DETERMINANTS OF COMMERCIAL BANK LENDING: EVIDENCE IN GCC

A Thesis Submitted in Partial Fulfillment of the Requirements for the Master's Degree of Science in Finance

BY

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2021-2022

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ACKNOWLEDGEMENT

First and foremost, I would like to thank Allah Almighty for giving me this knowledge, strength, and ability to complete my thesis. Without his blessings, this achievement would not have been possible.

Then, especially thanks to my supervisor of this thesis Dr. Tahar Tayachi for his continuous guidance and support during this research journey, for his great effort to enable me to complete this thesis. He has been providing his heartfelt support and guidance at all times and has given me invaluable guidance and suggestions.

I would like to thanks the all the finance faculty Dr. Ahmed Ben Saida, Dr. Rozina Shaheen, and Dr. Mohamed Raheem for their help and support during this journey.

Finally, I would to deep thanks to my family who was there with me at every stage and step, encouraging me during this journey to get high grades. I reached this stage by preferred by God and then by preferred them.

Thank You All,

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Abstract

Banking is one of the highly sensitive industries as its most of the revenue is generated from loans. The current study aims to investigate the impact of interest rates, capital sufficiency, asset quality, and liquidity on the lending behavior of commercial leading banks of Gulf Cooperation Council (GCC). For this purpose, the investigator aimed to use a quantitative research method so that only accurate, authentic, and fully updated data can be obtained from the selected population. This research would provide assistance to regulators for the development of credit risk management standards for various credit related problems like economic sector funding, lending restrictions and risk weighted assets, etc. which can put an impact on the asset quality. Moreover, the researcher collected plenty of data from secondary sources to analyze the impact more effectively with good arguments. Furthermore, all the obtained data were further analysed by using a regression model and statistical analysis methods to evaluate the effectiveness, efficiency, and reliability of all the obtained data from various sources. The results of the conducted research suggested that there is a strong impact of various numbers of determinants of commercial banks of GCC on the lending behaviours like interest rates, capital sufficiency, asset quality, and liquidity. The current research study also indicated that the banks of GCC are needed to stay more vigilant in the use of multiple factors while following the lending trends to increase their revenues and profits.

Keywords: Lending, Bank size, GDP (Gross Domestic Product), Credit risk, Liquidity Ratio, Volume of Deposit, Cash reserve, Investment portfolio, Interest rate

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CHAPTER ONE

1. INTRODUCTION

1.1 Background of the study

Ever since invention of money in prehistoric days, there have always been some who have excess finances that they may not require for instant usage, termed as surplus economic units, and those who lack money to fund their present demands. Others with surplus funds began loaning money to cover the wants of those with a cash shortfall in exchange for a consideration, resulting in the advent of credit[1] according to Miyajima (2017). The concept was distinguished by direct lending, in which the participants were to interact directly with one another. It entailed the surpluses - lenders and the deficit units - borrowers searching for and negotiating with each other individually, with the lender bearing all of the risk.

Since then, the system's history has witnessed the rise of indirect lending gradually substituting direct lending. Indirect lending is the practice of banks combining deposits from diverse surplus entities (companies, governments, and people) and giving loans to those in need of funds[2]. Commercial banks will then reward customers with interest on their savings while also taking on the default risk. The banks will then attach a margin appropriate with the debtor's risk level to what is paid to depositors to arrive at the debtor's costs. The loans are then repaid via banks.

Lending is a crucial service provided by banks that contributes significantly to their income generating. Due to the type of need being covered, the loans might be short, medium, or long term. Credit is therefore a primary driver in assisting the economic activities of families,

[1]Ken Miyajima, "What Influences Bank Lending in Saudi Arabia?," *IMF Working Papers* 17, no. 31 (2017): 1, https://doi.org/10.5089/9781475578669.001.
[2]Serpil Tomak, "Determinants of Commercial Banks Lending Behavior: Evidence From Turkey," *Asian Journal of Empirical Research*, 2013, 933–43.

businesses, and governments, which determines the growth and expansion of any state's economy. Bank lending operations have an impact on economic growth by providing capital for investment. Many economies have liberalized financial firms as a result of this[3].It must be recognized that commercial banks' financial intermediaries function allows them to decide funding for diverse economic sectors depending on available possibilities and the risks connected with each industry. Notwithstanding well-known liberalization programs, experts remain split on the causes of borrowing behaviors.

Bank loans are a significant source of long-term finance in advanced economies. Commercial banks are crucial in mobilization of assets and distributing financial resources. Finally, commercial banks perform an important role in forming a country's economic development and growth. Banks have the power, aptitude, and future outlook for mobilizing financial resources and allocating them to profitable projects. Commercial banks would be keen in providing loans to their clients since they are driven by three factors: liquidity, solvency, and profitability, and are not impacted by the nation's fiscal regulations[4].

In most industrialized nations, such as Japan, long-term debt accounts for 70% of total loans[5]. Commercial banks in developing markets are unwilling to make long-term loans to private corporations. As a result, it is widely acknowledged that the main impediment to economic growth in emerging and developing countries is a lack of long-term financing. Researchers have also discovered that non-financial institutions in emerging economies regard a shortage of long-term lending as a major problem inhibiting their functions and expansion.

[3]Ayman Mansour Khalaf Alkhazaleh, "Factors May Drive the Commercial Banks Lending: Evidence from Jordan," *Banks and Bank Systems* 12, no. 2 (2017): 31–38, https://doi.org/10.21511/bbs.12(2).2017.03.
[4]James Onyango Ayieyo, "Determinants of Lending Behavior in Selected Commercial Banks in Kenya," *International Journal of Economics, Commerce and Management* IV, no. 9 (2016): 767–82.
[5]Ayieyo.

They believe that enterprises with quicker growth have a larger share of long-term indebtedness to overall obligations.

By pooling deposits and capital from multiple industries and organizations, large-sized banks are better positioned to provide a broader range of financial products to their customers. Smaller banking institutions are more likely to underwrite modest loans to small company owners, which are more hazardous than the portfolios of larger banks. A large balance sheet enables credit risk management teams to diversify their entire portfolio by examining diverse geographical and economic sectors, reducing the risk of asymmetric shocks. The prevalence of non-performing loans is linked to the size of the institution.

1.1.1 Lending behavior

Scholars have conducted extensive research on the credit extension practices of different financial organizations. Some studies explored what factors influence a bank's readiness to provide loans to various areas of the economy, while others attempted to evaluate the effect of such lending activities on a country's economic production and improvement[6]. The majority of the studies agreed that commercial banks should have certain fundamental lending precepts and systems in place to serve as a compass in their loan extension efforts. This study will investigate the influence of asset quality, interest rates and capital adequacy and liquidity, on the lending behavior of commercial banks in Gulf Cooperation Council (GCC).

It is general knowledge that savings or cash received from depositors are the primary source of credit; nevertheless, the overall sum given out is typically a portion of the consolidated deposits, with the remainder maintained in reserve to preserve the bank's level of

[6]Felicia Omowunmi Olokoyo, "Determinants of Commercial Banks' Lending Behavior in Nigeria," *International Journal of Financial Research* 2, no. 2 (2011), https://doi.org/10.5430/ijfr.v2n2p61.

liquidity. Credit generation is often the majority of banks' principal activity. It may be determined that the loan portfolio accounts for the majority of a bank's assets and income stream. When making a credit decision, banks often consider a number of factors, including the capacity and willingness to repay, to determine the possibility of a loan applicant fulfilling his loan commitments.

