



# ASSESSING KUWAIT FINANCIAL STABILITY: PROPOSING A FINANCIAL STABILITY INDEX FOR KUWAIT

أحد مشاريع



The 2022 Third Place Research Paper Winner  
"Kuwaiti Economic Student Prize"

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# **ASSESSING KUWAIT FINANCIAL STABILITY: PROPOSING A FINANCIAL STABILITY INDEX FOR KUWAIT**

**Abdullah Saad Alsarea**

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# ABSTRACT

This research attempt to assess Kuwait financial system stability and proposed a financial stability index for Kuwait. The research used ten years quarterly span data starting from Q1-2010 to Q1-2020 and covered three market sector that includes banks, capital market, and real estate market. The research utilized twenty indicators including and used three different approaches to construct the proposed index namely: Variance Equal Weights (VEW), Hybrid Method (HM) and the Principal Component Analysis (PCA).

The research found a correlation of the proposed financial stability index with the GDP growth as well as the ability to capture business cycle and high financial instability during the sample period. The result also identified the correlation of the financial stability and the following variables: Capital Adequacy Ratio, Non-Performing Loans Ratio, Non-Performing Loans net of provisions to Capital Ratio, Return on Assets, Return on Equity, Capital to Assets Ratio, Total Credit to Total Deposit, Liquid Assets Ratio, Capital Market Quarterly Returns, Real Estate Loans to Total Loans. Also, this empirical research indicate that banks capital adequacy ratio and non-performing loans ratio are important variables and should be monitored by the policymakers and regulator along with the other variables. In addition, this research is consistent with the literature that financial institutes tend to increase their capital adequacy and provisions during the economy growth and high instability periods. Finally, this research suggests considering the proposed index under the Hybrid Method (HM) and the Principal Component Analysis (PCA) as a lead indicator and a starting point to assess and monitor Kuwait financial system stability on quarterly basis.

**Keywords:** Financial Stability Index, Financial Soundness Indicators, Capital Adequacy Ratio, Non-Performing Loans Ratio, Principal Component Analysis, Kuwait.

## **LIST OF ABBREVIATIONS**

BGIG	Gross Income Growth
CAR	Capital Adequacy Ratio
CBK	The Central Bank of Kuwait
CSB	The Central Statistical Bureau
CTA	Capital to Assets Ratio
CTD	Total Credit to Total Deposit
EMPI	Exchange market pressure index
GCC	Gulf Cooperation Council
GDP	Gross Domestic Product
GLG	Gross Loans Growth Ratio
IMF	International Monetary Fund
IMR	Interest Margin to Gross Income
IRS	Interest rate, spread
KFSI	Kuwait Financial Stability Index
LAR	Liquid Assets Ratio
Mkt.Cap	Market Capitalization Growth
Mkt.Return	Capital Market Quarterly Returns
MOF	Ministry of Finance.
Net NPLs%	Non-Performing Loans net of provisions to Capital Ratio
NFETC	Net Foreign-Exposure to Total Capital
NPLs	Non-Performing Loans
NPLs%	Non-Performing Loans Ratio
OECD	Organization for Economic Co-operation and Development
PCA	Principal Component Analysis
RELG	Real Estate Loans Growth%

RELTL	Real Estate Loans to Total Loans
REPG	Real Estate Prices Growth%
RETG	Real Estate Trading Growth
ROA	Return on Assets
ROE	Return on Equity
SMEs	Subject Matter Experts

## **CHAPTER ONE: INTRODUCTION**

This research attempts to assess Kuwait financial stability and propose a financial stability index for Kuwait. this research will provide an overview of Kuwait financial system and its relevance and importance towered achieving Kuwait vision 2035 that aims to transform the state to a regional financial and trade hub. The vision was launched in 2017 consist of seven pillars and 106 projects to secure state's economy and sustainable diversified economy, effective civil service, sustainable living environment, developed infrastructure, high quality healthcare, creative human capital, and global positioning. The main objectives of the vision are to utilize state's resources efficiently and to diversify its business and source of income by developing the non-oil sector. It is worth to highlight that Kuwait is highly depending on oil industries which comprise 93% of the state's revenue and 54% of its Gross Domestic Product (GDP) in average for the last ten years.

### **1.1 An Overview:**

Though Kuwait government has been engaged in several initiatives and interventions towards achieving its vision as illustrated in Table 8, it has not indicated any provision or adoption of any financial measuring tool to measure the effectiveness of these initiatives and interventions with regards to their economic impact and toward the achievements of its sustainable and diversified economy objectives. Many countries developed and published several financial and economic indicators to assess their financial and economic stability. For example, The United State of America (USA) has several published indexes such as real estate, financial stability, consumer confidence, price index, etc. UAE has several published indexes such as The United Arab Emirates (UAE) composite financial stability index, Dubai real estate index, industrial index, tourism index ...etc. As a matter of fact, other Gulf Cooperation Council (GCCs) members countries has at least one index or more to capture economic movement. While Kuwait utilizing its GDP, international oil prices and Kuwait Stock Exchange Index as a financial indicator which is not adequate in modern economic terms and would impact the efforts of Kuwait to achieve its vision. Furthermore, a preliminary investigation has been conducted and found that Kuwait does not have financial stability index or real estate index. Also, using GDP as an indicator are lagged and published after nine months of each quarter closing in addition to the lagged information and reports that are available on the main source of economic information in Kuwait such The Central Statistical Bureau (CSB), The Central Bank of Kuwait (CBK), and Ministry of Finance (MOF).

Moreover, due to the fierce competition in the region and fluctuations of the international oil prices Kuwait needs to maintain its comparative advantage to attract foreign direct investments and foreign portfolio investment to achieve its vision. Many global comparative indicators have been developed by international institutes and publicly reference such as Human Development Index, Ease of Doing Business, The Global Financial Centers Index, World Happiness Index, The Corruption Perceptions Index, Education Index, and Index of Economic Freedom. Kuwait attained low ranking globally and regionally on those indicators as illustrated in **Table 1**

Table 1 Kuwait Ranking

Index	Year	Global Ranking	GCC Ranking
(Human Development Index (HDI	2020	64	6
(Ease of Doing Business (EDB	2020	83	6
(The Global Financial Centers Index (GFCI	2020	103	6
(World Happiness Index (WHI	2020	48	4
(The Corruption Perceptions Index (CPI	2020	78	6
Education Index	2015	120	6
Index of Economic Freedom	2020	79	5

Hence, Kuwait ability to achieve its vision depends on its strengths and comparative advantages, several meetings with SMEs have been conducted to investigate the matter and address the current challenges from different perspective. Several questions have been asked such as if Kuwait is capable to achieve its 2035 vision to transform into a regional trade and financial hub, what is the comparative advantage of Kuwait, and if Kuwait has strong financial system (A.Alsarea, personal communication, 2020)

All consulted SMEs agreed that there are many challenges and obstacles that might prevent Kuwait from achieving its vision such as lack of efficient strategic plan and lack of public data to measures and monitoring economy growth. On the other hand, they consented that Kuwait high income, high reserves and strong financial system are advantages that need to be maintained and improved. Despite that SMEs` response were disputing about Kuwait capability to transform into financial hub the main questions remain if Kuwait has strong financial system that can attract and maintain international investments and portfolios (A.Alsarea, personal communication, 2020).

During the last ten years, The International Monetary Fund (IMF)



developed the Financial Soundness indicators (FSIs) which have been endorsed and widely adopted by policymakers and regulators in both advanced and emerging economies as it provides insights about economy health and soundness. Where only 46 countries reported their FSIs in 2009 compared to 139 countries in 2019. The increase of reporting countries as shown in **Figure 1** indicates the global trend and importance of such indicators to compare the financial stability of different countries/region to establish business relationships and attract international direct portfolio and investments. Even though, IMF succeeded to promote its FSIs, still there are no consent on the methodology of constructing the financial stability index. All studies highlighted that the quality of the index depends on the quality of the data and variable selections which should be based on country's economy structure, data availability and data reliability (Balakrishnan, Danninger, Elekdag, & Tytell, 2009).

As indicated by the IMF, The Central Bank of Kuwait (CBK) and Capital Market Authority (CMA) have been approached to investigate the current utilized measures and indicators to assess and monitor Kuwait financial system. CBK and CMA had several attempts to develop a financial stability index for Kuwait. However, those indexes have not been published yet due to the need of further validation and verification (A. Alsarea, personal communication, 2020). Yet there is no consent of how such an index should be developed. Moreover, All the consulted SMEs agreed that Kuwait lacked long time series data similar to advanced economies and there is a research gap as there is no research has been yet conducted specifically for Kuwait.

Figure 1 IMF's FSIs Report



Source: (IMF, 2020a)

## **1.2 Problem Definition and Research Objective:**

Now that it is evident that Kuwait lacks a well-advised financial stability index, several questions lend themselves to the researchers as followings; what is the financial stability, what are the sources of potential risk and financial instability, who would be interested of such information, how could financial instability be measured and monitored, what would be the most appropriate approach to develop a measurement tool or index, is it appropriate tool for country that relies on a solo source of income such as Kuwait, what market sectors and variables should be included, and what are the adequate data analysis techniques should be used.

While the ultimate objective of this research is to assess Kuwait financial stability and to propose a financial stability index for Kuwait to enable the policy and decision makers to assess and monitor Kuwait financial system stability and to propose an effective financial and economic policies.

## **1.3 Research Methodology and Data Analysis Method:**

To achieve research objective, an empirical test based on Balakrishnan et al. (2009) Emerging Markets Financial Stability Index Model (EM-FSI) has been conducted with adjustments to suit Kuwait economy structure and the data availability. The research used ten years quarterly span data starting from Q1-2010 to Q1-2020 and covered banking sector, capital market, and real estate market. Three methodologies have been utilized to construct the proposed index which were the most common used approaches by the literature namely: Variance Equal Weights approach (EVW), Hybrid approach (HM) and Pinchable Component Analysis approach (PCA). Also, visual, and statistical analysis will be employed to verifies the proposed index and assess its ability to capture business cycle and financial instability.

## **1.4 Thesis Structure:**

The research consists of five chapters and structured as followings: chapter one starts with an overview of the problem and its relevance to the country of Kuwait. Also, the chapter defined the research objectives and briefly describe research methodology and data analysis tool. While chapter two attempts to read into the influential theories, frameworks, and critic of the best practices to develop a thorough understanding of the research questions. Then, chapter three will discuss the specific methods by which the research and analyses were conducted. It starts with problem definition and research objectives, then, it moves to the data and variables selection methodology. Followed by presenting the research approach and

data analysis tool. Hereafter, chapter four analyses the assembled data and compare the results of each methodology followed by the discussion and findings. Finally, chapter five draws together the key findings, making the research conclusion, recommendation, and suggestion for the future research.

## **CHAPTER TWO: LITERATURE REVIEW**

This chapter aims to developing better understanding of the concept of financial stability index, it attempts to trace the origins the best practices and impact from scholars` perspective. The search in the literature is an attempt develop a most suitable design of a financial stability index for Kuwait.

### **2.1 Overview of the financial Sector:**

Financial system today, as points out by Mishkin (2011) is the engine of any economy as it plays vital role as the main focal point in any business and social activity. The United State Census Bureau`s North American Industry Classification System (2017), determined three main functions for the financial system. First, Raising Funds by taking deposits, issuing securities, and processing the incurred liabilities. Second, Pooling of risk by underwriting insurance collecting fees, insurance premiums, or annuity considerations; build up reserves; invest those reserves; and make contractual payments. Finally, providing Specialized Services by facilitating or supporting financial intermediation, insurance, and employee benefit programs. Therefore, financial instability could affect people lives and wealth as well as business activities, international trades, and obligations fulfilment capability.

Whilst Adeishvili (2013) agrees that banks became **intermediates** in all financial transactions such as accepting deposit, providing loans, generate information, validate creditworthiness of customers, providing effective payment and settlement systems to support economy`s functionality and growth. He pointed out to banks and financial system sensitivity to bad events and rumors as they are interconnected and dominating other parts of the economy. Therefore, it can cause severe consequences due to banks business model and nature as they have a highly leveraged capital structure with a complex and non-transparent assets and liabilities that relays on taking risk to fulfil the mismatch of liquidity and credit gap. Also, Adeishvili (2013) explained the importance of policymakers and regulators` essential role to ensure transparency and maintaining the confidence in the financial system to protect depositors and control banks risk-taking process by applying control measures such as capital ratio, required reserve ratio, liquidity coverage ratio and credit rating. In addition, ensuring banks financial reporting and disclosures requirements that fairly represent banks financial position, outlook, and their ability to resist any local or global financial shock.

## **2.2 Financial Stability:**

According to Mishkin (1990), financial stability could be defined as the capability and efficiency of resources allocations to operate the financial system without disruption. Schinasi (2005), agrees and elaborated by specifically mentioning the financial stability occurred when economic processes are enhanced, risks are reduced, and the system can absorb financial shocks. In other word, financial stability can be defined by its absence, where financial system is disrupted and incapable to function efficiently. Whereby, systematic risk, credit risk, and operational risk massively threaten liquidity, payment systems and asset's value deterioration leading to serious economic, social, and environment problems. Thus, one can define financial stability occurred when financial institutions and payment services are operating smoothly without interruption, systematic, operational and credit risks are defined, measured, and monitored, and finally the financial system can predict and cope with national and international financial shocks (Babar, Latief, Ashraf, & Nawaz, 2019).

Financial instability and risks factors also have been subject of several studies as they evolved in line with the development of financial industry. Many researchers have studied those factors such as Houben, Kakes and Schinasi (2004), who identified and clustered the potential risk sources into endogenous and exogenous factors that include institutional, operational, market, Infrastructural, collapse of confidence, domino effects in addition to macroeconomic disturbances and event risk as shown in Figure 2. Apparently, the significant of each factor depends on country's economy structure and financial system efficiency.

Figure 2 Source of Financial Risks and Instability

Endogenous		Exogenous
<p><b>Institutions-based:</b></p> <ul style="list-style-type: none"> <li>&gt; Financial risks</li> <li>- Credit</li> <li>- Market</li> <li>- Liquidity</li> <li>- Interest rate</li> <li>- Currency</li> </ul> <p>&gt; <b>Operational risk</b></p> <ul style="list-style-type: none"> <li>- Information technology</li> <li>- Weaknesses</li> <li>- Legal/integrity risk</li> <li>- Reputation risk</li> <li>- Business strategy risk</li> <li>- Concentration risk</li> <li>- Capital adequacy risk.</li> </ul>	<p><b>Market-based:</b></p> <ul style="list-style-type: none"> <li>&gt; Counterparty risk</li> <li>&gt; Asset price misalignments</li> <li>&gt; Run on markets.</li> <li>- Credit</li> <li>- Liquidity</li> <li>- Contagion</li> </ul> <p><b>Infrastructure-based:</b></p> <ul style="list-style-type: none"> <li>&gt; Clearance, payment, and settlement system risk</li> <li>&gt; Infrastructure fragilities</li> <li>&gt; Legal</li> <li>&gt; Regulatory</li> <li>&gt; Accounting</li> <li>&gt; Supervisory</li> </ul> <p><b>Collapse of confidence leading to runs.</b></p> <p><b>Domino effects</b></p>	<p><b>Macroeconomic disturbances:</b></p> <ul style="list-style-type: none"> <li>- Economic environment risk</li> <li>- Policy imbalances</li> </ul> <p><b>Event risk</b></p> <ul style="list-style-type: none"> <li>- Natural disaster</li> <li>- Political events</li> <li>- Large business failures</li> </ul>

### 2.3 Financial Stability Measurement:

Furthermore, financial stability measurements still debatable and challengeable according to Adeishvili (2013) due to the continuance development and complexity of the financial industry as well as the increasing interconnection of the global economy. Singala and Asher (2008) agreed and suggested that financial stability could be measured by detecting and identifying risks and sources of the possible financial shocks, measuring, and assessing potential costs and the ability to evaluate the weakness of the financial system (Adeishvili, 2013). Accordingly, many researchers and practitioners proposed different methods and tools to predict failure, monitor and evaluate financial system stability such as Altman’s z-score Model (1968) and the Early Warning Signals Indicators (EWS) that had been used since 1970’s and developed over the time (Filippopoulou, Galariotis, & Spyrou, 2020).

Furthermore, The International Monetary Fund “IMF” and The Bank of International Settlement “BIS” investigate the cause and effects of the international financial crises by focusing particularly on the banking sector in both developing and developed countries which inspired many researchers and practitioners to develop indicators that aim to capture potential financial crisis from specific perspectives. For example, Kaminsky et al. (1998), developed 105 indicators to predict potential currency’s crisis and he founds that effective warning system must include broad variety of financial and non-financial variables to function.

Precisely, Kaminsky et al. (1998) listed five economic indicators that showed its ability to predict currency crisis. These are international reserves, real exchange rate, credit growth, credit to the public sector, and domestic inflation.

On other hand, many studies have been conducted to assess crisis from **banking sector** such as Demirgüç-Kunt & Detragiache (1998) who observed that crises emerge during weak economy, slow GDP growth and high inflation. Moreover, according to Pesola (2001), the main causes of the financial crises in Nordic countries was the financial fragility and the high financial leverage accompanied with a negative financial shock.

