, the search for industrial development for a knowledge economy paved the way for competitiveness among advanced economies in financial, technological, commercial, administrative and cultural skills (Houghton and Sheehan, 2000), which is facilitated by information flows, technology transfers and financial transactions on a global scale in recent years. The importance of knowledge is essentialised in modern economies and societies, where it has increasingly taken an important role in post-industrial societies since the 1990s, specifically, in financial services (Godin, 2008).

Development trajectories of industrialised economies show that economic growth has increasingly been knowledge-based and its importance to the economic process essentially changed over the last decades, whereby, a knowledge-based economy has provided opportunities for economic and social development (Arvanitidis and Petrakos, 2011). Over recent decades, in order to develop and emphasise the importance of both physical and human capital, the use of high technology and knowledge-innovation has increasingly played an important role in each economic region, as there is an increasing practice pointing to the significance of the regional scale in the advances of the knowledge-based economy. Therefore, knowledge workers or human resources based on knowledge have also become prominent in specialist areas such as finance, innovation, education, technology and research. As part of their attempt to develop knowledge to the levels whereby it creates additional value to the economy,

advanced economies have focused on enhancing highly skilled labour to manage the wealth generation process in their countries.

The Gulf Cooperation Council (GCC) member countries have recently identified plans and projects directed towards transforming their economic systems into knowledge economies in a concerted effort to diversify wealth generation and economic development initiatives. As articulated previously, GCC countries are rentier economies, whose economic resources and wealth derives mainly from oil extraction. Their role as serious contenders in the global financial system is a consequence of extraordinarily high hydrocarbon prices over the last few decades (until recent times). Consequently, these countries have started to use the capital accumulated from the oil revenues as a mechanism to reconfigure their position in the global financial system. In addition to the financial sector, the GCC region's economies are strongly derived from the service sectors, including the public sector, real estate, tourism and insurance. Therefore, the development strategies of the GCC countries can adopt tertiary and knowledge economy developmental strategies. In line with such developmental strategies, the creation of human capital, using modern technology and an affiliation with the world financial system have increasingly become important for the economic and financial development strategies of the GCC states. Through such policies, the GCC countries can develop their financial services, human resources in tertiary sectors, education systems and apply high-technology to develop new knowledge (Ewers and Malecki, 2010).

This thesis aims to explore the relationship between a knowledge-based economy performance and the standard economic performance of the GCC countries. The rest of the paper is organised as follows: the initial sections present the aims, objectives and research questions, and research rational and significance. Section 2.4. presents the conceptual definitions and determinants of a knowledge economy by highlighting the historical background of a knowledge economy. Following on from this, endogenous growth theory is articulated as a theoretical framework, highlighting Schumpeterian and neo-Schumpeterian approaches in Section 2.5. The political economy of the GCC countries is discussed in Section 2.6 with the objective of evaluating the economic, social, and political parameters of the region. Section 2.7. presents empirical modelling and analysis through the KAM model or Knowledge Assessment Methodology, where descriptive statistics are depicted in Section 2.7.1 and the findings from the causality analysis as an econometric model are presented in Section 2.7.2. Finally, Section 2.8. concludes with an overall evaluation taking into consideration all the results.

2.2. AIMS, OBJECTIVES AND RESEARCH QUESTIONS

The aim of this paper is to explore and examine the current state of the knowledge economy and its impact on economic growth in the GCC region for 1995, 2000, and 2012 as assessed through descriptive methods and during the 2006-2015 period through applying an econometrics model. In doing so, this paper aims at exploring the conceptual definition of a knowledge based economy in order to identify the necessary pre-requisites in forming a new theoretical framework for a knowledge economy model.

In line with the formulated aim, the following objectives are developed:

(i) to explore the meaning and determinants of a knowledge based economy;

(ii) to construct a model for a knowledge economy by also referring to the political economy of the GCC countries;

(iii) to assess the GCC's position and performance according to the World Bank's Knowledge Economy Index (KEI);

(iv) to empirically explore the relationship between the performance of a knowledge economy and economic growth in the GCC countries.

In line with these aims and objectives, the following research questions are developed:

(Q1) What is the development trajectory and state of a knowledge-based economy in view of the economics and financial realities of the GCC, and, therefore how appropriate is the knowledge economy for the GCC economies?

(Q2) What is the relationship between the knowledge economy and economic growth in the GCC countries?

2.3. RESEARCH RATIONALE AND MOTIVATION

Knowledge economies provide new opportunities for countries to use their current wealth for economic development. Therefore, countries need to create a highly-skilled labour force and effectively manage technological progress through knowledge accumulation in the post-industrial period. However, the GCC countries have serious challenges to overcome, in order to transform their current economic systems, dependant on petroleum and financial

accumulation, to knowledge-based economies, since they have not experienced industrialisation. Moreover, the development of knowledge economies require following an industrialisation path as demonstrated by previously developed countries. Industrialisation is also imperative for the GCC countries, which is the essential option to move into a knowledge economy for the post-petroleum period. However, it is, presumably, expected that these countries can manage this transformation by relying on financial accumulation, regardless of the fact that they have not experienced industrialisation. It should be noted that this transformation cannot be actualised as easily as previously anticipated because of their historical economic trajectories which demonstrate obstacles through a lack of human capital, and a problematic labour market, and economic structure.

This research, therefore, develops from considering financial accumulations directed to the generation of knowledge-based economies by conceptually defining what a knowledge-based economy can entail; assessing the current state of the knowledge economy within GCC states by applying the knowledge assessment methodology devised by the World Bank; and exploring the relationship between economic performance and a knowledge-based economy. Within this frame, the conceptual and empirical attempts in this study should be considered as a contribution to the field by filling a particular gap in the development of the GCC countries.

2.4. KNOWLEDGE ECONOMY: DEFINITION, DESCRIPTION AND DETERMINANTS

2.4.1. Historical Background of a Knowledge Economy

The economic systems and wealth creation has passed through various stages in human history: from land based agricultural economies to the natural resources and labour based industrial economy as part of industrial society, and to a knowledge based economy in post-industrial society. Therefore, the main factors of production have shown differences in each period. These factors and processes leading to wealth creation hold fundamental importance for the development and growth of countries (Houghton and Sheehan, 2000).

A quick review of economic history demonstrates that the nature of economy, in particular, had changed from the 16th century onwards with the advent of the industrial revolution. In fact, the economy as a structure started to become evident after the 16th century, although it prevailed in every part of human history. However, as most authors accepted the nature of the emergent economy became a main engine of transformation for states in the 18th century with the

emerging industrial revolution through which manufacturing of tangible goods had become the main source of wealth generation and competitiveness.

With the advent of technology and recognising the importance of knowledge creation since the 1950s, the knowledge economy has played an increasingly important role in wealth creation in post-modern times, while previously knowledge was considered only related to economic growth and wealth in the agricultural and industrial sectors (Brinkley, 2006: 3-4).

The advanced economies, with the emergence of the post-industrial society, are currently sustaining their economies through knowledge and information production and therefore they have geared their economic systems and policies to ensure the production of knowledge with the objective of gaining a competitive edge (Vesela and Klimova, 2014: 414). Therefore, knowledge is being produced today in the same manner as manufacturing products such as cars and steel were produced in the last century (Winden and Berg, 2004: 9). Thus, post-industrial knowledge societies are marked by a shift from the use of raw materials and cheap labour to the use of knowledge and information technologies and educated-human capital (Heng *et al*., 2012: 530-531).

The observed shifts can be identified through four main developments in the last decades (Dunning, 2000: 8):

(i) the increasing importance of knowledge capital and its impact on the development of states, firms and individuals;

(ii) increasing cooperative alliances and ventures in institutions creating wealth and innovation;

(iii) the globalization of internal and cross-border markets through technological changes and innovation;

(iv) the emergence of various new important economic players in the global economy.

Consequently, the use of knowledge has accelerated thereafter and it has played an important role in economic performance towards the end of the 20th century through the germination of a knowledge economy (Godin, 2008: 4; Heng *et al*., 2012: 530-531).

Based on such a trajectory of economy outlined above and increasing recognition of the role of knowledge in the economy, the concept of a knowledge economy was introduced in 1962 by Machlup (1980), who outlined the production and distribution of knowledge as well as its creation and its economic significance in the USA. According to Machlup (1980), knowledge economy is mainly concerned with distribution and education, which constitutes the largest part of industry (Godin, 2008: 13). Machlup (1980: 26) predicted that the knowledge economy would become a main source of economic performance in the coming decades, and therefore, he defined production of knowledge as a human activity through the effective use of the human mind via apperception, awareness, and knowingness (Kerr and Riain, 2009: 31-32).

As an important indicator of knowledge production and knowledge economy, many supporters of knowledge-based economies have also remarked as to how intensively information and communication technologies are in determining economic and business processes, in addition to the observed nature of the degree of knowledge-intensity in the changing economies (Bozkirlioglu, 2006). This refers to intellectual capital as the main driving force of a knowledge economy in the form of high technology, information systems, innovation, computerisation and automation. These factors have an equal and a crucial significance due to interaction in the nature of the relationship between each other.

Following Machlup, many economists attempted to develop the notion of knowledge economy around the 1980s to integrate knowledge variables into the analysis of economic performance. These attempts needed to develop the understanding of the main concept of a knowledge economy and its possibilities for the economic system (Heng *et al*., 2012: 530-531). These main contenders in the debate such as economists and policy makers mostly claim that technological change and investment in knowledge and technology positively affect economic performance. They also justify their position through endogenous growth theory, which considers technological change as an essential factor for economic growth. Furthermore, economists supporting the knowledge economy have focused on investment in human capital and research and development in order to accelerate economic growth (Kerr and Riain, 2009: 31-32). Since then, the OECD and the World Bank has taken up the concept to transform into policy as the next stage for the developmentalist states.

In recent years, academic and policy interest have increased resulting in publications in various forms (among others see: Low *et al.*, 2015; Adam and Westlund, 2013; Asongu, 2013; Poorfaraj *et al.*, 2011; Rutten and Gelissen, 2010; Dolfsma, 2008; Westlund, 2006; Kahin and Foray,

2006; and Feldman and Link, 2001). This study should, therefore, be considered as an important conceptual and empirical contribution to knowledge economy related studies within a particular region.

2.4.2. Knowledge and Information: Conceptual Definition

The term 'knowledge economy' is defined differently in different phases of economic trajectories such as 'the knowledge-based economy', 'the knowledge-driven economy', 'knowledge society', 'the digital society', 'the new economy' and 'the information economy' in knowledge economy literature (Hvidt, 2014: 28). However, it will be useful to explicitly identify the definition of knowledge and information in order to understand the conceptual definition of knowledge in economy, and, hence, knowledge economy.

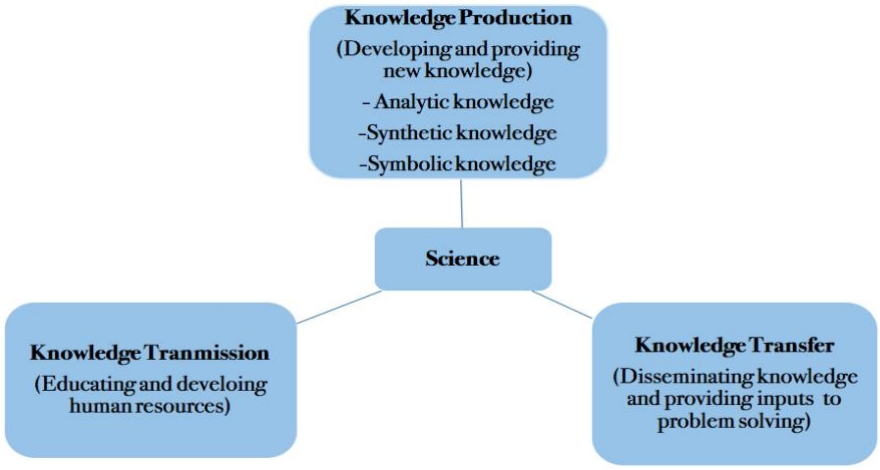
Information and knowledge as concepts are close to each other in terms of content but information cannot be commensurate to the term 'knowledge economy', as it can limit the definition of knowledge economy. While information refers to data, knowledge can be counted as an asset, and a process of production (Karlsson and Johansson, 2004: 4). However, it is easier to access information, codifying and transferring to somewhere via an electronic environment. On the other hand, it is difficult to get knowledge having its own characteristics, such as, the difficulties of codification and interpretation of knowledge. Although information is an important factor in economies, knowledge is defined as the scarcest source (Karlsson and Johansson, 2004: 4). Moreover, where knowledge is concerned, the main economic problem is its reproduction, while the reproduction of information poses no real problem (Foray, 2000: 5). Therefore, companies, firms, individuals and states having knowledge can contribute to the development and growth of their societies. Consequently, the term of knowledge is more desirable to use in the literature, such as the ordinary use of the word, where all information in its rudimentary form is knowledge (Machlup, 1980: 8). Therefore, a new economy is called a knowledge economy, which includes but is not limited to information, data, communication technologies, and innovation.

2.4.2.1. The role of science system in the knowledge economy

The science system in a structure takes an increasingly important role in a knowledge economy. Research laboratories, universities, a government's science ministry, research councils and private research institutions are at the core of the science system. In the knowledge economy,

the science system contributes to the key functions of knowledge as depicted in Figure 2.1, which are discussed below.

Figure 2.1: The Contribution of the Science System to Knowledge Economy



Source: OECD (1996: 22-24)

(i) Knowledge production

In the process of the contribution of the science system to a knowledge economy, there are three types of knowledge production: analytic, synthetic and symbolic (OECD, 1996: 21-25). Analytic knowledge necessitates that scientific knowledge is extremely important to produce knowledge in industrial regulations based on cognitive, rational process or research and development activities. The most important feature of analytic knowledge is that the connection and network between universities and industry is more important and flowing than the other knowledge types (Isik and Kilinc, 2013: 25). Synthetic knowledge comprises of industrial regulations taking an important role through innovation by applying existing knowledge or new combinations of knowledge. Despite a lack of importance of R&D in this type of knowledge, tacit knowledge defined as skills, ideas and experiences that people hold in their minds is more important in synthetic knowledge. Symbolic knowledge also relates to the aesthetic features of productions, such as, media sectors, fashion *etc*. Such knowledge types emerge from cultural and social formations of each society (Isik and Kilinc, 2013: 25).

These three types of knowledge production are essential for knowledge development. They affect working mechanisms of knowledge through production, collaboration, and diffusion of knowledge. Participation by universities and industries in the process of knowledge production

leads to an emergence of analytical knowledge considering research and development that can lead to the emergence of organic knowledge that directly contributes to knowledge development. Following on, human factors step in the development process of knowledge through the insertion of skills and capabilities by harmonising the existing knowledge and new knowledge. Such knowledge, indirectly, affects knowledge development, because it is an innovation of the existing knowledge such as product development rather than a new product. Furthermore, symbolic knowledge, indirectly, also impacts on knowledge development, because it affects cultural and social perceptions of the society. Therefore, it can affect how aesthetics are perceived so that it needs to be fitted into a society.

(ii) Knowledge transmission

Knowledge transmission generating scientific systems are composed of education and training of scientists and engineers (OECD, 1996: 23). Learning by doing has become important for individuals, firms and national economies in the knowledge economy. Human skills and its absorbing of the new technologies adds value to the economy in the new epoch especially through relations between universities and industries (OECD, 1996: 23). In this, universities have played an essential role in terms of satisfying the needs of high-quality R&D and human capital. Therefore, universities involvement in knowledge creation can be seen by products or their educational objectives by meeting the needs of sectors through the creation of high-qualified human capital (OECD, 1996: 24). By doing this, in the process of knowledge transmission, universities are essential for the working mechanism of knowledge.

(iii) Knowledge transfer

As regards to knowledge transfers in science systems, it plays a crucial role in a knowledge economy, which is essential for the diffusion of knowledge. Knowledge transfer commences with the creation of knowledge, and then by developing the importance of knowledge distribution networks and national systems of innovation. In this system, knowledge transfer has a broadly important role to find the enabling knowledge for technological and informational progress and its development into the economy (OECD, 1996: 24). Therefore, knowledge transfers can be considered as a booster mechanism of knowledge development by providing an opportunity to reach knowledge through innovative transfer mechanisms, such as, national innovation systems, universities, and R&D institutions.

In sum, the science system needs to make a balance among knowledge production, transmission and transfer to economic and social actors in developing a working mechanism of knowledge in the knowledge-based economy (OECD, 1996: 25).

2.4.2.2. The quest for know-how, know-why, know-what and know-who

Before explaining the quests for knowledge, it is useful to consider a definition of knowledge based on a codified and tacit knowledge. In this regard, codified knowledge is defined as an objective and rational knowledge describing numbers, data, words and formulas, as such knowledge types are considered as signs and symbols and are decontextualised into codes of practice exemplifying computer programmes, patents, and information technologies in a modern economy (OECD, 1996: 13). On the other hand, "tacit knowledge is knowledge that has not been documented and made explicit by the one who uses and controls it. The fact that a certain piece of knowledge is tacit does not rule out the possibility of making it explicit if incentives to do so are strong enough" (Lundvall, 2000: 7). Therefore, the most important aspect of knowledge transformation is the process of learning how tacit knowledge can be transformed into codified knowledge (OECD, 1996: 13). Following the description of codified and tacit knowledge, as identified by Lundvall and Johnson (1994), knowledge can be also classified into four groups: 'know-what', 'know-why', 'know-how' and 'know-who'.

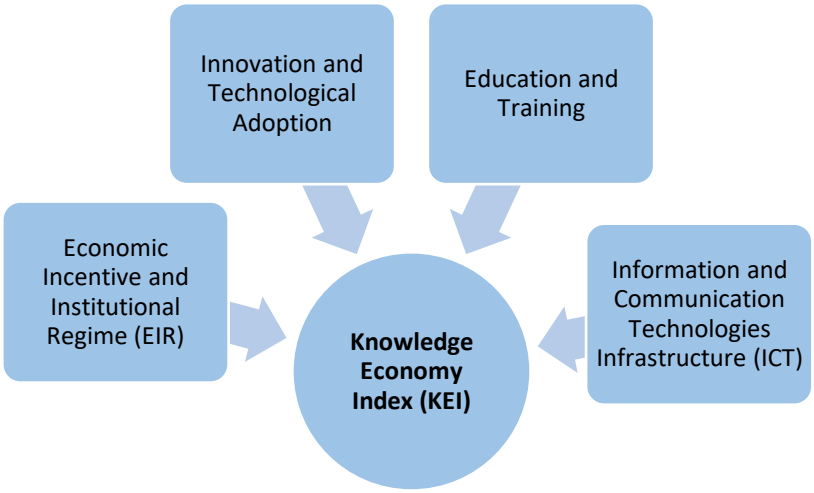
'Know-what' refers to facts about knowledge regarding what is called information, such as, breaking it down into bits and being communicated as data (Lundvall and Johnson, 1994). Therefore, this could be considered as codified knowledge. It can also be processed in the form of input to produce knowledge, the outcome of which may also be classified as innovation. As for 'know-why', "[it] refers to knowledge about principles and laws of motion in nature, in the human mind and in society" (Lundvall, 2000 (4). With this feature of 'know-why', it could also be a form of codified knowledge. Furthermore, having this type of knowledge, it is possible to accelerate technological development and to minimize the mistakes in a testing period (Lundvall, 2000: 4). As regards to 'know-how', it refers to the production technique and economic activities in relation to skills such as the ability to do something (Lundvall, 2000: 4). 'Know-how' is also defined as intelligence that is the ability to know-how to perform tasks in the sense of performing intelligent action coming from thinking (Godin, 2008: 8). It should be noted that 'know-how' and 'know-why' as types of knowledge takes an important role into innovation and technology as part of the production process. However, 'know-how' could be related with tacit knowledge (Lundvall and Foray, 1996: 115-116; Lundvall, 2000: 4).

Finally, ‘know-who’ also involves some information relating to ‘known of whom’, which also involves the production phase by bringing all knowledge together to manage growth and development. Sometimes, knowing key people can be more important to the innovation process than knowing scientific theories. Therefore, since ‘know-who’ takes people to the centre of the knowledge process, it could also be related to tacit knowledge (OECD, 1996: 12).

2.4.2.3. Defining and describing the knowledge economy with its pillars

The World Bank developed the Knowledge Assessment Methodology (KAM), which defines the Knowledge Economy Index (KEI) with the objective of measuring a country’s ability to generate and diffuse knowledge. As identified by the World Bank indicators for KAM, there are four main pillars of a knowledge economy. In other words, KEI considers the components of knowledge and the aggregate index shows the overall level of a state in developing the knowledge economy in order to provide an environment for economic development for countries. As depicted in Figure 2.2, KEI comprises of four sub-indices: economic incentive and institutional regime; education and training; innovation and technological adoption; and information and communication technologies infrastructure, which are discussed below.

Figure 2.2: Structure of the Knowledge Economy Index



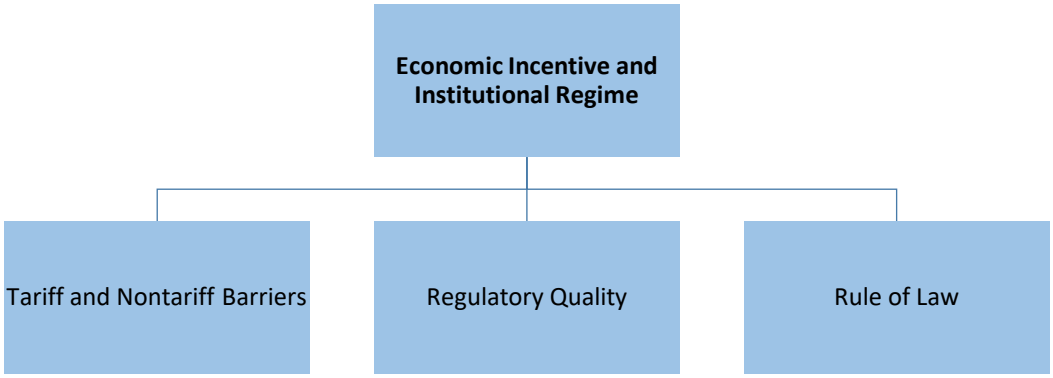
Source: World Bank Knowledge Assessment Methodology (KAM) (1995, 2000, 2012)

2.4.2.3.1. Economic incentive and institutional regime

The economic incentive and institutional regime (EIR) take into account the tariff and non-tariff barriers, which are applied in international trade; regulatory quality measuring, such as,

drops in price regulation; and the rule of law, such as, judiciary efficiency and contract enforcement, as depicted in Figure 2.3 (Palickova, 2014: 140-143).

Figure 2.3: The Pillars of Economic Incentive and Institutional Regime



Source: World Bank KAM (1995, 2000, 2012)

Paving the way for the EIR promotes use of the existing and new knowledge efficiently in all sectors in the economy and enables entrepreneurship to flourish, as well as, facilitating economic and social transformation by knowledge (Debnath, 2011: 187). Furthermore, a knowledge economy could be possible with appropriate institutional, economic and regulatory environments supporting the knowledge use, accumulation, diffusion and development (Heng *et al*., 2012: 532). The EIR, therefore, helps to encourage entrepreneurships and competition leading to innovation in the knowledge economy through its components (Debnath, 2011: 187).

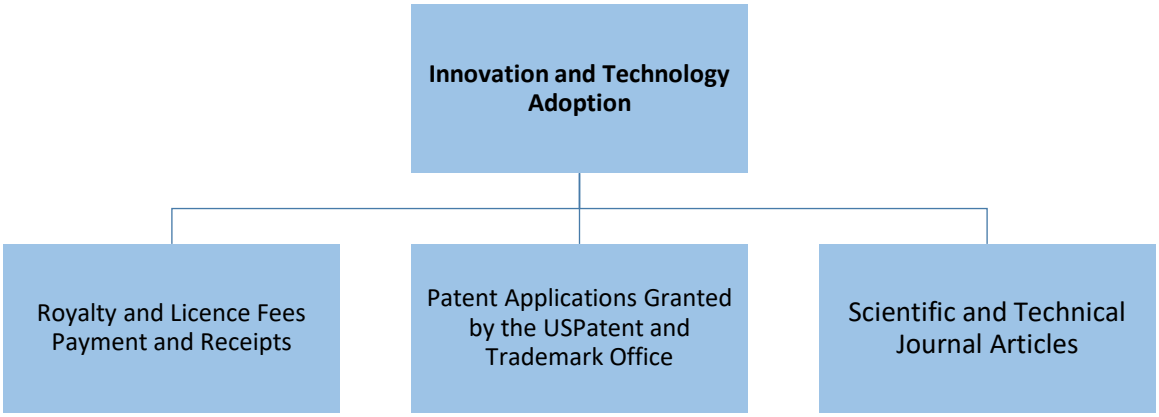
2.4.2.3.2. Innovation and technological adoption

Innovation and technological adoption, which require innovation systems of the country to internalise global knowledge, adjust it according to local necessities and produce new technologies as a result (Houghton and Sheehan, 2000: 11-12).

It should be noted that knowledge assets are available in every economic system from their history. These assets, however, must be retrofitted and transformed into the innovative products of value. Furthermore, this objective can be managed through new developmental techniques and through knowledge acquisition (Kacou, 2008: 10; Heng *et al*., 2012: 532). Knowledge economy could only be possible with the available institutional, economic and regulatory environment supporting knowledge use, accumulation, diffusion and development and its positive reflection on the innovation and technological development (Heng *et al*., 2012: 532). As can be seen in Figure 2.4, the sphere of innovation and technological adoption index

comprises of royalty and licence fees payment and receipts, patent applications granted by the US Patent and trademark office, and scientific and technical journal articles. Following these main indicators, total expenditures for R&D as percentage of GDP and rate of relations between universities and business firms could also be included into the innovation index developed by the World Bank.

Figure 2.4: The Pillars of Innovation and Technology Adoption



Source: World Bank KAM (1995, 2000, 2012)

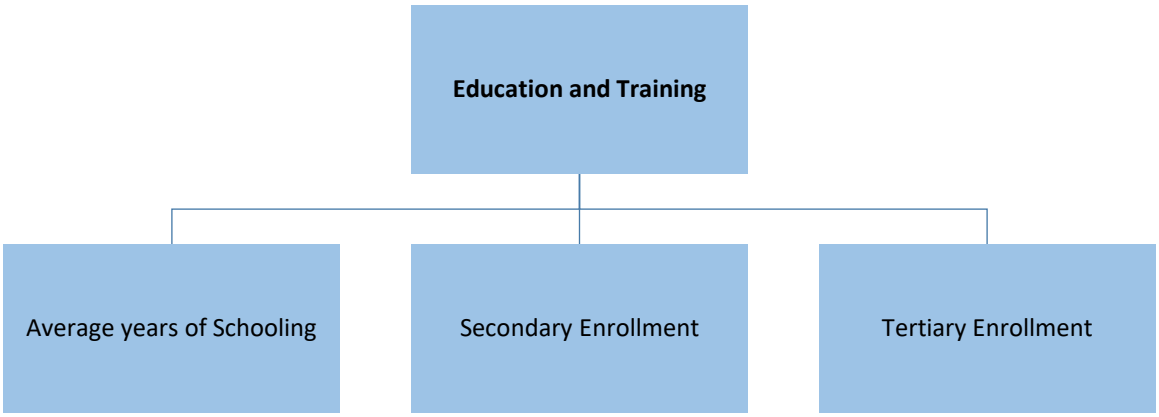
The development of innovative system of firms, research centres and other relevant institutions and organisations are related with innovation ability that fosters the R&D resulting in new knowledge and technologies. In this sense, there have been several studies considering the relationship between innovation and R&D and its role in economic progress as can be seen in Appendix A, Table A2.1 (Arvanitidis and Petrakos, 2011: 17-19). This tendency, therefore, leads to increased investment in R&D in all sectors in order to accelerate a new proactive and patented legal and regulatory regime in the progress of a knowledge economy (Kerr and Riain, 2009: 31-32).

2.4.2.3.3. Education and training

Education and training, which identifies the importance of human capital needs through essentialising education and training to efficiently produce, share and use knowledge (Affortunato *et al.*, 2010: 704-705). This refers to a university playing an active role in R&D in order to create new knowledge and innovative ideas. As can be seen in Figure 2.5, the education and training index consists of average years of schooling, secondary enrolment, and tertiary enrolment. In addition to these indicators, the literacy rates for adults over 15 years of age, and

public expenditure for education as a percentage of GDP can also be included as a measure (Palickova, 2014: 140-143).

Figure 2.5: The Pillars of Education and Training



Source: World Bank KAM (1995, 2000, 2012)

The importance of human capital as a part of education has increased as being a main factor of economic growth in a knowledge economy era. Therefore, the impact of human capital on economic growth has also been discussed within the economic growth theories such as new growth theory, endogenous theory and neo-classical growth theories (Palickova, 2014: 140-143). In this, human capital having the ability to create, acquire, and disseminate knowledge refers to a well-educated and skilled labour force contributing to enhanced total factor productivity and economic growth.

Furthermore, in this education process, the importance of higher education has increased day by day since its contribution to the production of new knowledge and innovative use of established knowledge. Thus, it is possible to state that governments or any policy-making institutions need to provide an appropriate economic, legislative and infrastructure environment to universities and industries in order to foster relations. For example, the establishment of the National Science Foundation in the USA is one of the most important institutionalisation measures undertaken by the government to promote the collaboration between universities or research centres and industries (Heng *et al.*, 2012: 532). Following this explanation, it is important to indicate that an educated population can work around technologies in knowledge production in order to affect economic performance (Arvanitidis and Petrakos, 2011: 17-19).

It should be noted and as evidenced in Appendix A, Table A2.1, there have been a number of studies on exploring human capital as a key indicator of economic dynamism and its effect on economic performance (Barro, 1991; Mankiw *et al*., 1992; Brunetti *et al*., 1997; Barro and Sala-i-Martin, 1995; Hanushek and Kimko, 2000; Arvanitidis and Petrakos, 2011).

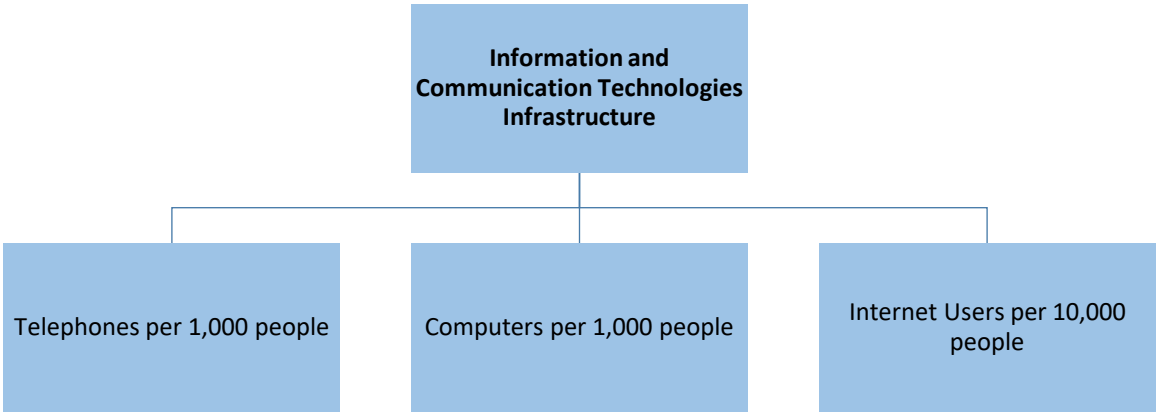
2.4.2.3.4. Information and communication technologies infrastructure

Information and communication technologies infrastructure (ICT) as a dynamic information infrastructure is required for effective communication, and distribution of the knowledge and information process (Metcalfe and Ramlogan, 2005: 531). The ICT is also crucially important for a knowledge economy as substantiated by the definition offered by the OECD (1996: 7), which defines knowledge economies as "directly based on the production, distribution and use of knowledge and information". Therefore, it is possible to state that a knowledge economy is also based on information and communication. Furthermore, an efficient system of knowledge access and diffusion is a *sine qua non* determinant for innovation and knowledge economy in general (Hidalgo and Albors, 2008: 3-4). According to the World Bank, as seen in Figure 2.6, the ICT index of knowledge economy consists of numbers of telephones per 1,000 people, computers per 1,000 people, internet users per 1,000 people or total expenditures for ICT, as a percentage of GDP.

Information access is also associated with the use of the ICTs with relatively low usage costs. ICTs have made the transmission of information all around the world more convenient. Governments, therefore, aim to improve their ICT systems to be able to respond to the requirements of the post-industrial economy (Arvanitidis and Petrakos, 2011: 17-19).

As can be seen in Appendix A, Table A2.1, there have been some studies investigating the links between the ICTs and economic performance (Schreyer, 2000; Oliner and Sichel, 2000; Arvanitidis and Petrakos, 2011).

Figure 2.6: The Pillars of Information and Communication Technologies Infrastructure



Source: World Bank KAM (1995, 2000, 2012)

2.5. ENDOGENOUS GROWTH: THEORETICAL FRAMEWORK

2.5.1. Endogenous Growth Theory for a Knowledge Economy

The shifting nature of economic paradigms towards a knowledge economy is not a new process; as knowledge and its articulation in innovation has shaped the everyday life in human history. However, while knowledge had not been the main source of economic performance in the past, in modern times, knowledge has played a crucial role for economic growth since the 20th century by possessing a commercial value. All developed economies based on knowledge are referred to as knowledge economies by creating, distributing and using knowledge in their economic systems. Knowledge, thus, has become the most productive source of economic growth through education, R&D and information and technologies infrastructure in wealth creation *vis-à-vis* traditional sources used in the past (Vesela and Klimova, 2014: 414).

Economic theory making has, in various forms and articulations, endogenised knowledge economy, its process and consequences. As regards to theorising the essentialisation of a knowledge economy in post-modern modes of production, endogenous growth theory can be considered as an appropriate theoretical frame. By going beyond neoclassic growth theory, the endogenous growth theory has recognised knowledge production and technological progress as the key driving force (Nelson, 1997: 29). Endogenous growth theory aims to identify how markets function to generate growth through, factors such as, knowledge, technology,

innovation and human capital by increasing returns (Romer, 1986; Lucas, 1988; Aghion and Howitt, 1992). Moreover, it explains long-run growth as diffusing from new technological knowledge, while technological innovation is considered to facilitate a changing economy and the social structure of society (Tasci, 2007: 317-318).

Knowledge economy is based on three main factors: 'R&D and innovation', 'qualified human capital and information technologies', and 'active global market'. Therefore, under such circumstances, a knowledge economy can be traced back to Schumpeter's growth model (2010) mostly relating to the impact of R&D, technology, information technologies, and human capital on economic growth before the denomination of a knowledge economy through endogenous growth models developed by Schumpeter's followers, such as, Romer (1986, 1990) and Lucas (1988).

Endogenous growth theory is based on the one of the main articulations of neo-classical theory, namely total factor productivity (TFP) depending mainly on the rate of technological progress for economic growth in the long run. Endogenous growth theory, however, distinguishes from neo-classical theory due to recognising that the rate of technological progress through innovations in new products, new processes and new markets is accelerated by economic forces. Thus, economic policies including trade competition, education, and intellectual property directly benefits from R&D activities, as these pursuits affect the rate of technological progress as identified by endogenous growth models (Howitt, 2004: 3). It, furthermore, underlines that economic activities creating and diffusing new knowledge have played critical role for the growth of nations, societies and individual firms (Cortright, 2001: 2).

Endogenous growth theory is also based on two important thrusts for driving the process of economic growth: technological progress as a product of economic activity and holding knowledge and technologies. Thus, endogenous growth theory is related to internalising technology into a model of how markets function, which, therefore, refers to the essential questions on what makes economies growth; why the world is measurably richer today than a century ago; and why have some nations developed more than others. In this regard, the main point of endogenous growth theory is that knowledge drives growth. Thus, endogenous growth theory helps to make sense of the ongoing movement towards knowledge-based economy from a resource-based economy.

It should also be noted that the endogenous growth theory emphasises that knowledge is also a main source as an asset for economic performance in addition to capital and labour. Thus, it is argued that transition to a knowledge economy has led long-run growth, in which wealth generation is driven by accumulation of knowledge (Romer, 1986). Moreover, in the endogenous growth theory, accumulation of knowledge and technology is considered as the main engine of economic growth unlike physical capital handled by other theories. Furthermore, it is possible to state that the main assumption of endogenous growth theory is to take technological progress as an endogenous factor directly developed within the system for having growth consequences.

Endogenous growth models also point out a different approach on the requirements to improve a country's economic growth and development possibilities by focusing more on institutions, knowledge generation and education. To understand the effects of endogenous growth models on economic growth and development, it is important to examine the World Bank's study on *The East Asian Miracle* (1993), which explains the high economic performance of Asian countries such as Japan, South Korea, and Singapore through the methodology of endogenous growth theory, namely through knowledge generation, innovation, and dynamic education. Therefore, endogenous growth models can explain why some countries grow rapidly, reaching higher performance levels, and jump from lower paths of growth to higher paths of growth, while others remained in lower paths of growth and lower performance rates of economic growth despite having similar levels of resources and capital accumulation (Cypher and Dietz, 2008: 249).

2.5.2. Schumpeterian Approach for Endogenous Growth Theory in a Knowledge Economy

Schumpeter (2010) explained that the impact of knowledge accumulation in the form of knowledge-based technological progress and human capital along with its spill over and diffusion leads to economic growth. Schumpeter (2010), however, has never theorised and modelised the relationship between knowledge and economic growth. According to Schumpeter (2010) innovation helps to boost economic growth, who also identifies five kinds of innovation: to launch high quality new products or new models of existing products; to implement new techniques into the production process; to locate new markets; to invent a new raw material resources and intermediate goods; and to reorganize the industry (Tasci, 2007: 325).

Another important notion which emerged in economic growth literature via the contribution of Schumpeter (2010) is 'creative destruction', which relates to innovation. Creative destruction means that new technologies and innovation leads to economic trivialisation of old technologies. Schumpeter (2010) shows that the dynamics of technological change is completely endogenous through creative destruction, which leads to improving economic growth in a country (Aghion and Howitt, 1998:53). Schumpeter's innovation approach, moreover, has also been accepted as the baseline for the Lisbon Strategies of 2010, which essentialises competitiveness, dynamism, and a knowledge-based economy, forming the EU's economic vision for the following 10 years (Tasci, 2007: 325).

Schumpeter (2010) argues that for firms, creative destruction leads to improving the market share, because it is more innovative than pre-existing competitors. Therefore, newly innovated products create fresh opportunities for their companies to reach more consumers than their competitors, despite higher prices. In the process of becoming commonly available, the price of new products, however, will decrease over time. Therefore, firms, which want to protect their market share in a sector, need to innovate in order to remain competitive'. This process, therefore, triggers creative destruction because firms which cannot sustain innovation will vanish by losing competitive advantage (Antonelli, 2008: 38-41). From the impact of innovation on the competitiveness of firms, regions and national economies, clearly innovative firms, regions, and states have a commanding lead over the competitors in their income and effectiveness (Lundvall, 2002).

Schumpeter (2010) followed two different approaches towards the innovation process. An initial approach saw new entrepreneurs entering niche markets playing a crucial role via introducing new ideas through innovation. A second approach relates to large firms being engines for economic growth by accumulating non-transferable knowledge, which is sometimes called creative accumulation in specific technological areas and markets. These two Schumpeterian approaches also related to creative destruction in the form of being an engine behind economic progress.

2.5.3. Neo-Schumpeterian Approaches to Endogenous Growth Theory

2.5.3.1. Romer and Lucas's model

Schumpeter, who led the field in innovation and technologies and its impact on economic growth, while his successors, such as, Romer, Lucas, Aghion and Howitt have helped to put

knowledge at the centre of economics theory making (OECD, 1996: 11). Romer (1986) and Lucas (1988) developed endogenous growth models by taking into consideration knowledge and technological progress with the objective of explaining and filling the gap observed in neo-classical growth models. Importantly, Romer (1986) considered knowledge accumulation and production creation as a positive externality in modelling long-term growth, while Lucas embedded human capital as knowledge capacity in growth theories (Ruttan, 2001: 25). Romer and Lucas, therefore, counted on knowledge and technological progress in production functions, whereas a classical approach considered knowledge and technology having an external impact on production (OECD, 1996: 11).

There is also an important difference between endogenous growth models and neo-classical growth theory. For example, the former identifies that knowledge is directly related to economic growth and technological innovations pave the way for more new technologies contributing economic growth, while neo-classical theories consider knowledge as an external factor. For example, Romer in his second endogenous growth model suggests that the capital coefficient (0.25) depreciates the share of capital and the labour coefficient (0.75) acutely overrates the share of labour. Therefore, Romer pointed out that human capital has played a crucial role in the development of new knowledge and technology. On this point, Romer impressed with Lucas's model relating human capital as the main factor of economic growth in his model as an alternative to the neo-classical model. Lucas, moreover, mainly considered two models: the schooling model and the learning by doing model, both of which is expected to lead human capital growth to positively affect the production of new goods. Thus, Romer and Lucas managed to inspire endogenous growth literature for development economics through their models (Ruttan, 1998: 4-7).

Romer's model is based on physical capital, labour, human capital, and an index of technology levels. In the model, capital is measured in units of consumption goods, labour services L are skills and human capital, H is a measure of the cumulative effects of activities, such as, education. The model used the rival component of knowledge, H, from the non-rival, technological component, A (Romer, 1990: 78-79). In this model, it is assumed that there are only three sectors in the economy comprising: R&D, an intermediate good sector, and a final good sector. Furthermore, in the model, the population and supply of labour are both constant and human capital in the total population is fixed. In the production, H_A is used to explain the labour, physical, and total human capital in this production. In this regard, a simple functional Cobb-Douglas production function (Romer 1990, 80) is expressed as follows:

$$Y(H_Y, L, x) = H_Y^{\alpha}, L^{\beta} \sum_{\iota=1}^{\infty} x_l^{1-\alpha-\beta} \qquad (2.1)$$

Equation (2.1) articulates output as an additively separable function of all the different types of capital goods, including physical labour (*L*), human capital (H_Y), and physical capital (*x*), (Romer 1990, 81). On the other hand, knowledge is a non-rival input in this model. Therefore, researchers having *A*, can take advantage in the sector. This process is formulated by Romer as:

$$\dot{A} = \delta H_A A \qquad (2.2)$$

Where H_A provides a clear explanation of the total human capital employed in the research. Equation (2) could be based on two essential assumptions that dedicating more human capital to research results in a higher rate of production of new goods, and the large total stock of knowledge leads to a higher productivity of a researcher in the R&D sector (Romer 1990, 83).

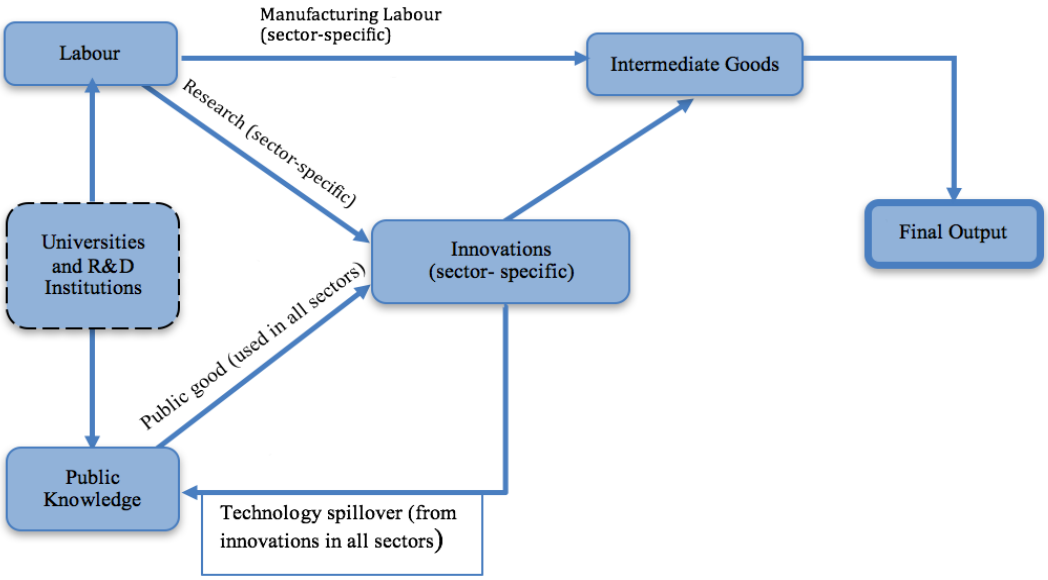
2.5.3.2. Aghion-Howitt model

Aghion and Howitt (1992) analysed the technological progress developing the product quality and its impact on the patent competition. By doing this, Aghion and Howitt predicated Schumpeterian creative destruction on their endogenous growth model, which is termed as a new Schumpeterian approach by the growth literature (Howitt, 2004: 3-4). In this model, Aghion and Howitt (1998) claim that economic growth rates depends on the R&D activities in an economic system.

As explained in Figure 2.7, in the model, universities and research institutions help to improve public and labour knowledge leading to specific innovation, which play a crucial role in the new technological production. In this model, final output production uses intermediate goods. The productivity of the input increases over time renewing by itself with new and better ones. The new goods are generated by dedicating labour to research supported by knowledge accumulation due to previous innovations in the circular scheme, shown in Figure 2.7. Furthermore, universities and research institutions take crucial roles in this model with initiating the knowledge production for public and labour usages, creating specific innovation before one step of the production of intermediate goods in the process of final output production. In this

regard, it could be seen that knowledge centres such as universities and R&D institutions help to develop the necessary skilled labour and knowledge production.

Figure 2.7: A Schematic Presentation of Economic Activities in a Schumpeterian Model



Source: Adapted from Aghion and Howitt (1998: 86)

2.5.4. Summary

The discussion has explored the importance of knowledge and knowledge production in economic theory making. While knowledge itself is an important input for economic growth through the efficiency and innovation for development, the production of knowledge as part of a commodification process has generated new spaces of opportunity for economic growth and development.

Based on the theoretical frame essentialising knowledge as discussed above, the following section conducts an econometric analysis to examine the impact of a knowledge economy on economic growth in the GCC countries. Pre-empting this discussion, a contextualisation outlining the political economy of the GCC states is advanced.

2.6. THE POLITICAL ECONOMY OF THE GCC COUNTRIES: AN INTRODUCTION

The economic and social structures of the GCC countries have undergone marked changes since the discovery of oil in the first half of the 20th century. Since then the emergent political economy of the region is defined as rentierism due to the increased oil wealth and its distribution

to the public to 'buy legitimacy' in these kinship-based traditional monarchies. The widening of oil wealth into the financial and investment sectors promoted the GCC region as an important global actor (Hvidt, 2014: 24), particularly since the 1990s. Responding to oil dependency over the last five decades, the GCC states recently developed economic diversification strategies, including attracting financial investment to accelerate economic growth and create a knowledge economy to moderate the potential impact of oil depletion.

As discussed above, the flow of knowledge, capital, human capital, and information have been increasingly important to a global economy providing new sources of wealth generation. By attempting to build a knowledge-based economy, the GCC region has become prominent as one of the most ambitious region all over the world (Engelke, 2015: 1). GCC countries, therefore, have planned to jump from resource-based economies to post-industrial economies by using their financial power to import technologies and educate human resources (Ewers and Malecki, 2010: 496). As part of their knowledge infrastructure preparedness, GCC states have built regional innovation systems, higher-education systems and ICT in order to join the league of knowledge-based economies such as Japan, Singapore, the United Kingdom and the Nordic states (Ewers and Malecki, 2010: 494).

In this regard, conferences and declarations on knowledge economies directed at the GCC countries were held by national and international organisations, such as the World Bank Report (2008) entitled: *The Road Not Travelled: Education Reform in the Middle East and North Africa*. This report mainly focussed on the quality of education and skills in the Middle Eastern region. The report also emphasised that a well-educated and technically skilled labour force is crucial for the development of a knowledge economy. Following this, in December 2009, the *Tunis Declaration on Building Knowledge Economies* was released, concluding an international conference held by the Islamic Educational, Scientific and Cultural Organisation. Among others, such attempts made it clear that for the GCC, the transforming of their economic base for the post-petroleum era was the main conference agenda item. In 2003, the Arab Human Development Report (UNDP, 2013) entitled *Building a Knowledge Society* reflecting on constituting an Arab knowledge society was issued by the UNDP. This report mostly focussed on the Arab educational systems emphasising the importance of developing cognitive learning, problem solving and imbuing openness to other cultures (Ulrichsen, 2012: 99-100).

The strategy of transition from oil dependent economies to knowledge-based economies poses significant challenges for the political economy of the rentier state structure of the GCC states

(Ulrichsen, 2012: 95). This section presents an analysis of the economic, social and political structures of the GCC countries with the objective of evaluating their potential to transform oil-based economies into futuristic knowledge economies.

2.6.1. Economic, Societal and Political Factors

The structural nature of the GCC countries differ from other nation states. While several structural factors explain the system prevailing in the GCC countries, this study seeks to identify the economic, societal, and political factors related to the challenges and opportunities presenting to the GCC states in transforming their economic structures. By doing so, the nature of economic diversification, labour markets, and education systems in the GCC region is elucidated assessing the political economy of the GCC region in terms of their receptivity for the knowledge economy.

2.6.1.1. Economic diversification in the GCC countries

Economic, societal and political factors have undeniably played an important role in the process of shifting to a knowledge economy for the post-petroleum era in the GCC countries (Djeflat, 2009: 7). In this regard, recently, each of the GCC country adopted national vision programmes: *Economic Vision for Oman 2020*; *Vision Kuwait 2030*'; *Economic Vision for Bahrain 2030*; *Qatar National Vision 2030*; *the UAE Economic Vision 2030* and *Saudi Arabia Economic Vision 2030* (Ulrichsen, 2012: 100-101). Under these national visions, each GCC country has embarked on new projects to change their economic, social and political structure in order to propel internal dynamics to transform their economies and societies. All the declared national visions emphasise human capital development with a central aim of transitioning toward a post petroleum era (Ulrichsen, 2012: 120). It should be noted that economic diversification is not a new strategy for the GCC countries, it has been discussed by policymakers of the GCC states since oil and gas became the main source of national revenues in the region (Hvidt, 2013: 2).

As mentioned above, due to oil and gas dependence, economic diversification in the region is limited. For example, a manufacturing sector is nearly non-existed in the region. The economic structure is mainly divided in two categories: 'oil and gas' and 'import substitution industries.' It is possible to extend oil and gas sectors as refineries, alongside the vast petrochemical sectors and energy-based industries, which are mostly driven by state. As regards to the import substitution sector, it is driven by food product and manufacture and construction materials, which are mainly private owned and labour-intensive businesses (Hvidt, 2013: 6-7).

As part of such a political economy, there is an imbalance between state-owned and privately-owned sectors in the GCC countries, which arises from the late developmentalist state model controlling the main source (oil and gas) as the producer of the rent. This can also be explained by the fact that only a small section of the national population is involved in economic activities and oil and gas sectors do not provide many jobs. However, economic diversification involves also expansion and empowerment of the private sector, as it will provide a further capital base for development, along with jobs, new technologies, new management methods, efficient working methods, thereby, building their societies into knowledge-based economies (Hvidt, 2013: 8).

As categorisation of the economic structure indicates, economic diversification in the GCC countries relates to oil and gas sectors and the small privately-owned industries. In addition to state and private sectors, the GCC states have also considered the investments in foreign countries through Sovereign Wealth Funds (SWFs). These funds, sourced from the revenue surpluses generated by oil and gas, aim to accumulate wealth for future generations by diversifying national incomes from oil and gas to mitigate potential economic crises and the risks of changing oil prices (Bazoobandi, 2017).

To summarise, the economies of the GCC states are based on oil and gas revenues and resulting financial accumulations; never having experienced industrialisation. Therefore, their political economies remain characterised by rentierism and neo-corporatism. The proposal of building a knowledge society and economy is essential to enable sustainable economies to develop over the long term in the face of a changing global economy.

2.6.1.2. Structural problems inherent to current labour markets in the GCC region

Along with abundant natural resourced-based wealth, there is significant impetus in the GCC region to motivate the public and private sectors for learning, and incentive for innovation among nationals. However, according to Hvidt (2015), current education systems do not mainly prepare students efficiently to engage in a knowledge economy by developing their innovative nature. In terms of citizens and their development, there is a structural imbalance because of the declining share of national workers in the total labour forces as compared to the foreign workers (Nour, 2013: 23). However, despite the high share of the private sector in total employment figures, the share of national workers in the private sector is close to zero, as citizens opt for public sector jobs. This analysis is closely related to the development policies

of oil rich states, which have provided public sector jobs for nationals with high salaries, comfortable lifestyles, free health care, schooling and high pensions (Hvidt, 2015, 22-23). Following such privileges, current wealth transferral has flowed from state coffers to the national population through high salaries, general loan forgiveness, marriage funds, free land, and housing (Hvidt, 2015, 15-16) as part of distributive-rentierist political economies. It is possible to suggest that the economic and social realities of the GCC countries provide insufficient incentives for young generations to engage with professional knowledge and knowledge workers, as a result of the rentier mechanism of wealth distribution. Such privileges lead to nationals adopting management positions, while foreign workers undertake professional jobs as well as private sector jobs at the lower end of the scale. Thus, it is imperative for the Saudi administration to change the culture by helping to improve priorities, motivation, aspiration and entrepreneurship for the nation to enhance effective development and engagement in the national economy (Hvidt, 2015, 22-23).

Implementing a change strategy towards a knowledge economy could be a problem for the GCC countries over the long term in the process of shifting towards a knowledge economy, although buying in imported expertise and high-quality institutions could be a consistent strategy in responding to the expectations and requirements of their national visions during the short term. There has been an increasing momentum towards nationalisation of the labour force through Saudisation, Emiratisation, Omanisation, and Qatarisation as part of the adapted visions (Wiseman *et al.*, 2014: 6). Following this, professional foreign workers could help to develop their national workers in the short term in order to enhance the national human capital in the long term. Therefore, the GCC states have an opportunity to reduce dependence on foreign workers in the long term, which, requires a requisite education and training strategy to develop both human qualities and the quality of the workforce.

2.6.1.3. The low skill levels and education in the GCC states

In addition to economic diversification and labour force concerns, skill levels and the quality of education has increasingly become a serious problem hampering economic development in the GCC states. However, the problem of education and skill levels could be considered at both national and foreign workers level. While it is true that well-educated foreign workers exist in the GCC countries, there are also un-educated large numbers of foreign workers employed in routine service industries.

As can be seen in Table 2.1 complied from the *Global Competitiveness Report* published by the World Economic Forum, and *Human Development Report* of United Nations, quantity of education (Quantity Education Index refers as 1= Poor and 7= excellent) in the region in 2015 yields fairly well for Bahrain, Kuwait, Oman; and was quite good for Saudi Arabia with 5.87; while it was almost over the average for Qatar. In addition, the quality of education for the GCC countries was close to excellent for Qatar and the UAE and was over average for Bahrain and Saudi Arabia. However, Kuwait and Oman showed low performance on quality of education in 2015.

Table 2.1: Education Indices of the GCC Countries 2015

Countries	Quantity of Edu.	Quality of Education	Quality of Math and Science Education	Average Years of Schooling	Secondary Education Enrolment (% of Gross)[1]	Tertiary Education Enrolment (% of Gross)
Bahrain	4,88	4,75	4,56	9,8	95,51	33,46
Kuwait	4,68	3,67	3,41	7,7	100,34	28,45
Oman	4,66	3,37	3,35	6,8	93,51	28,14
Qatar	4,09	5,80	5,67	9,79	111,62	14,26
Saudi Arabia	5,87	4,23	4,11	8,4	116,17	57,52
United Arab Emirates	4,20	5,47	5,33	9,14	92,30	16,84

Source: Global Competitiveness Report Database, World Economic Forum, 2015

According to the quality of maths and science education as depicted in Table 2.1, which is one of the most important indicators for the GCC countries needing the skilled labour in relation to their knowledge economy strategy, it was satisfactory for Qatar and the UAE; stable for Saudi Arabia and Bahrain; while figures were quite low for Kuwait and Oman.

One of the most important indicators is also average years of schooling which helps to identify the human development level. As can be seen in Table 2.1 in 2015, while Bahrain, Qatar, the UAE, and Saudi Arabia is in the high human development range, Kuwait and Oman are within the medium human development scales. According to enrolment figures for secondary and

[1] Secondary Education Enrolment (% of Gross) and Tertiary Education Enrolment (% of Gross) can exceed 100% due to the inclusion of over-aged and under-aged students because of early or late school entrance and grade repetition (The World Bank, World Development Indicators).

tertiary education, as can be seen, the secondary education enrolment is quite high in the GCC countries, whereas tertiary education enrolment shows low performance in the GCC countries except for Saudi Arabia.

Following these indicators, seeking the promotion of knowledge economies in the GCC countries, university education, research and collaboration between universities is highly important. In this regard, a number of projects have been devised by the GCC countries, such as: the Knowledge Village and Internet City in Dubai, the Qatar Science and Technology Park in Doha, the Knowledge Oasis Muscat, the King Abdullah University of Science and Technology in Saudi Arabia, the Masdar Institute of Science and Technology in Abu Dhabi, the Education City in Doha hosting highly prestigious universities, including: George Town University School of Foreign Service; University College London; Texas A&M University; Northwestern University; Virginia Commonwealth University; Weill Cornell Medical College; Carnegie Mellon University, and Qatar Faculty of Islamic Studies (Ulrichsen, 2012: 105-106).

GCC states operate important projects in R&D to improve their innovation capacity by collaborating with important research institutions and universities across the world. As previously referred to, GCC states need to improve the skill levels of their citizens in order to address the technological and research gaps in the region. Sustainable development of these economies, currently maintained by expatriates, requires citizens to emerge in the future to fill these roles. Revisions to the education system and training structures are expected to enhance the productivity of labour, encourage national workers to adopt foreign technologies, promote the development of local technologies, and bridge technological gaps (Nour, 2013: 36).

2.7. EMPIRICAL ANALYSIS AND MODELLING

The previous section provides a detailed discussion and evaluation on the nature of a knowledge economy in the GCC countries. Based upon the discussion, as stated in the initial section, the aims here are to develop an empirical analysis to examine the state of a knowledge economy and its relationship to economic growth with the objective of locating empirical substantiation for the research. The initial part evaluates the extent to which GCC states have prepared to institute a knowledge economy within the region, while the latter section explores and examines the impact of knowledge economy constructs on regional development after detailing the econometrics model.

2.7.1. Knowledge Assessment Methodology: Evaluating the State of the Knowledge Economy in the GCC Region – Empirical Analysis 1

In order to understand the performance of the GCC countries in relation to their attempts to devise and implement a knowledge economy, Table 2.2 provides the Knowledge Economy Index (KEI) scores from the World Bank's Knowledge Assessment Methodology (KAM) to assess the knowledge economy performance in each country.

As identified by the KAM, there are also four main pillars of knowledge economy in the KEI:

(i) Economic Incentive and Institutional Regime (EIR);
(ii) Innovation and Technological Adoption (InoTech);
(iii) Education and Training;
(iv) Information and Communication Technologies (ICT) Infrastructure.

The first empirical part of this research employs the KAM, which is a benchmark tool applied to measure a country's position from a knowledge economy perspective. The KEI is based on a simple average of four sub-indices representing the four pillars of the knowledge economy. The KAM is based on 80 structural and qualitative variables serving as proxies for knowledge economy pillars. The 2012 estimation of KAM is based on 146 countries and 9 regions. The KAM performance of these countries is ranged from 0 (weakest) to 10 (strongest).

The empirical analysis in this section is based on six GCC countries which are compared to selected countries with similar population and land sizes, which have proved relatively successful in the process of developing knowledge economies. Such countries have a knowledge economy vision incorporated within their economic systems to transform their economies into a knowledge economy. Examples are: Singapore, Japan, Norway, Luxembourg, Sweden and the UK.

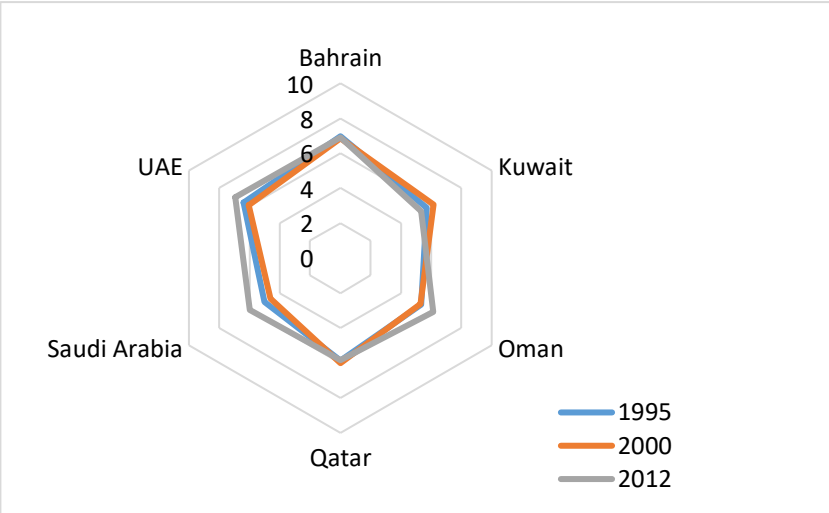
2.7.1.1. Knowledge economy index and its pillars for the GCC countries

The results of the KEI scores of the World Bank show slight improvements since 1995 for GCC states. The average values for the GCC countries, however, were not at the desired level in comparison to their capital base.

Table 2.2 details Bahrain's recent improvement in its KEI performance: in 2012, it scored 6.9 in KEI ranking 49th out of 146 countries. Kuwait, scored 5.33 and ranked 64th in the KEI in 2012, which yields a relatively worse score than Bahrain. As a peripheral country, Oman scored

6.14 and ranked 47th position in the KEI in 2012, which is above the MENA and world scores. Qatar performed well on the KEI with an overall score of 5.84 resulting into 54th ranking in 2012. Qatar's performance is higher than the MENA and world averages as well. With this score, Qatar, however, is the lowest performing country in the region just after Kuwait among the GCC countries. Saudi Arabia also ranked 50th out of 146 countries worldwide on the KEI with 5.96 taking fourth place in the region, while its global ranking was 76 in 2000.

Figure 2.8: Knowledge Economy Index in the GCC



Source: World Bank KAM (1995, 2000, 2012)

Table 2.2: KEI and KE Ranks of the GCC Countries

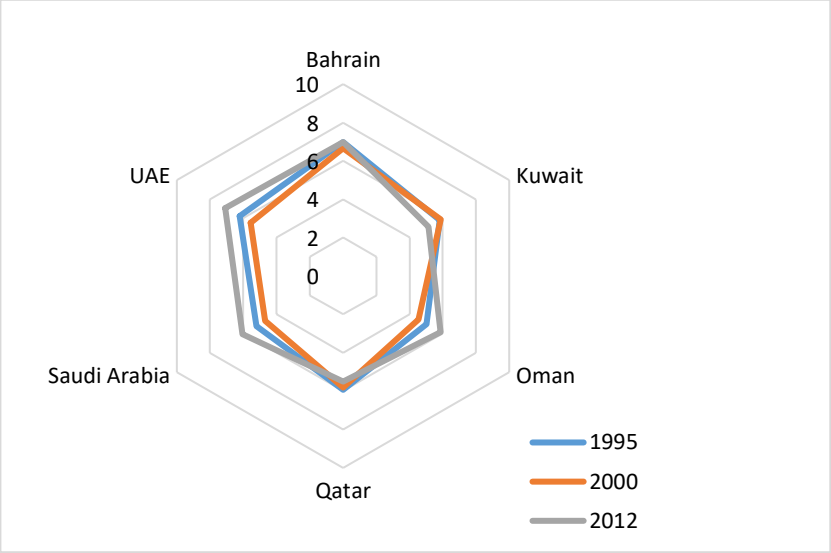
Country	Year	Knowledge Economy Index (KEI)	Knowledge Economy Rank (KE)
Bahrain	1995	6,97	36
	2000	6,85	41
	2012	6,9	43
Kuwait	1995	5,71	57
	2000	6,16	46
	2012	5,33	64
Oman	1995	5,34	65
	2000	5,28	65
	2012	6,14	47
Qatar	1995	5,86	54
	2000	6,01	49
	2012	5,84	54
Saudi Arabia	1995	5,02	78
	2000	4,6	76
	2012	5,96	50
UAE	1995	6,39	46
	2000	6,05	48
	2012	6,95	42

Source: World Bank KAM (1995, 2000, 2012)

As can be seen in Figure 2.8 and Table 2.2, Saudi Arabia demonstrated good progress by jumping 26 places in the ranking from 2000 to 2012, which is a remarkable achievement compared to the developments shown by other countries. Lastly, the UAE is the first out of six GCC countries on the KEI and it was ranked 42 in 2012 with a score of 6.94, which is above the MENA's average at 4.74 and world average at 5.12.

With regards to the knowledge economy focussed Knowledge Index (KI), the results presented in Figure 2.9, show that Bahrain and the UAE scored 6.98 and 7.09, respectively, in 2012. With these scores, the UAE seems to be performing well on KI since 2000, as it scored 5.56. As the findings demonstrate, Saudi Arabia is the third in the ranking with a score of 6.05 in 2012. On the other hand, Oman demonstrated a slightly better performance by scoring 5.87 in 2012. Qatar and Kuwait, however, are the only two GCC countries which demonstrated a decline in 2012 yielding scores of 5.5 and 5.15, respectively, while scoring 5,.81 and 5.88 in 2000.

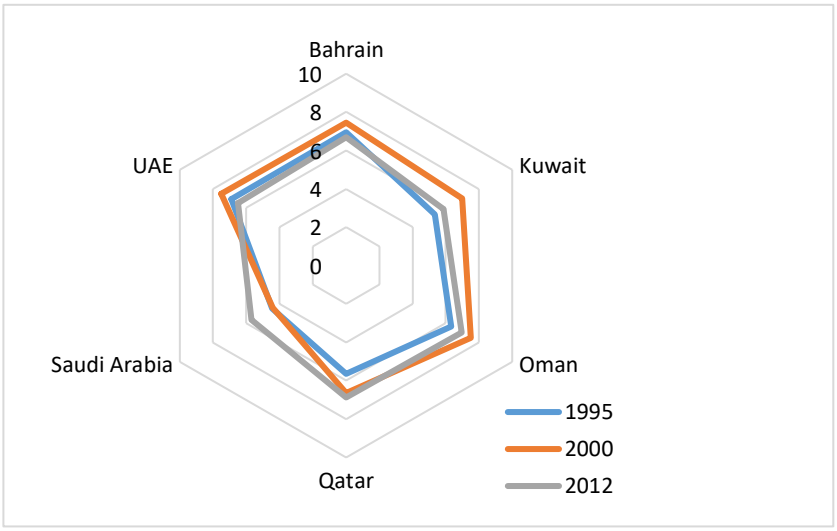
Figure 2.9: Knowledge Index in the GCC



Source: World Bank KAM (1995, 2000, 2012)

Regarding the individual pillars, on the EIR index, Bahrain is a highly successful country with a 48th position and 6.69 score in the KEI in 2012 as shown in Figure 2.10. This performance is higher than the MENA and world averages. As evidenced by the results, Kuwait demonstrated the poorest performance after Saudi Arabia among all the GCC countries with their KEI scoring 5.86 and 54th position in the world in 2012. Furthermore, Oman is the highest ranked country among all the GCC states with a KEI score of 6.96 and reaching 44th position in the KEI. With this performance, Oman managed to improve its EIR position and was above the MENA and world scores in 2012. Qatar has also experienced a remarkable economic and social performance over the last decades. Therefore, the score of Qatar on the EIR was 6.87 and its ranking is 45th that is above the MENA and world average in 2012. With this performance, Qatar is in second position on the EIR for the GCC countries.