The debtor risk profile and the customer relations are the two most important factors that banks assess[7]. The most essential component is the risk factor, which means that even if a customer has a strong and long-term connection with the bank and is ready to return the loan obtained but lacks the capacity, the bank will be unable to recover their principal and interest when they fall due. In their credit extension choices, banks should thus thoroughly consider the borrower's overall risk, which is essentially the capacity to satisfy future debt payments when they become due.

1.1.2 Determinants of lending behavior

Determinants of bank lending behavior among commercial banks relate to the elements that influence commercial banks' loan extension. Banks often evaluate a variety of criteria in making lending decisions, including the areas of the economy to which they are lending, the sort of customers on whom they are taking risks, and the quantity to be provided. These variables include capital adequacy, interest rates, asset quality, and liquidity[8]. Loan pricing, often known as interest rate, is one of the most important criteria examined by both the client and the lending institution throughout the loan decision-making process.

[7]Mitku Malede, "Determinants of Commercial Banks' Lending Behavior: Evidence from Turkey," *Asian Journal of Empirical Research* 3, no. 8 (2013): 933–43.
[8]Tomak, "Determinants of Commercial Banks Lending Behavior: Evidence From Turkey"; Ayieyo, "Determinants of Lending Behavior in Selected Commercial Banks in Kenya."

Liquidity alludes to a bank's capacity to meet its financial commitments, primarily to customers, when those deposits are needed[9]. The loan portfolio, which contributes significantly to a bank's earnings, is most likely the greatest asset on a bank's balance sheet. As a result, it is the most significant source of commercial banks' risk to their safety and soundness. The liquidity level retained by banks is heavily reliant on lending activities, which serves as a framework for loan growth. When there is a lesser demand for debt instruments, commercial banks maintain more short-term assets, but when there is a larger loan demand, commercial banks hold fewer liquid assets, which is influenced by the large profits related to long loans. As a result, loans and advances have an inverse connection with a bank's liquidity.

The link between loan provisions and total loans is referred to as asset quality. Because the loan provision is an item on the profit and loss statement, it must be adequately offset. As a result, it assesses a bank's leadership's effectiveness in increasing income through the extension of loans and advances. The link between the non-performing loan book and the entire loan book is referred to as lending efficiency in this context[10].Capital adequacy measures a bank's capital's ability to withstand fiscal and operational fluctuations. When the Basel Capital Accord went into force, a lot of research was done on the effects of a bank's capital on its loans, but existing studies are not thorough in this field[11]. Monetary contraction has a significant detrimental impact on the credit facilities of underinvested banks.

1.2 Problem Statement

Banking is a very sensitive industry since the majority of its revenue is produced via loan operations. The loan procedure may subject the bank to considerable risk, which might

[9]Olokoyo, "Determinants of Commercial Banks' Lending Behavior in Nigeria."
[10]Tomak, "Determinants of Commercial Banks Lending Behavior: Evidence From Turkey."
[11]Miyajima, "What Influences Bank Lending in Saudi Arabia?"

result in a loss. As a result, understanding the causes of loan behaviour is critical for bank executives; else, successful bank performance or profit is unlikely. Commercial banks' financial intermediaries' function is crucial in promoting economic growth and development in every country. Banks are able to accumulate funds through the financial intermediaries, which are then utilized to fund economy of a nation. Poor lending practices will cause institutions to incur significant losses, potentially leading to their demise. This could have a knock-on impact in the economy, leading to the entire collapse of the financial industry.

1.3 Research Aims

The primary goal of the study was to identify the factors of lending behavior in GCC banks. The following were the precise objectives that led this research:

1. To investigate the impact of capital sufficiency on lending behavior in GCC commercial banks.
2. To ascertain the impact of interest rates on lending behavior in commercial banks in GCC.
3. To investigate the impact of asset quality on lending behavior in commercial banks in GCC.
4. To ascertain the impact of liquidity on lending behavior in commercial banks in GCC.

1.4 Research Rationale

The purpose of this research was to determine the lending habits of commercial banks in GCC. It is critical to understand how the financial systems of rising countries in general, and GCC in particular, functioned. This is done to gain insight into how interest rates, capital adequacy, liquidity and asset quality, impact the characteristics and structures of loans, which

is then replicated in the loan conditions that form the foundation of agreements between the bank and its customers. The research will also assist the regulators in developing credit risk management standards to oversee different credit-related hazards such as lending restrictions, risk-weighted assets, and economic sector funding, which will have an influence on asset quality. The commercial bank's staff and management will profit from this research as well, as they will understand which elements to consider when making credit judgments and managing their credit facilities.

CHAPTER TWO

2. LITERATURE REVIEW

This chapter examines previous works of other researchers in this field, specifically to the determining factors of commercial lending.

2.2 Theoretical Framework

Various researchers have presented numerous theories concerning credit evaluation and regulation. We will look at four theories: delegated monitoring of borrowers, credit risk management portfolio theory, loan pricing theory, and information asymmetry theory.

2.2.1 Portfolio theory to credit risk management

Since the 1980s, commercial banks have successfully applied Modern Portfolio Theory (MPT) to market risk and credit risk management. Most financial institutions use Value at Risk (VaR) models to manage their market risk vulnerabilities and interest rates[12]. Regrettably, despite the fact that banks identify credit risk as their primary problem, the application of current portfolio theory to credit risk has lagged.

Commercial banks understand the influence of credit saturation on their firm profitability, which may be negative if not handled properly. This has commanded the most of commercial banks to use quantitative techniques to credit risk measurement, while the main impediment has been a lack of trustworthy data. The banking sector has also taken major efforts toward developing tools for assessing credit risk. Banks have also used credit derivative instruments to quickly and effectively shift risk that they do not want to bear while

[12]Ayieyo, "Determinants of Lending Behavior in Selected Commercial Banks in Kenya."

simultaneously preserving client rapport. As a result of these two developing concerns, advancement in credit risk management on a portfolio level has risen tremendously.

In the beginning, banks used an asset-by-asset approach to credit risk management. This approach entailed periodically assessing the loan book quality and other credit hazards, employing credit risk ratings, and completely incorporating the findings of this study to calculate the potential losses of a specific loan portfolio. The asset-by-asset method is based on a thorough credit examination as well as the bank's own credit risk rating system. Credit risk assessment systems and frequent loan reviews enable managers to identify portfolio changes in real time. Depending on the conclusion of an institution's difficulty in loan recognition, credit risk rating system, and loan assessment, administration may then adjust its portfolio tactics or simply speed up loan monitoring.

The fundamental shortcoming of the asset-by-asset method is a failure to give a holistic perspective of the credit risk portfolio, where risk alludes to the possibility that actual losses exceed predicted losses. The incapacity to detect and assess concentration risk is the primary drawback of the asset-by-asset method. Concentration risk is the heightened risk caused by increasing exposure to a potential borrower, related debtors, or a certain sector[13]. As a result, commercial banks supplement this technique with a quantitative evaluation of their loan portfolios using multiple credit models.