Despite, Adeishvili (2013) highlighted wide range of early warning indicators and approaches that have been developed to measure banks and financial system stability such as the CAMELS rating system approach, which ranks banks based on their Capital Adequacy, Assets Quality, Management, Earning, Liquidity and Sensitivity to economy adverse events. Other studies such as Ishrakieh et al., (2020) have concluded that EWS and CAMELS approach were developed on a stand-alone basis without considering their interrelationship and interdependence of other financial and non-financial variables. Therefore, new tools and methodologies have been suggested and introduced by experts such as Financial Conditions Index (FCI) by Bordo et al. (2002) that been adopted by many reputable institutes such as Bloomberg Financial Conditions Index by Rosenberg (2017) and the Federal Reserve Bank of Chicago National Financial Conditions Index by Brave and Butters (2011) (Ghesquiere, McAfee, & Burnett, 2019). Similarly, Financial Stability Index (FSI) that usually dominated by prices indicators such as stock and real estate market prices. Finally, the Composite Financial Stability Index (CFSI) that consolidate several variables or sub-indexes in one single value to monitor and capture market fluctuations to detect potential threats that could emerge to a financial crisis.

According to Ishrakieh et al., (2020), the first traced composite financial stability index was introduced by Illing and Liu (2003). The index aimed to examine Canada systematic risk by constructing three sub-indexes: Banks, Foreign Exchange, Bond, and Equity Markets for the period from 1980 to 2002. Illing and Liu applied several aggregations method such as Principal component analysis (PCA), variance equal weights, and variable transformations based on their sample cumulative distribution functions providing stress measurement that has influenced many researchers cross the globe.

Nelson and Perli (2005), introduced the first Financial Stability Index

for the USA by using economic, qualitative and experts' judgments analysis. The index includes several variables such as interest rates and asset prices, financial fragility, mortgage market, individual institutions, probabilities of multiple defaults for the period 1993 to 2004. At the same time, Hanschel and Monnin (2005) developed a financial stress index and framework to evaluate Swiss banking sector's stability by combines deferent types of economic variables that include real variables, price indices, balance sheet data, and other non-public and public data on yearly basis for the period of 1987–2002. One of Hanschel and Monnin's main objective was to predict economy stress and potential threats through the proposed FSI which found significant link between banking sector's stress level and macroeconomic shocks and it can be used for exploring the potential threats of financial stress or financial crisis. On the other hand, Van den End and Tabbae (2005) developed FSI for The Netherland through calculating financial system default risk by using Macro financial Risk model (MfRisk) that consists of put options of the banking, insurance and pension sectors, Default Risk, Market Prices, Market Volatility, and Interest Rate by using quarterly banks, and market data for the period of 1990-2004. In addition to the proposed FSI, the study emphasize how could the concentrations and the imbalance of financial institutes' assets and liabilities might affect financial stability and proposed a guideline for policymakers. Furthermore, Van Den End (2006) developed composite FCI for Netherlands and six of Organization for Economic Co-operation and Development (OECD) countries by using quarterly data of 1988-2004. The composite index consists of two sub-indexes; Monetary Conditions Index (MCI): Interest rates, the effective exchange rate, and Financial Conditions Index (FCI) that combines house and stock prices. Van Den End used different analysis such as Macro-Financial Risk Model, Merton Option Model and Vector Autoregression Model (VAR) to conclude his study of proofing how could FSI enhance transparency if presented to the public and how significantly market and banks' financial statement could affect financial stability.

Consequently, The International Monetary Fund (IMF) made significant contribution by adopting and promote Babihuga (2007) research that Investigates the relationship between macroeconomic and financial soundness indicators (FSIs) which assembled panel dataset for 96 countries covering the period 1998-2005. Babihuga applied four different methods for estimating macroeconomic effects: pooled ordinary least squares regression model, Fixed effects, Anderson-Hsiao Two Stage Least Square (2SLS), and generalized method of moments (GMM). He finds strong relationship between GDP growth rate and inflation rate as well as the impact of interest and real exchange rate on the financial stability.



Also, Babihuga highlighted how could country's economy "specific characteristics" might affect the relationship of FSIs and macroeconomic variables. Finally, he suggested clustering countries based on its income level, market concentration, quality of the regulatory supervision, financial sector size could improve cross country comparison.

Further research by Cardarelli et al., (2009) developed a framework and constructs market-based monthly financial stress index for 17 developed countries through employing variance weighted approach to aggregate indicators of exchange rate volatility, corporate bond spreads, equity returns, equity volatility, inverted term spread, and TED spread for the period from 1981 to March-2008. This study significantly emphasized the role of financial sector (Banks in particular) and how it can lead to more severe economic downturn which could take five quarter to recover.

In the same objectives, Balakrishnan et al. (2009) introduced The Emerging Markets Financial Stress Index (EM-FSI) that was based on Cardarelli et al., (2009) Financial Stress Index and aim to assess how could the financial stress transmitted from advanced to emerging economies by considering five components: the banking sector beta, stock market returns, time-varying stock market return volatility, sovereign debt spreads, and an exchange market pressure index. This study covered 26 countries spinning the period from January 1997 to March 2009 and segregates financial stress transmission factors to common and country specific factors through three main measures: Global controls, Country characteristics, Financial and trade linkages. The main findings of the study underline how the financial stress tend to spread rapidly from advanced to emerging economies especially those with higher foreign liabilities. Moreover, the study found that emerging countries with lower current account and fiscal deficits during calm periods are able to obtain some buffers against financial stress. However, this buffer is ineffective during the high stress period and the real economy could be affected.

According to Mahmah (2017), the previous three studies influenced many researchers and practitioners to develop and construct different stress and financial stability indexes that been used for cross countries comparison purpose or customized based on each economy structure and data reliability and data availability. Further studies attempt to investigate IMF's Financial Soundness Indicators relevance and importance for different cluster of economies and region. For example, Daly and Akhter (2009) investigate how IMF's Financial Soundness Indicators become compiled and disseminated by many national regulatory authorities due to its ability to assess financial vulnerabilities and prediction of

financial crisis. Moreover, Daly and Akhter develop two additional indices that measure corruption perceptions and degree of economic freedom and observe the relationship with FSI and finds that countries with highest level of economic freedom have lower volume of non-performing loans. Also, Duca and Peltonen (2009) developed Composite Financial Stability Index (CFSI) for 28 advanced and emerging countries with a panel data set of 94 events covering the period of the 1990-2009 to measure the financial instability level at given adverse event. The authors used three main indexes: macroeconomic, asset prices and credit with nine variables and the results showed that credit booms and global developments are more likely to cause financial crisis if policymakers and regulators not coordinating on the national and international level and how it is extremely important for preserving financial stability. Similar, Arzamasov and Penikasa (2014) conduct a cross country study to construct Financial Stability Index for 48 countries by using IMF quarterly Financial Soundness Indicators for the period for 2002 to 2018. The study utilized more than nine data analysis techniques such as panel analysis, linear regression, Jarque-Bera test, mean squared error and Spearman correlation coefficient to find that the best model contains Return on Assets Ratio (ROA) and Regulatory Capital to Risk-Weighted Assets Ratio (CAR) which have strong negative impact on financial stability. Later additional research has been conducted by Kočišová (2015), Zigraiova and Jakubik (2015), and Duprey et al. (2017) agrees on the importance of monitoring economic growth, credit growth, capital adequacy and non-performing loans to measure country's financial stability.

Likewise, many researchers attempted to construct financial stress or stability index on country level by using banking sector and other econometrics data such as Gersl and Hermanek (2007) who developed aggregate financial stability index for Czech Republic by using nine indicators that include financial sector profitability, credit risk, liquidity risk, interest rate risk, and exchange rate risk. They found that using such indicator is adequate, could be useful for a comparison and serve as basis for any sophisticated index that might accurately reflect business cycle. Similarly, Guarda and Rouabah (2007) constructed FSI for Luxembourg by using six variables form the banking sector quarterly data as well as Albulescu and Goyeau (2008) and Manolescu and Manolescu (2017) for Romania, Ali (2012) and El Mahmah (2017) for The UAE, El-Shal (2012) for Egypt, Kondratovs (2012) and Sin et al. (2013) for Latvia, Ekinçi (2013) For Turkey, Koopa and Korobilis (2014) for the USA Chmutova and Biliaieva (2015) for Ukraine, Dumičić (2017) for Croatia, Kapetanios et al., (2017) for the United Kingdom, Arzamasov and Penikasa (2014) for Israel, Roy et al., (2015) for India, Mohammed and AL.Shakargi (2015), Khalaf (2018,

2019) for Iraq. Babar et al., (2019) for Pakistan, Zaytoon (2019) for Palestine, Petronevich and Sahuc (2019) for France, Ishrakieh et al. (2019) for Lebanon.

In regards of the sectors and minimum number of variables that should be consists of the financial stability index, Khalaf (2019) pinpoint that there is no consent regarding the required number of variables to construct such an index which vary from 11 to 21 based on economy's structure and data availability. For example, UAE constructed its CFSI by using 3 sub-indexes and 17 indicators. While Jordan FSI constructed from 3 sub-indexes and 19 indicators, Oman has 6 sub-indexes and 13 indicators, Egypt with 3 sub-indexes and 21 indicators, Turkey has 6 sub-indexes and 13 indicators, India with 5 sub-indexes and 17 indicators, and finally Iraq has 6 sub-indexes and 11 indicators. Therefore, one can conclude that there is no standard to construct the financial stability index as it is reflecting country status and capable to capture the business cycle.

However, Gadanez and Jayaram (2009) summarized the most common used sectors and variables to assess financial stability that have been developed and promoted by policymakers and academic researchers during the last two decades. They highlighted six main sectors commonly used in the literatures. First, the real sector which is represented by the gross domestic product growth rate to indicate economy's ability to create wealth and government fiscal position. Second, corporate credit risk which can be determined by several indicators such as leverage ratio and net foreign exchange exposure to equity. Third, household sector's soundness and income by its net assets, net disposal income, credit growth and consumption. Fourth, the external sector by monitoring real exchange rates, foreign exchange reserves, current account, capital flows and maturity/currency mismatches. Fifth, the financial sector which focused on the monetary and banks indicators such as capital adequacy, assets quality, liquidity, profitability, and concentration of the loans portfolio. Last, the financial markets that includes market returns, leverage, and change in market capitalization value.

## **2.4 Financial Stability Indexes Methodologies :**

Moreover, in reviewing the literatures, it has been noted that many different methodologies and statistical approaches have been utilized in the literatures to construct financial stability index through. In general, most of the studies coincides about data analysis methodology and how data should be normalized by using either normal, empirical, or statistical approaches based on the data set and the unit of measurement. Subsequently, variables weighting techniques should be conducted and

most of the examined studies used Principal Component Analysis (PCA), Variance Equal Weights Method or based on expert's opinion.

The most frequently used method in the literatures was the Variance Equal Weights Method (VEW), which has been used by Gersl and Hermanek (2007), Rouabah (2007), Albulescu (2009), Kirils Kondratovs (2012), Babar et al., (2019), Hanschel and Monnin (2005), Daly and Akhter (2009). Most of the authors agreed that it is easy to calculate and interpret. In the contrary, Gadanecz and Jayaram (2009) suggested that using economic weights or Cumulative Distribution Functions (CDF) could result accurate and better index. However, Illing and Liu (2006) and Balakrishnan et al., (2009) found no significant differences between the two approaches and explained how the index should be constructed by the summation of each variable multiplied by the assigned weight.

The second common method used in literatures the was the Principal Components Analysis (PCA) or Factor analysis (FA) which is a multivariate statistical technique firstly introduced by Karl Pearson (1901) and developed afterwards by Harold Hotelling (1933). According to Mahmah (2017), the approach aims to reduce wide range of variables and extract the common factors from a group of relevant economic series to capture the highest level of common trend. According to Kim & Ko (2020), PCA could simplifies analysis interpretation, capture the highest level of common trend, and learn more about the composition of variables. While the main drawbacks of the method considered to be its inability to differentiate of deferent variables such as gender and age, it is minimizing the contribution of individual indicators which do not move with other individual indicators (OECD, 2008) and might not capture the essential aspects of what is being measured. Moreover, according to Arzamasov and Penikas (2014) to use PCA method the input data must be standardized when they have different units of measurement and scales. If the data were not standardized, the results would be highly dependent on the selection of the scale and the nature of the units of measurement. Finally, they found that the index under PCA is significantly correlated with the macroeconomic data.

## **2.5 Emerging Market Financial Stability Index:**

Although extensive research has been carried out on the financial stability for advance economies, the emerging economies still facing the challenge of data availability and reliability as highlighted by Mahmah (2017). Balakrishnan et al. (2009) develops an Emerging Markets Financial Stability Index (EM-FSI) methodology which is based on IMF Financial Soundness Indicators that have been developed and proposed

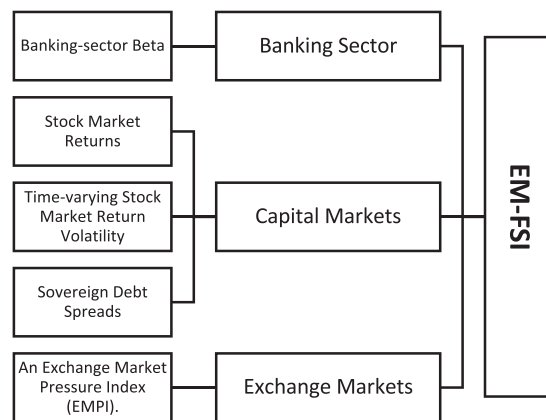
by Cardarelli et al. (2009) which has been widely adopted. EM-FSI relies primarily on market data which can be the most reliable, relevant and could be collected on frequent basis. The EM-FSI assess the financial stability through assessing three market segments as shown in Figure 3 as follows: banking sector, capital markets and exchange markets. Moreover, Balakrishnan used the following five variables to construct the index; banking-sector beta denoted as  $\beta$ , stock market returns, time-varying stock market return volatility, sovereign debt spreads, and an exchange market pressure index (EMPI). However, these variables were limited by data considerations and a preference for frugality.

Hereafter, Balakrishnan explained how the variables should be standardized by using variance-equal weighting technique same as Kaminsky and Reinhart (1999) which also considered the most common weighting method in the literature. Each component is computed as a deviation from its mean and weighted by the inverse of its variance and summed as shown in Equation 1 below:

Equation 1 - Balakrishnan et al. (2009) EM-FSI Aggregation

$$\mathbf{EM-FSI} = \beta + \text{Stock market returns} + \text{Stock market volatility} + \text{Sovereign debt spreads} + \text{EMPI}$$

Figure 3 - Balakrishnan et al. (2009), EM-FSI Model

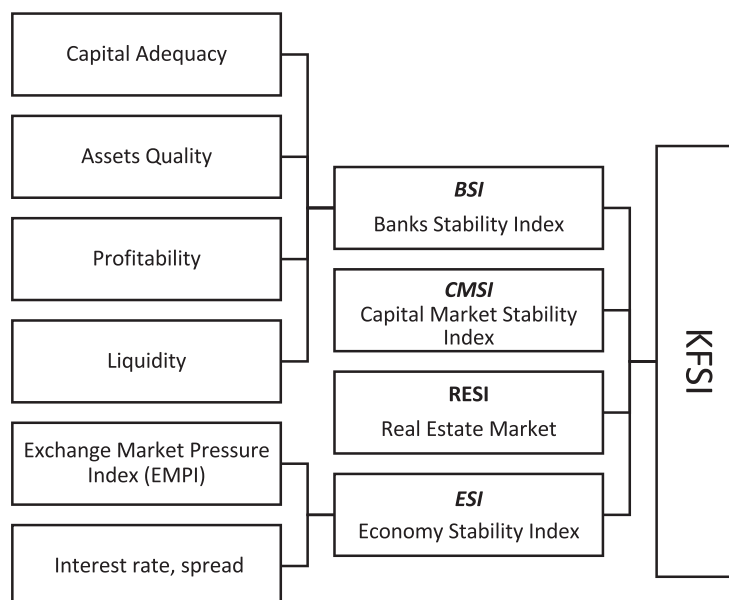


Despite the increased interest in measuring financial stability on country level to assist and support policymakers and regulators, there is still an ongoing gap in the literature for developing and emerging countries, especially for Kuwait that this research aims to fill as based on our best knowledge Kuwait has not develop such an index until now. Thus, the primary focus of this research is to fill the research gap and propose a financial stability index for Kuwait.

## CHAPTER THREE: DATA, RESEARCH DESIGN, AND METHODOLOGY

The primary focus of this research is to assess Kuwait financial system stability and propose a financial stability index for Kuwait. An empirical test based on Balakrishnan et al. (2009) Emerging Markets Financial Stability Index (EM-FSI) has been conducted with adjustments to suit Kuwait economy structure and the data availability. EM-FSI original design consists of three market sectors and five variables which will be adjusted to include detailed banks' indicators which have been extensively used by regulators and proven its capability as an early warning indicator such as capital adequacy ratio, non-performing loans, and growth of credit portfolio. In addition to the real estate market donated by the privet house trade, growth of the average prices and its proportion of banks credit portfolios as illustrated in Figure 4.