Figure 2.10: EIR Index in the GCC Countries

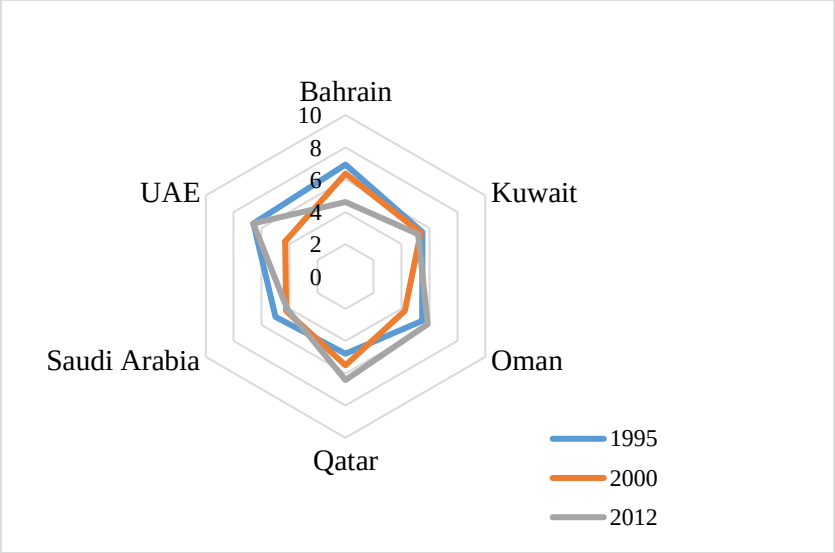


Source: World Bank KAM (1995, 2000, 2012)

As regards to the EIR index in 2012, Saudi Arabia ranked 60th with a score of 5.68, which is above the MENA average of 5.41 and world average of 5.45. However, when Saudi Arabia is compared with the other GCC countries, it remains last in the EIR index, which can be explained by the changing traditional economic landscape of the country contributed by WTO membership. The UAE also scored 6.5 and ranked 50th places on the EIR index, which places it fourth among the GCC countries despite this score being above the MENA and world averages.

On the innovation pillar, as can be seen in Figure 2.11, Bahrain showed its weakest performance achieving 75th position and a 4.61 score in 2012. With this low performance, Bahrain is placed beneath the MENA region and world averages and ranks fifth behind Saudi Arabia among all the GCC countries in 2012. Kuwait also performed relatively poorly in 2012 with a score of 5.22 and ranking of 64th position, which is well below the MENA and world averages.

Figure 2.11: Innovation and Technological Adoption Index in the GCC



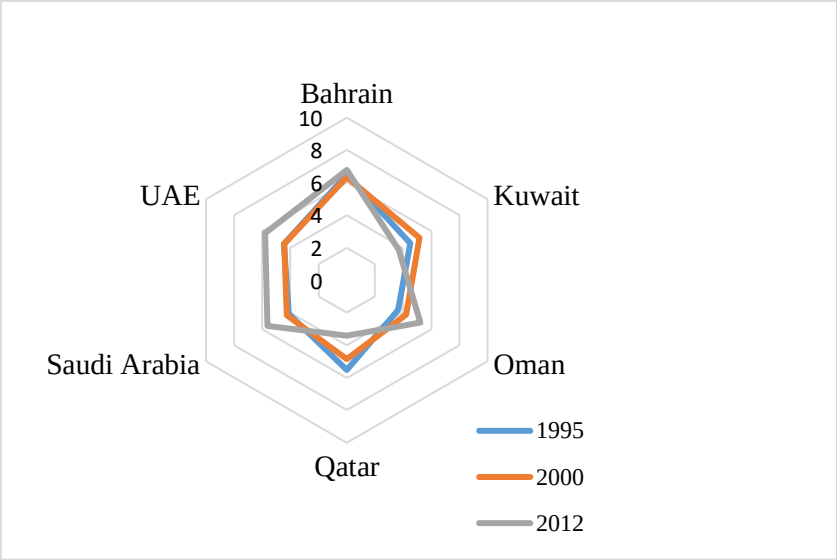
Source: World Bank KAM (1995, 2000, 2012)

As illustrated in Figure 2.11, Oman scored 5.88, ranking at 57th place in the innovation index. Although Oman is the third highest placed country in the GCC countries, it remained below the MENA and world averages in 2012. Qatar also significantly performed with a score of 6.42 achieving a ranking of 49 in 2012, which secured Qatar second place among the GCC countries and above the MENA average, which is below a world average for 2012. Furthermore, Saudi Arabia scored 4.14, which is its weakest of the four pillars in 2012. Moreover, Saudi Arabia performed poorly in comparison to MENA and world averages being ranked at 84th position. Lastly, the UAE reached an index score of 6.6 and 46th position in 2012. Although, the UAE is the first among the GCC countries as far as the innovation index is considered, its performance on innovation is less than the world average and slightly above the MENA average.

Regarding the education pillar, as seen in the Figure 2.12, Bahrain achieved the highest score with 6.78 and 45th global position in the four pillars. With this performance, Bahrain is over the MENA and world averages, and the first county among all the GCC countries. However, Kuwait scored 3.7 and ranked 98th in global positioning in 2012. With this poor performance, Kuwait is slightly above the MENA average, although it is slightly below the world average in 2012. Oman also demonstrated the lowest performance in the four pillars with scores of 5.23 and 74th position in the KEI in 2012. Oman, nonetheless, is above the MENA and world averages for 2012. Qatar, furthermore, is the weakest in the four pillars among the GCC states during 2012, with scores of 3.41 and101st position, which is lower than the MENA and world

averages for this year. Saudi Arabia, however, considerably progressed in its 'education pillar', achieving a score of 5.65, above the MENA average of 3.72 and world average of 3.48 in 2012. Within the GCC states Saudi Arabia is ranked third on the education pillar behind Bahrain and the UAE. Finally, the UAE scored 5.8 and ranked 55th place in 2012; which is quite above the world and MENA averages and second position in the Gulf region.

Figure 2.12: Education and Training Index in the GCC

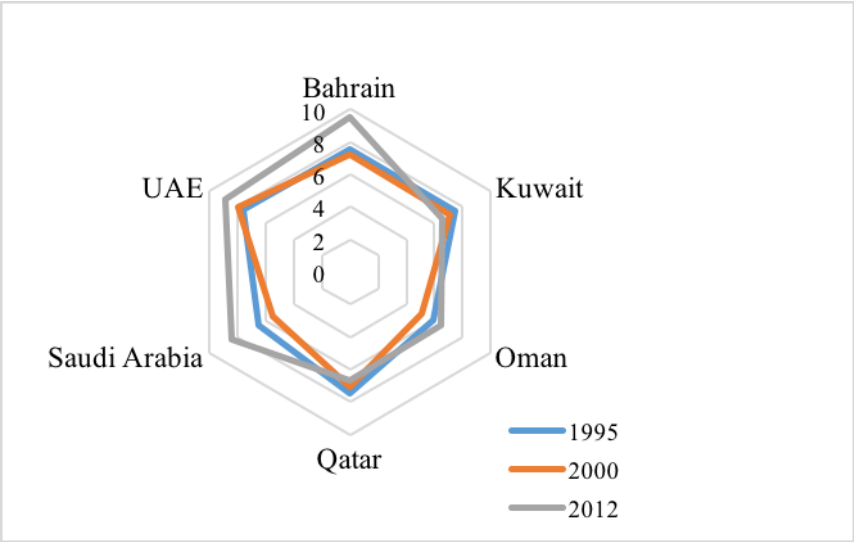


Source: World Bank KAM (1995, 2000, 2012)

On the ICT index, as seen in the Figure 2.13, Bahrain may be commended for its success, as its position sharply increased from 40th place in 2000 to 1st position in the world in 2012, below. This improvement in Bahrain can be explained by the use of the internet, as the amount of internet users per 1,000 of the population increased from 60 in 2000 to 820 in 2012. Kuwait also scored 6.53 and ranked 54th place, which is slightly above the MENA and world averages in 2012. Furthermore, although Oman is the last country with a score of 6.49 and 55th place in the GCC region, its score is above the MENA and world averages in 2012. In a similar manner to Oman, Qatar has also performed relatively well on the ICT rankings in 2012, as it reached a 6.65 score and 51st place in the ICT index of 2012, which indicates that its performance is higher than the MENA and World averages and achieves fourth position among the GCC countries in 2012. Furthermore, Saudi Arabia scored 8.37 in the ICT behind Bahrain and UAE in 2012, which saw Saudi Arabia placed 21st worldwide. It is quite significant progress for Saudi Arabia and the GCC region. Finally, on the ICT pillar, the UAE ranked 12th place and scored 8.88,

which is the second highest score in the MENA and Gulf region and its score is higher than the MENA and world averages in 2012.

Figure 2.13: ICT Infrastructure Index for the GCC Countries



Source: World Bank KAM (1995, 2000, 2012)

As outlined, the GCC countries have performed less than satisfactorily according to the data provided by the World Bank Knowledge Economy pillars and analysis developed on these data, especially in education and innovation, although they have been strongly interested to transform their economies into knowledge-based ones. It should, however, be noted that the GCC states have performed far better than the rest of the MENA region and the world averages in the EIR and ICT indexes (Hvidt, 2014: 31).

The analysis demonstrates that the GCC region has attempted to transform directly into knowledge-based economies by-passing the industrial phase in the development of economic structures. Currently granting over 225,000 patents yearly (Hvidt, 2014: 44) across the world, as an indication of knowledge and information generated in a mass-production manner, which indicates generally that economies are moving towards a knowledge economy. The GCC countries, however, are still far from producing knowledge on a large scale to contribute to patent issuance (Hvidt, 2014: 44). An important aspect of a knowledge economy is the human capital issue, for which the GCC states should develop policies on educating their own people to become knowledge workers. Incentives such as high salaries and benefit packages offered to their expatriate workers can be considered to gain advantage over global competitors importing educated-workers, such as, the UK and USA (Hvidt, 2014: 45).

2.7.1.2. Benchmarking countries in the knowledge economy for the GCC countries

2.7.1.2.1. Knowledge economy index and its pillars for the selected countries

To understand the performance of the GCC countries in relation to a knowledge economy, the performance of some sampled countries is examined for comparison: Sweden, Norway, United Kingdom, Luxembourg, Japan, and Singapore. These countries were selected due to their similarities with the GCC states, such as, total population, per capita income, natural resources income, and trade partnerships.

Table 2.3: Global Ranks of the Selected Countries on the KEI

Country	Year	Knowledge Economy Index	Knowledge Economy Rank
Sweden	1995	9,45	4
	2000	9,65	1
	2012	9,43	1
Norway	1995	9,46	3
	2000	9,25	7
	2012	9,11	5
UK	1995	9,09	11
	2000	8,89	12
	2012	8,76	14
Luxembourg	1995	8,42	20
	2000	8,51	22
	2012	8,37	20
Japan	1995	8,77	17
	2000	8,81	17
	2012	8,28	22
Singapore	1995	8,40	21
	2000	8,57	20
	2012	8,26	23

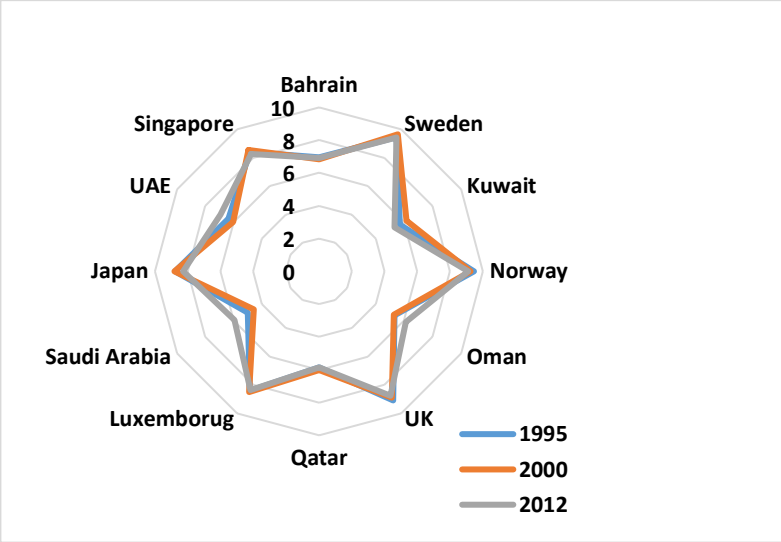
Source: World Bank KAM (1995, 2000, 2012)

As the Table 2.3 demonstrates, the performance of these sampled countries is at the higher end comparison to the values of the GCC countries. Statistics highlighted in Table 2.3 indicate, noticeably that Luxembourg has a relatively very small population like the GCC states, but it was ranked as 20th with a scoring of 8.37 in 2012. In addition, Norway, similarly to the GCC countries, also depends on its natural resources for income, ranked 5th place, and achieved a score of 9.11 out of 10 in 2012. Following this, the UK, a key trade and investment partner for the GCC region ranked 14th position and scored 8.76 in 2012. Japan and Singapore provide important examples of rapid transformation into knowledge-based economies accomplished

through the application of existing technology intensive sectors. Accordingly, Japan ranked 22nd position and scored 8.28 in 2012. Singapore almost matched Japan with its rank of 23rd place and score of 8.26 in 2012.

Analysis demonstrates that of the GCC states, the UAE, Bahrain, and Oman, are closest to the selected countries cited above, with their knowledge economy rankings of 42, 43, and 47 positions and scores of 6.97, 6,.9, and 6.14, respectively, in 2012. Figure 2.14. shows the lowest scores are associated with the GCC countries. Certain key features of the selected countries in the benchmarked sample are similar to those of the GCC countries, and since the knowledge economy performance of the benchmarked sample countries is well established, the GCC countries should be able to manage to transform their natural resources based economic systems into a knowledge-based economy by developing similar strategies, capacities and capabilities.

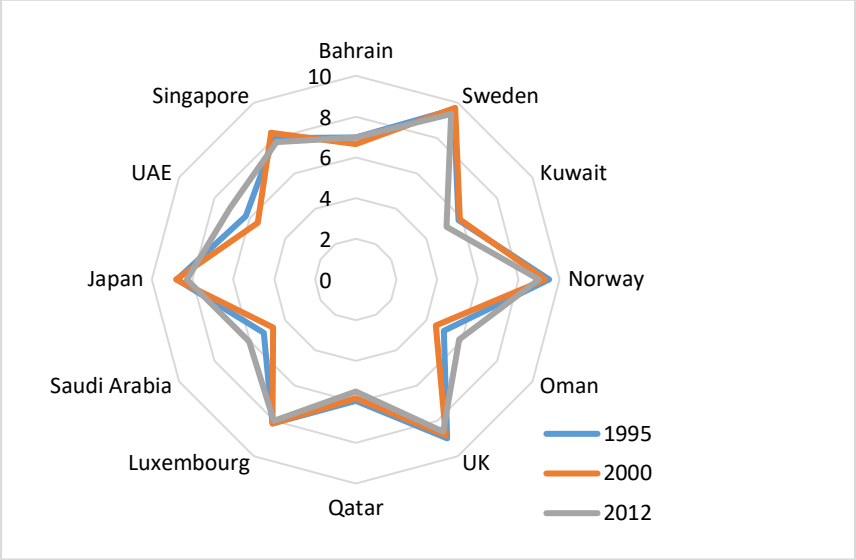
Figure 2.14: KEI in the GCC and Selected Countries



Source: World Bank KAM (1995, 2000, 2012)

As figure 2.15 depicts, the UAE was the high-performing GCC member state with its score of 7.09 in KI in 2012. The UAE, therefore, is quite close to the selected countries, specifically, Singapore, scoring 7.79 in 2012. Qatar, Oman, and Kuwait, however, scored between 5 and 6 bands in 2012.

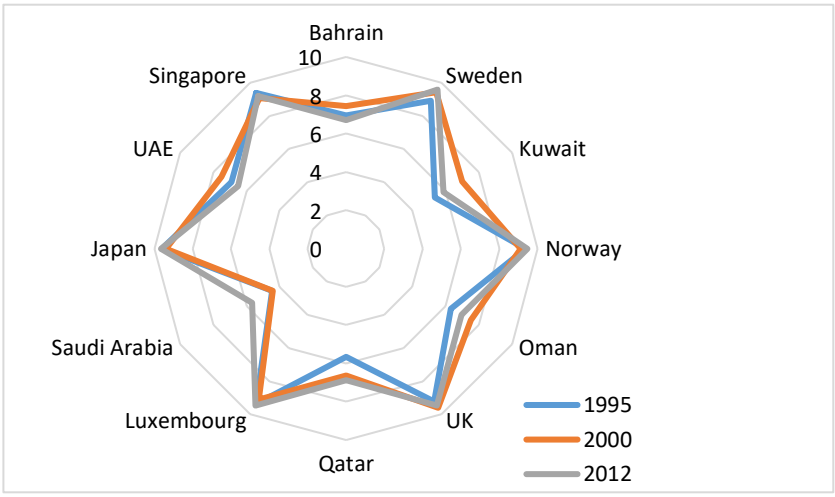
Figure 2.15: Knowledge Index in the GCC and Selected Countries



Source: World Bank KAM (1995, 2000, 2012)

It is possible to see a parallel picture for EIR index in Figure 2.16 between the GCC countries and the sampled benchmarked countries. For the benchmarked countries, the score band fluctuates between 9 and 10 in 2012, while the score band shows between 5 and 7 for the GCC states. The most successful GCC state was Oman in 2012 with a score of 6.96, whereas, Singapore was the poorest performing country among the selected countries with a score of 9.2 out of 10 in 2012.

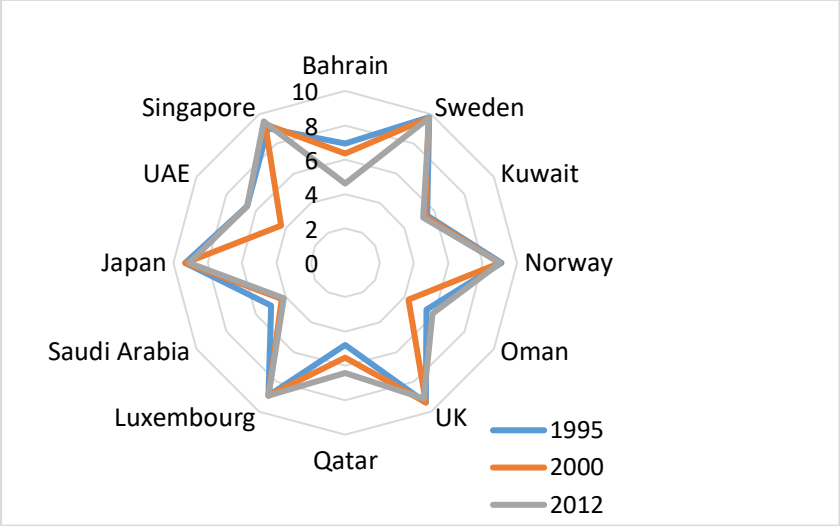
Figure 2.16: EIR Index in the GCC and Selected Countries



Source: World Bank KAM (1995, 2000, 2012)

A similar result can be seen for the innovation and technological adoption index as depicted in Figure 2.17. For the GCC countries, Saudi Arabia was the poorest performing country with a score of 4.4 out of 10 in 2012, while Luxembourg was the lowest performing of the selected countries with a score of 8.94 out of 10 in the same year. The highest performance in the GCC countries is the UAE scoring 6.6, whereas, Sweden had a high innovation performance with a score of 9.74 out of 10 in 2012.

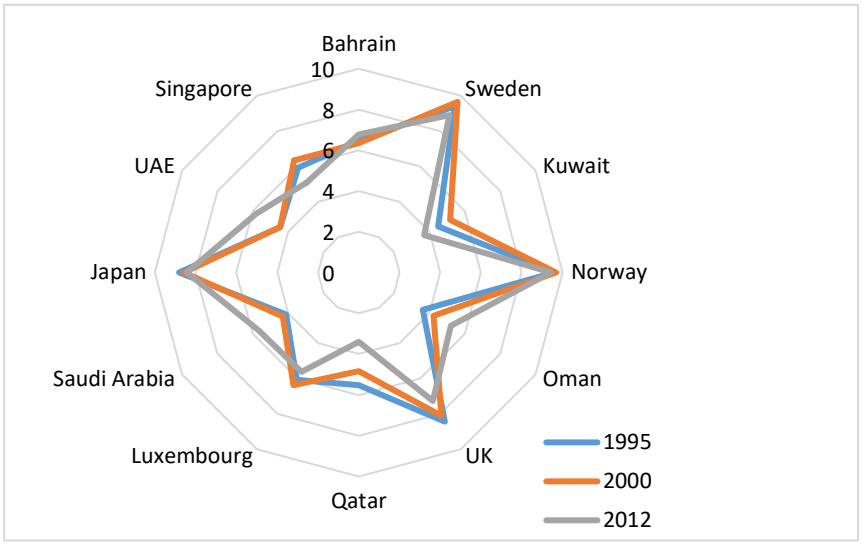
Figure 2.17: Innovation and Technological Adoption Index in the GCC and Selected Countries



Source: World Bank KAM (1995, 2000, 2012)

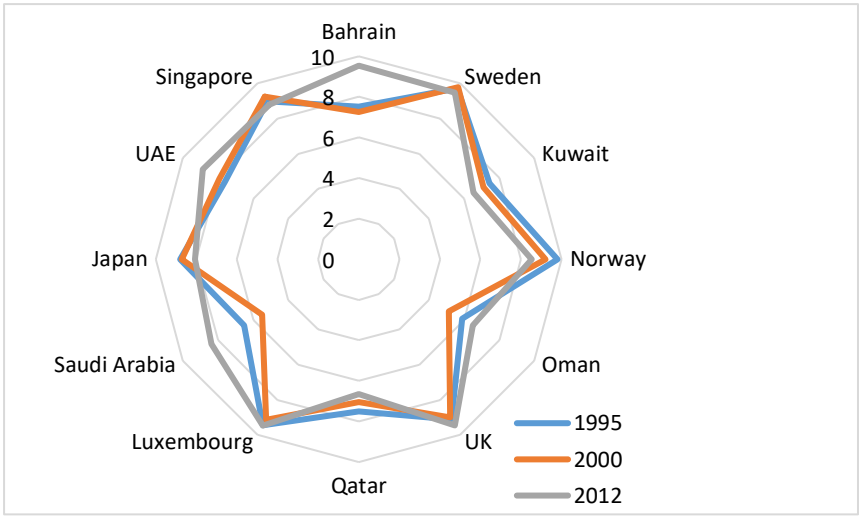
The comparison on the education and training index between the GCC states and the selected countries demonstrates a slight difference from the other knowledge economy pillar indices as seen in Figure 2.18. The distinction observes states showing poor performance in the benchmarked countries, such as, Singapore with 5.09 and Luxembourg with 5.61, which underperformed in comparison to the UAE with 5.8, Bahrain with 6.78, and Saudi Arabia with 5.65 in 2012. However, it is important to note that Kuwait and Qatar demonstrated poor performances with a score of 3.7 and 3.41 respectively, whereas, the rest of the GCC countries demonstrated high performance in the education index, when compared to the performance of the benchmarked countries.

Figure 2.18: Education and Training Index in the GCC and Selected Countries



Source: World Bank KAM (1995, 2000, 2012)

Figure 2.19: ICT Infrastructure Index in the GCC and Selected Countries



Source: World Bank KAM (1995, 2000, 2012)

As the analysis indicates, there has been an improvement in the ICT infrastructure index for the GCC countries, when compared with the benchmarked countries, as seen in Figure 2.19. For example, Bahrain claimed the first position in the world in 2012 with its score of 9.54, while Sweden was the closest follower of Bahrain among the benchmarked countries in this study with its score of 9.49. The UAE has also performed highly on the ICT index by scoring 8.88. With such improvements, the UAE managed to perform better when compared to Singapore, Norway, and Japan among the selected countries in 2012. It is also counted that Saudi Arabia

has developed in the ICT with its score of 8.37 in 2012, with which Saudi Arabia managed to suppress the success of Japan among the benchmarked countries in this study. When the performance of the GCC countries is compared with the benchmarked states, Kuwait, Oman, and Qatar lagged in ICT development with their respective scores of 6.53, 6.49, and 6.65 in 2012.

2.7.2. The Relationship between Knowledge Economy and Economic Performance in the GCC Countries: Econometric Modelling – Empirical Analysis 2

The preceding section presented the results of the initial data analysis through the WB's KAM model, while this section presents the empirical process and econometrics analysis in aiming to examine the relationship between the pillars of knowledge economy and economic performance proxied with GDP (per capita) and total natural resources rents (TNRR).

2.7.2.1. Data, variables and model selection

The econometrics modelling in this study in examining the relationship between economic growth and KEI is constructed through time series modelling of six GCC countries with data spanning from 2006 to 2015. The data utilised is based on annual frequency, for variables relating to knowledge economy pillars and their sub-pillars. In addition, macroeconomic variables such as trade openness and inflation are used to expand the econometric modelling in examining the relationship between the KEI and economic growth. In this model, openness refers to the sum of exports and imports in the macroeconomic level of the GCC countries. In addition, there are some sub-pillars under the 'EduIndex', which measures the quality of human capital to represent the role of national labour in the region on their economic performances.

As for the dependent variables, they are described as follows: *GDP (Per Capita)* is intended to control for growth and to reflect the material wealth of a country, which is mostly accepted as the most important indicator reflecting the economic performance of a country. In this regard, the relationship between knowledge economy indicators and the GDP values is expected to explain the impact of a knowledge economy on the performance of a country. For the economic performance, GDP per capita values are considered in estimating the causality between knowledge economy and GDP by controlling for the population of these countries. The data for GDP per capita is assembled from the World Bank database.

TNRR is used to capture the natural resources rents of the GCC states in order to locate the share of the TNRR in the GDP. This indicator helps to compare the impact of a knowledge economy on GDP and natural resources rents whereby the nature and impact of a rentier state is captured. In terms of description, TNRR could be categorised as oil rents, natural gas rents, coal rents, mineral rents, and forest rents. It is important to state that oil and gas rents refer to the difference between the value of total production at market prices and total costs of production.

Independent variables utilised in the empirical analysis are as follows:

Worldwide Governance Index (WGI) is used to evaluate the political aspects of development, which includes six pillars including regulatory quality, rule of law, government effectiveness, control of corruption, voice and accountability, and political stability. However, the index is constructed by using Principal Component Analysis or PCA in order to produce a single index through six pillars. Therefore, WGI helps to analyse the EIR index of knowledge economy through its political and non-economic aspects.

Freedom Index is used to explain the EIR index as the WGI. Despite the freedom index consisting of nine components comprising of intellectual property protection, property rights, tariff rates, business freedom, trade freedom, investment freedom, financial freedom, monetary freedom, and fiscal freedom, in this study, it is constructed by using PCA in order to use a single index as freedom. Data for this index is collected from the Heritage Foundation.

InoTech Index or Innovation and Technologies adoption index of a knowledge economy is comprised of sub-indices as capacity for innovation, quality of scientific research institutions, university and industry collaboration in R&D, company spending on R&D, availability of latest technologies, FDI and technologies transfer, scientific and technical journal articles. This index is also constructed by using PCA in order to relegate it to a single index as *Inotech*. The data in this index is collected from the World Bank and Global Competitiveness Index of World Economic Forum.

EduIndex or Education and Training Index of a knowledge economy is comprised of quantity of education, quality of education, quality of math and science education, secondary education enrolment, tertiary education enrolment, average years of schooling. It is composed by using PCA in order to regress a single index naming *Eduindex*. For this variable, the data is derived

from the World Bank, Global Competitiveness Index of World Economic Forum, and United Nations Development Programme.

ICTIndex or Information and Communication Technologies Infrastructure Index of knowledge economy is evaluated by considering internet use, computer use, ICT goods imports, and ICT goods exports. It is constructed by using PCA in order to merge into one as ICTIndex, for which the data is collected from the World Bank.

In addition to the independent variables, other control variables are also included in this study to evaluate the relative impact of independent variables, such as trade openness and inflation derived from the World Bank.

Based on literature, and in line with the variable description provided above, the baseline model, accordingly, looks as follows:

$$GDP_{it} = \beta_0 + \beta_1 Openness_{it} + \beta_2 Inflation_{it} + \beta_3 WGI_{it} + \beta_4 Freedom_{it} + \beta_5 InoTechIndex_{it} + \beta_6 EduIndex_{it} + \beta_7 ICTIndex_{it} + \alpha_I + \varepsilon_{it} \quad (2.3)$$

$$TNRRs_{it} = \beta_0 + \beta_1 Openness_{it} + \beta_2 Inflation_{it} + \beta_3 WGI_{it} + \beta_4 Freedom_{it} + \beta_5 InoTechIndex_{it} + \beta_6 EduIndex_{it} + \beta_7 ICTIndex_{it} + \alpha_I + \varepsilon_{it} \quad (2.4)$$

where i denotes country; t stands for time period; α_I measures individual specific effects; ε_{it} is the error term; *TNRR* refers to total natural resources rents.

2.7.2.2. Econometric modelling and empirical process

In the light of exploring the relationship between a knowledge economy and economic performance, this study employs quantitative methodology to examine the relationship, if any, between a knowledge economy and economic performance as proxied by GDP per capita in the GCC countries. In addition, this study aims to examine whether there is also a relationship between a knowledge economy and the TNRR in the GCC countries driven by oil revenues.

As illustrated in Appendix A, Table A2.1. and also within the empirical literature survey on knowledge-based economies, there are a number of empirical studies examining the knowledge economy and economic performance through causality analysis. This study builds on the existing literature to explore the nexus between a knowledge economy and economic

performance in the case of the GCC states, with data spanning the 2006-2015 period, applying the variables defined above.

It is important to mention that there are some econometric challenges in expending the data set. Firstly, the knowledge economy index was released by the World Bank only for 1995, 2000, and 2012. Therefore, in order to complete the data between these years, the World Bank's statistical methodology in measuring the pillars of knowledge economy was utilised to complete the data for the rest of these years. The statistical method of generating data for the missing years is based on interpolation and extrapolation methods. Secondly, as the sample consisted of rentier states, this created some further challenges for completing the data set, due to these states yielding economies different to the rest of the world.

As a second step, PCA is used in order to produce a single index for the knowledge economy through the application of sub-indices. It is important to state that PCA is applied for each data set as per GCC countries separately, in order to get efficient data and results rather than taking the average of the data.

As an econometric methodology, this study employs Granger Causality modelling with a panel data test to decipher the relationship between the knowledge economy and economic performance as GDP per capita and TNRR in the GCC countries. As part of the econometrics techniques, unit root tests assuming homogeneity of cross sectional elements, such as Levin, Lin and Chu (2002), Im *et al.* (2003), and Breitung (2000) are carried out in order to specify whether the variables are stationary or not and contains any stationary or not in all cross-sectional elements (Abubakar *et al.*, 2015: 98).

After conducting unit root tests for each country's data sets, this study employs the panel co-integration tests in order to determine whether there is a relationship among variables in long term or not. In detail, co-integration test mainly aims to clarify whether two or more variables are combined or not. When the variables combine, it is conducted considering the time. Therefore, the problem in short time could be purged in long term. In the case of not combining the two variables, it is not possible to straighten the confusions (Dickey et al, 1991).

The study employed both first and second-generation panel cointegration tests; these are the Pedroni (1999; 2000 and 2004) residual-based test. In the literature, Pedroni Panel Co-integration tests are, commonly, used. This test which allows for heterogeneous co-integrating vectors, not only allow differing the dynamic and fixed effects among the panel cross sections

but also it allows differing the co-integrating vector among the cross sections through alternative hypothesis. In this study, seven tests are employed in separate two categorises in the concept of Pedroni co-integration. In this regard, in the first category, three tests of them are related with non-parametric. First test is statistics relating with the type of variation ratio namely panel-v statistics. Second test is based on panel p statistics. Third test is also Phillips and Perron t statistics. The last test is on Dickey-Fuller (1979; 1981) t statistics. In the second category, first test is based on Phillips and Perron p statistics. Second test is mainly based on Phillips and Perron t statistics, and last test is Dickey-Fuller t statistics (Guvenek and Alptekin, 2010: 181). After Pedroni co-integration test, Kao panel co-integration test is employed in this study. Furthermore, the Fully Modified OLS (FMOLS) and Dynamic OLS (DOLS) estimators are also employed in this study in case of inconsistency of co-integration panel (Abubakar *et al.,* 2015: 98-99). After co-integration tests, Granger causality test is employed in order to specify the relationship among variables and in order to determine the casual direction if there is any relationship among variables. In this regard, variables have to be stationary in Granger test because of its causality feature rather than estimation (Granger, 1969).

2.7.2.2.1. Unit root test

As part of the empirical process, as identified, it is essential that data should be subjected to unit root tests to locate the stationarity of the data. If it is not stationary, it is possible to make it stationary by taking its difference within the first, second or other orders.

Table 2.4: Unit Root Results

			LLC		IPS		Breitung	
			t-statistic	p-value	t-statistic	p-value	t-statistic	p-value
GDP	Intercept	Level	0.2667	0.3948	-2.8063	0.0025***	-	-
		1.difference	-1.5898	0.0559*	-4.2905	0.0000***	-	-
		2.difference	-10.0391	0.0000***	-3.8141	0.0001***	-	-
	Trend-Intercept	Level	0.5596	0.7121	0.4830	0.6855	2.0412	0.9794
		1.difference	-0.0915	0.4635	-4.8877	0.0000***	-0.9871	0.1618
		2.difference	-8.7547	0.0000***	-0.9398	0.1737	-6.3178	0.0000***
TNRR	Intercept	Level	-4.1790	0.0000***	-2.0915	0.0182**	-	-
		1.difference	-7.3146	0.0000***	-3.0549	0.0011***	-	-
		2.difference	-10.5877	0.0000***	-4.0576	0.0000***		
	Trend-Intercept	Level	-3.3396	0.0004***	0.1412	0.5562	0.0068	0.5027
		1.difference	-7.1971	0.0000***	-0.7918	0.2142	-4.4899	0.0000***

		2.difference	-10.5013	0.0000***	-1.3983	0.0810*	-6.8960	0.0000***
WGI	Intercept	Level	-0.1308	0.4479	1.0671	0.8571	-	-
		1.difference	-5.5694	0.0000***	-2.4367	0.0074***	-	-
		2.difference	-8.6751	0.0000***	-3.6484	0.0001***		
	Trend-Intercept	Level	-2.5217	0.0058***	0.2154	0.5853	0.0646	0.5258
		1.difference	-5.7658	0.0000***	-0.7429	0.2287	-0.9601	0.1685
		2.difference	-9.4122	0.0000***	-1.3342	0.0911*	-1.7361	0.0413**
Freedom Index	Intercept	Level	-3.1623	0.0008***	-0.4755	0.3172	-	-
		1.difference	-4.2336	0.0000***	-1.2813	1.0000	-	-
		2.difference	-6.8083	0.0000***	-3.4656	0.0003***		
	Trend-Intercept	Level	-6.3979	0.0000***	-0.6460	0.2591	2.2384	0.9874
		1.difference	-7.4292	0.0000***	-0.6906	0.2449	0.7736	0.7804
		2.difference	-10.3314	0.0000***	-1.4892	0.0682*	-1.2833	0.0997*
Inotech	Intercept	Level	-4.3796	0.0000***	-1.1432	0.1265	-	-
		1.difference	-4.3701	0.0000***	-1.6184	0.0528*	-	-
		2.difference	-8.1126	0.0000***	-3.2323	0.0006***		
	Trend-Intercept	Level	-2.1979	0.0140**	0.5441	0.7068	1.0455	0.8521
		1.difference	-4.8190	0.0000***	-0.3038	0.3806	-2.0332	0.0210**
		2.difference	-7.5648	0.0000***	-0.7087	0.2393	-2.4845	0.0065***
Edu Index	Intercept	Level	-3.6800	0.0001***	-0.7312	0.2323	-	-
		1.difference	-10.9375	0.0000***	-4.2094	0.0000***	-	-
		2.difference	-10.9943	0.0000***	-4.8389	0.0000***		
	Trend-Intercept	Level	-8.4077	0.0000***	-1.4289	0.0765*	-0.9511	0.1708
		1.difference	-12.7376	0.0000***	-2.1956	0.0141**	-2.1034	0.0177**
		2.difference	-7.2311	0.0000***	-0.8122	0.2383	-1.6220	0.0524*
Ict Index	Intercept	Level	-2.8191	0.0024***	1.2842	0.9005	-	-
		1.difference	-9.2346	0.0000***	-3.5495	0.0002***	-	-
		2.difference	-11.8608	0.0000***	-4.6332	0.0000***		
	Trend-Intercept	Level	-5.3910	0.0000***	-0.4662	0.3205	-0.3110	0.3779
		1.difference	-9.6888	0.0000***	-1.1208	0.1312	-3.3482	0.0004***
		2.difference	-9.0400	0.0000***	-1.0696	0.1424	-3.7019	0.0001***

Notes: (***) significant at 1% level, (**) significant at 5% level, (*) significant at 10% level.

Table 2.4. depicts the results of unit root including the LLC (Levin, Lin and Chu) test (Levin *et al.*, 2002), IPS (Im *et al.*, 2003) test, and Breitung test have been presented.

H_0 hypothesis to be tested in the LLC test is as follows:

H_0: $\alpha = 0$

H_1: $\alpha < 0$

According to hypothesis, H_0 series contains unit root. As seen in Table 2.4., the LLC test results indicates that all variables are stationary as being significant at 5% level as intercept and trend-intercept except for GDP and WGI variables. WGI is also stationary as being significant at 5% level in its first variation. GDP is, however, found to be stationary in its second variation.

The hypothesis H_0: ρ_i for all '*i'* has panel unit root in IPS test with its alternative hypothesis creating as $\rho_i < 0$. According to the IPS test, all variables are stationary in their first variation at 10% level while some variables are not stationary when it is analysed as intercept and trend.

In substantiating the results, Breitung test is also undertaken, for which the hypothesis is as follows:

H_0: $\rho_i \equiv \sum_{k=1}^{p+1} \alpha_{ik} - 1 = 0$ all *i*=1….N

H_1: $\rho_i < 0$ all *i*=1….N

According to this hypothesis, H_1, Y_{it} refers to stationary as trend. Although Breitung test is stronger than the other two *t* statistics, it is possible to state that all variables are stationary as being significant at 10% level in their second variation as intercept and trend. When it is followed the LLC test, all variables have to be considered as their second variation in order to be stationary as seen in Model I (2) because of GDP being stationary in its second variation.

2.7.2.2.2. Co-integration Tests

After identifying the non-stationary of the data, this section presents the co-intergration test in an attempt to produce the necessary econometrics foundation for efficient running of panel data analysis in a later section.

Table 2.5: Pedroni Panel Co-Integration Test (GDP as dependent variable)

		Test statistic	p-value	Weighted test statistic	p-value
Within-Dimension	Panel-v statistic	-0.110844	0.5441	-1.934117	0.9735
	Panel-ρ statistic	2.783360	0.9973	2.818864	0.9976
	Phillips and Perron, t statistic	0.868616	0.8075	-2.482398	0.0065***
	Dickey-Fuller, t statistic	-0.588232	0.7218	-0.902823	0.1833
Between-Dimension	(Group) Phillips and Perron, ρ istatistiği	3.816524	0.9999		
	(Grup)Phillips and Perron, t statistic	-2.513121	0.0060***		
	(Grup) Dickey-Fuller, t statistic	-0.360783	0.3591		

Note: Lag length automatically selected on the basis of SBC.

According to Pedroni (1999), if time dimension of panel is short, group ADF *t* and panel ADF *t* statistic is resulted in positive. The critic value of all statistics is -1.64 except *v* statistic. If it is k< -1.64, null hypothesis is rejected. From this point of view, according to Pedroni panel co-integration test results, when only group PP *t* statistic is considered, it is significant at 1% level as statistic as seen in Table 2.5. H_0 hypothesis is rejected and there is no co-integration among series.

According to Kao co-integration test results in Table 2.6., H_0 hypothesis is rejected at 5% level of significance and there is not co-integration among series. Therefore, alternative hypothesis having co-integration among series is accepted.

Table 2.6: Kao Panel Co-Integration Test (GDP as dependent variable)

	Test statistic	p-value
ADF	-2.285682	0.0111**

Notes: (***) significant at 1% level, (**) significant at 5% level, (*) significant at 10% level.

In Pedroni and Kao co-integration test, Barlett Kernel method is used and Bandwidth is specified through Newey-West method in Pedroni and Kao co-integration test. In further substantiating the process, Pedroni Panel Co-Integration Test is also utilised.

Table 2.7: Pedroni Panel Co-Integration Test (TNRR as Dependent Variable)

		Test statistic	p-value	Weighted test statistic	p-value
Within-Dimension	Panel-v statistic	-1.688443	0.9543	-1.744022	0.9594
	Panel-ρ statistic	2.970654	0.9985	2.745779	0.9970
	Phillips ve Perron, t statistic	-2.209595	0.0136	-4.748953	0.0000***
	Dickey-Fuller, t statistic	-0.547392	0.2921	-1.600037	0.0548*
Between-Dimension	(Group) Phillips and Perron, ρ statistic	4.177946	1.0000		
	(Group)Phillips and Perron, t statistic	-6.398478	0.0000***		
	(Group) Dickey-Fuller, t statistic	-0.393629	0.3469		

Note: Lag length automatically selected on the basis of SBC.

According to Pedroni (1999), when only group PP *t* statistic is regarded, it is, statistically, significant at 1% level. H_0 hypothesis is rejected and there is not co-integration among series. As depicted in Table 2.7., PP *t* statistics at 1% level and ADF *t* statistic at 10% level are, statistically, significant in intro-group statistics.

Table 2.8: Kao Panel Co-Integration Test (TNRR as dependent variable)

	Test statistic	p-value
ADF	-0.551800	0.2905

Notes: (***) significant at 1% level, (**) significant at 5% level, (*) significant at 10% level.

It should be mentioned that in Pedroni and Kao co-integration test, Barlett Kernel method is used and Bandwidth is specified through Newey-West method in Pedroni and Kao co-integration test.

2.7.2.2.3. Panel DOLS and FMOLS Estimations

Following the unit root and co-integration tests, DOLS (Dynamic Ordinary Least Square) developing by Mark and Sul (2003) and FMOLS (Full Modified Ordinary Least Square) methods developing by Pedroni (2000 and 2001) are applied in this part of the study in order to test the consistency of estimations with expectations of being the unbiased estimator of the relationship between unit root test and co-integration test. FMOLS method helps to fix the deviation of the fixed effect estimations resulting from econometrics problem such as autocorrelation and changing variation (Pedroni, 2000). DOLS method also purges the deviations in static regression such as deriving from endogenous problem by adding the dynamic factors to model (Mark and Sul, 2003).

FMOLS method of Pedroni (2000), which significantly enables the heterogeneity among individual cross sections, considers the potential correlation in differences between among fixed term, error term, and independent variables. Pedroni (2000) has also investigated the impact of FMOLS method on the small samples and showed that there is a remarkable performance of *t* statistics on small samples.

Table 2.9: Panel FMOLS (Full Modified Ordinary Least Square) Results

Variables	2006-2015 (GDP)		
	Coefficient	t-statistics	Prob. value
Openness	0.503249	2.139468	0.0384**
Inflation	1.14×10^{9}	2.046921	0.0471**
WGI	1.38×10^{10}	3.801391	0.0005***
Freedom_Index	-2.98×10^{9}	-0.720516	0.4753
Inotech	3.60×10^{9}	0.729576	0.4698
EduIndex	1.10×10^{10}	2.235031	0.0309**
IctIndex	1.40×10^{10}	2.198507	0.0336**

Observation	60	Mean dependent var	2.20×10^{11}
Adjusted R-squared	0.961338	S.D. dependent var	2.08×10^{11}
S.E. of regression	4.08×10^{10}	Sum squared resid	6.84×10^{22}
Long-run variance	1.64×10^{21}		

Notes: (***) significant at 1% level, (**) significant at 5% level, (*) significant at 10% level.

As the results in Table 2.9. depicts, the model predicts nearly the entire variation in economic growth or GDP level, as R^2 is 0.96, which indicates the efficiency of the model supporting with correlation matrix which is stable for all indicators in this model as seen in Appendix A, Table A2.2 . As for all individual variables, 'openness' is found to be significant significant at 5%, 'inflation' is significant at 5%, 'WGI' is found to be significant at 1%, 'EduIndex' is significant at 5%, and 'ICTIndex' is significant at 5% level of significance, while the other variables, namely 'Freedom Index', 'inotech' are not statistically significant. According to Table 2.9., the expansion of the ICT facilities in the region through the established index is found to be positively correlated with GDP in the GCC countries, which should be considered as a positive sign in terms of the impact of knowledge economy on economic growth in the region. As for 'EduIndex' is significant and also has a positive sign. This relation could be explained that the region has been investing large sums of funds in education. However, it is a fact the impact of education can also be, efficiently, seen in the long run. As for 'WGI' is significant at 1% with positive impact. It seems that economic growth helps these countries to develop a better governance system which is one of the most important indicator for knowledge economy in

countries. As expected by neo-classical formulation, 'inflation' and 'openness' are a positive relationship to higher economic growth and hence increasing GDP in a country, which is found to be significant in this study as well because of the direct impact of GDP on inflation and openness.

As for 'freedom index', and 'inotech', there is a disappointing finding in the results presented in Table 2.9. It seems that 'freedom index' is not statistically significant for the GDP in Gulf region. This implies, out of everyday practice, the stronger economic expansion results in less freedoms in the region. In other words, economic growth seems not bringing expansion of freedoms but rather increasing security concerns have in recent years motivated the countries in the region to be more alert to freedoms. In particular, with the eruption of Arab Spring, the GCC states became more cautious of political demands which they surpassed with further expansion of patronage. The case for Bahrain is an example, as the political demands by Shite minority resulted in violence by the state. As for 'Inotech', as a strongest element of knowledge economy, it is not statistically significant. It can be explained by the fact that the economic wealth in the region is utilised to import technology and knowledge rather than the GCC countries heavily investing in production of innovation and knowledge such as expenditure on R&D. Thus, with further richness, it seems that countries purchasing more from the external world of such commodities and services rather than utilising their richness for expansion of a base in innovation.

Table 2.10: Panel DOLS (Dynamic Ordinary Least Square) Results

Variables	2006-2015 (GDP)		
	Coefficient	t-statistics	Prob. value
Openness	0.594360	2.204907	0.0324**
Inflation	8.88×10^{8}	1.338906	0.1870
WGI	1.29×10^{10}	3.131644	0.0030***
Freedom_Index	-2.26×10^{9}	-0.538753	0.5926
Inotech	3.82×10^{9}	0.830125	0.4107
EduIndex	9.78×10^{9}	1.940075	0.0584*
IctIndex	1.65×10^{10}	2.287381	0.0267**

Observation	60	Mean dependent var	2.12×10^{11}
Adjusted R-squared	0.958878	S.D. dependent var	2.03×10^{11}
S.E. of regression	4.11×10^{10}	Sum squared resid	7.93×10^{22}
Long-run variance	2.40×10^{21}		

Notes: (***) significant at 1% level, (**) significant at 5% level, (*) significant at 10% level.

As can be seen in Table 2.10., R^2 being very high (0.95) indicates high efficiency of the model in predicting the variations observed in GDP supporting with correlation matrix which is stable for all indicator in this model as seen in appendix A. As for individual variables, 'openness' is significant at 5%, 'WGI' is significant at 1%, 'Eduindex' is significant at 10%, and 'ICTIndex is significant at 5% level of significance, while other variables, namely 'Inflation', 'Freedom Index', and 'inotech' is not statistically significant. As expended from the ICT facilities in the GCC countries, 'ICT index' is found to be positively contributing in explaining GDP in the GCC region. Therefore, in terms of ICT, the impact of the knowledge economy on economic growth is positive. As for 'EduIndex' is significant and also has a positive sign. This relation could be explained that the region has been investing large sums of funds in education such as in Qatar and the UAE. However, it is a fact the impact of education can also be, efficiently, seen in the long run. As for 'WGI' is significant at 1% with positive impact. It seems that economic growth helps these countries to develop a better governance system which is one of the most important indicator for knowledge economy in countries. As for 'openness' is significant with positive impact on GDP. This implies that the region has a huge wealth through natural resources income.

'Inotech' is a disappointing index which is not significant in this model, it could be explained that the collaboration between education and R&D and innovation will take effect in the long term. It seems that improvement of innovation and technologies in the region such as expenditure on R&D, patent application, and university-industry collaboration does not affect the economic growth. Furthermore, 'freedom index' is also not found to significant with GDP in the GCC countries which can be explained by that fact that economic growth increase with decreasing of 'freedom index' unlike democratic countries. As above, this can be explained by the political economy nature of the GCC countries, as political legitimacy is bought rather than gained through popular electoral support.

Table 2.11: Panel FMOLS (Full Modified Ordinary Least Square) Results

Variables	2006-2015 (TNRR)		
	Coefficient	t-statistics	Prob. value
Openness	0.491726	5.053409	0.0000***
Inflation	7.04×10^{8}	3.041959	0.0041***
WGI	1.99×10^{9}	1.324054	0.1928
Freedom_Index	-2.34×10^{9}	-1.371857	0.1776
Inotech	2.53×10^{8}	0.123832	0.9021
EduIndex	3.80×10^{9}	1.860975	0.0699*
IctIndex	1.09×10^{9}	0.413184	0.6816

Observation	60	Mean dependent var	8.98×10^{10}
Adjusted R-squared	0.963870	S.D. dependent var	9.79×10^{10}
S.E. of regression	1.86×10^{10}	Sum squared resid	1.42×10^{22}
Long-run variance	2.81×10^{20}		

Notes: (***) significant at 1% level, (**) significant at 5% level, (*) significant at 10% level.

As the results in Table 2.11. depicts, the model predicts nearly the entire variation in TNRR level, as R^2 is 0.96, which indicates the efficiency of the model supporting with correlation matrix which is stable for all indicators in this model as seen in Appendix A, Table A2.3. As for individual variables, 'openness' is significant at 1%, 'inflation' is significant at 1%, and 'EduIndex is also significant at 10%, while other indicators are not statistically significant. It is remarkable that the results are different from the GDP being dependent variable, when TNRR is dependent variable. This result could be explained with the characteristic aspect of the GCC region basing on oil and gas rents. The impact of natural resources rents on the economic in the region is directly related with inflation and openness. Therefore, there is a positive correlation between openness and inflation and TNRR in the region. The rest of these three indicators is not significant with the TNRR in the region. This result shows that the economic diversification in the GCC countries is necessary for these states.

Table 2.12: Panel DOLS (Dynamic Ordinary Least Square) Results

Variables	2006-2015 (TNRR)		
	Coefficient	t-statistics	Prob. value
Openness	0.548044	5.176487	0.0000***
Inflation	5.99×10^{8}	2.300200	0.0259**
WGI	2.01×10^{9}	1.243181	0.2200
Freedom_Index	-1.50×10^{9}	-0.908266	0.3684
Inotech	8.27×10^{8}	0.457205	0.6496
EduIndex	3.99×10^{9}	2.014271	0.0497**
IctIndex	1.51×10^{9}	0.532486	0.5969

Observation	60	Mean dependent var	8.75×10^{10}
Adjusted R-squared	0.960754	S.D. dependent var	9.57×10^{10}
S.E. of regression	1.90×10^{10}	Sum squared resid	1.69×10^{22}
Long-run variance	3.71×10^{20}		

Notes: (***) significant at 1% level, (**) significant at 5% level, (*) significant at 10% level.

As the results of Table 2.12. depicts, model is predicting the natural resources rents level of the GCC countries with a R^2 value of 0.96, which indicates the efficiency of the model supporting with correlation matrix which is stable for all indicators in this model as seen Appendix A, Table A2.3. As for individual variables, 'openness' is significant at 1%, 'inflation' is significant at 5%, and 'EduIndex' is also significant at 5%, while other indicators are not statistically significant as seen parallel with its FMOLS results.

According to FMOLS and DOLS results, it is remarkable that 'EduIndex' and control variables are significant for economic performance both of GDP and TNRR in the region. However, 'freedom index', 'WGI', and 'inotech' indicators are crucial important for implementation of knowledge economy for a country. It is important that the relationship between these kind of variables and knowledge economy has to be investigated as economic, social, and political structure of the GCC countries, specifically.

Table 2.13: Granger Causality Results

	GDP	*TNRR*	*WGI*	*Freedom Index*	*Inotech*	*Edu Index*	*Ict Index*	*Trade Openness*	*Inflation*
GDP→	-	(4.0676) [0.0241]**	(1.9430) [0.1556]	(0.3492) [0.7072]	(0.5654) [0.5723]	(0.4962) [0.6122]	(1.7530) [0.1854]	(0.78989) [0.4604]	(0.61834) [0.5436]
TNRR→	(3.0156) [0.0595]*	-	(2.0482) [0.1414]	(0.0809) [0.9224]	(0.4954) [0.6127]	(0.2308) [0.7948]	(2.3414) [0.1083]	(8.04300) [0.0011]***	(0.35760) [0.7014]
WGI→	(0.3227) [0.7259]	(0.1642) [0.8490]	-	(4.5156) [0.0166]**	(0.0095) [0.9905]	(0.9688) [0.3877]	(1.6464) [0.2046]	(0.12200) [0.8855]	(0.85314) [0.4332]
Freedom→ Index	(0.9096) [0.4103]	(0.0982) [0.9066]	(0.0328) [0.9677]	-	(0.5858) [0.5610]	(2.4677) [0.0967]*	(2.3096) [0.1115]	(0.46184) [0.6332]	(2.75452) [0.0749]*
Inotech→	(1.0073) [0.3736]	(0.6113) [0.5473]	(0.6405) [0.5320]	(0.0843) [0.9193]	-	(1.7144) [0.1921]	(1.7797) [0.1809]	(0.46919) [0.6287]	(1.63578) [0.2067]
Edu Index→	(4.4979) [0.0168]**	(2.0877) [0.1363]	(0.2261) [0.7986]	(2.8052) [0.0716]*	(0.7605) [0.4736]	-	(0.5729) [0.5681]	(2.52211) [0.0921]*	(7.14777) [0.0021]***
Ict Index→	(6.3483) [0.0038]***	(6.0182) [0.0050]***	(2.8344) [0.0698]*	(0.4783) [0.6231]	(2.2461) [0.1181]	(3.7599) [0.0313]**	-	(5.04746) [0.0107]**	(7.59040) [0.0015]**
Trade Openness→	(1.61473) [0.2108]	(4.90950) [0.0120]***	(2.11401) [0.1331]	(0.05744) [0.9442]	(0.83348) [0.4414]	(0.31704) [0.7300]	(1.09771) [0.3428]	-	(1.53909) [0.2262]
Inflation→	(0.34053) [0.7133]	(0.41198) [0.6649]	(2.08025) [0.1373]	(0.05239) [0.9490]	(1.86634) [0.1670]	(0.72881) [0.4883]	(3.25150) [0.0484]**	(0.66230) [0.5208]	-

Notes: (***) significant at 1% level, (**) significant at 5% level, (*) significant at 10% level. The values in bracket refers the F test. The values showing square bracket also refers the prob values. Lag length is adjusted as minimum value of the SIC.

Table 2.13 provides Granger causality results between individual variables employed in the empirical models; as regression provides us the meaning and significance of a relationship but it does not demonstrate the direction of the causation. Therefore, Granger causality test is employed to identify the direction of impact.

According to the Table 2.13., the H_0 hypothesis, which states that WGI does not Granger cause freedom index, has been rejected, as governance causes freedom and there is a unilateral directional relationship from the WGI index to freedom being significant at 5% level. Furthermore, the H_0 hypothesis, which states that freedom index does not Granger cause inflation, has been rejected, as freedom causes inflation and there is a unilateral directional relationship from freedom index to inflation being significant at 10% level. It means that freedom affects consumption in the market. As for the H_0 hypothesis, which states that trade openness index does not Granger cause TNRR, has been rejected, as openness causes natural resources rents and there is a bilateral relationship being significant at 1% level. This bilateral relationship is also explained with the oil dependency of the region.

According the results reported in Table 2.13 indicates, the H_0 hypothesis, which states that ICT index does not Granger cause GDP, has been rejected, as ICT causes GDP and there is a unilateral directional relationship from the ICT index to GDP being significant at 1% level. In a similar manner, the H_0 hypothesis, which states that ICT index does not Granger cause TNRR, has been rejected in favour of a conclusion that there is a unilateral directional relationship from the ICT index to TNRR at significance level of 1%. It is remarkable that the increasing of and GDP and TNRR does not affect the ICT because of oil dependency of these countries. It means that economic diversification is necessary for a knowledge economy in the region. Moreover, the H_0 hypothesis, which states that ICT index does not Granger cause the WGI, has been rejected in favour of a conclusion that there is a unilateral directional relationship from the ICT index to the WGI at significance level of 10%. It is expected results that the improvement of ICT affects the governance and transparency in the region. Another relationship is that the H_0 hypothesis, which states that ICT index does not Granger cause eduindex, has been rejected, as ICT causes education and there is a unilateral directional relationship from ICT index to eduindex being significant at 5% level. It implies that the improvement of ICT affects the education positively in the region. Furthermore, the H_0 hypothesis, which states that ICT index does not Granger cause openness, has been rejected, as ICT causes openness and there is a unilateral directional relationship from ICT index to openness being significant at 5% level. It

means that the increasing demand on the ICT affects the openness because the GCC countries imports the ICT facilities. Another relationship is that the H_0 hypothesis, which states that ICT index does not Granger cause inflation, has been rejected, as ICT causes inflation. Moreover, there is a unilateral directional relationship from ICT index to inflation being significant at 5% level. It means that the increasing demand on ICT facilities makes pressure on price in the market.

The results indicate that Edu Index index does not Granger cause GDP in rejected in favour of a conclusion that there is a unilateral directional relationship from education to GDP significance level of 5% as seen in Table 2.13. It means that education relates economic diversification in the region because education could directly affect the non-oil sector. Furthermore, the H_0 hypothesis, which states that education index does not Granger cause freedom index, has been rejected, as ICT causes freedom index. The results demonstrate that there is a bi-directional relationship between education and freedom, which is found to be significant at 10% level. This bilateral relationship shows the reliability of this model because these indicators develop together. The H_0 hypothesis, which states that education index does not Granger cause trade openness, has been rejected, as education causes openness and there is a unilateral directional relationship from education to openness being significant at 10% level. Another relationship is that the H_0 hypothesis, which states that education index does not Granger cause inflation, has been rejected, as education causes inflation and there is a unilateral directional relationship from education to inflation being significant at 1% level.

According to the relationship in each other of dependent variables of this model, the H_0 hypothesis, which states that TNRR does not Granger cause GDP, has been rejected, as TNRR causes GDP. The results demonstrate that there is a bi-directional relationship between TNRR and GDP, which is found to be significant at 10% and 5% level. It means that TNRR cause the GDP being significant at 10% level because of oil dependency of the GCC countries. This result also shows the reliability of this model. Another expected result is that there is not any causality of InoTech in the region. This result could be explained that while the region has been investing large sums of funds in innovation and technologies in the last years, it is a fact that the impact of these kind of investments such as R&D and university-industry collaboration can only be seen in the long run.

2.7.2.3. The Key Findings

This study can be considered a novel approach to research via examining the quantitative relationship between economic performance and knowledge-based economy indicators in the GCC region for the period between 2006-2015, based on the KEI indicators generated by the World Bank created for 1995, 2000, and 2012. The preceding sections presented the empirical process and findings based on econometrics analysis. This section recapitulates the key findings drawn from this study.

The GCC countries have similar political economies in terms of being rentier states depending on oil and gas revenues. However, despite these similarities, the GCC countries can differ from one another on some specific indicators as their governance and economic priorities can vary. For example, Bahrain has a national vision called 'Economic Vision 2030' and, therefore, Freedom, InoTech, ICT Index, and openness as policy options are significant for Bahrain. This implies that innovation, R&D, technology, and ICTs have played a significant role in the economic performance of Bahrain.

The results for Kuwait are comparable to the other GCC countries but WGI, Freedom, InoTech, and the ICT index as knowledge economy indicators plays a significant role in economic performance for the state, as detailed in the Kuwait National Development Plan 2035.

The findings show that InoTech, EduIndex, ICTIndex is important in Oman where the policies on knowledge economy have been heavily implemented because of their search for an alternative source of economy under the conditions of relatively less oil-income. Therefore, Eduindex is significant for Oman, as the Oman National Vision 2020 and 2040 identifies a knowledge economy as one of the main pillars.

The results for Qatar show that Freedom, InoTech, EduIndex, ICTIndex is significant for the relationship between KEI and economic performance. As the results show EduIndex has played an important role in Qatar, which has aimed to be an education hub in the region central to their National Economic Vision 2030. These results show that Qatar has prioritised knowledge economy pillars for the post-petroleum era.

As the results demonstrated, in the case of Saudi Arabia WGI, Freedom, ICTIndex played a significant role in explaining their economic performance, which is reported in the Saudi Vision

2030 as an object. The variables show that after the 2010s such indicators have demonstrated better performance with an increasing momentum towards the pillars of KEI.

Lastly, the findings demonstrate that the UAE has been the leading country with economic performance that has also been successful on a knowledge economy for which WGI, Freedom, InoTech, EduIndex, and ICT has played a significant role in the state.

2.8. CONCLUSION

The entire discussion on knowledge economy and its relationship with economic performance has been the subject of previous studies, which are at the centre of this GCC focused research, as this study aims to explain economic growth through knowledge economy indicators, in the case of the GCC countries. In doing so, this study also compares the GCC states through the four main pillars of a knowledge economy. In the light of these pillars, this study attempts to answer the question: 'What is the role of a knowledge-based economy in the entire economic structure of oil-rich GCC countries?' In responding to this question, the KAM and Granger Causality was used as the two prominent empirical tools to conduct empirical analysis to substantiate this study.

The nature of rentier states, and a sole-type of economic activity defining these rentier oil-dependent states has brought challenges to the regular relationship between economic development and a knowledge-based economy observed in the rest of the world. Basic and unique characteristics of the GCC states are valid in their effort to build up a knowledge-based economy, such as the lack of populations, and the distributive nature of the rentier state. Furthermore, according to the empirical results, a lack of adequate and appropriate local skills and technologies in the GCC countries remains a challenge, although a skilled-labour market is significant for a knowledge-based economy. Economic and social realities in the region create insufficient incentive for local workers to take active roles pursuing the development of a knowledge economy. Therefore, local labour fails to satisfy the needs regarding requirements for technological progress and innovation. As a consequence of that, the implementation of a Schumpeterian model of growth has become deadlocked in the GCC countries in terms of knowledge accumulation.

Although endogenous growth in the literature requires heavy knowledge accumulation to manage technological progress through innovation, the empirical results show that knowledge economy pillars in general have not been embedded in the economic performance of the GCC

countries, and that constitutes a problem for the post-petroleum era. It should be derived from this, that these countries have never experienced industrialisation as a result of being rentier economies. For example, according to the empirical results in this research, despite playing a vital role in economic performance, WGI and Education in the GCC countries are not strong determinants of economic performance as much as the other pillars, such as, ICT and InoTech, which mostly have a unidirectional relationship with economic performance. This shows that public policy making in the GCC countries is mainly based on the import of the ICT and InoTech instead of creating an education and innovation system for critical thinking and active learning regarding developing the knowledge economy. This fact is far away from the reality of endogenous growth. In fact, the current educational system is not able to prepare the younger generation for taking an active role within the knowledge economy. Therefore, they have faced challenges regarding the implementation of economic diversification, creating a technological hub, and restructuring the labour market.

It should also be noted that among the GCC countries, the UAE has developed pro-active policies and strategies for the post-petroleum era by reducing their oil-dependency through production and knowledge economy policies. In addition, Qatar is the second most successful country in the region through their investment on education to develop and become the foremost education hub in the region. Despite their efforts, these countries still are dependent on oil and gas revenues and are not producers except for oil and gas so that they are heavily based on imports. As presented in the descriptive empirical results, the GCC countries have still an inadequate local labour force and technology indicators when they are compared to advanced states. Furthermore, the GCC countries need to develop the skill levels of the local labour force so that indigenous technologic development and innovation can replace importation. However, human capital in these countries has not been developed enough to contribute to their economic performance, because their human resources are mostly dominated by expatriates. Therefore, the GCC countries not only import their technology from foreign countries but also import skilled labour. Consequently, the lack of national human capital remains an important barrier in developing a knowledge economy, economic diversification and transformation for the post-petroleum era in the region.

This research can be construed as a unique study aiming to examine the adoption of a knowledge economy in the GCC countries. Despite its unique design limitations are apparent. The GCC countries are not transparent in data and information dissemination which implies that data collection has been a significant challenge. Therefore, this study provides vital future

advice for potential researchers, namely, that knowledge economy indicators are not convenient to apply to all countries in the world. This infers that the GCC states require unique development methods suited to their particular economic and political structures, and societal nature, in addition to being rentier economies.

CHAPTER 3

INTELLECTUAL CAPITAL FORMATION AND FINANCIAL PERFORMANCE OF THE GCC ISLAMIC AND CONVENTIONAL BANKS AS A REFLECTION OF KNOWLEDGE ECONOMY: AN EMPIRICAL ANALYSIS

3.1. INTRODUCTION

Apparent within recent changes to the global economy are differences between modern and traditional approaches to value creation processes, as seen through a complex, dynamic and competitive environment, which prioritises a knowledge-based economy providing sustained advantages to economic and financial actors (Ting and Lean, 2009: 588). The value and wealth creation base not only relate to products and physical assets but also to intellectual assets. Therefore, people, firms, banks, financial institutions and each segment of the market, have been affected by this on-going transformation. Consequently, as a reflection of a knowledge economy, the concept of intellectual capital has started to play a significant role as "the invisible balance sheet" (Rezai and Mousavi, 2014: 1809), which has more value for organisations than physical assets in this changing global economy.

'Intellectual capital' has been identified as the lifeblood of a knowledge-based economy, which contains a variety of idiosyncrasy, such as, knowledge, skills, good relationships, and technological proficiency in terms of human capital and structural capital (Ku-Ismail and Al-Musali, 2011: 63-64). The notion of intellectual capital, moreover, needs to be developed to measure and evaluate the impact of intellectual capital on organisations, although a number of empirical studies exist which consider issues from different aspects (among others, *see*: Mavridis and Kyrmizoglou, 2005; Kamath, 2007; Yalama and Coskun, 2007; Li *et al.*, 2008; Damayanti and Budiyanawati, 2009; Khalique *et al.*, 2013; Mubaraq and Ahmed Haji, 2014; Nawaz and Haniffa, 2017; Bhatia and Mehrotra, 2016; and Al-Musali and Ku-Ismail, 2016).

In a modern economy, intellectual capital is at the centre of the banking sector, which has played an increasingly prominent role in promoting innovation, growth and business. Furthermore, the

rationale for highly intellectual capital in the banking sector emerges from instituting intellectually homogeneous practices and dependency on the intensive knowledge-based nature of banking and finance in comparison with the other economic sectors (Ku-Ismail and Al-Musali, 2011: 64).