2.3 Information Asymmetry Theory

This concept is based on the notion that a borrower may know a great deal of information about the risk involved with the project that they have asked the bank to fund that the lender may not have. This might result in an issue with unfavorable selection and behavioral

[13]M Ivanović, "Determinants of Credit Growth: The Case of Montenegro," *Journal of Central Banking Theory and Practice* 5, no. 2 (2016): 101–18, 10.1515/jcbtp-2016-0013.

hazard. These significant gaps can reduce the efficacy of shifting monies from those with surplus to those in fiscal distress. The bank may overcome these problems in three ways. One, by building a promise to long-term client relationships. Second, by facilitating communication with other stakeholders, and third, by outsourcing the responsibility of borrowers monitoring[14].Prior to a bank issuing out a loan, all essential information must be gathered in order to overcome the information asymmetry challenge.

2.4 Theory of delegated monitoring of borrowers

Banks screen borrowers by obtaining information during the loan evaluation process and after loan disbursements. It entails determining if the applicant has met the bank's lending criteria, assessing the borrower to determine his creditworthiness, and post-loan surveillance to ensure that all agreements are met[15]. When banks manage their clients' operational accounts, they have access to sensitive information on cash movements and spending. This confidential data is helpful in the scenario of small and medium businesses.

Financial efficacy in the banking industry has been identified as a need for economic progress. This reveals why so much attention is placed on ongoing study in this field. This is influenced further by changes in the banking business, which is marked by fierce rivalry. Globalization of markets and financial liberalization have spawned a new age of competitiveness for local banking, with many banks broadening their businesses to stay up with the latest trends.

[14]S. Manole, C. Petrescu, and R Vlada, "Determinants of Household Loans," *Theoretical and Applied Economics* 4, no. 609 (2016): 89–102.
[15]Alkhazaleh, "Factors May Drive the Commercial Banks Lending: Evidence from Jordan."

2.5 Loan Pricing Theory

It is impractical for banks to continually give very low interest rates on deposits while still giving high interest rates on credit facilities in order to increase their revenue. Banks should address the issue of moral hazard and adverse selection when attempting to optimize income because it is difficult to target borrower type with confidence at the time of commencing client connection. Because high interest rates are usually favorable to high-risk borrowers, they may cause an unfavorable selection problem. Once these debtors obtain the loans, it is extremely likely that they will engage in moral hazard behavior as a result of pursuing high-risk developments.

2.6 Empirical Framework

Banks are in a stronger role to predict the likely achievement of envisaged project financing because they can draw on encounter from equivalent previous undertakings that they have funded. They are generally in a place to obtain important information that entrepreneurs might not even be successful in obtaining easily. They must also be acquainted with the macroeconomic environment of their geographical scope as well as prevalent economic indicators. This discussed the significance of banks in the business communities. Simultaneously, they must strike a balance between income generation and the dangers associated with their bank lending practices.

The bank's credit terms may then be driven by the need to retain its customers, which may display it with an attempt to profit from other investment opportunities such as service fees, which are non-interest-bearing incomes. As a result, financial institutions should not ignore the relevance of relationship factors because they may offer inside helpful data to them in the future. As a result, it's fascinating to see how banks incorporate relationship factors into their credit assessment.

The majority of the recent work has been on overall credit expansion in both emerging and developed nations. According to the existing research, consumer lending is influenced by supply-side variables such as liquidity and demand variables such as income gains and borrowing rates (interest). Coletta, De Bonis and Piermattei (2014)[16] identified that high per capita GDP has a positive correlation with the level of debt in various households across 33 developing countries. Consumer lending in Pakistan were shown to be favorably linked with bank liquidity, income bracket, and financial system reforms[17]. Ivanovic (2016)[18] researched the drivers of credit facilities in Montenegro before to the global financial and economic crisis of 2007 and deduced that increase in national income and bank liquidity had a significant effect in determining commercial lending.

According to Manole, Petrescu, and Valda (2016)[19], the unemployment level and the CPI (consumer price indices) have affected loans in Romania. Yuksel, Zengin, and Kartal (2016) [20]investigated the influence of macroeconomic variables on customers' lending in Turkey, namely the rate of interest and rate of unemployment. The researchers noted that interest rates had a beneficial influence on consumer lending, but rates of unemployment have a detrimental effect. Using quarterly data, Guo and Stepanyan (2011)[21] explored the association between macroeconomic factors and consumer lending in Middle Eastern and North African nations. According to the research, increase in Gross domestic product has a beneficial influence on commercial lending. Abdul-Muhmin (2008)[22] ascribed the surge in debt levels in

[16]M. Coletta, R. De Bonis, and S. Piermattei, "The Determinants of Household Debt: A Cross-Country Analysis," *SSRN Electronic Journal*, 2014, 10.2139/ssrn.2571267.
[17]A. Ahmed, A. Amanullah, and M. Hamid, "Consumer Perception and Attitude towards Credit Card Usage: A Study of Pakistani Consumers.," *Journal of Comparative International Management,* 12, no. 1 (2009): 47–57.
[18]Ivanović, "Determinants of Credit Growth: The Case of Montenegro."
[19]Manole, Petrescu, and Vlada, "Determinants of Household Loans."
[20]S. Yüksel, S. Zengin, and M. T. Kartal, "Identifying the Macroeconomic Factors Influencing Credit Card Usage in Turkey by Using MARS Method.," *China-USA Business Review,* 15, no. 12 (2016): 611–15.
[21]K. Guo and V. Stepanyan, "Determinants of Bank Credit in Emerging Market Economies.," *IMF Working Papers* 11, no. 51 (2011).
[22]S Almutair, "Dynamics of the Relationship between Bank Loans and Stock Prices in Saudi Arabia," *International Business & Economics Research Journal,* 14, no. 3 (2015): 439–53, 10.19030/iber.v14i3.9209.

GCC to increased liquidity position of the commercial banks. According to Almutair (2016)[23], commercial lending is favorably associated to the stock prices. A notable study that looked at macroeconomic factors that can influence bank lending in GCC was executed. According to the study, economic expansion, price of oil, and bank liquidity all have a significant positive effect on lending. The rate of interest was negative and inconsequential[24].

Several research works on commercial bank lending behavior have been assessed. Some studies concentrate on the variables impacting bank credit extension to aspects of the economy, while others examined the effects of lending on economic progress. The majority of these studies agreed that commercial banks should have some rudimentary lending precepts and systems in place to serve as a roadmap in their credit extension operations. As a result, it is critical to evaluate and take into account some of the elements suggested by other researchers in their attempt to learn the determinants of commercial bank loan founding.

2.7 Conceptual Framework

This research utilizes the following conceptual framework to address the variables that have been identified to have an impact on the lending behavior in commercial banks.

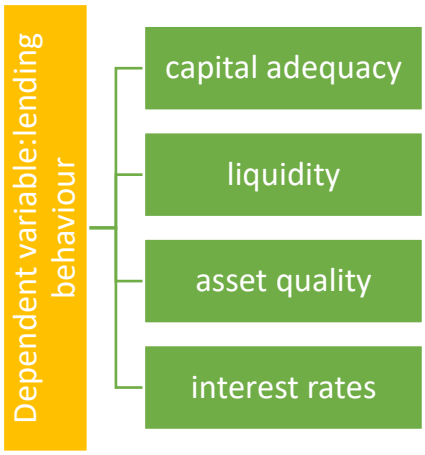

Figure 1: Conceptual framework (Harvard.com)

[23]Almutair.
[24]Miyajima, "What Influences Bank Lending in Saudi Arabia?"