Figure 4 Kuwait Financial Stability Index (KFSI)



### 3.1 Data and Variables Selection

The population is Kuwait financial institutions which include local and international banks operate in Kuwait, financial companies such as investment, financing, insurance, and exchange firms. While the sample consisted of the listed banks in Kuwait stock exchange which are regulated and supervised by The Central Bank of Kuwait (CBK) as listed in Table 3. A secondary data that covers ten years span on quarterly basis starting from Q1-2010 to Q1-2020. The data has been collected from banks' interim financial statements that been reported and referenced in Kuwait

stock exchange (Boursa Kuwait) and The Central Banks of Kuwait (CBK) quarterly statistical bulletin. Moreover, other econometrics data have been collected from various reliable sources such as Kuwait Central Statistical Bureau (CSB), International Monetary Fund (IMF) and The World Bank database.

Table 2 List of Kuwaiti Listed Banks

No.	Ticker	Bank Name	Establishment Date	Bank Type
1	<a href="#">NBK</a>	National Bank	19.05.1952	Conventional
2	<a href="#">CBK</a>	Commercial Banks of Kuwait	19.06.1960	Conventional
3	<a href="#">Gulf</a>	Gulf Bank	29.10.1960	Conventional
4	<a href="#">ABK</a>	Ahli Bank of Kuwait	23.05.1967	Conventional
5	<a href="#">AUB</a>	Ahli United Bank	24.02.1971	Islamic
6	<a href="#">KIB</a>	Kuwait International Bank	13.05.1973	Islamic
7	<a href="#">Burgan</a>	Burgan Bank	27.12.1975	Conventional
8	<a href="#">KFH</a>	Kuwait Finance House	23.03.1977	Islamic
9	<a href="#">Boubyan</a>	Boubyan Bank	13.03.2004	Islamic
10	<a href="#">Warba</a>	Warba Bank	17.02.2010	Islamic

In this research twenty independent variables have been utilized based on Balakrishnan et al. (2009) methodology and the most common used indicators by literatures with adjustments to suit Kuwait economy structure. The indicators cover banking sector, capital market, real estate market and economic indicators which highly contribute to Kuwait economy and will be used as a sub-index to indicate the contribution of each sector. Moreover, those sectors normally generate daily data based on real transaction that could be helpful to capture the trend and movement of the real economy rather than lagged aggregate indicators such as GDP. Table 4 summarize the variables, sub-indexes, and the sign of each variable to understand the affect and theoretical relationship with the financial system stability.

Table 3 Kuwait Financial Stability Index Variables

Index	Code	Indicator	Name	Source	Sign
BSI	X1	CAR	Capital Adequacy Ratio	CBK FSI	(+)
	X2	%NPLs	Non-Performing Loans Ratio	CBK FSI	(-)
	X3	%Net NPLs	Non-Performing Loans net of provisions to Capital Ratio	CBK FSI	(-)
	X4	BGIG	Gross Income Growth	Calculated	(+)
	X5	IMR	Interest Margin to Gross Income	CBK FSI	(+)
	X6	ROA	Return on Assets	CBK FSI	(+)
	X7	ROE	Return on Equity	CBK FSI	(+)
	X8	CTA	Capital to Assets Ratio	CBK FSI	(-)
	X9	CTD	Total Credit to Total Deposit	CBK	(-)
	X10	LAR	Liquid Assets Ratio	CBK	(+)
	X11	GLG	Gross Loans Growth Ratio	CBK	(+)
	X12	NFETC	Net foreign-Exposure to Total Capital	CBK	(-)
CMSI	X13	Mkt.Return	Capital Market Quarterly Returns	CBK	(+)
	X14	Mkt.Cap	Market Capitalization Growth	CBK	(+)
RESI	X15	RETG	Real Estate Trading Growth	NBK	(+)
	X16	REPG	%Real Estate Prices Growth	NBK	(+)
	X17	RELG	%Real Estate Loans Growth	Calculated	(+)
	X18	RELTL	Real Estate Loans to Total Loans	Calculated	(+)
ESI	X19	IRS	Interest rate, spread	CBK	(-)
	X20	EMPI	Exchange market pressure index	Calculated	(-)

## XI. Capital Adequacy Ratio (CAR):

Capital Adequacy Ratio or Regulatory Capital to Risk Weighted Assets (CAR) considered to be one of the main financial regulators' measurement tool of banks capability to absorb financial shock across the globe. It was introduced by Basel Committee on Banking Supervision (BCBS) to measure banks risk appetite and future expectation of the market and become one of IMF FSIs core set. According to Wong et al. (2005) and Babihuga (2007), there is an inverse relationship between CAR and real GDP growth rate due to banks intention to maintain adequate capital as a buffer to absorb any financial shock during market downturn and less amount of capital during the market upturn to boost its profitability (Babihuga, 2007). Also, it was found that CAR is negatively correlated to Inflation rate as it is decreased during high level of inflation. Moreover, CAR could be significant to small capital bank more than large capital bank and it is one year lagged as the change in bank capital need time to be adjusted (Roscoe, 2015). According to Basel III CAR minimum requirement globally is 8%. However, from precautionary perspective The Central Bank of Kuwait set the minimum CAR of 13% for all Kuwaiti bank to ensure it ability to absorb any future financial shock (The Central Bank of Kuwait, 2008).



Figure 5 X01-CAR

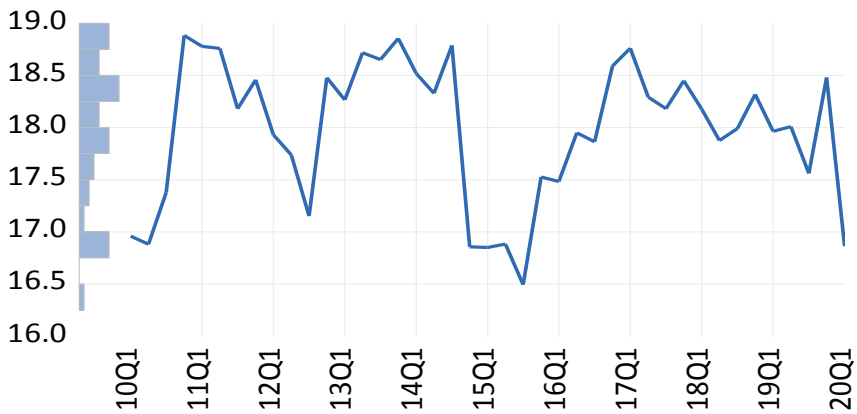
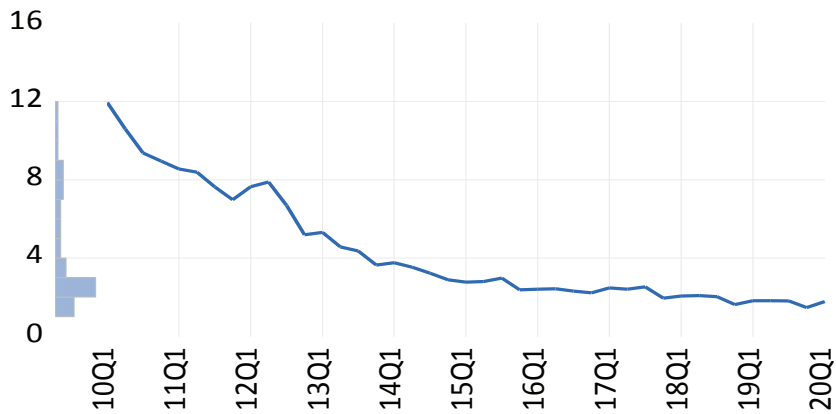


Figure 5 shows Kuwaiti banks' CAR% over the last ten years. CAR% reached its minimum at 16.48% in Q3 – 2015 when the government of Kuwait projected its first budget deficit after 16 years due to the slump of oil prices (Babar et al., 2019). Obviously, The Central Bank of Kuwait aimed to increase CAR during the upturn periods to reserve adequate level of capital that can support bank during the downturns.

## X2. Non-performing Loans Ratio (NPL):

According to IMF's financial soundness indicators compilation guide (2019), NPL is one of the core sets that intend to identify problems with banks' **Asset Quality** and provide insights of systemic credit risk. Moreover, it could benchmark the financial systems during different business cycle stages overtime. Although, NPL is a lagging indicator, it has strong negative relationship with GDP which could be helpful tool to predict GDP direction Furthermore, according to Gerlach et al. (2005) and Babihuga (2007) NPL has negative relationship with inflation rate due to the increase in borrower's ability to meet the debt obligation. On other hand, higher NPL effect Banks' profitability and growth rate (International Monetary Fund, 2019). Moreover, NPL% widely considered one of main financial instability indicator according to Manolescu and Manolescu (2017) and Karanovic and Karanovic (2015).

Figure 6 X02-NPL%

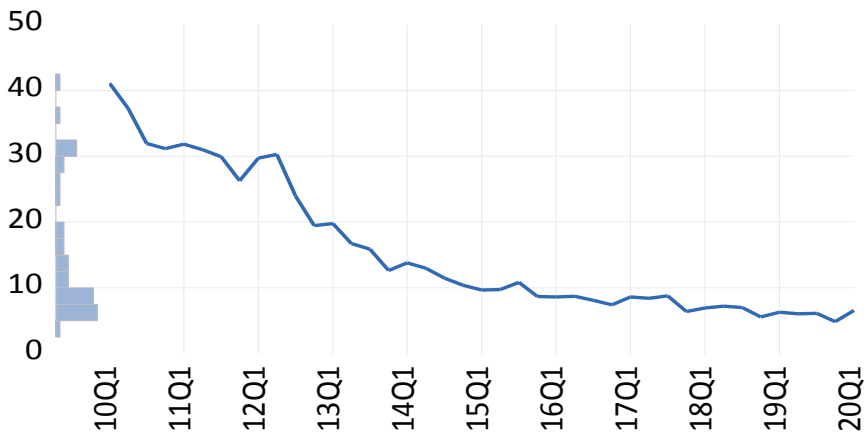


During the last years, The Central Bank of Kuwait has adopted strict precautionary policy to decrease NPL ratio from 11.9% in Q1-2010 to 1.5% in Q4-2019 which indicate Kuwaiti banks' ability to absorb any upcoming financial shock. Figure 6 shows how The Central Bank of Kuwait (CBK) succeeded to decrease NPL% from its highest level of 11.9% in Q1-2010 to its historical lowest level at 1.5% in Q4-2019. Eventually, CBK tends to increase banks' financial shocks absorbing ability to maintain Kuwait financial stability level.

### **X3. Net Non-Performing Loans to Capital Ratio (Net NPLs%):**

Non-performing loans net of provisions divided by total banks capital (Net NPLs%) is another one of IMF FSI coreset (International Monetary Fund, 2019). The indicator intended to compare the potential impact on capital of NPLs, net of provisions to indicate the capacity of bank capital to withstand NPL-related losses. However, the impact of NPL losses on capital is uncertain due to many factors such as recovery rate and collateral values. As shown in Figure 7 Net NPLs% has the same behavior as NPLs% and they are moving in the same direction as banks intend to reduce the NPL or increase capital to increase its ability to absorb any upcoming financial shock.

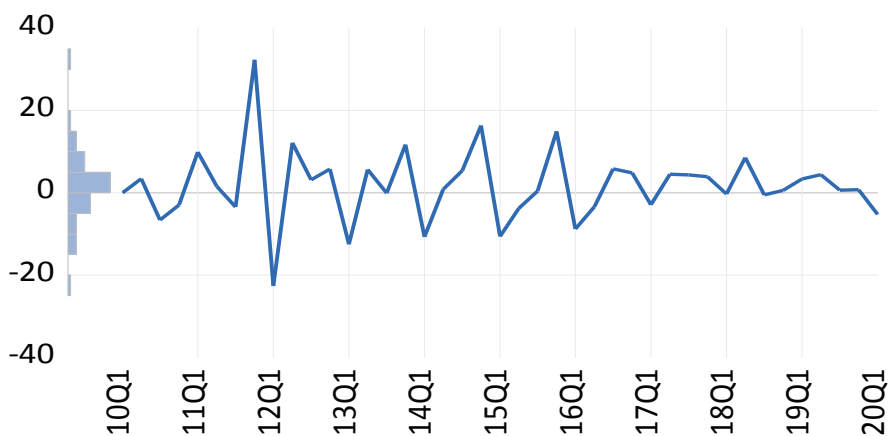
Figure 7 X03- Net NPLs%



#### X4. Banks Gross Income Growth (BGIG)

Growth of bank sector gross income that include interest and noninterest income to indicate financial sector performance. The gross income is used to measure many banks performance indicators such as the Interest Margin and Noninterest Expenses to measure banks efficiency. However, as shown in Figure 8 the growth ratio is controlled by the CBK as it requests additional provisions either specific or precautionary to maintain stable growth and reduce volatility.

Figure 8 X04-BGIG

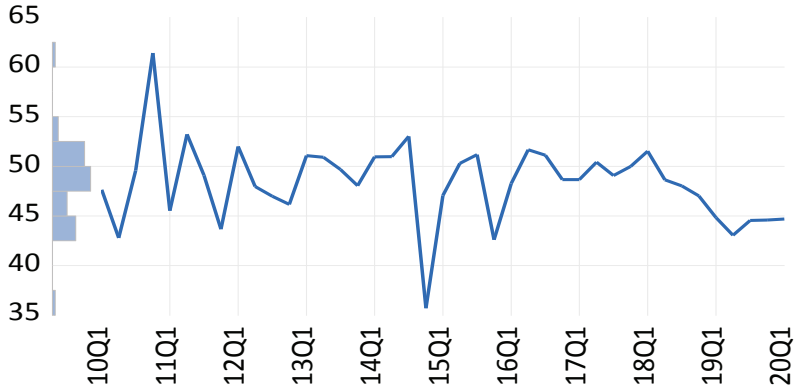


#### X5. Interest Margin to Gross Income (IMR):

One of IMF FSI core set indicator to measure of the relative share of net interest earnings—interest earned less interest expenses—within gross income. This ratio indicates the quality of operational revenue whereas the

low ratio indicates market volatility and higher instability (International Monetary Fund, 2019). Figure 9 shows how the interest margin reached its lowest level at 35.7% in 2014Q4 due to the increase of noninterest revenue and the rebound of investments value after the financial crisis.

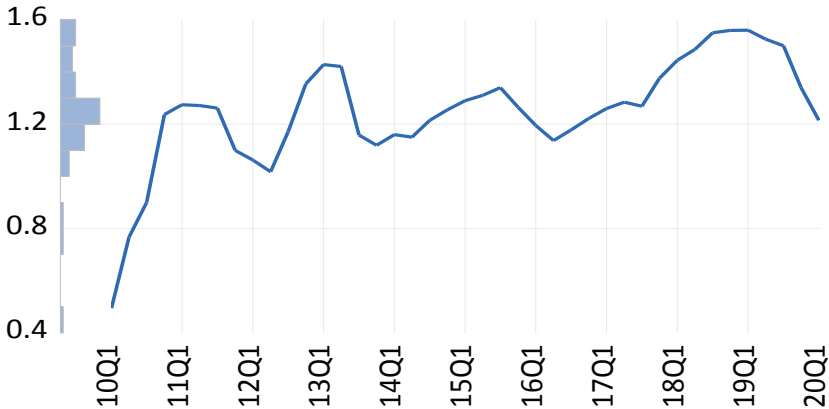
Figure 9 X05-IMR



**X6. Return on Assets (ROA):**

Considered to be one of important profitability measurement that indicate management’s efficiency of utilizing bank’s asset to generate profit for both investors as well as depositors (Musleh & Ali, 2012). ROA is calculated by dividing net income by the average value of total assets over the same period. Usually, banks generate more profit during booming economy and vice versa. Therefore, it has inverse relationship with the GDP and Non-performing loan. In addition, banks with higher profitability tend to reserve more capital to increase its ability of financial shocks absorbing (International Monetary Fund, 2019). Figure 10 shows how ROA tendency at 1.2% over the last ten years with a positive trend whilst the lowest value at 0.49% in 2010Q1 and the highest at 1.56% in 2019Q1.

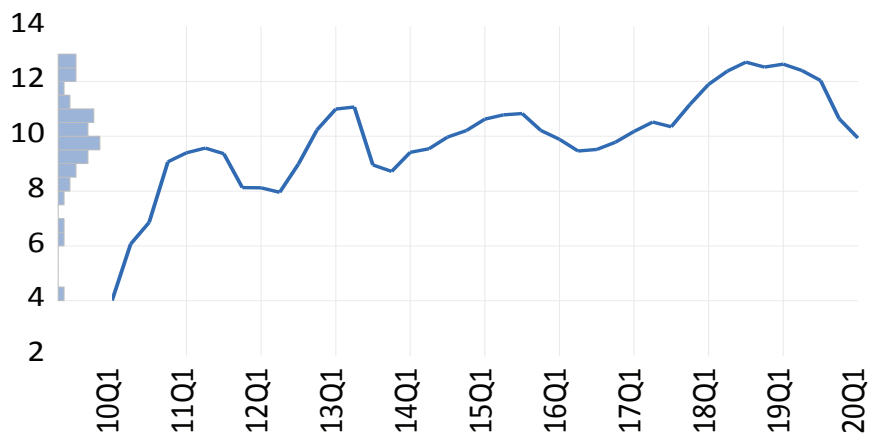
Figure 10 X06-ROA



### X7. Return on Equity (ROE):

Similar to ROA, ROE measures the efficiency utilizing banks capital as it is calculated by dividing net income by the average value of shareholders equity over the same period (International Monetary Fund, 2019). Moreover, according to the IMF FSI Compilation Guide (2019) higher leverage ratio generally generates higher ROE as it tends to increase the associated risks. Figure 11 shows how ROE has positive trend with a mean of 9.9%.