The measurement of intellectual capital performance in banks or elsewhere, has been subject to debate in a search for the most appropriate methods. In the literature, the most popular method is the Value Added Intellectual Coefficient (VAIC), method of measuring the efficiency of intellectual capital (Pulic, 1998; 2000; 2004), which relates to financial statements categorised as human capital, structural capital, and capital employed. Therefore, the VAIC model has been applied to the banking sector assessing their financial data with the objective of evaluating intellectual capital performance and its impact on financial performance. The measurement of intellectual capital efficiency in banks has become more of an issue in the modern banking system due to the increased use of innovation, human capital, and technology. In order to respond to such measurement issues, in this study, the measurement of intellectual capital efficiency is framed through the intellectual capital terminology and its pillars, such as, human capital, structural capital, and capital employed supported by the VAIC model and disclosure analysis as part of the empirical section.

As for the organisation and the contents of this paper, following the introduction and establishing the research aims and objectives in the initial sections, the definition and determinants of intellectual capital in the banking sector are presented in Section 3.4 to constitute a conceptual framework to the study. In addition, under Section 3.4.4, an Islamic understanding in terms of creating knowledge and human capital is articulated by shedding light on the modern banking system and its perspective on intellectual capital. Such a perspective relates to intellectual capital goals, which concern the realm of 'what ought to be' in Islamic banking institutions and operations. Developing an Islamic understanding of knowledge and human capital in order to evaluate existing studies is an important feature of this research detailed in the following sections. A review of empirical studies in the field is presented in Section 3.5. before conducting empirical analysis. The empirical research examines and evaluates the development of intellectual capital in the GCC banking sector. Section 3.6. analyses the intellectual capital performance of, initially, all types of banks and then evaluates Islamic and conventional banks as individual cases through applying two different empirical models: the VAIC model in Section 3.6.1. and disclosure analysis in Section

3.6.2. which includes descriptive results and regression models. Lastly, Section 3.7. presents a general discussion and conclusion.

3.2. AIMS, OBJECTIVES AND RESEARCH QUESTIONS

This paper explores and examines the state and determinants of intellectual capital capability performance of the GCC Islamic and conventional banks and also the impact of this performance on the financial performance of the sampled Islamic and conventional banks in the GCC states. In this empirical study, as discussed in detail in the following sections, the intellectual capital capability is articulated by the level of human capital efficiency, structural capital efficiency, and capital employed efficiency. In addition, this paper also estimates and evaluates the development of intellectual capital performance of the sampled Islamic and conventional banks in the GCC countries through a disclosure analysis method via assessing their annual reports by constituting an Islamic and conventional intellectual capital disclosure (ICD) index.

In line with these aims, the following objectives are developed:

(i) to explore the theoretical formation of intellectual capital through Islamic ontology and epistemology;
(ii) to identify the intellectual capital performance level of Islamic and conventional banks in the GCC countries;
(iii) to empirically investigate the role of knowledge on the intellectual capital performance of Islamic banks to facilitate the sustainability of a knowledge economy in the Islamic banking sector;
(iv) to develop a disclosure index to assess the discourse performance of Islamic and conventional banks in relation to intellectual capital performance;'
(v) to examine the impact of intellectual capital on the financial performance of the sampled Islamic and conventional banks through secondary data and data generated through disclosure analysis.

In line with the aims and objectives of this paper, the following research questions are developed:

(Q1) What is the impact of Islamic ontology and epistemology in developing intellectual capital for the sustainability of Islamic banking institutions?

(Q2) What is the level of intellectual capital of Islamic and conventional banks in the GCC countries?

(Q3) To what extent does the intellectual capital as a knowledge source determine the financial performance of Islamic and conventional banks in the GCC countries?

(Q4) What is the impact of intellectual capital disclosure performance on financial performance of Islamic and conventional banks in the GCC region?

3.3. RESEARCH RATIONALE, SIGNIFICANCE AND METHODOLOGY

The previous chapter explored and examined the knowledge development in the GCC countries at a macro or state level. This chapter takes that empirical attempt a stage further by locating the dynamics of knowledge, its articulation and consequences in the form of intellectual capital at bank level, namely, within Islamic and conventional banks, whereby, it complements the macro level study of Chapter 2 with a micro level empirical paper in this chapter to develop a comprehensive understanding on the subject.

The significance of this research stems from the motivation to evaluate the development of intellectual capital in Islamic finance that has been developed in the last decades, after the emergent wealth from petro-dollars in the 1970s. Therefore, considering the GCC countries as a case study helps to evaluate Islamic banking, where it has started to develop.

The development of human capital and articulating knowledge by discovering or improving existing knowledge is considered to be the foundation of Islamic finance despite an increasing emphasis on financial performance. Islam as a source of knowledge, on the other hand, prioritises the development of knowledge and human capital in order to develop societies. From this point, this study is significant and novel as it attempts to provide an ontological framework to essentialise knowledge for Islamic financial institutions. In addition, it assesses and analyses the level of intellectual capital in Islamic banks in comparison to conventional banks.

3.4. INTELLECTUAL CAPITAL FORMATION AND PERFORMANCE IN FIRMS AND INSTITUTIONS: A CONCEPTUAL INQUIRY

This section aims to provide an introductory and critical conceptual and empirical survey of the existing VAIC model-based literature to develop a foundation for the empirical part of the study.

3.4.1. Intellectual Capital: Conceptual Definition

While intellectual capital is one of the most significant assets in a knowledge-based economy, consensus has not converged on definitions of the concept although several broad definitions have been put offered. Many organisations develop their own definitions of intellectual capital in line with their structures and strategies (Ting and Lean, 2009: 589). Stewart (1991; 1994), for example, describes intellectual capital in terms of providing a competitive advantage to organisations, referring to knowledge, know-how accumulation, skills, experiences, and specialities of personnel in any organisations (Stewart, 1991: 45; 1994: 28).

Intellectual capital, epistemologically, refers to 'knowledge about knowledge', and understanding of intellectual capital corresponds to the need assessment of language in its identification and application (Chan, 2009: 5-6). However, due to the fact that knowledge is a tacit source, researchers face certain challenges to find a common language in terms of definition and discussion of intellectual capital. Therefore, intellectual capital can be identified as participation and stakeholders in an organisation (Chan, 2009: 6).

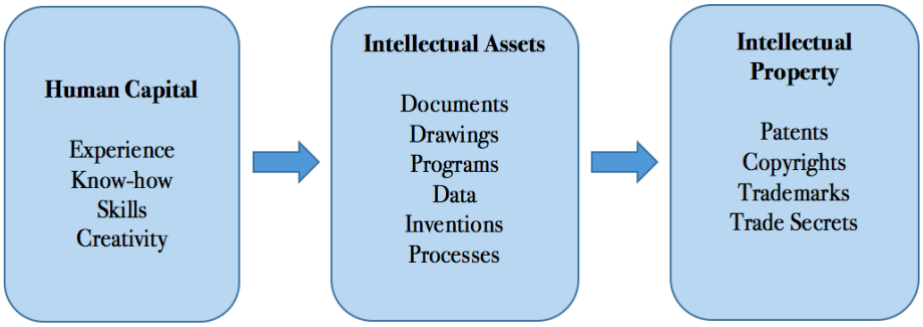
The term intellectual capital refers to a knowledge generation formation process and outcomes within organisations; and therefore, intellectual capital of organisations arises from accumulation of extensive knowledge through employees' knowledge and contributions (Chan, 2009: 6). However, the term intellectual capital can be expanded through the distribution of employees, stakeholders, participants, executives *etc*. that are all related to human knowledge in the form of human capital. Furthermore, intellectual capital is a broader term than human capital by consisting of structural capital (Chan, 2009; Edvinsson, 1997). It becomes apparent that the term of intellectual capital is used with other terms synonymously such as knowledge capital, human capital, and intangible assets (Chan, 2009; Tseng and Goo, 2005).

The components of intellectual capital can, thus, be categorised as human capital, customer capital, structural capital, innovation capital, process capital, social capital, and cultural capital

(Donmez and Erol, 2016: 31). However, in this study, intellectual capital is assigned an economic value through some proxies for measurement consisting of human capital, structural capital, and capital employed in line with studies, such as, Pulic (1998; 2004), Al-Musali and Ku-Ismail (2016) and Nawaz and Haniffa (2017). Hence, intellectual capital cannot be relegated only to knowledge that exists in organisations and firms.

While related to knowledge accumulation, intellectual capital can be confused with the term, knowledge. In fact, intellectual capital is the sum of everything about knowledge that in totality has been known by organisations in providing some advantages to them in the market (Nawaz, 2017: 214). This implies that intellectual capital is the articulation of acquired knowledge in different spheres of organisations' everyday operations. In such a process, knowledge is a source that helps to create intellectual capital, as seen in Figure 3.1. Therefore, it is possible to state that intellectual capital arises as long as knowledge is transformed to a value that leads to growth and development in an organisation or firm through patents, copyright, trademarks, and other value-added services. Therefore, intellectual capital refers to a value rather than basic data or knowledge, as seen in Figure 3.1.

Figure 3.1: The Formation Process of Intellectual Capital



Source: Sullivan (1998: 22)

Through the development of intellectual capital, it is observed that executives in organisations have changed their business strategies from tangible assets to intangible assets that led to growth in their business corporations (Tseng and Goo, 2005: 188). Intellectual capital is, therefore, considered as the main significant source of value creation nowadays (Mention and 2013: 286).

3.4.2. Theoretical Framework on Intellectual Capital: Resource-based Theory

In the knowledge economy era, firms have captured competitive advantage in the market through the intangible capital they have developed, such as attaining quality, keeping abreast of changes in the economy, maximising productivity, abstaining from wasting sources, and contributing to their societies through utilising innovative ideas.

The intangibility of intellectual capital can be linked to non-material sources embedded in the firms as hidden capital that also contributes to the economic growth of the firms and countries. Such perspective and change in the economy led to the emergence of new theories, and valuing and measuring methods, in terms of intangible resources (Andriessen, 2004: 3). Therefore, economists *(see*: Barney, 1991; Grant, 1991; Andriessen, 2004; Priem and Butler, 2001; and Barney and Clark, 2007) have sought theories to develop a scientific foundation to account for such changes in the economy, such as, resource-based theory, agency theory, organizational learning theory that closely relate to a 'knowledge economy'. Therefore, intangible assets (henceforth, intellectual capital in this research) help to measure and value the contribution of firms and organisations in the area of intellectual capital. Furthermore, resource-based theory shows how intangible and financial resources related to knowledge stimulate financial performance, in this case, within the banking sector (Al-Musali and Ku-Ismail, 2016: 527). Therefore, resource-based theory is a better theory to provide a basis for analysing intellectual capital in the banking sector.

Resource-based theory provides advantage to firms and organisations through its possession of incomparable material, human, and organisational sources that helps to create value related to capital and strategies that all need to be valuable, rare, inimitable, and non-substitutable (Barney, 1991; Priem and Butler, 2001; Barney and Clark, 2007). From this perspective, contenders considering resource-based capital have focused on understanding the empirical application of the theory and its impact on firm's or organisation's performance (*see*: Barney, 1996: 469; and *see* others: Grant, 1991; Godfrey and Hill, 1995; Barnett, Greve, and Park 1994; Henderson and Cockburn 1994). Therefore, resource-based or knowledge-based theory has been applied during the early 1990s, to explain firm's performance, while there was a widely accepted theory of the firm at that time (Barney, 1996: 469). In this regard, the matter of resources, such as knowledge, learning, culture, teamwork, and human capital have been developed through resource-based theory (Barney, 2001: 45).

While a knowledge-based economy has been considered through macroeconomic perspectives (*see* others also related to intangible capital: human capital theory; technical change and innovation theory; intellectual investment; new growth theories; evolutionary theories; and the analytical approach), while, from a broad viewpoint, resource-based theory is more oriented towards microeconomic perspectives (*see* others also related to intangible capital: competence views, dynamic capabilities, intangible capital ideas, and knowledge creation stances) by considering firms' performance rather than the economic performance of an entire country (Bounfour and Edvinsson, 2005: 6-7). At this point, it is important to state the shortcomings of the resource-based theory: for example, resource-based theory considers firms, and not society, whereby, it becomes difficult for this theory to contribute to the social welfare of societies and, therefore, remains at firm, organisational or micro-level (Barney and Clark, 2007: 261-262).

Resource-based theory is pertinent to the intellectual capital performance of firms or organisations by examining its portfolio of resources and their articulation. Therefore, resource-based theory enables an examination of intangible assets and its impact on tangible assets in the firms and organisations to maintain a sustainable competitive advantage. Consequently, to understand the impact of intellectual capital on the financial performance of banks, it is necessary to consider knowledge, experiences, skills, innovation, culture, and human capital (Al-Musali and Ku-Ismail, 2014 and 2016; Nawaz and Haniffa, 2017; Rezai and Mousavi, 2014; Abhayawansa and Abeysekera, 2008). In addition, resource-based theory considers intellectual capital that assists firms to gain a sustainable competitive advantage, as well as, physical and financial capital. In fact, according to resource-based theory, intellectual capital is the most important source that provides competitive advantage and value added to the firm as it cannot be easily imitated and substituted (Reed *et al.*, 2006).

Since ascertaining the value of intellectual capital as significant for the firms, a number of measuring methods have merged as depicted in Figure 3.2 (*see*: Section 3.6.1.2. Model selection and variable definition). However, traditional techniques are not sufficient to measure intangible assets, because these methods mostly consider financial values and tangible assets of firms rather than intangible values (Nawaz and Haniffa, 2017). Therefore, new methods such as VAIC provides an opportunity to examine the performance of firms through intangible assets and subsequent impacts on financial performance (Al-Musali and Ku-Ismail, 2014 and 2016; Ku-Ismail and Al-Musali, 2011; Nawaz and Haniffa, 2017). In this sense, the GCC countries represent one of the best examples to examine the intellectual capital and financial performance relationship, as they are financially developed and have knowledge-based economic policies

for the post-petroleum era. While the intellectual capital generated by the GCC banks may not be sufficient to provide a competitive edge, their foreign institutional shareholders contribute to their intellectual capital through their experience, technological and organisational capabilities (Al-Musali and Ku-Ismail, 2012: 120).

3.4.3. Measurement of Intellectual Capital

The measurement of intellectual capital has been conducted by several different models since the 1950s that comprise human capital, structural capital, and relational capital. However, in the late 1990s, the VAIC model, which is developed by Pulic (1998; 2004), focuses on two components of intellectual capital including human capital and structural capital by contributing to value creation that has been at centre of the many empirical studies (*see*: Dzenopolijac *et al*., 2017: 885-886). In addition, Pulic (2004) argues that the value creation efficiency of organisations can be measured both in physical (capital employed) and non-physical (human and structural capital) terms instead of focussing only on intangible assets to measure the value creation of organisations. Some scholars have focussed on relational capital (customer and supplies relations) instead of capital employed by arguing that 'intangible' by nature does not contain any financial value (Yang and Lin, 2009; Mavridis and Kyrmizoglou, 2005; Rehman *et al*., 2011).

Despite the measurement differences apparent among several aspects, due to the resemblance of idiosyncrasies, it is difficult to measure intellectual capital through the financial statements of organisations, while they remain the main source of providing some advantages to organisations in the market. The VAIC model by Pulic (1998; 2000; 2004), hence, aims at measuring intellectual capital performance through the disclosed information in financial statements. Therefore, the VAIC model has become very popular in the literature to work on intellectual capital from different cases and aspects, as per this research. The following sections defines and explores various aspects of the model.

3.4.3.1. Human capital, structural capital, and capital employed

As part of the VAIC model, 'human capital' consists of people contributing to organisations through their capabilities, experience, and success at the centre of each organisation as a main source in order to create economic value (Puntillo, 2009: 100; Alipour, 2012: 55). This kind of sources can be seen as value to the organisations in order to contribute to the value creation dynamics (Alipour, 2012: 55). Furthermore, more qualified and efficient personnel mean better

efficacy for organisations, increasing their value-added efficiency (Rehman *et al*., 2011: 9). In this regard, to manage such efficiency, human capital is needed to contain some components within itself, such as, technical knowledge, education, motivation, experience, and skills (Beattie and Thomson, 2007: 137). Therefore, organisations having high levels of human capital, can be seen as productive, profitable and high value in the market. For instance, in order to increase financial performance, the financial sector needs well-developed human capital, who are customer-oriented, more skilled, acquainted with technologies for both use and developing innovation, and have broad experiences (Zin *et al*., 2014: 402).

'Structural capital' is another significant component of intellectual capital that consists of all non-human knowledge assets in organisations, that facilitate employees to perform at maximum efficiency, such as, systems, databases, copy rights, patents, rules, and policies which all are important for decision making process in any organisation (Rehman, 2011: 9; Bontis, 1998: 66; Calabrese *et al*., 2013: 3748; Mehralian *et al*., 2013: 210; Watson and Stanworth, 2006; Alipour, 2012: 55). Therefore, through these non-human assets, structural capital can assist organisations through its capabilities to meet the market expectations. Strong structural capital, moreover, provides an environment for organisations to deploy human resources (Ramezan, 2011: 90) by covering the system, human capital, and process of an organisation by involving non-human assets in business strategies. This type of capital also refers to knowledge that is captured and institutionalised within the process, structure, and culture of organisations, being a subset of its explicit knowledge (Alipour, 2012: 55). Therefore, it is possible to divide the structural capital as innovation capital, such as, software, brands, patents and processes of the organisation, such as, culture, vision, mission, basic values and principles, and strategies (Puntillo, 2009: 100). Structural capital can also be identified as permanent capital in organisations in contrast to human capital, which necessitates the preservation of structural capital in an organisation, to reuse at any time.

'Capital employed' is also considered as relational capital, which refers to the amount of capital that drive organisations' capacity to create income and value in the form of current and fixed assets, for example, in terms of operating assets of organisations (Zin *et al*., 2014: 403), such as equity capital, loans and liabilities. Moreover, capital employed also refers to the comprising of knowledge that helps to develop the relationship between organisations and its external partners, such as, customers and suppliers. Therefore, this kind of capital relates to the value of an organisation's image, brand, and reputation as invisible assets that all affect external partners (Shamsudin and Yian, 2013: 331-332).

3.4.4. Essentialising Islamic Intellectual Capital Formation through Islamic Ontology and Epistemology

Islamic moral economy, as identified in Chapter 4, is based on revealed knowledge as an ontological base; and therefore, institutions are expected to emerge and operate according to the principles derived from the knowledge revealed in *Qur'an* and how such knowledge was explained and practiced by the Prophet of Islam (*see*: Chapter 4 for a detailed discussion). Indeed, the historical knowledge and practice as the articulation of *Qur'an*, *hadith* and *sunnah*, is also an important source in responding to the emergence of Islamic institutions and shaping the value base of these institutions by Islamic norms.

Islamic moral economy identifies the objectives of individuals being *falah,* or salvation in this world and the hereafter. Societal objectives are identified through the expansion of *ihsani* social capital or growth of beneficence, whereby, *ihsan* works as an equilibrium mechanism (Naqvi, 1994). Within this substantive morality, individuals are expected to develop themselves through a *tazkiyah* process by essentialising 'growth in harmony' in the sense that their individual growth should pave the way to the growth of others, so that a *tazkiyah* process can be effective in achieving the 'perfection path' through *rububiyah*, given to human beings. In other words, Islamic moral economy suggests that Allah created everything with a particular path for development (*rububiyyah*) as a natural course. Importantly, these are provided as knowledge for individuals to develop and follow. In this process of achieving *rububiyyah*, the concept of *ihsan* suggests that those who are in a favourable position should attempt to bring others to a similar level, as the equilibrium nature of *ihsan* suggests (Naqvi, 1994).

Due to the importance given to knowledge in emancipating and empowering individuals for development purposes, the first revealed verse of the *Qur'an* relates to 'reading'. The accumulated knowledge that is Islam is then articulated through practices in developing faith or *iman* so that through a *tazkiyah* process the objective of *rububiyah* can be achieved (Zaman and Asutay, 2009). The result of such a process is considered as *falah* or individual salvation indicating an immersed process of knowledge in the form of Islam and *iman*'s augmentation. Individuals are expected to take such a salvation process to the society, which includes organisations, so that the *rububiyyah* process can be completed by individuals acting upon expanding *ihsan*. This process, thus, results into expansion of knowledge articulation in organisational and societal level, as well. Thus, knowledge and its embeddedness and

affirmation in the form of intellectual development is an essential part of an Islamic moral economy system, as the 'becoming process' in Islam requires a learnt and informed nature.

3.4.4.1. The role of human being on knowledge articulation in Islam

Human progress is also related to the rise and fall of societies through the nature and capabilities of human activities, which cannot only be explained by economic dynamics but also moral, political, institutional, social, and demographic variables throughout history, as the Ibn Khaldunian take up suggests (Chapra, 2008b: 840). All these dynamics are only possible to be changed by humans who are responsible to develop society through knowledge produced by both revealed and acquired knowledge according to Islam. Therefore, one of the important axioms of Islamic moral economy is *islah*, that is reform through the agency of the individual; as Islamic moral economy perceives human beings as the main agent of change (*see*: Asutay, 2007a).

Considering the importance attached to knowledge with a particular reference to development, the holiness of its acquisition has been demonstrated by the first verse revealed in forming the *Qur'an* which relates to '*iqra*' or 'reading'. Since revealing '*iqra*', human beings have been obliged to obtain knowledge to develop society and discover the universe for Allah's sake, as stated in *Qur'an* (13:11). Therefore, in order to develop society, humankind need to self-develop attaining knowledge with an aim to reach perfection through the 'becoming' process essentialised by Islamic methodology (Zaman and Asutay, 2009).

A vital question is why human-beings are responsible to develop society, which can be related to the term, *umran*, frequently referred to in the *Qur'an* with regards to the development of society, civilisation, and habitat. Malkawi (2013) states that *umran* constitutes the material aspect of development within a moral frame of society, which provides the necessary structure for building and developing human capital, as well as, economic and social paradigms (Malkawi, 2013: 127). Therefore, good governance should essentialise justice for individual, social, economic, and political development of the society in line with the substantive morality of Islam.

The development of human capital is essential for human beings to increase their abilities and capabilities in fulfilling their duties to Allah, thereby, increased service to society for sake of God is considered a part of socialisation, that *ihsan* suggests (Abdullah, 2012: 66-67). As identified in the *Qur'an* (43:10): "He it is Who made for you the earth a resting place, and has

made for you roads therein, in order that you may find your way", the blessing in the world has been created for human-being's sake (Sadr, 2015: 401). Thus, humankind is the main driving force of the world as, they are considered *khalifah* or vicegerent/ representative of Allah, as identified in the *Qur'an* (2:30): "And when your Lord said to the angels: I am making a caliph (human) on the Earth. They said: Are you making therein one who corrupts it and sheds blood, while we hymn Your praise and sanctify You? He said: Surely, I know that which you do not know". This can be explained as "Human being are people who have superior personality, with the mastery of knowledge and skills in the context of the duties and responsibilities entrusted to the representative of God for the prosperity of society and also for the management of the whole universe" (Thaib, 2013:14).

Therefore, according to Islam, people need to have skills and knowledge by improving themselves to attain *falah*, so that the development of their society and the world through *ihsan* can be possible. However, at this point, improvement of human beings should not only be considered at an intellectual level but also spiritual and moral levels, as suggested by *tazkiyah*, considering for most societies and communities above self-interest (Thaib, 2013:14) whereby a 'socialising' nature emerges, so that *umran* can be achieved. In order to secure this aim, human beings need to reach the necessary knowledge levels, and institute such knowledge.

It should be noted that the economic and social development of society known as *umran*, is an emanation from the principle of uniformity of consciousness, economic and social activities of humans, through their education, and mental ramifications (Malkawi, 2013: 13). In this regard, although Ibn Khaldun's encouragement on education and knowledge has triggered various scholars to work on human capital, and intellectual improvements (Zin *et al*., 2017: 166), the significance of knowledge and education, including the Islamic essentialisation of knowledge, can also be explained by the following statement of the Prophet: After the battle of Badr that Prophet Muhammed gave prisoners their liberty as long as they would teach ten *Muslim* children each (Abdullah, 2012: 69). It can, therefore, be summarised that knowledge is considered more important than any type of wealth and property.

3.4.4.2. Understanding the Relationship between Knowledge and Human Capital Formation of Islam

The understanding of human development in Islam is unique with its *tawhidi* foundation, expressed in *tazkiyah* and *rububiyyah* axioms, which is articulated in every aspect of everyday

life, including economic, political, religious, and social spheres. In all these aspects, human capital needs to be in a state of steadiness and order (*istiqamah*), which is formed by intellectual rectitude, knowledge, individual productivity and moral dynamics so that the *khalifah* individual, as vicegerent of Allah on earth, can be developed (Hashi and Bashiir, 2009: 4). In this sense, every individual who comprises human capital in Islam, is expected to develop their talents and skills through the becoming process, as being gifted is considered a dominant quality through which human beings are expected to develop society for the sake of God (Hashi and Bashiir, 2009: 4).

The concept of human capital in terms of intellectual capital from an Islamic perspective have been elucidated through the term, *ahliyyah*, which means capability, qualification, and proficiency, closely related to human capabilities and qualities to perform duties in social, economic, and political life in order to improve lives through *falah*, and make society better through *ihsan*. This is because Muslims believe that Allah empowers with qualities of intellect, freewill, and knowledge to discover the best of the world to develop societies and to serve human beings (Rafiki *et al*., 2014; Bakir *et al*., 2015; Hashi and Bashiir, 2009). Therefore, according to Islam, a person who has skills and knowledge maintained by high morality and exemplary values is a good person in terms of intellectual capital, since human beings have been commanded to be on the *istiqamah* or follow a *rububiyah* direction in their social and business life, which includes abstaining from laziness (Rafiki *et al*., 2014: 175). Furthermore, to develop human capital, Islam promotes attaining knowledge for being hardworking, so that individual freedom can be achieved by freeing oneself from needs; and also, individuals are encouraged to take part in social activities with the objective of avoiding ignorance, laziness, carelessness and coercion in their life (Hashi and Bashiir, 2009: 3).

In contrast with a conventional economic, political, and social system, Islam essentialises human capital in the form of capabilities, knowledge and morals, realising objectives of serving society for the sake of Allah (Rafiki *et al*., 2014: 175). Furthermore, development in Islam is a way for human beings to attain *falah*, while growth is the ultimate aim in a conventional system (Abdullah, 2012: 73). Hence, human capital in Islam is a means to develop society and to reach the final goal, namely, *falah*, by fostering moral behaviour, which is the most important objective of development (Abdullah, 2012: 74). Therefore, Islam promotes a comprehensive human capital model covering moral, ethical, intellectual, physical, spiritual, and psychological improvements, rather, than only education and skills (Abdullah, 2012: 64-65). Furthermore, the objective of a human in Islam is identified as performing optimally in life, to fulfil social

responsibilities as human beings, by prioritising social good and collectivism (Abdullah, 2012: 67). One of the best examples in building social welfare through human capital, is exemplified when the Prophet Muhammed and his followers migrated to Madinah. They possessed neither wealth nor resources, but they had Islamically inspired and formed human capital to implement appropriate policies to manage economic development (Sadr, 2015: 399) through a sharing economy, collectivity and economic progress in Madinah. For example, when the *hijra* or migration of the Prophet had taken place from Makkah to Madinah, the Prophet established solidarity between the *muhajirun* or the immigrant from Makkah and the *ansar* or the local people of Madinah as the helpers by making them shareholders. This aimed at establishing the foundation of an Islamic social formation based on sharing economy through collective decision making so that empowerment of the Muslims could take place from simply 'owning nothing' towards a great civilisation through social, legal, economic and political development (Asutay, 2018).

Islam conceptualised that human beings are superior to other creatures because of the ability to acquire knowledge and apply it to their lives (Rana and Malik, 2016). In addition, Islam identifies that training and development is important as part of the *tazkiyah* process for the development of moral and spiritual aspects of human capital by encouraging positive values, such as, trustworthiness, hard-work, integrity, and advancement in any organisations (Chapra, 2008a; Rana and Malik, 2016). However, such knowledge does not mean only gaining highly prestigious degrees and using them for self-interest, but rather having the honour of reaching to a *falah* level, which is evidenced by the *Qur'an* (39:9): "Are those equal, those who know and those who do not know? Only they will remember (who are) people of understanding". Furthermore, having knowledge needs to accompany being humble and abstaining arrogance by cultivating knowledge to help human beings to become effective users of knowledge (Bakir *et al*., 2015: 22).

Although individual knowledge and human capital in Islam have been given significant roles to develop society, modern organisations have emerged as part of the societal stake-holding (*see*: Chapter 4). However, within an Islamic frame, it is expected that these modern organisations should also contribute to advancement, including knowledge development through increasing human capabilities through *rububiyyah* and *tazkiyah*. Therefore, since Islamic banks are modern organisations, it is expected that they should essentialise and institutionalise intellectual capital and human capital, which is explored in detailed in the empirical part of this study, in the following sections.

3.5. SURVEYING THE EMPIRICAL STUDIES ON INTELLECTUAL PERFORMANCE IN FIRMS AND FINANCIAL INSTITUTIONS

The available empirical studies reveal that intellectual capital has played a significant role in enhancing the business and financial performance of organisations. A quick survey of the existing literature shows a very broad emerging literature on intellectual capital including various case studies across countries and sectors, ranging from pharmaceutical industries to the financial sector. However, it is important to state that each case study has its own measurement method. For instance, while industrial case studies have been mostly focussed on survey analysis, the financial sector has been measured by the VAIC model developed by Pulic (1998; 2000; 2004). In addition to the differing measurement techniques, the components of intellectual capital may vary from case to case. Therefore, it is important to present a survey of the existing literature on intellectual capital to develop a better understanding of the empirical studies, including their methodologies.

The performance impact of intellectual capital, has mostly been considered in relation to the financial sector after Pulic propounded the VAIC model resulting in many studies (among others *see:* Pulic, 2004; Do Rosario Cabrita and Landeiro Vaz, 2006; Sharma and Mani, 2012; Ting and Lean, 2009; Mavridis, 2004; Goh, 2005; Kamath, 2007; Yalama and Coskun, 2007; El-Bannany, 2008; Mavridis and Kyrmizoglou, 2005; Mohiuddin *et al*., 2006; Nawaz and Haniffa, 2017; Muhammad and Ku-Ismail, 2009; Al-Musali and Ku-Ismail, 2016).

By shifting the focus on Islamic banks, in a recent study, Nawaz and Haniffa (2017) conducted an empirical study to examine the impact of intellectual capital on the financial performance of 64 Islamic financial institutions in 18 countries spanning from 2007 to 2011 through the VAIC model. The results reveal that there is a significant relationship between intellectual capital measured by the VAIC model and the financial performance of sample countries. According to analysis, each component of VAIC, such as efficiency of capital employed and human capital, has a significant positive relationship with financial performance, while the paper could not locate a significant relationship between structural capital efficiency and the financial performance of sampled financial institutions. Therefore, Nawaz and Haniffa (2017) suggests that the value creation capability of Islamic financial institutions highly considers human capital efficiency and capital employed efficiency.

In investigating the relationship between intellectual capital measured by the VAIC model and the financial performance of banks measured by ROA and ROE in the GCC countries for the period, 2008-2010, through OLS regression analysis, Al-Musali and Ku-Ismail's (2016) results show that intellectual capital performance of the sampled banks in the GCC states has a positive significant relationship with the financial performance of banks. According to the result of each indicator of VAIC, there is a significant positive relationship between human capital efficiency and financial performance in Bahrain, Oman, and Saudi Arabia, but a negative relationship in Kuwait. However, for Qatar, they could not find any relationship between human capital efficiency and ROE, while it has a significant relationship with ROA. According to structural capital efficiency, the study located a significant relationship with financial performance only in Kuwait, Qatar and the UAE. In addition, Al-Musali and Ku-Ismail (2016) found that there is a significant relationship between efficiency of capital employed and banks' ROE in Kuwait, Oman, and UAE and significant associations with ROA in Oman, Qatar, Saudi Arabia, and UAE, only.

In considering the impact of intellectual capital on the performance of financial sectors in Malaysia, Muhammad and Ismail (2009) explored 18 companies in 2007. Their results show that there is a positive relationship between intellectual capital and financial performance of the sampled insurance and brokerage companies, determined by profitability and ROA. In addition, the results show that market value has been created more by capital employed, determined by physical and financial capital, compared to intellectual capital.

Mohiuddin *et al.* (2006) measured the financial performance of banking sectors, applying the VAIC model by a sample of 17 commercial banks in Bangladesh covering the 2002-2004 period. The results show that the sampled banks had a higher human capital efficiency when compared with capital employed and structural capital efficiencies. In a similar study, Mavridis and Kyrmizoglou (2005) examined the intellectual capital performance of the banking sector in Greece for the period, 1996-1999, who found a positive correlation between value added and intellectual capital, specifically human capital.

In examining the determinants of intellectual capital of banking sectors in the United Kingdom for the period, 1999 to 2005, through adding the investment on the IT systems' banking efficiency, and efficiency of investment in intellectual capital to the VAIC model by conducting multiple regression analysis, El-Bannany (2008) shows that the investment on IT systems has a positive and significant impact on intellectual capital performance. In shifting the focus on

profitability, Yalama and Coskun (2007) investigated the impact of intellectual capital on profitability of banking sectors listed on the Istanbul Stock Exchange between 1995 and 2004, through data envelopment analysis. This study reports that intellectual capital has greater significance than physical capital on profitability.

In examining the VAIC components to measure the value-based performance of banking sectors in India, through a sample of 98 commercial banks for the period, 2000 to 2004, Kamath's (2007) study shows that foreign banks have the best performance on human capital efficiency, while domestic banks have performed well in physical capital efficiency. In general, results revealed that foreign banks have a greater intellectual capital performance than domestic banks in India, for the specified period.

Goh (2005) used the VAIC model to measure the intellectual capital performance of commercial banks in Malaysia spanning from 2001 to 2003. The results reveal that the value creation capability of both domestic and foreign banks in Malaysia is imputed to human capital efficiency. Therefore, his study reports that the investment on human capital leads a higher return than physical and structural capital.

In considering the impact of human and physical capital on intellectual added value-based performance of 141 Japanese banks for the period, 2000 to 2001, Mavridis (2004) shows that there is a significant positive correlation between value added and physical capital. However, his findings show the best performing banks used more human but physical capital.

In a Malaysian case study, Ting and Lean (2009) conducted an empirical study by examining the relationship between intellectual capital and the performance of financial institutions in Malaysia by measuring it through the VAIC model. The results revealed that the indicators of VAIC has a significant positive relationship with ROA in Malaysia.

In a comparative study, Sharma and Mani (2012) measured the human capital of private and public banks in India spanning from 2005 to 2010, through the value-added method. However, in order to calculate the variation of the human capital efficiency, different methods were used, such as, an exponential trend method, ANOVA, and GAP analysis. The results show that the index of human capital efficiency in public banks is higher than private banks. Moreover, the study suggested that the banks in India need accounting standards for measuring, reporting, and disclosing of intellectual capital in their annual reports.

Cabrita and Vaz (2006) examined the relationship between intellectual capital and value creation in 35 Portuguese banks, which located a positive significant relationship between intellectual capital and the performance of sampled banks.

The performance of intellectual capital, has also been studied in the measuring of firms' performances in literature (among others, *see*: Bontis *et al*., 2000; Huang and Hsueh, 2007; Abdolmohammadi, 2005; Shiu, 2006; Petty and Cuganesan, 2005; Riahi-Belkaoui, 2003; Firer and Williams, 2003; Bozbura, 2004; Tseng and Goo, 2005; Anshoria and Iswatia, 2007). Bontis *et al.* (2000), for example, examined the impact of human capital, structural capital, and customer capital on firms' performances in the service sector and non-service sector by contacting survey analysis with 63 participants. The findings show that human capital has a significant impact on the performance of non-service sectors when compared to the service sectors. Furthermore, they also found that customer capital also plays an important role on the construction of structural capital. However, structural capital has a considerable impact on the performance of both service and non-services sectors.

In investigating the relationship between intellectual capital and firms' performance in engineering consultancy sectors by conducting a survey with 101 participants from the sector in Taiwan, Huang and Hsueh's (2007) results show that human capital did not have a significant impact on firms' performance as much as structural capital and consumer capital. Abdolmohammadi (2005) also examined the impact of ICD on market capitalisation of 284 companies based on their annual reports spanning from 1993 to 1997 in the USA. The results show that there is a highly significant positive correlation between ICD and market capitalisation.

Examining the annual reports of 80 Taiwanese listed technological companies through the VAIC model in 2003, Shiu's (2006) study reveals that the VAIC model has significantly positive correlation with profitability and market valuation but a negative correlation with productivity. According to results, the technology sector in Taiwan has been, progressively, concentrated on transforming intellectual capital to value added products or service.

Petty and Cuganesan (2005) conducted a study based on voluntary ICD analysis with the longitudinal data of companies listed on the Hong Kong Stock Exchange. The results of the disclosure analysis show that Hong Kong became more aware of ICD, indicating the existence of a positive relationship between intellectual capital performance and company share prices.

Moreover, the sampled companies seem to be willing to consider developing the level of intellectual capital.

With the objective of investigating the relationship between intellectual capital and profitability, productivity and market value related performance of 75 companies listed on the Johannesburg Stock Exchange in South Africa, Firer and Williams' (2003) study illustrates that there is no significant relationship between intellectual capital and the performance of listed companies in South Africa. They reported that the sampled companies in South Africa are less dependent on intellectual capital in comparison with the European countries.

Bozbura (2004) examined the relationship between the components of intellectual capital including human capital, structural capital, and the market value of companies listed on the Istanbul Stock Exchange. Their results show that there is a significant positive relationship between the components of intellectual capital comprising human capital and relational capital and the market value of companies.

In an empirical study based on examining the relationship between intellectual capital including human capital, structural capital, innovation capital, and relational capital and the market value and performance of 500 firms in Taiwan, Tseng and Goo (2005) demonstrate that there is a significant positive relationship between intellectual capital and the market value of firms.

In exploring the relationship between intellectual capital and 10 insurance companies listed on Indonesia's Stock Exchange, by measuring the intellectual capital through the market to book value method, Anshoria and Iswatia's (2007) study highlights a significant positive relationship between intellectual capital and firms' profitability. In a similar study, Riahi-Belkaoui (2003) also examined the impact of intellectual capital on 84 US multinational companies. The study found a significant positive relationship between intellectual capital and the performance of listed companies.

In addition to the VAIC model, the concept of intellectual capital has been studied through disclosure analysis in the literature (among others, *see*: Bhatia and Mehrotra, 2016: Li *et al*., 2008; Ahmed Haji and Mubaraq, 2012; Mubaraq and Ahmed Haji, 2014; Damayanti and Budiyanawati, 2009; Kamath, 2017; Sharma and Dharni, 2017; Ahmed Haji and Mubaraq, 2012).

Among such studies, Bhatia and Mehrotra (2016) conducted an empirical study based on measuring intellectual capital through disclosure analysis. The study examined 40 banks listed on the Bombay Stock Exchange through an index comprising 44 disclosure items by virtue of multiple regression. The results show that there is no clear intellectual capital pattern in India. However, the study located that intellectual capital is affected by four variables such as size, risk, human capital, and board composition out of nine variables. In this sense, human capital is only significant for intellectual capital from the pillars of the VAIC.

In examining the impact of firms' characteristics on intellectual capital in the case of 34 Islamic banks in Asian countries through multiple regression analysis, Damayanti and Budiyanawati's (2009) study demonstrates that there is a significant relationship between intellectual capital and all firms' characteristics, with the exception of firms' size.

In shifting the debate to corporate governance, Li *et al*. (2008) examined the relationship between ICD and corporate governance structure of the companies by sampling 100 firms comprising of seven sectors in the UK for financial year-ends between March 2004 and February 2005 through multiple regression analysis. In their study, they used 61 ICD items under the three categories: human capital, structural capital, and relational capital. The results show that there is a significant relationship between ICD and all of the governance factors except for role duality and there is also a positive relationship between ROA and intellectual capital disclosure index (ICDI).

Ahmed Haji and Mubaraq (2012) investigated the trends of ICD of 20 banks in Nigeria for the period, 2006-2009. The results report that in general ICD of Nigerian banks increases over the sampled years. In particular, human and internal capital were the main drivers of the ICD but only internal capital showed increasing performance trends over time. In extending this study, Mubaraq and Ahmed Haji (2014) investigated the impact of corporate governance on ICD of 20 banks in Nigeria for the years 2006 to 2010 through a panel regression model. The study created 44 ICD items to measure intellectual capital. The results established that there is a positive significant relationship between all the corporate governance and ownership structure components and ICD except for banks' size. Furthermore, the governance and ownership structure variables were found to have significant association with at least one of the ICD pillars of human capital, internal capital, and external capital.

Kamath (2017) presented the determinants of ICD in the case of India for the period 2010-2011 and 2013-2014, for which 200 firms from 12 different sectors were selected in the study for multiple regression analysis. The results show that the market capitalisation, ownership and age of the firms are the significant determinants of the ICD in India, while performance, size and type of industry were significant for only large cap firms. Furthermore, market capitalisation observed to increase disclosure levels.

In examining the status and trends of ICD in India as an emerging economy covering the years from 2004-2005 to 2013-2014, Sharma and Dharni (2017) selected 20 companies from six sectors (pharmaceutical, basic metals, industrial manufacturing, energy, financial services and information technologies), totalling to a sample of 1,200 firms. The results show that although the trend differed among various sectors, it was significant and positive. The main result of this study is that ICD is prone to increase with the size of the companies.

In summary, as the empirical studies presented so far indicates the significance of intellectual capital with its development and trends over the years assessed mainly through the VAIC model-based studies at the level of firms, in general, and banks, in particular. Although the results of these empirical studies diverge from each other, a main result shows intellectual capital is necessary for firms and banks as intangible assets, in responding to the change in economic dynamics. In addition to the VAIC model, as presented, disclosure analysis is also a common method to measure intellectual capital performance of organisations. In this method, it is significant to create disclosure items as sampled companies and sectors. Disclosure analysis also differs from case to case citing many different results in empirical studies with regard to methodologies and methods of studies. The main result of disclosure analysis reveals that intellectual capital needs to be developed for organisations. According to these two types of measurement of intellectual capital, human capital and structural capital is more dominant components of IC in general.

3.6. THE IMPACT OF INTELLECTUAL CAPITAL ON FINANCIAL PERFORMANCE IN ISLAMIC AND CONVENTIONAL BANKS IN THE GCC: EMPIRICAL PROCESS AND FINDINGS

In an attempt to determine the intellectual capital formation in Islamic and conventional banks, separately, and together in the GCC region, this study, as explained, develops econometrics analysis based on secondary data and primary data generated through disclosure analysis. Due

to methodological differences, each of these empirical analyses are presented in the respective sections. The following sections presents the model selection, variable definition, empirical process and the findings according to the method through which data generated for each of the empirical modelling.

3.6.1. Determining the Impact of Intellectual Capital on Financial Performance: Econometric Analysis based on VAIC Model – Empirical Analysis 1

This section presents the empirical process for the first empirical analysis based on the VAIC model through secondary data collected from various databases.

3.6.1.1. Hypothesis development

The relationship between the VAIC and the financial performance of banks regardless of comprising either conventional or Islamic, or both, is theoretically explored by a number of studies through different samples from selected empirical papers (among others *see:* Pulic, 2004; Do Rosario Cabrita and Landeiro Vaz, 2006; Sharma and Mani, 2012; Ting and Lean, 2009; Mavridis, 2004; Goh, 2005; Kamath, 2007; Yalama and Coskun, 2007; El-Bannany, 2008; Mavridis and Kyrmizoglou, 2005; Mohiuddin *et al*., 2006; Nawaz and Haniffa, 2017; Muhammad and Ismail, 2009; Al-Musali and Ku-Ismail, 2016). In this section, by referring to those empirical papers, hypotheses development is generated for this study.

VAIC and financial performance: In the light of the existing studies, the previous section presented the literature review and theoretical background regarding the relationship between intellectual capital performance and the financial performance of banks. According to resource-based theory, intellectual capital, which includes human, structural sources and their efficient use, provides a competitive advantage to firms and organisations, such as banks (*see:* Zeghal and Maaloul, 2010; Reed *et al*., 2006; Al-Musali and Ku-Ismail, 2014). Therefore, it is expected that the VAIC performance as a total of its constituting indicators, positively, affect the financial performance of banks (*see*: Al-Musali and Ku-Ismail, 2016; Muhammad and Ismail, 2009; Mavridis and Kyrmizoglou, 2005; Yalama and Coskun, 2007; Do Rosario Cabrita and Landeiro Vaz, 2006). Consequently, the following hypothesis is developed to be tested in this study:

> *H_1: There is a significant positive relationship between VAIC and the financial performance of banks in the GCC countries.*

In addition to the level of VAIC in total, it is important to impress that each indicator of VAIC can differ in explaining the impact of VAIC on a bank's financial performance. Therefore, testing and evaluating each component of VAIC including human capital, structural capital and capital employed could present more realistic results regarding the intellectual capital performance of banks and its impact on the financial performance of the sampled banks. In this sense, the following hypotheses are considered to be tested for the impact of each of the constituting indicators on financial performance in the GCC banks.

Human Capital and Financial Performance: Human capital is the main source for firms, organisations, and banks to manage an efficient economic and financial performance (Puntillo, 2009; Alipour, 2012). In addition, a more qualified and efficient human source is able to contribute to the increase of value-added efficiency and to the improvement of performance in an organisation (Rehman *et al*., 2011) through producing new ideas, methods and techniques (Berg, 1969). Due to the contribution of human resources on productive, profitable, and high value elements for the organisation, such as, banks in this study, the expectation is that the level of human capital affects the financial performance of banks as a positive outcome (*see*: Nawaz and Haniffa, 2017; Mavridis and Kyrmizoglou, 2005; Mohiuddin *et al.*, 2006; Goh, 2005; Ting and Lean, 2009). Therefore, the following hypothesis is developed for this study:

> *H_{1a}: There is a significant positive relationship between human capital efficiency (HCE) and financial performance of banks in the GCC countries.*

*Structural Capital and Financial Performance***:** Although structural capital does not directly relate to intangible assets, it is a significant indicator of intellectual capital by providing an environment that helps to create new knowledge and promote employees to learn this new knowledge (Florin *et al*., 2003). This helps to create an added value to the organisation through copyrights, patents, databases, software, brands, rules and policies, which are non-human assets; but being structural capital, they are formed by knowledge and human capital. Therefore, an organisation requires structural capital to keep up with changes in technology and economy that affect the performance of an organisation or a firm, for example, banks in this study. In this respect, as identified by Youndt *et al.* (2004) and Nawaz and Haniffa (2017), structural capital can be associated with financial performance. Accounting for the results of previous studies, the prediction is that the level of structural capital has positive impact on financial performance in banks (among others *see*: Rehman *et al*., 2011; Bontis, 1998; Calabrese *et al*., 2013;

Mehralian *et al*., 2013; Watson and Stanworth, 2006; Alipour, 2012; Nawaz and Haniffa, 2017). Therefore, the following hypothesis is constructed to be tested in this study:

> *H_{1b}: There is a significant positive relationship between structural capital efficiency (SCE) and the financial performance of banks in the GCC countries.*

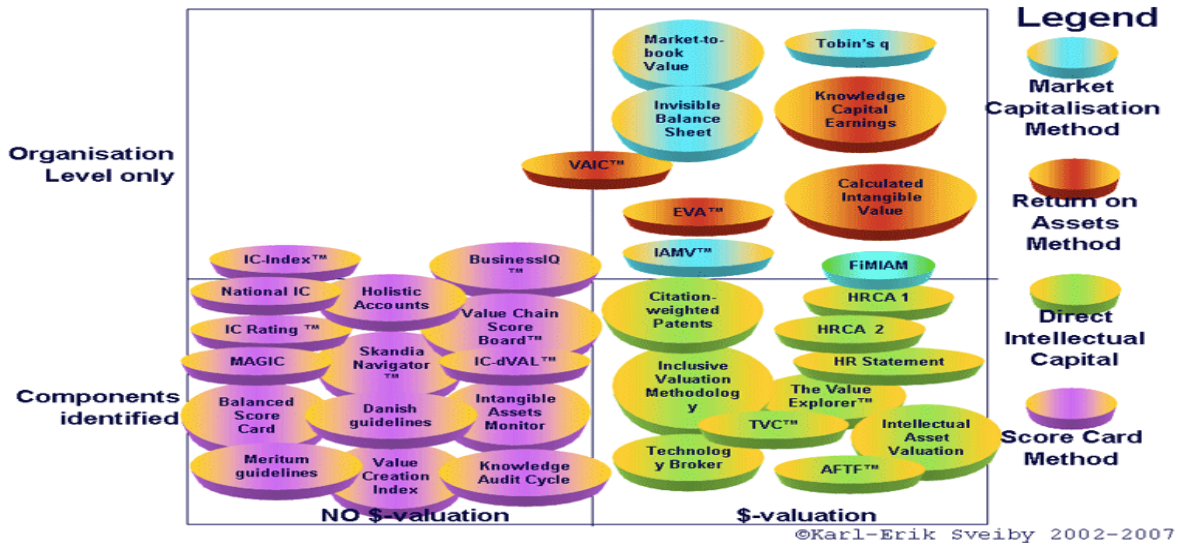
Capital Employed and Financial Performance: Intellectual capital has been associated with financial capital which is articulated as being linked to human-centred and non-human centred assets. Capital employed has been related to the amount of capital, which helps to generate income and value based on both current and fixed assets (Zin *et al*., 2014). This kind of capital can be associated with relationships between organisations and firms, including banks, as in this study, and external factors, such as, customers and suppliers. Therefore, it is expected that this kind of relationship can affect the value of banks in terms of brand, image, reputation *etc*. (Shamsudin and Yian, 2013). Moreover, well-organised capital employed increases the image and reputation of banks among customers and external partners, which, in turn, affects the financial performance of banks. From this perspective, the expectation is that capital employed has positive impact on financial performance in banks (Nawaz and Haniffa, 2017; and Ting and Lean, 2009). Therefore, the following hypothesis is developed to be tested in this study:

> *H_{1c}: There is a significant positive relationship between capital employed efficiency (CEE) and financial performance of banks in the GCC countries*

3.6.1.2. Model selection and variable definition

The models that aims to measure intangible assets have been categorised in 34 different ways in terms of organisational levels, due to various components involved. The methods have ignored their monetary value by focussing on the market capitalisation method, return on assets method, direct intellectual capital, and scorecard method. Figure 3.2 summarises the methods used in measuring the intangible assets. Being one of the frequently utilised methods, this section focuses on the VAIC model with the objective of describing and analysing the impact of intellectual capital on financial performance of banks in the GCC countries (Puntillo, 2009: 100-101).

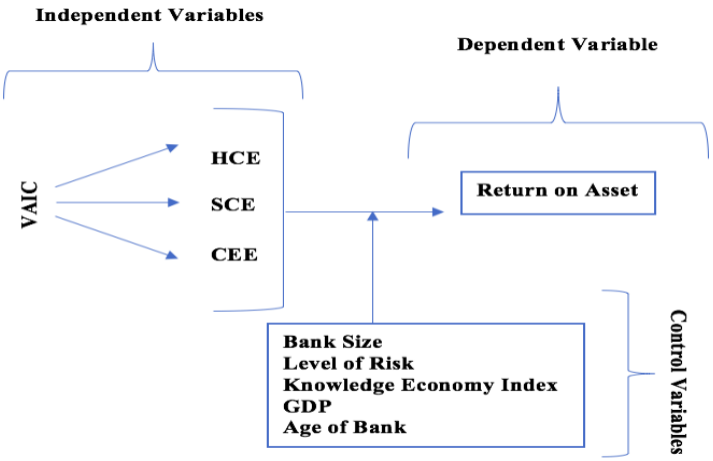
Figure 3.2: Intangible Assets Measuring Models



Source: Puntillo (2009: 101)

Among the models depicted in Figure 3.2, VAIC model consolidates the measurement of contribution of intellectual capital to the value creation in organisational levels through indicators of human capital, structural capital, and capital employed. However, in this study, by referring to the existing studies on intellectual capital, different control variables are used due to the fact that the GCC countries have some idiosyncrasies such as being rentier states and having knowledge economy visions. Therefore, to identify the peculiarities of the model used in this study, the model selection process is depicted in Figure 3.3.

Figure 3.3: Summary of Model



Based on the model and process depicted in Figure 3.3; the formal regression model is developed as follows:

$$ROAA = \beta_i + \beta_1 VAIC + \beta_2 BankSize + \beta_3 levelofrisk + \beta_4 KEI + \beta_5 GDP + \beta_6 AgeOp + \beta_7 Crisis + \beta_8 Type + \varepsilon \quad (3.1)$$

$$ROAA = \beta_i + \beta_1 HCE + \beta_2 SCE + \beta_3 CEE + \beta_4 BankSize + \beta_5 levelofrisk + \beta_6 KEI + \beta_7 GDP + \beta_8 AgeOp + \beta_9 Crisis + \beta_{10} Type + \varepsilon \quad (3.2)$$

The variables included in the regression equations in 3.1 and 3.2. are explained as follows:

Dependent Variable:

ROAA: To analyse whether intellectual capital has a significant impact on financial performance of banks, the return on average assets (ROAA) is considered as the dependent variable. ROAA refers to the efficiency of available assets to create profits. It is calculated through 'net profit of banks before tax' divided by 'average total assets' in annual reports (Al-Musali and Ku-Ismail, 2016: 518). It is important to state that this study prefers to use the value of average assets in order to determine changes in assets during the financial year. This variable has been also used as ratio of bank performance in the literature, such as Dietrich and Wanzenried (2011) and Platonova *et al.* (2018).

Independent Variables:

This research conducts the VAIC model to measure the intellectual capital performance of banks in the GCC countries. VAIC is constituted by three elements: human capital efficiency, structural capital efficiency, and efficiency of capital employed as taken from the literature stated in previous section.

$$VAIC = HCE + SCE + CEE \quad (3.3)$$

In this model Value Added (VA) is the key indicator to calculate the other indicators in the model.

$$VA = OUTPUT - INPUT \quad (3.4)$$

where:

Output = Total income

Input = Operating expenses (excluding personal costs)

Other variables are measured as:

HCE = VA / Human Capital (staff expenses) (3.5)

SCE = VA / Structural Capital (balance between equities and long-term liabilities) (3.6)

CEE = VA / Capital Employed (balance between current assets and current liabilities) (3.7)

In addition, the following *control variables* are developed:

Bank Size: expressed by Total Asset

Level of Risk: expressed by Net Loans to Total Assets

Knowledge Economy Index: In order to provide novelty, Knowledge Economy Index or KEI is included among the independent variables in this study with the objective of capturing the impact of the nationwide KEI performance on the individual banks' intellectual capital. As identified in Chapter 2, KEI is estimated by the World Bank only for the years, 1995, 2000, and 2012, for their member countries through Knowledge Assessment Methodology or KAM model. In order to generate time-series of this variable for the sampled countries, the statistical estimation method of the World Bank is utilised in Chapter 2 to calculate the KAM index values for the rest of the years. The detailed description of the process of estimating this variable can be found in Chapter 2. Thus, KEI is used as a control variable in this empirical paper too.

GDP per capita: Gross Domestic Product (per capita)

AgeOp: Longevity of banks being operational, namely the age of the banks

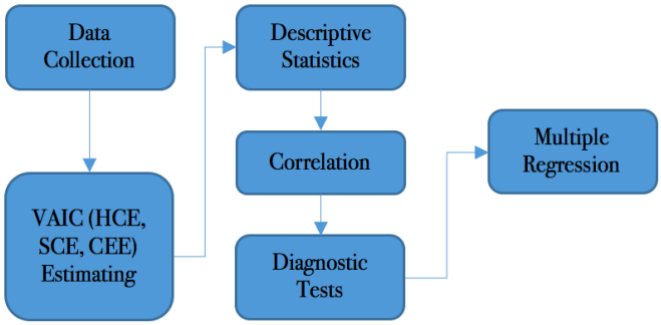
Crisis Dummy: Considering that the GCC economies heavily depended on oil revenues, oil price fluctuation is captured through a dummy variable. The crisis period in the GCC countries is considered to be the 2012-2014 period due to high oil prices, while the 2015 and 2016 years are considered as a low oil price period.

Type Dummy: As a dummy variable, *Type* refers to classification of banking institution whether it is Islamic or conventional. This variable is, only, considered for all types of banks but not for an individual banking type.

3.6.1.3. Empirical process

In order to fulfil the objectives of this research, clear empirical process is followed by referring to the existing literature as depicted in Figure 3.4.

Figure 3.4: Summary of Empirical Process



Firstly, this study employs correlation analysis to examine whether there is any correlation between the ROAA and the indicators of VAIC. Secondly, OLS is used to examine the relationship between ROAA and independent and control variables of the sampled banks in the GCC countries. When *t* and *n* are small, OLS outperforms in compliance with the other models (Buddelmeyer *et al.*, 2008). In this case, although the number of observation in total is acceptable in the literature with 240 observations, this study still includes short panel data with short *t* (5 years) and small *n* (48 banks). Therefore, OLS model is the best estimator model in this study.

Before conducting the regression model, it is important to verify the model by testing for heteroscedasticity and multicollinearity (Wooldridge, 2015: 74-81).

Heteroscedasticity refers to the circumstance where the variance of error term needs to vary or increase for each observation. Robust command in Stata helps to correct errors by considering the variance of error term (Baum, 2006: 137). Appendix B shows the distribution of variance of residuals for each observation. As can be seen in the results, the variances of residuals are homoscedastic.

As regards to multicollinearity, it refers to the condition in a regression model in which two or more explanatory variables have a highly linear relationship. In other words, it is not always acceptable to add more independent variables to the model in order to increase explanatory power. This may sometimes lead to increased relationships among explanatory or independent variables used in the regression equations; hence, it is not acceptable for the model. It should be noted that explanatory variables can have a relationship with dependent variables but not a

high correlation between each other. For example, if the correlation coefficient among independent or explanatory variables is 'one', it would be impossible to estimate the parameters. A close relationship among the explanatory variables makes the OLS method unusable (Dougherty, 2011: 165). One of the main ways of detecting this problem is to examine the correlation matrix of the explanatory variables. As can be seen, Appendix B demonstrates that there is no perfect collinearity or near collinearity. Another way is to estimate the variance inflation factor (VIF) values. Since the VIF values are less than 10, there is no multicollinearity problem (Baum, 2006) as established in Appendix B.

3.6.1.4. Sample banks

The sample in this research consists of 19 Islamic banks and 29 conventional banks from the GCC countries, except the Omani banks. The first Islamic bank in Oman was established in 2013; hence Oman is ruled out of this study, as not having enough data. The criterium for the sampling is based on data availability and locations that must be within the GCC countries. The distribution of the sampled Islamic and conventional banks in relation to the country of origin are listed in Table 3.1:

Table 3.1: Sampled Banks

Countries	Islamic Banks	Conventional Banks
Bahrain	Al Salam Bank, Bahrain Islamic Bank Khaleeji Commercial Bank	Ahli United Bank, Bank ABC Gulf International Bank BBK National Bank of Bahrain
Kuwait	Ahli United Bank Kuwait Kuwait Finance House Boubyan Bank Kuwait International Bank	National Bank of Kuwait Burgan Bank Gulf Bank Al Ahli Bank of Kuwait Commercial Bank of Kuwait
Qatar	Qatar Islamic Bank Masraf Al Rayan QIIB	Qatar National Bank The Commercial Bank Doha Bank Al Khaliji Commercial Bank Ahli Bank
Saudi Arabia	Al Rajhi Bank Alinma Bank Al Jazira Bank	National Commercial Bank Samba Financial Group Riyad Bank Banque Saudi Fransi Saudi British Bank Arab National Bank Public Joint Stock Company Alawwal Bank Saudi Investment Bank
UAE	Dubai Islamic Bank Abu Dhabi Islamic Bank Emirates Islamic Bank Al Hilal Bank Sharjah Islamic Bank Noor Bank	Emirates NBD Abu Dhabi Commercial Bank First Gulf Bank HSBC Bank Middle East Limited Masreqbank Union National Bank
Total	19	29

3.6.1.5. Data Source

The data for the dependent and independent variables were collected from the Orbis Bank Focus (Bankscope) database, including bank size and risk related variables. The individual GDP data were assembled from the World Bank database. Although KEI was released by the World Bank for 1995, 2000, and 2012, as explained above, and in detail in Chapter 2, the sub-index of pillars for a knowledge economy was extended to establish a time-series data or the sample period for this study for 2012 and 2016.

3.6.1.6. Empirical findings

The following sections follows the empirical process described above through descriptive exploration of the variables for both Islamic and conventional banks separately, and together, followed by an econometrics analysis to locate the determining factors of VAIC model.

3.6.1.6.1. Descriptive analysis

Table 3.2. shows the initial descriptive results in relation to intellectual capital for both conventional and Islamic banks of the GCC countries between 2012 and 2016 years.

Table 3.2: Intellectual Capital Performance of the GCC Banks (2012-2016)

Year	Coefficient	Bahrain	Kuwait	Qatar	Saudi Arabia	UAE
2012	HCE	12.34	18.46	21.66	13.94	14.02
	SCE	0.16	0.84	0.93	1.06	0.27
	CEE	1.19	1.22	1.16	1.34	1.04
	VAIC	13.69	20.52	23.75	16.34	15.33
2013	HCE	11.83	17.46	20.36	14.14	13.42
	SCE	0.09	0.85	0.78	0.99	0.24
	CEE	1.23	1.17	1.20	1.35	1.04
	VAIC	13.15	19.48	22.34	16.48	14.70
2014	HCE	12.12	16.97	20.11	14.04	14.03
	SCE	-0.19	0.91	0.72	0.97	0.33
	CEE	1.35	1.28	1.16	1.35	1.12
	VAIC	13.28	19.16	21.99	16.36	15.48
2015	HCE	12.75	17.52	19.62	13.63	13.46
	SCE	0.15	0.84	0.58	1.00	0.20
	CEE	1.26	1.27	1.17	1.35	1.12
	VAIC	14.16	19.63	21.37	15.98	14.78
2016	HCE	13.02	16.82	20.75	14.71	13.70
	SCE	0.23	0.82	0.49	1.02	0.19
	CEE	1.26	1.19	1.17	1.35	1.08
	VAIC	14.51	18.83	22.41	17.08	14.97
2012-2016	HCE	12.47	17.50	21.18	14.00	13.73
	SCE	0.09	0.84	0.76	1.02	0.24
	CEE	1.16	1.22	1.06	1.20	1.08
	VAIC	13.72	19.56	23.00	16.22	15.05

As can be seen in Table 3.2, results show that Qatar has the highest VAIC value on average with 23.00, while Qatar scored 21.18, 0.76 and 1.06 for HCE, SCE and CEE, respectively. Thus, Qatar has the highest human capital efficiency among other the GCC countries, which demonstrates similarity to the existing literature, as discussed in the literature review section in detail.

As the results show, Kuwait performs relatively well on a VAIC value with 19.56 for the sampled period, allowing Kuwait to be the second highest country on VAIC performance, while, as illustrated by Table 3.2, Kuwait is not highest country in the region in terms of each component of the VAIC, with HCE, SCE and CEE being 17.50, 0.84, and 1.22, respectively. As the results depict, although Saudi Arabia performs less than satisfactorily on the VAIC performance for the average of the sampled period, as it is in third position, by achieving a fair score of 16.22, it is the best country in the average of SCE and CEE for the 2012-2016 period

with 1.02 and 1.20, respectively, while HCE is 14.00. The UAE underperformed in relation to the expectation on VAIC performance averages for that period achieving fourth position in the region, yielding a 15.05 score, while it could not manage to lead in any component of the VAIC, as illustrated in Table 3.2. Lastly, Bahrain has a relatively poor performance on the VAIC value of 13.72, with resulting HCE, SCE, and CEE values of 12.47, 0.09, and 1.16, respectively, which relegates Bahrain into the lower position among the GCC countries.

Table 3.3: Intellectual Capital Performance of the GCC Conventional Banks (2012-2016)

Year	Coefficient	Bahrain	Kuwait	Qatar	Saudi Arabia	UAE
2012	HCE	12.26	18.76	20.62	14.06	17.26
	SCE	0.19	0.97	0.86	1.02	0.16
	CEE	1.50	1.23	1.50	1.53	1.21
	VAIC	13.95	20.96	22.98	16.61	18.63
2013	HCE	12.41	17.87	17.87	13.98	16.61
	SCE	0.31	0.94	0.67	0.97	0.31
	CEE	1.55	1.19	1.52	1.53	1.21
	VAIC	14.27	20.00	20.06	16.48	18.13
2014	HCE	12.32	16.29	17.81	14.29	16.46
	SCE	0.27	1.05	0.61	0.96	0.35
	CEE	1.60	1.36	1.45	1.52	1.22
	VAIC	14.19	18.70	19.87	16.77	18.03
2015	HCE	12.10	16.28	17.72	13.63	16.07
	SCE	0.40	0.99	0.37	0.99	0.24
	CEE	1.54	1.27	1.48	1.52	1.22
	VAIC	14.04	18.54	19.57	16.14	17.53
2016	HCE	12.10	15.82	18.18	15.02	16.45
	SCE	0.54	0.87	0.19	1.04	0.17
	CEE	1.53	1.24	1.50	1.52	1.25
	VAIC	14.17	17.93	19.87	17.58	17.87
2012-2016	HCE	12.24	17.00	18.44	14.19	16.57
	SCE	0.34	0.96	0.54	0.99	0.25
	CEE	1.55	1.26	1.49	1.52	1.22
	VAIC	14.11	19.22	20.47	16.70	18.04

Table 3.3 depicts the intellectual capital performance of the conventional banks in the GCC countries for the period, 2012-2016. Accordingly, Qatar demonstrates the best performance in the region in terms of intellectual capital accumulation in conventional banks with 20.47 of VAIC value on average. However, in terms of each indicator of the VAIC, Qatar is the highest in the HCE component with 18.44 and SCE and CEE scores are 0.54 and 1.49, respectively. As can be seen, Kuwait is the second-best country on VAIC performance with the value of 19.22 on average for five years spanning 2012 to 2016, but the components of VAIC in Kuwait are not the highest among the GCC countries, as Kuwait scored 17.00, 0.96, and 1.26 for HCE, SCE, and CEE, respectively. The UAE performs relatively well on VAIC values, with 18.04, close to Kuwait's performance, being in third position, while the VAIC indicators of the UAE

are not at the highest position scoring 16.57, 0.25 and 1.22, respectively. Saudi Arabia achieved fourth position in terms of intellectual capital performance in conventional banks with a value of 16.70. Lastly, as depicted in Table 3.3, Bahrain has a relatively poor performance on the VAIC value with 14.11, demonstrating HCE, SCE, and CEE scores of 12.24, 0.34, and 1.55, respectively. However, the score of CEE in Bahrain is at the top of the region among the conventional banks, as seen in Table 3.3.