2.8 Research Gap

As a result, it is possible to infer that there is a scarcity of study on the variables that drive commercial banks' loan creation behaviour, with a particular emphasis on risk and relationship aspects. Most of the previous research provide insufficient empirical data since the authors concentrated on the effect of such actions on bank borrowers instead of what the results demonstrated for the bank and banking sector. Additionally, there is limited understanding of how developing nations make credit decisions, the similarities and differences between lending theory in first-world economies, and the role of connection variables and risk in credit generation, as well as their influence on the overall banking industry. There is a scarcity of empirical research on loan creation behaviour that focuses on borrowing terms in connection to relationship characteristics and risk characteristics of debtors in developing countries. Furthermore, the few studies that were conducted have focused on organizations registered with the securities exchange stock market, and as a result, there have been few efforts to support research on commercial banks. As a result, the study was meant to fill this information vacuum.

CHAPTER THREE

3. DATA & METHODOLOGY

The chapter presents the study methodology by emphasizing the study subject, design of the study, sampling techniques, population of the study, sample size, research tools, methodological approach, and data analysis and model building. The proposed framework was integrated into the investigation at this point.

3.2 Research Design

The descriptive correlation research design will be used in this study. A correlation study is a quantitative research approach in which there are two or more quantitative variables from the same group, for which an assessment is being performed to identify whether or not there is a link (or co variation) between or among the variables in question. A multiple regression model is used to determine the relationship between the total amount of loans advanced by commercial banks and all of the other variables, which were identified as of interest rate, asset quality, capital adequacy, and liquidity ratio.

3.3 Target Population

A target population is the specific group of people who might benefit from knowledge about a topic. In the context of this investigation, a population may be described as a well-defined collection of people, services, elements, events, groups of objects, or homes that are under investigation. In population research, everyone has an equal chance of success, resulting in a more representative sample. This research includes four banks in for countries of GCC, The banks in question are the:

1. UAE (Abu Dhabi Commercial Bank, First Abu Dhabi Bank, National Bank of Fujairah & National Bank of Ras Al-Khaimah) .

2. Qatar (Commercial Bank, Doha Bank, Qatar Islamic Bank & Qatar National Bank).
3. Kuwait (Gulf Bank, National Bank of Kuwait, Ahli United Bank & Al Ahli Bank of Kuwait)
4. KSA (Al-Jazira Bank, Al Rajhi Bank, Riyad Bank & Saudi National Bank).

3.4 Data Collection

To carry out the research, the study relies on secondary data, which is collected from Bloomberg. Secondary data consists of the use of already published papers or materials, as well as information from libraries, such as audited financial statements, books, periodicals, and other reports. In addition, the information available on the websites of the banks is used in the investigation. The research is conducted over a seventeen-year period beginning 2005 to 2021.

3.5 Data Analysis and Presentation

3.5.1 Data Analysis

The information gathered is mostly quantitative in nature. The quantitative portion of the study is carried out using descriptive statistics. The descriptive statistical techniques are utilized by the researcher to aid in the description of the data and the determination of the degree of difficulty. The instrument of choice for this investigation is regression analysis. Regression analysis is a statistical procedure that is used to estimate the connections between different variables[25]. It consists of a variety of strategies for statistical modelling and analysis of a large number of variables in a situation where the goal of the study is to determine the link between one or more independent factors and a single dependent variable.

[25]Fox. J, *Applied Regression Analysis and Generalized Linear Models*, 3rd ed. (Thousand Oaks, CA: Sage publications, 2016).

In the course of the research, descriptive and inferential statistics will be used in the analysis. The trend analysis method is developed in order to identify the behavior of the variables over a seventeen -year period of time. A t-test with a 95 percent confidence interval will be used to calculate the means of the variables and to identify correlations between them. When the degree of correlation between the variables is determined, the research will use an econometric approach, applying the multiple regression analysis of the Ordinary Least Squares (OLS) technique, which will be performed using E view & Excel.

3.6 Model for Data Analysis

3.6.1 Data Sources and Description

The secondary data is gathered from the banks' audited financial records, which are then combined. In the research, descriptive and inferential statistics were employed in the analysis, with regression analysis serving as the primary instrument of investigation.

The aggregate of all loans advanced by the banks in each financial year is used to assess bank lending behavior. To determine liquidity, the ratio of total loans issued to total assets is calculated. This is done on each bank during the course of the research, and the results will becombined to determine the overall industry position. The capital adequacy of a company is determined by calculating the equity capital to total assets ratio. The term "total assets" refers to the total amount of loans and advances. The interest rates component was calculated by computing the average interest rates issued by the Central Bank which were designated as Central Bank Rates in this case. The asset quality is determined by dividing the loan loss provision by the total amount of loans and advances.

3.6.2 Multiple Linear Regression

Regression analysis is carried out in order to find the correlations between two or more variables that have cause-and-effect relationships and to make predictions about the subject matter based on the correlations. Answers to questions such as: 1) are there any relationships between the dependent and independent variables?2) what is the power of the relationship, if one exists? and 3) is it feasible to make future-oriented predictions about the dependent variable are sought in this study, among others.

The analysis of regression using a single independent variable is referred to as univariate regression analysis, while the analysis of regression using many independent variables is referred to as multivariate regression analysis. Aiming to account for the fluctuation of the independent variables in the dependent variable synchronously is the goal of multivariate regression analysis[26].The following is how the multiple regression analysis models are formulated in this way:

$$Y = \beta_0 + \beta_1 X_1 + \cdots + \beta_n X_n + \mu \qquad \ldots\ldots \textit{(i)}$$

When attempting to determine the drivers of commercial bank lending behavior in the banking industry in the GCC, with a particular emphasis on lending behavior of banks in the GCC the following regression equation is used: In this case:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \mu \ldots\ldots\ldots \textit{(ii)}$$

Where: -

- *Y* is the dependent variable in this case, the lending behavior of commercial banks.
- β_0 is the regression coefficient
- β_1, β_2, β_3, and β_4 are the slopes of the regression equation.

[26]Gülden Kaya Uyanık and Neşe Güler, "A Study on Multiple Linear Regression Analysis," *Procedia - Social and Behavioral Sciences* 106 (2013): 234–40, https://doi.org/10.1016/j.sbspro.2013.12.027.

- Liquidity is represented by X_1
- Capital Adequacy is represented by X_2
- Interest Rates are represented by X_3
- Asset Quality is represented by X_4
- μ is the error term.

For the purpose of determining the significance of the regression constants β_0,β_1, β_2 ,β_3, and β_4 the t-statistic with a 95 percent confidence level is employed. The F-test will be used to determine the significance of the whole regression at a 95 percent confidence level. The coefficient of determination R^2 and the modified coefficient of determination $R^2$are used to determine the extent to which the four independent variables X_1,X_2,X_3, and X_4.