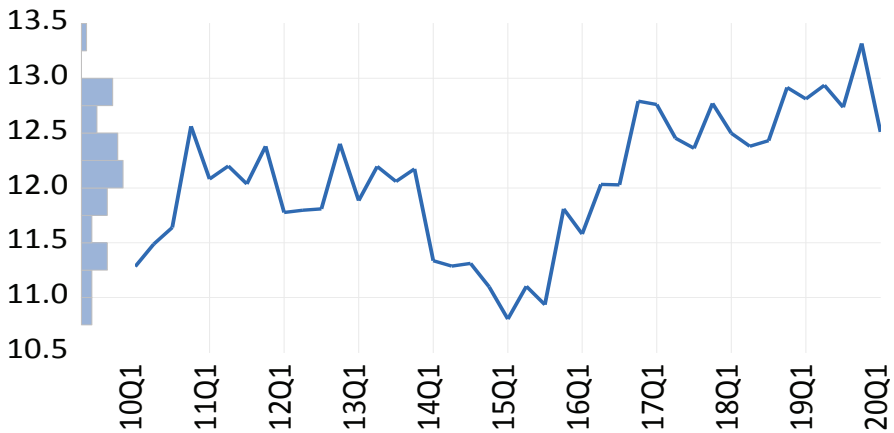
Figure 11 X07-ROE



### X8. Capital to Assets Ratio (CAT):

Capital to Assets Ratio (CTA) is one of IMF FSI Core Set that indicate bank sector risk appetite and its financial leverage (Musleh & Ali, 2012). In other word, to what extend the financial sector is funded by other sources rather than its capital and exposed to credit risk which has been found one of the weaknesses characterizing the banking sectors around the globe(International Monetary Fund, 2019). In Figure 12 the range of CTA ratio for Kuwait banks vary from 10.8% to 13.3% and the lowest recorded value was on 2015Q1 in line with the result and indication of the IMR.

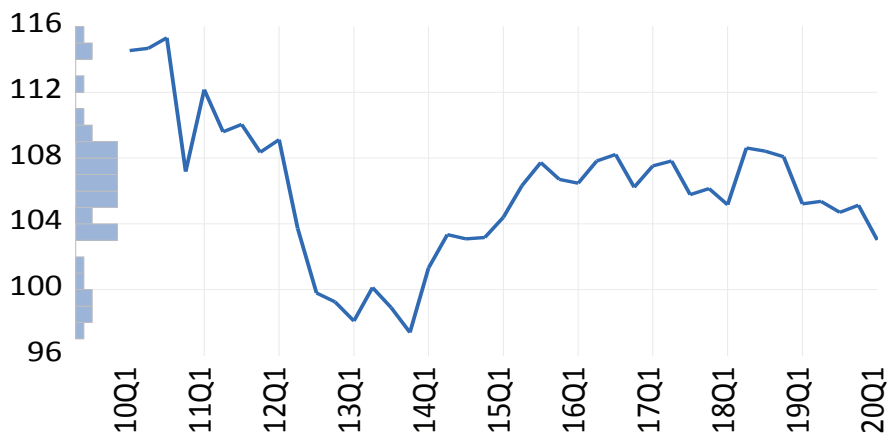
Figure 12 X08-CTA



**X9. Total Credit to Total Deposit Ratio (CTD):**

Total credit to total deposit ratio is another IMF FSI core set indicator that measure banks liquidity and the mismatches of the financial system (Ishrakieh, Dagher, & El Hariri, 2020). It has been highlighted by the IMF FSI Compilation Guide (2019), during high financial stress the gap between total credit to total deposit is getting wider and liquidity risk increase. The literatures recommend using only customer deposit and exclude corporate deposit as it is considered more stable and could provide clear insight of liquidity mismatch. It is important to monitor the credit ratio as large withdrawals could led to a liquidity shortage and result and increase in the interbank rate (IMF, 2020b). The highest recorded value was at 115% in 2010Q3 as shown by Figure 13 which was during a high financial stress period align with the literature.

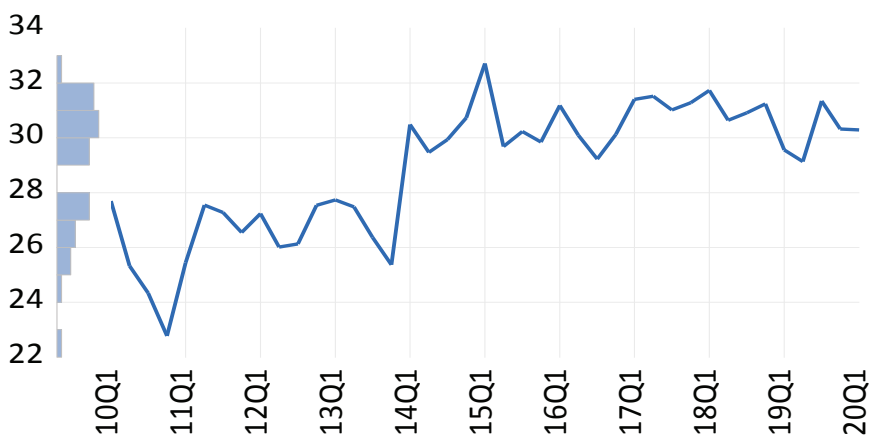
Figure 13 X09-CTD



### X10. Liquid Assets to Total Assets (LAR):

liquid assets to total assets is another measure of liquidity that reflect the maturity mismatch and only include assets that can be converted to cash within one financial year under the regular market conditions (Babar et al., 2019). Banks tend to increase the ratio during the high stress period to meet its customer demand and any shortage increase its liquidity risks (Ishrakieh et al., 2020). as shown in Figure 14 which was on 2015Q1.

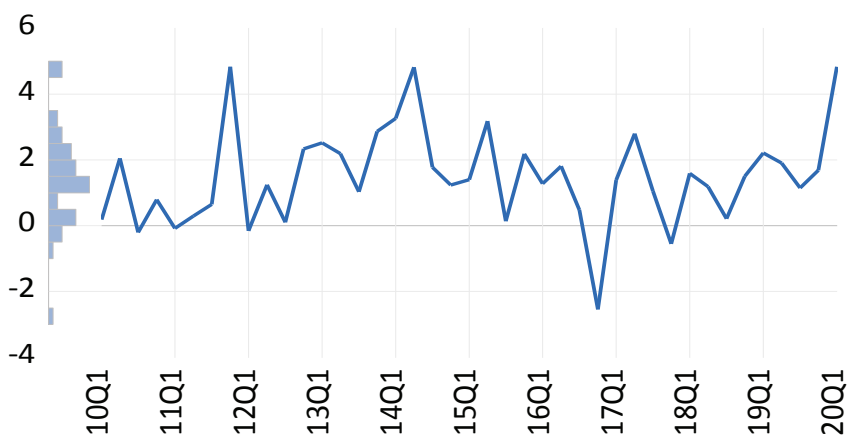
Figure 14 X10-LAR



### X11. Gross Loans Growth Ratio (GLG):

The gross loan is the dominators of the most assets quality indicators. Credit portfolio growth indicates banks risk appetite and economy cycle the growth (IMF, 2018). Moreover, the increase in credit portfolio will increase banks credit and liquidity risk profile and decrease profitability over the time as shown in Figure 15.

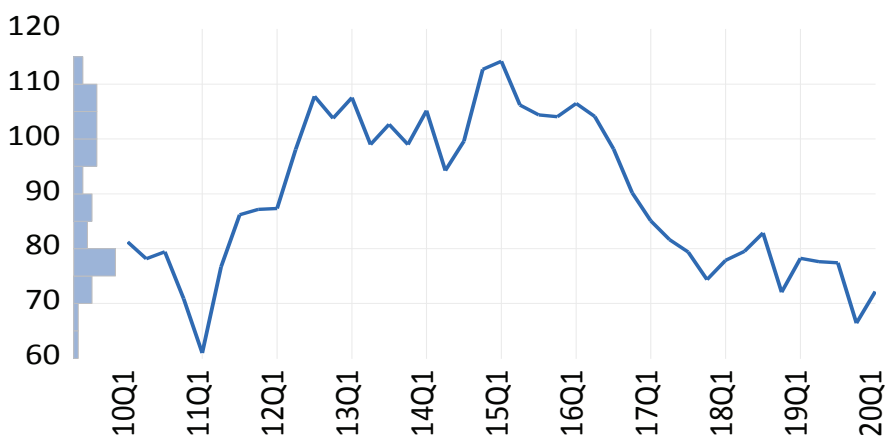
Figure 15 X11-GLG



## X12. Net foreign-Exposure Ratio (NFETC):

According to IMF FSI Compilation Guide (2019), Net Foreign-Exposure to Total Capital intend to evaluate exchange rate risk exposure and the potential vulnerability of the mismatch of foreign currency assets and liabilities. The exchange rate risk and currency crisis has been the most widespread and caused the most severe crisis in the past few decades that took the economy several years to recovered after each crisis (Siņenko, Titarenko, & Āriņš, 2012). High exchange rate risk may impair the value of foreign exchange assets and lead to deterioration in profitability due to the increase of required provisions (Ishrakieh et al., 2020).

Figure 16 X12-NFETC

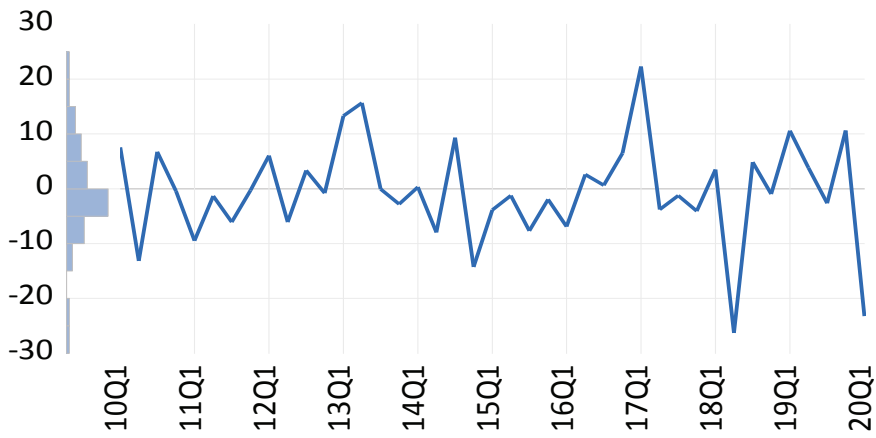


## X13. Capital Market Returns (Mkt. Returns):

Stock market returns consider to be an early indicator of investors outlook and expectation. Normally, capital market crises occurred after a “bubble” or inflation in the market value based on the fundamentals, or as predicted by standard models as cited in (Al-Kandari et al., 2020). Most of the financial crises occur after sharp fall of stock prices and runout of the investors which leads to decrease in banks collateral values and increase of the non-performing loans. The proposed index utilized Kuwait price index quarterly growth as proxy of the market returns, whereas the decline of the index will increase market financial instability and vice versa as highlighted by most of the literature. Figure 17 showed the quarterly returns of Kuwait stock exchange for the period from 2010Q1 to 2020Q1 which was instable with an average negative return of 0.4%.



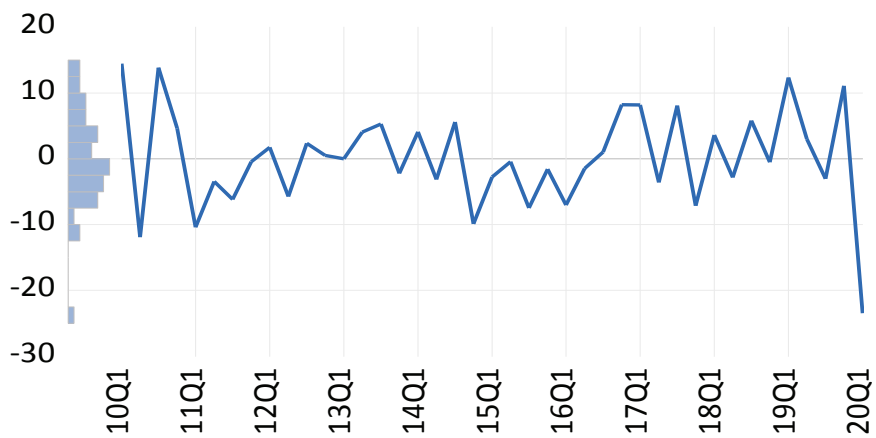
Figure 17 X13-Mkt. Returns



**X14. Capital Market Capitalization (Mkt.Cap):**

Likewise, the market return, stock market capitalization value is utilized as a proxy to the economy growth. Market capitalization has a significant negative relationship with Kuwait economic growth (International Monetary Fund, 2019). It is calculated by multiplying the number of outstanding shares of the listed company by the closing price of each quarter. Normally, the market risk and volatility should increase during the high uncertainty and instability which will lead to decrease the market capitalization value.

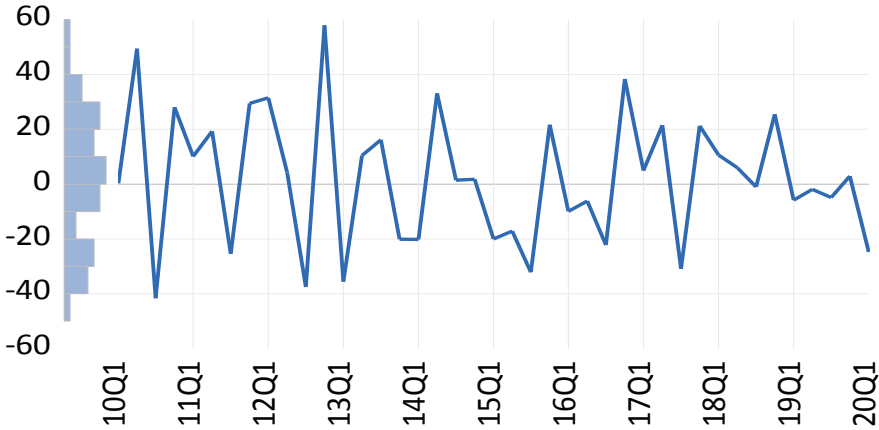
Figure 18 X14-Mkt.Cap



**X15. Real Estate Total Trading Value Growth (RETG):**

Residential real estate prices are one of the IMF FSI core set indicators that aim to measure sensitivity to market risk (International Monetary Fund, 2019). Due to lack of proper data for Kuwait real estate market, price and trading of the private houses will be used as proxy to measure customer confidence and willingness to purchase private house for residential or investment purposes. It is worth to mention that ownership of private housing in Kuwait is limited to individual citizens which reflects household consumptions and outlook of the economy as shown by Figure 19.

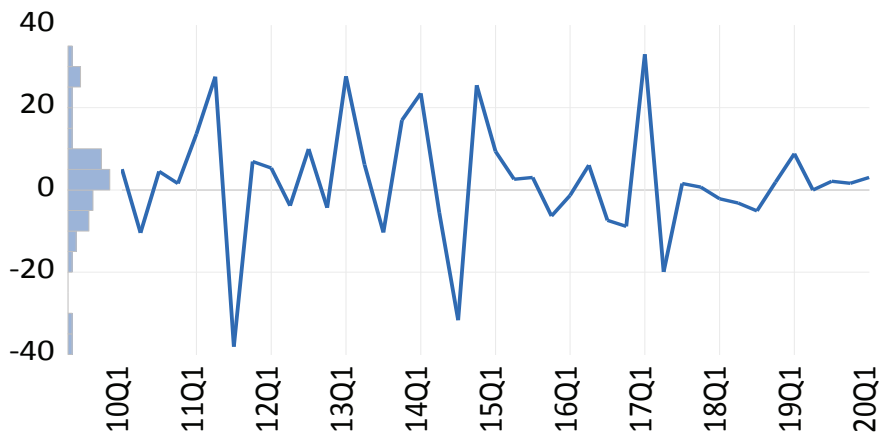
Figure 19 X15-RETG



**X16. Real Estate Average Prices Growth Rate (REPG):**

The growth of average residential real estate price will be utilized as another indicator to measure growth due to the size and stable demand of this market as well as its contribution in banks provision and individual wealth. the decrease of the average prices will decrease financial stability as it can trigger financial shock that can deterring banks collateral value and increase non-performing loans. As shown in Figure 20 the lowest recorded value was on 2011Q3 in the contrary of the Kuwait stock exchange market return which might indicate of inverse relationship.