Table 3.4: Intellectual Capital Performance of the GCC Islamic Banks Countries (2012-2016)

Year	Coefficient	Bahrain	Kuwait	Qatar	Saudi Arabia	UAE
2012	HCE	12.47	18.10	23.39	13.61	10.79
	SCE	0.10	0.67	1.04	1.18	0.37
	CEE	0.66	1.21	0.59	0.83	0.88
	VAIC	13.23	19.98	25.02	15.62	12.04
2013	HCE	10.88	16.95	24.51	14.55	10.23
	SCE	-0.29	0.74	0.97	1.04	0.17
	CEE	0.70	1.14	0.65	0.88	0.86
	VAIC	11.29	18.83	26.13	16.47	11.26
2014	HCE	11.80	17.82	23.93	13.38	11.59
	SCE	-0.96	0.73	0.91	1.00	0.30
	CEE	0.91	1.19	0.67	0.89	1.02
	VAIC	11.75	19.74	25.51	15.27	12.91
2015	HCE	13.85	19.08	22.79	13.63	10.86
	SCE	-0.27	0.66	0.93	1.04	0.16
	CEE	0.79	1.27	0,66	0.91	1.01
	VAIC	14.37	21.01	24.38	15.58	12.03
2016	HCE	14.55	18.06	25.04	13.89	10.95
	SCE	-0.28	0.74	0.99	0.99	0.20
	CEE	0.81	1.12	0.63	0.89	0.91
	VAIC	15.08	19.92	26.66	15.77	12.06
2012-2016	HCE	12.71	18.00	23.93	13.81	10.88
	SCE	-0.34	0.71	0.97	1.05	0.24
	CEE	0.78	1.19	0.64	0.88	0.94
	VAIC	13.15	19.90	25.54	15.74	12.06

Table 3.4. presents the intellectual capital performance of Islamic banks in the GCC countries for the period,2012-2016. As can be seen, Qatar demonstrated the highest average value of VAIC with 25.54, among the GCC countries. As for the components of VAIC, they - HCE, SCE, and CEE - all performed well with 23.93, 0.97, and 0.64 respectively, but only the HCE indicator of VAIC in Qatar managed to score highest in the GCC region. Kuwait seems to demonstrate the second-best performance on the VAIC model of Islamic banks, scoring a value of 19.90. Accordingly, the performance of each indicator of VAIC for Kuwait, the CEE has performed relatively better than the other countries with a value of 1.19. HCE and SCE are reasonably well, achieving a value of 18.00 and 0.71, respectively. Saudi Arabia has performed fairly well, with a value of 5.25, although it has performed the best on the SCE with 1.05. The

values of HCE and CEE for Kuwait are 13.81 and 0.88, respectively. However, Bahrain and the UAE performed poorly, with the value of 13.15 and 12.06, respectively, and did not perform the best for each of the components of VAIC, as seen in Table 3.4.

Figure 3.5: The Average of Human Capital Efficiency in the GCC Islamic and Conventional Banks (2012-2016)

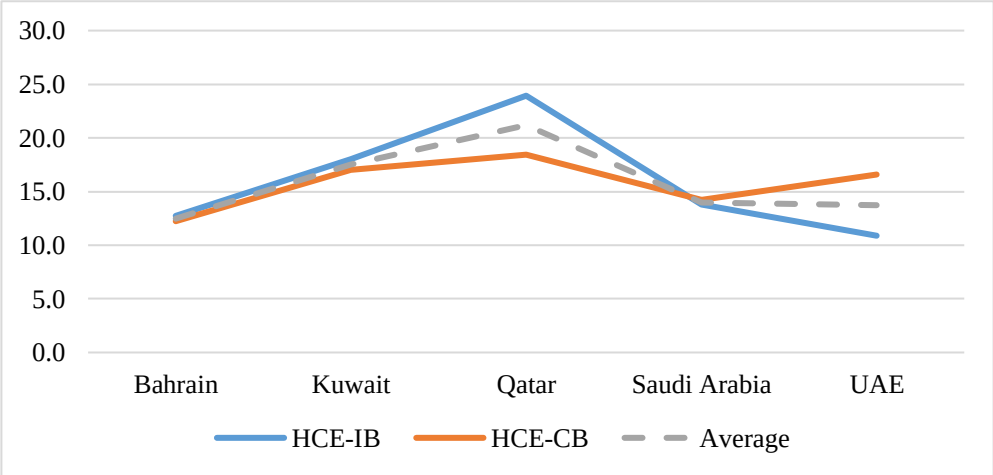
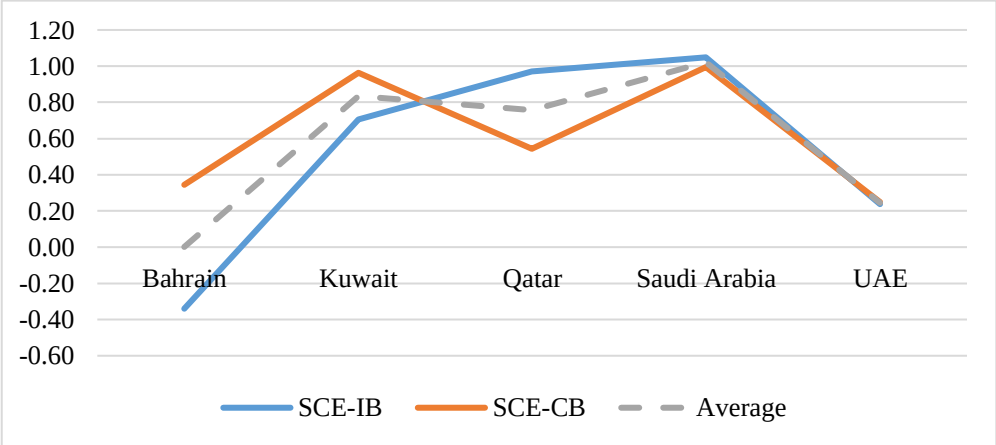


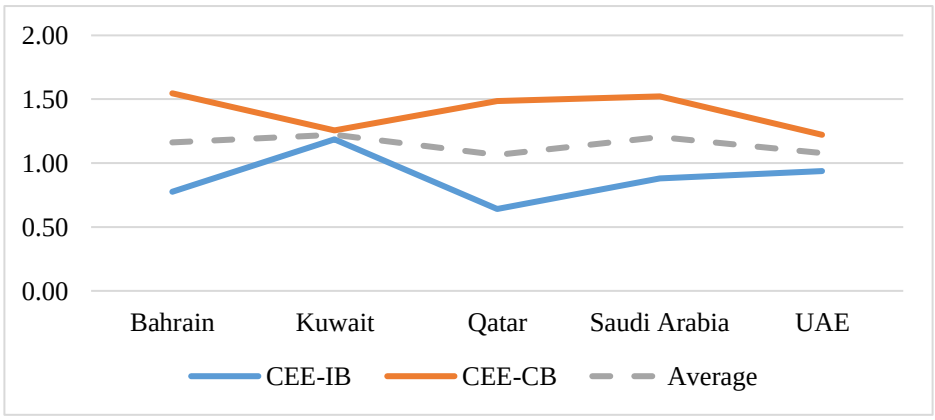
Figure 3.5. presents the trends in the average values of HCE for the both conventional and Islamic banks over five years spanning 2012 to 2016. As can be seen, Bahrain and Kuwait show higher trends than the overall average in Islamic banks, while conventional bank have slightly been under the average. However, conventional and Islamic banks in these countries show almost similar HCE performance over the sampled period. Qatar has shown increasing trend of HCE in Islamic banks with regard to conventional banks; hence, HCE in Islamic banks is rather higher in comparison to conventional banks and the average of sampled banks in Qatar. However, Saudi Arabia and the UAE shows an increasing trend of HCE in conventional banks, while the tendency in Islamic banks declined for the period in question, for these countries. While the difference between conventional banks and Islamic banks in Saudi Arabia can be considered as insignificant, the trends in the case of UAE shows considerable difference, as seen in Figure 3.5.

Figure 3.6: The Average of Structural Capital Efficiency in the GCC Islamic and Conventional Banks (2012-2016)



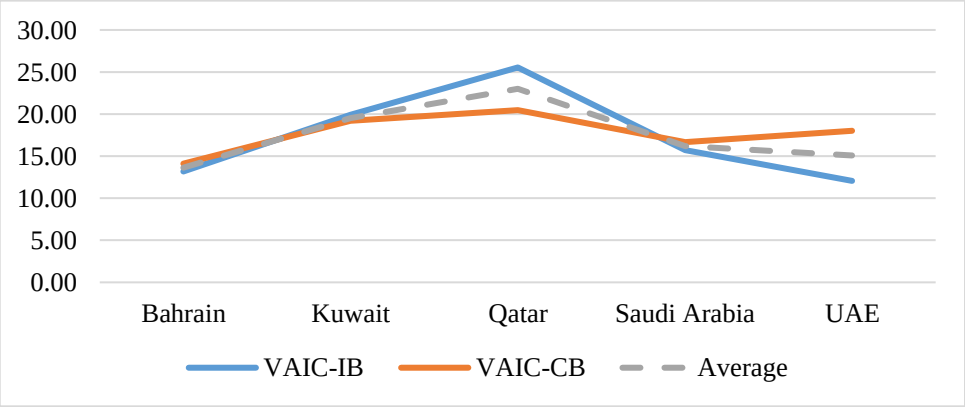
According to the average trends for SCE, Figure 3.6. shows that SCE performance in conventional banks is better than Islamic banks in Bahrain and Kuwait. However, Islamic banks in Qatar and Saudi Arabia, relatively performed better than conventional banks in these countries. In Qatar, there is a significant difference in the SCE performance between Islamic banks and conventional banks, while in Saudi Arabia, the SCE trend in both type of banks is very close to each other over five years.

Figure 3.7: The Average of Capital Employed Efficiency in the GCC Islamic and Conventional Banks (2012-2016)



According to Figure 3.7, the trend in CEE in conventional banks shows a performance above Islamic banks. As can be seen in Figure 3.7, there are significant differences among Islamic and conventional banks.

Figure 3.8: The Average of Value Added Intellectual Coefficient in the GCC Islamic and Conventional Banks (2012-2016)



After explaining the trends for each indicator of VAIC, Figure 3.8 shows the average of VAIC for Islamic and conventional banks. According to the depicted trends, the performance of VAIC in Islamic banks is higher than the conventional banks in Qatar and Kuwait only. While the averages of conventional and Islamic banks appear close to each other in Kuwait, they demonstrate significant differences in Qatar. The trends in VAIC performance in conventional banks are above the tendencies for Islamic banks in Bahrain, Saudi Arabia, and the UAE. However, the difference between conventional and Islamic banks are not worth considering in Bahrain and Saudi Arabia, while the identified differences between conventional and Islamic banks in the UAE should be reflected upon.

3.6.1.6.2. Econometrics analysis with aggregated data in the GCC countries

Table 3.5: Descriptive Statistics

Variables	Mean	SD	Min.	Max.
ROAA	1.490958	0.894622	-4.33	3.23
VAIC	15.97102	5.357537	6.910745	33.18427
HCE	15.41766	5.254855	6.397574	32.47575
SCE	0.5831726	0.8224855	-4.775036	2.394725
CEE	1.213709	0.4239998	0.3830135	2.947586
BSize	32.2×10^7	30×10^7	1.258402	198×10^8
LoR	59.64242	9.622784	25.99	75.08
AgeOp	36.6	21.90657	4	127
KEInx	1.535396	0.8117282	0.2554461	3.645801
GDP	39933.08	20015.77	20028.65	88565
CrisisDummy	0.4	0.4909218	0	1
TypeDummy	0.3958333	0.4900509	0	1

According to the summary statistics provided in Table 3.5 in preparing for the regression analysis, ROAA as dependent variable is able to generate profit for sampled banks with a mean value of 1.5. VAIC scored an average mean of 15.97 that shows the sampled banks are efficient

in generating the value. As for VAIC's pillars, namely HCE, SCE, and CEE scored means values of 15.97, 0.58 and 1.21, respectively. This result shows that the pillars are associated with the VAIC performance, as seen in the literature, the value of HCE is generally the main driver for the value of VAIC. According to control variables, the mean value for the bank size is US$ 32.2 billion, while the mean value of risk level measured as net loans to total assets is measured at 59.64, with minimum and maximum values of 25.99 and 75.08, respectively, that seems parallel with the existing studies. The mean value for the age of operation is 36.6 which shows that the age of banks is rather old when compared to the age of countries. It is important to note that the age of operation of conventional banks are higher than Islamic banks; as the first Islamic bank established in the GCC, was the Dubai Islamic Bank, in 1975, and therefore, most of the Islamic banks are rather younger. Another variable is that KEI, the mean value of which is at a level of 1.5, showing that the GCC countries has poor performance on KEI. Regarding GDP *per capita*, its mean is around US$40,000. As for the dummy variables, the mean value for the crisis dummy and type dummy is around 0.4, which shows that the sampled Islamic banks are less than the sampled conventional banks in the GCC countries.

Table 3.6: Correlation Matrix

Variables	ROAA	VAIC	HCE	SCE	CEE	BSize	LoR	AgeOp	KEInx	GDP	CrisisDummy	TypeDummy
ROAA	1.0000											
VAIC	0.3604	1.0000										
HCE	0.3927		1.0000									
SCE	0.1171			1.0000								
CEE	0.0257				1.0000							
BSize	0.3353	0.1631	0.2004	0.0473	0.1328	1.0000						
LoR	0.1712	0.3339	0.2676	0.3221	-0.1342	0.1918	1.0000					
AgeOp	0.0966	-0.1348	-0.0961	0.0221	0.1478	0.2565	-0.1065	1.0000				
KEInx	0.2238	-0.1428	-0.1433	-0.1222	-0.0628	0.2013	0.1899	0.0114	1.0000			
GDP	0.2192	0.4406	0.4353	0.0381	-0.1156	-0.0241	0.2416	-0.1692	-0.0906	1.0000		
CrisisDummy	-0.0049	-0.0066	-0.0067	-0.0264	0.0130	0.1291	0.1291	0.0558	0.4990	-0.2616	1.0000	
TypeDummy	-0.1979	0.0939	-0.0347	-0.0928	-0.5832	0.1482	0.1482	-0.3929	0.0373	0.0440	0.0000	1.0000

As the correlation matrix in Table 3.6. shows, there is a moderate relationship between VAIC and its pillars and ROAA except for CEE, as CEE's relation is weaker than the other components. In addition, as can be seen, there is also a moderate relationship between control variables and ROAA with the exception of AgeOp that is weaker than the other variables. As regards to the dummy variables, there is a negative relationship with ROAA and the coefficients are on the lower side, which is particularly true for the crisis dummy variable, in particular, as seen in Table 3.6.

Table 3.7: Regression Results

ROAA	Model 1	Model 1a	Model 1b	Model 1c
VAIC	0.0649151***			
HCE		0.0662273***		
SCE			0.1178094	
CEE				-0.1257859
BSize	4.39×10^{-9}***	4.313×10^{-9}***	7.22×10^{-9}***	6.97×10^{-9}***
LoR	-0.0011446	0.0009179	0.0018608	0.0059179
AgeOp	0.0023079	0.0025692	0.0011899	0.0009566
KEInx	0.3884358***	0.3830563***	0.2851506***	0.2593164***
GDP	2.54×10^{-6}	2.30×10^{-6}	9.98×10^{-6}***	9.37×10^{-6}***
CrisisDummy	-0.3262644***	-0.3297386***	-0.1825632*	-0.1798235
TypeDummy	-0.3204967**	-0.2738425*	-0.211447	-0.3117688*
Number of obs.	240	240	240	240
R^2	0.3198	0.3241	0.2304	0.2229
Root MSE	0.75049	0.74815	0.79829	0.80219

Note: (***) refers that p value is significant at 1% level; (**) refers that p value is significant at 5% level; (*) refers that p value is significant at 10% level.

The regression results for the estimated models are depicted in Table 3.7. As depicted, Model 1 predicts the ROAA of banks in the GCC countries with a R^2 value of 0.32, which indicates the efficiency of the model supported with the findings generated in the correlation matrix that is stable almost for all variables in this model. In other words, 0.32 indicates that 32% of the variation in dependent variables accounted for the independent variables. As for individual variables, as can be seen in Table 3.7, as expected 'VAIC' is significant and positive at 1% level of significance, because VAIC performance in total is constructed by human capital, structural capital, and capital employed, positively affects financial performance in banks, as discussed in the hypothesis development and literature review. In other words, an increase in VAIC increases the value of ROAA by 0.065. 'BSize' is also positive and significant at 1%, which is in line with the expected result indicating that the size of banks has a positive impact on the financial performance of their respective institutions in the GCC countries. Thus, an increase in 'BSize' around US$ 1 billion will increase the value of ROAA by 4.39.

As can be seen in Table 3.7, as expected 'KEInx' is positive and significant at 1% which is explained by the fact that the GCC countries have their own national visions, including knowledge-based economic policies. An increase in KEInx increases ROAA's value by 0.39 showing the impact of knowledge economy policies in the GCC countries. If the GCC countries manage knowledge transformation, it also affects the financial performance of the banks. This result shows that development of human capital, technology use and produce, R&D expenditures, and economic incentives affect the financial performance of banks. As the results demonstrate, as expected the 'CrisisDummy' variable is negative and significant at 1%, because

the economies in the GCC countries are heavily based on oil and gas revenues. When the other variables are stable, the value of ROAA decreases around 0.33 after the period of oil crisis in the GCC countries as compared to the period before the oil crisis. Therefore, 'CrisisDummy' considers the decline of oil and gas prices. According to the result, in the period of the low level of oil and gas prices, the financial performance of banks is affected negatively. As a case in this study, the oil crisis of 2015 and 2016, negatively impacted on the financial performance of the sampled GCC banks.

As the regression results in Table 3.7 depicts, the 'TypeDummy' variable is negative and significant at 5%. This is an interesting result because being an Islamic bank is not significant for financial performance in this model. In fact, being an Islamic bank produces a negative impact on financial performance. In other words, ROAA value of Islamic banks is less than conventional banks by 0.32. This result shows that as discussed in the section of 'essentialising Islamic intellectual capital formation through Islamic ontology and epistemology' of this study, Islamic banks need to focus on the substance of Islamic economics, which prioritises humans, and knowledge that relates to intellectual capital. However, since the Islamic banking sector has emerged through mimicking the conventional system, rather than organic emergence based on Islamic authenticity, they are bound with the institutional logic of conventional banks.

According to model 1, 'LoR', 'AgeOp', and 'GDP' are not statistically significant which runs contrary to the results expected in this model. First of all, 'AgeOp' could affect financial performance in banks due to the historical experience in developing certain social capital through various practices, but it is found non-significant. This may be explained by the use of technology in the modern banking system. A second unexpected result is 'GDP,' that could be related to specific features of GCC countries which are rentier economies based on oil and gas revenues, and mostly state-oriented economies, rather than the private sector. Lastly, 'LoR' being insignificant can be explained by the fact that the impact of risk on financial performance may appear in the future. Therefore, it is not significant in this model.

As the findings in Table 3.7 demonstrates, Model 1a which is based on human capital as VAIC's component, rather than the estimated total value of VAIC, predicts the ROAA of banks in the GCC countries with a R^2 value of 0.32 indicating that the included variables can explain 32% of the total variation in ROAA. As for individual variables, as expected, 'HCE' is positive and significant at 1% level of significance implying that human capital has positive impact on banks' performance both at managerial and financial level. This implies that an increase in HCE

affects the value of ROAA by 0.066. This result is also in parallel with the national visions of the GCC countries, which prioritised economic development and growth through investment in human capital, so it affects the financial performance of banks. As presented in model 1a, 'BSize' is positive and significant determinant at 1% but has less impact on financial performance. An increase in 'BSize' increases ROAA by 4.31. 'KEInx' is also found to be positive and significant at 1%, hence; an increase in KEInx increases the value of ROAA by 0.38. 'CrisisDummy' variable is negative and significant at a 1% level of significance; hence, the value of ROAA decreases around 0.33 in 2015 and 2016, as before the oil crisis. Therefore, during the period of the oil crisis, the financial performance of banks is affected negatively in the GCC countries. 'TypeDummy' is negative and significant at a 10% level of significance. This implies that being an Islamic bank is significant but has a negative impact on financial performance, which is less than that of model 1. In the other words, the ROAA value of Islamic banks is less than conventional banks by 0.27. In addition to significant results, non-significant variables are the same with model 1, which can be rationalised in the same way.

As the econometrics panel model results in Table 3.7 demonstrates, Model 1b, which is based on the structural capital as VAIC's component, estimates the ROAA of banks in the GCC countries with a R^2 value of 0.23. Such level of coefficient of determinacy is lower than the previous two models. However, the results still refer to statistical efficiency. As for all individual variables, 'BSize' is found to be positive and significant at 1%. Therefore, a 1 billion US$ increase in 'BSize' can increase the value of ROAA by 7.22. 'KEInx' is positive and significant at 1%; hence, an increase in 'KEInx' increases ROAA by 0.29. 'GDP' is positive and significant at 1%. In this model, GDP variable can also be considered as significant together with the other variables that are significant in the previous models. This can be related to the increasing level of GDP per capita affecting the consumption of employers on their personal development, such as training and education to effect financial performance in banks. 'CrisisDummy' variable is negative and significant at a 10% level of significance, hence; the value of ROAA decreases around 0.18 in 2015 and 2016 in the period of declining oil prices. In this model, it should be noted that although 'CrisisDummy' is significant and negative as similar to the previous model, it is also less significant in this model. However, it is important to note that 'SCE' and 'TypeDummy' is not significant in this model along with other non-significant variables. While expectation of the impact of 'SCE' on financial performance in banks is significant and positive, the reason for the opposite result can be explained by the fact that this kind of capital may show its impact in the future, through a lagged impact. In other

words, the outcome of expenditures on technology, R&D, education, and training takes effect in the future through lagged impact as part of financial performance. 'TypeDummy' has also an unexpected result that is not significant in this model.

As depicted in Table 3.7, Model 1c relates to capital employed as VAIC's component, which produced R^2 value of 0.22, which is lower than the previous model. However, this should not affect the efficiency of the model, which is supported with correlation scores that were found to be acceptable for all variables in the model. As for the test of all the variables, 'BSize' is found to be positive and significant at a 1% level of significance; hence, a 1 billion US$ increase in 'BSize' increases the value of ROAA by 6.97. 'KEInx' is positive and significant at 1%; hence, an increase in 'KEInx' increases ROAA by 0.26.

As can be seen in Table 3.7, in model 1c, 'GDP' variable is positive and significant at a 1% level of significance. Lastly, 'TypeDummy' is negative and significant at 10%, the ROAA value of Islamic banks is less than conventional banks by 0.31. These results are in line with the previous models. It is important to state that 'TypeDummy' supports argument of this study being Islamic bank is significant and has negative impact on financial performance because of its emergence and development trajectory being based on the process of mimicry of the conventional banking system implying that particular reference to Islamic ontology emphasising knowledge is not considered in the construction.

In addition to significant variables in Model 1c in Table 3.7, a number of variables are not statistically significant, such as 'CEE', 'LoR', 'AgeOp', and 'CrisisDummy'. They are all unexpected results, but the statistical insignificance of the 'CEE' may be related to its future impact on financial performance, while the rest of non-significant variables has the same explanation with the previous models.

The overall results show that VAIC and its component, HCE, is significant in explaining financial performance of banks in the GCC countries, while SCE and CEE are not significant. This can be explained as these countries have focussed on human capital development as part of their knowledge-based economy policies. Furthermore, in contemporary times, focussing on human capital rather than structural capital and capital employed is more effective in banks in the GCC countries. Another important finding is that in the models tested in this study, the operational age of banks is not significant for banks in the GCC countries.

One of most important findings in this empirical analysis is that being an Islamic bank is significant but has a negative impact, which constitutes the main argument of this study. Since the emergence of Islamic banking is based on a conventional banking system, they tend to neglect the authenticity of Islamic economics in their operations. This is evident in the findings that being an Islamic bank does not offer an advantage on financial performance. In fact, according to the results, there is a statistically negative impact of being an Islamic bank on the financial performance of banks in the GCC countries.

3.6.1.6.3. Econometrics analysis for the GCC Islamic banks

Table 3.8: Descriptive Statistics

Variables	Mean	SD	Min.	Max.
ROAA	1.272632	1.190112	-4.33	3.23
VAIC	16.59098	5.881299	8.180543	33.18427
HCE	15.19301	5.690127	6.397574	31.20695
SCE	0.4891022	1.091548	-4.775036	2.394725
CEE	0.9088681	0.2974066	0.3830135	1.63143
BSize	19.5×10^7	19.8×10^7	1.258402	90.6×10^7
LoR	61.40042	9.216275	31.3	75.08
AgeOp	25.98947	15.91767	4	59
KEInx	1.57×10^9	8.79×10^8	2.55×10^8	3.65×10^9
GDP	41018	19182.2	20029	88565
CrisisDummy	0.4	0.4924969	0	1

According to the descriptive statistics depicted in Table 3.8 in preparing for the regression analysis, VAIC is efficient to generate the mean value at 16.59. VAIC's components are associated with VAIC performance that the value of HCE can be considered as main pillar for the VAIC. As for the control variables, the mean value for the bank size is US$ 19.5 billion, while the mean value of risk level is measured at 61.40. This shows that Islamic banks can be considered as small in terms of banking size when it is compared to conventional banks. As demonstrated by the age of operation, Islamic banks are a new way of banking, as can be seen in the results, for which the mean value is measured at 25.9. The mean value for KEI, GDP *per capita*, and crisis dummy is measured at 1.57, around US$ 41,000, and 0.4, respectively.

Table 3.9: Correlation Matrix

Variables	ROAA	VAIC	HCE	SCE	CEE	BSize	LoR	AgeOp	KEInx	GDP	CrisisDummy
ROAA	1.0000										
VAIC	0.4203	1.0000									
HCE	0.4334		1.0000								
SCE	0.0380			1.0000							
CEE	-0.1204				1.0000						
BSize	0.3545	0.1443	0.1112	0.1502	0.1750	1.0000					
LoR	0.2285	0.3227	0.2023	0.6245	0.2181	0.2066	1.0000				
AgeOp	0.0991	-0.0111	-0.0433	0.0570	0.4013	0.4810	0.1022	1.0000			
KEInx	0.2086	-0.2973	-0.2917	-0.0723	-0.0320	0.1102	0.1427	-0.0102	1.0000		
GDP	0.3523	0.5461	0.5444	0.1638	-0.2179	-0.0549	0.1797	-0.1305	-0.0856	1.0000	
CrisisDummy	0.0971	0.0491	0.0507	-0.0131	0.0482	0.1058	0.1783	0.0765	0.5016	-0.2800	1.0000

According to the correlation matrix in Table 3.9, there is a moderate relationship between VAIC and HCE and ROAA, while SCE and CEE has weaker relationship with ROAA than HCE and VAIC. In fact, CEE has a negative relationship with ROAA. This also shows that HCE can be considered as a main pillar of VAIC, in this model. In addition to independent variables, control variables have also moderate relationship with ROAA with the exception of AgeOp is weaker than the other control variables. As for the dummy variable, CrisisDummy has also a weaker relationship with ROAA, as seen in Table 3.9. It can, hence, be concluded that none of the variables have a high correlation with ROAA. This result also supported by VIF results, hence, a multicollinearity problem does not exist, as seen in Appendix B.

Table 3.10: Regression Results

ROAA	**Model 1**	**Model 1a**	**Model 1b**	**Model 1c**
VAIC	0.0851969***			
HCE		0.0935567***		
SCE			-0.1836739	
CEE				-0.5007894
BSize	1.65×10^{-8}***	1.62×10^{-8}***	2.18×10^{-8}***	2.08×10^{-8}***
LoR	-0.003555	0.00335	0.0204062	0.0105106
AgeOp	0.0003361	0.0010598	-0.0025967	0.0013056
KEInx	4.95×10^{-10}***	5.05×10^{-10}***	1.74×10^{-10}	1.98×10^{-10}
GDP	9.26×10^{-6}	7.51×10^{-6}	0.0000248***	0.0000227***
CrisisDummy	-0.216166	-0.2730856	0.1896585	0.1929085
Number of obs.	95	95	95	95
R^2	0.3886	0.4065	0.3304	0.3258
Root MSE	0.9673	0.95305	1.0123	1.0158

Note: (***) refers that p value is significant at 1% level; (**) refers that p value is significant at 5% level; (*) refers that p value is significant at 10% level.

The regression results for the estimated models for Islamic banks are presented in Table 3.10. As depicted, Model 1 has R^2 value of 0.38, which shows the efficiency of the model 1 and indicates that 38% of the variation in dependent variable can be accounted by the variation independent variables. In respect of individual variables, as seen in Table 3.10, as might be expected from the literature mentioned in the previous sections, 'VAIC' is significant and positive at 1% level of significance. Therefore, an increase in VAIC affects the value of ROAA by 0.085. 'BSize' has also significant and positive impact on ROAA at a 1% level, which means that an increase in 'BSize around US$ 1 billion will increase the value of ROAA by 1.65. Another important result is that KEInx has significant and positive impact on ROAA, which implies that an increase in human capital, technology use and produce, R&D expenditures, and economic incentives can increase the financial performance of Islamic banks in the GCC countries, as predicted in Table 3.10. As the results for model 1 demonstrates, 'LoR', 'AgeOp', 'GDP', and 'CrisisDummy' are not, unexpectedly, statistically significant due to similar reasons with the previous results including all type of banks.

As regards to findings for Model 1a in Table 3.10, which considers human capital as VAIC's pillar rather than the total value of VAIC, the results show R^2 value of 0.41 which indicates that 41% of variation in dependent variable can be explained by independent variables. As regards to individual variables, as it is expected, 'HCE' is positive and significant at a 1% level of significance, which indicates that an increase in HCE can increase the value of ROAA by 0.094 in Islamic banks. This result shows parallelism with the aims of national visions of the GCC countries. As for the control variables, 'BSize' and 'KEInx are found to be significant and positive at a 1% level for Islamic banks. As for the other variables, 'LoR', 'AgeOp', 'GDP', and 'CrisisDummy' are not significant for Islamic banks in the GCC countries according to model 1a, as can be seen in Table 3.10.

As depicted in Table 3.10, Model 1b and model 1c, which considers SCE and CEE as VAIC's pillars, yields R^2 value of 0.33, indicating a moderate efficiency of the model 1b and model 1c. Thus, these results present that independent variables can explain 33% of the total variation in dependent variables for Islamic banks in the GCC countries. As for individual variables, while 'BSize' and 'GDP' are found to be significant and positive at 1%, other variables including SCE and CEE as main independent variables in these models are found to be insignificant for Islamic banks in the GCC countries due to similar reasons presented in the results of all types of banks.

The overall results show that VAIC and HCE are significant in explaining the financial performance of Islamic banks in the GCC countries. However, SCE and CEE are not significant for Islamic banks in the GCC countries. This can be related to knowledge-based economy policies in the GCC countries that consider human capital development and intellectual capital in their economic and financial systems, for the post-petroleum era. Furthermore, in addition to significance of bank size in explaining financial performance, KEI is significant for VAIC and HCE, but not for SCE and CEE. This result is related with the priorities of the GCC countries that is human and intellectual capital development. As the results indicate, CrisisDummy variable is not significant for Islamic banks, that is an expected result for Islamic banks because of the duration of Islamic banks against financial crisis.

3.6.1.6.4. Econometrics analysis for the GCC conventional banks

Table 3.11: Descriptive Statistics

Variables	Mean	SD	Min.	Max.
ROAA	1.634	0.5930716	0.03	2.78
VAIC	17.62308	5.0491	8.761404	34.46225
HCE	15.56485	4.963899	6.910745	32.47575
SCE	0.6448049	0.5790851	-1.342347	1.710542
CEE	1.413433	0.3730495	0.6047517	2.947586
BSize	40.5×10^7	32.6×10^7	5.661028	198×10^8
LoR	58.49062	9.739886	25.99	74.44
AgeOp	43.55172	22.54253	5	127
KEInx	1.51×10^9	7.67×10^8	2.55×10^8	3.65×10^9
GDP	39222.28	20578.08	20028.65	88564.82
CrisisDummy	0.4	0.491596	0	1

According to the summary statistics presented in Table 3.11, ROAA is efficient to generate profit for sampled conventional banks with a mean value of 1.63. The mean value of VAIC is 17.62 and its components namely, HCE, SCE, and CEE are associated with VAIC performance. According to the results, HCE can be considered as a main driver for the value of VAIC. Regarding control variables, the mean value of the bank size and risk level are US$ 40.5 billion and 58.49, respectively. These results show that conventional banks are bigger than Islamic banks and risk level in conventional banks is lower than Islamic banks. Moreover, according to age of operation, the mean value of conventional banks is higher than Islamic banks with a value of 43.55. Following this, the mean value for KEI, GDP per capita, and crisis dummy are measured at 1.57, around US$ 39,000, and 0.4, respectively, as can be seen in Table 3.11.

Table 3.12: Correlation Matrix

Variables	ROAA	VAIC	HCE	SCE	CEE	BSize	LoR	AgeOp	KEInx	GDP	CrisisDummy
ROAA	1.0000										
VAIC	0.3855	1.0000									
HCE	0.3719		1.0000								
SCE	0.2573			1.0000							
CEE	-0.1297				1.0000						
BSize	0.3342	0.2283	0.2543	-0.0788	-0.1721	1.0000					
LoR	0.2129	0.3164	0.3302	0.0551	-0.1965	0.2888	1.0000				
AgeOp	-0.0459	-0.1930	-0.1644	-0.0824	-0.2965	0.0459	-0.1215	1.0000			
KEInx	0.2996	-0.0408	-0.0141	-0.1943	-0.0628	0.2961	0.2189	0.0499	1.0000		
GDP	0.1249	0.3457	0.3667	-0.0912	-0.0593	0.0069	0.2714	-0.1822	-0.0979	1.0000	
CrisisDummy	-0.1396	-0.0542	-0.0497	-0.0460	0.0007	0.1047	0.1011	0.0545	0.4995	-0.2511	1.0000

According to the correlation matrix in Table 3.12, there is a moderate relationship between all variables and ROAA. However, CEE, AgeOp, and CrisisDummy have negative relationship with ROAA. AgeOp has also a weaker relationship with ROAA than the other variables in this model. Thus, there is no high correlation between independent variables and dependent variables and multicollinearity problems are not found in this model, supported by VIF results, as seen in Appendix B.

Table 3.13: Regression Results

ROAA	Model 1	Model 1a	Model 1b	Model 1c
VAIC	0.0429333***			
HCE		0.0399146***		
SCE			0.3705075***	
CEE				-0.1106612
BSize	2.82×10^{-9}**	2.84×10^{-9}**	4.57×10^{-9}***	4.10×10^{-9}***
LoR	0.0004533	0.000822	0.0013422	0.0039094
AgeOp	0.0001756	-0.0002092	-0.0002703	-0.0016396
KEInx	3.47×10^{-10}***	3.37×10^{-10}***	3.75×10^{-10}***	3.09×10^{-10}***
GDP	-1.54×10^{-6}	-1.57×10^{-6}	2.99×10^{-6}	1.16×10^{-6}
CrisisDummy	-0.451918***	-0.448362***	-0.4428035***	-0.4290246***
Number of obs.	145	145	145	145
R^2	0.3740	0.3552	0.3915	0.2751
Root MSE	0.48109	0.48824	0.4743	0.51769

Note: (***) refers that p value is significant at 1% level; (**) refers that p value is significant at 5% level; (*) refers that p value is significant at 10% level.

The regression results for estimated models for conventional banks in the GCC countries are depicted in Table 3.13. Model 1 estimates R^2 value of 0.37, which indicates the efficiency of the model. Regarding individual variables, VAIC is significant and positive at 1% which implies that an increase in VAIC increases the value of ROAA by 0.043. 'BSize' is also significant and positive at 5% which is an expected result, which implies that an increase in

'BSize' around US$ 1 billion increases the value of ROAA by 2.82. 'KEInx' and 'CrisisDummy' are significant at a 1% level. However, while 'KEInx' has positive impact on ROAA, 'CrisisDummy' has a negative impact, as expected. The result of CrisisDummy supports the argument that Islamic banks is more durable than conventional banks against financial crisis discussed in Islamic finance literature. According to model 1, 'LoR', 'AgeOp', and 'GDP' are not statistically significant due to similar reasons with previous model as seen in Table 3.13.

As depicted in Table 3.13, Model 1a and Model 1b relates to HCE and SCE as VAIC pillars, which produced R^2 value of 0.36 and 0.39, respectively, indicating a moderate relationship. As for individual variables, in the Model 1a, HCE and BSize are significant and positive at 1% and 5%, respectively, while CrisisDummy is significant and negative. Similarly, in the Model 1b, SCE and BSize are significant and positive at 1%, while CrisisDummy is significant and negative. According to Table 3.13, 'LoR', 'AgeOp', and 'GDP' are not statistically significant in Model 1a and Model 1b. These results can be also explained as a previous model, which included all types of banks. As opposed to HCE and SCE, CEE is also found to be insignificant in this model. However, the results of control variables in this model are same with the other models, including VAIC, HCE, and CEE, due to similar reasons demonstrated in this research.

Overall, VAIC, HCE, and SCE are significant for conventional banks, while CEE is not significant in explaining the financial performance of conventional banks in the GCC countries. Furthermore, as expected, CrisisDummy is significant, but negative in this model. This result can support the argument that conventional banks are not resilient in the face of financial crisis.

3.6.1.6.5. Conclusion

The regression analyses presented in this study explored and examined the financial performance of banks in the GCC countries vis-à-vis intellectual capital they produced. As the results indicates, in model 1, VAIC is statistically significant for the financial performance in the GCC countries. According to the descriptive results, Qatar and Kuwait has performed relatively well in VAIC. Therefore, it is important to conclude that VAIC has been significant position in the financial performance of banks in Qatar and Kuwait, when it is compared to other GCC countries, which have moderate scores for VAIC.

As it is expected that bank size and KEI has a positive and significant relationship with financial performance of banks. It is important to state that policies on a knowledge economy in the GCC

countries that has become popular in the last decades aiming to diversify the oil-dependency in the region has an impact on the financial performance of banks. According to dummy variables, which are quite important for rentier states, the period of declining oil prices has a significant negative relationship with financial performance, which confirms research expectations.

The specialisation of banks has also a significant negative relationship with the financial performance of banks in the GCC countries. Therefore, in this model, being an Islamic bank in terms of the VAIC model has a significant but negative relationship with the financial performance of the banks in the GCC countries.

As for the individual sub-models relating to the components of VAIC, only HCE has a significant positive relationship with ROAA. Furthermore, while bank size, KEI, and crisis dummy are found to be significant and has a positive relationship, which is parallel with model 1, type dummy is not significant in the sub-models.

According to individual analysis of bank types, while VAIC and HCE are significant and positive for financial performance in both Islamic banks and conventional banks, SCE is significant and positive for financial performance in only conventional bank performance. These results show that conventional banks are, statistically, performing better than Islamic banks in terms of VAIC and its pillars, and their impact on financial performance of banks, while according to descriptive analysis, Islamic banks and conventional banks show similar trends in terms of the scores of VAIC and its pillars. Furthermore, the results of 'CrisisDummy' support the model in this study which distinguishes Islamic banks from conventional banks in this empirical analysis. Because, oil price crisis in the GCC countries, negatively, affects conventional banks, as also depicted in table 3.13.

3.6.2. Intellectual Capital Disclosure and Financial Performance Nexus: Empirical Process and Findings in the case of the GCC Islamic and Conventional Banks – Empirical Analysis 2

In an attempt to determine the intellectual capital disclosure or ICD and its impact on the financial performance in all banks through aggregated data, and Islamic and conventional banks, separately, this section presents the empirical process and the findings according to the data generated through disclosure analysis.

The rationale for using disclosure analysis in extending the empirical effort stems from the necessity to develop an additional angle to the research question developed in the beginning of the study through a comparative analysis between the empirical results based on disclosed information and secondary data-based analysis presented in the previous section. In the previous empirical part, intellectual capital and its impact on financial performance of banks through actual financial data based on VAIC model is presented. The empirical analysis in this part, on the other hand, constructs a disclosure index constituting intellectual capital through human capital, structural capital, and relational capital with the objective of measuring disclosed intellectual capital through annual reports of banks, whereby, a different set of data were generated to examine its association with the financial performance.

In sum, in addition to the relationship between VAIC and the financial performance of banks in the GCC countries and comparing the performance of conventional and Islamic banks *vis-à-vis* intellectual performance, in this part this study examines the disclosure performance of Islamic banks through the information communicated in their annual reports on intellectual capital.

Consequently, after presenting two empirical analysis, we would be able to identify the proximity between the measured intellectual capital through actual financial data and through constructed disclosure items from annual reports in the sampled banks in particular Islamic banks. This helps to compare the performance of Islamic and conventional banks through two different sets of empirical analysis. Thus, conducting a disclosure analysis helps to advance the evaluation by gaining further depth to the explored relationship.

3.6.2.1. Hypothesis Development

Although, there are number of studies on disclosure analysis of intellectual capital in different sectors and samples (among others *see:* Bhatia and Mehrotra, 2016: Li *et al*., 2008; Mubaraq and Ahmed Haji, 2014; Kamath, 2017; Sharma and Dharni, 2017; and Ahmed Haji and Mubaraq, 2012), the case of Islamic banks is quite rare in the literature (*see*: Damayanti and Budiyanawati, 2009; and Ahmed Haji and Mubaraq, 2012). Hence, this study extends the empirical analysis in this chapter by also examining the impact of disclosed information on intellectual capital on the financial performance of the GCC Islamic and conventional banks with the objective of filling the observed gap in the literature.

It is also important to note that in formulating the model, this study extends the variables used in the practice of ICD for conventional banks by developing an intellectual capital index for Islamic banks through applying Islamic terminology to respond to the peculiarities of Islam on intellectual capital. This is expected to provide a more nuanced and, hence, Islamically blended index for examining intellectual capital disclosure in Islamic banks' annual reports.

Furthermore, an important contribution of this attempt in comparison to the papers available in the field is that it also utilises the knowledge economy index developed in Chapter 2 with the objective of locating the impact of a larger environment *vis-à-vis* knowledge economy on the sampled banks' intellectual capital and also the financial capital of the sampled banks.

In the light of the existing studies and within the expressed frame, this study develops four main hypotheses to explore and examine the relationship between ICD and financial performance of banks in the GCC countries by comparing conventional and Islamic banks. The rationale for these hypotheses is explained as follows along with the hypotheses' statements:

ICD and financial performance: In the light of the existing studies, intellectual capital is identified as intangible capital that create a value for organisations (Hunter *et al*., 2005). In addition, it helps to increase organisational performance through its representative of knowledge, skills, experience, relationship with customers and business partners, training that all help an organisation to be competitive and to manage performance (Sullivan, 1998). However, in terms of disclosure analysis, ICDI can also be categorised through the following constituents: human capital disclosure index (HCDI), structural capital disclosure index (SCDI), and relational capital disclosure index (RCDI) (among others *see:* Bhatia and Mehrotra, 2016: Li *et al*., 2008; Mubaraq and Ahmed Haji, 2014; Kamath, 2017; Sharma and Dharni, 2017; Ahmed Haji and Mubaraq, 2012; Bontis, 2000; Stewart, 1991-1994). ICDI as the totality of HCDI, SCDI, and RCDI increases organisational performance through each sub-components of the indicators of intellectual capital as specified in the variable definition section. Therefore, it is expected that ICD has positive impacts on organisational performance at both management and financial level (*see*: Li *et al*., 2008; Sharma and Dharni, 2017; Damayanti and Budiyanawati, 2009). Therefore, the following hypothesis is tested in this study:

> *H_1: There is a significant positive relationship between ICD and financial performance of banks in the GCC countries*

In addition to the total level of ICD performance, it is important to test each ICD component in order to evaluate whether they are significant for the financial performance of the sampled banks.

Human capital disclosure and financial performance: Human capital items such as employee's capabilities, knowledge, training, learning, know-how, and education in the variable definition section can be recognised as an organisation's most valuable resource that makes human capital the main source affecting the organisational performance (Curado *et al*., 2011: 1083). Due to the contribution of human capital items that all are listed in the variable section on organisational performance, the expectation is that the performance in human capital disclosure is significant for the financial performance of banks (*see*: Bhatia and Mehrotra, 2016; Mubaraq and Ahmed Haji, 2014). Therefore, it is hypothesised that:

> *H_{1a}: There is a significant positive relationship between human capital disclosure (HCD) and the financial performance of banks in the GCC countries.*

Structural capital and financial performance: Structural capital is also known as internal capital comprising processes, routines, structural capital, corporate structure, copyrights, patents, and trademarks, and all these sub-categories are listed in the variable definition section. It is suggested, among others, by Bontis (1998) that structural capital can be considered as a mechanism and structure of organisation that affects human capital in terms of intellectual capital. However, in the organisation, this kind of capital can be used by employees as they are not removable from the organisation, such as, corporate culture and structure that embodies and supports human capital (Edvinsson, 1997). Therefore, the expectation is that higher level of structural capital disclosure has positive impact on an organisation (Mubaraq and Ahmed Haji, 2014). It is, consequently, hypothesised that:

> *H_{1b}: There is a significant and positive relationship between structural capital disclosure (SCD) and financial performance of banks in the GCC countries.*

Relational capital and financial performance: Relational capital refers to the relationship of the organisations with their employees and external stakeholders, such as, customers or corporate partners, as well as, external capital related to trust, brand, image, business collaboration, customer service, environmental effects, and contracts. All these constituents form relational capital and are listed in variable definition section (Edvinsson and Malone, 1997; Stewart, 1997; Bozzolan, 2003). These items can be related to the image and branding of the organisation

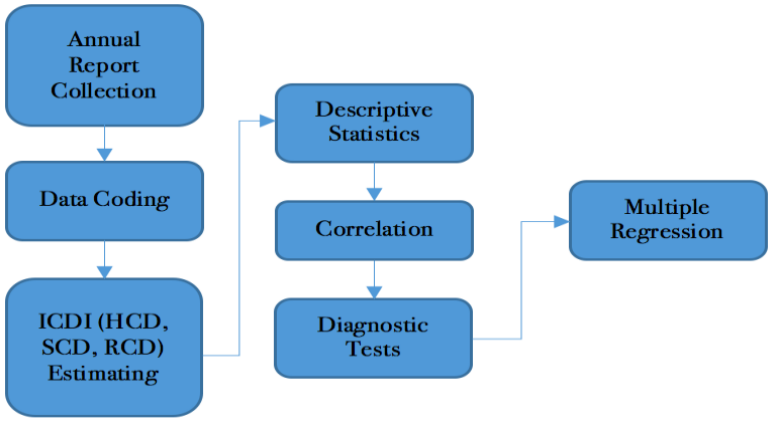
among its customers and in the market. Therefore, it is expected that high levels of relational capital contribute to organisations' corporate and financial performance (Mubaraq and Ahmed Haji, 2014). Accordingly, the following hypothesis is developed to be tested in this study:

> H_{1c}: There is a significant and positive relationship between relational capital disclosure (RCD) and financial performance of banks in the GCC countries.

3.6.2.2. Empirical process

In order to fulfil the objectives of this research, the empirical process pursued in this section is depicted in Figure 3.9.

Figure 3.9: Summary of Empirical Process



As summarised in Figure 3.9, in the data generation process, ICD index or ICDI is constructed, which is discussed in the following section and presented in the variable definition.

Following this, ICDI is measured by applying a coding method to the banks' annual reports by utilising content analysis. After constituting an ICDI data set, this research employs correlation analysis to examine whether there is any correlation between the ROAA and ICDI, and its components. This is followed by an OLS analysis supported through diagnostic tests, which were conducted to find the relationship between ROAA and ICDI, its pillars, and control variables, in the sampled GCC banks. In this study, OLS model is the best estimator because having short panel data with short *t* (5 years) and small *n* (45 banks) (Buddelmeyer *et al.*, 2008).

As discussed above in section 3.6.1.3, there are a number of tests conducted to ensure the efficiency of the data, which are described above, such as, heteroscedasticity and multicollinearity (Wooldridge, 2015: 74-81; Baum, 2006). For this model, Appendix B shows

that the variances of residuals are homoscedastic so there is no heteroscedasticity problem. Considering multicollinearity testing, Appendix B shows that there is no perfect collinearity or near collinearity, indicating that independent variables can be used in the OLS analysis. Another way of multicollinearity testing is to estimate the VIF values. According to the results presented in Appendix B, the VIF values are less than 10 so there is no multicollinearity problem (Baum, 2006).

3.6.2.3. Research method for data collection: Content analysis

Many studies on intellectual capital have used content analysis as a reliable and valid research method to generate data to measure intellectual capital (among others *see:* Bhatia and Mehrotra, 2016: Li *et al*., 2008; Mubaraq and Ahmed Haji, 2014; Kamath, 2017; Sharma and Dharni, 2017; Ahmed Haji and Mubaraq, 2012; Damayanti and Budiyanawati, 2009) or on topics such as CSR disclosure performance of banks as (*see*: Haniffa and Hudaib, 2017; Platonova *et al*., 2018). Although content analysis can be traced back to the late 1600s in theological studies (Krippendorff, 2004: 3) within the context of hermeneutics, content analysis in terms of quantitative approach utilising units of analysis as texts, newspapers, reports *etc.* emerged after World War II as an integrated analysis form with the contribution of Berelson (1952) and spread to number of disciplines (Krippendorff, 2004: 11).

Content analysis is defined by Krippendorff (2004: 18) as "a research technique for making replicable and valid inferences from text (or other meaningful matters) to the contexts of their use". Thus, as a scientific tool, content analysis facilitates the engagement of the researcher with the text to extract new insights, new understanding on specific phenomena on condition that it is being reliable and produces valid results (Krippendorff, 2004: 18). Basically, content analysis can be summarised as analysis of periodical and stable published information by institutions, groups, society, and banks, such as, annual reports, or corporations by using different methods like 'word coding method'.

Weber (1990: 9) also describes content analysis in a functional form as "a research method that uses a set of procedures to make valid inferences from text. These inferences are about the sender(s) of the message, the message itself, or the audience of the message". There are a number of reasons why content analysis can be used as a data collection method in the studies as research method. One of most important points related to this study is that "content analysis reflects cultural patterns of groups, institutions, or societies; reveals the focus of individual,

group, institutional, or societal attention" (Weber, 1990: 9). Thus, considering these definitions and features, content analysis fits into this research, which is focussed on examining annual reports to generate data on intellectual capital with the objective of evaluating the banks in terms of intellectual capital and the culture of Islamic banks through some econometric techniques as stated in detail above.

As a method, in the coding process in this study, annual reports of the sampled banks have been read in detail with a particular attention for each word and integrated meaning of texts in order to reach reliable and valid results as Krippendorff (2004) emphasised. In doing so, Krippendorff's (2004: 22-24) concerns and suggestions were taken into account, such as, "texts have no objective qualities", "texts do not have single meanings", "the meanings invoked by texts need not be shared", "meanings (contents) speak to something other than the given texts, even where conventions suggest that messages 'contain' them or texts 'have' them", "texts have meanings relative to particular contexts, discourses, or purposes", and "the nature of texts demands that contents analysts draw specific inferences from a body of texts to their chosen context". Due to such concerns, the coding process of content analysis is a critical step to reach reliable and valid results; therefore, there is a need to pay attention and follow the procedure in a systemic way.

Content analysis in this study provides repeatability and valid inferences from the data generated from the annual reports of the sampled banks in the GCC countries. The disclosure index used in this study applies 43 disclosure items for conventional banks with a further 10 more disclosure items for Islamic banks, resulting into a total of 53 index items for Islamic banks. In constructing disclosure items, the distinction of Islamic and conventional banks was considered and, therefore, additional items included for the Islamic bank disclosure index to reflect the peculiarities of Islamic banks, in addition to common items. The common items can be rationalised on the ground of possessing the same organisational structure as conventional banks. In developing the disclosure items, the existing and grounded studies (such as Bhatia and Mehrotra, 2016: Li *et al*., 2008; Mubaraq and Ahmed Haji, 2014; Kamath, 2017; Sharma and Dharni, 2017; Ahmed Haji and Mubaraq, 2012; Damayanti and Budiyanawati, 2009; Platonova *et al*., 2018) were utilised. The index was developed and used for the disclosure analysis in this study, which is described in the following section as part of the variable definition; as each section of the index relates to a particular variable.

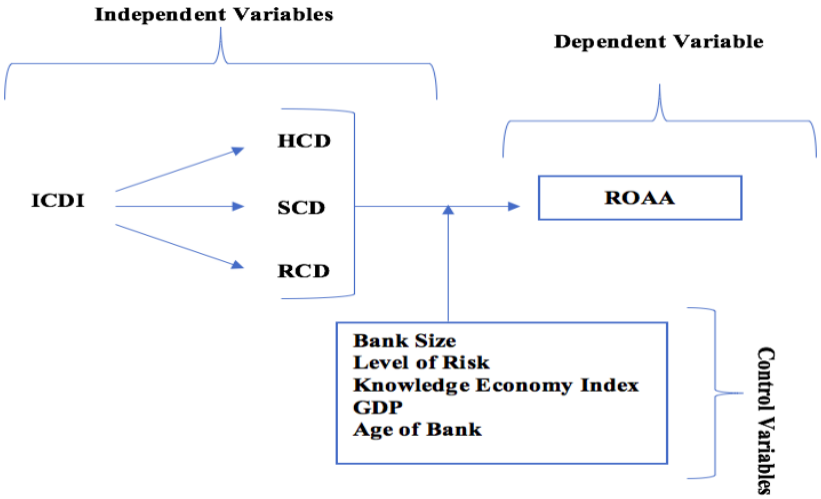
3.6.2.4. Model selection for econometric analysis

This study examines the ICD in the sampled Islamic and conventional banks' annual reports in the GCC countries for the period of 2012-2016, with the objective of locating its impact on financial performance of the sampled banks. As discussed in the empirical section, intellectual capital has been measured through VAIC with the help of annual financial data of the sampled banks. However, in this part, while VAIC still remains the theoretical frame, it is measured through ICD of the sampled banks' annual reports. Therefore, this empirical research provides an opportunity to also test whether there is an inconsistency between the VAIC model tested in the first part of this chapter, with the disclosure-based data generated analysis in this section, for Islamic and conventional banks in the GCC countries.

In the empirical process, the disclosure items are determined for each component of intellectual capital, which are human capital, structural capital and relational capital. It should be noted that relational capital is also termed as external capital and customer capital. However, the term of relational capital is considered in this study as it is generally used in the ICD literature as stated above.

Based on the existing body of the knowledge and the objectives of this study, Figure 3.10 presents the summary of the model. Accordingly, the regression models 3.8 and 3.9 are developed:

Figure 3.10: Summary of Model



$$ROAA = \beta_i + \beta_1 ICD + \beta_2 BankSize + \beta_3 levelofrisk + \beta_4 KEI + \beta_5 GDP + \beta_6 AgeOp + \beta_7 Crisis + \beta_8 Type + \varepsilon \quad (3.8)$$

$$ROAA = \beta_i + \beta_1 HCD + \beta_2 SCD + \beta_3 RCD + \beta_4 BankSize + \beta_5 levelofrisk + \beta_6 KEI + \beta_7 GDP + \beta_8 AgeOp + \beta_9 Crisis + \beta_{10} Type + \varepsilon \quad (3.9)$$

The variables included in the regression equations in 3.8 and 3.9. are discussed and explained in the following section.

3.6.2.5. Variable definition

Dependent Variable

ROAA: To examine whether ICDI has a significant impact on financial performance of banks in the GCC countries, *ROAA* is considered as a dependent variable, which refers to the efficiency of available assets to create profits. It is calculated through net profit of banks before tax divided by average total assets in annual reports.

Independent Variables

ICDI: This study measures the ICDI to examine the intellectual capital performance of banks in the GCC countries, which is consisted of three elements: HCD, SCD, and RCD. In this model, the creation of intellectual disclosure items is the key to calculate the ICDI and its components. Therefore, this study has used disclosure items from the existing literature and has also modified the existing indices by including further items related to Islamic finance, as explained above. It is important to specify and categorise each ICD item from a broad perspective so that an efficient measurement of indicators of intellectual capital through the disclosure model can be achieved.

ICDI value is measured by using the following formula (adapted from Haniffa and Hudaib, 2007):

$$ICDI_j = \frac{\sum_{i=1}^{n_j} X_{ij}}{n_j} \quad (3.10.)$$

where,
n_j = number of items for j_{th} bank,
n_j = 53 for Islamic banks; 43 for conventional banks

X_{ij} = 1 if i_{th} item disclosed, 0 if i_{th} item not disclosed, so that $0 \leq ICDI_j \leq 1$.

HCD Index: As depicted in Table 3.14, HCDI is consisted of 16 items for conventional banks and 17 items for Islamic banks. An additional item is added for Islamic banks which is 'training on Islamic finance and banking' to bank's employees in addition to the general training on professional qualifications. Hence, the distinction between conventional and Islamic banks has been considered in this research.

Table 3.14: Human Capital Disclosure Items

Type	Items	Sources
CB and IB	Employee Communication/Team Work/synergy	Palacios-Marqués and Garrigós-Simón (2003); Bhatia and Mehrotra (2016); Chahal and Bakshi (2016); Curado *et al*. (2011); Li *et al*. (2008); Kamath (2017); and Mubaraq and Ahmed Haji (2014)
CB and IB	Knowledge Sharing	Palacios-Marqués and Garrigós-Simón (2003); Bhatia and Mehrotra (2016); Chahal and Bakshi (2016); Curado *et al*. (2011); Kamath (2017); and Mubaraq and Ahmed Haji (2014)
CB and IB	Professional Qualification	Palacios-Marqués and Garrigós-Simón (2003); Bhatia and Mehrotra (2016); Chahal and Bakshi (2016); Curado *et al*. (2011); Ishak and Al-Ebel (2013); Kamath (2010); Kamath (2017); Li *et al*. (2008); and Mubaraq and Ahmed Haji (2014).
CB and IB	Training and Education	Platonova *et al*. (2018); Bhatia and Mehrotra (2016); Chahal and Bakshi (2016); Curado *et al*. (2011); Ishak and Al-Ebel (2013); Kamath (2010); Kamath (2017); Li *et al*. (2008); Mubaraq and Ahmed Haji (2014); and Sharma and Dharni (2017)
CB and IB	Conference Organisation/ Sponsorship	Platonova *et al*. (2018)
CB and IB	Competitive Salary	Platonova *et al*. (2018)
CB and IB	Safety and Health at Work	Bhatia and Mehrotra (2016); Chahal and Bakshi (2016); Kamath (2017); and Mubaraq and Ahmed Haji (2014)
CB and IB	Reward for Employee (Remunerations)	Platonova *et al*. (2018) and Kamath (2017)
CB and IB	Employee Satisfaction / Appreciation	Platonova *et al*. (2018); Bhatia and Mehrotra (2016); Chahal and Bakshi (2016); Curado *et al*. (2011); Mubaraq and Ahmed Haji (2014); and Sharma and Dharni (2017)
CB and IB	Employee Voice Opinions/survey	Bhatia and Mehrotra (2016); Chahal and Bakshi (2016); Kamath (2017); and Mubaraq and Ahmed Haji (2014)
CB and IB	National Employee Policy	Author's own
CB and IB	Employee Age	Bhatia and Mehrotra (2016); Li *et al*. (2008); and Mubaraq and Ahmed Haji (2014)
CB and IB	Number of Employees	Platonova *et al*. (2018); Bhatia and Mehrotra (2016); Curado *et al*. (2011); Li *et al*. (2008); and Mubaraq and Ahmed Haji (2014);
CB and IB	Employee involvement with community	Li *et al*. (2008)
CB and IB	Employee know how	Bhatia and Mehrotra (2016); Ishak and Al-Ebel (2013); Chahal and Bakshi (2016); Curado *et al*. (2011); Kamath (2010); Kamath (2017); Li *et al*. (2008); Mubaraq and Ahmed Haji (2014); and Sharma and Dharni (2017)
CB and IB	Meeting Attendance	Author's own
IB	Training given to staff on Islamic banking fundamentals	Platonova *et al*. (2018)

SCD Index: As seen in Table 3.15, SCDI is measured by 13 items in conventional banks and 17 items for Islamic banks to capture the particularities and distinctiveness of Islamic banking in relation to SCDI. The additional Islamic bank disclosure items are: 'reputable *shariah* board', 'Islamic management philosophy', 'reference to innovation through Islamic rules', and 'purification of the prohibited income'.

Table 3. 15: Structural Capital Disclosure Items

Type	Items	Sources
CB and IB	Corporate culture	Bhatia and Mehrotra (2016); Chahal and Bakshi (2016); Curado *et al*. (2011); Ishak and Al-Ebel (2013); Kamath (2010); Kamath (2017); Li *et al*. (2008); and Mubaraq and Ahmed Haji (2014)
CB and IB	Corporate Philosophy	Bhatia and Mehrotra (2016); Curado *et al*. (2011); Ishak and Al-Ebel (2013); Kamath (2010); Kamath (2017); Li *et al*. (2008); and Mubaraq and Ahmed Haji (2014)
CB and IB	Transparency	Chahal and Bakshi (2016); and Mubaraq and Ahmed Haji (2014)
CB and IB	Leadership/pioneer	Bhatia and Mehrotra (2016); Chahal and Bakshi (2016); Curado *et al*. (2011); Kamath (2017); Li *et al*. (2008); and Mubaraq and Ahmed Haji (2014)
CB and IB	Patent	Palacios-Marqués and Garrigós-Simón (2003); Bhatia and Mehrotra (2016); Curado *et al*. (2011); Ishak and Al-Ebel (2013); Kamath (2010); Kamath (2017); Mubaraq and Ahmed Haji (2014); and Sharma and Dharni (2017);
CB and IB	Copyright	Bhatia and Mehrotra (2016); Ishak and Al-Ebel (2013); Kamath (2010); Kamath (2017); Mubaraq and Ahmed Haji (2014); and Sharma and Dharni (2017)
CB and IB	Trademark	Bhatia and Mehrotra (2016); Curado *et al*. (2011); Kamath (2010); Kamath (2017); Mubaraq and Ahmed Haji (2014); and Sharma and Dharni (2017)
CB and IB	Research and Development	Palacios-Marqués and Garrigós-Simón (2003); Bhatia and Mehrotra (2016); Chahal and Bakshi (2016); Curado *et al*. (2011); Kamath (2017); Li *et al*. (2008); Mubaraq and Ahmed Haji (2014); and Sharma and Dharni (2017)
CB and IB	IT Infrastructure	Bhatia and Mehrotra (2016); Chahal and Bakshi (2016); Curado *et al*. (2011); Ishak and Al-Ebel (2013); Kamath (2010); Kamath (2017); Li *et al*. (2008); Mubaraq and Ahmed Haji (2014); and Sharma and Dharni (2017)
CB and IB	Innovation	Palacios-Marqués and Garrigós-Simón (2003); Bhatia and Mehrotra (2016); Chahal and Bakshi (2016); Curado *et al*. (2011); Kamath (2017); Li *et al*. (2008); Mubaraq and Ahmed Haji (2014); and Sharma and Dharni (2017)
CB and IB	Quality Standard	Palacios-Marqués and Garrigós-Simón (2003); Curado *et al*. (2011); and Li *et al*. (2008)
CB and IB	Atmosphere is supportive	Chahal and Bakshi (2016); Bhatia and Mehrotra (2016); and Kamath (2017)
CB and IB	Product Development	Platonova *et al*. (2018); Chahal and Bakshi (2016); and Sharma and Dharni (2017)
IB	Reputable *Shariah* Board	Author's own

IB	Islamic Management Philosophy	Adapted from: Bhatia and Mehrotra (2016); Curado *et al*. (2011); Ishak and Al-Ebel (2013); Kamath (2010); Kamath (2017); Li *et al*. (2008); and Mubaraq and Ahmed Haji (2014)
IB	Reference to Innovation through Islamic Rules	Platonova *et al*. (2018)
IB	Purification of the Prohibited Income	Author's own

Table 3.16: Relational Capital Disclosure Items

Type	Items	Sources
CB and IB	Business collaboration and partnership	Palacios-Marqués and Garrigós-Simón (2003); Bhatia and Mehrotra (2016); Ishak and Al-Ebel (2013); Kamath (2010); Kamath (2017); Li *et al*. (2008); Mubaraq and Ahmed Haji (2014); and Sharma and Dharni (2017)
CB and IB	Customer relations/service	Palacios-Marqués and Garrigós-Simón (2003); Bhatia and Mehrotra (2016); Kamath (2017); Li *et al*. (2008); Mubaraq and Ahmed Haji (2014); and Sharma and Dharni (2017)
CB and IB	Customer loyalty	Bhatia and Mehrotra (2016); Curado *et al*. (2011); Kamath (2010); Kamath (2017); Mubaraq and Ahmed Haji (2014); and Sharma and Dharni (2017)
CB and IB	Branding	Bhatia and Mehrotra (2016); Curado *et al*. (2011); Kamath (2010); Kamath (2017); Li *et al*. (2008); Mubaraq and Ahmed Haji (2014); and Sharma and Dharni (2017)
CB and IB	Customer feedback	Bhatia and Mehrotra (2016); Chahal and Bakshi (2016); and Mubaraq and Ahmed Haji (2014)
CB and IB	Customer satisfaction	Platonova *et al*. (2018); Bhatia and Mehrotra (2016); Chahal and Bakshi (2016); Kamath (2017); Mubaraq and Ahmed Haji (2014); and Sharma and Dharni (2017)
CB and IB	Goodwill	Bhatia and Mehrotra (2016); Mubaraq and Ahmed Haji (2014); and Sharma and Dharni (2017);
CB and IB	Contribution to economic development	Platonova *et al*. (2018)
CB and IB	Market/Sector preferences	Bhatia and Mehrotra (2016); Curado *et al*. (2011); Ishak and Al-Ebel (2013); Kamath (2017); Li *et al.* (2008); Mubaraq and Ahmed Haji (2014); and Sharma and Dharni (2017)
CB and IB	Company reputation and image	Curado *et al.* (2011); Ishak and Al-Ebel (2013); Kamath (2017); and Li *et al*. (2008)
CB and IB	Trust	Author's own
CB and IB	Value added service	Kamath (2017)
CB and IB	Social and economic well-being of the local communities	Platonova *et al*. (2018)
CB and IB	Reduce time to solve problem/saving of time	Author's own
IB	Regularly used Islamic contracts	Adapted from: Bhatia and Mehrotra (2016); Kamath (2010); Kamath (2017); Li *et al.* (2008); and Mubaraq and Ahmed Haji (2014)
IB	Islamic brand and image	Author's own

IB	Use of fixed income securities	Author's own
IB	Use of variable income securities	Author's own
IB	Information provision to customers on *zakat* and *zakat* calculation service'	Platonova *et al.* (2018)

RCD Index: As can be seen in Table 3.16, the RCDI value is measured through 14 items-based index for conventional banks, while the Islamic banks' index consists of 19 items. In addition to common items with conventional banks, Islamic banks have additional items: 'regularly used Islamic contracts', 'Islamic brand and image', 'use of fixed income securities', 'use of variable income securities', and 'information provision to customers on *zakat* and *zakat* calculation service'. These additional items again aim to capture the differences between conventional and Islamic banks in terms of ICD.

In addition, the following *control variables* are developed:

Bank Size: Proxied by Total Assets

Level of Risk: Proxied by Net loans to total assets

Knowledge Economy Index: This variable was created and estimated by the World Bank only for 1995, 2000, and 2012. However, as mentioned previously, this is estimated for the rest of the years in Chapter 2, with the method used by the World Bank to complete the time-series in a consistent manner. This index consists of four pillars: economic incentive and institutional regime; innovation and technologies adoption; education and training; and information and communication infrastructure. The details of the estimation method and completion of data can be found in Chapter 2.

GDP: GDP per capita

AgeOp: Longevity or the age of operation of banks

Crisis: *Dummy variable* is used to capture the fluctuation of oil price considering the period of 2012-2013-2014 as high oil price years, while the period of 2015 and 2016, as low oil prices.

Type: Dummy variable is used to identify nature of the bank regarding whether it is Islamic or conventional bank. This variable can be considered for only all types.