3.7 OLS Regression

The Least Squares Method is a kind of statistical analysis. It is quite simple to understand the least squares approach utilized in OLS regression. Consider a scatterplot of data points that shows a linear trend in a single direction. As a result of an OLS linear regression technique, a line of best fit is created, which can then be used to accurately portray the dispersion of the data points with a single line[27].Because of this fact, the line fit obtained by using the Ordinary Least Squares (OLS) approach will have the minimum value of the sum of squared deviations of each data point from the line.

3.7.1 Procedure for OLS Regression

[27]Alexander Burton, "OLS (Linear) Regression," in *The Encyclopedia of Research Methods in Criminology and Criminal Justice* (Wiley, 2021), 509–14, https://doi.org/10.1002/9781119111931.ch104.

The OLS regression technique of analysis involves fitting a regression plane onto a "cloud" of data that is considered to have a linear trend, as opposed to other analysis methods. However, even though the regression plane does not touch every point in the data cloud, it can model the partial relationships between each slope (that is, each regression coefficient) and the outcome variable while simultaneously controlling for the effects of the other variables in the model. As a result, in OLS, regression coefficients are determined by minimizing the sum of squares of the differences between the values fitted onto the regression plane and the values observed in the data. For various reasons, OLS regression has a large number of data assumptions that the researcher must verify before starting the study.

3.7.2 Assumptions for OLS Regression

In multivariate regression analysis, the following assumptions must be met: normal distribution, linearity, freedom from extreme values, and the absence of additional independent variables (assumed by the model).

1. **Linearity:**

It is stated in the linearity assumption that a model cannot be adequately defined if the independent variables in the model do not have a linear relationship with the dependent variable when considered as a whole. Another critical requirement is that the connection between each independent variable (except binary variables) and the dependent variable must be linear. This assumption is vital since a non-linear model fails to describe the systematic pattern of the connection between the dependent and independent variables when using a non-linear model[28].OLS suffers from interpretability bias due to nonlinearity, which is exacerbated by the fact that the independent variable's units (or levels) are non-consequential (i.e., any unit change

[28]Burton.

in the independent variables always results in the exact resulting change in the dependent variable).

This assumption may be tested in various ways, including visual and statistical representations. Examination of a scatter plot of the student residuals plotted against the un-standardized projected values is one graphical approach to determining whether the linearity assumption is valid. This scatter plot may be used to determine whether or not there is a linear connection between the independent factors and the dependent variable taken as a whole.

Incremental F-tests may be performed to determine if any independent variables in the model cannot be described linearly with the outcome variable to perform a statistical assessment of linearity[29].These tests may reveal whether or not the variables in the model have a statistically significant impact on the divergence from linearity for the whole model. If there are no statistically significant departures from the mean, the linearity condition is satisfied, and it may be argued that a linear model fits the data well.

2. Independence is a state of mind (non-autocorrelation).

The independence assumption of OLS is satisfied if the error terms in the regression model are not connected with one another (i.e., independent of each other)[30].This assumption is primarily based on how the data were gathered. As a result, if data were randomly picked from a large population, there is probably no link between the error factors.

3. Normality.

[29]Uyanık and Güler, "A Study on Multiple Linear Regression Analysis."
[30]Luigi Grossi and Tiziano Bellini, "Credit Risk Modelling through Robust Generalized Linear Models," *Journal of Economic Literature* 1, no. 1 (2014): 377–86, https://doi.org/10.1007/3-540-35978-8_42.

It is required that the distribution of mistakes (residuals) be regularly distributed throughout the multiple regression plane, according to the normality assumption in multiple regression. Although huge samples are used, there are three reasons why it is critical to test for this assumption. OLS estimators are less efficient for starters when the error distribution includes heavy tails, which happens when outlying data points cause non-normal error distributions to be generated.

Second, skewed error distributions might have a negative impact on how the least squares fit interpreted in a given situation. Since the conditional mean of the dependent variable is impacted by the skewed distribution when the predictors are taken into account, this is the case. At the end of the day, multimodal error distributions may lead data to be dichotomized into groups, resulting in non-normality in the error distribution as a result.

4. Error Variance with a constant value.

As a result of this assumption, the dependent variable's volatility around the regression plane (i.e., the error variance) remains constant throughout the analysis. In regression models, heteroskedasticity, also known as nonconstant error variance, is a concern since it reduces the efficiency of least squares estimators and may result in incorrect computations of coefficient standard errors. To test this assumption, a scatterplot of the studentized residuals plotted against the unstandardized projected values should be used to do so. This graphic may be visually inspected to see whether or not this assumption has been fulfilled by the model. It is possible to test the assumption of heteroskedasticity statistically if it is assumed to exist and if visual examination does not provide compelling evidence of homoscedasticity.

A Breusch-Pagan test may be used to statistically evaluate this assumption[31].The significance of a significant result (p.05) using this test indicates that the dependent variable's variation around the regression plane is not constant under the null hypothesis that the model has constant error variance (i.e., homoscedasticity and heteroskedastic).A nonsignificant p-value, on the other hand, implies that the model's assumption of homoscedasticity has been fulfilled.

3.7.3 Data Presentation

The data will be presented using percentages, tabulations, means, and other central measures of tendencies, among other techniques. Tables are utilized to summarize and illustrate replies in order to facilitate further study and comparison of the responses received. The usage of percentages is useful in simplifying data by restricting all of the numbers to the range of 0 to 100 and converting it to standard form, which is expressed as percentages with a base of 100 for comparative comparisons.

[31]Fox. J, *Applied Regression Analysis and Generalized Linear Models*.

CHAPTER FOUR

4. Results & Discussions

This section will discuss the statistical analysis and findings to interpret them for thorough understanding of all banks.

4. 1: Descriptive statistics – UAE BANKS

The descriptive statistics is computed for all the dependent and independent variables included in study.

Table 1: Descriptive Statistics UAE Bank (Calculated by E view)

	BL	ASSETS	GDP	IP	LENRAT	LR	RR	CR
Mean	100780.5	174480.4	1.24E+12	0.104470	5159.951	0.119427	0.121853	0.030544
Median	39570.15	57302.00	1.25E+12	0.101854	3381.750	0.102319	0.107216	0.024477
Maximum	423382.7	1000343.	1.51E+12	0.226891	20831.60	0.314797	0.261057	0.107806
Minimum	3302.600	6279.800	9.45E+11	0.023268	246.6000	0.012409	0.023413	0.006161
Std. Dev.	109924.6	225798.4	1.74E+11	0.056284	4798.967	0.066624	0.063260	0.021034
Skewness	1.388818	1.995654	-0.033598	0.406640	1.427546	0.973272	0.460012	1.613339
Kurtosis	4.276462	6.705286	1.612615	2.111203	4.798696	3.720859	2.349282	5.326968
Jarque-Bera	26.47642	84.03577	5.466500	4.112262	32.26276	12.20789	3.597990	44.84097
Probability	0.000002	0.000000	0.065008	0.127948	0.000000	0.002234	0.165465	0.000000
Sum	6853073.	11864665	8.44E+13	7.103973	350876.7	8.121065	8.285972	2.076965
Sum Sq. Dev.	8.10E+11	3.42E+12	2.04E+24	0.212250	1.54E+09	0.297399	0.268120	0.029642
Observations	68	68	68	68	68	68	68	68

Measures of central tendency and measures of dispersion both are part of this study. From table #1, it is clear that mean of all variables is greater than median (expect GDP) which explains that all the variables are following the positive skewed distribution instead of normal distribution. Only GDP is the variable who follows the negative skewed distribution. The data set is showing variation as standard deviation values is high. The value of coefficient of skewness explains the same. Each variable is based on 68 values. The data is collected over the

time, starts from 2005 and ends in 2021. To get an idea about any kind of stationarity in time series data, the test of Stationarity is performed.