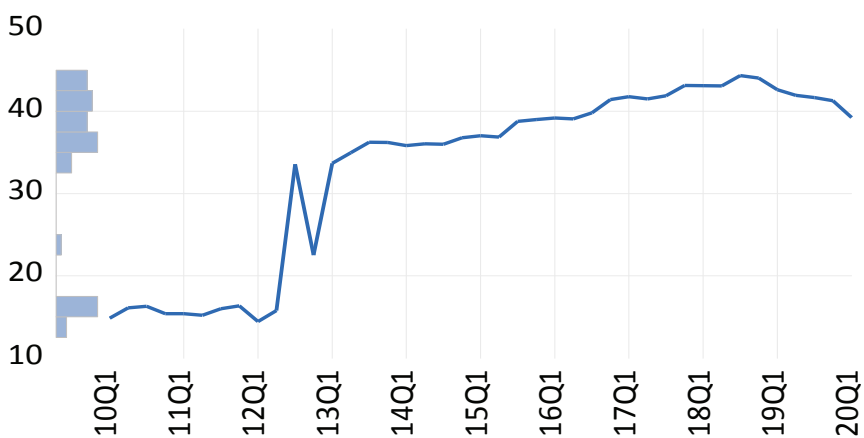
Figure 20 X16-REPG



### X17. Real Estate Loans to Total Loans (RELTL):

Residential real estate loans are those loans that are collateralized by residential real estate (Musleh & Ali, 2012). The proportion of residential real estate loans will be used as proxy to measure the concentration risk of real estate loans to the total credit portfolio. The growth of the ratio measure customer confidence and willingness to spend on private housing purchasing and development. Residential real estate price bubble used to be one of the main threats on the financial system as it affects banks collateral and credit portfolio (Babar et al., 2019). Accordingly, net household assets and disposable income can measure households' ability to weather (unexpected) economic downturns. As explained by Figure 21 residential real estate loans comprise 33% in average of the total commercial bank loan portfolios during the last 10 years while most of it have 15 years duration and secured by the individual citizens monthly salary (Central Bank of Kuwait, 2020).

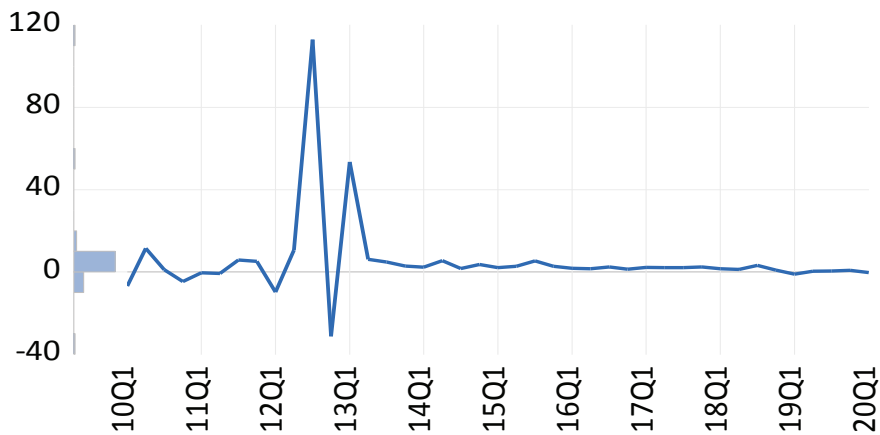
Figure 21 X17- RELTL



### **X18. Real Estate Loans Growth Rate (RELG):**

The growth of residential real estate loans portfolio is also a measurement of banks and household confidence. The increase in the ratio indicates the positive outlook of the market as banks considered to maintain its loans portfolio mix and structure to support its potential long-term growth as this type of loan could reach 15 years tenor. Figure 21 showed the growth of residential real estate loans during the last 10 years which considered to be stable after 2013Q2.

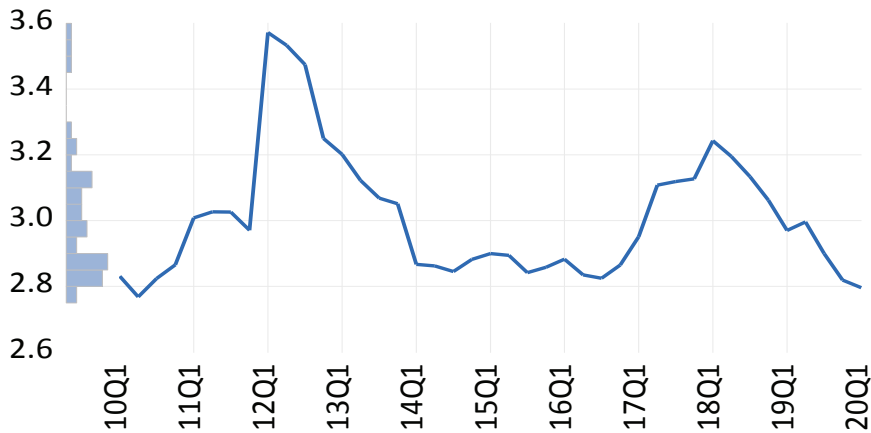
Figure 22 X18- RELG



### **X19. Interest rate spread (IRS):**

Interest rate is one of the important monetary tools that used by central bank of Kuwait to influence and control money supply. Interest rate spread is the difference of the interest rate charged by banks on loans to private sector customers and the interest rate paid by commercial or similar banks for demand, time, or savings deposits (International Monetary Fund, 2019). Interest rate shocks may impact the ability of borrowers to service their debt, as well as their collaterals (Ishrakieh et al., 2020). During to the high growth period, interest spread is wider which increase banks interest revenue as well as its associated risk as shown by Figure 23.

Figure 23 X19-IRS



## X20. Exchange market pressure index (EMPI):

Monitoring currency exchange rate is an essential component of any financial stability index as its high volatility decrease the confidence in the financial system as well as the economy (Central Bank of Kuwait, 2019). Given that 92% of Kuwait revenue is from crude oil exporting in USD and the average foreign trade exceeds \$ 2 trillion. Therefore, having stable and low currency volatility increase the financial stability (as cited in Ishrakieh et al., 2020). The Exchange Market Pressure Index (EMPI) was introduced by Girton and Roper (1977) and since then become an important early warning indicator for currency crises(Ishrakieh et al., 2020). It has been deployed and enhanced by many researchers and practitioners such as Eichengreen et al. (1995, 1996), Kaminsky et al. (1998), Berg and Pattillo (1999), Cerra and Saxena (2002), Edison (2003), Kamin et al. (2007), and Moore and Wang (2009) (Ishrakieh et al., 2020).

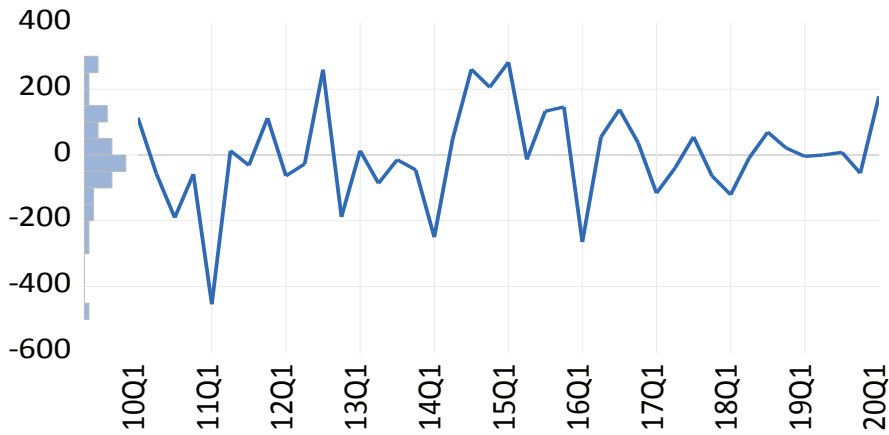
According to Balakrishnan et al. (2009), the increase of EMPI indicates high exchange rate pressure which increases financial instability and vice versa. Also, Balakrishnan highlighted how EMPI could captures currency depreciation and declines in international reserves as:

Equation 2 Exchange market pressure index (EMPI)

$$EMPI_{i,t} = \frac{(\Delta e_{i,t} - \mu_{i,\Delta e})}{\sigma_{i,\Delta e}} - \frac{(\Delta RES_{i,t} - \mu_{i,\Delta RES})}{\sigma_{i,\Delta RES}}$$

Whereas i= country, t= time, Δ= change in percentage, μ=mean, σ= standard deviation e=exchange rate, RES= international reserves.

Figure 24 X20-EMPI



### 3.2 Research Approach

In this research, the proposed index will be designed and adjusted to capture the national business activity by means Gross domestic products (GDP) growth. According to IMF (2019), The Real Gross Domestic Product (GDP) is an aggregate indicator (inflation adjusted) that represent the total monetary value of final goods and services produced within a country during specific period. Although it is the most used measure of country's economic value, it is six months lagged indicator which provides historical information that could be irrelevance with a limited support to the decisionmaker. Most of the literatures used GDP as a dependent variable to test the proposed financial stability index. While many researchers considered it as a significant variable to construct the composite index. According to Swiston (2008) and Manolescu (2017), real GDP could be highly correlated with the proposed financial stability index with the previous quarter. Thus, Real GDP will be utilized to conduct a robustness test after constructing the indices.

To begin with constructing the index, it is essential to standardize the data by using the Z-Score (Equation 3) as the variables have different measurement units. Whereas Z= standardized value, X= Value,  $\mu$ = Average value of X series and  $\sigma$ = standard deviation of X series.

Equation 3 Z-Score

$$Z - Score = \frac{X - \mu}{\sigma}$$

Followed by assigning the weights for each variable by using three methodology that have been commonly used by the literature to explore the best method and for verification purpose. Starting with variance equal

weights (VEW), which is the most used and simple approach. The second approach will be the hybrid methods which basically will use only the first approach significant variables. Finally, the principal component analysis (PCA) where the variables will be reduced and only the high loading factor will be used to sharpen the index performance,

**First Approach: Variance Equal Weights (KFSI<sub>VEW</sub>):** Hence, the selected variables are normalized and aggregated into four sub-indexes; Banks Stability Index (BSI), Capital Market Stability Index (MSI), Real Estate Stability Index (RESI), and Economy Stability Index (ESI) by using a Variance Equal Weights Method (VEW) to construct Kuwait Financial Stability Index under the first approach as per Equation 4 below:

Equation 4 Kuwait Financial Stability Index KFSI<sub>VEW</sub>

$$KFSI_{VEW} = \sum_{wi}^{ni} \text{Banks Stability Index (BSI)} + \text{Capital Market Stability Index (MSI)} \\ + \text{Real Estate Stability Index (RESI)} + \text{Economy Stability Index (ESI)}$$

**Second Approach: Hybrid Method (KFSI<sub>HM</sub>):** Under the second approach, a multiple linear regression (MLR) approach limited to the significant variables will be deployed to develop the index. By means, only variables that have great contribution to KFSI<sub>VEW</sub> will be utilized. The variables should have an equal weight and aggregated to form the index based on Equation 5.

Equation 5 Kuwait Financial Stability Index KFSI<sub>HM</sub>

$$KFSI_{HM} = \sum_{wi}^{ni} X_i$$

**Third Approach: Principal Component Analysis (KFSI<sub>PCA</sub>):** The main purpose of this approach is to reduce the number of variables by identifying the common direction and correlation. Principal Component Analysis approach will be exploited to reduce the selected variables and to construct KFSI<sub>PCA</sub> by utilizing the component with high loading factor to construct the proposed index according to the below equation:

Equation 6 Kuwait Financial Stability Index KFSI<sub>PCA</sub>

$$KFSI_{PCA} = \sum_i^n \text{Factor}$$

### **Robustness checks:**

To measure the quality models visual and statistical analysis shall be conducted, mainly Pearson correlation coefficients will be utilized to explore and compare the result of the three approach alongside with Kuwait standardized real GDP growth.

### **3.3 Data Analysis Method**

The selected variables will be statistically analyzed using the Statistical Package for Social Science (SPSS) version 27, EViews 11 Student Version Lite and Microsoft Excel 365. Data descriptive analyses will be provided to have better understanding of the selected indicators. Correlation test will be performed to identify and understand variables causal relationship. Followed by proposing Kuwait financial stability report under the three-methodology using Variance Equal Weights (VEW), Hybrid Method (HM) and Principal Component Analysis (PCA). Finally, the final section discusses the findings with the literature.

### **3.4 Assumptions**

The research assumes that financial sector has significant impact on Kuwait economy growth as well as providing insights about real economy's performance. Also, the research assumes that data is reliable and was prepared and conducted according to the international standards.

### **3.5 Limitations**

- The research is limited to Kuwait economy and specifically financial sector.
- There might be other factors that could influence Kuwait economy, but this research will focus on financial sector, capital market, and real estate market.
- This research did not cover geopolitical risk or event risk such as Covid-19 and lockdown which could have severe impact on Kuwait economy.
- Due to lacks available quarterly data and longtime series, this research is limited to the selected variables the results might be differ with different set of variables.
- This research is limited of the financial market contagion factors.



## CHAPTER FOUR: DATA ANALYSIS, FINDINGS AND DISCUSSION

The primary focus of this research is to assess Kuwait financial system stability and propose a financial stability index for Kuwait based on the economy structure, data availability and reliability. In this chapter the selected variables will be statistically analyzed using the Statistical Package for Social Science (SPSS) version 27, EViews 11 Student Version Lite and Microsoft Excel 365. Data descriptive analyses will be provided to have better understanding of the selected indicators. The correlation test will be performed to identify variables relationship and their direction. Followed by constructing the proposed financial stability by using three models as followings: Variance Equal Weights (VEW), Hybrid Method (HM) and Principal Component Analysis (PCA). Finally, the final section discusses the findings considering the literature.

### 4.1 Descriptive Analysis

Data descriptive analyses was conducted to overview the data shape and behavior, the total observation covered 41 quarters from 2010Q1 to 2020Q1 as shown in Table 5 below:

Table 4 Descriptive Statistic

Variables	N	Minimum	Maximum	Mean	Std. Deviation
X1-CAR	41	16.4942	18.8827	17.9779	0.6787
X2-NPLs	41	1.4600	11.9500	4.3212	2.8775
X3-NetNPLs	41	4.8700	41.0800	15.5644	10.4920
X4-BGIG	41	- 22.7000	41.0811	2.7173	10.8897
X5-IMR	41	35.7059	61.3998	48.3496	4.0499
X6-ROA	41	0.4943	1.5602	1.2471	0.2086
X7-ROE	41	4.0091	12.7035	9.9275	1.7663
X8-CTA	41	10.8045	13.3175	12.0673	0.6132
X9-CTD	41	97.3939	115.3071	105.9519	4.2566
X10-LAR	41	22.7752	32.7070	28.9000	2.3709
X11-GLG	41	- 2.5404	4.8298	1.4781	1.4742
X12-NFETC	41	60.9706	114.1510	89.5033	14.1321
X13-Mkt.Return	41	- 26.2761	22.2908	- 0.4627	9.3300
X14-Mkt.Cap	41	- 23.4848	14.4451	0.0748	7.5007
X15-RETG	41	- 41.5882	57.9405	2.1556	24.3599
X16-REPG	41	- 38.1278	32.9609	2.1716	14.0915
X17-RELG	41	- 31.3031	112.9607	5.0876	20.1411
X18-RELTL	41	14.4387	44.3507	33.1282	10.7796
X19-IRS	41	2.7680	3.5720	3.0090	0.1982
X20-EMPI	41	- 453.8980	282.1152	-	146.3696

Table 5 provides variables descriptive analysis and patterns. Twenty variables with 41 observations have been used without obvious outliers and tendency of the data concentrated around the mean. Also, the variables clearly explain the status of Kuwait financial system during the last ten years. For example, Kuwaiti banks succeeded to maintain its capital adequacy ratio above 13% which is the minimum required ratio by the Central Bank of Kuwait. Whilst the NPLs ratio standard deviation was 10.49% which indicate the volatility of the real economy as the ratio increases due to high financial instability period and has a direct impact on banks performance, profitability, liquidity, and capital.

On the other hand, the capital market had a negative average return during the last ten years of 0.46% with standard deviation of 9.33%. Market capitalization increased by 7.48% on average. Similarly, Kuwait real estate market witness an increase of the residential properties average price of 2.15% on quarterly basis as with standard deviation of 14%. In addition, residential properties loans proportion of gross loans remains material with an average value of 33.12% which indicate the materiality and the concentration of this sector which could impact the financial system and consider to be a potential financial threat.

## 4.2 Correlation Test

Pearson's correlation test has been conducted to identify variables relationships and its variability which found to be aligned with the literature. However, some of the relationships were interesting and worth to be highlighted such as the inverse relationship of the X4-banks gross revenue and X5- interest margin ratio. Also, the high correlation of X2-NPLs and X3-NetNPLs and their negative impacts on banks profitability (X6-ROA and X7-ROE), banks liquidity (X10-LAR) and banks leverage (X8-CTA). Finally, the negative correlation between X2-NPLs and X3-NetNPLs with X18-RELTL which might indicate how banks tend to rely on its real estate collateral to minimize the required provisions during financial shocks and high instability periods as illustrated in Table 6.