3.6.2.6. Sample Banks

The sample in this research consists of 21 Islamic banks and 24 conventional banks from the GCC countries, by excluding Oman due to the fact that Islamic banking experience in Oman is very recent. The criterium for the sampling is based on the availability of annual reports and banks from the GCC countries. The list of the sampled banks can be found in Table 3.17:

Table 3.17: Sampled Banks

Countries	Islamic Banks	Conventional Banks
Bahrain	Al Salam Bank, Bahrain Islamic Bank Khaleeji Commercial Bank Al Baraka Bahrain ABC Islamic Bank Kuwait Finance House Bahrain Ithmaar Bank	Ahli United Bank, Bank ABC Gulf International Bank BBK National Bank of Bahrain
Kuwait	Ahli United Bank Kuwait Kuwait Finance House Boubyan Bank Kuwait International Bank Warba Bank	Burgan Bank Gulf Bank Al Ahli Bank of Kuwait Commercial Bank of Kuwait
Qatar	Qatar Islamic Bank Masraf Al Rayan QIIB	Qatar National Bank The Commercial Bank Doha Bank Al Khaliji Commercial Bank Ahli Bank
Saudi Arabia	Al Rajhi Bank Alinma Bank Al Jazira Bank Bank Al Bilad	National Commercial Bank Riyad Bank Banque Saudi Fransi Saudi British Bank Alawwal Bank
UAE	Emirates Islamic Bank Al Hilal Bank	Emirates NBD Abu Dhabi Commercial Bank First Gulf Bank Masreqbank Union National Bank
Total	21	24

It should be stated that a total of 225 annual reports were examined through content analysis with the constructed index to generate data through disclosure analysis for this study covering the 2012-2016 period.

3.6.2.7. Data sources

All the data for financial and economic variables were collected from Orbis Bank Focus (Bankscope) database which includes the bank size and risk related variables. The GDP data for individual countries were assembled from the World Bank. As mentioned previously, KEI

was created in this study by following the World Bank's method. The data for the individual pillars of intellectual capital were generated from the sampled banks' annual reports through disclosure analysis to measure the ICDI.

3.6.2.8. Empirical Findings

3.6.2.8.1. Descriptive analysis

Table 3.18: Intellectual Capital Disclosure Performance of the GCC Banks (2012-2016)

Year	Coefficient	Bahrain	Kuwait	Qatar	Saudi Arabia	UAE
2012	HCDI	0.40	0.35	0.46	0.51	0.31
	SCDI	0.55	0.43	0.57	0.54	0.48
	RCDI	0.61	0.49	0.70	0.67	0.61
	ICDI	0.52	0.42	0.58	0.57	0.47
2013	HCDI	0.44	0.43	0.41	0.44	0.36
	SCDI	0.56	0.44	0.58	0.53	0.53
	RCDI	0.62	054	0.73	0.66	0.67
	ICDI	0.54	0.47	0.57	0.54	0.52
2014	HCDI	0.46	0.40	0.47	0.50	0.33
	SCDI	0.64	0.52	0.58	0.50	0.53
	RCDI	0.68	0.65	0.77	0.70	0.66
	ICDI	0.60	0.52	0.60	0.57	0.51
2015	HCDI	0.49	0.47	0.47	0.58	0.27
	SCDI	0.58	0.52	0.58	0.54	0.50
	RCDI	0.72	0.68	0.76	0.74	0.64
	ICDI	0.59	0.56	0.60	0.62	0.47
2016	HCDI	0.46	0.42	0.40	0.52	0.27
	SCDI	0.60	0.51	0.57	0.54	0.47
	RCDI	0.73	0.66	0.75	0.72	0.61
	ICDI	0.60	0.53	0.57	0.60	0.45
2012-2016	HCDI	0.45	0.41	0.46	0.47	0.37
	SCDI	0.59	0.48	0.58	0.53	0.50
	RCDI	0.67	0.60	0.74	0.70	0.64
	ICDI	0.57	0.50	0.59	0.58	0.48

Table 3.18. shows the ICD performance of the entire sampled banks regardless of being conventional or Islamic in the GCC countries. As can be seen, Qatar performed the best on ICD performance for the period of 2012 and 2016 with the average score of 0.59, while its score is the highest on RCDI with 0.74 in the region. Following Qatar, Saudi Arabia is the second successful country on ICD performance for the period of 2012 and 2016 scoring 0.58 that is

almost the same score as Qatar. Saudi Arabia has a highest score only in one pillar of intellectual capital that is HCDI with 0.51 as the average of sampled years. The third best performing country on the disclosure performance of intellectual capital for the period in question is Bahrain with an average index value of 0.57, that is also very close to the performance of Qatar and Saudi Arabia. Bahrain performed the highest score in the SCDI among the components of intellectual capital by scoring 0.57. Kuwait and the UAE have relatively performed poorly in the ICDI for five years, as compared to the other GCC countries. Their scores for ICDI are 0.50 and 0.48, respectively and they do not have any high score for the pillars of intellectual capital, as depicted in Table 3.18.

Table 3.19: Intellectual Capital Disclosure Performance of the GCC Conventional Banks (2012-2016)

Year	Coefficient	Bahrain	Kuwait	Qatar	Saudi Arabia	UAE
2012	HCDI	0.35	0.31	0.48	0.44	0.30
	SCDI	0.57	0.46	0.58	0.46	0.40
	RCDI	0.51	0.50	0.69	0.69	0.57
	ICDI	0.48	0.42	0.58	0.53	0.42
2013	HCDI	0.45	0.38	0.40	0.46	0.31
	SCDI	0.57	0.42	0.57	0.49	0.51
	RCDI	0.54	0.57	0.74	0.66	0.59
	ICDI	0.52	0.46	0.57	0.54	0.47
2014	HCDI	0.50	0.33	0.43	0.50	0.29
	SCDI	0.69	0.48	0.55	0.48	0.52
	RCDI	0.66	0.68	0.74	0.71	0.59
	ICDI	0.62	0.50	0.57	0.56	0.47
2015	HCDI	0.51	0.44	0.50	0.56	0.31
	SCDI	0.57	0.48	0.55	0.52	0.55
	RCDI	0.71	0.75	0.79	0.70	0.66
	ICDI	0.60	0.56	0.61	0.60	0.51
2016	HCDI	0.50	0.34	0.43	0.46	0.28
	SCDI	0.58	0.48	0.57	0.52	0.48
	RCDI	0.71	0.70	0.74	0.73	0.61
	ICDI	0.60	0.51	0.58	0.57	0.46
2012-2016	HCDI	0.46	0.36	0.45	0.49	0.30
	SCDI	0.60	0.47	0.57	0.50	0.49
	RCDI	0.63	0.64	0.74	0.70	0.60
	ICDI	0.56	0.49	0.58	0.56	0.46

After presenting the aggregate results in Table 3.18, Table 3.19 presents the results of intellectual capital performance of conventional banks in the GCC countries. According to the

results, Qatar is again the leading country on the intellectual capital performance of conventional banks in the GCC countries for the years spanning 2012 to 2016 with a score value of 0.58, while Qatar leads only in RCDI pillar of intellectual capital with a score of 0.74. Saudi Arabia and Bahrain follows Qatar, performing equal scores in ICD indices with 0.58, that is almost the same as Qatar's performance, evidenced in Table 3.19. However, while Saudi Arabia is a leading country in HCDI with the score of 0.51, Bahrain is the highest country in SCDI with 0.59. Kuwait and the UAE have performed relatively poorly on the average ICDI, with scores of 0.49 and 0.46, respectively, with no high scores in the ICDI pillars.

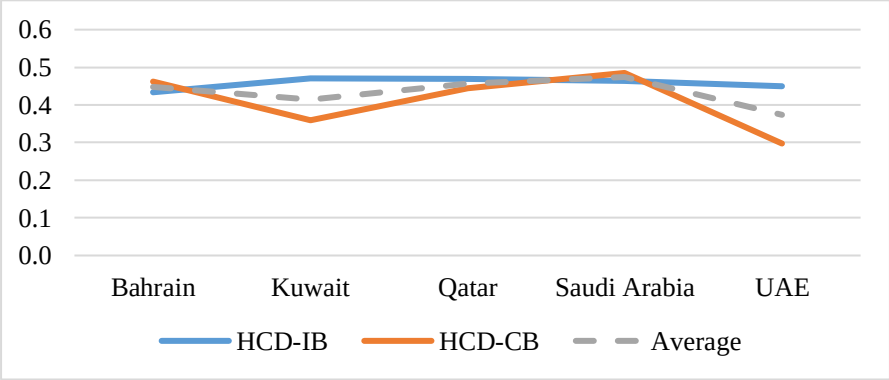
Table 3.20: Intellectual Capital Disclosure Performance of the GCC Islamic Banks (2012-2016)

Year	Coefficient	Bahrain	Kuwait	Qatar	Saudi Arabia	UAE
2012	HCDI	0.45	0.39	0.45	0.57	0.32
	SCDI	0.53	0.40	0.55	0.62	0.56
	RCDI	0.70	0.48	0.72	0.66	0.66
	ICDI	0.56	0.42	0.57	0.62	0.51
2013	HCDI	0.44	0.48	0.41	0.41	0.41
	SCDI	0.55	0.45	0.59	0.57	0.56
	RCDI	0.70	0.51	0.72	0.67	0.76
	ICDI	0.55	0.48	0.57	0.55	0.58
2014	HCDI	0.43	0.47	0.51	0.50	0.38
	SCDI	0.60	0.56	0.61	0.53	0.53
	RCDI	0.70	0.62	0.79	0.68	0.74
	ICDI	0.57	0.55	0.64	0.57	0.55
2015	HCDI	0.46	0.51	0.43	0.59	0.24
	SCDI	0.59	0.55	0.61	0.56	0.44
	RCDI	0.72	0.61	0.74	0.79	0.63
	ICDI	0.59	0.56	0.59	0.65	0.44
2016	HCDI	0.43	0.51	0.37	0.58	0.26
	SCDI	0.61	0.53	0.57	0.56	0.46
	RCDI	0.74	0.63	0.75	0.72	0.61
	ICDI	0.59	0.56	0.57	0.62	0.44
2012-2016	HCDI	0.43	0.47	0.47	0.46	0.45
	SCDI	0.57	0.50	0.58	0.57	0.51
	RCDI	0.71	0.57	0.74	0.70	0.68
	ICDI	0.57	0.51	0.59	0.60	0.50

Table 3.20 depicts the results for the ICD performance of Islamic banks in the GCC countries. The results show that Saudi Arabia has the highest ICDI with the score of 0.60 for the period in question; and it performed the best score in HCDI with 0.49. As can be seen, Qatar is the

second-best country in ICDI with a score of 0.50, that is almost the same as Saudi Arabia's performance. However, Qatar is the leading country in the GCC region regarding the SCDI and RCDI with scores of 0.58 and 0.74, respectively. Bahrain has relatively performed well on the ICDI with a score value of 0.57 that is very close to Qatar's performance, so it captures the third level for ICDI in the region. Lastly, Kuwait and the UAE performed less than satisfactorily on ICD performance for the 2012 to 2016 period, with average scores of 0.51 and 0.50 respectively, as the pillars or the components of the ICD have been positioned at a lower level in these countries, when compared to the other GCC countries.

Figure 3.11: The Average of Human Capital Disclosure in the GCC Islamic and Conventional Banks (2012-2016)



After providing the descriptive results of ICDI in the GCC countries in general, and in relation to being Islamic and conventional banks, it is important to examine the trends as they relate to each pillar of ICD, by distinguishing their individual performance with disaggregated manners, in terms of bank types. According to the average score of the HCDI over the period of 2011-2015, Figure 3.11 shows that HCD performance in Islamic banks is better than conventional banks in Kuwait, Qatar, and the UAE. In Kuwait and the UAE, there are distinctive differences between Islamic banks and conventional banks in terms of HCDI, while in Qatar, the average performance of HCD in both type of banks is very close to each other. However, in Bahrain and Saudi Arabia, HCDI in conventional banks is higher than the score for the Islamic banks.

According to SCDI in both conventional and Islamic banks, the trend of the average of SCDI in conventional and Islamic banks shows the same direction as seen in Figure 3.12. although SCDI trend in Islamic banks is mostly over conventional banks by a narrow margin in Kuwait, Qatar, Saudi Arabia and the UAE, except for Bahrain, where the SCDI trend is below the conventional banks with a slight difference.

Figure 3.12: The Average of Structural Capital Disclosure in the GCC Islamic and Conventional Banks (2012-2016)

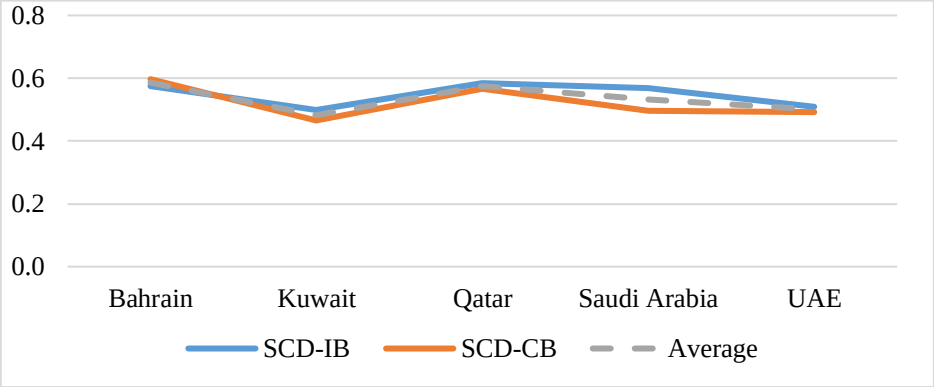


Figure 3.13: The Average of Relational Capital Disclosure in the GCC Islamic and Conventional Banks (2012-2016)

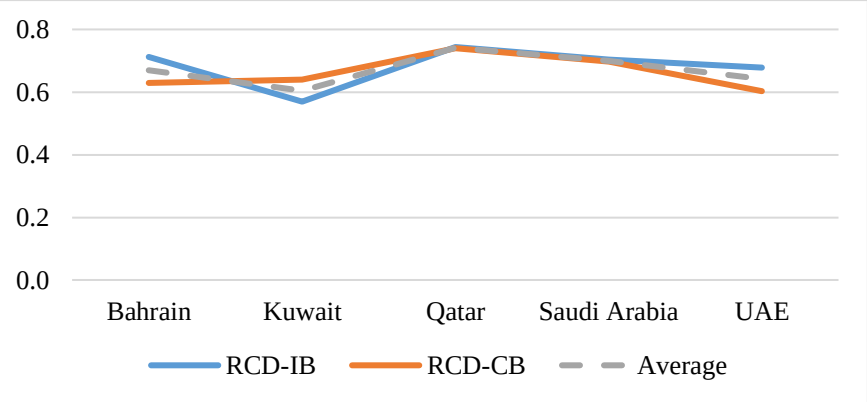
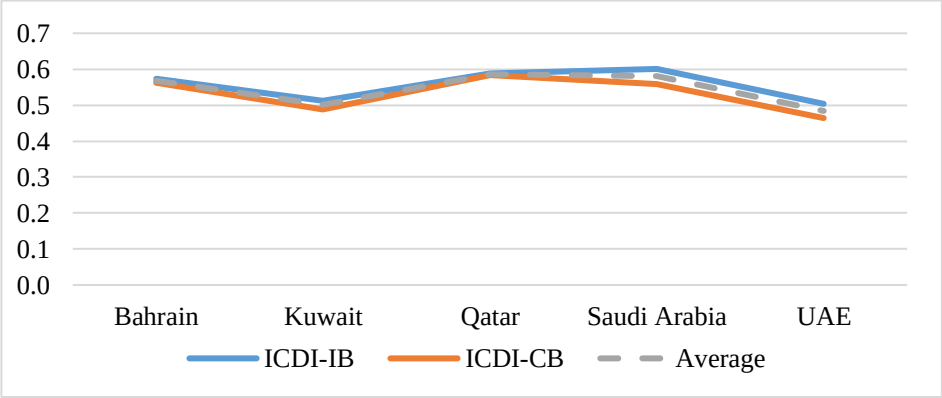


Figure 3.13. shows the trends in the average scores of RCDI for Islamic and conventional banks in a comparative manner for the period 2012 to 2016. While the average of RCDI of Islamic banks in Bahrain and UAE is higher than conventional banks, it is lower than conventional banks in Kuwait. In addition, as can be seen, the RCDI trend for Qatar and Saudi Arabia is equal in both for Islamic and conventional banks.

According to the trends depicted in Figure 3.14., the trend ICDI in Islamic and conventional banks has fluctuated in the same direction in the GCC countries. The average score of Islamic banks is higher than the conventional banks in the GCC countries except for Qatar that has equal ICDI scores for both of Islamic and conventional banks for the sampled years.

Figure 3.14: The Average of Intellectual Capital Disclosure Coefficient in the GCC Islamic and Conventional Banks (2012-2016)



3.6.2.8.2. Econometrics analysis for all types of GCC banks

After presenting the descriptive results, this section proceeds with econometric analysis for the impact of ICD scores on financial performance. Table 3.21 presents the descriptive statistics for the variables included in the model.

Table 3.21: Descriptive Statistics

Variables	Mean	SD	Min.	Max.
ROAA	1.324756	1.024794	-4.33	3.28
ICDI	0.5457333	0.1087491	0.16	0.76
HCDI	0.4308	0.1354169	0.06	0.75
SCDI	0.5380889	0.1109069	0.15	0.92
RCDI	0.6691111	0.1624673	0.21	1
BSize	27.8×10^7	30.9×10^7	794502.3	198×10^8
LoR	59.33969	11.51109	25.99	101.58
AgeOp	32.46667	18.5773	2	90
KEInx	1.403022	0.7556075	0.26	3.65
GDP	39086.01	20891.54	20028.65	88564.82
CrisisDummy	0.4	0.4909903	0	1
TypeDummy	0.4666667	0.5	0	1

According to the data summary depicted in Table 3.21, ROAA as dependent variable presents the generated profit for the sampled banks with a mean value of 1.32. ICDI statistics shows a mean value of 0.55 that shows the sampled banks are moderately efficient in generating the value. The components of ICDI, namely HCDI, SCDI, and RCDI have the mean values of 0.43, 0.54, and 0.67 respectively that present the indicators relating to the ICDI performance. Therefore, each indicator is about balanced impact in contributing to ICDI, although RCDI is more effective than the other components.

As for the control variables, the means of the bank size is 27.8 billion US$, while the mean value of risk level is 59.34 with a minimum and maximum value of 25.99 and 101.58 respectively, which presents the risk of diversity within the banks. Following, the mean value of age of operation or 'AgeOp' is 32.47, which shows that sampled banks have operational experience in the region. The mean of 'KEInx' is 1.40 that presents the level of the GCC countries in terms of KE. The mean of GDP per capita is around US$ 40,000. As for the dummy variables, the mean values for crisis dummy and type dummy are 0.4 and 0.47, respectively, as viewed in table 3.21.

Table 3.22: Correlation Matrix

Variables	ROAA	ICDI	HCDI	SCDI	RCDI	BSize	LoR	AgeOp	KEInx	GDP	CrisisDummy	TypeDummy
ROAA	1.0000											
ICDI	0.0850	1.0000										
HCDI	0.0255		1.0000									
SCDI	0.0774			1.0000								
RCDI	0.0963				1.0000							
BSize	0.3794	0.1718	0.1380	0.0426	0.2026	1.0000						
LoR	0.2368	-0.0255	0.0125	-0.1165	0.0219	0.2137	1.0000					
AgeOp	0.2366	-0.0503	0.0143	-0.0557	-0.0660	0.2964	0.0365	1.0000				
KEInx	0.2733	0.0368	-0.1249	0.0475	0.1484	0.3045	0.1823	0.0237	1.0000			
GDP	0.2675	-0.0200	-0.1152	0.0074	0.0513	0.0674	0.2377	-0.1314	-0.0693	1.0000		
CrisisDummy	-0.0049	-0.0066	-0.0067	-0.0264	0.0130	0.1291	0.1291	0.0661	0.5368	-0.2540	1.0000	
TypeDummy	-0.1979	0.0939	-0.0347	-0.0928	-0.5832	0.1482	0.1482	-0.4585	-0.1265	-0.1056	0.0000	1.0000

Table 3.22 presents the Pearson correlation coefficient, which shows that there is an acceptable correlation relationship between ICDI and its components, and ROAA with a positive but rather weak relationship. Control variables have positive and moderate correlation with ROAA, while dummy variables have negative correlation as seen in Table 3.22. The results verify that there is no correlation concern for the regression analysis.

As the econometrics panel model results in Table 3.23. demonstrates, model 1 performs well with a R^2 value of 0.30, which specifies the efficiency of the model, which is supported by a correlation matrix, as the latter indicated that the results are acceptable almost for all variables in this model as seen Table 3.23. In other words, R^2 being 30% shows that 30% of variation in the dependent variable is explained by the independent variables.

Table 3.23: Regression Results

ROAA	Model 1	Model 1a	Model 1b	Model 1c
ICDI	0.9399443*			
HCDI		0.7136363		
SCDI			0.9605224*	
RCDI				0.292099
BSize	5.01×10^{-9}**	5.08×10^{-9}***	5.56×10^{-9}***	5.61×10^{-9}***
LoR	0.0106543**	0.0097501**	0.0114276**	0.0100119**
AgeOp	0.0087444***	0.0084859**	0.0084768**	0.0087133**
KEInx	0.3505538***	0.3750022***	0.330608***	0.3339915***
GDP	0.000011***	0.0000116***	0.0000108***	0.000011***
CrisisDummy	-0.2442596	-0.245064	-0.2176819	-0.2177871
TypeDummy	-0.2907395**	-0.2873316**	-0.2879758**	-0.2594378*
Number of obs.	225	225	225	225
R^2	0.3048	0.3036	0.3062	0.2979
Root MSE	0.87013	0.8709	0.86929	0.87445

Note: (***) refers that p value is significant at 1% level; (**) refers that p value is significant at 5% level; (*) refers that p value is significant at 10% level.

As for the individual variables, 'ICDI' has a positive significant relationship at 10% which indicates that ICD including of HCDI, SCDI, and RCDI in total is significant for financial performance of banks. Thus, a unit increase in ICDI leads to a 0.94 unit increase in ROAA. As can be seen in Table 3.23, 'BSize' has a positive and significant relationship at a 5% level of significance, which is in line with the expected results indicating that the size of banks has a positive impact on financial performance in the GCC countries, hence; one billion US$ increase in 'BSize' positively affects ROAA at the level of 5.01. As for 'LoR', it is significant and positive at 5%, which shows that high risk in banks has a positive impact on financial performance in the GCC countries by increasing ROAA by 0.01.

In addition, 'AgeOp' has a significant positive relationship at 1%, which is line with the expected results that the age of operation of banks is significant for financial performance, because of historical institutional experience as an important factor in explaining the performance of banks. Therefore, an increase in 'AgeOp' slightly increases ROAA by 0.009. Moreover, 'KEInx' is significant and positive at a 1% level of significance, as expected, which is an important result because human capital development, technology use, R&D expenditures, innovation, and economic incentives affect the financial performance of the sampled banks in the GCC countries by the coefficient value of 0.35. This result is in parallel with the national vision discourse of the GCC countries and financial performance of banks. Furthermore, GDP per capita has a significant positive relationship at 1%, which is also an expected result, as GDP per capita can explain the performance of financial institutions directly due to the nature of business cycles, whereas, it has very limited positive impact on the ROAA.

As regards to the 'TypeDummy', as the results in Table 3.23 shows, it has negative significant relationship at 5%, which is line with the expected results that being Islamic bank is not significant for financial performance of banks in the GCC countries. In the other words, the ROAA value of Islamic banks is less than conventional banks by 0.24. In fact, having a negative impact can be explained with the emergence process of Islamic banks as they have relatively short institutional existence and operational practices in a historical perspective. In other words, Islamic banks have not had enough institutionalisation time to be able to develop their capacities in intellectual capital development considering their forty years of historical past, while most of the Islamic banks are even younger than forty years.

Lastly, as can be seen, the 'crisis dummy' variable is not significant contrary to the result expected in this model, which implies that financial performance is not affected by the oil prices. While this may sound perplexing, the dis-embedded nature of finance can be offered as an explanation here.

As displayed in Table 3.23, Model 1a, 1b, and 1c, focussed only on the HCDI, SCDI, and RCDI. As the result indicates, for the pillars of ICDI, control variables show same significance level with the total ICDI level with only one variable, namely SCDI among ICDI components, being significant at a 10% level, hence; an increase in SCDI increases ROAA by 0.96. This shows that banks' annual reports have been used to disclose mostly structural and managerial information, such as, corporate culture, corporate philosophy, transparency, leadership, innovation, and product development, *etc*. However, although patent copyright and trademarks are important for organisations, in annual reports, they are not disclosed as much as the other disclosure items identified in the index. Therefore, it is possible to state that banks prefer to disclose structural information rather that relational and human capital material in their annual reports. As indicated with the communicated information in the annual reports, structural capital is significant for the financial performance of the sampled banks in the GCC countries, while human capital and relational capital are not considered significant to financial performance.

The overall results show that while total ICDI and SCDI levels are significant in explaining the financial performance of banks, HCDI and RCDI are not. This shows that in annual reports, banks prefer to disclose their structural information and visions to present their banks' general structure and financial data to external players. Therefore, structural capital is perceived to be

more significant in explaining financial performance of banks in the GCC countries. According to the results depicted in Table 3.23, the results of control variables are similar to expectations.

It should be noted that the most important result is 'type dummy variable' which means that being Islamic bank is not significant and has a negative impact on explaining the financial performance of the sampled banks. It is important to state that banks need to improve their disclosure practices in their annual reports to inform customers and business partners, such as, disclosing information about their human resources and relationship with external players.

3.6.2.8.3. Econometrics Analysis for GCC Islamic banks

Table 3.24: Descriptive Statistics

Variables	Mean	SD	Min.	Max.
ROAA	0.985619	1.262996	-4.33	3.28
ICDI	0.5594286	0.1046682	0.27	0.73
HCDI	0.4505714	0.1435326	0.12	0.71
SCDI	0.5514286	0.1114194	0.18	0.76
RCDI	0.6768571	0.1389335	0.21	0.95
BSize	15.1×10^7	19.2×10^7	7.94502.3	90.6×10^7
LoR	60.08143	12.65158	31.3	101.58
KEInx	1.301048	0.7127964	0.26	3.65
GDP	36732.94	19787.46	20028.65	88564.82
AgeOp	23.38095	15.50892	2	59
CrisisDummy	0.4	0.4922476	0	1

According to the descriptive statistics demonstrated in Table 3.24, ROAA presents the generated profit for the Islamic banks with a mean value of 0.99. The mean value of ICDI is 0.56 indicating that the sampled banks are moderately efficient in generating value. HCDI, SCDI, and RCDI have the mean value of 0.45, 0.55, and 0.68 respectively that are moderately associated with ICDI. Control variables are also efficient to generate the mean values as seen in Table 3.24.

Table 3.25: Correlation Matrix

Variables	ROAA	ICDI	HCDI	SCDI	RCDI	BSize	LoR	KEInx	GDP	AgeOp	CrisisDummy
ROAA	1.0000										
ICDI	0.1810	1.0000									
HCDI	0.1000		1.0000								
SCDI	0.1952			1.0000							
RCDI	0.1500				1.0000						
BSize	0.3747	0.1249	0.0928	0.1719	0.0514	1.0000					
LoR	0.2976	0.0256	0.1509	-0.0694	-0.0344	0.1953	1.0000				
KEInx	0.2115	0.1103	-0.0857	0.1335	0.2336	0.1307	0.1358	1.0000			
GDP	0.3313	-0.0714	-0.1067	-0.0483	-0.0103	0.0623	0.1909	-0.0790	1.0000		
AgeOp	0.1662	0.1928	0.0937	0.3162	0.0970	0.5144	0.1953	0.0557	-0.0459	1.0000	
CrisisDummy	0.0879	0.1146	0.0634	0.0859	0.1324	0.0760	0.1021	0.5650	-0.2615	0.0793	1.0000

According to Table 3.25, there is a moderate relationship between ICDI and its pillars and ROAA with a positive but weak correlation. Control variables have also positive relationships with ROAA but CrisisDummy has a rather weak relationship. Therefore, there is no high correlation between all variables and ROAA. In fact, a diagnostic test was applied, according to VIF results, a multicollinearity problem does not exist, as seen in Appendix B.

Table 3.26: Regression Results

ROAA	Model 1	Model 1a	Model 1b	Model 1c
ICDI	1.814954**			
HCDI		0.8683389		
SCDI			1.978184**	
RCDI				1.017052
BSize	2.04×10^{-8}***	2.02×10^{-8}***	2.06×10^{-8}***	2.09×10^{-8}***
LoR	0.0160791**	0.0140824**	0.0185051**	0.0168103**
KEInx	0.2455511	0.2974798	0.2215827	0.2154791
GDP	0.0000198***	0.0000202***	0.0000193***	0.0000192***
AgeOp	-0.0040806	-0.0021251	-0.006715	-0.0030326
CrisisDummy	-0.096289	0.087051	0.1163169	-1.987753
Number of obs.	105	105	105	105
R^2	0.3184	0.3060	0.3232	0.3086
Root MSE	1.0797	1.0895	1.0758	1.0874

Note: (***) refers that p value is significant at 1% level; (**) refers that p value is significant at 5% level; (*) refers that p value is significant at 10% level.

As the regression results for estimated models for Islamic banks in Table 3.26 presents, Model 1 estimates the financial performance of Islamic banks in the GCC counties with a R^2 value of 0.32 which implies a moderate explanatory power. Regarding the individual variables, ICDI is significant and positive at 5% for the financial performance of Islamic banks in the GCC countries, as expected in a similar manner in the previous models. As for control variables, 'BSize', 'LoR', and 'GDP' are significant and positive at 1%, 5%, and 1%, respectively.

As for sub-models, as seen in Table 3.26, although it was not an expected result for Model 1a, HCDI is not statistically significant in explaining the financial performance in Islamic banks in disclosure analysis. This may show that actual financial reports and annual reports can differ in a bank. Regarding control variables, 'BSize', 'LoR', and 'GDP' are significant and positive at 1%, 5%, and 1%, respectively. In Model 1b, SCDI is significant and positive at 5% for financial performance that shows that Islamic banks prefer to disclose structural capital items as seen in Table 3.15 rather than items related to human capital. As for control variables, significant variables are same with the other models. Regarding Model 1c, CEE is not significant while control variables are significant similar to the other models, as depicted in Table 3.26.

The overall results show that ICDI and SCDI is significant in explaining financial performance of Islamic banks in the GCC countries from the perspective of disclosure analysis, while HCDI and RCDI are not significant for Islamic banks. These results show that actual financial statements depicted in the first empirical part and annual reports presented in the second empirical part can differ in a bank. In annual reports of Islamic banks, items related to knowledge such as research, development, innovation, product development is favoured to disclose but it is not reflected in the financial statement.

3.6.2.8.4. Econometrics Analysis for the GCC conventional banks

Table 3.27: Descriptive Statistics

Variables	Mean	SD	Min.	Max.
ROAA	1.6215	0.626485	0.03	2.78
ICDI	0.53375	0.1112501	0.16	0.76
HCDI	0.4135	0.1259628	0.06	0.75
SCDI	0.5264167	0.109589	0.15	0.92
RCDI	0.6623333	0.180879	0.21	1
BSize	3.90×10^7	3.48×10^7	5661028	1.98×10^8
LoR	58.69067	10.42231	25.99	74.44
KEInx	1.49225	0.7832473	0.26	3.65
GDP	41144.94	21684.46	20028.65	88564.82
AgeOp	40.41667	17.40259	5	90
CrisisDummy	0.4	0.491952	0	1

According to descriptive statistics presented in Table 3.27, ROAA as a dependent variable presents a moderate efficiency in generating the value of 1.62 for conventional banks in the GCC countries. ICDI statistics is also moderately efficient with 0.53. As ICDI pillars, HCDI, SCDI, and RCDI are associated with ICDI with an estimated the mean value of 0.41, 0.53, and 0.66, respectively. As for control variables, they are also moderately efficient in generating the value.

Table 3.28: Correlation Matrix

Variables	ROAA	ICDI	HCDI	SCDI	RCDI	BSize	LoR	KEInx	GDP	AgeOp	CrisisDummy
ROAA	1.0000										
ICDI	0.0662	1.0000									
HCDI	0.0241		1.0000								
SCDI	0.0006			1.0000							
RCDI	0.1016				1.0000						
BSize	0.3470	0.2986	0.2920	0.0616	0.3112	1.0000					
LoR	0.2325	-0.0918	-0.1731	-0.1845	0.0638	0.3235	1.0000				
KEInx	0.3562	0.0094	-0.1324	0.0056	0.1086	0.3553	0.2498	1.0000			
GDP	0.1637	0.0403	-0.0995	0.0746	0.0975	0.0156	0.3040	-0.0873	1.0000		
AgeOp	0.0490	-0.1337	0.0832	-0.2586	-0.1402	-0.0070	-0.0422	-0.1061	-0.3155	1.0000	
CrisisDummy	-0.1118	0.1873	0.1522	0.1522	0.2142	0.1066	0.0770	0.5232	-0.2510	0.0707	1.0000

Table 3.28 presents the correlation matrix, which depicts that there is a moderate relationship between ICDI and its pillars, and ROAA with a positive but weak relationship. As regards the control variables, there is no high correlation with a dependent variable. According to these results, it is possible to state that there is no high correlation between any of the variables and a dependent variable. These results are also supported by VIF results that multicollinearity problem does not exist in these models, as seen in Appendix B.

Table 3.29: Regression Results

ROAA	Model 1	Model 1a	Model 1b	Model 1c
ICDI	0.69188			
HCDI		0.6836874		
SCDI			0.3290008	
RCDI				0.3149119
BSize	2.57×10^{-9}**	2.31×10^{-9}*	3.35×10^{-9}***	2.93×10^{-9}**
LoR	0.0035392	0.003982	0.0027607	0.0022829
KEInx	0.4328384***	0.4520128***	0.4099393***	0.418233***
GDP	4.19×10^{-6}*	4.50×10^{-6}*	4.43×10^{-6}*	4.24×10^{-6}***
AgeOp	-0.0072532**	0.0064831**	0.0070895**	0.0070102**
CrisisDummy	-0.5291819***	-0.5359721***	-0.4868858***	-0.5120125***
Number of obs.	120	120	120	120
R^2	0.3441	0.3459	0.3354	0.3393
Root MSE	0.52299	0.52226	0.52644	0.52491

Note: (***) refers that p value is significant at 1% level; (**) refers that p value is significant at 5% level; (*) refers that p value is significant at 10% level.

According to econometrics panel estimated models for the GCC conventional banks in Table 3.29, Model 1 estimates the financial performance of conventional banks in the GCC countries with a R^2 value of 0.34 which present a moderate level of efficiency of the model 1. As for individual variables, ICDI is not significant in this model, which is not expected. As for sub-models, HCDI in Model 1a, SCDI in Model 1b, RCDI in Model 1c is insignificant for

conventional banks in the GCC countries from the perspective of disclosure analysis. As for control variables, all variables are significant for conventional banks except 'LoR' as seen in Table 3.29.

These results imply that while conventional banks have very good results between VAIC and its pillars, and ROAA in the first empirical analysis is based on actual financial statements, these variables are not significant in explaining the financial performance of conventional banks in the GCC countries in the second empirical analysis based on disclosure analysis.

3.6.2.8.5. Conclusion

According to regression analysis based on ICDI and its relationship with the financial performance of banks in the GCC region, model 1 shows that ICDI is statistically significant. Therefore, descriptive results can be, clearly, interpreted through regression results. Qatar, Saudi Arabia and Bahrain have similar scores on ICDI implying that ICDI plays a key role in their financial performance. However, Kuwait and the UAE have modest ICDI scores as the other GCC countries. Therefore, the performance of the sampled banks in Kuwait and the UAE can be interpreted through different dimensions rather than only with intellectual capital. Putting emphasise on the importance of a knowledge economy in the GCC countries as rentier states, also appears in banks' annual reports as it has a statistically positive significant relationship in determining the financial performance in the region. As can be seen, the age of banks is significant in the models, which could be explained by the fact that banks develop experience in developing the disclosure practices along with developing necessary practice for intellectual capital formation. Another important variable is that being an Islamic bank is also significant but indicates a negative relationship in determining the financial performance of banks in disclosure analysis. As for bank types in the form of Islamic and conventional banks, while conventional banks, statistically, perform better than Islamic banks in analyses-based actual financial statements in the first empirical analysis, Islamic banks perform better than conventional banks in disclosure performance and its impact on financial performance.

3.7. DISCUSSION AND CONCLUSION

The aim of this study is to examine the impact of intellectual capital on financial performance measured by two different methods, namely secondary data based VAIC and a disclosure analysis based VAIC model for the GCC Islamic and conventional banks for the 2012 to 2016

period. While institutional distinction in the sense of being an Islamic or conventional bank is considered to be important in this study, the use of KEI as a determining variable as developed here, should be considered as an important novelty introduced by this study. This study, hence, aims at bridging the gap in the literature by comparing these two types of banks and expanding the nature of analysis.

Conducting two different empirical analyses in this research enables an examination of the subject matter through two different perspectives on intellectual capital in banks. The first empirical part, which is based on secondary data for human capital, structural capital, and capital employed, analyses the actual performance of the banks at the end of the financial years. According to this analysis, while VAIC and human capital are significant for the financial performance of banks, structural capital and capital employed are not significant. As opposed to the expectations, being an Islamic bank has a negative impact on financial performance. The second empirical analysis, which is based on disclosure performance of the sampled banks in relation to intellectual capital of the sampled banks, data was generated from annual reports through content analysis and examined by the constructed index items. This helped to examine the impact on the financial performance of the sampled banks in a comparative manner with the analysis based on secondary data. According to results of the second method, as discussed above, ICDI and structural capital is significant for financial performance in banks. Being an Islamic bank is also significant in this analysis but has a negative impact on financial performance. Therefore, conducting two different analyses provides different results in addition to some similarities; one significant variable is human capital, and the other is structural capital. Such divergent performances of the models on the same subject can be justified on the grounds that variances between disclosure and actual performance by definition is different in the sampled banks, as disclosure is voluntary implying that the sampled banks do not fully disclose every item listed in the index developed by this study.

The results in this study differs in comparison to the previous studies available in the literature in some dimensions, such as being an Islamic bank is not significant for financial performance. This is a conflicting result with the methodology of Islamic economics that prioritise human well-being, knowledge creation, intellectual contribution, as explained in an earlier section under the conditions of positive impact of intellectual capital on financial performance of banks. However, analyses in this study show that Islamic banks variable is significant, but it has negative relationship with financial performance. This can be associated with the emergence process of Islamic banks that mimicked the conventional banking system, which is the subject

matter of the next chapter. The results, however, are clear in demonstrating that Islamic banks can differ from conventional banks. The important result is that while conventional banks have better performance in the first empirical analysis based on secondary data, Islamic banks seem to be performing better in empirical analysis based on disclosure analysis. It is important to draw attention to the distinction between the well-defined results produced by data sources for Islamic and conventional banks.

Lastly, it should, however, be noted that at country level, Qatar is the only state where Islamic banks performed better than the conventional banks in the VAIC score, while the other GCC countries experienced opposite results, as can be seen in Figure 3.8. It should also be noted that according to descriptive results of disclosure analysis, the performance of intellectual capital in Islamic banks is better than conventional banks with a minor difference, as depicted in Figure 3.14. This can be summarised that according to descriptive results, Islamic banks in disclosure analysis has performed better than in VAIC analysis. Therefore, Islamic banks need to go beyond disclosure performance by practising them in managing performance in actual financial statements, which is necessary for Islamic methodology in terms of knowledge and human development.

On critical reflection, Islamic banks are expected to internalise and endogenise the knowledge production process as essentialised in Islamic ontology. In other words, the articulation of Islamic ontology, as discussed above in detail, necessitates a knowledge essentialisation process as part of the becoming process. The knowledge essentialisation is coupled with the idea of using and sharing such a knowledge base and its products through the *ihsani* process to improve the situation of individuals, organisation and societies. Therefore, Islamic banks, as the main organisations of Islamic ontology, are expected to engage in knowledge development to advance their own operations, whereby, they contribute to the development of Muslim society and beyond. The discourse as discussed above explains this in detail. Such productive activity includes developing new products in line with Islamic aspirations, sustained R&D activities, innovative products, services and structures, while developing staff skills and knowledge.

However, as can be seen from the descriptive studies including depictions in Figures 3.5-3.8 and Figures 3.11-3.14, Islamic banking performance on intellectual capital categories is nearly *at par* with the conventional banks in the GCC region; as the trends are rather closer or slightly lower. In comparison to the theoretical expectations, the identified pro-activity expected of Islamic banks is not obvious. The reason for this is that Islamic banks are constructed around

conventional banking institutional logic with the *fiqhi* process of Islamising their processes. This implies that an essentialised Islamic ontological base and its articulation is highly active in shaping their operation. This is the subject matter of the next chapter, which explains the emergence of institutions and how the emergence of Islamic banks should appear in relation to an Islamic ontological knowledge base.

CHAPTER 4

CONSTRUCTING THE EMERGENCE OF ISLAMIC FINANCE AS AN INSTITUTIONAL INNOVATION: AN EXPLORATION IN KNOWLEDGE LED INSTITUTIONALISATION

4.1. INTRODUCTION

Through an exploration and examination of the knowledge economy in a macro sense while considering institutional intellectual capital in an organisational manner, Chapters 2 and 3 presented conceptual and empirical studies. By doing so, the importance of knowledge is essentialised through Islamic ontology by suggesting that similarly to other Muslim societies, the GCC states should essentialise knowledge for their development taking the form of a knowledge economy and, consequently, all banks, should be framed as part of the knowledge economy through contributing to intellectual capital formation.

The findings in Chapter 2 suggest that the GCC countries could not yet be considered as knowledge economies despite their various claims to knowledge economy status, as they currently do not fulfil the expected parameters. Similarly, in Chapter 3, the results depict that banks, including Islamic banks, are far from fully developing intellectual capital by failing to realise their potential. This necessitates an exploration into the reasons underpinning such macro or economy wide, and micro or institutional failure in knowledge development. This chapter argues that Islam essentialises knowledge and inherently is a source of knowledge, which constitutes the foundations for economic activity and institutional formations in generating a knowledge economy and attendant intellectual capital at an institutional level.

In responding to the knowledge and intellectual development failures identified at both macro and micro levels in Chapters 2 and 3, this section argues that Islam, as a knowledge source and constituting knowledge, provides the essence of a knowledge economy and intellectual capital formation. To this end, this chapter explores the emergence of institutions through the basis and framework of Islamic moral economy by applying the theory of emergence to discuss the

institutional nature of Islamic banks and financial institutions (IBFIs) as an attempt to examine whether they represent emergence or an emergent pattern. The former refers to ontologically ecumenical articulation, while the latter refers to using the institutional logic of existing institutions from a different ontology by legitimating their Islamicity within the existing system beyond an Islamic system of economy.

Institutions, by definition, plays key roles in the economic life of societies regardless of whether their emergence is based on historically cultural elements or transferring the existing institutions to a different society through political decisions. However, an organic emergence is a particular type of emergence that refers to institutions emerging from the social formation of the society in a gradual manner through cultural values, norms, cognitive repertories, and roles peculiar to that particular society (Portes, 2010). On the other hand, there is an innovation-based emergence termed as 'institutional innovation' that is based on importing existing institutions into new settings (Raffaelli and Glynn, 2015).

To have a broader understanding of the emergence of institutions, in relation to banking and finance related institutions as provided by this study, models of institutional emergence and the concept of institutional innovation need to be explored to understand the formation of institutional emergence regarding whether it is organic or an innovated institution. The organic emergence of institutions relates to methodological aspects of institutional emergence determining whether their emergence is based on a particular ontology and epistemology in line with the social formation of a particular society to reveal the authenticity of the knowledge source. The second scenario, which is the implantation of the existing institutions into different settings, relates the emergence process to the notion of mimicking, mirroring, and hybridity that all lead to facilitating the existing institutions produced by different ontology to be implanted in a dissimilar society by redefining the receiving society's metaphors in generating the hybrid institutions. At the end of such process, rather than organic formation, isomorphic formation of the institutions emerges in different shapes. Therefore, a deconstructivist process should be able to reveal whether an institution represents an emergence in the form of being an organic institution or is only an emergent pattern in the form of institutional innovation.

Considering that IBFIs are deemed new ways of operating financing and judged by some as the new form of institutional and operational institutions, the emergence of these institutions requires scrutinisation to understand whether they represent organic emergence or only an institutional innovation. In fact, IBFIs and other Islamic institutions are expected to come into

existence through organic emergence by essentialising embeddedness within the ontological source of Islam, namely, the *Qur'an*, which is the beginning of a 'learning' process and knowledge source. In other words, Islamic economics possesses unique knowledge and norms, including the axioms based authentication process derived from *Qur'an* and *Sunnah*, which provides the underlying moral and legal or *Shari'ah* foundations. Thus, Islamic economics is based on revealed knowledge as a starting process rather than artefact knowledge.

The methodology of Islamic economics and the emergence of Islamic finance should constitute the organic emergence within Islamic values, norms and roles. However, a prime criticism levelled against Islamic banks is that they emerged in the form of a bank as an instrument of a 'capitalist' market system rather than as an embedded financing method. Therefore, rather than being emerged within the parameters of the social formation in the Muslim world, IBFIs emerged as a result of increasing wealth in the GCC region, in particular, during the 1970s, providing legitimacy to the increased wealth through Islamic finance (Warde, 2000). The emergent oil wealth forced the emergence of a particular institutional nature for organising financing; thus, banking and financial institutions were transplanted by using Islamic injunctions or *fiqhi* rules to justify them through certain elements of Islamic social formation. Therefore, one of the most important issues is whether IBFIs represent the aspired social formation of an Islamic society in the sense of endogenising the knowledge base and axioms of the Islamic moral economy for the benefits of the society. However, as it is argued below, IBFIs are part of institutional innovation rather than organic emergence.

The rest of the paper is organised as follows: Section 4.2. presents the aims, objectives and research questions, and research rational and significance. Following on from this, in order to actualise the discussion above, the emergence model is articulated through the concept of authentic emergence and institutional innovation by applying an axiomatic formulation of Islamic economics to explain its methodology in Section 4.3. In this, Portes' (2010) institutional emergence model is explained as part of the organic emergence. Following Portes' model, the concept of institutional innovation is discussed within the normative, socially constructed and culturally embedded aspects as the second scenario in Section 4.4. In order to evaluate the effectiveness of these two emergence types in the case of IBFIs, the notion of emergence is discussed through its philosophical aspects and emergent patterns in Section 4.5. In articulating the nature of emergence in the case of IBFI, Section 4.6. presents these two scenarios and emergence theory as merged in the following section to frame construction by explaining the concept of isomorphic institutions articulating the notion of mimicking, mirroring, and

hybridity to argue for the institutional innovative nature of IBFIs rather than constituting organic emergence. Section 4.7. essentialises the authentic ontology and epistemology of divine knowledge in Islamic economics followed by a discussion on the concept of the Islamisation of knowledge and the axioms of Islamic moral economy to reveal the source of knowledge of the current IBFIs and its authenticity through the axioms of Islamic moral economy. In Section 4.8, the authentic process of emergence of IBFIs is explored through a conceptual model to conclude that IBFs are substantiated as an emergent pattern in the form of institutional innovation rather than being part of emergence science. Lastly, Section 4.9 concludes with an overall evaluation taking into consideration all the discussions put forward in this chapter.

4.2. AIMS, OBJECTIVES AND RESEARCH QUESTIONS

The aim of this paper is to explore and examine the emergence of Islamic banks, considering whether as an institution they can be framed as an organic emergence or emergent pattern in an attempt to understand the institutional innovation nature of IBFIs.

In line with this aim, the following objectives are developed:

(i) to explore the organic or embedded emergence models of institutions through the social formation (ontological and epistemological source) of a society;

(ii) to explore the theoretical formation of Islamic finance by referring to the ontological source of knowledge embodied in the axioms of Islamic moral economy;

(iii) to assess the current position of IBFIs as being embedded into the capitalist economy's market system (and dis-embedded from Islamic ontology) through the Islamisation of knowledge and *fiqh* process with the objective of identifying the emergence or institutional innovation nature of emergence.

Consequently, the following research questions are developed:

(Q1) How do institutions emerge through a value system, norms, and roles of a particular society to represent organic or embedded emergence?

(Q2) How institutions are defined as organic or innovated institutions?

(Q3) Can knowledge be considered as a base for organic emergence?

(Q4) What is the knowledge source of IBFIs?

(Q5) Could the materialisation or the surfacing of IBFIs be considered as an embedded emergence generated by the social formation of the society?

4.2.1. Research Methodology

With regard to research philosophy, this study uses an interpretivist approach to explore the emergence of IBFIs. Therefore, the theoretical framework is subjected to normative research philosophy through a deductive analysis of the constructed models. The importance of this research philosophy is in its role of selecting an appropriate research strategy such as discursive analysis to use interpretivism as a philosophical approach.

An interpretivist approach is useful for research to understand the differences between institutions and social actors in the society (Saunders *et al.*, 2009: 116). This allows a detailed understanding of the emergence of IBFIs and its relationship with the existing institutions, such as, conventional financial institutions as part of the qualitative research methodology that is used to identify particular features and the source of knowledge of these institutions (Morris, 1994).

The discursive method is utilised as an architectonical frame for the reconstruction of the emergence process of institutions based on reliable scientific or divine knowledge related to their ontological and epistemological base in the study. Therefore, this method provides heuristic aspects of the study to find the axiomatic construction of the model through grounded theory that helps to create a fundamental relationship between knowledge and axioms through exploration and specification.

4.2.2. Research Rationale and Significance

The significance of emergence of Islamic economics stems from the actualisation of ontological reasoning determined by *Qur'an* and the *Sunnah* as the knowledge source. Accordingly, *tawhidi* ontology is a priori for Muslims in their everyday practices including the nature and operation of the institutions facilitating their daily application. Therefore, Islamically embedded institutions are expected to follow a path dependence based on knowledge formulated by *tawhidi* ontology. This implies that such institutions should fit into the framework derived from ontologically determined epistemology in order to ensure coherence with the values, norms and roles defined by Islam through deductive methods.

It is commonly argued that the current nature of IBFIs, however, indicates that they have been constructed on the prevailing (conventional) institutional logic of banking and financial institutions through the Islamisation process, which, therefore, do not demonstrate coherence with neither the social formation of Islam nor with the aspired political economy of the society. In other words, IBFIs are the products of market forces for moving capital and transferring money through different (Islamic) metaphors with the same objective of 'creating an indebted individual' (Lazzarato, 2012). Therefore, the consequences produced by the IBFIs are the same with the conventional system.

From this starting point, the significance of this study stems from the fact that it argues that the process of the emergence of IBFIs represents an institutional innovation rather than organic emergence and therefore, they articulate the features of an emergent pattern rather than emergence. This implies that although Islamic economics has a knowledge base in Islamic ontology and epistemology, which should be the base to initiate and launch institutions in coherence with the guidance of the *Qur'an* and *Sunnah* in an embedded manner, IBFIs were innovated and constructed only according to *fiqhi* transactional principles or Islamic metaphors within the institutional logic of conventional banks through a mimicking and mirroring process, as the banks and organisational institutions are the product of Enlightenment ontology. Thus, an emergence theoretical framework constitutes the base of this study.

4.3. EXPLORING THE EMERGENCE OF INSTITUTIONS: PORTES' FRAMEWORK

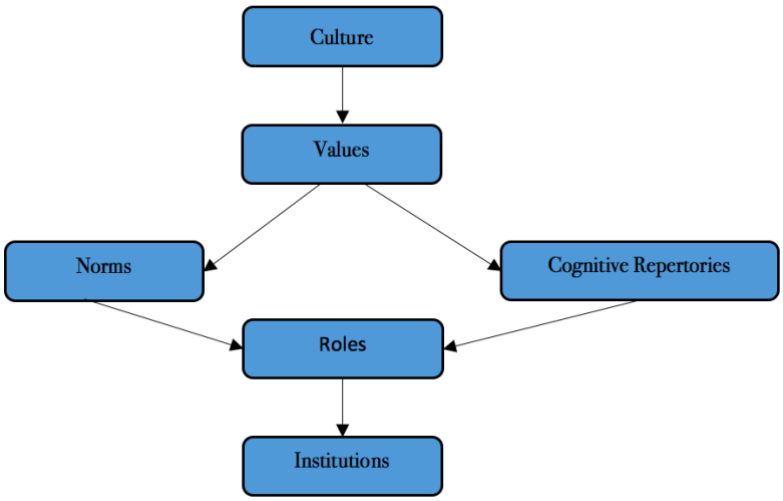
Modern sociology has identified and developed the central distinction between culture and social structure. In this, culture reifies the symbolic components for fundamental human interaction, mutual understanding and order, while social structure consists of actual people taking active roles in the status hierarchy of an organisation. The main analytical distinction between culture and social structure in a society relates to the existence of human beings in physical reality; while both are significant in our understanding of the social reality with their relevant actions and consequences. Thus, culture and its product of social structure provides an opportunity for analysing the differences between what ought to be (the normative) and what is reality (positive) in multiple contexts (Portes, 2010: 51-52). For instance, due to a knowledge economy being one of the main determining factors of economic activity, it brought about the emergence of its own institutions through the emerging cultural factors and social structure attached to the nature of a knowledge economy.

These emergent institutions and organisations use knowledge and social capital within the evolving nature of culture and social structure of the societies (Tonkiss 2006:107). Therefore, in the emergence of institutions, the components of culture and social structure are considered within a hierarchy of causal influences from deep factors of everyday practices (Portes, 2010: 51-52). In this conceptual framework, institutions arise from the deep causal level of culture through the values, norms, roles, and cognitive repertories of the society. As for IBFIs, Islam constitutes the source of values and norms comprising a religion defining the way of life for its adherents. This implies that the influence of Islam penetrates into every aspect of life from shaping individual behaviour to institutions and the nature and operations of those institutions.

4.3.1. The Emergence of Institutions within Portes' Cultural Framework

Any economy, in a theoretical sense, is expected to be embedded in cultural and social relations of its social formation through its economy related notions articulated with particular individual and organisational behaviours. For example, a capitalist economy operates within a market system with opportunistic and self-maximising individual and organisational behaviour. As highlighted in Figure 4.1, Portes' (2010: 18) model, different cultural structures are socialised as part of the social formation to shape economic activities in order to build the institutional structure through values, norms and roles of the social formation of that society. With such an emergence, as part of the culture of a society, the level of values, that are unperceivable and embedded in everyday practices, relate to the deepest level of causal influences. Although institutions are a part of culture, they are considered as perceivable and collective in everyday practice through being articulated by the cultural values, norms, roles, and cognitive repertories, as can be seen in Portes' definitions of these elements.

Figure 4.1: The Emergence of Institutions through the Elements of Culture



Source: Portes (2010: 54)

According to Portes (2010), values are generally based on moral principles shaping people's acts that reveal through norms. Therefore, values are generally based on the deep elements of culture, which are the motivating force for moral principles of people's behaviour. From this aspect, the significance of values is associated with the essential obligators and traditions of a society. Thus, the range of values fluctuates between desirable and detestable in a society (Portes, 2010: 52). However, according to North (1990), among others, values are considered as part of the deep culture because of their embeddedness nature in everyday practices in a society rather than, for example, having an unrestrained self-interest in every economy (Portes, 2010: 52). The components of social structure in a society are also associated with a deep level of society but moral values and cognitive frames do not make these. These are based on the realm of power at the deep level of society within the hierarchical structure (Portes, 2010: 53). However, in this conceptual framework, Portes' cultural structure is considered rather than social structure in order to explain the emergence of institutions.

According to Portes (2010), norms may either be formal or informal. For instance, laws are formal, while any organisational policies can be considered informal. Furthermore, Portes (2010) argues that norms, mostly, are associated as components of sanctions or enforcements and that severity of the sanctions represents the significance of the implicit values of the norms in a society. While values substitute general moral principles, norms reify the concrete contractions for action. These sanctions and enforcements can be formal and codified into constitutions and laws, or these rules may be considered as implicit and informally enforced

(Portes, 2010: 52). Moreover, the concept of norms has been used, at least from the mid-19th century with Durkheim's contribution, to refer to sanctions and enforcements as elements of culture (Durkheim, 1965). Therefore, the importance of the value reified in norms is demonstrated in the level of sanctions and enforcements. Although norms are not free-floating, they come together in an organised package, as rules. However, this sociological aspect has been ignored in economic literature, although this provides economists with an analytical thinking perspective. When individuals enter into the social world, they are subject to the restraints and incentives of norms, which serve as the system (Portes, 2010: 52).

As for cognitive repertories, as can be seen in Figure 4.1, they are the same level with norms as part of causal influence of Portes' framework that is also referred as cultural repertories or cultural capital. According to Portes, cultural capital refers to individual values such as educational sufficiency and more concrete complex of values and knowledge of cultural elements (Porter, 2010: 29). In addition to Portes, Bourdieu (1984) also stressed the importance of cultural capital, such as, teaching by families. Accordingly, having more cultural capital means more experiences and more capital in the way of emerging of institutions. In sociology, for example, a researcher is focused on the effect of family on the enforcement of the concept of cultural capital.

It is, therefore, important to define social capital in order to explain what cultural capital is. In this sense, social capital is defined as a source of social control; a source of benefits through family relations; a source of resources and reaching information through non-family networks. Thus, benefits through family are associated with cultural capital in Bourdieu's (1984) analysis. For instance, what families do is to affect their children's behaviour through education whereby they can convey a set of values and cultural elements (Portes 2010: 29). In Portes' definition, cultural capital also refers to cultural reproduction to sustain the society's organic progress in dynamic analysis.

Along with normative expectations, as in Figure 4.1, the next level of culture relates to the definition of roles, which embody cognitive repertories of skills and cultural toolkits such as language, which is the significant component of these cognitive repertories. According to DiMaggio and Powell (1983), the most innovative aspect of the new institutionalism in sociology has been its impact on cognitive frameworks as components of individual and collective actions. In addition, Swidler's (1986) notion of cultural tool kits shows parallelism with Bourdieu's (1984) approach to cultural capital. Therefore, these theoretical developments

have enhanced the cognitive elements of culture in the behaviour of actors in roles (Portes, 2010: 53). Consequently, it is possible to state that roles are the organised set of norms that are divided into how individuals serve as the mechanism in their social positions (Portes, 2010: 52). Thus, roles come together with determined normative expectations, skills, and cultural toolkits (Portes, 2010: 52). From this aspect, roles are, mostly, described as the set of behaviours for occupants of particular social positions, and, hence, they constitute the fundamental part of institutions, but they are not the entire institutions in themselves (Portes, 2010: 52).

4.3.2. Portes' Approach to Institutions and Institutional Grafting

According to Portes (2010: 55), institutions consist of a set of rules, which can be classified as formal or informal rules depending on the relationship among 'role occupants' in organisations referring to family, school and the other institutionally structured areas of companies, religion, social and work environment, and economy. With these components, the definition of institutions is close to everyday practices.

Portes (2010) also identifies institutions as 'symbolic blueprints of organisations' in order to distinguish them from visible organisations. While organisations are associated with people's routine course in their lives and are embedded in the tangible signs of the underlying structures of power, institutions (as the soft structure of the organisations) are the symbolic blueprint for organisations (Portes, 2010: 55). Portes also emphasises that the institutionalist school represented, among others, by North (1990) and his followers should be able to explore the conceptual framework of the relationship between institutions and roles in an explicit manner, if they want to use the term of individual norms for institutions. Moreover, they have to managed to combine relationships among symbolic blueprints, such as, roles. Therefore, as Giddens (2013) specified: "institutions are not social structures, but they have social structures" (Portes, 2010: 55) by themselves through actualisation of the symbolic blueprints specifying relationships among roles (Portes, 2010).

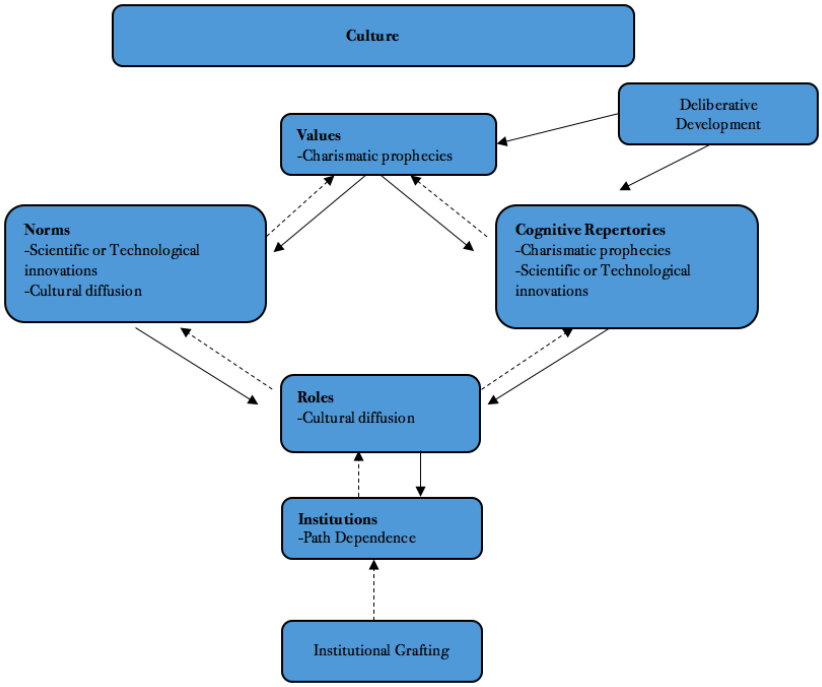
In Portes' framework, it is important to differentiate between institutions and organisations to understand the real character of social and economic organisations. Portes (2010) emphasised that institutions are deeply bound up with the assumption of embeddedness. Although institutions are able to conduct the transfer of human capital, these changes could affect institutions. Therefore, role occupants as a part of human capital do not, unquestioningly, follow institutional rules. In fact, they incessantly improve them, change them, and, sometimes, bypass

them in their daily interactions. Thus, Portes (2010) stated that the differences between institutions and organisations not only embody the assumption of embeddedness as the analytic distinction but also the consequences of real action in their daily interaction. Thus, within the identified distinctions between institutions and organisations, institutions are considered as the power of social interactions until a particular level, which are prepared to change and evolve into alternative ways (Portes, 2010: 56).

As stated earlier, institutions are also defined as symbolic blueprints indicating the functions and privileges of roles and their occupants' relationships. Within such a description, institutions and the resulting organisations could be started over from scratch in terms of coming into existence or emergence, such as a central bank, a stock exchange and so on; or could be reformed as to force the self-determination of the judicial system or catalyse the local legislative body (Portes, 2010: 57).

It should be noted that some contenders, such as Evans (2004), have also specified that the set of rules, being framed and shaped by trial and error in developed countries over centuries, are grafted onto underdeveloped countries with the aim to achieve comparable results (Portes, 2010: 57), which ignores the culture of such societies through which such roles and institutional forms did not emerge organically. Therefore, institutional grafting occurs at the surface level of social life, which faces dual set of forces, based on the deep structure of the societies that are product of values and power as depicted in Figure 4.2. Within the principality of culture, different norms and tools can be considered taking place into similar roles, as an assumption. These roles are mainly the products of the values, which are prerogative of the societies in the form of inscriptive bonds with the objective of promoting universalistic rules (Portes, 2010: 57). However, Ostrom (1990), in her solution to the 'tragedy of the commons' also criticises the attempts of the states to enforce external rules such as institutional grafting that ignore the emergence of organic rules within the society, as depicted in Figure 4.2 (Portes, 2010: 59). In fact, Portes (2010: 59) substantiates that institutional blueprints stem from dialogue and loyalty among users of common sources from the society. For instance, Portes (2010: 59) suggests that 'fishers', who use the same ocean, are more capable than the setting of rules by state bureaucrats in the establishment of durable measures against the depletion of stocks. This capability emerges from deliberative development within the society but not from an institutional grafting, which is imposed by state bureaucrats (Portes, 2010: 58). Therefore, in some cases, universalistic rules can not fit into particular societies who require their own set of rules stemming from deliberative development or organic emergence within the society.

Figure 4.2: Determinants of Social Change in Modern Societies

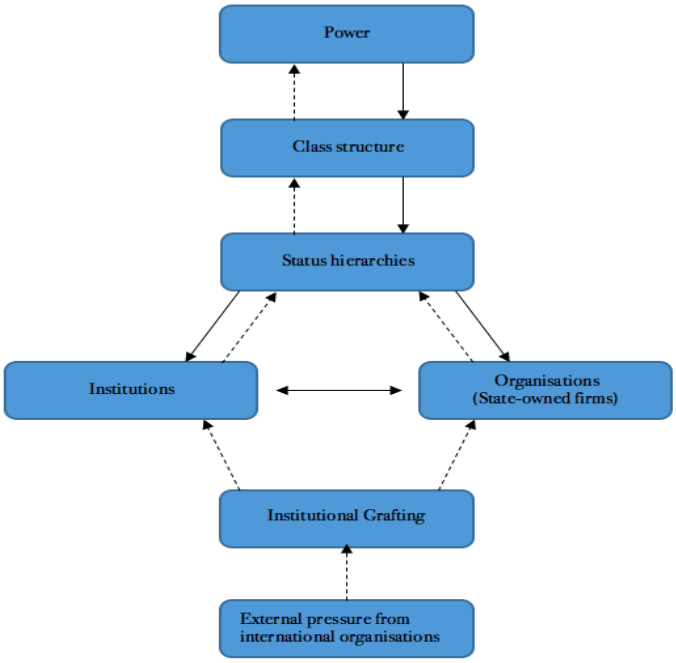


Source: Portes (2010: 58, 65)

The idea of importing or grafting institutions starts at the surface level of societies aiming to push it up into the normative structure and value system of society. Therefore, the participatory strategy starts at the beginning of the other's (organic institutions) end as can be seen in Figure 4.2, by involving the occupants in a wide discussion of values such as development goals; the norms and rules; and cognitive repertories such as the technical means essential for reaching them. Thus, institutional blueprints could emerge from such discussions resulting into bilateral causality of culture itself (Portes, 2010: 59). As can be seen, in the model of Portes' emergence of institutions, on the one hand, there are organic institutions in which the departing point of emergence is culture with a historical path of dependence. Thereby, culture creates values, then, constitutes cognitive repertoires, norms, and roles. After creating the value system and norms of the society, institutions can emerge by itself as seen in Figure 4.1. On the other hand, institutional grafting can imply that their set of rules are imposed by a business environment or state apparatus as depicted in Figure 4.2. Hence, reverse emergence can happen, which, then, requires making such grafted institutions to fit into the society through subsequently adapted roles, norms, cognitive repertories, and values as seen in Figure 4.2 and 4.3. Therefore, imposed rules do not always fit into the society well, as provided by the 'fishers' example above.

The discussion on institutions could be extended to a different dimension through cross-national diffusion of culture, operated at the deep level of Portes' framework, which can also affect the normative and skill components of roles as depicted in Figure 4.2. Therefore, it is important to emphasise that the diffusion of skill repertoires through new technologies and norms from the developed countries to the underdeveloped parts of the world is one of the most significant sources of transformation in those societies (Portes, 2010: 64), which may not necessarily be related to the social formation of the developing countries. Thus, in the case of the recipient developing countries, technological progress becomes a significant actor in the change of the cognitive repertories and roles played by actors. For instance, with the advent of the internet, innovation has led to changes in the content of the role of occupants and the rules imputed to them in the institutions of modern societies, as viewed in Figure 4.2. However, these changes need to fit into the society to ensure their norms and roles lead to the emergence of organic institutions. If technological progress does not fit into the society, cultural diffusion cannot lead to the emergence of organic institutions.