Table 2: Stationarity test at level UAE Bank (Calculated by E view)

	t-Stat	P-Val
BL	0.781049	0.538348
ASSETS	0.923884	0.892140
GDP	0.630070	0.630070
IP	0.244592	0.979818
LENRAT	0.936962	0.388858
LR	0.048794	0.645071
RR	0.000264	0.053181
CR	0.098409	0.122262

Table 2 consist of results of Stationarity test. The obtained p-value is compared with 5% level of significance to examine which variables are significant or not. Only one variable named as "RR" is significant and rest of all the variables are insignificant. To remove the effect of stationarity the 1st Difference technique is applied to data set. After doing 1st difference the test of Stationarity is repeated. Table # 3 is consisting of results of Stationarity test.

Table 3: Stationarity test at 1st difference UAE Bank (Calculated by E view)

	t-Stat	P-Val
BL	0.132471	0.027599
ASSETS	0.056883	0.007803
GDP	0.387849	0.387849
CR	0.045036	0.064163
LR	0.012612	0.010389
VD	0.000979	0.126194
RR	0.042563	0.001912
IP	0.438370	0.069703
LA	0.002701	0.077749
LENRAT	0.139850	0.978875

Table 3 has computed p-value for every variable is compared with 5% level of significance to estimate about the significance of variables. In this 2nd test, "BL, ASSETS, LR and RR" four variables become significant at 5% alpha level while remaining all variables is

still insignificant. The 1st difference technique is not effective as much as expected because 6 variables are still insignificant.

Table 4: ANOVA and Log of Variables UAE Bank (Calculated by E view)

Dependent Variable: LOG(BL)
Method: Panel Least Squares
Date: 03/17/22 Time: 14:47
Sample: 2005 2021
Periods included: 17
Cross-sections included: 4
Total panel (balanced) observations: 68

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.364927	2.058895	-1.634337	0.1075
LOG(ASSETS)	1.036347	0.032539	31.84924	0.0000
LOG(CR)	0.048022	0.011613	4.135079	0.0001
LOG(GDP)	0.087989	0.079277	1.109888	0.2716
LOG(IP)	-0.027256	0.018275	-1.491395	0.1412
LOG(LR)	-0.042670	0.013667	-3.122032	0.0028
LOG(LENDRATE)	-0.019568	0.033436	-0.585255	0.5606
LOG(RR)	-0.052226	0.018469	-2.827854	0.0064
LOG(VD)	0.159345	0.028629	5.565923	0.0000

Root MSE	0.050529	R-squared	0.997960
Mean dependent var	11.09646	Adjusted R-squared	0.997684
S.D. dependent var	1.127128	S.E. of regression	0.054246
Akaike info criterion	-2.867848	Sum squared reside	0.173614
Schwarz criterion	-2.574089	Log likelihood	106.5068
Hannan-Quinn criter.	-2.751451	F-statistic	3608.384
Durbin-Watson stat	1.615712	Prob(F-statistic)	0.000000

Before applying regression analysis, log transformation is applied to entire data set in Table 5. The value of R-squared explains that the 99% of data set shows variation and the fitted regression model is a good fitted model. Four of the coefficients of regression equation have negative effect and rest of them shows positive effect on dependent variable. The significance of all coefficients is tested by comparing with 5% level of significance. "LOG(ASSETS), LOG(GDP), LOG(LR), LOG(RR) and LOG(IP)" are the significant variables of this fitted model.

4. 2: Descriptive statistics – Qatar BANKS

The descriptive statistics is obtained for all the dependent and independent variables included in the study.

Table 5: Descriptive Statistics Qatar Bank (Calculated by E view)

	ASSETS	BL	CR	GDP	IP	LENDRATE	LR	RR	VD
Mean	187324.6	129306.0	0.017732	3.74E+11	0.164688	7937.160	0.194214	0.059958	4.555995
Median	97502.25	65673.90	0.013474	3.63E+11	0.150030	3334.400	0.182364	0.049753	4.301051
Maximum	1093038.	789882.9	0.070814	4.64E+11	1.816601	53078.80	0.444779	0.233726	7.939015
Minimum	9551.600	6192.200	0.003945	2.87E+11	-0.746870	502.6000	-0.007935	0.026893	2.000083
Std. Dev.	251435.4	185217.3	0.013106	5.12E+10	0.235306	12380.18	0.110942	0.037023	1.500399
Skewness	2.334189	2.360686	1.503282	0.268591	4.326177	2.582778	0.497159	3.092195	0.360777
Kurtosis	7.487317	7.531201	5.833619	1.952853	40.20961	8.465674	2.519431	13.63871	2.431119
Jarque-Bera	118.8010	121.3322	48.36166	3.924395	4135.019	160.2436	3.455574	429.0483	2.392089
Probability	0.000000	0.000000	0.000000	0.140549	0.000000	0.000000	0.177677	0.000000	0.302388
Sum	12738072	8792808.	1.205751	2.54E+13	11.19876	539726.9	13.20655	4.077131	309.8077
Sum Sq. Dev.	4.24E+12	2.30E+12	0.011508	1.76E+23	3.709707	1.03E+10	0.824638	0.091837	150.8303
Observations	68	68	68	68	68	68	68	68	68

Measures of central tendency and measures of dispersion both are included in table # 5. From table #5, it is shows that mean of all variables are greater than median which express that all the variables are not following normal distribution. All the variables belong to positive skewed distribution. The value skewness coefficient indicates the same. Each variable is based on 68 cases. Standard deviation of all variables depicts that data set is having much variation.

Table 6: Stationarity test -level Qatar Bank (Calculated by E view)

	t-Stat	P-Val
ASSETS	0.476336	0.534230
BL	0.368356	0.431319
CR	0.027144	0.039774
GDP	0.225742	0.225742
IP	0.034525	0.136873
LR	0.089964	0.621004
RR	0.000180	0.005102
VD	0.342184	0.050213

Data set is collected for year 2005 to 2021 which means that the collected data set is time series data set. To check the Stationarity effect in time series data set test of Stationarity is utilized. The results of Stationarity test is given in table # 6. The p-value is compared with 5% level of significance to assess which variable is significant. All the variables are insignificant except “RR and VD”.

Table 7: Stationarity test -1st difference Qatar Bank (Calculated by E view)

	t-Stat	P-Val
ASSETS	0.143290	0.089457
BL	0.058129	0.128055
CR	0.001704	0.080240
GDP	0.518261	0.518261
IP	0.045640	0.000527
LR	0.000197	0.011524
RR	1.48E-05	0.001574
VD	0.005907	5.29E-05

To eliminate the stationarity effect, 1st Difference method is used to data. After 1st difference again data set is check by using test of Stationarity and results are given in table # 7. Again the p-value is compared with 5% level of significance to check that which variable is significant and which one is insignificant. In this 2nd test, "IP, LR, RR and VD" last four variables become significant at 5% alpha level while remaining four variables is still insignificant.