Accordingly, based on the Pearson's correlation test, **KFSI<sub>VIEW</sub>** has indicate a significant correlation with the followings variables as listed in Table 6 and namely Capital Adequacy Ratio, Non-Performing Loans Ratio, Non-Performing Loans net of provisions to Capital Ratio, Return on Assets, Return on Equity, Capital to Assets Ratio, Total Credit To Total Deposit, Liquid Assets Ratio, Capital Market Quarterly Returns, Real Estate Loans to Total Loans which will be utilized to construct **KFSI<sub>IHM</sub>**:

Table 5 KFSIview Significant Correlated variables

Variable	Sign	KFSI
X01-CAR	(+)	.461
X02-NPLs%	(-)	-.770
X03-Net NPLs%	(-)	-.777
X06-ROA	(+)	.702
X07-ROE	(+)	.745
X08-CTA	(-)	.439
X09-CTD	(-)	-.475
X10-LAR	(+)	.574
X13-Market Return	(+)	.375
X18-RETL	(+)	.773

### Principal Component Analysis (PCA)

Principal Component Analysis allows us to reduce the data set and summarize it by suggesting new variables or factors that aggregate the intercorrelated ones. To apply this approach, KMO and Bartlett's Tests have been conducted to indicate data structure and suitability detection as showed in Table 6. The Kaiser-Meyer-Olkin (KMO) used as a measure of the sampling adequacy which assess how the approach could be useful based on data structure and variance. KMO returns values between 0 and 1 whereas the higher is better and most of the literature indicate that the approach is not appropriate if the value is under 0.5. In addition, Bartlett's test was deployed to ensure the significant correlation between variables. Small significance level values (less than 0.05) indicate if the approach is appropriate or not. Based on the two tests, the data considered to be adequate and could be used to analyze apply the method.

Table 6 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.531
Bartlett's Test of Sphericity	Approx. Chi-Square	825.472
	df	190
	Sig.	.000

Next step, the VARIMAX was used to rotate the data and select the factors based on its eigenvalue, factor loading, and communality as listed in appendix 2. The selected variables must have equal or greater than the following criteria: eigenvalue of 1, factor loading of 0.5 and communality of 0.8.

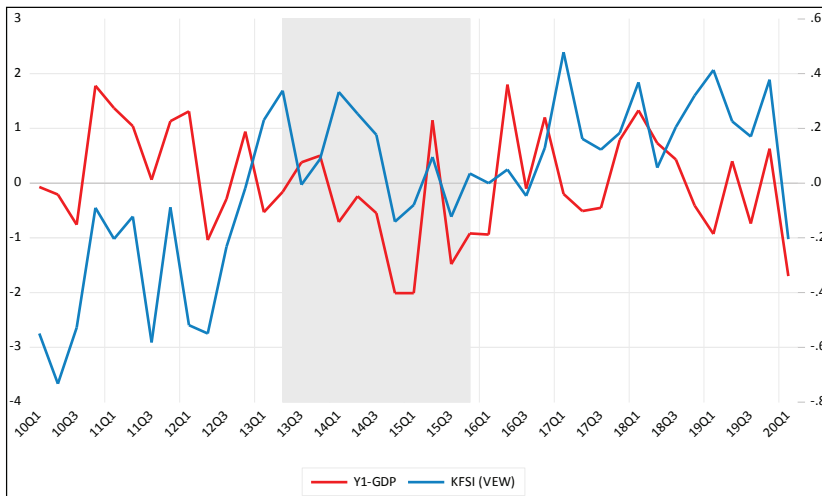
Giving those criteria, the number of selected variables decreases quite dramatically and only four factors have been selected to construct **KFSI<sub>PCA</sub>**. The cumulative rotation sums of squared loadings reached 59.17% and the selected factors covered twelve components (variables). The first factor related to banks performance as it consists of X02- Non-Performing Loans Ratio, X03- Non-Performing Loans net of provisions to Capital Ratio, X18- Real Estate Loans to Total Loans, X07- Return on Equity, X10- Liquid Assets Ratio, X06- Return on Assets. The second factor consists of X08- Capital to Assets and X01- Capital Adequacy Ratio, thus it was named to banks leverage as it considers banks capital. The third factor signify the capital market as it aggregate X14- Market Capitalization Growth and X13- Capital Market Quarterly Returns. The last factor represents the Real estate market which includes X17- Real Estate Loans Growth% and X19- Interest rate, spread.

As other variables consist of X04- Gross Income Growth, X05- Interest Margin to Gross Income, X09- Total Credit to Total Deposit, X11- Gross Loans Growth Ratio, X12- Net Foreign-Exposure to Total Capital, X15- Real Estate Trading Growth, X16- Real Estate Prices Growth%, and X20- Exchange market pressure index found to be insignificant and have low loading factor on Kuwait financial stability. They will be polarized to enhance quality of the proposed index.

The blow graphs indicate the pattern and behavior of the proposed index under the three methods. Obviously, all the results were adequately reflecting Kuwait business cycle and captured the most important high stress episodes such as the recovery from 2008 capital market crash and the raise and crash of oil prices during 2012-2015.

Figure 25 reveals the visual relationship between **KFSI<sub>VEW</sub>** and the normalized GDP growth. The proposed index recorded its minimum value on 2010Q2 and its highest recorded value on 2017Q1 with standard deviation of 0.30. Although, both variables have common trend they have low correlation of 0.07.

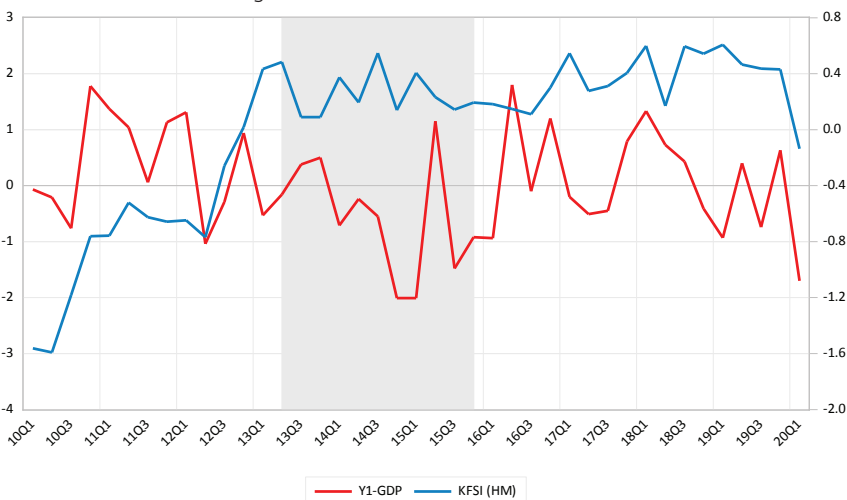
Figure 25 KFSI<sub>VEW</sub> Vs. GDP Growth



Source: Author Calculation

similarly, Figure 26 stands out **KFSI<sub>HM</sub>** role as it tend to present the upper limit or the ceiling of economy growth. The proposed index obviously indicates the stress level of the financial system specially during the shaded period that indicate oil prices crash starting from 2013Q2 to 2015Q4. The highest recorded value was 0.61 on 2019Q1 while the lowest recorded value was -1.59 on 2010Q2 with standard deviation of 0.59 which mean higher volatility comparing with **KFSI<sub>VEW</sub>** in addition to the significant correlation with the normalized GDP growth at 0.468 based on Pearson's correlation test.

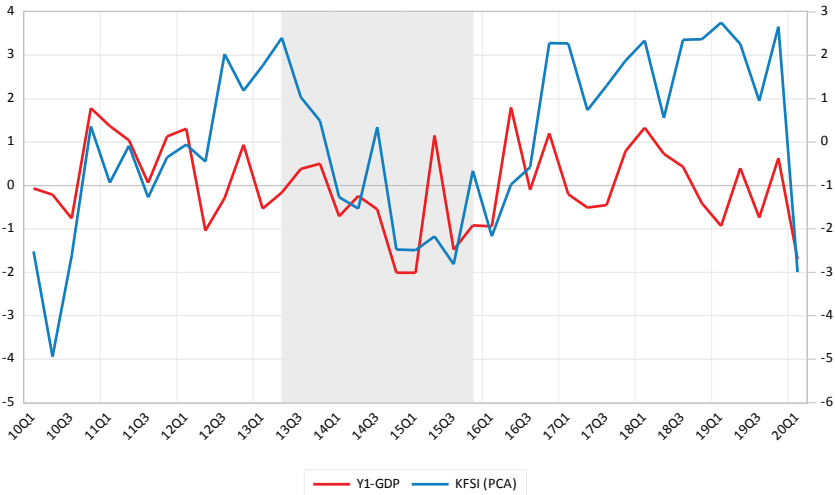
Figure 26 KFSI<sub>HM</sub> Vs. GDP Growth



Source: Author Calculation

Lastly Figure 27 exemplify the trend of **KFSI<sub>PCA</sub>**. Similar to the previous two approaches. The proposed index under the PCA method trend is aligned with the normalized GDP growth. The index peak was 2.75 recorded at 2019Q1 and the lowest value was on 2010Q2. The index has the highest standard deviation of 1.96 among other approaches and has a significant correlation with the normalized GDP growth at 0.340 according to the Pearson's correlation test.

Figure 27 KFSI<sub>PCA</sub> Vs. GDP Growth



Source: Author Calculation

### 4.3 Robustness Test

The objective of the robustness test to ensure the proposed financial stability index validity and ability to capture the business cycle under the three approaches. Hence, Pearson's correlation test was conducted (Table 7) which indicate a significant correlation of **KFSI<sub>HM</sub>** and **KFSI<sub>PCA</sub>** with the GDP growth and could indicate the short-term trend. Moreover, visual validation was implemented, and Figure 29 showed different episodes of Kuwait economic cycles. For example, the proposed financial stability index senses the stress level during the oil price crisis 2013Q2 – 2015Q3 when the oil price slumps from 118 \$/bbl to 37 \$/bbl leading to the announcement of the first government budget deficit in the last 16 years.

Table 7 Pearson Correlations

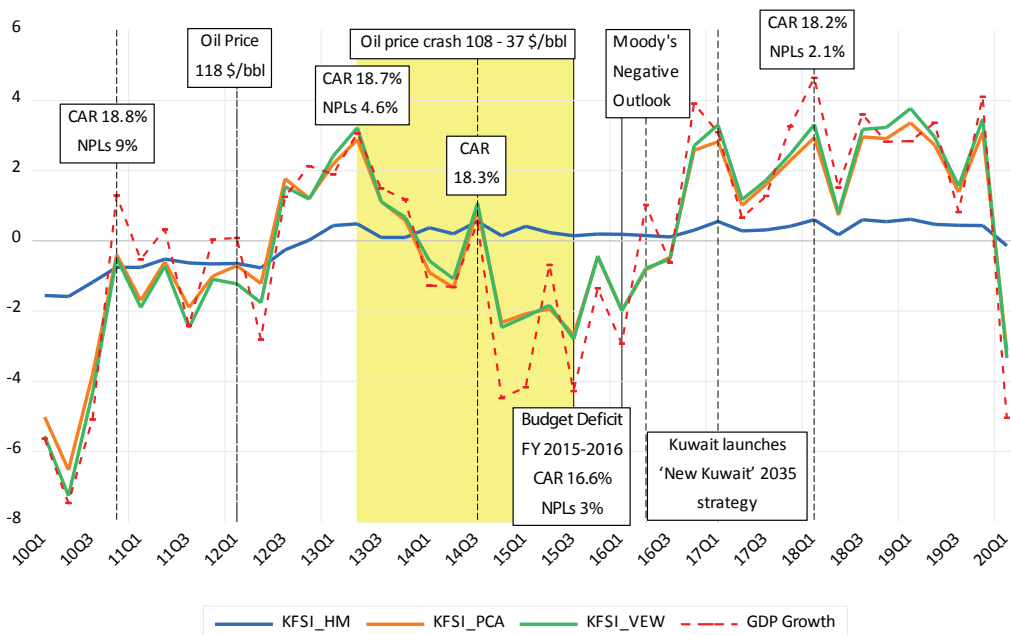
	KFSI <sub>VEW</sub>	KFSI <sub>HM</sub>	Y1GDP_ZS	KFSI <sub>PCA</sub>
KFSI <sub>VEW</sub>	1	0.05	0.069	.678**
KFSI <sub>HM</sub>	0.05	1	.468**	0.159
Y1GDP_ZS	0.069	.468**	1	.335*
KFSI <sub>PCA</sub>	.678**	0.159	.335*	1

\*\* . Correlation is significant at the 0.01 level (2-tailed).  
 \* . Correlation is significant at the 0.05 level (2-tailed).

### 4.4 Discussion and Findings

The main results of this research were consistent with the literature, the research found a correlation of the financial stability with GDP growth. It was confirmed that the proposed index under the three approaches showed their ability to capture Kuwait economics movements and could indicate the business cycles. As the Figure 28 indicated that index tends to increase during high instability and uncertainty and vis versa which in line with the previous studies. When the index reaches its peak, the capital

Figure 28 KFSI Vs. GDP Growth



adequacy, NPLs and capital to assets ratios tend to be at the highest level which is in line and support Pesola (2001) and IMF FSI (2019) explanation. This research share with the literature that banks intend to increase their capital buffer and provisions during the high instability period to enhance their ability to absorb any future financial shock.

Moreover, this result agrees with Arzamasov and Penikasa (2014), Kočišová (2015), Zigraiova and Jakubik (2015) as they emphasize the role of Return on Assets Ratio (ROA) and Regulatory Capital to Risk-Weighted Assets Ratio (CAR) and how it should be part of any model to enhance its measurement capability. Also, the correlation test identified significant correlated variables which are capital adequacy ratio, non-performing loans ratio, non-performing loans net of provisions to capital ratio, return on assets, return on equity, capital to assets ratio, total credit to total deposit, liquid assets ratio, capital market quarterly returns and real estate loans to total loans which were part of proposed index under the three approaches. One surprising variable that was found to be association with the financial stability was X18- Real estate loans to total loans which represent one third of the financial system loans portfolio. This is a particularly useful finding as it indicates the impact of the real estate market on Kuwait financial system which should be investigated.

Though three approaches have been implemented to construct Kuwait financial stability index, **KFSI<sub>PCA</sub>** and **KFSI<sub>HM</sub>** correlation with the GDP growth is significant and should be investigated to develop more sophisticated, complex, and dynamic financial stability index for Kuwait. This finding agrees with Arzamasov and Penikas (2014) finding that the index under PCA is significantly correlated with the macroeconomic data and in contrary with Balakrishnan et al. (2009) who found no significant differences between the different approaches.



## CHAPTER FIVE: CONCLUSION, RECOMMENDATIONS, AND FURTHER RESEARCH

### 5.1 Conclusion

This research set out to assess Kuwait financial system stability and propose a financial stability index for Kuwait. This research strengthens the idea of the importance to assess and measure Kuwait financial stability. Despite lacking sufficient reliable and valid data to construct the index, the available variables and the utilized approaches confirmed their ability to indicate Kuwait financial stability and could be utilized by policymakers and regulators to assess, monitor, and develop Kuwait financial system.

This research deployed twenty variables and three different approaches to construct Kuwait financial stability index by using the most common approaches by the literature. The first step was data selection according to the relevance literature, Kuwait economy structure and data availability. The second step, data normalizing by using the Z-Score method followed by the third step where data aggregated to construct the financial stability index under the Equal Variance Weights approach (EVW), Hybrid approach (HM) and Pinchable Component Analysis approach (PCA).

The high value of the index indicates high stress period and found to be along with high economy growth which donated by the GDP. Visual and statistical comparisons of the proposed index have been employed including Pearson correlation which identify the correlated variables that could indicate Kuwait financial stability namely, capital adequacy ratio, non-performing loans ratio, non-performing loans net of provisions to capital ratio, return on assets, return on equity, capital to assets ratio, total credit to total deposit, liquid assets ratio, capital market quarterly returns and real estate loans to total loans.

This empirical research agrees with the findings of other studies, where banks capital adequacy ratio and non-performing loans ratio are critical indicators that should be monitored by the policymakers and regulator. In addition, this research is consistent that Kuwait financial institutes tend to increase their capital adequacy and provisions during the economy growth and high instability periods as agreed by literature.

Moreover, **KFSI<sub>PCA</sub>** and **KFSI<sub>HM</sub>** correlation is significant with the GDP growth which could indicate Kuwait economic cycle and instability level. This finding could be a starting point to assess and monitor Kuwait financial system stability on quarterly basis rather than the GDP and

to consider KFSI as a lead indicator to assess Kuwait financial system stability.

Finally, the contribution of this research has been confirmed as it provides the basis for the future work to develop Kuwait financial stability index to provide a leading indicator to assess Kuwait financial system stability. Therefore, this research is among the first attempts to assess and propose a financial stability index for Kuwait.

## **5.2 Recommendations**

The findings of this research suggest that the government of Kuwait should utilize the proposed indexes as a leading indicator to assess and monitor Kuwait financial system stability. Also, policymakers and regulators by means CBK and CMA should adopt the proposed index as it provides insights that could assist them to take proactive actions by focusing and relaying on relevant data as illustrated in chapter four. Finally, it is recommended to compare the result with other country in the region to assist Kuwait Direct Promotion Authority (KDIPA) to attract new foreign investment and portfolio.