Figure 4.3: Structuring Institutional Grafting



Source: Portes (2010: 63)

Institutional grafting can also be imposed by external powers or agencies. As detailed in Figure 4.2 and 4.3 as dashed lines, the emergence of grafting institutions can also start from the end, at the bottom, through the pressure of international organisations. In modern times, neo-liberal

policies followed by the 1979 Washington Consensus resulted in imposed or grafted market institutions and organisations in the developing world via the imposition of multilateral agencies, including the IMF among others, which were alien to the social formation of those societies, to the extent that it created a constitutional crisis in some countries. For example, El-Deen (2002) explains that due to the creation of market-based institutions in Egypt, the state faced a constitutional crisis, which was overcome by the pragmatism of the politicians, as in reality a constitutional change was essential, which, however, was not possible under the political circumstances of the country.

Institutions emerged by external pressure from international organisations through institutional grafting, however, embodies some anomalies as they may not be related to the social formation of those societies in which they were grafted (Rutherford, 1984:344). Therefore, "new institutional principles are grafted onto other lines and modified in the face of new conditions. In time, these institutions may become subject to challenge from some alternatives discipline of line" within the society (Rutherford, 1984: 33). As a result, as illustrated in Figure 4.3, the relationship between power and external organisations designates new institutions based on universalistic rules, which mostly do not fit into the society. This is due to not following a particular historical path as part of that respective society through the principles of the society, as depicted in Figure 4.2.

While cultural affect is explained here, it should be noted that religion and religious prophecies may influence the culture through their impact on the value system. Supporting this idea, according to Weber's social change theory, the history of religion and the role of charisma and charismatic prophecies provide the necessary force to demolish the existing social order in order to regenerate it as a new ideological blueprint, as observed in Figure 4.2. (Portes, 2010: 65). Therefore, cultural and religious factors play a significant role in the emergence of institutions. In fact, charismatic prophecies through religious influences can be used by state bureaucracy as a tool for justification of the imposed rules in an inverse emergence, such as, institutional innovation or institutional grafting.

4.4. INSTITUTIONAL INNOVATION BEYOND ORGANIC EMERGENCE

Institutions, as explained so far, plays a significant role in ordering the activities and fundamental interactions of a society throughout history through their structures on developing and shaping meaningful behaviours, roles, and interactions among members of a society. Here,

they are able to organise societies towards change and innovation. As an achievement, financial institutions assisted sectors of impoverished and low-income groups in a society, previously excluded from financial services, through microfinance by generating hybrid organisational forms, which represent innovated institutions and serve innovative products bringing about changes in the existing financial system (Raffaelli and Glynn, 2015: 407).

As the literature and practice indicates, there are two types of institutional innovations: institution is occurred by an existing institution and, secondly, institutions are created by a new institution. In this regard, institutional innovation, which occurs within the existing innovation, embraces the new opportunities emerging from the changing environment and cultural sensitivities (Raffaelli and Glynn, 2015: 407). Thus, not only this kind of innovation is able to preserve the existing institutions but also helps to develop and expand them.

Institutional innovation may be identified as 'institutional change' by the use of an existing institution with different form, quality, products, applications, and regulations (Hargrave and Van de Ven, 2006: 866). Accordingly, the creation of new institutions may be identified to create a new system to add high value to turn an opportunity into an advantage, provided by a changing environment, culture, and system; and to be more efficient than similar systems. This entirely new creation is also known as institutional entrepreneurship (DiMaggio, 1998: 14). Therefore, it is possible to delimitate that institutional innovation can arise within the range from 'more disruptive innovation as the creation of new institutions' to 'less disruptive innovation such as improvement of existing institutions' (Raffaelli and Glynn, 2015: 408).

Although, the reasons for change in institutions are attributed to exogenous factors through the impact of the external environment on institutional shifts, some contenders such as Mahoney and Thelen (2010: 3) stated that exogenous factors are limited in their capacity to explain institutional change. Thus, in order to go beyond these factors, they argued that endogenous dynamics and sources are incorporated into modification or creation of institutions, to give rise to innovations (Raffaelli and Glynn, 2015: 408).

In addition to exogenous and endogenous factors, institutional change is also explained by the new phenomenon of institutional innovation. Although the notion of institutional innovation has been, slightingly, used by academics to mark the first stage of its emergence, it has become more popular than the other factors over time among some academics and practitioners from various disciplines (Raffaelli and Glynn, 2015: 408). In fact, this new phenomenon of

institutional innovation requires a reframing, redefining, and reshaping, and developing the existing institutions to meet new expectations of people, financial sectors, bureaucracy *etc*.

The new phenomenon of institutional innovation, hence, aims to strike a balance between existing explanations of institutional resolution and change. Although Raffaelli and Glynn (2015) aim to consider the creation and rising of new institutional forms, they take into consideration the change in the existing institutions through the new phenomenon of institutional innovation. In this regard, Raffaelli and Glynn (2015) explain the changes in the fundamental factors of institutions in the form of normative, regulative, and cognitive institutions, which lead to change in existing institutions.

Furthermore, Raffaelli and Glynn (2015) also advocate the notion of institutional innovation defining as novel, useful, and legitimate change that disrupts the cognitive elements of institutions such as 'cognitive', 'normative' and 'regulative'. In this sense, institutional innovation also refers to the new idea as good as the other types of innovation (Van de Ven, 1986: 591). As, it provides a novelty to organisations in order to solve their problems and accomplish their objectives so institutional innovation is also useful for organisations (Raffaelli and Glynn 2015: 409). However, it is important to state that both novelty of usefulness relates to how much these elements are embedded or adopted into/by a culture or an organisation (Van de Ven, 1986: 592). Although novelty and usefulness are dimensions of general innovations in general, novelty in institutional innovation is adopted by the broader organisations, societies, and cultures that lead to accelerate the rise of institutional innovation (Raffaelli and Glynn, 2015: 408).

Hagel and Brown (2013: 14-15), for instance, state that the emergence of credit cards relates to innovation because of its novelty and usefulness. However, the application of credit cards was attributed as institutional innovation with the VISA application in 1976. By doing this, Visa card started to provide the banks with a mechanism to work together through a centralising payment-progressing system. After this initial innovation, credit cards could be considered as institutional innovation via the legitimisation of credit cards through the VISA system along with its novelty and usefulness (Raffaelli and Glynn, 2015: 414).

As this explanation intends, innovation in general can shift into institutional innovation through legitimate change, which is quite significant for the creation, transformation, and diffusion of institutions, in order to demonstrate their differences from the other institutions within the

legitimacy (Dacin *et al*., 2002: 47). Therefore, legitimisation can involve new institutional innovation by bridging old and familiar institutions and innovation in general to institutionalised innovation.

4.4.1. The Foundation of Institutional Innovation: Normative, Social Construction, Culturally Embedded, and Bundling of Logics and Practices

In line with Scott's (1987) process related contribution, Raffaelli and Glynn (2015: 410), in their attempt, in theorisation of the notion of institutional innovation, have grounded their theory on four elements of institutionalisation: 'normative', 'social construction, 'embedding cultural elements' and 'delineating particularistic logics and practices'.

The normative elements of institutionalisation consider the value and history in order to support stability in an organisation or society through its longevity or sustainability structure although normative elements such as norms, values, and beliefs change over time within a society, organisation and institution. To give an example, today's economic and societal agendas involve sustainability and environmental issues, which threaten the future, but these issues were not on the agenda until recent times (Raffaelli and Glynn 2015: 410). Therefore, changing values over time can move in concert with institutional structure in order to form innovation in a society, organisation, and institution. Furthermore, through normative process, institutional innovation may comply with norms and values along with its novelty and useful factors. Therefore, institutional innovation can be, more rapidly and easily, accepted by societies, institutions, and organisations within their structures (Raffaelli and Glynn, 2015: 411).

In addition to normative elements, the historical development process, which led to the rise of institutional innovation can be considered in order to develop institutional innovation through social constructivism. In history, it is possible to see that the end of one process in time may help to trigger the institutional innovation leading to a new era. Therefore, Raffaelli and Glynn (2015: 411) explain the influence of historical process on new institutions through social structure of societies, institutions, and organisations that create cognitive and normative patterns. Thus, social structure, not only basing on the descents from history but also leading the need for innovation, can trigger change in cultural, economic, and environmental transformation in the transmission process into the new period. This process leads to the emergence of an institutional innovation by itself. Hence, key social actors within a social

structure need to identify institutional innovations in order to make them novel and useful, and more understandable for societies and institutions (Raffaelli and Glynn, 2015: 412).

Following social constructivism, Scott (1987: 498) considers institutional innovation embedded in culture. By exploring this, cultural elements involve the class frame through symbols, cognitive systems, and normative beliefs rather than technical elements (Raffaelli and Glynn, 2015: 412). The importance of cultural elements in an institutional system is that innovation embeds within the culture in the society. Therefore, culture, which also functions to enable innovation, accelerates the adoption of innovation in societies by legitimating the innovation through their belief system embedded in culture (Raffaelli and Glynn, 2015: 412). Furthermore, culture plays a connective role in different strategies decided by actors in institutions or societies in order to indigenise the innovations. Therefore, culture as a source of nonmaterial capital can contribute to institutions prioritising the importance of innovation that makes culture a key dimension (Raffaelli and Glynn, 2015: 412).

Lastly, innovation could also incorporate multiple and different logics and practices embedded in belief similar to cultural embeddedness from an institutional innovation perspective as detailed in Section 4.4. For example, microfinance institutions are considered as both a market interest and form of social welfare to create a hybrid institution, which is embedded in culture and belief as an institutional innovation (Raffaelli and Glynn 2015, 413). Therefore, while institutional innovation fulfils the requirements of markets at the practice side, at the same time it responds to societal needs on the social side. From these explanations, it is possible to specify that innovation embedded in cultural and belief systems, affects actors and practices of innovation into the adoption and spill over process of innovation in societies through broader elements of culture.

4.5. EMERGENCE AS A NEW SYSTEM UNDERSTANDING

As mentioned above, emergence as a concept is also utilised to examine the formation of institutions and practices to identify whether they represent a genuine or organic ‘formation or innovation’ or merely represent ‘a different way of doing the usual practices’. In recent years, there has been an increasing interest in examining the emergence of institutions.

The concept of emergence is difficult to explain in the sense of its broad components, which are used by interdisciplinary studies from economics to psychology. Over the last decades, a number of contenders (for example, *see*: Bickhard, 2000; Cunnigham, 2001; Sawyer, 2001;

Clayton and Davies, 2006; Lawson, 2012; Martin and Sunley, 2012) have contributed to the debate on 'emergence' in the social sciences including economics. However, the origin of the debate can be traced back to the 1800s when the notion of 'emergence' was introduced by Mill (1843), then his followers such as Lewes (1875), Alexander (1920), Broad (1925), Pepper (1926), Stephan (1992) and Skyttner (1996).

The features of emergence are described as being 'novel' and 'unpredictable', and 'being ontological in nature' with significant aspects of reality. However, the studies on emergence have differed in its categorisation process. Some scholars (*such as*: Harper and Endres, 2012; Stephan, 1992; Krugman, 1996; Hodgson, 2000; Elsner, 2010; Halley and Winkler, 2008) have shown interest in several core conditions that economic patterns, such as, rules of systems and structures, has to satisfy to qualify as emergence. In their approach to emergence they have identified the following features: 'material realisation', 'coherence', 'non-distributivity', 'structure dependency', 'genuine novelty', 'unpredictability', and 'irreducibility' (Harper and Endres, 2012: 354). Among these, any of them is considered sufficient to specify as a strong emergence or weak, while others (such as: Christen and Franklin, 2002; O'Connor, 1994; Humphreys, 1996) prefer to consider the philosophical framework of emergence by approaching it through ontological and epistemological perspectives. There is also another group of contenders (such as: Clayton and Davies, 2006 and Goldstein, 1999), who consider the notion of emergence in terms of historical perspective through complex systems.

In recent decades, the concept of emergence has attracted increasing attention and controversy across the social sciences, including economics. However, economic emergence has been excluded by the neo-classical approach in their analysis due to a modernist position of homogeneity. Alternatively, an evolutionary approach has considered the importance of emergence. Therefore, it can be stated that emergence studies are integrative concepts of both evolutionary economics and complex systems theory in an attempt to make sense out of dynamic economic realities.

It is, therefore, important to note that there are two main streams of literature appearing to explain the notion of 'emergence': complex adaptive systems including socio-economic systems, and evolutionary systems; and a philosophical approach concerning ontology and epistemology (Martin and Sunley, 2012). Evolutionary economics is mainly focussed on 'emergence.' According to evolutionary scholars, such as Dopfer and Potts (2004a; 2004b), Hodgson (2000), and Elsner (2010), emergence refers to generation, adoption and diffusion of

a social rule that all lead to emerging novel properties in a complex system. Therefore, it is possible to indicate that evolutionary economics relates to the process to produce novelty, new technologies, new institutions and practices in which new kinds of patterns are envisaged to lead in constituting economic progress and change in patterns of interactions with the whole economy.

4.5.1. Philosophical Perspectives on Emergence

The notion of emergence has become one of the main topics of conversation in both economics and sociology through interdisciplinary research related to complexity issues for the last two decades, although, for the last decade, the concept of emergence has been debated in a more scientific and complex manner. Based on the given introduction above, it is important to explain the ontological and epistemological aspects of emergence in order to evaluate the progress of the emergence related literature from the past to present (El-Hani and Pihlström, 2002: 18), as this can help with the assessment of the formation process of the IBFIs.

The concept of emergence is tentatively defined as "occurring when wholes (combinations of things) produce structural or functional effects that are qualitatively different from what the parts can produce alone" (Corning, 2005: 51). On the other hand, emergence is used by philosophers "to denote the possibility that, when certain elements or parts stand in particular relations to one another, the whole that is formed has properties known as 'emergent patterns' that are not possessed by those elements including causal powers or parts taken in isolation" (Lewis, 2012: 368). In this sense, the concept of emergence could be constituted by emergent patterns which are based on physical capital or its derivatives that involve the practices of the existences' causal powers (Lewis, 2012: 368). From this explanation, the emergent properties of an emergent pattern need to "specify the elements of which that entity is usually composed"; "give an account of how those elements must be structured in terms of relating to one another to constitute the entity in question" and also needs to "offer a causal explanation of how and when the elements are arranged in the requisite way, their behaviour gives rise to the emergent causal powers of the entity in question" (Lewis, 2012: 370).

The philosophical aspect of emergence is, mostly, contextualised as reductive and non-reductive physicalism that is currently orthodoxy on the mind-body problem (Kim, 1992). However, basically, the ontology of emergence suggests irreducibility and epistemologisation (El-Hani and Pihlström, 2002: 40-41), because of its embeddedness in a "physicalist ontological

monism with a dualism of physical and physiological properties" (El-Hani and Pihlström, 2002: 21). Edmund *et al.* (2008: 290) remarks on ontology of emergence by formulating its definition as:

Emergence is not a specific thing; for example, like a stone in your pocket;

Emergence is not one specific behaviour, known to occur at some moment in time;

Neither is emergence a well-defined category, like the stones on some particular beach;

The category of all emergent behaviours is of interest; yet debate will occur on which behaviours should be included, and which should be excluded;

Hence, it is each observer who decides to include or exclude a given behaviour in his own category of emergent behaviours.

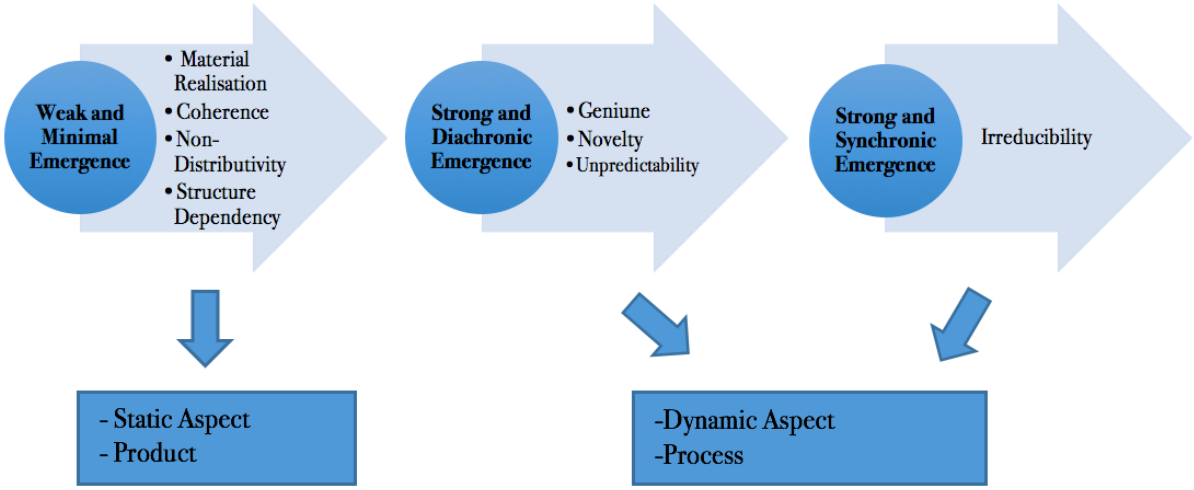
Regarding ontological and epistemological senses of emergence, de Haan (2006: 294), by referring to its ontological articulation, also defines that "emergence is about the properties of wholes compared to those of their parts, about systems having properties that their objects in isolation do not have". As for epistemological sense, as defined by de Haan (2006: 294) "emergence is also about the interactions between the objects that cause the coming into being of those properties, [namely] the mechanisms producing novelty". It can, hence, be noted that the first definition represents organic emergence, while the other, emergent pattern.

In addition to a philosophical perspective, emergence can be specified for a particular emergence such as genetic emergence and economic emergence *etc*., because "emergence is necessary for survival and growth in all living dissipative structures" (Foster and Metcalfe, 2012: 430). For example, economic emergence can be seen in the gaining of wealth and power of states (Foster and Metcalfe, 2012: 430) through "forming of habits, routines, cultural norms, conventions, money, standards, institutions" (Harper and Lewis, 2012: 330). However, it should be noted that any kind of emergence generates a discussion whether they are organic emergences or emergent patterns.

4.5.2. Emergent Patterns within the Complex Adaptive System and Evolution

Evolutionary economics has become more of an issue in a changing economic environment, especially when explaining new emergence institutions and economic patterns. Harper and Endres (2012), examined the emergent patterns within the seven characteristics of the notion of emergence as depicted in Figure 4.4.

Figure 4.4: Determinants of Social Change in Modern Societies



Source: Adapted from Harper and Endres (2012)

As identified in Figure 4.4, 'material realisation' in the sense of emergent patterns, first, are realised in physical structure and processes in which there are no resource disembodied capital (Harper and Endres, 2012: 354). In the macro level, all capital orders, as an emergent pattern, are based on the consistency to one another. Furthermore, all physical capital in terms of material realisation relies on the mental abilities of human being with a valuing mind to become physical capital or tacit capital (Bechtel and Richardson, 1992: 255; Harper and Endres, 2012: 354). In addition, emergent capital constitutes a whole with a system which is the interacting source of production. Therefore, the connections among at least two things lead to determine as to whether it represents a system of capital or not. Without connections, it is not possible to mention any system of capital, which is made by these connections in more 'coherence' and unified than mere capital conglomeration.

'Coherence' is the second feature of emergent patterns by separating the capital from the existing ones through connections and, thereby, implies that the pattern is not a mere

conglomeration but consists of a systemic whole: connected and interacted. Therefore, no single centralised control mechanism can govern the system, as there is an interrelationship among the factors of the system producing coherence. Thus, the system can be explained as the result of these interrelationships among elements of the system rather than the relationship among individual parts (Harper and Endres, 2012: 356). If the relationship among elements is to work, the whole component must be coherent. However, if the relationship between elements is a subjective concept, the coherence properties that are attributed to them cannot be determined by the whole component that means that the individual relationship between elements generates subjective preferences that fulfil conventional elements of rational coherence (Infante *et al*., 2016: 9-10). Furthermore, the similarities between the elements are not sufficient to determine the systemic whole that all such relations among them need to be coherent in the original foundation of a systemic whole, normatively (Murphy and Medin, 1985: 289). Therefore, the coherence provides to accommodate what is already known of an external structure, and to define partly by relations connecting properties in an internal structure (Murphy and Medin, 1985: 299).

As a third characteristic of the emergent patterns, the entire emergent patterns are possessed of at least one systemic property, which refers to 'non-distributivity' (Harper and Endres, 2012: 356). The notion of "non-distributivity has an objective status and must be presented in principle" (Grib *et al*., 2006: 8462) that provides some expression and some specific features different than the conventional system. Moreover, "all systems of capital possess global properties of their own that their components lack. Because the individual components do not possess this global property, it cannot be presented in the partial state spaces of individual system" (Harper and Endres, 2012: 356). For instance, having a structure of a systemic property that is presented by a particular system, which does not allow them to be part of any other component of the system, requires to be the feature of non-distributivity, because of "coming for free by virtue of a pattern being a system" (Harper and Endres, 2012: 356).

The fourth characteristic feature of emergent patterns is the 'structure dependence' that implies the systemic properties of the emergent patterns base on the composition of the system and its connective structure. For instance, two systems could have the same structural organisations as an internal structure but a different environment as an external structure. Another two systems may have different structural organisations but the same environment (Harper and Endres, 2012: 357). Therefore, the pattern of structure dependence implies that the institutions or organisation would have an unequal share within the same environment if they possess the same

mode of the system or *vice versa*. Because, the pattern of structure dependence needs to have both an internal structure that is "the collection of connections among components of the system" and an external structure that is "the collection of connections among the system components and environmental items beyond system boundaries" (Harper and Endres, 2012: 357).

These four characteristics or features of emergent patterns are common to all forms of emergence and strong forms of emergence in economics although they represent weak and minimal emergence as depicted in Figure 4.4., while evolutionary economics also suggests the fulfilment of the following features: 'genuine novelty', 'unpredictability', and 'irreducibility':

'Genuine novelty' shows that the outcome is qualitatively different from the existing goods and produces new form to have functional effects on the existing goods. 'Genuine novelty' represents the strong and diachronic emergence as can be seen in Figure 4.4. Moreover, genuine novelty necessitates new ways of interactions among the existing elements to produce a new broader pattern that has not been revealed in the system before. Here, emergence affects the production of novel properties and creating new interactions between entire entities in a system (Ireland and Zaroukas, 2012: 2). Furthermore, it is important for organic emergence that genuine novelty leads to emerge a diachronic emergence, which has a capacity to generate novel spatial formation that necessities the truly creative novelty rather than coexistence of novelties (Ireland and Zaroukas, 2012: 7). However, it is important to state that according to evolutionary economics, "the properties of genuine novelty may emerge in a complex system that are not reducible to constituent micro-element" (Harper and Lewis, 2012: 330).

Another feature of an emergent pattern is 'unpredictability' that has been developed over time. In the changing world and economic system, it is not possible to predict a new type of economic pattern and its results for the future by using rational tools. 'Unpredictability' also represents the strong and diachronic emergence as can be seen in Figure 4.4. All new capital structures in this process are unforeseeable by itself (Harper and Endres, 2012: 358). The uncertainty of emergent patterns stems from the unpredictability and capriciousness of the future knowledge and progress (Popper, 1963: vi). Because, a strong emergent pattern necessitates the uncertainty in socio-economic life so the actors in the system will not know the consequences of their actions and expected utility that rises from the feature of the emergent pattern of unpredictability based on unpredictable knowledge of the combination of a systemic whole (Harper and Lewis, 2012: 335). Therefore, spatial economics defines an emergent pattern as:

"not something that is obviously predictable from the properties or the behaviour of the individual elements" (Krugman, 1995: 26).

The last feature of emergent patterns is 'irreducibility,' implying that systemic properties of emergent patterns do not follow from the elements of a capital system in reduced systems (Harper and Endres, 2012: 354). Therefore, 'irreducibility' represents strong and synchronic emergence as depicted in Figure 4.4. In detail, irreducibility is defined in an emergent system as an emergent pattern (Champandard, 2003: 585):

Emergent system is often considered as irreducibly complex, which means that removing any component breaks higher-level patterns. When removing a component from an emergent system, major effects on the patterns should be observed. If there are only minor changes, the components are combined in a trivial fashion and therefore are not emergent.

Therefore, emergent properties are the components of a systemic feature of a complex system within an emergence that is irreducible to any other pattern due to the structure and features of the emergence.

Overall, classification of these emergent patterns shows that each of them have their own impact on emergence demonstrating a strong or weak impact. Furthermore, comprising genuine novelty, unpredictability, and irreducibility has a very strong impact in identifying the nature of emergence. As the classifications are depicted in Figure 4.4, strong emergences in diachronic features such as 'genuine novelty', 'unpredictability' and synchronic forms such as 'irreducibility' are radical outcomes, when it is compared to weak emergences such as 'material realisation', 'coherence', 'non-distributivity', and 'structure dependence', which are mainly based on physical capital and static aspects within their connection to dispersed agents within industries. However, weak emergence defines how the notion of emergence could be considered with the individual elements, which are predictable and observable incorporating the individual factors as indicated in Figure 4.4. As for strong emergence, it is irreducible in the sense that broad capital in terms of strong emergency cannot be reduced to the interaction within the firm or industry. However, it is important to specify that diachronic as strong emergence is mainly related to formation, integration, categorisation of capital to pave the way to synchronic emergency. After these explanations, the most important distinction between weak emergence and strong emergence is that weak emergence could be formulated with computable information due to being predictable and reducible regarding what is known.

4.6. MERGING THE THEORIES FOR THE CONSTRUCTION OF THE FRAME: PORTES' MODEL, INSTITUTIONAL INNOVATION AND THE ROLE OF KNOWLEDGE

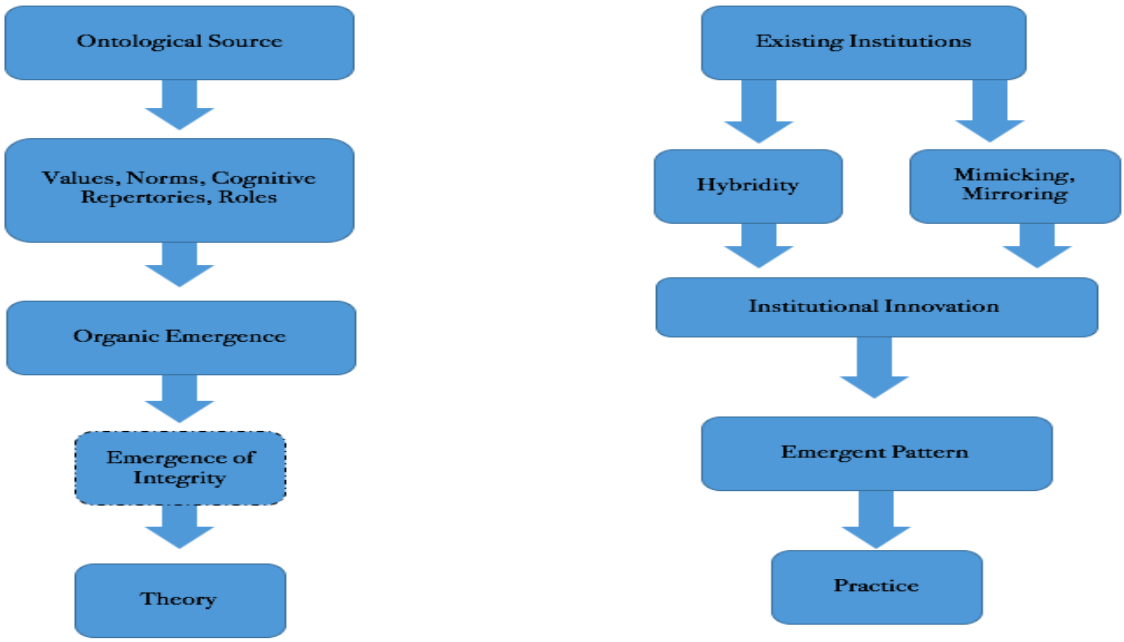
After the explanation of emergence of institutions within the three different approaches, namely Portes' model in terms of cultural base, emergent patterns in terms of emergence theory, and institutional innovation in terms of usefulness, novelty and legitimacy, it is important to detail and merge them to see their working mechanisms, so that the process of creating an institution or modifying an existing one can visibly or effectively be formed as a basis. However, if these approaches are evaluated through 'what is to be' and 'what ought to be' in the form that Hume (1739 cited by Hume, 2003) articulates, emergence of institutions can be explained within these three approaches. Furthermore, the statements based on 'what is to be' can be related to descriptive and positive statements, while 'what ought to be' refers to normative statements. In other words, they can be labelled as 'fact' and 'value' in the formation of institutions. Scott (1987) stated that although, values, norms, and cognitive repertories change in time for societies and institutions, the normative order of institutions helps to maintain the structure over time and promote stability, which has been the key with Islamic normative principles.

Many contenders, among others, North (1990), Scott (1995) and Portes (2010), explain the emergence of institutions through norms, values, and changed patterns of behaviour in addition to rules and laws. The cultural and historical approach has been emerged within the cultural balance but emergence, sometimes, seems not to be fixed in a society even operating in parallel to cultural norms. In understanding emergence, the definition of institutions is important. North (1990: 3) defines institutions as "the rules of the game of a society", while Aoki (2001: 26) states that "an institution is a self-sustaining system of shared beliefs about how the game is played". From these statements, it can be understood that emergence can differ among societies as their cultural norms and values. An institution which could be suited to a society within an idiosyncratic cultural norm, would not necessarily suit another society, which relates to individual social formation. Therefore, the process of emergence relates to the articulation of a society's culture, values, cognitive repertories, roles, and norms that eventually lead to the emergence of an institution. However, as seen in Portes' model in Figure 4.1., the emergence of an institution takes places through a particular interaction between society and political power that is comprised of common habits, rules, and daily life practices (Charles and Johnson, 2005: 46).

In addition to cultural and historical process underlying the emergence of institutions, changes of environment or patterns can lead to alterations in human behaviours, new or existing institutions. However, following this process, change within existing institutions can derive from new purposes to perpetuate the needs of people or groups of the system. This can provide a lower transaction cost, new administrative structures, ease of enforcement, which, in the end, meets cultural expectations. However, these institutions cannot go further than adapting, reshaping, or mimicking institutions that already exist or were created for other purposes, at one time (McCay, 2002: 370).

In addition to a cultural and historical trajectory for the emergence of an institution, emergent patterns can explain the emergence as weak or strong, as stated above. Furthermore, in contrast to the emergence of an institution based on the social elements of emergence, emergent patterns can be considered in terms of technical elements. However, in order to consider them as an emergence, it needs to merge all emergent patterns. Therefore, emergent patterns, which do not make sense alone, pave the way to the notion of emergence, collectively. Otherwise, they would be only a part of a whole, implying that they could emerge together. In this point, as mentioned above, the state of weakness and strength in the nature of emergence is a matter of the discussion on emergence; as weak emergence can be related to innovation in terms of its feature of novelty, usefulness, and legitimacy.

Figure 4.5: Merging the Theories: Theoretical Mechanism of the Proposed Frame



After providing the connection among the approaches of emergence, it is important to interlink them as depicted in Figure 4.5. The formation of institutions can be divided as 'new institutions' or 'institutional change'. However, both can be examined to identify the nature of emergence as weak or strong.

As mentioned above, firstly, the emergence of institutions can be extracted from historical and cultural depth, which constitutes the ontological base of the institutions as can be seen in the left side of Figure 4.5. Institutions can differ from one society to another because of their cultural norms, values, roles, and cognitive repertories in spite of the fact that rapidly emerging economic orders could not ensure similar performances in such institutions in a globalised economic system. If a society manages to create an institution through their ontological knowledge based on their culture, religion, and social dynamics by using their own epistemology without being impressed by the global order, at that time, it is possible to create an organic institution created through autotelic ontological sources. Therefore, this kind of organic institutions can find opportunities to directly respond to the needs of the society and other societies sharing common cultural values, spiritual values, and social structures leading to the creation of new institutions; composing authentic institutions emerging from the base of a particular society by constituting its superstructure. This formation process can be considered as 'what ought to be' in relation to the institutions created by the imposition of a hegemonic economic system, for instance, as part of the global neo-liberal system.

Emergence can also be explained by its emergent patterns generally related to the technical practices within the physical structure and process. However, as can be seen in Figure 4.4, the categorisation of emergence as weak and strong helps to determine an institution, organisation, or product whether it substantially constitutes emergence or superficially leads to an emergent pattern. As mentioned above, 'material realisation', 'coherence', 'non-distributivity', and 'structure dependency' as emergent patterns are static, and based on product while 'genuine novelty', 'unpredictability', and 'irreducibility' refers to dynamic processes. However, if emergent patterns cannot be in unity as whole, it is not possible to mention an emergence, which then can be considered as weak or strong as its feature and as an emergent pattern, as detailed in Section 4.5.2.

Lastly, the concept of emergence can be related to institutional innovation based on novelty, usefulness, and legitimate features of emergence as detailed above. In fact, emergent patterns provide an emergence on an individual basis addressing specific purposes rather than a whole,

because such types of emergences are not able to ensure integrity. Therefore, by definition, emergent patterns need to provide emergence as a whole to provide integrity among each other. Only at a time, it is possible to state an organic emergence which has its origin embedded in society, culture, and spiritual matters. Otherwise, these emergent patterns need a hybrid formation to mimic existing institutions in order to bring in compliance with cultural, religious, and social structures of a society. Therefore, although these new formations appear to depend on ontological sources of societies by driving their own knowledge as a source, these emergence types have only imitated existing institutions and compete with them as an outcome, shown in Figure 4.5.

4.6.1. Institutional Isomorphism: Articulating Mimicking, Hybridity, and Mirroring in the Process of Making of Institutional Innovation/Emergent Patterns

In understanding the emergent patterns, it is important to examine the interactions between different societies, markets and institutions. For this, the concepts and processes of mimicking, hybridity, and mirroring is useful, which are discussed in this section in order to develop the substance of the theoretical frame proposed by this study. Such a process leads to the emergence of various organisations with the similar soft institutional software. For example, the case with the existing (conventional) banking system as an organisation, which has become a hegemonic form through mimicking, hybridity, and mirroring process, and it is now forcing other alternatives (such as Islamic finance) to give up its own authenticity and resemble through mimicking, hybridity, and mirroring, conventional banking and finance in terms of its institutional software and organisational structure.

It should be noted that the studies on new paradigms of institutions have become popular among anthropologists, sociologists, economists, and political scientists to classify the institutions within interdisciplinary studies. Here, as previously referred to, the role of culture and order has become significant in explaining social structure in the last decades (Scott, 2003: 879). However, within their own authentic culture and social order, cultural identities shape the institutions through existing ones. Therefore, new institutions have emerged within the perspective of cross-over and cultural mixes in the globalising world. Furthermore, despite having organic norms, values, and cultural wealth, the tendency to mimic existing institutions instead of creating organic institutions have prevailed in many societies including in the developing world with the objective of reducing the transaction costs and also in responding to intellectual shortcomings in their societies. Therefore, hybrid institutions have emerged in

different societies through the convergence process – convergence towards the imposed modernist truth as opposed to the organic institutional formation in each society. However, this kind of converged institutional emergence may have lasting consequences at the expense of authentic emergence in the sense that "people belonging to such cultures of hybridity have had to renounce the dream of ambition of rediscovering any kind of 'lost' cultural purity..." **(**Hall *et al*., 1992: 310). In other words, hybridity prevents any search for organic emergence by creating the culture of complacency and contentment.

It is useful to offer conceptual definitions of mimicking, hybridity, and mirroring before explaining their relationship with institutional innovation in terms of isomorphic institutions. From these concepts, mimicking is the starting point of the convergence process to compete with the existing entities. Despite being a biological concept in explaining a similarity of one organism to another (Smith and Harper, 2007), mimicking is an interdisciplinary concept, which is defined as: "copies the behavioural norms of the group to make clear the uncertain environment" (Ferdinand and Wang, 2013: 896), where innovation is poorly understood and the efficiency benefits from adoption are not clear (Guler *et al*., 2002: 214). Mimicry is also an easy way of legitimisation that is defined as: "a process where actors copy organisational leaders, structure, products, system *etc.* to gain legitimacy (Park, 2014: 225). However, it is important to state that while mimicking, initially, aims to keep up with existing institutions, it could be adopted by a social structure in time, and then become accustomed norms for the institutions. From this perspective, mimicry also leads to an institutional spread of ideas, structures, and systems (Park, 2014: 223).

As regards hybridity, this refers to a mixture. In a broad sense, however, hybridity, refers "captur[ing] the spirit of the times with its obligatory celebration of cultural difference and fusion, and it resonates with the globalisation mantra of unfettered economic exchanges and the supposedly inevitable transformation of all cultures" (Kraidy, 2005: 1). Although the concept of hybridity is, mainly, used in post-colonial, identity and cultural studies, it originates from the science of biology. It, therefore, has a very broad meaning whereby it has become popular even in economics and finance studies to explain current products and emerging institutions.

Hybridity can be categorised as 'institutional hybridity' and 'practical hybridity'. The former is, mostly, open to international institutions in their planning and management, because institutions are mainly based on political influence, technical knowledge, and human capital. Therefore, these kinds of institutions can be defined as "the mixing or combination of different

institutional forms" (Millar, 2014: 505). The main character of these institutions that "they are internationally designed and planned but attempt to incorporate local individuals and processes" (Millar, 2014: 505). Practical hybridity, on the other hand, refers to the fact that "local individuals also choose for themselves if and how they follow internationally prescribed modes of practice, subvert them, or even invent their own practice within the structure set by international planners" (Millar, 2014: 505). Practical hybridity can be affected by international actors and their hegemony.

In the case of Islamic banks, the concept of hybridity implies the hegemonic power of existing institutions through interiorising the hybrid products of existing paradigms. Islamic banks themselves and their products have become hybrid products of conventional banks rather than developing their authentic structure and products through alternative paradigms (Asutay, 2016). Therefore, 'institutional hybridity' and 'practical hybridity' can be seen in Islamic banks.

Concerning mirroring, it is the advanced form of hybridity through transformation. As a physiological concept, it refers to imitating the gesture, speech pattern and attitude of another that occurs from nonverbal presenting mirrored behaviour (Foulkes, 1984). However, the concept of mirroring in emergence of institutions appear as imitating the structure, implication process and product development of each other. Foulkes (1984: 81) provides the most commonly-held definition of the concept of mirroring as follows:

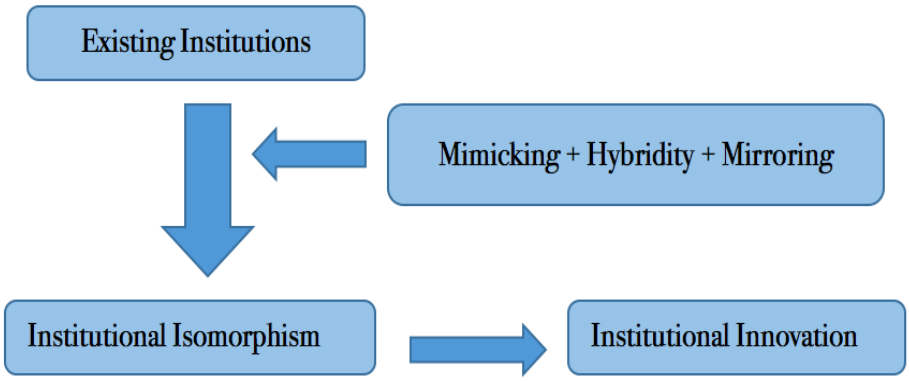
> Mirror reactions are characteristically brought out when a number of persons meet and interact. The person sees himself, or part of himself – often a repressed part of himself – reflected in the interactions of other group members. He sees them reacting in the way he does himself, who are in contrast to his own behaviour. He also gets to know himself – and this is a fundamental process in ego development – by the effect he has on others and the picture they form of him.

As Foulkes (1984) identifies, mirroring is a stage where identity annihilation takes place under the hegemonic identity in the sense that the authenticity of the emergent pattern is annihilated by the existing and hegemonic identity. This is the trajectory, as explained below, with Islamic finance and banking; as the institutional logic of conventional banking being hegemonic in nature has been taking over the authentic search of Islamic finance by relegating it to the negative screening in relation to *riba*, while the process of merging commences with mimicry and results in hybridity and completes with mirroring.

Based on the discussion so far, it is important to emphasise that the creation of hybridity through mimicking and mirroring is not the long-run solution. Accordingly, such formation is not

considered as effective for institutions because of its betweenness and unintended impacts on the society (Ang, 2003:149). In fact, although such emergent institutions, at the first appearance, look like hybrid formation, they have not gone beyond the mimicking of existing institutions. Therefore, the resulting institutions can have similarities to the existing one in the mimicking process or can be same in the mirroring process despite using different metaphors in doing the same thing. These similarities can be shown in the practices and process sides of the new institutions such as their production method, products, management processes, and applications. It should be noted that imitation extends from new and weak to strong and rooted. However, the harmonisation of the notions of hybridity, mimicking, and mirroring as observed in Figure 4.6. can lead to the rise of an institutional isomorphism which helps to explain the relationship among organisations, institutions, and individuals in terms of emergence.

Figure 4.6: The Formation of Institutional Innovation



Through the mimicking and mirroring process, institutions have become more homogenous with their key supplier, resource and product, consumers, regulatory agencies and other organisations that all produce similar services and products. Therefore, the inter-organisational structure and patterns have emerged that brings out the similarities among the institutions that has grown more and more alike (DiMaggio and Powell, 1983: 148; Beckert, 2010: 150). In clearly identifying such similarities, the concept of an 'isomorphic institution' has been used by new institutionalists in order to comment on the importance of cognitive repertories in terms of cultural norms and roles of institutional boundaries. Similar to Hawley's (1968 cited by Di Maggio and Powell, 1983: 149) definition that: "Isomorphism is a constraining process that forces one unit in a population to resemble other units that face the same set of environmental conditions", isomorphism can also be articulated in the emergence of institutions as a restrictive process that cause one institution in a society to resemble other institutions that face the same environmental conditions (DiMaggio and Powell, 1983: 149).

Thus, the notion of isomorphic institutions helps to explain the process, through which institutions resemble each other in time through mimetic, coercive, normative processes (DiMaggio and Powell, 1983: 150-154). Otherwise, these institutions stay out of the system as long as complying with the existing rules. Furthermore, new institutions or existing institutions may have changed their structure in parallel to other institutional environments, in order to have more similarities to existing structures by considering the social norms of societies (Dacin, 1997: 48) as a result of market engineering process or market disciplining process, which aligns the institutions. Therefore, it is possible to state that diversity of institutions, having even different structures, is isomorphic and determined by environmental diversity. Supporting this, the notion of institutional isomorphism results in the same or similar structures of institutions which operates in common sectors. Therefore, institutional isomorphism is the process that leads to resemble each institution to each other, which face the same environmental conditions in the same institutional environment or system (Daft, 1998:541), such as the case with IBFIs as explained by Pitluck (2012).

Mimetic isomorphism as a type of institutional isomorphism is a process of imitating other institutions, which comply with the systems in the long term by the new institutions in the same system (DiMaggio and Powell, 1983: 151). By imitating, these institutions, which takes part in the same system afterwards, it can reduce their research costs and risks in order to gain on existing institutional types and operational structures and to endure the difficult situation of uncertain conditions at the first stage of new institutions (DiMaggio and Powell, 1983: 151). Therefore, it is important to state that institutions imitate the existing ones in the knowledge deficit related to the generally accepted systems similar to human behaviour (Ercen, 2010:4)

Institutions, moreover, tend to imitate themselves in their field, as they are in a struggle for being more legitimate or successful, whereby, they attempt to ensure their structure in comparison to the others (DiMaggio and Powell, 1983: 152). Furthermore, institutions have to meet the cultural expectation which has been identified by DiMaggio and Powel (1983: 150) through a ‘coercive’ mechanism of institutional change implying that “coercive isomorphism results from both formal and informal pressures exerted on organizations by other organizations upon which they are dependent and by cultural expectations in the society within which organizations function.”

In addition to meeting the cultural expectations, new institutions have to accept the legitimacy produced by regulatory and normative elements within the cultural and cognitive elements

(Ruef and Scott, 1998: 878) because existing institutions also provide legitimisation to the new institutions even depending on cultural identities as well as political and economic interests (Beckert, 2010: 159). Suchman (1995: 574), therefore, articulates that: "Legitimacy is a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs and definitions". Although these similarities initially appear restrained, institutions start to imitate others, whereby, isomorphism provides ground for legitimacy via creating hybrid institutions.

4.7. FRAMING THE EMERGENCE OF IBFIs: CONSTITUTING A FRAMEWORK THROUGH KNOWLEDGE AUTHENTICATION PROCESS IN ISLAMIC ECONOMICS

The ontology, considering the nature of reality and existence, and epistemology of knowledge, enabling the production of knowledge in a scientific and social paradigm, constitutes the existential part of knowledge (*see*: Dillon and Wals, 2006; Crotty, 1998: 10; Ramey and Grubb, 2009; Blaikie, 2007), which are substantial material for conceptualising, theorising and analysing Islamic economics. Therefore, ontology and its articulation in epistemology constitutes the philosophical part of methodology as sources of knowledge and its application to system or discipline (Haneef and Furqani, 2011: 3), which is depicted in Figure 4.7 in a later section. In line with this, the knowledge base of Islamic economics is constructed through revealed knowledge as the starting point.

Methodology is not only related to creating a theory but is also concerned with reliability and applicability of theory in everyday practice. Supporting this definition, Islamic economic methodology also concerns authentic theories that are feasible in reality for a practising Muslim society that institutes *Qur'anic* injunctions. The methodology is also important for ontological articulations in Islamic economics in constituting its authentic principles within the axiological aspects as a practical applicability of Islamic economics (Haneef and Furqani, 2011: 4). However, it is important to state that "the source of authenticity comes not only from the ontology of Islamic knowledge and its epistemological articulation, but also through the historical practice of economy and finance amidst the periphery as part of everyday life" (Asutay, 2016: 105).

As a foundation of Islamic economic methodology, the principle of *tawhid* (God's unity and sovereignty) as a complementarity and unitarity axiom constitute the core of Islamic ontology

and its epistemological articulation. The *Qur'an* and *Sunnah* are accepted as the primary sources of knowledge in Islam (Haneef and Furqani, 2011: 9). Here, it isunderstood that the first revealed word '*iqra*' (read) of *Qur'anic* revelation emphasised the need to obtain knowledge. Although Kahf (2003) stresses deduction as a methodology of Islamic economics in the sense of discovering theories and general rules of *fiqh*, essential principles and theories have been, directly, derived from the foundational text of the *Qur'an* and *Sunnah*, such as the prohibition on *riba* (interest) and zakah implementation (Haneef and Furqani, 2011: 12) along with the nature of economic and financial activities. Therefore, the substantivist school suggests that Islamic economics related knowledge is constituted through direct deduction from revealed knowledge or an Islamic ontological base.

Tawhidi methodology or the unitarity and complementarity axiom, hence, defines the nature of Islamic knowledge, which together with the Islamic epistemology aims at constituting and giving meaning to Islamic order and its constituents of systems including Islamic economics (Choudhury, 2011: 4). Therefore, within the *Qur'an* and *Sunnah* as normative guidance, *tawhid*[2] determines the worldview of Islam suggesting that everyone and everything is created by God and, therefore, creation leads to unitarity as a form, and complementarity as a function. Centring *tawhidi* ontology as the source of individual Muslim's behaviours and acts requires developing an axiomatic framework of Islam as a philosophical foundation (Malik, 2018) to articulate such an ontology and epistemology in everydayness. Choudhoury, (2011: 15), therefore, states that "conscious oneness [tawhid] means that the ultimate and indivisible absoluteness and completeness of creatorship, knowledge, will and power over all things, rest with God alone", which is derived from *Qur'an* (2:255).[3]

The progressive organic unity in the framework of *tawhid* is obtained by learning interaction, integration, and creative evolution of the systemic entities (Choudhury, 2011:5), which

[2] *Tawhidi* ontology, traditionally, has been explained by three aspects by *Taqi-ud-Din Al Hilali* and Muhsin Khan: First, *Tawhid al-Rububiyyah* (Allah alone is the absolute Lord of creation); Second, *Tawhid al-Uluhiyyah* (none else in mind can be worshiped except Allah as the one absolute in His purity having no form); Thirdly, *Asma al-Husna* (the attributes of Allah are complete in meaning and cannot be extended by the rationalists and human whims) (Choudhury, 2011: 20).

[3] "Allah, none has the right to be worshipped but He, the Ever Living, the One Who sustains and protects all that exists. Neither slumber nor sleep overtakes Him. To Him belongs whatever is in the heavens and whatever is on the earth. Who is he that can intercede with Him except with His Permission? He knows what happens to them in this world, and what will happen to them in the Hereafter. And they will never compass anything of His Knowledge except that which He wills. His Kingdom extends over the heavens and the earth, and He feels no fatigue in guarding and preserving them. And He is the Highest, the Greatest" (Qur'an, 2:255).

indicates interrelationships between systems under the Islamic order with the hereafter as an additional dimension. Adding the hereafter is considered within the *tawhidi* positioning of complementarity and unitarity implying that this world and hereafter is part of the same existence (Choudhury, 2011: 6). In other words, according to Choudhury, *tawhid* and the hereafter are unbounded because of fundamental nature of the knowledge stock obtained by Islamic epistemology (Choudhury, 2011: 5) facilitated by the essential epistemological foundation of the Islamic worldview that is the *Qur'an* and the *Sunnah*. Therefore, *tawhidi* ontology is conveyed to the multiverses through *Sunnah* referring to the *Qur'an* and interpretation of Islamic scholars in the light of *Qur'an* and *Sunnah* as a secondary epistemic context (Choudhury, 2011: 17). This is considered through *ilm al-yaqin* (the knowledge of certainty), *ayn al-yaqin* (vision of certainty), and *haqq al-yaqin* (truth of certainty) classification of knowledge (Al-Ghazali, 2004; Al-Ghazali, 2016). Thus, *tawhidi* ontology accomplishes the "interconnection among *haqq ul-yaqin* (knowledge of Allah), *ilm al-yaqin* (worldy knowledge from the divine episteme), and *ayn al-yaqin* (functional ontology for normative and positive actions in the unifying world system of everything)" (Choudhury, 2011: 66), which has implications for Islamic economics and finance constructs.

With the development of a diverse phenomenological methodology in the form of *tawhidi* ontology (Choudhury, 2011: 19), economics and finance have been embedded in the diverse subsystems of the global system like the other systems formed by conscious *tawhid*. Therefore, this unifying relationship within the framework of *tawhid* is Islamic ethics resulting in Islamic morality in producing a good society (Choudhury, 2011: 7) or the *ihsani* society. Because of this unifying relationship, the emergence of political economy as a discipline needs Islamic values and ethical norms to constitute a base to develop a new epistemology of political economy embedded in Islamic economics (Choudhury, 2011:9). From this aspect, Islamic moral economy is related to becoming a process in human development as a result of "the knowledge construction process of knowing (Islamic ontology), doing (Islamic faith)" (Asutay, 2016: 106), as can be seen in Figure 4.7 in a later section.

Within the same way in universal epistemological methodology in this world system, Islamic economics and finance has been studied at the intellectual level (Choudhury, 2011: 11) by bringing out the nature of the new scientific method and its reflection on Islamic economics and finance in terms of the precept of *tawhidi* ontology of Islam as the moral epistemological foundation (Choudhury, 2011: 20). However, along with the emergence of science, system or

discipline from an Islamic perspective, it has failed in practice by adhering to existing examples from different aspects. Choudhury (2011: 23) explains this failure as:

> The essential body of *Qur'anic* science has failed to emerge, leaving the Muslims for a long time now in imitative copying of received body of thought done elsewhere, and then attempting in fiasco to explain the *Qur'anic* verses in reference to such extraneous thought. The futility of such exercise can be seen by assigning primacy of episteme to extraneous fields and secondarily copying *Qur'an* into them.

4.7.1. Islamisation of Contemporary Knowledge

Islamic economics seems to be constructed 'dichotomously' between the conceptual and the empirical dimensions. In the conceptual dimension, Islamic economists aimed at exploring the Islamic normative base derived from the *Qur'an* and related knowledge, which as mentioned earlier, can be traced back to the revelation of '*iqra*' (read!) as the very first verse. However, IBFIs have *muamalat* or a transactions nature, which requires a *fiqhi* approach developed by *mufti*s and scholars in examining the Islamic justification or *Shari'ah* compliancy of a particular transaction, action and *muamalat*. Thus, the Islamic system of economics requires ontological foundations and also an operational (*fiqhi*) nature in developing a system.

Despite the ontological differences, in the making of Islamic economics, Islamic economists as well as the financiers did not see any harm in borrowing from mainstream economics. It should be noted that the idiosyncrasy of Islamic economics relates to being grounded on *wahy* (divine revelation) that is a particular ontological characteristic of Islamic economics diverging from the mainstream economics. However, while Islamic economics is seen as a scientific discipline requiring scientific methodology, it is, totally, based on Islamic ontology in its construct, which is based on a certain type of knowledge, namely, revealed knowledge, derived from the *Qur'an* and *Sunnah* (Choundhury, 1999; Haneef and Furqani, 2011: 2).

As explained by Anwar (1990), the methodology of Islamic economics aims at encouraging improved economic knowledge within an Islamic framework, which can be achieved in two ways: Islamisation of modern economic theories through Islamic axiological values and Islamic epistemology; and secondly developing economic theories through Islamic norms independent of mainstream economics (Haneef and Furqani, 2011: 8). The main contenders of Islamic economics during the 1970s and 1980s drew attention to the need of Islamic economic methodology in terms of the Islamisation of knowledge that Islamic economics needs to

integrate Islamic knowledge with modern economics in order to build an Islamic vision of a good life (Haneef and Furqani, 2011: 11).

The matter of Islamisation of contemporary knowledge in every discipline has become one of the main topics of discussion among Muslim scholars since the 1970s led by Al-Faruqi (1982); while the main contenders include Alatas (2006), Al-Attas (2005), Zarqa (2003), Chapra (1992; 2000), Choudhury (1986: 1999), Naqvi (1981; 1994), Sardar (1988), Nasr (1987), Ashraf (1985) and Haneef (2009). Although, Islamic traditional knowledge is based completely on the *Qur'an* and *Sunnah*, the Islamisation of knowledge refers to the Islamisation of contemporary knowledge, dominated by Western thought, in the light of *Qur'an* and *Sunnah*, whereby, Islamic metaphors are used to construct the same theories and practices. In the face of increased Islamisation in every sphere of modern times, Al-Attas (2005) prefers to use the phrase of 'Islamisation of contemporary knowledge', while Al-Faruqi (1982) initially used the notion of 'Islamisation of modern knowledge' instead of simple phrase: 'Islamisation of knowledge,' which is used as a generic term to delineate the meaning of this process (Hashim and Rossidy, 2000: 22).

As mentioned above, Islamic knowledge is a product of its own ontology and epistemology implying that the formation of knowledge is based on *Qur'an* and *Sunnah* as primary source. However, with the emergence of the Islamisation of knowledge, the discussion on a starting point of knowledge has centred on whether, firstly, the production of knowledge and establishment of concepts has to be based on the *Qur'an* and *Sunnah* directly, or if they should be derived from Western concepts and then Islamised to use in Muslim societies. In this regard, six discourses of the knowledge production in Islam have come into prominence, as explored by Haneef (2005). The first two discourses are about 'articulating the Islamic paradigm of knowledge and developing a *Qur'anic* methodology' based on *tawhidi* episteme and historical Islam. The third discourse is 'a methodology of dealing with the *Qur'an*' to relativise the *Qur'an* with social and natural sciences. Another discourse relates to developing 'a methodology for dealing with the *Sunnah'* in order to understand whether the *Sunnah* can be applied to a current context, or not. A fifth discourse relates to the 're-examining of the Islamic intellectual heritage' that helps to interpret the historical context and contemporary reality by evaluating Islamic heritage through the human mind with the help of Islamic scholarship, regarding whether it is different for today, or not. Lastly, the sixth discourse deals 'with the Western intellectual heritage' resigned to the fact that Western thoughts and concepts are

universal, and, therefore, Islamising them in the light of Islamic ontology should suffice (Haneef, 2005: 31-33).

The last discourse namely the Islamisation of knowledge, particularly, for contemporary Islamic finance is the most critical one, as it has shaped the nature of Islamic banking and finance practice. However, the critics in the form of essentialists and substantivists have argued that along with the development of Western knowledge being Eurocentric, and the search for authenticity through Islamic sources, modern knowledge cannot be applied to the Muslim world in its original form because of its aspects of Eurocentric production (Hashim and Rossidy, 2000: 23). This identifies the major distinctions between the Islamic and Enlightenment spheres of knowledge, as each ontology gives meaning to reality in a different manner, including the answers to the questions as to what a human is, and what is the role of a human in the universe. For instance, a main criticism raised against an Islamic banking model is that it has been modelled in line with the conventional commercial banking system with its institutional logic, by developing *Shari'ah*-compliant financing instruments in an attempt to develop an Islamic alternative to the modern banking system and its instruments (Haneef, 2009: 56-57). In this regard, the process is constructed through mimicking the institutional and operational nature of conventional practices derived from Western knowledge by Islamising it through "the *fiqh* paradigm [which has been] stripped off from Islamic moral economy [to ensure the hegemony of] neo-classical paradigm and conventional practices" (Asutay, 2016: 106). Therefore, rather than representing Islamic emergence, the Islamisation of knowledge constituted the methodological base in the emerging pattern of IBFIs.

In exploring the ontological distinctions, as Hashim and Rossidy (2000: 23) states, the source of Western knowledge is based on empirical and rational means essentialising the human faculties as sources of knowledge, rather than the revealed knowledge. However, *tawhidi* ontology is the basic and unifying principle of Islam as the core of the Islamic worldview which is in total contrast with Western knowledge in the sense that Islamic ontology locates the source of knowledge in the revealed knowledge. In other words, the emergence of knowledge in Islam is based on the *Qur'an* and *Sunnah*, systemised as *tawhidi* ontology, while the Islamisation of knowledge is a process of rationalising Islam in the light of Islamic ontology and epistemology in order to catch up with the contemporary world system by endogenising modern thought into Islam through the Islamic authentication process. A critical reading suggests that the two main contenders of the Islamisation of knowledge, Al-Attas and Al-Faruqi, as identified by Hashim and Rossidy (2000: 32), believed that knowledge is not value-neutral and Islamic knowledge

has its ontological, epistemological and axiological principles culminated in the *tawhidi* paradigm. However, it seems that Al-Attas and Al-Faruqi found the process of Islamisation of knowledge as an answer to the short-term intellectual short-comings in the Muslim world.

In contrast to Al-Attas and Al-Faruqi's initiation of the Islamisation of knowledge, Ashraf (1985) asserting that the agglomeration of knowledge deriving from two distinct worldviews which are antagonistic and completely different from each other claims that the Islamisation of knowledge is an inconsistent and incoherent method. Therefore, he argues that Muslim scholars should begin with the articulation of the concept based on Islamic ontology and epistemology, rather than through Western concepts. According to Ashraf (1985), Muslim scholars should rearticulate Islamic concepts in relation to the present conditions, and then make comparison between Islamic concepts and Western concepts. After such comparisons, Hashim and Rossidy (2000: 34) argue that Islamic disciplines can be produced in all sciences in the light of Islamic ontology and epistemology. This seems to be the middle position between substantivists and the Islamisation of knowledge camps.

4.7.2. The Articulation of Foundational Axioms of Islamic Moral Economy

In modern times, the Islamisation of knowledge has led to the emergence of Islamic banking which has been heavily criticised for its certain shortcomings in particular in relation to *Maqasid al-Shari'ah* in responding to the social and development expectations. The 'social failure' (Asutay, 2007b) observed in Islamic banking experience has raised further concerns regarding the Islamisation of knowledge, namely, that it is not necessarily the best strategy upon which to construct institutions. This further implies that in constructing institutions, authentic Islamic knowledge has to be essentialised beyond *Shari'ah* compliancy, as Islamic banking results from *Shari'ah* compliancy within the institutional logic of conventional banking.

In the essentialisation of Islamic knowledge, one of the methodological ways of contracting knowledge is to go through the axioms. The philosophical and conceptual foundation or the axioms of the Islamic economics' system is best categorised by seven axioms[4] (Naqvi, 1994; Ahmad, 1979, 1994; Chapra, 1992; Nomani and Rahnema, 1994; Asutay, 2007a, 2007b, 2012): *Tawhid* (God's unity and sovereignty implying unitarity and complementarity), *al-'adl wa'l-*

[4] Initially, the axioms were identified by Ahmad (1979) noting only four axioms; Chapra (1992) notes three fundamental axioms, while Naqvi (1981, 1994, 2003) gives four main axioms. However, in this study, seven axioms are noted by agglomerating from these contenders, as also seen in Asutay (2007a).

ihsan (justice and equilibrium), *ikhtiyar* (free-will), *fard* (responsibility), *rububiyyah* (divine arrangements for nourishment, sustenance and directing things towards their perfection), *tazkiyah* (purification, plus growth), *khilafah* (a human's role as vicegerent of Allah on earth).

Firstly, according to the axiom of *Tawhid*, an individual's economic activity needs to be guided by an ethical vision (Naqvi, 1997: 4) that is the absolute belief in the concept of *tawhid* (Naqvi, 1994: 26) which relates only to God (Naqvi, 1981: 48). As the vertical dimension of Islam, this acts as a unifier of all aspects of human life: "linking the imperfect and finite social institutions with a Perfect and Infinite Being" (Naqvi, 1994: 26). This requires that "an unconditional surrender to *Allah* links all individuals to Him on an equal footing and makes them equal to each other" (Naqvi, 2003: 150), which essentialises the vertical dimension ethicality of Islam. Therefore, the "vertical dimension of the Islamic ethical system manifests itself by the inherent equality of each individual as represented by their paralleling proximity to God" (Asutay, 2007a: 7). By integrating the political, economic, social, and religious aspects, individuals find an opportunity to see the integral parts of a homogenous whole (Naqvi, 1994: 26; Asutay, 2007a: 7). This homogenous whole helps individuals to achieve social harmony by encouraging a sense of belonging to a universal brotherhood (Naqvi, 1994: 26), as in this paradigm everything is considered complementing each other. This axiom fertilises the sustained system through *risalah* (God's Prophets as the source of divine guidance); *akhirah* (the hereafter, that is an accountability system founded on divine law in the life beyond this one). These helps to construct a framework for economic activity to take place within Islamic norms as complementarity under unitarity suggests a particular mode of production and results into an extended stake-holding nature for the governance of society, economy and institutions (Asutay, 2007a: 7). *Tawhid* and its articulations thereby identify the nature of institutions and also shapes individual and organisational behaviour towards higher objectives of *Shari'ah*, that is human well-being. Thus, accordingly, due to suggesting a particular mode of production and a particular nature of governance and management, the *tawhidi* system suggests that institutions and organisations have to essentialise such normative principles in their existence, which goes beyond 'maximising individuals and organisations' as essentialised by neo-classical paradigms.

When reflecting on the implications of *tawhid* for Islamic economics and finance theory making and practice development, as Asutay (2018) suggests, one finds that an extended stake-holding governance mechanism ought to shape Islamic organisations including Islamic banks and financial institutions. Similarly, the prohibition of *riba* within the *tawhidi* epistemology suggests the removal of the hegemony of capital and hence establishing equilibrium between

various factors of production (Asutay, 2018). As can be seen from such examples, *tawhid* has direct impact as the ontological source of Islamic knowledge on the theory making in Islamic economics and finance and also on the emergence of Islamic institutions by defining the nature of institutions.

Secondly, the axiom of *al-'adl wa'l-ihsan* connotes a balance of forces of equilibrium that shows the horizontal dimension of Islam (Naqvi, 1981: 49). Therefore, "justice has been held by the jurist to be an absolutely indispensable ingredient of the *Maqasid al-Shari'ah*, so far so that it is impossible to conceive of an ideal Muslim society where justice has not been established" (Chapra, 1992: 209). In addition to *al-'adl*, *ihsan* as a complementary to *adala* indicates "balance and reciprocity in human relation" (Naqvi, 2003: 151) in the sense of expansion of beneficence. Therefore, while the equality requires that the poor and the weak should take equal share with the others in a social environment, *al-'adl* and *al-ihsan* refers that "the poor and the weak should take more than their share in social cooperation in order to achieve an overall social equality of the human condition" (Naqvi, 2003: 151). Therefore, stating a social ideal in *Qur'an*, the axiom of equilibrium provides for an absolute directive of all social instruments and institutions in terms of their legal, economic and political aspects (Naqvi, 1994: 27). The development of *ihsan* in the society at large works through the efforts of individuals who reached *falah* making efforts to help those who have not reached to a similar level. Thus, such efforts aim at establishing equilibrium enabling assistance to those who do not have enough to develop through *tawhid*'s complementarity (Asutay, 2018). This helps to actualise the *maqasid al-Shari'ah* by developing policies to "fulfil the need of individuals, enable them to earn a respectable source of living, develop policies for an equitable distribution of wealth, and provide for growth and stability-oriented policies" (Asutay, 2007a: 7). Therefore, it is important to state that: "Islam not only emphasises the fact of Equilibrium but also insist on the quality of Equilibrium" (Naqvi, 1981: 51).

As regards to the third axiom, *ikhtiyar*, according to Islam, individuals are born with free-will that provide an environment for evaluating choices and making decisions (Naqvi, 1994: 29). This represents functional norms of economic activity in an Islamic economic system by giving a chance to individuals to interpret that freedom within a social context, and to keep up with the needs of changing times within the framework of Commandments (Asutay, 2007a: 7). Thus, *ikhtiyar* provides maximum opportunity space for economic and social activity to take place under the condition of justice within the definition of *tawhid* (Naqvi, 1997: 4).

Fourthly, the axiom of *fard*, logically, corresponds to *ikhtiyar* as it relates to *"*what mankind is free to do by making him responsible for all that he does" (Naqvi, 1981: 54). As an axiom, it essentialises that individuals and society must become conscious of their mutual obligations for public good by virtue of the principle of *tawhid* and mankind's viceregency on earth (Asutay, 2007a: 8). While *ikhtiyar* suggests freedom, *fard* ensures the fulfilment of the minimum in society, by Islam making certain obligations mandatory, such as, the payment of the *zakat*. The axiom therefore suggests that a human has responsibilities towards *Allah*, to his/her own self, and to others in society in terms of an ethical framework, by possessing free-will in all choices. In addition to these three dimensions of responsibility, individuals are also responsible towards non-humans, the environment, nature, and all objects on the earth due to be created, along with all things on the earth, provided by Allah as a consequence of the *tawhid* axiom (Asutay, 2007a: 8). However, it is important to state that the principle of *fard* or responsibility suggests a dynamic system. For instance, "if for any reason whatsoever an unjust social state comes to prevail, then it is man's responsibility to change it to the extent that it is feasible for him to do so" (Naqvi, 1994: 33). Lastly, the responsibility principle can be related to economy, for instance, every asset owner, both of private and public entities, has to reckon with the social aspect and responsibilities of their investments (Asutay, 2007a: 8). In addition, *zakat* being *fard* to be given from wealth generated is considered through this axiom as the right of the society to be returned to the society, which aims to ensure at the least the minimum social responsibility is achieved in society (Asutay, 2018).