Table 8: ANOVA and Log of Variables Qatar Bank (Calculated by E view)

Dependent Variable: LOG(BL)
Method: Panel Least Squares
Date: 03/17/22 Time: 14:47
Sample: 2005 2021
Periods included: 17
Cross-sections included: 4
Total panel (balanced) observations: 68

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.364927	2.058895	-1.634337	0.1075
LOG(ASSETS)	1.036347	0.032539	31.84924	0.0000
LOG(CR)	0.048022	0.011613	4.135079	0.0001
LOG(GDP)	0.087989	0.079277	1.109888	0.2716
LOG(IP)	-0.027256	0.018275	-1.491395	0.1412
LOG(LR)	-0.042670	0.013667	-3.122032	0.0028
LOG(LENDRATE)	-0.019568	0.033436	-0.585255	0.5606
LOG(RR)	-0.052226	0.018469	-2.827854	0.0064
LOG(VD)	0.159345	0.028629	5.565923	0.0000

Root MSE	0.050529	R-squared	0.997960
Mean dependent var	11.09646	Adjusted R-squared	0.997684
S.D. dependent var	1.127128	S.E. of regression	0.054246
Akaike info criterion	-2.867848	Sum squared reside	0.173614
Schwarz criterion	-2.574089	Log likelihood	106.5068
Hannan-Quinn criter.	-2.751451	F-statistic	3608.384
Durbin-Watson stat	1.615712	Prob(F-statistic)	0.000000

Regression analysis is performed on data set which is transformed first by using log transformation. The value of R-squared explains that the 99% of data set explains variation and the fitted model is a good fit. Half of the coefficients of regression equation show negative impact and remaining half have positive effect on dependent variable. The significance of all coefficients is tested by comparing p-value with 5% level of significance. “LOG(ASSETS), LOG(CR), LOG(LR), LOG(RR) and LOG(VD)” are the significant variables.

4. 3: Descriptive statistics – Kuwait BANKS

The descriptive statistics is computed for all the dependent and independent variables included in study.

Table 9: Descriptive Statistics Kuwait Bank (Calculated by E view)

	ASSETS	BL	CR	GDP	IP	LA	LR	RR	VD
Mean	14512.76	8621.551	0.022542	3.67E+10	0.188238	1388.962	0.143463	0.097690	6.795391
Median	6400.650	4471.950	0.011658	3.65E+10	0.184144	640.7000	0.121562	0.105349	5.287095
Maximum	40280.10	21917.10	0.242121	4.07E+10	0.318338	6011.100	0.664981	0.203970	100.6763
Minimum	2007.700	1322.400	0.000240	3.12E+10	0.075825	17.40000	0.009513	0.006187	2.879329
Std. Dev.	12190.74	6735.373	0.036527	2.88E+09	0.049635	1506.284	0.107429	0.054729	11.61976
Skewness	0.686048	0.684318	4.161573	-0.386517	0.414852	1.159752	2.277708	-0.071137	7.924297
Kurtosis	1.970132	1.916533	22.53221	1.800547	2.998724	3.309384	10.53472	2.055083	64.54917
Jarque-Bera	8.339285	8.633351	1258.433	5.769423	1.950498	15.51482	219.6508	2.587146	11445.19
Probability	0.015458	0.013344	0.000000	0.055871	0.377098	0.000428	0.000000	0.274289	0.000000
Sum	986867.6	586265.5	1.510346	2.49E+12	12.80016	94449.40	9.755485	6.642943	462.0866
Sum Sq. Dev.	9.96E+09	3.04E+09	0.088061	5.55E+20	0.165066	1.52E+08	0.773252	0.200680	9046.256
Observations	68	68	67	68	68	68	68	68	68

Measures of central tendency and measures of dispersion both are part of this study. From table #9, it is clear that mean of all variables is greater than median which explains that all the variables are following the positive skewed distribution instead of normal distribution. The value of coefficient of skewness explains the same. The data set is showing variation as standard deviation values is high. Each variable is based on 68 values.

Table 10: Stationarity test at level Kuwait Bank (Calculated by E view)

	t-Stat	P-Val
ASSETS	0.318445	0.944465
BL	0.129306	0.698952
CR	0.713621	0.269622
GDP	0.424727	0.424727
LA	0.021122	0.959898
LR	0.092164	0.242587
NPL	0.925345	0.066544
RR	0.990958	0.446201
VD	0.155566	0.240070
IP	0.772432	0.355578

The data is collected over the time, starts from 2005 and ends in 2021. To get an idea about any kind of stationarity in time series data, the test of Stationarity is performed. Table # 10 consist of results of Stationarity test. The obtained p-value is compared with 5% level of significance to examine which variables are significant or not. Not a single variable is significant; all the variables are insignificant.

Table 11: Stationarity test at 1st difference Kuwait Bank (Calculated by E view)

	t-Stat	P-Val
ASSETS	0.018635	0.025284
BL	0.073533	0.036907
CR	0.019762	0.189143
GDP	0.253007	0.253007
LA	0.010104	0.00034
LR	0.003135	5.18E-06
NPL	0.032849	0.006359
RR	0.000806	0.000205
VD	0.299017	0.148069
IP	0.001786	0.001727

To remove the effect of stationarity the 1st Difference technique is applied to data set as shown in Table 11. After doing 1st difference the test of Stationarity is repeated. Table # 11 is consisting of results of Stationarity test. The computed p-value for every variable is compared with 5% level of significance to estimate about the significance of variables. In this 2nd test, "ASSETS, BL, LA, LR, NPL, RR and IP" seven variables become significant at 5% alpha level while remaining variables is still insignificant.

Table 12: ANOVA and Log of Variables Kuwait Bank (Calculated by E view)

Dependent Variable: LOG(BL)
Method: Panel Least Squares
Date: 03/17/22 Time: 14:47
Sample: 2005 2021
Periods included: 17
Cross-sections included: 4
Total panel (balanced) observations: 68

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.364927	2.058895	-1.634337	0.1075
LOG(ASSETS)	1.036347	0.032539	31.84924	0.0000
LOG(CR)	0.048022	0.011613	4.135079	0.0001
LOG(GDP)	0.087989	0.079277	1.109888	0.2716
LOG(IP)	-0.027256	0.018275	-1.491395	0.1412
LOG(LR)	-0.042670	0.013667	-3.122032	0.0028
LOG(LENDRATE)	-0.019568	0.033436	-0.585255	0.5606
LOG(RR)	-0.052226	0.018469	-2.827854	0.0064
LOG(VD)	0.159345	0.028629	5.565923	0.0000

Root MSE	0.050529	R-squared	0.997960
Mean dependent var	11.09646	Adjusted R-squared	0.997684
S.D. dependent var	1.127128	S.E. of regression	0.054246
Akaike info criterion	-2.867848	Sum squared reside	0.173614
Schwarz criterion	-2.574089	Log likelihood	106.5068
Hannan-Quinn criter.	-2.751451	F-statistic	3608.384
Durbin-Watson stat	1.615712	Prob(F-statistic)	0.000000

Before applying regression analysis, log transformation is applied to entire data set. The value of R-squared explains that the 99% of data set shows variation and the fitted regression model is a good, fitted model. Four of the coefficients of regression equation have negative effect and rest of them shows positive effect on dependent variable. The significance of all coefficients is tested by comparing with 5% level of significance. “LOG (ASSETS), LOG (CR), LOG (GDP), LOG (IP) and LOG (LR)” are the significant variables of this fitted model.