## **5.3 Further Research.**

This research has thrown up many questions in need of further investigation. As there is no consent of the best method to construct the financial stability index and the proposed index could be the base to identify the best method that suit Kuwait economy. Further investigation to measure to what extend could the proposed index affect or indicate Kuwait GDP growth. Also, Kuwait economy structure need to be reassessed to identify significant sector which might require to use Granger causality approach. Also, deconstructing the proposed index could be helpful to assess the source of financial fragility. Finally, it would be interesting to assess the effects of the real estate market on Kuwait financial system and to identify the extend of Kuwaiti banks exposures.

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## APPENDIX 1

Table 8 New Kuwait 2035 Projects

Kuwait 2035 Strategic Plan	No. of Project	%	Average of % of Completion	Sum of Estimate Cost	% Of Estimate Cost	Sum of No. Of Jobs
<b>Sustainable Diversified Economy.</b>	<b>25</b>	<b>23.58%</b>	<b>43%</b>	<b>10,072,590,859</b>	<b>40.48%</b>	<b>2,603</b>
The Development of The Oil Sector	2	1.89%	97%	9,551,000,000	38.38%	2,279
The Creation of a Business Environment for The Private Sector	6	5.66%	28%	286,328,000	1.15%	190
The Development of National Tourism	4	3.77%	50%	132,931,859	0.53%	
The Knowledge Economy	5	4.72%	60%	66,081,000	0.27%	109
The Diversification of The Production Base	3	2.83%	13%	26,000,000	0.10%	25
The Sustainability of Public Finance	1	0.94%	80%	9,750,000	0.04%	
Privatization	4	3.77%	26%	500,000	0.00%	
<b>Developed Infrastructure.</b>	<b>24</b>	<b>22.64%</b>	<b>29%</b>	<b>5,111,828,258</b>	<b>20.54%</b>	<b>2,402</b>
The Development of The Marine Transportation System	9	8.49%	13%	1,647,400,000	6.62%	520
The Development of Air Transportation System	4	3.77%	21%	1,571,996,000	6.32%	1,350
The Development of The Land Transportation System	4	3.77%	17%	1,321,355,365	5.31%	24
The Development and Increase of The Production Capacity of Electrical and Water Energy	4	3.77%	89%	444,700,000	1.79%	248
The Development of The Information & Communication Technology Infrastructure	3	2.83%	25%	126,376,893	0.51%	260
<b>Sustainable Living Environment.</b>	<b>14</b>	<b>13.21%</b>	<b>44%</b>	<b>4,460,722,057</b>	<b>17.93%</b>	<b>194</b>
Providing Housing Welfare to The Citizens	5	4.72%	48%	3,226,653,457	12.97%	
The Sewage Water Treatment	2	1.89%	51%	746,500,000	3.00%	57
The Utilization of Renewable Energy	3	2.83%	35%	249,599,000	1.00%	100
The Improvement of The Efficiency of Waste and Refuse Management	2	1.89%	62%	233,650,000	0.94%	18
The Maintenance of Air Quality	2	1.89%	23%	4,319,600	0.02%	19
<b>Creative Human Capital.</b>	<b>16</b>	<b>15.09%</b>	<b>44%</b>	<b>3,157,494,300</b>	<b>12.69%</b>	<b>267</b>
The Increasing of Enrollment Capacity for Higher Education	1	0.94%	55%	2,782,639,300	11.18%	
The Support and Empowerment of The Youth	4	3.77%	22%	205,000,000	0.82%	68
The Improvement of Safety and Security Systems	2	1.89%	50%	120,200,000	0.48%	199
The Care for And Integration of Persons with Disability	2	1.89%	8%	27,000,000	0.11%	
The Improvement of The Quality of Education	5	4.72%	69%	16,755,000	0.07%	



The Improving of Care Services for The Elderly	2	1.89%	52%	5,900,000	0.02%	
High Quality Healthcare.	14	13.21%	49%	2,032,198,358	8.17%	8
The Increase of Bed Capacity In Hospitals	11	10.38%	39%	1,909,699,358	7.67%	
The Improvement of The Quality of Health Services	3	2.83%	87%	122,499,000	0.49%	8
Global Positioning.	7	6.60%	74%	30,618,326	0.12%	102
Supporting Culture, The Art and The Media	3	2.83%	66%	28,094,001	0.11%	102
The Enhancing of Kuwait's Global Image	4	3.77%	80%	2,524,325	0.01%	
Effective Civil Service.	6	5.66%	58%	19,489,709	0.08%	6
Electronic Government (E-Government)	6	5.66%	58%	19,489,709	0.08%	6
<b>Grand Total</b>	<b>106</b>	<b>100.00%</b>	<b>44%</b>	<b>24,884,941,867</b>	<b>100.00%</b>	<b>5,582</b>

Source: Kuwait Central Statistical Bureau (CSB) and researcher calculation (2020)

Table 9 Kuwait Gross Demotic Products Component

Kuwait Real GDP	2010		2019		2020 Q1	
	GDP	%	GDP	%	GDP	%
ALL AMOUNT IN ('000'000)						
OIL SECTOR	19,579	57.29%	18,347	44.89%	3,702	40.26%
OTHER SERVICES	3,253	9.52%	4,789	11.72%	1,144	12.44%
PUBLIC ADMINISTRATION AND DEFENSE	2,780	8.14%	4,334	10.60%	1,016	11.05%
FINANCIAL INTERMEDIATION AND INSURANCE	3,092	9.05%	3,802	9.30%	968	10.53%
MANUFACTURING	1,978	5.79%	2,820	6.90%	651	7.08%
EDUCATION	1,330	3.89%	2,582	6.32%	520	5.65%
WHOLESALE AND RETAIL TRADE	1,339	3.92%	1,644	4.02%	416	4.52%
HEALTH AND SOCIAL WORK	764	2.24%	1,525	3.73%	383	4.16%
CONSTRUCTION	730	2.14%	1,150	2.81%	305	3.32%
TRANSPORT	1,153	3.37%	1,284	3.14%	300	3.26%
TELECOMMUNICATION	1,230	3.60%	1,196	2.93%	280	3.04%
ELECTRICITY, GAS AND WATER	662	1.94%	1,168	2.86%	153	1.66%
HOUSEHOLD WITH EMPLOYED PERSONS	348	1.02%	583	1.43%	147	1.60%
HOTEL AND RESTAURANT	271	0.79%	409	1.00%	96	1.04%
AGRICULTURE AND FISHING	149	0.44%	185	0.45%	48	0.52%
PLUS: TAXES LESS SUBSIDIES ON PRODUCTS	(2,720)	-7.96%	(2,681)	-6.56%	(356)	-3.87%
LESS: FISIM	(1,765)	-5.16%	(2,265)	-5.54%	(577)	-6.27%
<b>REAL GDP</b>	<b>34,173</b>	<b>100.00%</b>	<b>40,872</b>	<b>100.00%</b>	<b>9,196</b>	<b>100.00%</b>

Figure 29 Kuwait Annual Real GDP

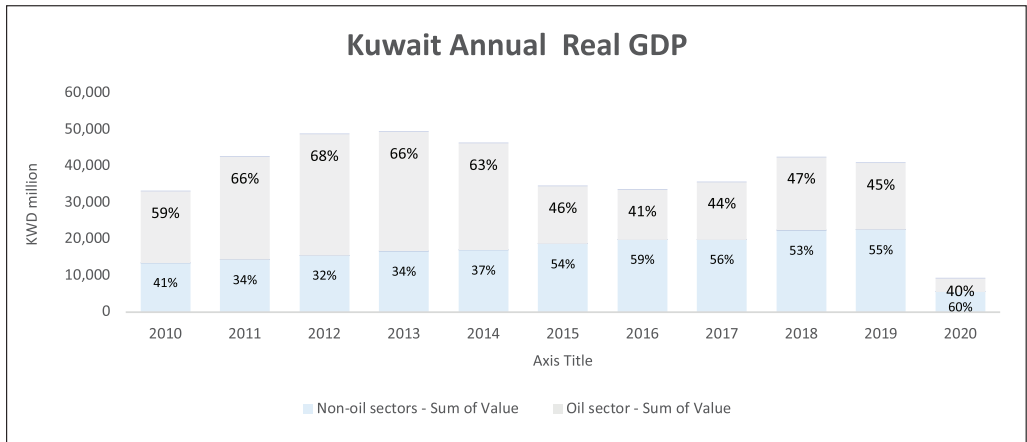


Table 10 Dataset

Date	X01-CAR	X02-NPL%	X03-Net NPL%	X04-BGIG	X05-IMR	X06-ROA	X07-ROE	X08-CTA	X09-CTD	X10-LAR	X11-GLG	X12-NFETC	X13-Mkt.Return	X14-Mkt.Cap	X15-RETG	X16-REPG	X17-RELG	X18-RELT	X19-IRS	X20-EMPI
31/03/10	16.96	11.95	41.08	-	47.63	0.49	4.01	11.28	114.54	27.69	0.18	81.23	7.54	14.45	0.26	5.07	(6.87)	14.83	2.83	113.36
30/06/10	16.88	10.60	37.26	3.43	42.79	0.77	6.07	11.49	114.66	25.33	2.05	78.14	(13.15)	(11.92)	49.38	(10.44)	11.41	16.10	2.77	(56.45)
30/09/10	17.38	9.37	31.94	(6.64)	49.58	0.90	6.86	11.64	115.31	24.34	(0.21)	79.41	6.75	13.84	(41.59)	4.50	1.04	16.29	2.82	(190.07)
31/12/10	18.88	8.95	31.15	(2.99)	61.40	1.24	9.07	12.56	107.18	22.78	0.79	70.88	(0.42)	4.62	28.00	1.57	(4.70)	15.40	2.87	(58.02)
31/03/11	18.78	8.55	31.84	9.89	45.53	1.27	9.40	12.08	112.17	25.44	(0.08)	60.97	(9.49)	(10.40)	10.07	13.64	(0.41)	15.39	3.01	(453.90)
30/06/11	18.76	8.38	30.99	1.56	53.23	1.27	9.57	12.20	109.59	27.55	0.29	76.69	(1.33)	(3.46)	19.30	27.52	(0.74)	15.21	3.03	13.06
30/09/11	18.18	7.64	29.92	(3.48)	49.08	1.26	9.36	12.04	110.05	27.27	0.65	86.16	(6.09)	(6.18)	(25.40)	(38.13)	5.78	15.99	3.03	(31.13)
31/12/11	18.46	6.98	26.28	32.35	43.67	1.10	8.13	12.38	108.35	26.55	4.83	87.14	(0.32)	(0.46)	29.40	6.88	5.12	16.34	2.97	112.52
31/03/12	17.93	7.65	29.74	(22.70)	52.00	1.06	8.11	11.77	109.12	27.24	(0.16)	87.32	6.03	1.73	31.47	5.33	(9.84)	14.44	3.57	(63.35)
30/06/12	17.74	7.89	30.28	12.15	47.96	1.02	7.95	11.80	103.72	26.01	1.24	98.07	(6.10)	(5.74)	4.25	(3.87)	10.60	15.77	3.53	(27.08)
30/09/12	17.15	6.68	23.94	3.13	46.97	1.17	8.98	11.81	99.81	26.13	0.10	107.78	3.34	2.36	(37.55)	9.95	112.96	33.56	3.47	259.40
31/12/12	18.48	5.19	19.47	5.73	46.15	1.35	10.23	12.40	99.26	27.54	2.34	103.79	(0.81)	0.50	57.94	(4.33)	(31.30)	22.51	3.25	(188.15)
31/03/13	18.26	5.31	19.77	(12.52)	51.07	1.43	10.99	11.88	98.09	27.73	2.52	107.55	13.27	(0.01)	(35.58)	27.65	53.51	33.68	3.20	12.68
30/06/13	18.72	4.57	16.73	5.65	50.91	1.42	11.06	12.20	100.12	27.48	2.19	98.97	15.64	4.07	10.41	6.12	6.06	34.95	3.12	(86.17)
30/09/13	18.65	4.36	15.86	(0.10)	49.69	1.16	8.95	12.06	98.91	26.37	1.03	102.68	(0.08)	5.29	16.14	(10.34)	4.75	36.23	3.07	(14.19)
31/12/13	18.85	3.64	12.64	11.73	48.05	1.12	8.72	12.17	97.39	25.37	2.86	98.97	(2.80)	(2.22)	(20.07)	16.94	2.84	36.20	3.05	(45.17)
31/03/14	18.52	3.76	13.79	(10.70)	50.95	1.16	9.41	11.34	101.32	30.48	3.26	105.16	0.31	4.10	(20.17)	23.52	2.24	35.83	2.87	(249.40)
30/06/14	18.33	3.53	12.97	0.82	50.98	1.15	9.55	11.29	103.34	29.47	4.82	94.23	(7.94)	(3.14)	33.10	(5.57)	5.46	36.04	2.86	49.03
30/09/14	18.79	3.23	11.47	5.36	53.02	1.21	9.97	11.31	103.09	29.93	1.77	99.62	9.33	5.60	1.44	(31.70)	1.64	35.98	2.85	260.28
31/12/14	16.86	2.89	10.38	16.33	35.71	1.26	10.21	11.10	103.17	30.73	1.24	112.70	(14.25)	(9.88)	1.74	25.47	3.56	36.79	2.88	206.26
31/03/15	16.85	2.77	9.65	(10.63)	47.07	1.29	10.62	10.80	104.40	32.71	1.40	114.15	(3.87)	(2.75)	(19.97)	9.37	2.05	37.02	2.90	282.12
30/06/15	16.88	2.80	9.73	(3.80)	50.31	1.31	10.78	11.10	106.33	29.68	3.18	106.19	(1.27)	(0.45)	(17.12)	2.56	2.74	36.85	2.89	(14.05)
30/09/15	16.49	2.97	10.81	0.40	51.19	1.34	10.83	10.94	107.72	30.23	0.14	104.39	(7.69)	(7.47)	(32.12)	3.02	5.36	38.78	2.84	132.72
31/12/15	17.52	2.37	8.67	14.92	42.61	1.27	10.21	11.81	106.70	29.84	2.18	104.07	(1.94)	(1.58)	21.69	(6.38)	2.70	38.98	2.86	146.01
31/03/16	17.48	2.40	8.63	(8.81)	48.27	1.19	9.89	11.58	106.46	31.18	1.28	106.46	(6.88)	(7.04)	(9.95)	(1.31)	1.76	39.17	2.88	(264.67)
30/06/16	17.95	2.42	8.72	(3.41)	51.68	1.14	9.46	12.03	107.82	30.09	1.81	104.08	2.60	(1.47)	(6.17)	6.00	1.54	39.08	2.84	54.70
30/09/16	17.86	2.31	8.10	5.82	51.12	1.18	9.52	12.03	108.22	29.22	0.48	98.18	0.63	1.00	(22.19)	(7.40)	2.38	39.82	2.83	138.20
31/12/16	18.59	2.22	7.43	4.82	48.65	1.22	9.78	12.79	106.23	30.12	(2.54)	90.18	6.48	8.21	38.38	(8.86)	1.32	41.42	2.87	37.15
31/03/17	18.76	2.47	8.60	(2.93)	48.65	1.26	10.18	12.76	107.52	31.40	1.39	85.07	22.29	8.17	4.96	32.96	2.19	41.77	2.95	(115.76)
30/06/17	18.29	2.40	8.42	4.49	50.43	1.28	10.51	12.45	107.82	31.52	2.80	81.63	(3.79)	(3.59)	21.45	(19.92)	2.12	41.50	3.11	(38.69)
30/09/17	18.18	2.52	8.79	4.34	49.07	1.27	10.34	12.36	105.77	31.02	1.05	79.36	(1.23)	8.07	(30.94)	1.55	2.04	41.89	3.12	55.16
31/12/17	18.45	1.95	6.41	3.91	49.98	1.38	11.16	12.77	106.14	31.28	(0.55)	74.34	(4.07)	(7.13)	21.24	0.68	2.39	43.13	3.13	(63.68)
31/03/18	18.18	2.06	6.96	(0.32)	51.53	1.44	11.89	12.50	105.17	31.73	1.59	77.87	3.52	3.61	10.61	(2.13)	1.56	43.11	3.24	(121.13)
30/06/18	17.88	2.08	7.22	8.54	48.64	1.49	12.37	12.38	108.61	30.64	1.18	79.49	(26.28)	(2.84)	6.03	(3.17)	1.18	43.10	3.20	(9.39)
30/09/18	17.99	2.02	7.02	(0.49)	48.03	1.55	12.70	12.43	108.43	30.91	0.21	82.86	4.86	5.79	(1.02)	(5.12)	3.12	44.35	3.13	69.38
31/12/18	18.32	1.62	5.56	0.60	47.03	1.56	12.52	12.91	108.08	31.24	1.50	72.05	(0.94)	(0.52)	25.46	1.88	0.82	44.04	3.06	21.35
31/03/19	17.96	1.81	6.30	3.37	44.84	1.56	12.63	12.81	105.22	29.56	2.21	78.22	10.60	12.35	(5.89)	8.83	(1.11)	42.61	2.97	(4.34)
30/06/19	18.01	1.81	6.07	4.39	43.06	1.53	12.40	12.94	105.37	29.14	1.90	77.62	3.81	3.00	(1.91)	(0.02)	0.34	41.94	3.00	(0.29)
30/09/19	17.56	1.81	6.12	0.63	44.56	1.50	12.03	12.74	104.69	31.34	1.15	77.40	(2.63)	(3.05)	(4.88)	2.08	0.48	41.66	2.90	8.22
31/12/19	18.48	1.46	4.87	0.76	44.58	1.34	10.64	13.32	105.14	30.32	1.69	66.39	10.63	11.09	2.89	1.63	0.78	41.27	2.82	(55.47)
31/03/20	16.86	1.78	6.56	(5.27)	44.69	1.22	9.93	12.51	103.01	30.28	4.83	72.17	(23.24)	(23.48)	(24.73)	3.01	(0.30)	39.24	2.80	178.96