Fifthly, the axiom of *rububiyyah* has an important role in an Islamic economic system referred to as "divine arrangements for nourishment, sustenance and directing things towards their perfection" (Ahmad, 1994: 12). Whereby, Allah creates, sustains nourishes and owns everything within a development path towards perfection[5]. Although Naqvi (2003: 182) states that *rububiyyah* gives the same information with *al-ihsan*, *rububiyyah* implies the necessity of sustainable economic growth and development from the perspective of harmonisation of

[5] "Is not He (Allah), Who has created the heavens and the earth, sends down rain from the sky and with it brings forth the beautiful gardens not better than the false gods that they worship? It is not in your ability to cause the growth of trees for those gardens. Is there another god besides Allah who could do that? No doubt they are a people who have swerved from justice in ascribing equals to Him" Qur'an (27:60).
"And Allah has made for you, from that which He has created, shadows and has made for you from the mountains, shelters and has made for you garments which protect you from the heat and garments which protect you from your [enemy in] battle. Thus, does He complete His favour upon you that you might submit [to Him]" (Qur'an, 16:81).
"Do you not see that Allah sends down rain from the sky, and We produce thereby fruits of varying colours? And in the mountains, are tracts, white and red of varying shades and [some] extremely black" (Qur'an, 35:27).

economic and social life in the world created within the balance by Allah. Therefore, humans must show a maximum effort to preserve and sustain this immaculate universe created by Allah as balanced and sustainable in the concept of *rububiyyah* and also opportunity spaces must be provided for all to develop in the path for perfection in the sustainability sense (Asutay, 2007a: 8).

Sixth axiom of the Islamic economic system within the identified philosophical and conceptual foundations is *tazkiyah* that refers to 'growth with purification'. Being the underlying operational nature of individuals and organisations within the Islamic economic development model, it includes the problem of human development and all its dimensions related to growth, through purification of human behaviours and relationships with the others and the societies (Ahmad, 1979: 13). The performing of *tazkiyah* is expected of individuals in all their relationships towards *Allah*, to human, to non-humans, to nature, and to society (Ahmad, 1979: 12). Therefore, it is possible to state that the result of *tazkiyah* is *falah* in both this world and the hereafter (Asutay, 2007a: 8) as indicated in the Qur'an[6]. Thus, *tazkiyah* as the articulation of *tawhid* suggests that while each stakeholder aims at fulfilling their *rububiyah*, an action of a stakeholder should not transgress the development objective of other stakeholders and, hence, *ihsan* or equilibrium should be maintained by providing equal opportunity spaces for development (Asutay, 2018). This, thus, identifies an institutional quality for the emergence of institutions.

A seventh axiom is *khalifah*, which refers to "man's status and role, specifying the responsibilities of man as such, of a Muslim, and of the Muslim *ummah* as the repository of this *khalifah*" (Ahmad, 1979: 12). Human beings are endowed with all the spiritual and mental features besides material sources by Allah in order to, effectively, fulfil the reasons for existence on earth, and to prepare to enter the hereafter (Chapra, 1992: 202). Although, all resources endowed by Allah to His *khalifah* are sufficient for living up to their mission, these sources are not unlimited and so need to be used efficiently and equitability to sustain them, that is also one pillar to reach *falah* (Chapra, 1992: 203). Therefore, being a *khalifah* on earth delineates roles, and responsibilities that all require defining "the Islamic concept of man's trusteeship, moral, political and economic, and the principle of social organisation" (Ahmad, 1979: 12). Thus, the implications of the principle of *khilafah* requires taking into consideration

[6] "Indeed, He succeeds who purifies his own self, and indeed he fails who corrupts his own self" (Qur'an, 91:9).

the notion of universal solidarity, sustainable consumption of resources, pursuing a humble life-style and having human freedoms to conduct daily life (Asutay, 2007a: 8). In addition, the *khalifah* individual is expected to embody the qualities required to fulfil the duty of essentialising the above-mentioned axioms in life in general, through being a *falah* individual and aiming to expand *ihsan* in society.

Consequently, the axioms of an Islamic system of economics, as mentioned above, are, constituting a different economic system when compared to the other economic systems through being responsive to economic and social issues, such as, sustainability of humans and the environment, human rights, social welfare, productivity, transparency in government, seeking the right knowledge, promoting work and produce via sustainability. As stated by Asutay (2018), the distinction observed is in generating a particular mode of production, as *tawhid* suggests, by rescuing 'human, land, labour and capital' in a Polanyian sense (1944). Therefore, a system established through these axioms provides the rationale for the Islamic economic system. Accordingly, institutions, prioritised these axioms in their structure and system, and, thereby, find opportunities to take place in a moral system of Islam by definition. If the emergent institutions formulated on such a normative foundation of Islam do not fulfil the expected economic and social responsibilities, the divergence is considered to be the outcome indicating certain failures, which should be responded to through the dynamic process identified by the *islah* axiom (*see*: Malik, 2018).

Thus far, philosophical and methodological discussion has been conducted through Portes' model, emergency and the concept of institutional innovation in addition to theory of emergent pattern, isomorphism, mimicking, mirroring and hybridity in order to formulate a basis for examining and exploring the emergence of Islamic financial institutions (Asutay, 2016b). Furthermore, the aspect of the ontology and epistemology of Islamic economics has been embraced to reveal the unique methodology of divine knowledge in Islamic economics as an organic knowledge rather than Islamisation of knowledge. Henceforth, the emergence of Islamic financial institutions is discussed by arguing that these institutions do not represent organic institutions due to failing to fulfil the conditions of emergence, but they represent an emergent pattern and, hence, institutional innovation.

4.8. EMERGENCE OF ISLAMIC BANKS AND FINANCIAL INSTITUTIONS WITHIN INSTITUTIONAL EMERGENCE AND INSTITUTIONAL INNOVATION

4.8.1. The Ontological and Epistemological Foundations of Islamic Finance as an Institutional Emergence through Divine Knowledge of Islam

Establishing a new model of institutional emergence from Islamic-based ontology and epistemology may be considered by some as an impossible mission in modern times. However, in developing the theoretical and intellectual foundations, this model has been developed through the axioms of Islamic economics by borrowing from Portes' emergence of institutions' model in order to explain how the institutions emerge in an embedded manner through the value system, norms, roles, cognitive repertories, and roles of a particular society. As mentioned above, Portes (2010) approaches the emergence by taking centre the cultural and historical aspects of the society. However, authenticity of institutional emergence in Islam is achieved through Islamic values, norms, and roles sustained historically, which distinguishes the nature of institutions being Islamically emerged or being part of institutional innovation.

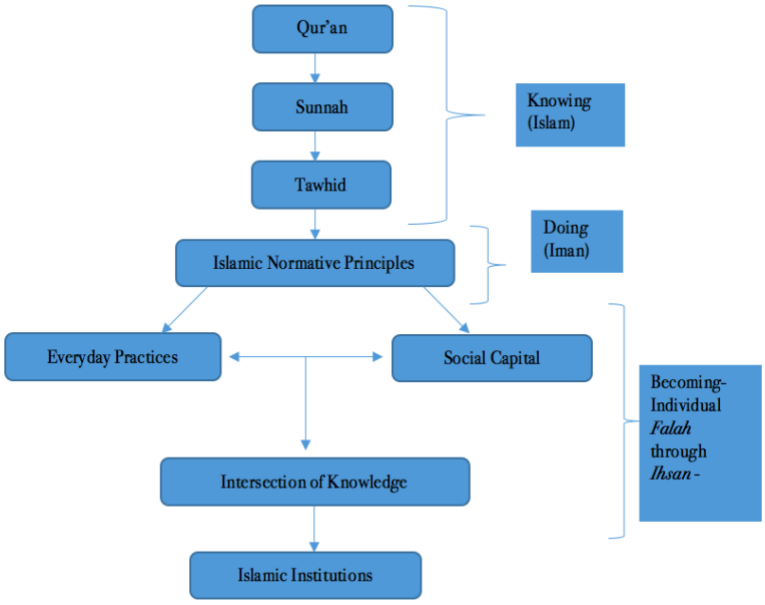
As can be seen in Figure 4.7, Islamic economics has its own ontological reasoning that is the *Qur'an* and *Sunnah* that determines the base, which corresponds to 'culture' in Portes' model. The most important distinction is that the Islamic emergence base is determined through the knowledge derived from *Qur'an* and *Sunnah* related to *tawhidi* ontology. In Portes' case, however, as can be seen in Figure 4.1, culture is a historically developed reality. It should be noted that in the Islamic economics case, it is acknowledged that Islamic ontology is articulated in different ways[7].

Although culture is an ontological source as identified by Portes, the expansion and the construction of the culture should be benchmarked against an ontological reasoning. If culture is made a reference point in Islamic economics, the nature and the operation of culture must be tested against the ontological benchmark that is the *Qur'an* and *Sunnah*. Therefore, the concept of culture in Portes' model is articulated as Islam leading to culture in terms of the everydayness of Islam. Therefore, the emergence of institutions that is based on culture in Figure 4.1 can

[7] While culture and practices can be expressed in different ways such as Hanafi, Shafi, Hanbali, Maliki, and Sufism etc., they are still derived from *Qur'an* and *Sunnah*.

follow the same structure with a base identified as the *Qur'an* and *Sunnah,* as demonstrated in Figure 4.7.

Figure 4.7: Authentic Process of Institutional Emergence in Islam



As the Figure 4.7 indicates, Islamic ontology and epistemology constitutes a value system in Portes' exposure in Figure 4.1. As for the norms in Portes' model, they refer to everyday practices in Islam in the sense of articulation of values in practical terms, which determines the institutions at the end, as depicted in Figure 4.7. For instance, Islamic norms determines a particular way of conducting financing, business, and commerce that all shape the nature of a particular institution. For example, the concept of *waqf* is a product of such a process. This is a natural consequence of the fact that Islamic normative principles, norms, and values have to fulfil the axioms of the Islamic moral economy on every aspect of everydayness through a particular ethical system (Asutay, 2018).

The cognitive repertories as depicted in Figure 4.1 corresponds to historically generated social capital in Figure 4.7. Social capital is identified as moral and civic norms through focussing on trust as an instrument facilitating the link between different stakeholders in the society. In addition, there is also relationship between social capital and Islamic finance, as Islamic finance is based on principles and values, trust-reinforcing regulation, investment opportunities and infrastructure and reputational intermediaries (Ng *et al.*, 2015: 2). Furthermore, cognitive repertories have been generated through practices such as charismatic prophecies in the case of Islamic finance. For instance, the 1940s and 1950s witness the emergence of charismatic

leadership in the social formation, who used their position to develop a particular understanding and how to develop strategies to diffuse Islamic finance through development over the years. However, Islamic finance needs, institutionally, a social capital rising from the society rather than relying on charismatic structure and needs to be shaped by Islamic ontology rather than by the regimes of governance, such as, having the liberal or conservative understanding of the governments determining the shape of Islamic financial institutions.

When it comes to the roles depicted in Figure 4.1, which is explained through the 'intersection of knowledge' in Figure 4.7 that redefines the existing knowledge and practices. For instance, when the *Qur'an* revealed to the society in Makkah, the roles were defined but new roles emerged while old roles did not disappear, they were redefined. For instance, in society, new roles may emerge and if this new role fits into the social formation prevailing in that society, it can contribute to change the accustomed daily life practices, such as *'adhan'* or 'the call to prayer' in the era of Prophet Muhammed. By calling the *adhan*, everyday practices did not disappear but revised to form a new role. However, at the same time, the roles that have existed in the society went through the Islamic moral and legal filter mechanism to be deemed acceptable. For example, the Islamic business models used today prevailed in the pre-Islamic era in Arab society, which were re-defined within Islamic norms to fit into Islamic social formations and modes of production. This implies that although certain roles are ontologically defined, they can be reconstructed to fit into Islamic expectations in changing times, such as, market understanding. However, the nuance is that the ontological base of the institution should remain as Islamic through which the cultural repertoire should be subjected to a filtering mechanism, which implies that Islamic ontology will determine the institutional logic in re-considering the cultural repertoire.

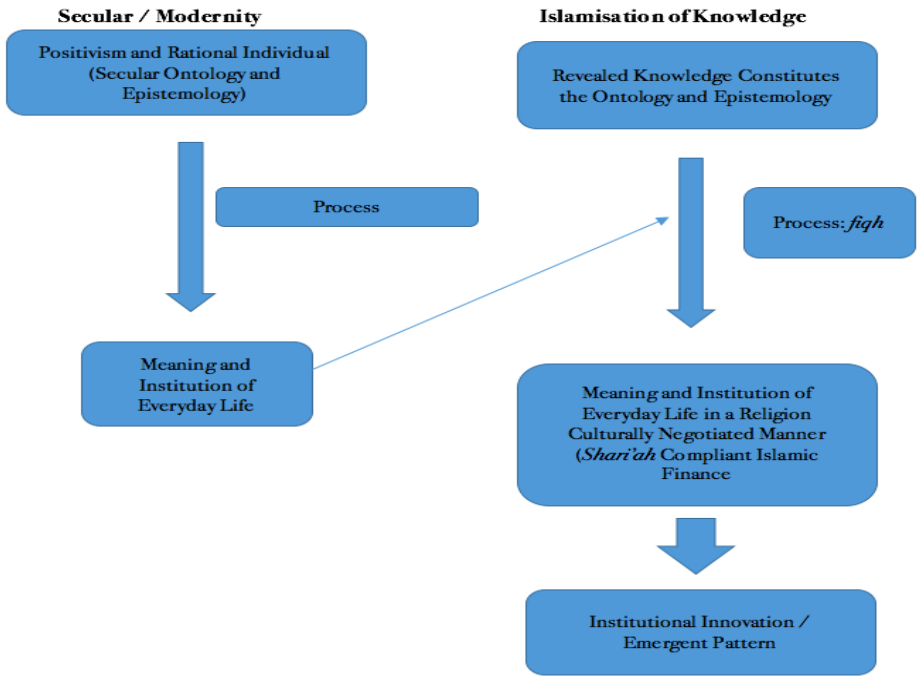
As can be seen in Figure 4.7, the consequence of this process is the emergence of institutions. In other words, authentic and authenticated institutions are expected to follow the structure and process identified in Figure 4.7. The product of such a process is the emergent institution that could be identified as a novelty. Thus, such an organic institution will make things by applying different ways, methods and practices under different institutional forms. In other words, as historical progress in Muslim society indicates, banks as an institution were not generated in Muslim societies; as due to the articulation of their religious system, they are not accumulationist societies (Asutay, 2018). However, they are always involved in business and run successful societies through their own business models and financial arrangements without

banking (for such examples, *see*: Alsabagh, 2018; Hanna, 2002), as part of organic emergence through embeddedness within the social formation of Islam.

4.8.2. Critical Reflections on the Emergence of Islamic Finance: The Failure in Path Dependence

The Islamic normative principles, historical experiment and experience in financing as a cognitive repertory, as modern attempts, have emerged since the 1940s. However, due to the global political economy, Islamic finance could not experience emergence with the description identified in Figure 4.7. In other words, Islamic ontology has not been able to generate an institution called a bank with a particularly Islamic institutional logic. Instead, Islam is instrumentalised to accept the institutional form and logic of another ontology, namely Enlightenment, and is forced to fit into such an institutional form and institutional logic with an emergence of a new role, that is the *Shari'ah* Boards in Islamic banks. Through an Islamisation process, Islam is interpreted in a rational manner by adopting the norms and institutions of modern reality to ensure the working of Islamic banks. As can be seen in Figure 4.8, *fiqh* has been the instrument of this process. As discussed, the process has worked through mimicry to produce hybrid identity that is Islamic banking, which locates its emergence as a product of multiple modernities, as depicted in Figure 4.8 (Asutay, 2016b). Therefore, in such a pragmatist process, Islamised knowledge and practice no longer represents the emergence of Islamic economics, as it does not share the ontology, value system and norms not the roles and the cultural repertories. Thus, the emergence is identified as an emergent pattern and institutional innovation, rather than being organic emergence; as Islamic banks do the same functions within the banking institutional logic but appliesa set of Islamic metaphors resulting in hybridity.

Figure 4.8: Contextualising: Hybridity, Mimicking, and Mirroring in Process in the Making of Islamic Banking and Finance



Source: Asutay (2016b; 2018)

One of the most important issues in the emergence of hybrid institutional forms of an Islamic finance process relates to the definition of stakeholders; as *tawhid* suggests a stake-holding governance mechanism and requires equal treatment of each of the stakeholders as explained through the axiomatic world. This, as stated above, indicates that none of the stakeholders should have hegemony over the others, which should be the case for capital. The prohibition of *riba* aims at ensuring such an objective by questioning the role of capital (Asutay, 2018). However, Islamic banks emerged by not questioning the hegemony of capital as part of the conventional institutional logic and constituted their operation under the hegemony of capital in the same manner. Hence, the ontological base of Islam and the axiomatic value system has not been allowed to play a role in determining the emergent nature of the institution of Islamic banking leading to a hybridised emergence.

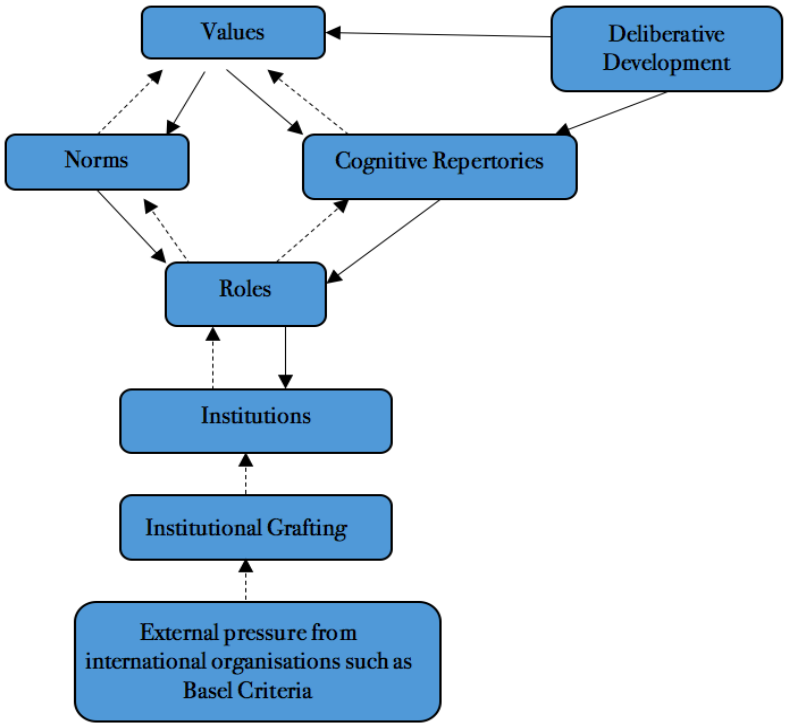
As regards to the definition of roles in modern times, in order to ensure Islamic banks are operating according to *Shari'ah* principles only, rather than Islamic ontology, in the form of *Shari'ah* compliancy, *Shari'ah* boards emerged as an authority operating in Islamic banks. This is a new institution emerged to respond to the institutional logic of a banking system, as neither, historically, the institution of bank did exist in the Muslim societies, nor was there a need for a

Shari'ah board. In other words, financing practices were historically an everyday practice which was shaped by Islamic repertories developed over the centuries. However, modern times requires the removal of Islamic excesses (Asutay, 2018) and operations, as well as products, to be made *Shari'ah* compliant through an adjustment process – a role that is constituted under the institution of *Shari'ah* boards, *Shari'ah* audit, and *Shari'ah* committees *etc*. These roles are important in bringing hybridised Islam to the institutional articulation in the form of Islamic banks and also for taming the emergence of counter-hegemonies against the market system.

As discussed, in the short-cut through *fiqh*, as depicted in Figure 4.8, in the emergence of Islamic banks, the Islamisation of knowledge process and realism as a methodology has been influential, which has negated the axioms of Islamic economics in forming substance by essentialising the compliancy or 'form' process through *fiqh* tools to justify their 'contemporary' practices as an emergent pattern.

By following this process, Islamic banks prefer to justify the infusion of existing institutions into an Islamic system for usefulness and legitimisation by ignoring novelty, because of its grafting structure by external pressure from international organisations, as seen in figure 4.9 (Pitluck, 2012; Rudnyckyj, 2014). For instance, an Islamic investment certificate, such as, *sukuk* can be considered as usefulness and legitimated to fit into an Islamic system, but when compared to a conventional system, it is a new version of a bond (Iqbal and Mirakhor, 2011; Khan, 2003; Bacha and Mirakhor, 2013; El-Gamal, 2006). In addition, the application of Islamic funds is an investment arising from individual and institutional investors in a legitimated system such as *Shari'ah*-compliant stocks. This process refers to a new or Islamic metaphor but based on the conventional certificates, shares, and unit trusts (Usmani, 2002: 140; El-Gamal, 2006). These examples can be expanded through other tools, such as, Islamic private equity funds, *takaful*, Islamic real estate investment trusts, Islamic hedging, and Islamic pension funds generated by a *shari'ah* compliancy process based on conventional private equity funds, conventional insurance, conventional real estate investment trusts, conventional hedging, and conventional pension funds (Bacha and Mirakhor, 2013; Omar *et al*., 2013; Krichene, 2012; Khorshid, 2004; Kettell, 2011; Loundy, 2013; Opar, 2013; Iqbal and Mirakhor, 2011; El-Gamal, 2006; Ahmed, 2001), respectively by following the Islamised process as depicted in Figure 4.8.

Figure 4.9: Structuring Institutional Grafting of Islamic Banks



Source: Modified version of Portes (2010)

According to figure 4.9, in the case of Islamic banks, as explained it emerged within the institutional logic of conventional banks, despite not sharing a common value system (Asutay, 2015); therefore, institutional grafting has taken place in shaping Islamic banks and financial institutions. For example, the Basel Committee on Banking Supervision, which develops banking laws and regulations, has requirements from all the banks in the world to follow certain criteria in their operations, from risk management to capital quality. Since Islamic banks define themselves as banks, they are expected to follow these rules as the national regulative authorities have endogenised the Basel rules in their regulative mechanism. Thus, banks, whether they are Islamic or conventional, have to meet Basel criteria, such as, capital adequacy. For Islamic banks, this leads to the emergence of institutional grafting through external pressure as the hegemony of international organisations forces alternative institutions, namely, Islamic banks, to convergence by imposing international rules (Asutay, 2015). Therefore, alternative practices, such as, Islamic banks are structured by international organisations to follow mainstream practices and structure. As discussed by Asutay (2015), the features of Islamic moral economy cannot be fulfilled under the imposition of Basel requirements leading to institutional grafting. Therefore, it is not possible to state that Islamic banks are organic institutions but hybrid practices as grafted institutions under the impositions from national and

international regulatory and standard setting bodies which ignores the specific features and requirements of Islamic moral economy. While institutions such as Accounting and Auditing Organisation for Islamic Financial Institutions (AAOIFI) and Islamic Financial Services Board (IFSB) standards emerge as part of the authentication process in IBFIs, they are tasked to ensure the operations designed according to market condition within the grafted structure and global system, rather than developing an authentic organic emergence.

Such a grafting process is also important to understand why participatory and PLS, along with risk sharing instruments have not been preferred by Islamic banks in their operations, despite the fact that they are theoretically essentialised (Asutay, 2015), as indicated by a number of studies (Asutay, 2007b, 2012; Aggraval and Yousef, 2000). Thus, this also evidences why Islamic banks as an institution do not fulfil the condition of emergence, but they only constitute institutional innovation, as discussed below.

Consequently, an emerging process of Islamic banks and financial institutions shows that these institutions represent disembeddedness in relation to the articulation of the value system of an Islamic moral economy, as they are grafted. In other words, as can be seen in Figure 4.9, the emergence process starts from bottom of the figure through national and international external pressure as deliberative development rather than following organic values, norms and roles. Thus, this emerging process presents an institutional innovation, as depicted in Figure 4.6.

Along with institutional innovation imitating towards a conventional system, as depicted in Figure 4.9, in term of products, and as given examples identify, the product innovation in Islamic banking and financial system also imitates and mirrors the conventional system (Rudnyckyj, 2014) by legitimating the process to fit into the Islamic system through the process stated in the Figure 4.8.

4.8.3. Islamic Banks and Financial Institutions as an Emergent Pattern through Mimicking: Institutional Innovation

The discussion so far brings us to define the emergence of Islamic banks as ‘institutional innovation’, which, as discussed above, specifies that institutions are innovated with certain distinctions preventing their consideration as organic institutions. The distinction between organic institutions and institutional innovation can be revealed through emergence theory in order to pinpoint whether an institution represents an emergence. This debate is depicted in Figure 4.1 as an articulation of Portes’ model and in Figure 4.6, the formation of institutional

innovation. This distinction can be related to the nature of organisations in terms of whether they are organic institutions or institutional innovation and whether they represent organic and something new.

As the ontological and axiomatic base articulates, Islam suggests a particular normative world of providing financing, not necessarily banking. Furthermore, these institutions are innovated by instrumentalising Islamic principles to fit into the institutional logic of banking rather than directly in Islam (Asutay, 2018). Therefore, it is important to test the emergence process of Islamic banks through the emergence theory and institutional innovation with particular concepts such as mimicking, mirroring and hybridity, as discussed above.

Innovated institutions can be organic institutions, but they have to fulfil the path of emergence rather than an emergent pattern, because there is a distinction between emergence and the emergent pattern. While emergence has an organic nature, emergent patterns use different metaphors by doing same things in revised form. One argument is that Islamic banking institutions can be explained through the historical path of emergence benefited from revealed knowledge and Islamic ontology, norms, roles, and values that all is reflected into the institutions. However, one of the most important distinctions here is that banking system has been pulled out from the historical path of another ontology by using a *fiqh* process through the Islamisation of knowledge methods and *Shari'ah*-compliance based operational form. Therefore, "Islamic banks and financial institutions and their products have become hybrid products of the current market rather than creating its own opportunity space to develop an alternative paradigm beyond alternative products" (Asutay, 2016: 106-107). In this process, it is possible to see the effect of Islamic norms, but these norms have not generated the banking institution, because, as discussed above, banking institution has not, historically, been part of Muslim world. For example, Islamic banks also move capital and transfer money like conventional banks but by using different ways and different metaphors such *halal, haram etc*. rather than by organically and authentically embedding within the normativeness of Islam.

In the literature, in addition to emergence theory, there is an emergent pattern categorised in seven criteria as can be seen in Table 4.1 and Figure 4.4. The model in this study argues that organic institutions has to follow their path dependence in term of emerging from a particular ontology and its articulations in the way of emergence. The emerged institution (to be considered emergence) has to fulfil seven criteria to be considered as an emergence and to be authentic otherwise it cannot go beyond being considered only as an emergent pattern. Thus,

Table 4.1 presents the conclusion of this discussion through evaluating the nature of emergence in Islamic banks.

Table 4.1: Evaluation of Islamic Banks and Financial Institutions as Emergent Patterns

Emergent Patterns	**Islamic Banks and Financial Institutions**	**Conclusion**
Material Realisation	Physical processes and structures	Fulfilled
Coherence	not present Islamic system as whole	Not fulfilled
Non-Distributivity	IB shares same system	Not fulfilled
Structure Dependence	Systemic properties depend on connective structures, reflect only the *fiqh* part, not the other parts	Not fulfilled
Genuine Novelty	not organic novelty only mirroring the existing system	Not fulfilled
Unpredictability	certain practises exist in IB and you can guess the return, Libor System, PLS also predictable	Not fulfilled
Irreducibility	Islamic System cannot be reduced to IB.	Not fulfilled

As can be seen in Table 4.1, the material realisation as a feature of an emergent pattern refers to a physical structure and process whether it is or not. This pattern proves the new things from the point of existence. Therefore, emergent institutions can attune to existing institutions through their own structure and process. Islamic banks provide the material realisation by doing the similar operations with the existing institutions.

Secondly, coherence, as a feature of emergence, plays a crucial importance in explaining the consistency of the whole system. Although Islamic banks work within the existing system applying different metaphors with coherence, these institutions are not part of the Islamic economic system, by not corresponding all axioms of Islamic economics as a whole.

Thirdly, the pattern of non-distributivity, as the third feature, refers to the state in which possessing global properties should be absent from the process. In the case of Islamic banks, they share the same global properties which deem them as inauthentic and distributive organisations.

Fourthly, structure dependence implies that systemic properties depend on connective structure but in the case of Islamic banks and financial institutions, the systemic properties are only reflected in the *fiqh* part rather than reflecting on the political economy of the institutional formation. Therefore, *fiqh* does not reflect the consequences of the entire axioms such as *tazkiyah*, *ikhtiyar*, *rububiyyah*, *al-adl*, and *al-ihsan* in the constitution of Islamic banks. As a

result of this formation, Islamic banks do not provide the connective structure of the Islamic properties by not adhering to the structure dependence.

The fifth feature is genuine novelty that essentialises the new contribution to the system through new ways and metaphors. In the case of Islamic banks and financial institutions, the system is driven by the *fiqh* process, which does not present a novelty, as it represents a mimicking and mirroring process to the existing banking and financial system (Rudnyckyj, 2014; Asutay, 2016b). Therefore, Islamic banks are the product of a hybrid system within the form of the institutional isomorphism (Pitluck, 2012). From this perspective, also Islamic banks cannot go beyond being an institutional innovation.

Unpredictability as another feature of emergence refers to the fact that there should not be pattern that should be unpredictable within institutions. However, Islamic banks offer certain and fixed return modes, so the pattern of unpredictability also is not taking place in these institutions by, for example, specifying the return for the deposits. Thus, since LIBOR constitutes to be the main benchmark for Islamic banking financing activities, even the PLS application are predictable, and therefore, Islamic banking activities including risk sharing and the PLS based financing do not provide an unpredictability.

The pattern of irreducibility refers that institutions have to be part of a system. For instance, a bank as a reduced institutional form of social formation of a particular society should reflect the qualities of the system. Since Islamic banks have been constituted within the institutional logic of a conventional bank developed from a particular ontological construct through their own path dependence, they cannot be reduced to an Islamic economic system, as the latter does not exist in practice today. In other words, Islamic political economy cannot be reduced into an Islamic banking system that does not represent the normative worldview of Islamic economics. Thus, since Islamic banks are not the product of an Islamic economics system, the reducibility does not work either.

In concluding, according to the seven features of emergence discussed so far, Islamic banks as institutions fulfils only the first pattern, that is material realisation but fails to fulfil the rest. This implies that the current state of Islamic banking as an institution does not represent an integrated or organic emergence, but rather they are considered as part of an emergent pattern. Furthermore, as the discussion indicates, these institutions are part of institutional innovation rather constituting organic emergence. As, Islamic banks found refuge in the hegemonic nature

of the existing institutions and banking system, while, "Islamic moral economy and political economy implies creating Islamic system of economics in everyday practice beyond relegation of the entire process to the prohibition of interest, excessive *gharar* and excessive speculation" (Asutay, 2016: 107). In other words, Islam suggests a particular knowledge creation within its principles, norms, values, and cognitive repertories to pave the way for the emergence of institutions. For example, the *waqf* system is, totally, different from institutional innovated Islamic banks with their organic emergence through having a path dependence defined by Islamic ontology, which makes them authentic as can been seen in Figure 4.1. In other words, the *waqf* institution fulfils the seven criteria of emergence, while the Islamic banking sector fulfils institutional innovation pillars through facilitating the movement of capital in a different way to enhance *Shari'ah*-compliance, but not the pillar of emergence.

In summary, as discussed, in the origin, institutions have to be knowledge-based structures and sources but in the outcome, as the practice of Islamic banking shows, they are mimicking and even mirroring the existing institutions by creating hybrid institutions in terms of isomorphic structure.

4.9. CONCLUSION

In the face of increasing wealth in the Muslim world and, in particular, in the GCC region, coupled with a search for authentication process within Islamic norms, in terms of developing Islamic identity, Islamic banks have emerged since the 1970s to provide legitimacy through Islamic finance within the existing market conditions. Therefore, the discussion of emergence has become important to identify Islamic banks regarding whether they are derived from Islamic ontology, epistemology and historical experiments or imitating the structure and system of the existing institutions. Such a debate is important as to how much Islamic banks represents the social formation assumed by Islam, and also whether the *fiqh* based approach and form of Islamic finance is sufficient to allow these institutions to be called Islamic institutions, in order to identify Islamic finance as an emergence or emergent pattern.

In exploring the emergence of Islamic banks, certain theoretical underpinnings were consulted such as Portes' emergence of institutions model (2010) and the model of emergent pattern of Harper and Endres (2012) along with benefiting from the concepts of mimicking, mirroring and hybridity.

As the detailed discussion, so far identifies, it is possible to state that although institutions are considered as the power of social interactions until a particular level that helps to change and evolve into alternative ways, Islamic banks do not fulfil the Islamic norm-based moral expectation of the society. As, they have the same structural organisation with the conventional system implying that imitating institutional formation, product and operational nature has shaped the institutional nature of Islamic banking. Therefore, it is possible to conclude that Islamic banks do not represent emergence but rather an emergent pattern, as institutions, they are not the product of the authenticated consequence of an Islamic economic system. Moreover, these institutions are emergent patterns so that institutional innovation rather than organic emergence of institutions have shaped their nature and operations through a gradual manner through their own ontology and epistemology being relegated to *fiqhi* process and *Shari'ah* compliancy. As a result, the Islamic banks as an emergent pattern or institutional innovation are not embedded within the values, norms, roles of an Islamic economic system and the aims of Islamic moral economy. Therefore, they should only be considered as a stepping-stone in the formulation and emergence of long-awaited Islamic aspirations.

The debate in this chapter also highlights the reasons for the underdeveloped nature of a knowledge economy in the Muslim world and the GCC in Chapter 2, as well as, explaining the underperformance of Islamic banks in intellectual capital development in Chapter 3. As knowledge development in the Muslim world has shifted to path dependence for many decades now, following the same mimicry, mirroring and hybridity of Eurocentric knowledge, despite the fact that Islam in itself represents knowledge. Since a search for knowledge has been given up through such quick fix processes, the knowledge development cannot be initiated at economy and society level and product development cannot be achieved at organisational level in Islamic banks and financial institutions. Considering that the revelation of the Qur'an commenced with the word 'read', and political economy has been reduced to mimicry, mirroring and hybridity of Eurocentric knowledge, this deduction should be carefully examined.

Lastly, it should be noted that the debate in this chapter has been mainly around Islamic banks, which are constructed around the institutional logic of capitalism. It may be possible to claim that non-banking Islamic financing institutions including venture capital firms and leasing companies are not necessarily generated through capitalist institutional logic or through grafting process, as they have loose structures. Such natural structure may keep them away from Islamisation of knowledge structure and may bring them closer to organic emergence in

developing risk-sharing and profit-and-loss sharing objectives of IME. However, the important distinction is that the emergence cannot be relegated to the role of *fiqh* as a determining factor, as organic emergence requires institutions should be generated from the Islamic social formation and Islamic modes of production. Therefore, while such institutional forms may fit into the operational nature of IME, their ontological base still relates to the definition of capital offered by capitalism rather than Islamic definition of capital as intended by the prohibition of *riba* or interest. In conclusion, non-banking Islamic financial institutions are grafted institutions through Islamisation of processes. Authentic institutions such as *zakah* and *waqf* and Islamic business models, however, represents emergence by fulfilling the expected features as explained in detail through Table 4.1.

CHAPTER 5

CONCLUSION AND DISCUSSION

5.1. SUMMARY

The idea of knowledge has always played a key role in determining economic progress and wealth creation providing creativity and competitiveness in financial, technological, and commercial sectors. By ensuring such outcomes, historically, knowledge has been a vital factor to facilitate economic progress, exemplified by the industrial revolution and subsequent emergence of industrial society. In post-industrial society, the nature and meaning of knowledge has changed resulting as a primary source of wealth creation within the new knowledge economies. Evolution of the knowledge creation process over the last few decades assists countries to change the nature of their economic systems to knowledge-based sectors through innovation in spheres such as finance, education, technology, and high-tech manufacturing specialisms. However, an emerging knowledge economy requires highly educated human capital, as intangible assets, to be able to play a prominent role in creating additional value in the economy.

In responding to requirements for change in their economies, the GCC countries attempted to transform economics based on natural resources to knowledge-based economies suited to a post-petroleum era, in order to transmute their current sources of wealth creation as part of future planning strategies supporting economic diversification. Strategies have been devised by governments in the region to create the necessary infrastructure to respond to the needs of a knowledge based economy. For example, in line with developmental strategies in the GCC states, creating high-skilled human capital has become one of the most important factors associated with economic revision to generate the necessary knowledge to facilitate innovation to sustain a knowledge economy. Therefore, this study examined the relationship between progressive growth in securing a knowledge-based economy and economic development in GCC countries. GCC states vast accumulations of wealth through oil revenues, enables significant roles and influence to be exerted within the global financial system. Additional prominence in the development of Islamic financial sectors is partially enabled through the

liquidity they inject into the sector. When facing fiscal difficulties created by the decreasing oil prices of recent years, diversifying economies has become an essential policy determinant for the sustainability of GCC economies and societies. Considering that the global economy has progressed from industrial to post-industrial societies, these states are left with the main option of procuring a knowledge-based economy. Human capital in an Islamic banking and finance sector needs to develop expediently, necessitating high levels of intellectual development and intensive knowledge-oriented skills. Therefore, evaluating the intellectual capital performance of Islamic banks when compared to conventional banks in the GCC countries is conducted in accordance with an examination of knowledge-based policies in the region along with analysing the impact of a knowledge-based economy on subsequent economic performance in the GCC region, as empirically conducted by this study.

This research evaluates the current positioning of the GCC countries consolidating knowledge gleaned through a political economy and attendant sectorial lens, thereby, specifying discussion on the impact of intellectual capital on the performance of Islamic banking. Islamic banking sectors are considered as a new way of financing, incorporating a new form of knowledge-based institutions inspired by Western knowledge while Islamised, therefore, ensuring compliance with Islamic legal norms and values. Islamic banks as institutions are similar to conventional banks in their operational form in the sense that they have replicated the institutional logic of conventional banks. Therefore, it is not possible to state that the emergence of these institutions can be considered as organic institutions emerging from the social formation of Islam. This implies that these institutions cannot go beyond mimicking the conventional system which makes them only a form of institutional innovation rather organic or authentic institutions in their own right. Thereby, as a part of a knowledge economy, in terms of human capital and use of knowledge, these institutions are similar to conventional banks, although in origin their authenticity is located within Islamic ontology and epistemology. Thus, knowledge helps to contextualise the emergence of Islamic banks, whether they are organic institutions or forms of institutional innovation. This research, therefore, has taken the debate further than previously determined regarding what constitutes ‘a knowledge economy and an economic performance nexus’ alongside ‘intellectual capital formation performance and the financial performance nexus’ of Islamic banks by opening a debate on the importance of knowledge on the emergence of institutions whereby, the emergent nature of Islamic banks is discussed.

As a result, this research presents a political economy approach at a macro level in the form of a 'knowledge economy and economic performance nexus.' It offers a sectorial analysis of an 'intellectual capital performance and attendant financial performance nexus' through empirical analyses, along with a theoretical framework-based research through emergence theory. Each of these topics are covered individually in the preceding chapters.

5.2. QUESTIONING KNOWLEDGE IN MACRO AND MICRO LEVEL IN THE GCC COUNTRIES: FAILURE IN THE EMERGENCE OF ORGANIC INSTITUTIONS

The entire discussion in this research is centred on the relationship between a knowledge economy and economic performance, and intellectual capital and the financial performance of banks through empirical and conceptual explorations. Empirical analyses on these issues explored the following:

(i) What is the performance of the GCC countries in relation to a knowledge-based economy and its impact on their economic performance from the perspective of political economy?

(ii) How does intellectual capital affect the financial performance of Islamic banks in the GCC countries when compared to conventional banks?

(iii) How can the materialisation of Islamic banks be framed through an emergence theoretical framework?

Explorations centred on the first research question posits that knowledge-based economies have not emerged in any significant way in the GCC states and their economies are still primarily dependent on natural resource revenues. Empirical analyses concerning the second research question points out that Islamic banks still lag behind conventional banks in their intellectual capital performance. Islamic banks seem insignificant regarding intellectual capital deployment despite knowledge and human capital being crucially important in Islam, as Islamic banks are considered to be constituted through the ontological basis of Islamic knowledge. Reflection on these inferences resulted in a solid theoretical solution through the emergence of Islamic financial institutions constituting institutional innovation as part of a knowledge economy. Regarding the third research question, this study concluded that while in an aspirational sense, Islamic banks should have been the product of emergence through Islamic ontology, the present nature of Islamic banks show that they have been formulated through the institutional logic of

conventional banks' operational forms, and, hence, can only be considered as an emergent pattern rather than creating emergence.

The results of the first research question can be rationalised on the grounds of the nature of the GCC states being rentier economies through the prevalence of one-type of economic activity based on the wealth generated by oil resources. Despite the expressed intention of moving their economies to knowledge economies, the GCC countries have displayed structural limitations in their effort to shift their economies to a knowledge-based economic structure because of the unique features, such as, the lack of an active population and the distributive nature comprising within rentier economies. Empirical analysis in this research identified the structural challenges facing GCC states by outlining causality between knowledge economy indicators and their economic performance. Subsequent results, as discussed in Chapter 2, articulate that knowledge economy pillars have not impacted economic performance, although these countries have many economic policies related to structuring a knowledge economy embedded within their national visions.

Although the causality analyses indicate that some variables have impacted economic performance, such as, ICT and InoTech, WGI and Education index, which are the main pillars for a knowledge economy, they are not found to be as significant as other indicators. This relationship can be explained through the nature of the rentier state, lacking WGI and exhibiting low quality education. Empirical analysis does show that the UAE and Qatar are relatively successful in their efforts to shift their economies to knowledge-based economies, even though they are far away from determining an actual impact of knowledge on their economic performance. The UAE and Qatar remain as natural resource-based economies despite displaying many national visions for economic diversification. Citing the UAE, as an example, the country aims to become a financial and business hub for the region, while also aiming to be a hub for Islamic economy. Qatar's goal is to be the education hub for the region. Such visions can yield impact for the future; and hence, the empirical analysis in this study could not locate the performance of a knowledge economy because of its nascent evolution in each of these countries.

In addition to the empirical results, the located failure in the transformation of economic systems of the GCC countries can also be ascribed to economic, social, and political factors. While economic diversification is considered as a solution towards the observed economic failure in the region, it is not a new strategy in the GCC states, as it has long been on the agenda,

since natural resources became the main economic driver in the region. Reasons why it has failed to produce any significant outcomes can be attributed to social and political realities and factors in the region. Firstly, there is an imbalance between public and private sectors in the region, as private sectors are weak and economies are based on the dominance of the public sector. While public sectors, in addition to petrochemical and energy-based industry, drives the other large industries, those industries are also related to the petrochemical sector. This leaves the private sector with food, manufacturing, and construction sectors which are driven by privately-owned and small companies deploying labour-intensive methods run mainly by expatriates. While many private initiatives yield a large share of total employment, the percentage of indigenous citizens working in the private sector is limited because of their preferences for employment within the public-sector which provides high salaries, free health care, schooling and large pensions providing a luxurious lifestyle. Therefore, this biased preference undermines the development of national human capital in the value-added sectors in the region, although each of the GCC countries has nationalisation policies in public and private sectors, as mentioned in Chapter 2. Due to the human capital conditions in the countries in the area, it can be concluded that if a knowledge society is built in the Gulf states, it would mainly develop through the contributions of foreign workers. Other factors include skill levels and the quality of education which have become major problems for securing economic development in the region. Of the GCC countries, the UAE and Qatar have well-developed education systems according to the *Global Competitiveness Report* of the World Economic Forum and a *Human Development Report* by the United Nations. However, despite positive developments in education in these two countries, they are still in the early stages regarding the attainment of the objectives of their education policies. As evidenced by the empirical results, education as a variable does not have a causal relationship with the economic performance of the region. It can be suggested that the long-term impacts of education may be evident in the future; however, this may be a protracted process, as the educated nationals in the region are employed within the public sector rather than high-tech or manufacturing sectors. Therefore, educated foreign professional are hired for employment within the knowledge related sectors in order to meet the specialised needs of the business sector, rather than nationals who are executives in these institutions or working in the public sector. To resolve these problems for the development of a knowledge economy, the GCC countries have devised nationalisation strategies in the labour market as a part of national vision, namely, Bahrainisation, Emiratisation, Kuwaitisation, Omanisation, Qatarisation, and Saudisation plans. However, they need to develop requisite high-skill levels among nationals to overcome the gaps in research

and development, which are essential to sustain a knowledge-based economy for the future in the region. While there are high expectations for the future, the empirical results to date, do not indicate any positive impact.

Conclusions for the second research question on the nexus between intellectual capital and financial performance, the role of human beings for knowledge articulation and the relationship between knowledge and human capital formation have importance in Islam. In line with these results, it can be expected that intellectual capital can play a leading role in the performance of Islamic banks in comparison with conventional banks through innovation from knowledge and social capital developed by Islamic values. The empirical analysis in this study established that being an Islamic bank has negative impacts on financial performance based on financial data and disclosure analysis generated data, although VAIC and ICDI variables are significant for the financial performance of banks. According to disclosure analysis, although the level of ICDI in Islamic banks is better than conventional banks with a minor difference, econometric results show that it is significant with negative impacts. The empirical results imply that there is a divergence between the normative world of Islam and its institutionalised articulation in the form of Islamic banks.

After presenting the lack of knowledge in the GCC countries in both political economy aspects and sectorial levels, it is important to discuss the potential reason for this failure in the region in the context of the emergence of institutions, which responds to the third research question. The ontological and axiomatic base of Islamic ontology enunciates a normative methodology for the emergence of institutions including financing institutions, not necessarily incorporating banking. The research argues that Islamic banks are innovated according to Islamic principles rather than within Islamic ontology. To this end, it is important to discuss the emergence process of Islamic banking institutions to identify whether their emergence represents an organic emergence or only emergent patterns, resulting from the formation of institutional innovation.

As explained in detail in Chapter 4, the innovated institutions are categorised as emergence or emergent patterns in relation to seven criteria. The historical path of emergence is one of the most important factors comprising organic emergence. Islamic banks did not come into existence as an institution through the historical path developed through Islamic ontology but rather through *Shari'ah*-compliance processes within the institutional logic of conventional banks. Thus, these institutions have become hybrid products of the existing market instead of creating and filling its own gaps by developing distinct institutions and products beyond

currently existing products. In this process, relegated forms of Islamic norms in the form of *fiqh* determines *Shari'ah* compliancy, but the institution itself was not generated by *tawhidi* based complementary Islamic ontology and mimicked the institution of banking historically produced in the non-Muslim world applying a different ontology. This can be seen in the financial transactions in Islamic banking, which uses the same structure with conventional institutions but constructs different ways and metaphors, such as, *halal*, *haram*, *riba*-free, *mudarabah etc.* rather than by authentically embedded institutional forms within normative Islam that comes from the emergence of these institutions. The cause of the identified divergence is, hence, explored through the institutionalisation process of Islamic banks which is based on mimicry processes – mimicking the conventional system by producing hybridity. In other words, the institutionalisation process of Islamic banks does not represent an emergence progression embedded within the Islamic value system.

As the discussion in Chapter 4 demonstrates, according to the seven patterns of emergence - 'material realisation', 'coherence', 'non-distributivity', 'structure dependence', 'genuine novelty', 'unpredictability', and 'irreducibility'- Islamic banks do not hold any of these features as constituting emergence or integrity of emergent patterns except for 'material realisation' indicating that they do not represent the whole. Therefore, as also explained by Portes' model, Islamic banks do not present organic emergence including not being historical path dependent and not being determined by Islamic norms and values as an institutional emergence. As explored in Chapter 4, in their current existence, Islamic banks accept the hegemonic nature of the existing banking institutions and banking system although Islamic moral economy and political economy implies creating an Islamic economic system in everyday practice by going beyond imitating and mimicking existing institutions.

The comparison between *waqf* and Islamic banks clarifies the distinction between the organic emergence and emergent pattern, as *waqf* represents total emergence through Islamic norms and values as well as displaying a 'historical path dependence' within Islamic ontology. In addition, *waqf* as an institution meets the seven criteria of emergence so that it fulfils the conditions of organic emergence rather than being an institutional innovation, while Islamic banks represents an emergent pattern or institutional innovation in the sense that they follow the institutional logic of the Enlightenment ontology. This implies that Islamic banking's institutional forms are not embedded within the values, norms, roles of an Islamic economic system and the aims of Islamic moral economy.

On reflection, the results of this research show that the use of knowledge plays a significant role in the economic performance of countries, financial performance of banks, and the emergence of organic institutions. The empirical results suggest that the GCC states need to focus on knowledge-based economic policies, mainly developing human capital to manage growth and development for the post-petroleum era. As for Islamic banks, development of intellectual capital is crucial to catch up with conventional banks. To this end, the use of knowledge itself is of crucial importance for the establishment of organic institutions emerging from Islamic norms following a historical trajectory rather than copying existing systems that leads only to institutional innovation.

5.3. LIMITATIONS AND FUTURE RESEARCH

The nature inherent to rentier states alongside reliance on a single form of economic activity has culminated in serious challenges to the GCC oil dependent monarchies. Transparency is one challenge which impacts on the economic or political realities of the GCC countries. Such challenges are extended to the provision of data relating to every aspect of life, including the data needed for this study. Similar to other studies of the GCC region, this study also confronts the lack of available data related to the economic, social and financial performance of the GCC states. Therefore, as a limitation, this study has suffered from inaccessibility as well as lack of data.

As an example of the issues outlined above, cited in Chapter 2, was an attempt made to go beyond the World Bank's knowledge economy index, as it is measured only for 1995, 2000, 2012. The lack of data for the rest of the years for constituting time-series data has motivated this study to calculate data for the unquantified years using 33 sub-indicators. These sub-indicators have been collected separately from several databases and national websites of the countries: a time-consuming process. To overcome data limitations, some missing data was collected by contacting particular institutions in the above-mentioned countries through e-mail.

The second limitation relates to the empirical section of Chapter 3. As it is regularly observed in Islamic banking and finance related studies, the unavailability of required data was the case for the empirical process in this chapter too, when conducting disclosure analysis. This research found that the annual reports of the Islamic banks lack the expected professionalism along with being irregular. Despite the challenges of the collection and coding, time periods and the number of banks were expanded, as much as possible. In addition, one of the main limitations

was the measuring method of the IC performance in this chapter. There is no single method to measure IC performance but the VAIC model was applied within this research because it is based on secondary data. This method is reliable because the data was collected from annual reports and the Orbis Bank Focus (Bankscope) database based on the financial statements of the sample banks.

Moving on from the data collection, another challenge, which contributes to this study, relates to the gap in the literature in Islamic economics methodology, as there is not any study on emergence in relation to Islamic banking, beyond Asutay (2009). Therefore, merging emergence theory and Islamic financial institutions by conceptualising them is a quite difficult task, when combined with the lack of theoretical studies on the subject. However, originality within this research stems from responding to such difficulties, and, hence, it contributes to the literature by addressing this gap.

Despite the lack of data and its collection difficulties, future research may consider constructing a knowledge economy index for other Muslim states, enabling evaluation determining how Muslim countries utilise knowledge in their economies. Furthermore, future research may consider constructing an expanded Islamic intellectual capital index for Islamic banks with the objective of improved reflection on the extent to which intellectual capital can contribute to their development. Lastly, the conceptualisation of Islamic economics in terms of emergence process can be further developed via charting its historical path dependence relating to everyday life to lead the way for current Islamic economics studies.

5.4. EPILOGUE

This research aims to examine the impact of knowledge on the economic performance of countries, on the financial performance of banks, and the emergence of Islamic financial institutions. In doing so, it empirically examined the impact of knowledge on macro performance in the case of states and sectorial performance in the case of Islamic and conventional banks in the GCC countries. With the recognition of the failure of knowledge use in these countries and its non-statistically significant impact on economic and financial performance, this research also developed a theoretical exploration through applying the emergence theoretical frame in the case of exploring the emergence of Islamic banks. Based on the empirical and theoretical studies, this study argues that in order to manage economic and financial performance in terms of macro and micro levels, organic institutions need to be

established within the society through the incorporation of Islamic values and norms. In conclusion, as theoretical and empirical analyses in each of the chapters presented indicate, this research attempted to fulfil the general aims of this research along with the individual aims of each essay, whereby, it aimed to contribute to ongoing debates on knowledge-based economy and on Islamic banking emergence.

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APPENDICES

Appendix A

Table A2.1: A Survey of Empirical Literature

Study	Sample	Method	Key Findings
Globalization, Peace & Stability, Governance, and Knowledge Economy (Amavilah *et al.*, 2014)	22 MENA and Sub-Sahara African countries with Intellectual Property Rights data for the period 1996-2010.	Three Stage Regression Technique	The finding is that there is a weak impact on the KE of the governance of formal institutions and although these institutions are necessary, the determinants of KE are inadequate in the MENA and SSA countries.
Software Piracy and Scientific Publications: Knowledge Economy Evidence from Africa (Asongu, 2014c)	10 African countries with data from African Development Indicators of the World Bank for the period 1996-2010.	Panel Data Techniques	The result shows that there is positive and stable relation between the school of thought and East Asian IPRs regime at the early stages of development.
Knowledge Economy Gaps, Policy Syndromes and Catch-up Strategies: Fresh South Korean Lessons to Africa (Asongu, 2014a)	53 African countries with data from Principal Component Analysis and World Development Indicators for the period 1996-2010.	Panel Data Techniques (Beta and Sigma Convergence techniques)	The knowledge index in African countries decreased between 2000 and 2009 and these countries can take lesson from some knowledge countries such as South Korea for their economies towards the KE.
Knowledge Governance and Economic Growth in Arab Countries (Andres, 2014)	Medium term growth data of 22 MENA countries between 2000 and 2010.	Cross-country Data	The results show that poor knowledge governance negatively affects the economic growth over the medium term.
The 'Knowledge Economy'-finance nexus in SSA and MENA countries (Asongu, 2014b)	SSA and MENA countries with data of the World Bank's knowledge economy index and seven financial intermediary dynamics of depth, efficiency, activity and size.	Dynamic panel GMM estimation techniques	The findings are that education helps to develop financial depth and efficiency but ease the financial size; EIRs are not regularly positive to financial development; ICT helps to improve only financial size; Innovation positively affects the financial activities.

The Impact of Formal Institutions on Knowledge Economy (Andres *et al.*, 2013)	22 MENA and SSA countries for the period 1996-2010.	Pane Data Models, Principal Component Analysis (PCA)	Although the enforcement of IPR laws is necessary for these countries, it is not a sufficient condition for a knowledge economy.
Modeling the Future of Knowledge Economy: Evidence from SSA and MENA Countries (Asongu, 2013)	22 MENA and SSA countries with data from World Development Indicators and the Financial Development and Structure Database of the World Bank for the period 1996-2010.	Principal Component Analysis; Panel data	Findings show that SSA and MENA countries with low levels in KE will catch-up their counterparts with higher levels in a horizon of 4 to 7.5 years.
Financial Sector Competition and Knowledge Economy: Evidence from SSA and MENA Countries (Asongu, 2012)	22 MENA and SSA countries with data from World Bank's KEI indicators for the period 1996-2010.	Panel Data	Findings show that the measures of financial sectors provides new overlook into how financial sector competition affects knowledge economy dimensions; the measurement of the financial system helps to improve dynamics in the knowledge economy and finance nexus.
Knowledge-based Economy (KBE) Frameworks and Empirical Investigation of KBE Input-output Indicators for ASEAN (Afzal and Lawrey, 2012)	ASEAN countries with data from the World Bank's World Development Indicators and the International Institute for Management Development's World Competitive Yearbook.	Multiple Regression Analysis, Standardized Beta Coefficient	The results show that Singapore has a high performance on the knowledge obtainment, production and distribution; Philippines have also a high performance on knowledge utilization; Indonesia has a weak performance on the all KEI indicators.
Financial Determinants of Human Development in Developing Countries (Asongu, 2011)	38 developing countries with data of the determinants of human development (financial dynamics of depth, efficiency, size and activity) from African Development Indicators of the World Bank and the Financial Development and Structure Database for the period 1996-2008.	Correlation Analysis	The result is that there is a positive link between financial size and human development.

Knowledge and Economic Growth: Evidence from Some Developing Countries (Poorfaraj *et al.*, 2011)	16 developing countries with the data of the KEI for the period 2000- 2008.	Panel Data, Regression	The results show that the knowledge economy takes an important role for economic growth in these 16 developing countries.
Knowledge Economy Factors and the Development of Knowledge-based Economy (Sundac and Krmpotic, 2011)	118 countries with data of the World Bank's KEI indicators in 2006.	Multivariate Regression Analysis	The result shows that economic growth of these countries is affected by the factors of knowledge economy.
The Economics of Knowledge Regulation: An Empirical Analysis of Knowledge Flows (Haussler, 2010)	157 German biotechnology firms with firms-level survey data of control of the knowledge	Regression, Survey Data	The findings show that the governance of the knowledge helps to compete and access to the knowledge source.
The Importance of ICT for the Knowledge Economy: A Total Factor Productivity Analysis for Selected OECD Countries (Seki, 2008).	Selected OECD countries for the period 1980-2003.	Data Envelopment Analysis	The results show that there is a growing performance in the OECD Countries. Japan shows the most performance for technological changing and Norway is also most successful country in technical efficiency.
An Econometric Analysis of the Role of Knowledge in Economic Performance (Driouchi *et al*., 2006).	Four groups of 56 countries with data from the United Nations Development Program and the World Bank for the period 1995–2001.	Regression Analysis	The results show that knowledge is a main driver of economic growth for each group of countries. Furthermore, economic performance relates to the timing of investment in education, ICT, R&D and innovation.

Measuring the Knowledge Base of an Economy in terms of Triple-Helix Relations among 'Technology, Organization, and Territory' (Leydesdorff *et al.*, 2006)	Data about more than a million Dutch companies are used for testing the indicator (postal codes, sector codes and firm sizes in terms of number of employees).	Shannon-Hartley Theorem	The results show that the performance of medium-tech sectors is higher than high-tech on the knowledge base.