4. 4: Descriptive statistics – KSA BANKS

Table 13: Descriptive Statistics KSA Bank (Calculated by E view)

	LA	LIQRATIO	LIQRES	LR	GDP
Mean	10426.36	0.047952	8067.100	8067.100	2.25E+12
Median	7180.700	0.043505	7432.400	7432.400	2.36E+12
Maximum	40161.50	0.092534	25180.60	25180.60	2.64E+12
Minimum	369.2000	0.019531	483.0000	483.0000	1.73E+12
Std. Dev.	8999.237	0.015644	5797.709	5797.709	3.24E+11
Skewness	1.160958	0.826838	0.698610	0.698610	-0.362028
Kurtosis	3.827693	2.980029	2.915805	2.915805	1.535432
Jarque-Bera	17.21639	7.749289	5.551384	5.551384	7.562782
Probability	0.000183	0.020762	0.062306	0.062306	0.022791
Sum	708992.3	3.260754	548562.8	548562.8	1.53E+14
Sum Sq. Dev.	5.43E+09	0.016397	2.25E+09	2.25E+09	7.04E+24
Observations	68	68	68	68	68

The descriptive statistics is obtained for all the dependent and independent variables. Measures of central tendency and measures of dispersion both are part of this study. From table #13, it is clear that mean of all variables is greater than median which indicates that all the variables are violating the assumption of normality and follows a positive skewed distribution. The value of coefficient of skewness explains the same. Every variable is based on 68 observations.

Table 14: Test of Stationary KSA Bank (Calculated by E view)

	t-Stat	P-Val
LA	0.775828	0.904404
LIQRATIO	0.137268	0.004178
LIQRES	0.324641	0.975750
LR	0.324641	0.975750
GDP	0.411142	0.411142

As the data set is based on time. Data set is collected for year 2005 to 2021. To check the Stationarity in data set test of Stationarity is applied and results are mentioned in table # 14. The p-value is compared with 5% level of significance to assess which variable is significant. All the variables are insignificant except “LIQRATIO”.

Table 15: Panel Unit Root Test at 1st Difference – KSA Bank (Calculated by E view)

	t-Stat	P-Val
LA	0.006733	0.004106
LIQRATIO	0.265585	0.001053
LIQRES	0.017988	0.069261
LR	0.017988	0.069261
GDP	0.416250	0.416250

To remove the effect of stationarity, 1st Difference is applied to data set. After 1st difference again data set is check by using test of Stationarity and results are mentioned in table # 15. The p-value is compared with 5% level of significance to check the s significance and insignificance of variables. In this test, “LIQRATIO and LA” two variables become significant at 5% alpha level while remaining all variables is still insignificant. The 1st difference technique is not effective as much as expected.

Table 16: ANOVA and Log of Variables KSA Bank (Calculated by E view)

Dependent Variable: LOG(BL)
Method: Panel Least Squares
Date: 03/17/22 Time: 14:47
Sample: 2005 2021
Periods included: 17
Cross-sections included: 4
Total panel (balanced) observations: 68

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.364927	2.058895	-1.634337	0.1075
LOG(ASSETS)	1.036347	0.032539	31.84924	0.0000
LOG(CR)	0.048022	0.011613	4.135079	0.0001
LOG(GDP)	0.087989	0.079277	1.109888	0.2716
LOG(IP)	-0.027256	0.018275	-1.491395	0.1412
LOG(LR)	-0.042670	0.013667	-3.122032	0.0028
LOG(LENDRATE)	-0.019568	0.033436	-0.585255	0.5606
LOG(RR)	-0.052226	0.018469	-2.827854	0.0064
LOG(VD)	0.159345	0.028629	5.565923	0.0000

Root MSE	0.050529	R-squared	0.997960
Mean dependent var	11.09646	Adjusted R-squared	0.997684
S.D. dependent var	1.127128	S.E. of regression	0.054246
Akaike info criterion	-2.867848	Sum squared reside	0.173614
Schwarz criterion	-2.574089	Log likelihood	106.5068
Hannan-Quinn criter.	-2.751451	F-statistic	3608.384
Durbin-Watson stat	1.615712	Prob(F-statistic)	0.000000

Log transformation is applied to entire data set and after this transformation regression analysis is performed. The value of R-squared explains that the 99% of data set explains variation and the fitted model is a good fit. Few of the coefficients of regression equation show negative impact and some of them have positive effect on dependent variable. The significance of all coefficients is tested by comparing with 5% level of significance. “LOG (ASSETS), LOG (GDP), LOG (IP) and LOG (RR)” are the significant variables.

CHAPTER FIVE

5. Conclusion and Recommendations

The main objective of conducting the research was the examination of multiple lending habits of commercial banks in GCC because the financial system of any country can play an integral role in the establishment and development of a strong economy of the country and GCC started suffering from economic problems from some recent years. I tried to analyse the contribution of multiple determinants in the lending behaviour of commercial banks of GCC like interest rates, liquidity, capital adequacy, asset quality, and structures of loans. For this purpose, the research adopted the use of the quantitative research method to obtain only a useful, authentic, reliable, accurate, and precise form of data by using the survey from the selected population of four leading commercial banks in four countries from GCC. However, also collected plenty of data from various types of secondary sources and analysed this data to support their arguments.

All the data which was obtained was further analysed, presented, and used for decision making after its processing for which purpose, the research adopted the SPSS analysis method. The findings of the research indicated that there is a strong contribution of the discussed determinants in the lending behaviour used by the commercial banks of GCC. To conclude, it can be stated that poor lending practices can lead commercial banks to suffer with significant big losses which can put a strong negative influence on their profits and revenues. Consequently, the economy of the banking industry would also start collapsing. It has been also revealed in the conducted research study that the managerial team members of the banking industry are needed to stay more vigilant and smarter in the formulation of lending practices to keep maintaining the bank revenues and satisfying the needs and demands of their customers as well.

Following are some recommendations to improve the financial determinants to keep the significant profitability.

Firstly, provision of currency in a systematic and efficient manner to commercial banks such as KSA and UAE Banks etc. to do some basic functions such as, to accept deposits from other similar banks, make loans to banks as well as people, serves as a banker for government, regulates other SMEs banks and controls the money supply.

Secondly, lending money to commercial banks requires cash availability every time. Sometimes commercial bank keeps ATMs full of cash which is not a function of Federal Reserve Bank. To keep cash with ATM is the particular job of commercial bank and they should use it for lending and borrowing. In some cases, cryptocurrency is used for lending and borrowing which do not exist in physical form and it is not issued by central authority so its utilization should be avoided.

Thirdly, Central bank can increase reserve requirement for commercial banks - so that banks would have to keep more amount of money with Central bank which will reduce their capacity to give loans. It is a tool of monetary policy. Moreover, Central bank can increase cash reserve proportion as a monetary tool –for the same scenario.

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Appendices

DETERMINANTS OF COMMERCIAL BANK LENDING: EVIDENCE IN GCC

Thesis submitted in partial fulfillment for the degree of Master's

in accordance with the requirements of Effat University

by

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May, 2022