Figure 30 Variables Graphs

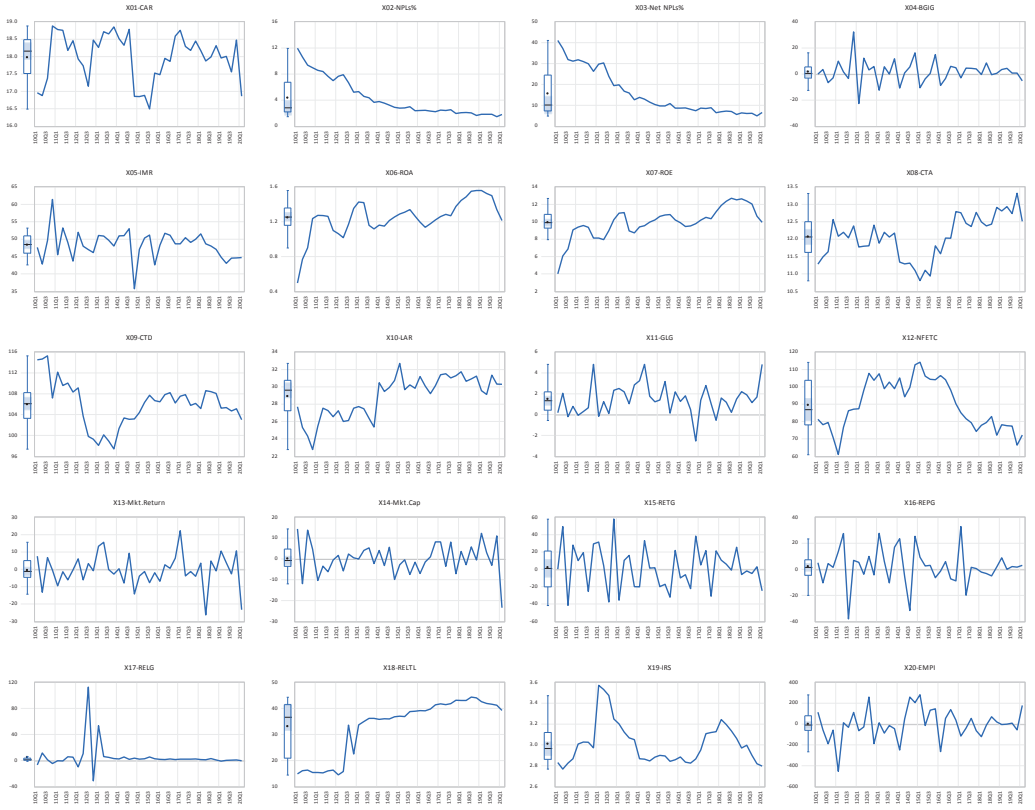


Table 11 Pearson's Correlation

	X1CAR	X2NPLs	X3NetNPLs	X4BGIG	X5IMR	X6ROA	X7ROE	X8CTA	X9CTD	X10LAR
X1CAR	1.00	(0.05)	(0.03)	(0.03)	0.40	0.26	0.17	0.54	(0.25)	(0.17)
X2NPLs	(0.05)	1.00	1.00	0.23	0.16	(0.70)	(0.80)	(0.31)	0.42	(0.80)
X3NetNPLs	(0.03)	1.00	1.00	0.21	0.16	(0.68)	(0.79)	(0.31)	0.40	(0.80)
X4BGIG	(0.03)	0.23	0.21	1.00	(0.38)	(0.33)	(0.32)	0.02	0.17	(0.15)
X5IMR	0.40	0.16	0.16	(0.38)	1.00	(0.02)	(0.05)	(0.03)	(0.00)	(0.20)
X6ROA	0.26	(0.70)	(0.68)	(0.33)	(0.02)	1.00	0.98	0.48	(0.37)	0.47
X7ROE	0.17	(0.80)	(0.79)	(0.32)	(0.05)	0.98	1.00	0.43	(0.36)	0.61
X8CTA	0.54	(0.31)	(0.31)	0.02	(0.03)	0.48	0.43	1.00	(0.05)	0.08
X9CTD	(0.25)	0.42	0.40	0.17	(0.00)	(0.37)	(0.36)	(0.05)	1.00	(0.10)
X10LAR	(0.17)	(0.80)	(0.80)	(0.15)	(0.20)	0.47	0.61	0.08	(0.10)	1.00
X11GLG	(0.00)	(0.19)	(0.17)	0.06	(0.17)	0.05	0.08	(0.08)	(0.35)	0.08
X12NFETC	(0.28)	(0.14)	(0.12)	(0.10)	(0.03)	(0.10)	(0.06)	(0.66)	(0.52)	0.10
X13Mkt. Return	0.39	0.01	0.00	(0.09)	0.26	0.04	0.01	0.22	(0.12)	(0.04)
X14Mkt.Cap	0.31	0.05	0.02	0.09	0.25	(0.05)	(0.05)	0.20	0.05	(0.06)
X15RETG	0.37	0.14	0.14	0.22	(0.04)	(0.04)	(0.07)	0.27	0.12	(0.10)
X16REPG	(0.00)	0.04	0.03	(0.05)	(0.12)	0.04	0.01	(0.03)	(0.17)	(0.02)
X17RELG	(0.19)	0.11	0.11	(0.07)	(0.03)	(0.01)	(0.04)	(0.13)	(0.29)	(0.17)
X18RELTL	(0.02)	(0.94)	(0.96)	(0.18)	(0.14)	0.62	0.73	0.27	(0.40)	0.78
X19IRS	0.18	0.13	0.17	(0.13)	0.12	0.17	0.11	0.15	(0.29)	(0.16)
X20EMPI	(0.41)	(0.20)	(0.21)	0.22	(0.15)	(0.03)	0.04	(0.24)	(0.17)	0.25
KFSI_VEW	0.46	(0.77)	(0.78)	(0.14)	0.09	0.70	0.74	0.44	(0.48)	0.57
	X11GLG	X12N-FETC	.X13Mkt Return	.X14Mkt Cap	X15RETG	X16REPG	X17RELG	X18RELTL	X19IRS	X20EMPI
X1CAR	(0.00)	(0.28)	0.39	0.31	0.37	(0.00)	(0.19)	(0.02)	0.18	(0.41)
X2NPLs	(0.19)	(0.14)	0.01	0.05	0.14	0.04	0.11	(0.94)	0.13	(0.20)
X3NetNPLs	(0.17)	(0.12)	0.00	0.02	0.14	0.03	0.11	(0.96)	0.17	(0.21)
X4BGIG	0.06	(0.10)	(0.09)	0.09	0.22	(0.05)	(0.07)	(0.18)	(0.13)	0.22
X5IMR	(0.17)	(0.03)	0.26	0.25	(0.04)	(0.12)	(0.03)	(0.14)	0.12	(0.15)
X6ROA	0.05	(0.10)	0.04	(0.05)	(0.04)	0.04	(0.01)	0.62	0.17	(0.03)
X7ROE	0.08	(0.06)	0.01	(0.05)	(0.07)	0.01	(0.04)	0.73	0.11	0.04
X8CTA	(0.08)	(0.66)	0.22	0.20	0.27	(0.03)	(0.13)	0.27	0.15	(0.24)
X9CTD	(0.35)	(0.52)	(0.12)	0.05	0.12	(0.17)	(0.29)	(0.40)	(0.29)	(0.17)
X10LAR	0.08	0.10	(0.04)	(0.06)	(0.10)	(0.02)	(0.17)	0.78	(0.16)	0.25
X11GLG	1.00	0.14	(0.18)	(0.28)	0.02	0.07	(0.06)	0.11	(0.17)	0.08
X12NFETC	0.14	1.00	0.06	(0.06)	(0.25)	0.09	0.27	0.14	0.06	0.34
X13Mkt. Return	(0.18)	0.06	1.00	0.77	(0.05)	0.19	0.11	0.05	0.08	(0.06)
X14Mkt.Cap	(0.28)	(0.06)	0.77	1.00	(0.05)	0.04	(0.02)	0.05	0.03	(0.04)
X15RETG	0.02	(0.25)	(0.05)	(0.05)	1.00	(0.19)	(0.42)	(0.21)	0.09	(0.20)
X16REPG	0.07	0.09	0.19	0.04	(0.19)	1.00	0.17	0.00	0.04	(0.14)
X17RELG	(0.06)	0.27	0.11	(0.02)	(0.42)	0.17	1.00	0.07	0.33	0.31
X18RELTL	0.11	0.14	0.05	0.05	(0.21)	0.00	0.07	1.00	(0.15)	0.25
X19IRS	(0.17)	0.06	0.08	0.03	0.09	0.04	0.33	(0.15)	1.00	(0.10)
X20EMPI	0.08	0.34	(0.06)	(0.04)	(0.20)	(0.14)	0.31	0.25	(0.10)	1.00
KFSI_VEW	0.25	(0.00)	0.37	0.29	0.02	0.21	(0.06)	0.77	(0.10)	(0.05)

## APPENDIX 2

Table 12 PCA Communalities

	Initial	Extraction
<b>X01-CAR</b>	1.000	0.837
<b>%X02-NPLs</b>	1.000	0.970
<b>%X03-Net NPLs</b>	1.000	0.969
<b>X04-BGIG</b>	1.000	0.803
<b>X05-IMR</b>	1.000	0.756
<b>X06-ROA</b>	1.000	0.850
<b>X07-ROE</b>	1.000	0.899
<b>X08-CTA</b>	1.000	0.850
<b>X09-CTD</b>	1.000	0.879
<b>X10-LAR</b>	1.000	0.779
<b>X11-GLG</b>	1.000	0.673
<b>X12-NFETC</b>	1.000	0.815
<b>X13-Mkt.Return</b>	1.000	0.852
<b>X14-Mkt.Cap</b>	1.000	0.869
<b>X15-RETG</b>	1.000	0.662
<b>X16-REPG</b>	1.000	0.800
<b>X17-RELG</b>	1.000	0.758
<b>X18-RELTL</b>	1.000	0.915
<b>X19-IRS</b>	1.000	0.730
<b>X20-EMPI</b>	1.000	0.720

Table 13 PCA Rotated Component Matrix

Component	Banks Performance	Leverage	Cap. Mkt.	Real Estate	Loans	Revenue	Other
X02-NPLs%	- 0.966						
X03-Net NPLs%	- 0.965						
X18-RELTL	0.935						
X07-ROE	0.890						
X10-LAR	0.821						
X06-ROA	0.804						
X08-CTA		0.739					
X01-CAR		0.738					
X12-NFETC							
X15-RETG							
X20-EMPI							
X14-Mkt.Cap			0.918				
X13-Mkt.Return			0.899				
X19-IRS				0.817			
X17-RELG				0.710			
X09-CTD					- 0.747		
X11-GLG					0.709		
X04-BGIG						0.826	
X05-IMR						- 0.743	
X16-REPG							0.872

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization converged in 17 iterations.

Figure 31 PCA Scree Plot

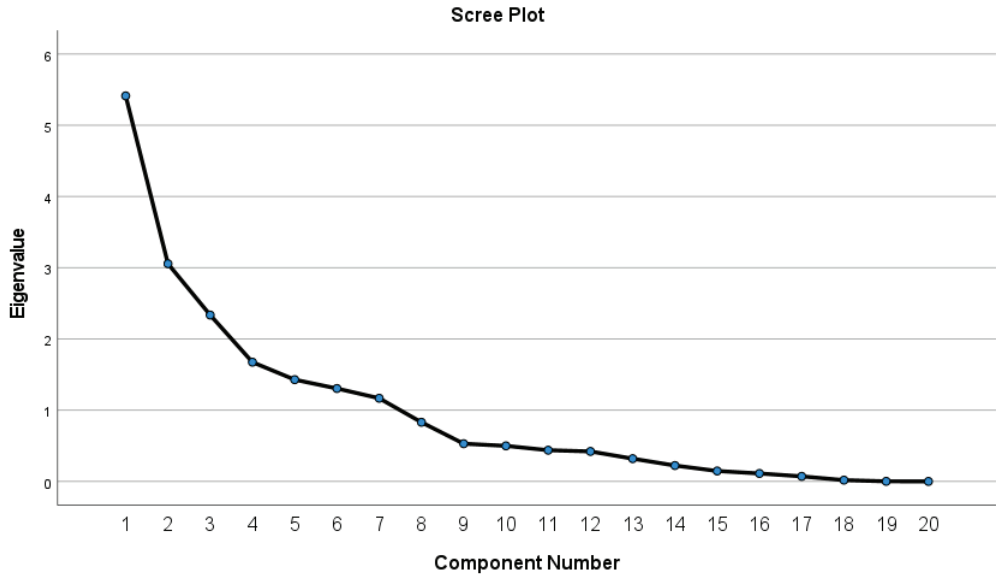


Table 14 PCA Component Score Coefficient Matrix

Component	Banks	Leverage	Market	Real Estate	Loans	Revenue	Other
<b>X01-CAR</b>	-0.026	0.274	0.151	0.017	0.221	-0.072	-0.066
<b>X02-NPLs%</b>	-0.18	0.013	-0.015	0.068	-0.046	-0.003	0.038
<b>X03-Net NPLs%</b>	-0.182	0.022	-0.031	0.086	-0.033	-0.013	0.029
<b>X04-BGIG</b>	-0.043	0.074	0.117	0.018	0.066	0.531	-0.094
<b>X05-IMR</b>	-0.039	-0.03	0.11	-0.049	0.038	-0.46	-0.238
<b>X06-ROA</b>	0.149	0.105	-0.081	0.157	-0.052	-0.062	0.041
<b>X07-ROE</b>	0.169	0.068	-0.071	0.108	-0.06	-0.056	0.02
<b>X08-CTA</b>	0.082	0.265	0.043	0.146	-0.139	0.177	0.059
<b>X09-CTD</b>	-0.012	-0.038	-0.039	-0.186	-0.43	-0.005	0.006
<b>X10-LAR</b>	0.17	-0.088	0.012	-0.144	-0.081	0.012	-0.038
<b>X11-GLG</b>	-0.036	0.109	-0.097	-0.173	0.473	0.064	0.124
<b>X12-NFETC</b>	-0.028	-0.217	0.08	0.003	0.334	-0.087	-0.115
<b>X13-Mkt.Return</b>	-0.001	-0.021	0.435	-0.035	0.034	0.018	0.09
<b>X14-Mkt.Cap</b>	0.01	-0.041	0.461	-0.071	-0.061	0.074	-0.025
<b>X15-RETG</b>	-0.047	0.265	-0.038	-0.023	0.178	0.12	-0.289
<b>X16-REPG</b>	-0.025	0.023	0.035	-0.053	0.063	0.06	0.709
<b>X17-RELG</b>	-0.006	-0.159	0.018	0.428	-0.092	0.106	0.094
<b>X18-RELTl</b>	0.182	-0.064	0.072	-0.035	-0.015	0.046	-0.013
<b>X19-IRS</b>	-0.026	0.077	-0.078	0.508	-0.024	-0.005	-0.112
<b>X20-EMPI</b>	0.053	-0.218	0.098	0.14	0.001	0.249	-0.319

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.



Table 15 PCA Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% Of Variance	Cumulative %	Total	% Of Variance	Cumulative %	Total	% Of Variance	Cumulative %
1	5.41	27.07	27.07	5.41	27.07	27.07	5.30	26.51	26.51
2	3.06	15.29	42.35	3.06	15.29	42.35	2.72	13.58	40.09
3	2.34	11.68	54.04	2.34	11.68	54.04	2.10	10.52	50.62
4	1.67	8.37	62.41	1.67	8.37	62.41	1.71	8.56	59.17
5	1.43	7.15	69.55	1.43	7.15	69.55	1.66	8.32	67.49
6	1.31	6.53	76.08	1.31	6.53	76.08	1.64	8.20	75.69
7	1.17	5.84	81.92	1.17	5.84	81.92	1.25	6.23	81.92

Table 16 PCA Component Transformation Matrix

Component	Banks	Leverage	Capital Market	Real Estate	Loans	Revenue	Other
Banks	0.98	0.02	0.00	0.05	0.16	- 0.04	0.03
Leverage	0.01	0.84	0.42	0.06	- 0.23	- 0.25	- 0.02
Market	- 0.08	- 0.35	0.56	0.56	0.26	- 0.36	0.22
Real Estate	0.11	- 0.33	0.65	- 0.47	- 0.40	0.24	- 0.10
Loans	- 0.07	0.23	0.26	0.09	0.55	0.75	0.04
Revenue	0.08	- 0.03	- 0.11	0.58	- 0.63	0.43	0.24
Other	0.02	- 0.06	0.04	0.34	- 0.02	0.04	- 0.94



بيت التمويل الكويتي  
Kuwait Finance House