Table A2.2: Correlation Matrix (GDP as Dependent Variable)

	Inflation	*Openness*	*WGI*	*Freedom Index*	*Inotech*	*Edu Index*	*Ict Index*	*GDP*
Inflation→	**1.0000**							
Openness→	0.2383	**1.0000**						
WGI→	-0.0552	-0.1183	**1.0000**					
Freedom Index→	-0.0847	0.0818	0.3423	**1.0000**				
Inotech→	-0.1820	0.1432	0.1251	0.4541	**1.0000**			
Edu Index→	-0.3219	-0.0737	-0.1035	0.2933	0.3383	**1.0000**		
Ict Index→	-0.4044	0.1209	-0.0229	0.4919	0.6540	0.6155	**1.0000**	
GDP→	-0.0393	-0.3155	0.1129	0.1558	0.1914	0.1487	0.2072	**1.0000**

Table A2.3: Correlation Matrix (TNRR as Dependent Variable)

	Inflation	*Openness*	*WGI*	*Freedom Index*	*Inotech*	*Edu Index*	*Ict Index*	*TNRR*
Inflation→	**1.0000**							
Openness→	0.2383	**1.0000**						
WGI→	-0.0552	-0.1183	**1.0000**					
Freedom Index→	-0.0847	0.0818	0.3423	**1.0000**				
Inotech→	-0.1820	0.1432	0.1251	0.4541	**1.0000**			
Edu Index→	-0.3219	-0.0737	-0.1035	0.2933	0.3383	**1.0000**		
Ict Index→	-0.4044	0.1209	-0.0229	0.4919	0.6540	0.6155	**1.0000**	
TNRR→	0.0624	-0.1172	0.0101	0.0643	0.1073	0.0673	0.0829	**1.0000**

Appendix B

Table B3.1: VAIC - Variance Inflation Factor for All Types of Banks

Variable	VIF	1/VIF
keinx	1.54	0.650092
vaic	1.52	0.656353
crisisdummy	1.51	0.663711
gdp	1.45	0.689060
bsize	1.38	0.726188
typedummy	1.36	0.736255
lor	1.28	0.779077
ageop	1.25	0.798605
Mean VIF	1.41	

Figure B3.1: VAIC - Variance of Residuals for All Types of Banks

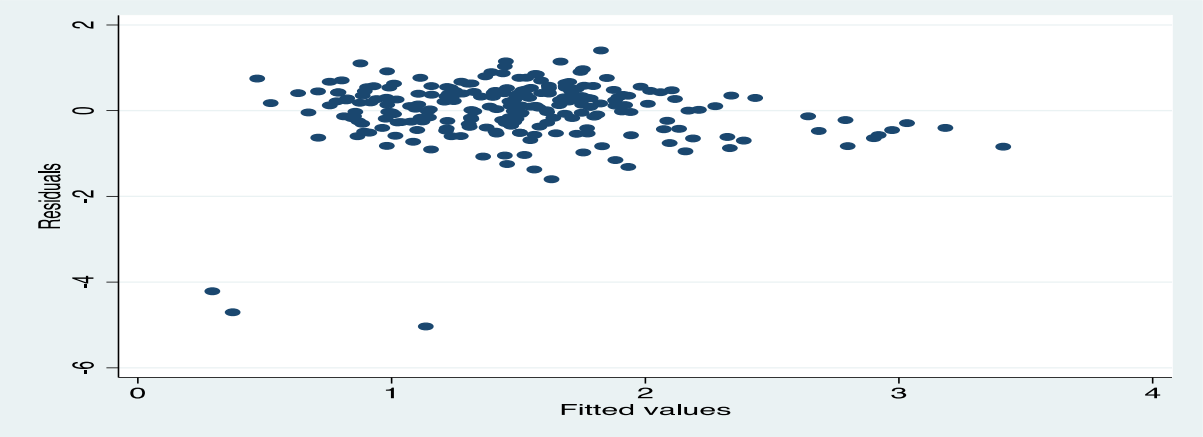

Table B3.2: VAIC - Correlation Matrix of the Explanatory Variables for All Types of Banks

	residu~s	roaa	vaic	bsize	lor	gdp	ageop	keinx	crisis~y	typedu~y
residuals	1.0000									
roaa	0.5655	1.0000								
vaic	0.6374	0.3604	1.0000							
bsize	0.5930	0.3353	0.1631	1.0000						
lor	0.3028	0.1712	0.3339	0.1918	1.0000					
gdp	0.3877	0.2192	0.4406	-0.0241	0.2416	1.0000				
ageop	0.1708	0.0966	-0.1348	0.2565	-0.1065	-0.1692	1.0000			
keinx	0.3958	0.2238	-0.1428	0.2013	0.1899	-0.0906	0.0114	1.0000		
crisisdummy	-0.0086	-0.0049	-0.0066	0.0962	0.1291	-0.2616	0.0558	0.4990	1.0000	
typedummy	-0.3500	-0.1979	0.0939	-0.3431	0.1482	0.0440	-0.3929	0.0373	0.0000	1.0000

Table B3.3: HCE - Variance Inflation Factor for All Types of Banks

Variable	VIF	1/VIF
keinx	1.52	0.656921
crisisdummy	1.51	0.663551
hce	1.46	0.683527
gdp	1.46	0.685907
bsize	1.38	0.725450
typedummy	1.34	0.746130
ageop	1.26	0.796443
lor	1.25	0.798065
Mean VIF	1.40	

Figure B3.2: HCE - Variance of Residuals for All Types of Banks

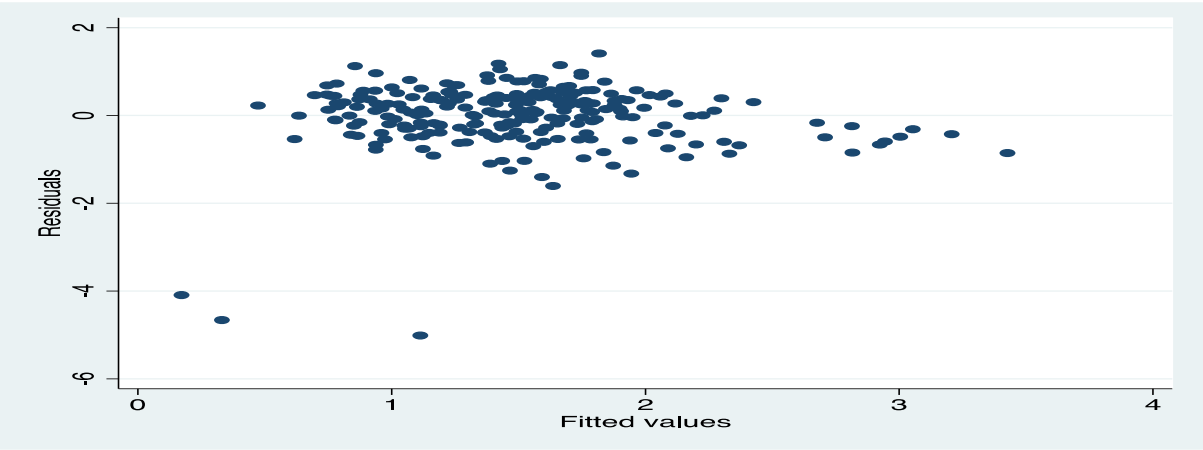

Table B3.4: HCE - Correlation Matrix of the Explanatory Variables for All Types of Banks

	residu~s	roaa	hce	bsize	lor	ageop	keinx	gdp	crisis~y	typedu~y
residuals	1.0000									
roaa	0.5693	1.0000								
hce	0.6899	0.3927	1.0000							
bsize	0.5891	0.3353	0.2004	1.0000						
lor	0.3008	0.1712	0.2676	0.1918	1.0000					
ageop	0.1697	0.0966	-0.0961	0.2565	-0.1065	1.0000				
keinx	0.3932	0.2238	-0.1433	0.2013	0.1899	0.0114	1.0000			
gdp	0.3851	0.2192	0.4353	-0.0241	0.2416	-0.1692	-0.0906	1.0000		
crisisdummy	-0.0086	-0.0049	-0.0067	0.0962	0.1291	0.0558	0.4990	-0.2616	1.0000	
typedummy	-0.3477	-0.1979	-0.0347	-0.3431	0.1482	-0.3929	0.0373	0.0440	0.0000	1.0000

Table B3.5: SCE - Variance Inflation Factor for All Types of Banks

Variable	VIF	1/VIF
keinx	1.45	0.689617
crisisdummy	1.44	0.692716
lor	1.42	0.701903
typedummy	1.37	0.730080
bsize	1.30	0.769557
ageop	1.25	0.803164
gdp	1.20	0.831397
sce	1.20	0.835178
Mean VIF	1.33	

Figure B3.3: SCE - Variance of Residuals for All Types of Banks

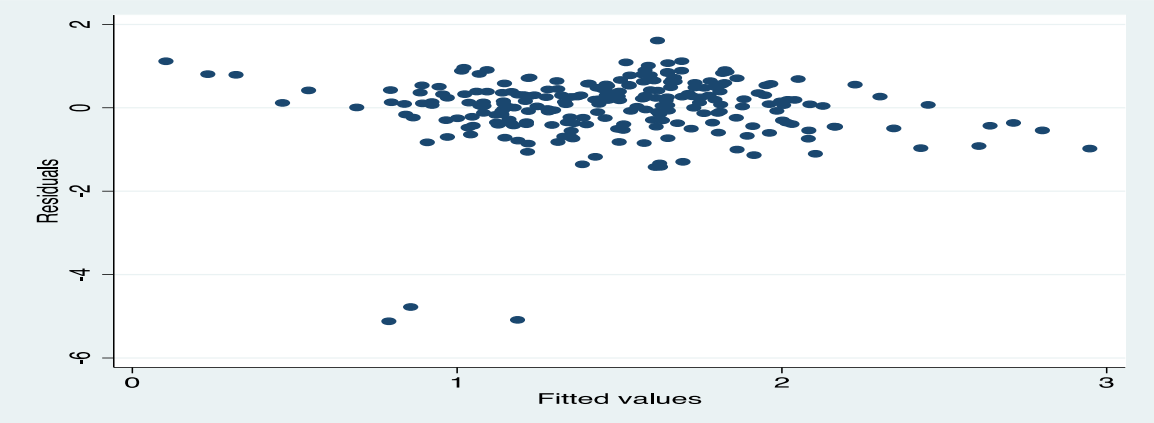

Table B3.6: SCE - Correlation Matrix of the Explanatory Variables for All Types of Banks

	residu~s	roaa	sce	bsize	lor	ageop	keinx	gdp	crisis~y	typedu~y
residuals	1.0000									
roaa	0.4800	1.0000								
sce	0.2440	0.1171	1.0000							
bsize	0.6986	0.3353	0.0473	1.0000						
lor	0.3567	0.1712	0.3221	0.1918	1.0000					
ageop	0.2012	0.0966	0.0221	0.2565	-0.1065	1.0000				
keinx	0.4662	0.2238	-0.1222	0.2013	0.1899	0.0114	1.0000			
gdp	0.4567	0.2192	0.0381	-0.0241	0.2416	-0.1692	-0.0906	1.0000		
crisisdummy	-0.0102	-0.0049	-0.0264	0.0962	0.1291	0.0558	0.4990	-0.2616	1.0000	
typedummy	-0.4124	-0.1979	-0.0928	-0.3431	0.1482	-0.3929	0.0373	0.0440	0.0000	1.0000

Table B3.7: CEE - Variance Inflation Factor for All Types of Banks

Variable	VIF	1/VIF
typedummy	1.97	0.506514
cee	1.57	0.635803
crisisdummy	1.44	0.692388
keinx	1.41	0.709518
bsize	1.30	0.768978
ageop	1.26	0.791534
lor	1.22	0.816615
gdp	1.21	0.824039
Mean VIF	1.43	

Figure B3.4: CEE - Variance of Residuals for All Types of Banks

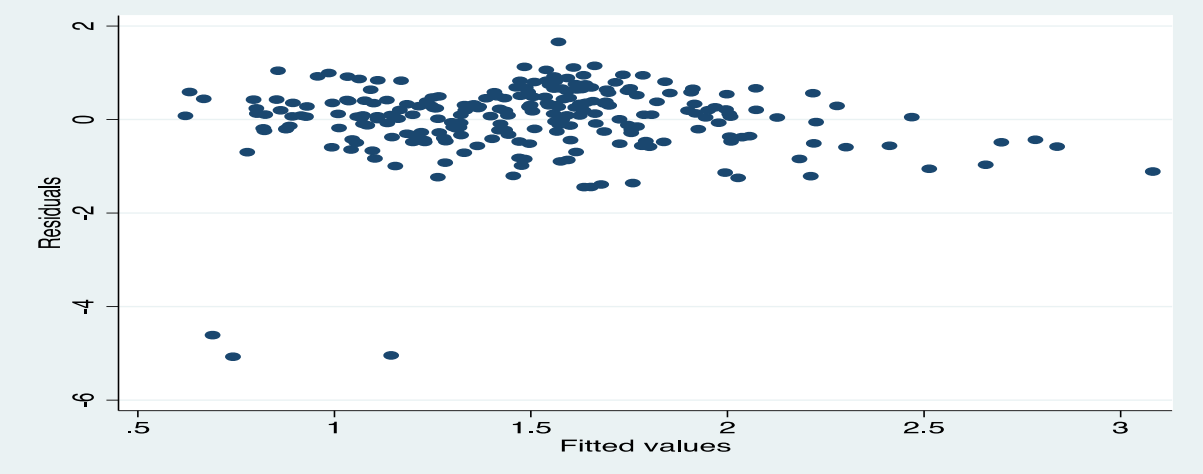

Table B3.8: CEE - Correlation Matrix of the Explanatory Variables for All Types of Banks

	residu~s	roaa	cee	bsize	lor	ageop	keinx	gdp	crisis~y	typedu~y
residuals	1.0000									
roaa	0.4721	1.0000								
cee	0.0544	0.0257	1.0000							
bsize	0.7103	0.3353	0.1328	1.0000						
lor	0.3627	0.1712	-0.1342	0.1918	1.0000					
ageop	0.2046	0.0966	0.1478	0.2565	-0.1065	1.0000				
keinx	0.4741	0.2238	-0.0628	0.2013	0.1899	0.0114	1.0000			
gdp	0.4644	0.2192	-0.1156	-0.0241	0.2416	-0.1692	-0.0906	1.0000		
crisisdummy	-0.0103	-0.0049	0.0130	0.0962	0.1291	0.0558	0.4990	-0.2616	1.0000	
typedummy	-0.4193	-0.1979	-0.5832	-0.3431	0.1482	-0.3929	0.0373	0.0440	0.0000	1.0000

Table B3.9: VAIC - Variance Inflation Factor for Islamic Banks

Variable	VIF	1/VIF
vaic	2.38	0.420776
gdp	2.00	0.500252
keinx	1.97	0.507496
crisisdummy	1.92	0.520285
bsize	1.45	0.691532
ageop	1.35	0.741566
lor	1.23	0.814140
Mean VIF	1.76	

Figure B3.5: VAIC - Variance of Residuals for Islamic Banks

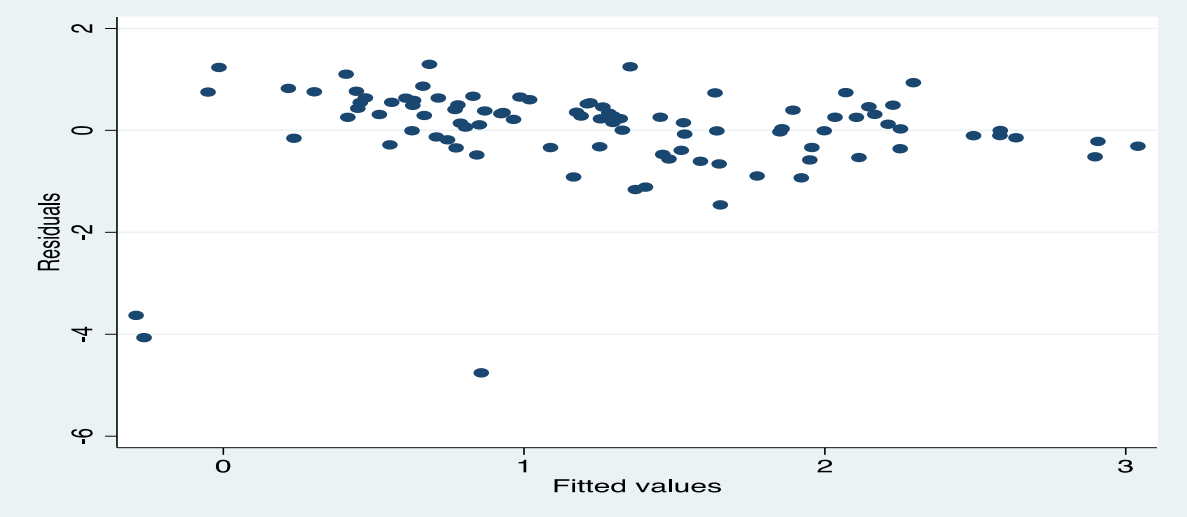

Table B3.10: VAIC - Correlation Matrix of the Explanatory Variables for Islamic Banks

	roaa	vaic	bsize	lor	ageop	keinx	gdp	crisis~y
roaa	1.0000							
vaic	0.4203	1.0000						
bsize	0.3545	0.1443	1.0000					
lor	0.2285	0.3227	0.2066	1.0000				
ageop	0.0991	-0.0111	0.4810	0.1022	1.0000			
keinx	0.2086	-0.2973	0.1102	0.1427	-0.0102	1.0000		
gdp	0.3523	0.5461	-0.0549	0.1797	-0.1305	-0.0856	1.0000	
crisisdummy	0.0971	0.0491	0.1058	0.1783	0.0765	0.5016	-0.2800	1.0000

Table B3.11: HCE - Variance Inflation Factor for Islamic Banks

Variable	VIF	1/VIF
hce	**2.16**	**0.462131**
gdp	**2.00**	**0.500126**
crisisdummy	**1.94**	**0.516283**
keinx	**1.89**	**0.529386**
bsize	**1.44**	**0.695522**
ageop	**1.35**	**0.738747**
lor	**1.15**	**0.866300**
Mean VIF	**1.71**	

Figure B3.6: HCE - Variance of Residuals for Islamic Banks

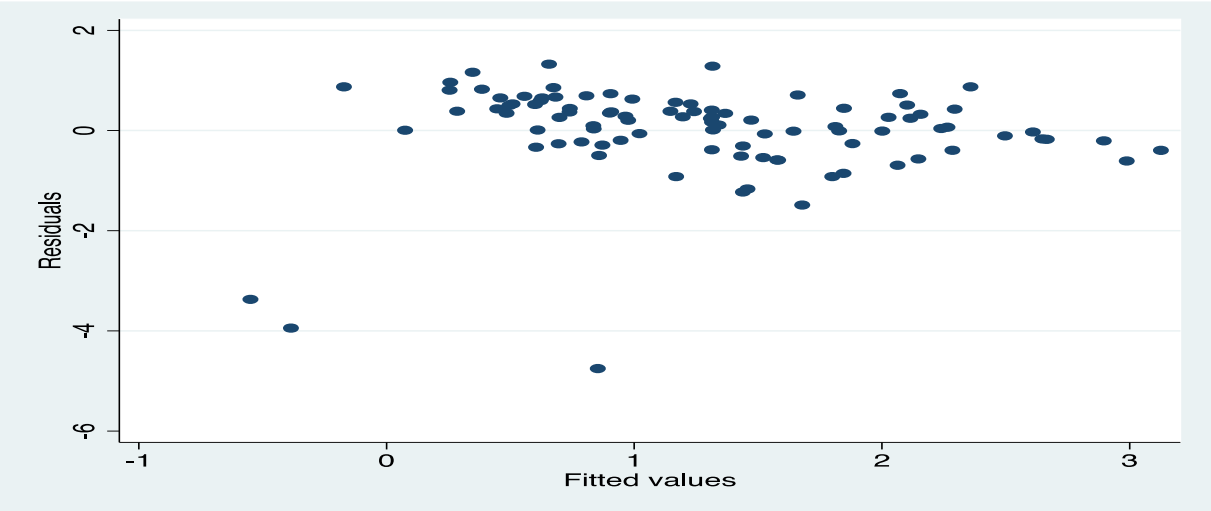

Table B3.12: HCE - Correlation Matrix of the Explanatory Variables for Islamic Banks

	roaa	hce	bsize	lor	ageop	keinx	gdp	crisis~y
roaa	**1.0000**							
hce	**0.4334**	**1.0000**						
bsize	**0.3545**	**0.1112**	**1.0000**					
lor	**0.2285**	**0.2023**	**0.2066**	**1.0000**				
ageop	**0.0991**	**-0.0433**	**0.4810**	**0.1022**	**1.0000**			
keinx	**0.2086**	**-0.2917**	**0.1102**	**0.1427**	**-0.0102**	**1.0000**		
gdp	**0.3523**	**0.5444**	**-0.0549**	**0.1797**	**-0.1305**	**-0.0856**	**1.0000**	
crisisdummy	**0.0971**	**0.0507**	**0.1058**	**0.1783**	**0.0765**	**0.5016**	**-0.2800**	**1.0000**

Table B3.13: SCE - Variance Inflation Factor for Islamic Banks

Variable	VIF	1/VIF
lor	1.86	0.536828
sce	1.73	0.577994
crisisdummy	1.51	0.663832
keinx	1.40	0.716003
bsize	1.37	0.731957
ageop	1.33	0.749503
gdp	1.18	0.847608
Mean VIF	1.48	

Figure B3.7: SCE - Variance of Residuals for Islamic Banks

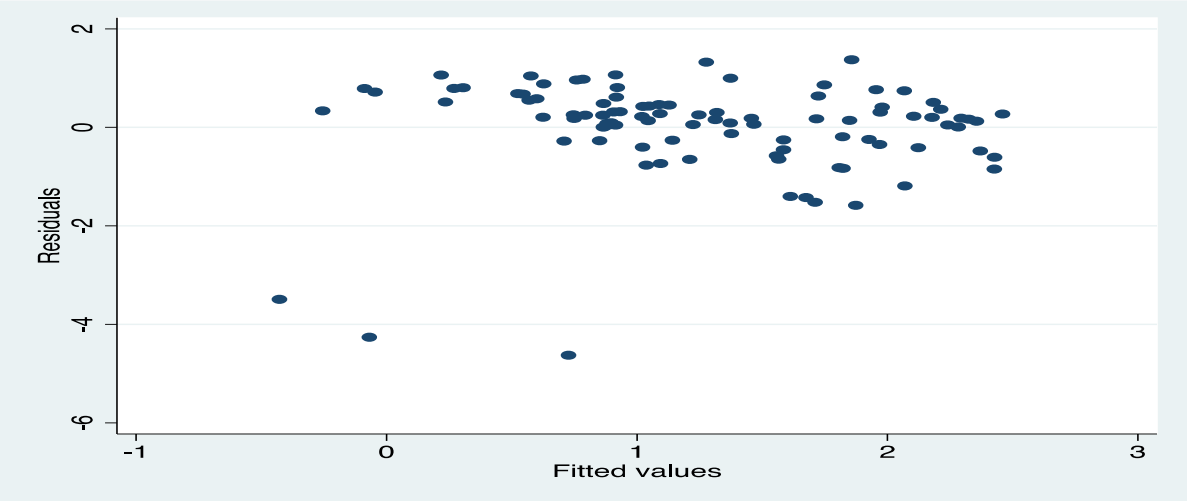

Table B3.14: SCE - Correlation Matrix of the Explanatory Variables for Islamic Banks

	roaa	sce	bsize	lor	ageop	keinx	gdp	crisis~y
roaa	1.0000							
sce	0.0380	1.0000						
bsize	0.3545	0.1502	1.0000					
lor	0.2285	0.6245	0.2066	1.0000				
ageop	0.0991	0.0570	0.4810	0.1022	1.0000			
keinx	0.2086	-0.0723	0.1102	0.1427	-0.0102	1.0000		
gdp	0.3523	0.1638	-0.0549	0.1797	-0.1305	-0.0856	1.0000	
crisisdummy	0.0971	-0.0131	0.1058	0.1783	0.0765	0.5016	-0.2800	1.0000

Table B3.15: CEE - Variance Inflation Factor for Islamic Banks

Variable	VIF	1/VIF
ageop	1.52	0.657025
crisisdummy	1.51	0.663799
bsize	1.37	0.732079
keinx	1.37	0.732574
cee	1.33	0.753347
gdp	1.25	0.796901
lor	1.23	0.811020
Mean VIF	1.37	

Figure B3.8: CEE - Variance of Residuals for Islamic Banks

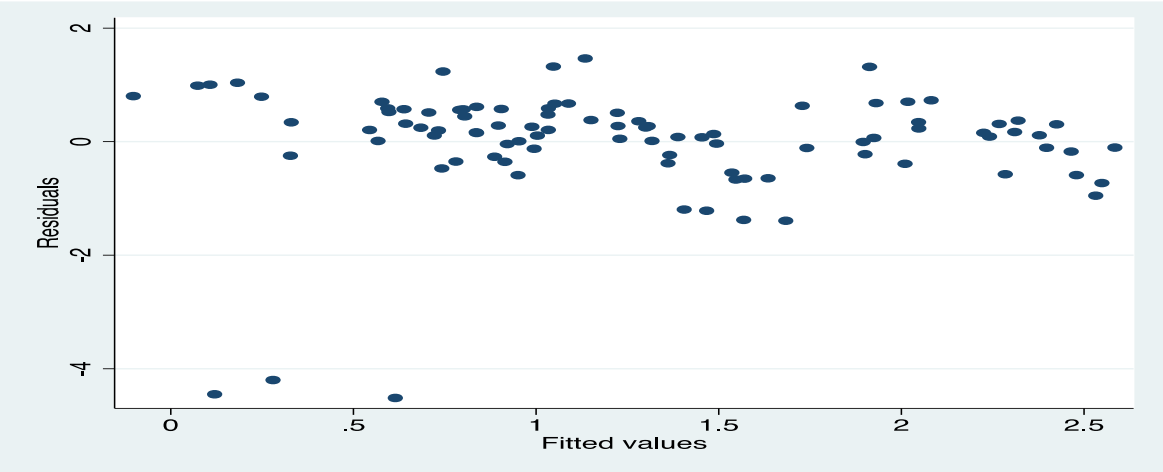

Table B3.16: CEE - Correlation Matrix of the Explanatory Variables for Islamic Banks

	roaa	cee	bsize	lor	ageop	keinx	gdp	crisis~y
roaa	1.0000							
cee	-0.1204	1.0000						
bsize	0.3545	0.1750	1.0000					
lor	0.2285	0.2181	0.2066	1.0000				
ageop	0.0991	0.4013	0.4810	0.1022	1.0000			
keinx	0.2086	-0.0320	0.1102	0.1427	-0.0102	1.0000		
gdp	0.3523	-0.2179	-0.0549	0.1797	-0.1305	-0.0856	1.0000	
crisisdummy	0.0971	0.0482	0.1058	0.1783	0.0765	0.5016	-0.2800	1.0000

Table B3.17: VAIC - Variance Inflation Factor for Conventional Banks

Variable	VIF	1/VIF
keinx	1.50	0.667638
crisisdummy	1.42	0.702041
gdp	1.30	0.769632
vaic	1.30	0.770867
lor	1.29	0.772564
bsize	1.23	0.811277
ageop	1.07	0.936038
Mean VIF	1.30	

Figure B3.9: VAIC - Variance of Residuals for Conventional Banks

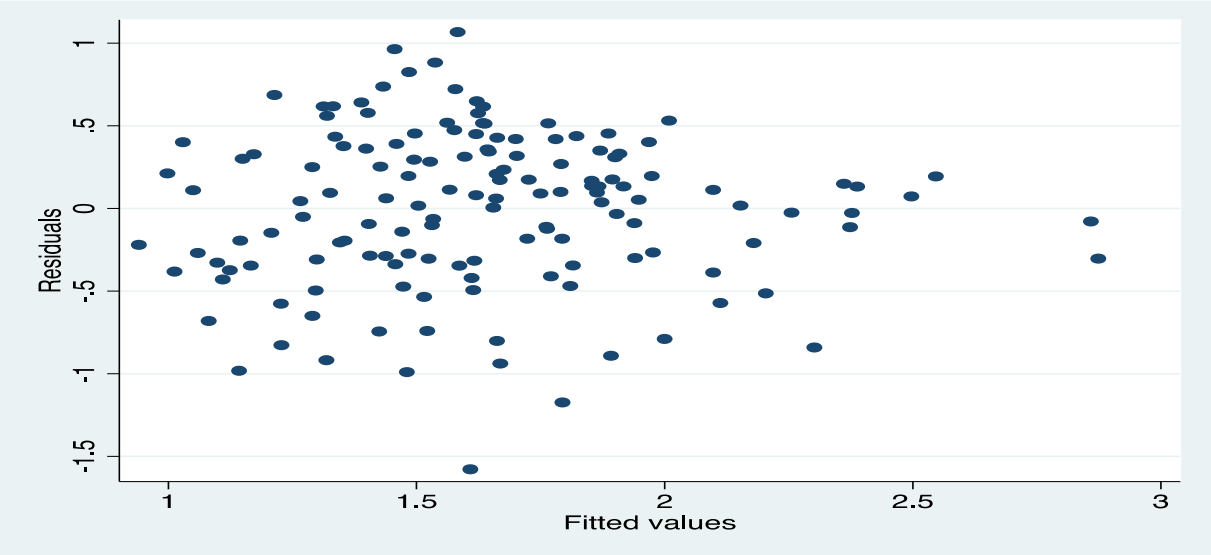

Table B3.18: VAIC - Correlation Matrix of the Explanatory Variables for Conventional Banks

	roaa	vaic	bsize	lor	ageop	keinx	gdp	crisis~y
roaa	1.0000							
vaic	0.3855	1.0000						
bsize	0.3342	0.2283	1.0000					
lor	0.2129	0.3164	0.2888	1.0000				
ageop	-0.0459	-0.1930	0.0459	-0.1215	1.0000			
keinx	0.2996	-0.0408	0.2961	0.2189	0.0499	1.0000		
gdp	0.1249	0.3457	0.0069	0.2714	-0.1822	-0.0979	1.0000	
crisisdummy	-0.1396	-0.0542	0.1047	0.1011	0.0545	0.4995	-0.2511	1.0000

Table B3.19: HCE - Variance Inflation Factor for Conventional Banks

Variable	VIF	1/VIF
keinx	1.49	0.671070
crisisdummy	1.42	0.702269
hce	1.32	0.754756
gdp	1.32	0.756315
lor	1.30	0.771959
bsize	1.24	0.803785
ageop	1.06	0.943890
Mean VIF	1.31	

Figure B3.10: HCE - Variance of Residuals for Conventional Banks

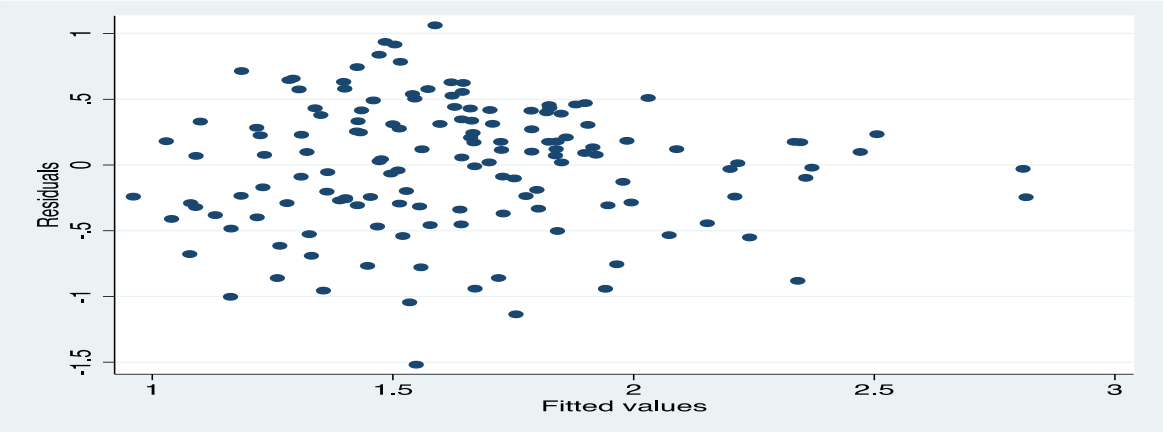

Table B3.20: HCE - Correlation Matrix of the Explanatory Variables for Conventional Banks

	roaa	hce	bsize	lor	ageop	keinx	gdp	crisis~y
roaa	1.0000							
hce	0.3719	1.0000						
bsize	0.3342	0.2543	1.0000					
lor	0.2129	0.3302	0.2888	1.0000				
ageop	-0.0459	-0.1644	0.0459	-0.1215	1.0000			
keinx	0.2996	-0.0141	0.2961	0.2189	0.0499	1.0000		
gdp	0.1249	0.3667	0.0069	0.2714	-0.1822	-0.0979	1.0000	
crisisdummy	-0.1396	-0.0497	0.1047	0.1011	0.0545	0.4995	-0.2511	1.0000

Table B3.21: SCE - Variance Inflation Factor for Conventional Banks

Variable	VIF	1/VIF
keinx	1.54	0.651378
crisisdummy	1.42	0.703050
lor	1.27	0.786077
gdp	1.24	0.809076
bsize	1.18	0.849625
sce	1.09	0.920804
ageop	1.05	0.948123
Mean VIF	1.25	

Figure B3.11: SCE - Variance of Residuals for Conventional Banks

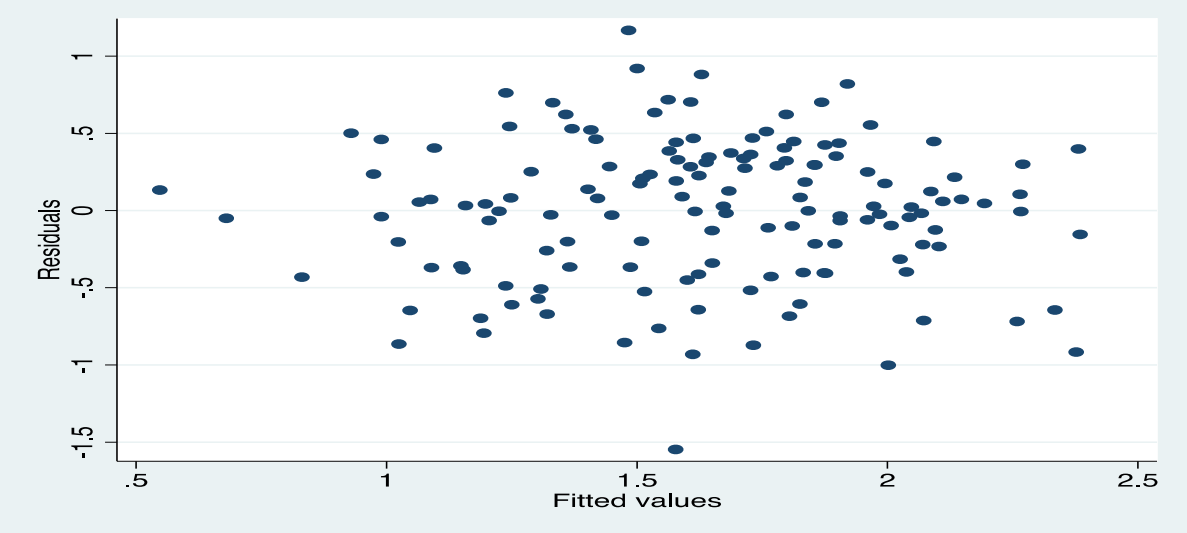

Table B3.22: SCE - Correlation Matrix of the Explanatory Variables for Conventional Banks

	roaa	sce	bsize	lor	ageop	keinx	gdp	crisis~y
roaa	1.0000							
sce	0.2573	1.0000						
bsize	0.3342	-0.0788	1.0000					
lor	0.2129	0.0551	0.2888	1.0000				
ageop	-0.0459	-0.0824	0.0459	-0.1215	1.0000			
keinx	0.2996	-0.1943	0.2961	0.2189	0.0499	1.0000		
gdp	0.1249	-0.0912	0.0069	0.2714	-0.1822	-0.0979	1.0000	
crisisdummy	-0.1396	-0.0460	0.1047	0.1011	0.0545	0.4995	-0.2511	1.0000

Table B3.23: CEE - Variance Inflation Factor for Conventional Banks

Variable	VIF	1/VIF
keinx	1.47	0.678535
crisisdummy	1.42	0.702875
lor	1.29	0.774349
gdp	1.21	0.826066
bsize	1.19	0.842166
cee	1.19	0.843393
ageop	1.18	0.851056
Mean VIF	1.28	

Figure B3.12: CEE - Variance of Residuals for Conventional Banks

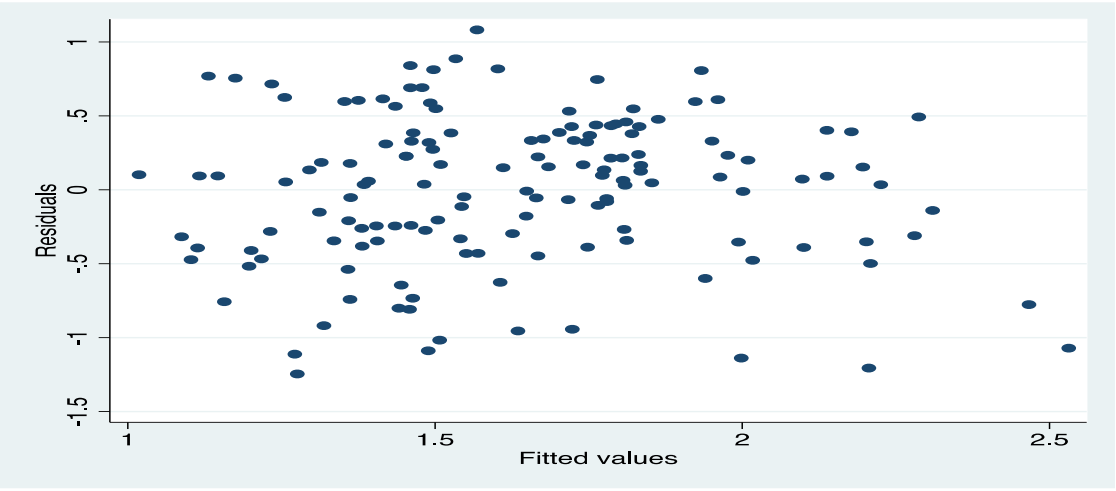

Table B3.24: CEE - Correlation Matrix of the Explanatory Variables for Conventional Banks

	roaa	cee	bsize	lor	ageop	keinx	gdp	crisis~y
roaa	1.0000							
cee	-0.1297	1.0000						
bsize	0.3342	-0.1721	1.0000					
lor	0.2129	-0.1965	0.2888	1.0000				
ageop	-0.0459	-0.2965	0.0459	-0.1215	1.0000			
keinx	0.2996	-0.0628	0.2961	0.2189	0.0499	1.0000		
gdp	0.1249	-0.0593	0.0069	0.2714	-0.1822	-0.0979	1.0000	
crisisdummy	-0.1396	-0.0007	0.1047	0.1011	0.0545	0.4995	-0.2511	1.0000

Table B3.25: ICDI - Variance Inflation Factor for All Types of Banks

Variable	VIF	1/VIF
keinx	1.62	0.616415
dummycrisis	1.58	0.632053
dummytype	1.55	0.643631
bsize	1.48	0.674322
ageop	1.40	0.716516
gdp	1.24	0.809576
lor	1.21	0.828510
icdi	1.12	0.889558
Mean VIF	1.40	

Figure B3.13: ICDI - Variance of Residuals for All Types of Banks

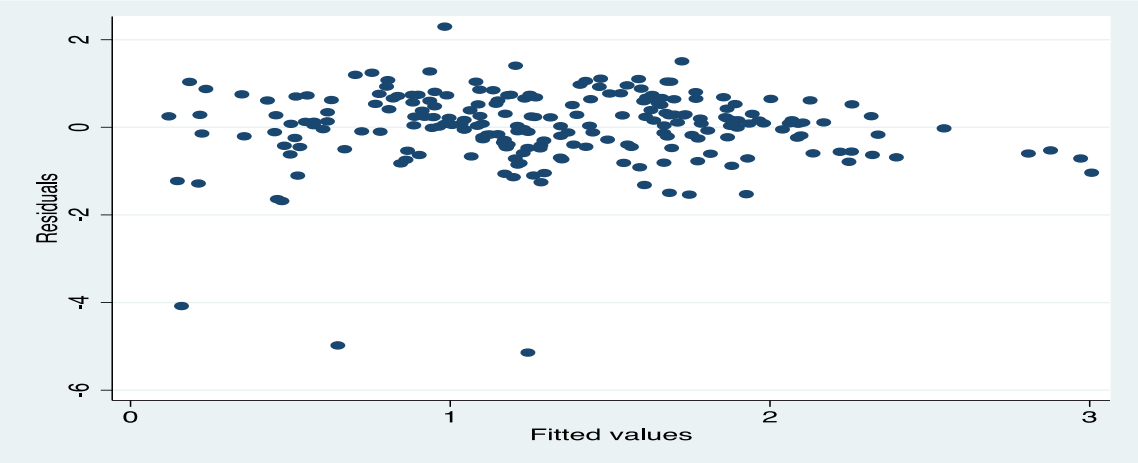

Table B3.26: ICDI - Correlation Matrix of the Explanatory Variables for All Types of Banks

	residu~s	roaa	icdi	bsize	lor	gdp	ageop	keinx	dummyc~s	dummyt~e
residuals	1.0000									
roaa	0.5521	1.0000								
icdi	0.1540	0.0850	1.0000							
bsize	0.6871	0.3794	0.1718	1.0000						
lor	0.4288	0.2368	-0.0255	0.2137	1.0000					
gdp	0.4845	0.2675	-0.0200	0.0674	0.2377	1.0000				
ageop	0.4285	0.2366	-0.0503	0.2964	0.0365	-0.1314	1.0000			
keinx	0.4950	0.2733	0.0368	0.3045	0.1823	-0.0693	0.0237	1.0000		
dummycrisis	0.0254	0.0140	0.1533	0.0858	0.0893	-0.2540	0.0661	0.5368	1.0000	
dummytype	-0.5619	-0.3102	0.1181	-0.3855	0.0604	-0.1056	-0.4585	-0.1265	0.0000	1.0000

Table B3.27: HCDI - Variance Inflation Factor for All Types of Banks

Variable	VIF	1/VIF
keinx	1.72	0.579726
dummycrisis	1.59	0.627761
dummytype	1.55	0.643927
bsize	1.48	0.673887
ageop	1.39	0.717668
gdp	1.24	0.807204
lor	1.19	0.838027
hci	1.17	0.856889
Mean VIF	1.42	

Figure B3.14: HCDI - Variance of Residuals for All Types of Banks

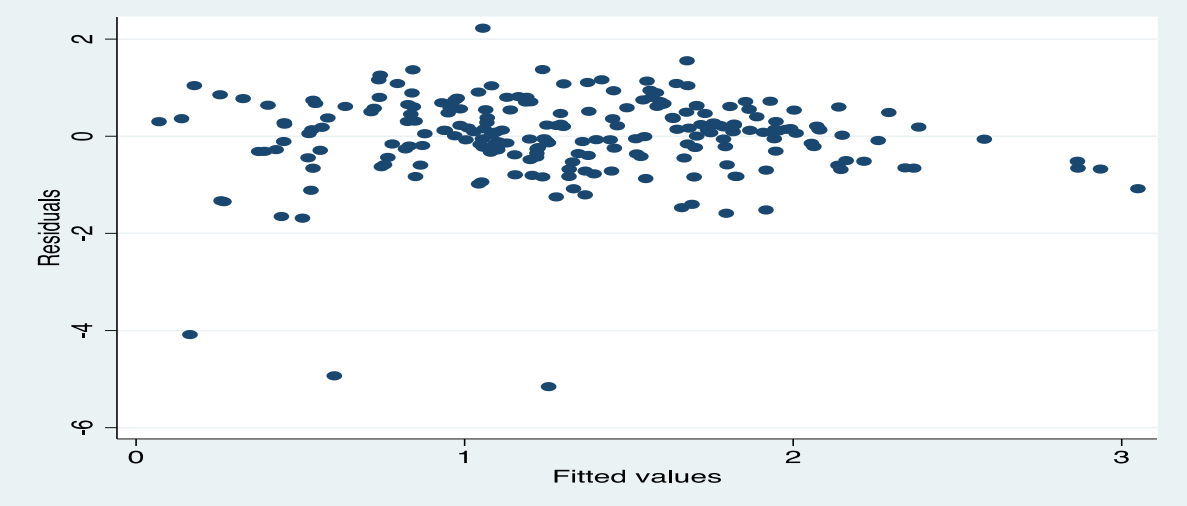

Table B3.28: HCDI - Correlation Matrix of the Explanatory Variables for All Types of Banks

	residu~s	roaa	hci	bsize	lor	keinx	gdp	ageop	dummyc~s	dummyt~e
residuals	1.0000									
roaa	0.5510	1.0000								
hci	0.0463	0.0255	1.0000							
bsize	0.6885	0.3794	0.1380	1.0000						
lor	0.4297	0.2368	0.0125	0.2137	1.0000					
keinx	0.4960	0.2733	-0.1249	0.3045	0.1823	1.0000				
gdp	0.4855	0.2675	-0.1152	0.0674	0.2377	-0.0693	1.0000			
ageop	0.4293	0.2366	0.0143	0.2964	0.0365	0.0237	-0.1314	1.0000		
dummycrisis	0.0255	0.0140	0.1066	0.0858	0.0893	0.5368	-0.2540	0.0661	1.0000	
dummytype	-0.5631	-0.3102	0.1369	-0.3855	0.0604	-0.1265	-0.1056	-0.4585	0.0000	1.0000

Table B3.29: SCDI - Variance Inflation Factor for All Types of Banks

Variable	VIF	1/VIF
keinx	1.61	0.622532
dummytype	1.54	0.648654
dummycrisis	1.54	0.650709
bsize	1.40	0.715631
ageop	1.39	0.717664
gdp	1.24	0.806025
lor	1.23	0.812062
sci	1.06	0.942827
Mean VIF	1.38	

Figure B3.15: SCDI - Variance of Residuals for All Types of Banks

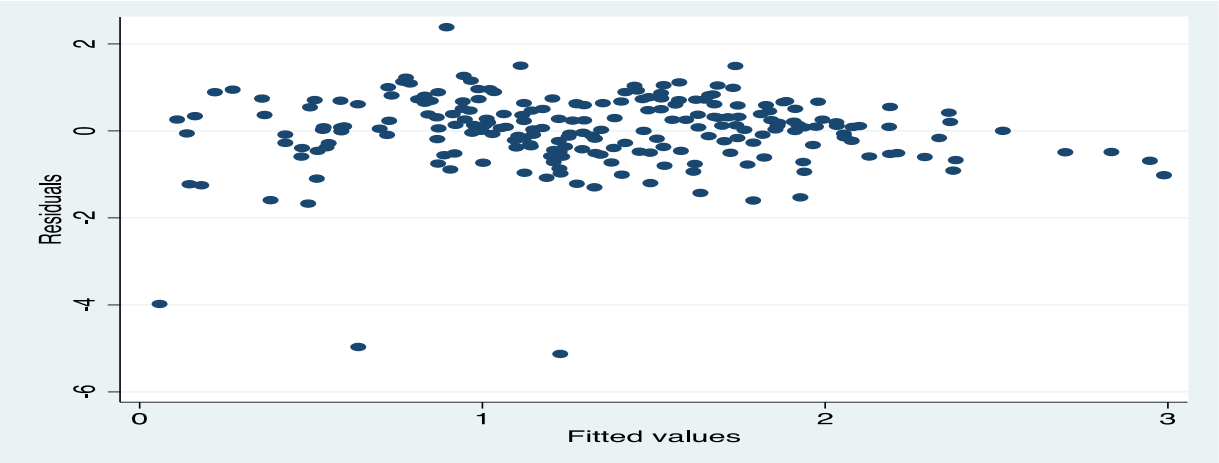

Table B3.30: SCDI - Correlation Matrix of the Explanatory Variables for All Types of Banks

	residu~s	roaa	sci	bsize	lor	keinx	gdp	ageop	dummyc~s	dummyt~e
residuals	1.0000									
roaa	0.5533	1.0000								
sci	0.1399	0.0774	1.0000							
bsize	0.6856	0.3794	0.0426	1.0000						
lor	0.4279	0.2368	-0.1165	0.2137	1.0000					
keinx	0.4939	0.2733	0.0475	0.3045	0.1823	1.0000				
gdp	0.4834	0.2675	0.0074	0.0674	0.2377	-0.0693	1.0000			
ageop	0.4275	0.2366	-0.0557	0.2964	0.0365	0.0237	-0.1314	1.0000		
dummycrisis	0.0254	0.0140	0.0723	0.0858	0.0893	0.5368	-0.2540	0.0661	1.0000	
dummytype	-0.5607	-0.3102	0.1128	-0.3855	0.0604	-0.1265	-0.1056	-0.4585	0.0000	1.0000

Table B3.31: RCDI - Variance Inflation Factor for All Types of Banks

Variable	VIF	1/VIF
keinx	1.61	0.622785
dummycrisis	1.57	0.636396
dummytype	1.52	0.657419
bsize	1.46	0.685259
ageop	1.40	0.713623
gdp	1.24	0.803371
lor	1.20	0.832738
rci	1.12	0.895322
Mean VIF	1.39	

Figure B3.16: RCDI - Variance of Residuals for All Types of Banks

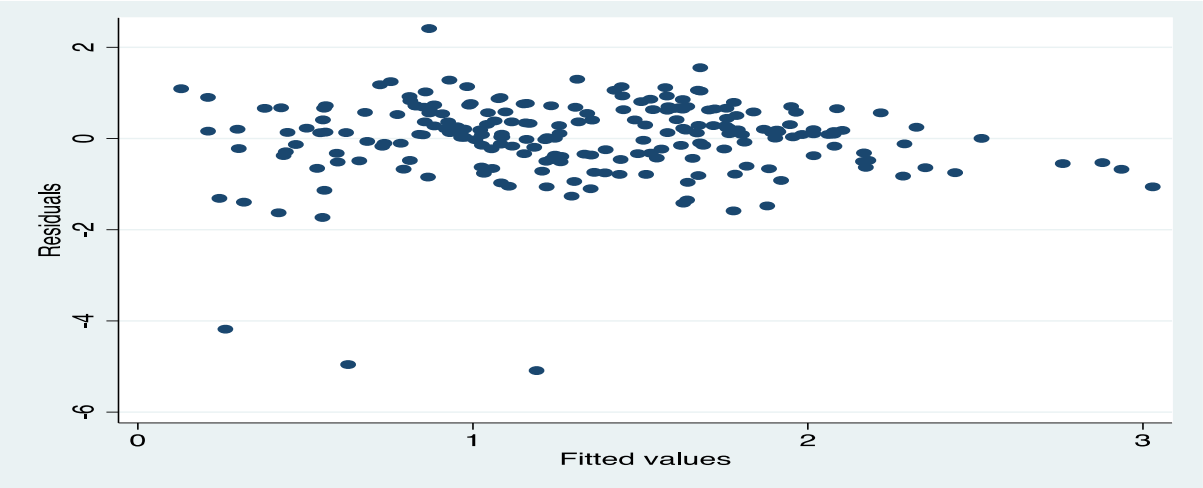

Table B3.32: RCDI - Correlation Matrix of the Explanatory Variables for All Types of Banks

	residu~s	roaa	rci	bsize	lor	keinx	gdp	ageop	dummyc~s	dummyt~e
residuals	1.0000									
roaa	0.5458	1.0000								
rci	0.1764	0.0963	1.0000							
bsize	0.6951	0.3794	0.2026	1.0000						
lor	0.4338	0.2368	0.0219	0.2137	1.0000					
keinx	0.5007	0.2733	0.1484	0.3045	0.1823	1.0000				
gdp	0.4901	0.2675	0.0513	0.0674	0.2377	-0.0693	1.0000			
ageop	0.4334	0.2366	-0.0660	0.2964	0.0365	0.0237	-0.1314	1.0000		
dummycrisis	0.0257	0.0140	0.1796	0.0858	0.0893	0.5368	-0.2540	0.0661	1.0000	
dummytype	-0.5684	-0.3102	0.0447	-0.3855	0.0604	-0.1265	-0.1056	-0.4585	0.0000	1.0000

Table B3.33: ICDI - Variance Inflation Factor for Islamic Banks

Variable	VIF	1/VIF
crisisdummy	1.60	0.626586
keinx	1.51	0.662625
ageop	1.43	0.699317
bsize	1.41	0.711264
gdp	1.15	0.867395
lor	1.12	0.890194
icdi	1.06	0.947335
Mean VIF	1.32	

Figure B3.17: ICDI - Variance of Residuals for Islamic Banks

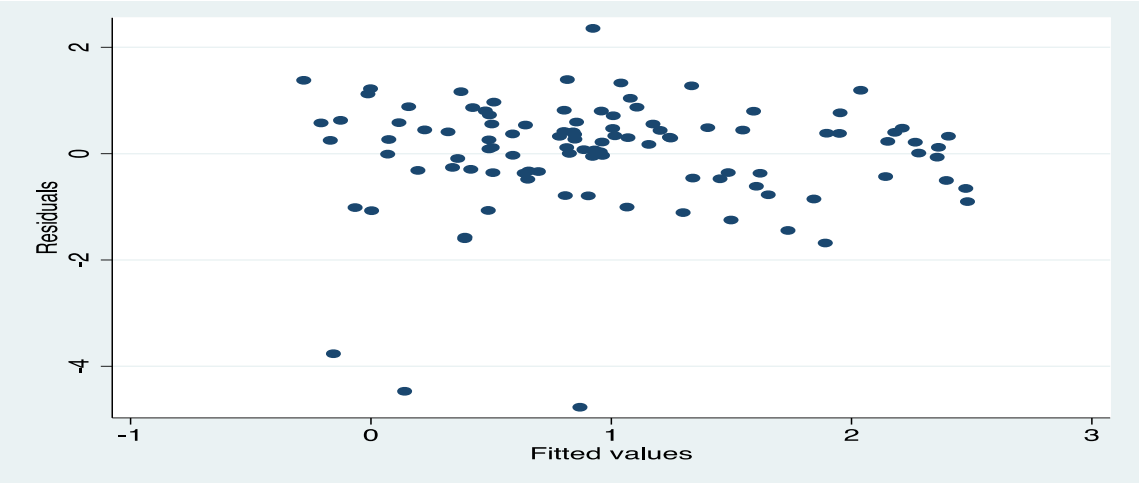

Table B3.34: ICDI - Correlation Matrix of the Explanatory Variables for Islamic Banks

	roaa	icdi	bsize	lor	keinx	gdp	ageop	crisis~y
roaa	1.0000							
icdi	0.1810	1.0000						
bsize	0.3747	0.1249	1.0000					
lor	0.2976	0.0256	0.1953	1.0000				
keinx	0.2115	0.1103	0.1307	0.1358	1.0000			
gdp	0.3313	-0.0714	0.0623	0.1909	-0.0790	1.0000		
ageop	0.1662	0.1928	0.5144	0.1953	0.0557	-0.0459	1.0000	
crisisdummy	0.0879	0.1146	0.0760	0.1021	0.5650	-0.2615	0.0793	1.0000

Table B3.35: HCDI - Variance Inflation Factor for Islamic Banks

Variable	VIF	1/VIF
crisisdummy	1.61	0.622092
keinx	1.55	0.647030
bsize	1.41	0.708707
ageop	1.40	0.714579
gdp	1.17	0.855593
lor	1.15	0.865897
hcdi	1.08	0.927660
Mean VIF	1.34	

Figure B3.18: HCDI - Variance of Residuals for Islamic Banks

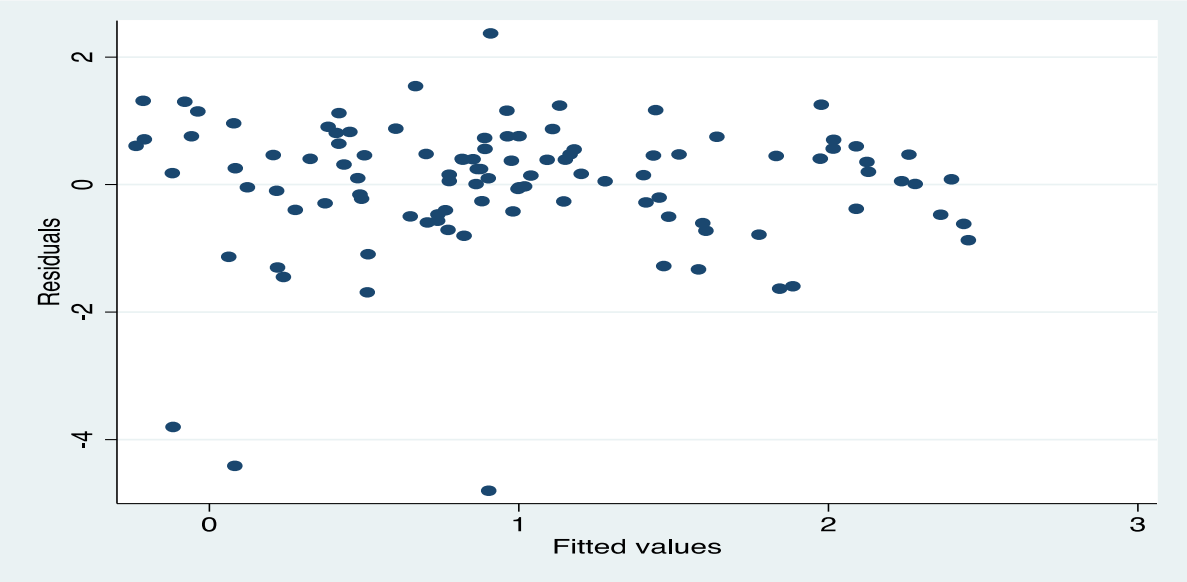

Table B3.36: HCDI - Correlation Matrix of the Explanatory Variables for Islamic Banks

	roaa	hcdi	bsize	lor	keinx	gdp	ageop	crisis~y
roaa	1.0000							
hcdi	0.1000	1.0000						
bsize	0.3747	0.0928	1.0000					
lor	0.2976	0.1509	0.1953	1.0000				
keinx	0.2115	-0.0857	0.1307	0.1358	1.0000			
gdp	0.3313	-0.1067	0.0623	0.1909	-0.0790	1.0000		
ageop	0.1662	0.0937	0.5144	0.1953	0.0557	-0.0459	1.0000	
crisisdummy	0.0879	0.0634	0.0760	0.1021	0.5650	-0.2615	0.0793	1.0000

Table B3.37: SCDI - Variance Inflation Factor for Islamic Banks

Variable	VIF	1/VIF
crisisdummy	1.59	0.627699
ageop	1.53	0.654770
keinx	1.53	0.655499
bsize	1.41	0.711671
scdi	1.16	0.863961
lor	1.15	0.868596
gdp	1.15	0.868818
Mean VIF	1.36	

Figure B3.19: SCDI - Variance of Residuals for Islamic Banks

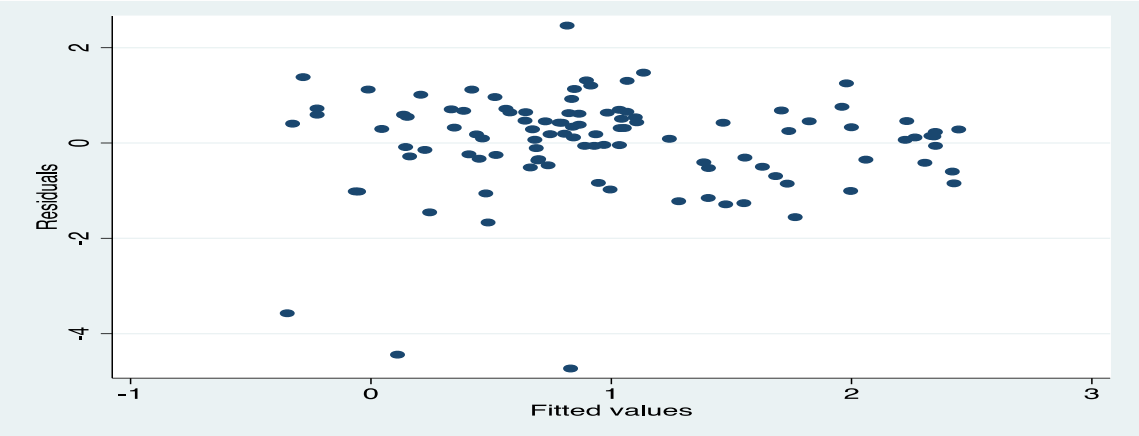

Table B3.38: SCDI Correlation Matrix of the Explanatory Variables for Islamic Banks

	roaa	scdi	bsize	lor	keinx	gdp	ageop	crisis~y
roaa	1.0000							
scdi	0.1952	1.0000						
bsize	0.3747	0.1719	1.0000					
lor	0.2976	-0.0694	0.1953	1.0000				
keinx	0.2115	0.1335	0.1307	0.1358	1.0000			
gdp	0.3313	-0.0483	0.0623	0.1909	-0.0790	1.0000		
ageop	0.1662	0.3162	0.5144	0.1953	0.0557	-0.0459	1.0000	
crisisdummy	0.0879	0.0859	0.0760	0.1021	0.5650	-0.2615	0.0793	1.0000

Table B3.39: RCDI - Variance Inflation Factor for Islamic Banks

Variable	VIF	1/VIF
crisisdummy	1.59	0.627677
keinx	1.57	0.638105
ageop	1.41	0.707568
bsize	1.41	0.711463
gdp	1.15	0.867860
lor	1.13	0.883307
rcdi	1.08	0.929911
Mean VIF	1.33	

Figure B3.20: RCDI - Variance of Residuals for Islamic Banks

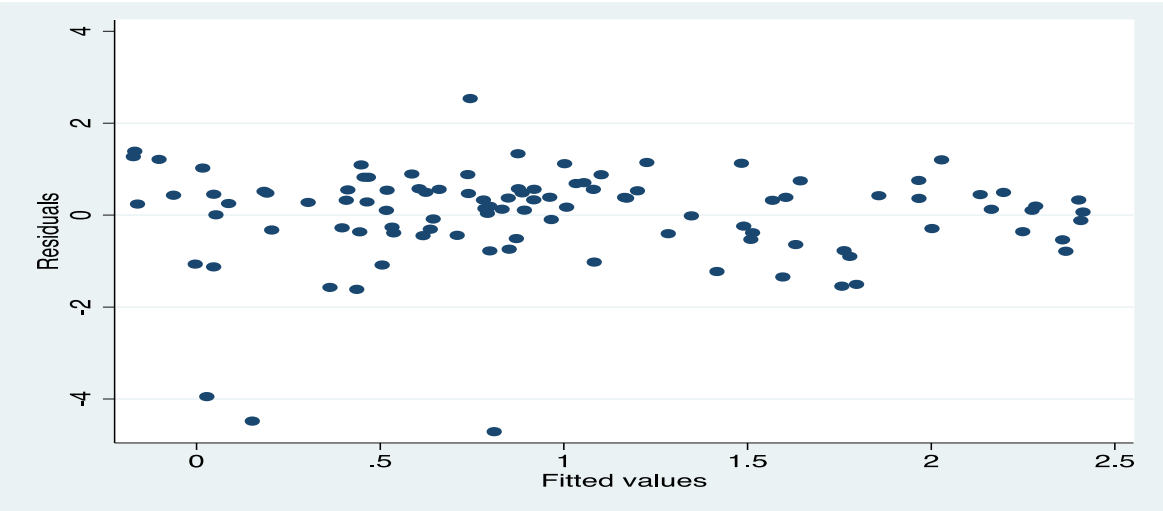

Table B3.40: RCDI - Correlation Matrix of the Explanatory Variables for Islamic Banks

	roaa	rcdi	bsize	lor	keinx	gdp	ageop	crisis~y
roaa	1.0000							
rcdi	0.1500	1.0000						
bsize	0.3747	0.0514	1.0000					
lor	0.2976	-0.0344	0.1953	1.0000				
keinx	0.2115	0.2336	0.1307	0.1358	1.0000			
gdp	0.3313	-0.0103	0.0623	0.1909	-0.0790	1.0000		
ageop	0.1662	0.0970	0.5144	0.1953	0.0557	-0.0459	1.0000	
crisisdummy	0.0879	0.1324	0.0760	0.1021	0.5650	-0.2615	0.0793	1.0000

Table B3.41: ICDI - Variance Inflation Factor for Conventional Banks

Variable	VIF	1/VIF
keinx	1.76	0.567573
crisisdummy	1.64	0.610241
bsize	1.49	0.673292
lor	1.37	0.727910
gdp	1.36	0.734252
icdi	1.31	0.763204
ageop	1.19	0.843289
Mean VIF	1.45	

Figure B3.21: ICDI - Variance of Residuals for Conventional Banks

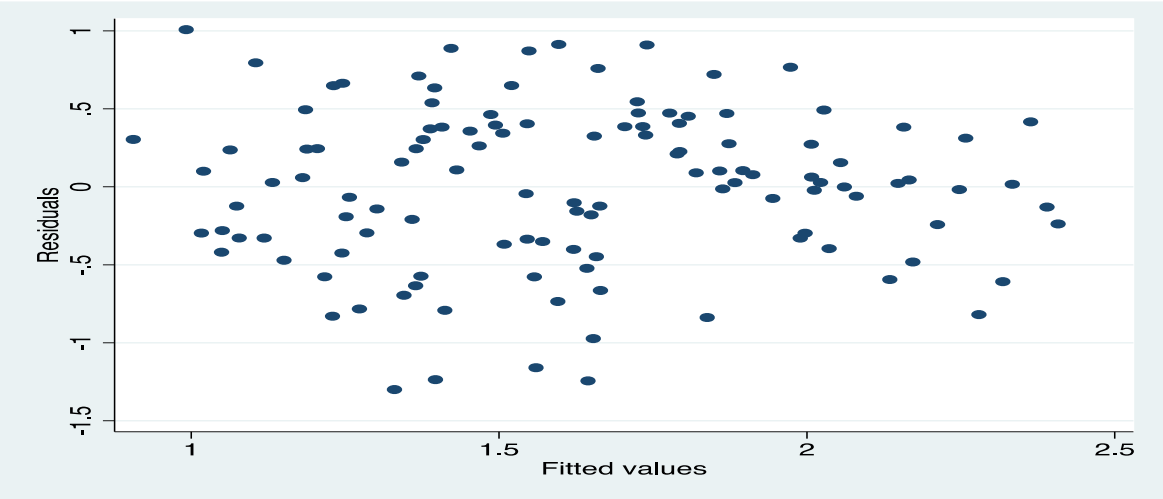

Table B3.42: ICDI - Correlation Matrix of the Explanatory Variables for Conventional Banks

	roaa	icdi	bsize	lor	keinx	gdp	ageop	crisis~y
roaa	1.0000							
icdi	0.0662	1.0000						
bsize	0.3470	0.2986	1.0000					
lor	0.2325	-0.0918	0.3235	1.0000				
keinx	0.3562	0.0094	0.3553	0.2498	1.0000			
gdp	0.1637	0.0403	0.0156	0.3040	-0.0873	1.0000		
ageop	0.0490	-0.1337	-0.0070	-0.0422	-0.1061	-0.3155	1.0000	
crisisdummy	-0.1118	0.1873	0.1066	0.0770	0.5232	-0.2510	0.0707	1.0000

Table B3.43: HCDI - Variance Inflation Factor for Conventional Banks

Variable	VIF	1/VIF
keinx	1.91	0.523252
crisisdummy	1.65	0.604817
bsize	1.58	0.633504
hcdi	1.42	0.706574
lor	1.40	0.714475
gdp	1.35	0.743423
ageop	1.15	0.866469
Mean VIF	1.49	

Figure B3.22: HCDI - Variance of Residuals for Conventional Banks

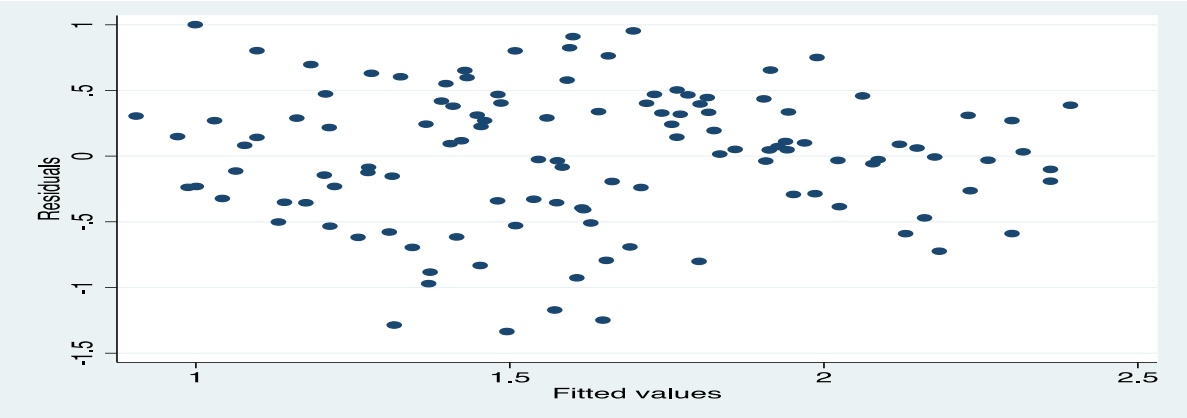

Table B3.44: HCDI - Correlation Matrix of the Explanatory Variables for Conventional Banks

	roaa	hcdi	bsize	lor	keinx	gdp	ageop	crisis~y
roaa	1.0000							
hcdi	0.0241	1.0000						
bsize	0.3470	0.2920	1.0000					
lor	0.2325	-0.1731	0.3235	1.0000				
keinx	0.3562	-0.1324	0.3553	0.2498	1.0000			
gdp	0.1637	-0.0995	0.0156	0.3040	-0.0873	1.0000		
ageop	0.0490	0.0832	-0.0070	-0.0422	-0.1061	-0.3155	1.0000	
crisisdummy	-0.1118	0.1522	0.1066	0.0770	0.5232	-0.2510	0.0707	1.0000

Table B3.45: SCDI - Variance Inflation Factor for Conventional Banks

Variable	VIF	1/VIF
keinx	**1.67**	**0.597559**
crisisdummy	**1.51**	**0.661006**
lor	**1.39**	**0.720329**
gdp	**1.36**	**0.736997**
bsize	**1.27**	**0.786467**
ageop	**1.23**	**0.813305**
scdi	**1.17**	**0.857951**
Mean VIF	**1.37**	

Figure B3.23: SCDI - Variance of Residuals for Conventional Banks

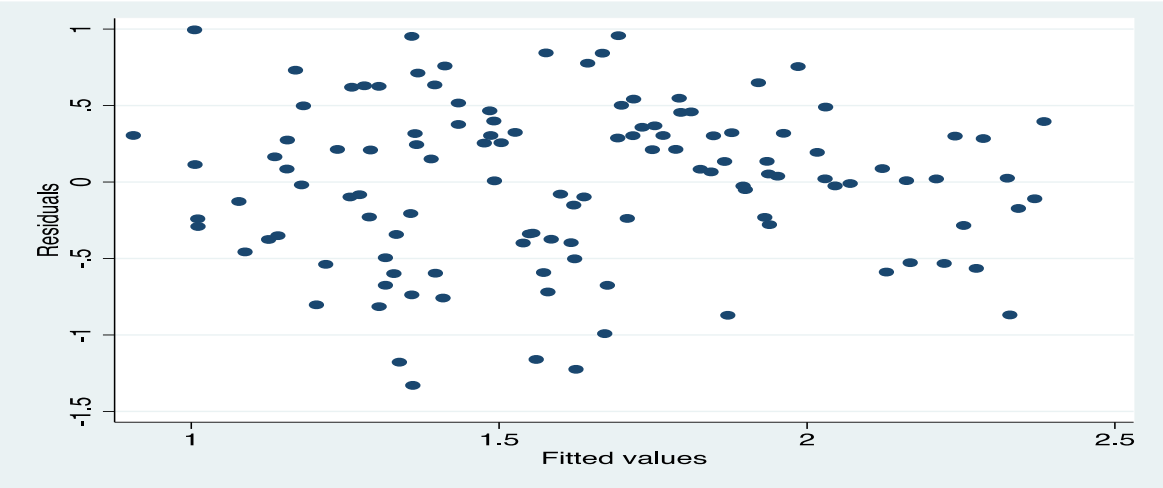

Table B3.46: SCDI - Correlation Matrix of the Explanatory Variables for Conventional Banks

	roaa	scdi	bsize	lor	keinx	gdp	ageop	crisis~y
roaa	**1.0000**							
scdi	**0.0006**	**1.0000**						
bsize	**0.3470**	**0.0616**	**1.0000**					
lor	**0.2325**	**-0.1845**	**0.3235**	**1.0000**				
keinx	**0.3562**	**0.0056**	**0.3553**	**0.2498**	**1.0000**			
gdp	**0.1637**	**0.0746**	**0.0156**	**0.3040**	**-0.0873**	**1.0000**		
ageop	**0.0490**	**-0.2586**	**-0.0070**	**-0.0422**	**-0.1061**	**-0.3155**	**1.0000**	
crisisdummy	**-0.1118**	**0.0611**	**0.1066**	**0.0770**	**0.5232**	**-0.2510**	**0.0707**	**1.0000**

Table B3.47: RCDI - Variance Inflation Factor for Conventional Banks

Variable	VIF	1/VIF
keinx	**1.70**	**0.588429**
crisisdummy	**1.61**	**0.622388**
bsize	**1.40**	**0.713086**
gdp	**1.37**	**0.731220**
lor	**1.31**	**0.762221**
rcdi	**1.23**	**0.811464**
ageop	**1.18**	**0.849658**
Mean VIF	**1.40**	

Figure B3.24: RCDI - Variance of Residuals for Conventional Banks

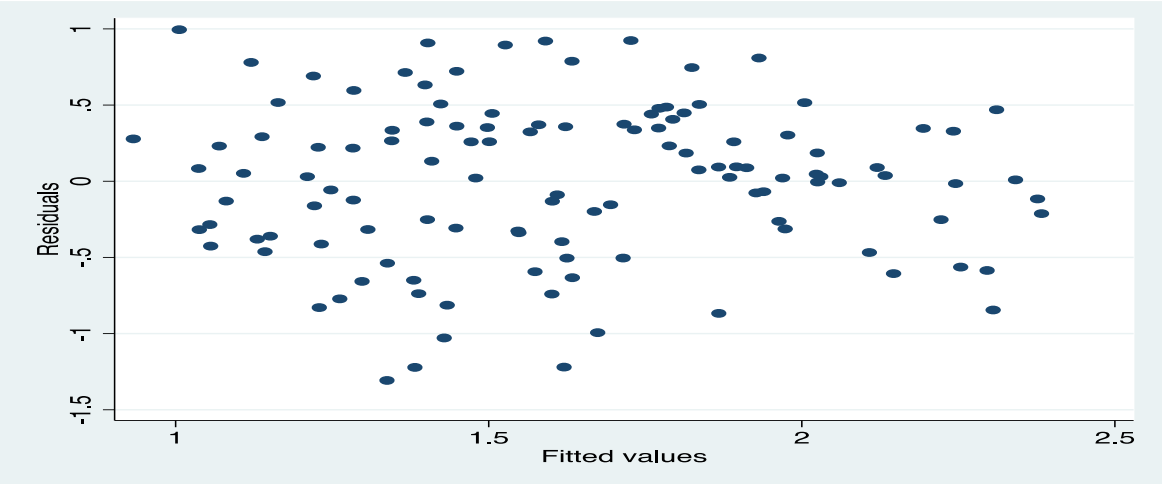

Table B3.48: RCDI - Correlation Matrix of the Explanatory Variables for Conventional Banks

	roaa	rcdi	bsize	lor	keinx	gdp	ageop	crisis~y
roaa	**1.0000**							
rcdi	**0.1016**	**1.0000**						
bsize	**0.3470**	**0.3112**	**1.0000**					
lor	**0.2325**	**0.0638**	**0.3235**	**1.0000**				
keinx	**0.3562**	**0.1086**	**0.3553**	**0.2498**	**1.0000**			
gdp	**0.1637**	**0.0975**	**0.0156**	**0.3040**	**-0.0873**	**1.0000**		
ageop	**0.0490**	**-0.1402**	**-0.0070**	**-0.0422**	**-0.1061**	**-0.3155**	**1.0000**	
crisisdummy	**-0.1118**	**0.2142**	**0.1066**	**0.0770**	**0.5232**	**-0.2510**	**0.0707**	**1.0000**