Determinants of Performance of Conventional and Islamic Banks in GCC

محددات أداء البنوك التقليدية والإسلامية بدول مجلس التعاون الخليجي

by

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Abstract

The aim of this research is to evaluate the impact of internal and external variables on the performance of both Islamic banks and conventional banks in the GCC. The Internal variables include capital adequacy, asset quality, management, earnings, liquidity and sensitivity of risk while the external variables are the economic growth and inflation. Return on equity and Return on asset were used in the STATA programming to identify the variable with the greatest effect or least effect on the performance of banks in GCC. Specifically, five conventional banks and five Islamic banks from 2012 to 2015 were used in the research.

نبذة مختصرة

يهدف هذا البحث إلى تقييم أثر المتغيرات الداخلية والخارجية على أداء كل من البنوك الإسلامية والبنوك التقليدية في دول مجلس التعاون الخليجي. تشمل المتغيرات الداخلية كفاية رأس المال وجودة الأصول والإدارة والأرباح والسيولة وحساسية المخاطر بينما المتغيرات الخارجية هي النمو الاقتصادي والتضخم. تم استخدام العائد على حقوق الملكية والعائد على الأصول في برمجة STATA لتحديد المتغير الذي له أكبر تأثير أو أقل تأثير على أداء البنوك في دول مجلس التعاون الخليجي. على وجه التحديد ، تم استخدام خمسة بنوك تقليدية وخمسة بنوك إسلامية من عام 2012 إلى عام 2015 في البحث.

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Table of Contents

List of Acronyms:

ETAR- Equity to Assets- To measure Capital Adequacy

LLR- Loan Loss Reserves/ Gross Loans- To measure Asset Quality

COSR- Cost to Income Ratio- To measure Earnings Quality

NLTA- Net Loans to Total Assets- To measure Liquidity

LDR- Loans to Deposits- To measure Management Quality

ROA- Return on Assets- To measure Profitability

ROE- Return on Equity- To measure Profitability

NIM- Net Interest Margin- To measure Profitability

GDP- Gross Domestic Product Growth Rate- Macroeconomic Factor

INF- Annual Inflation Rate- Macroeconomic Factor

GCC- Gulf Cooperation Council

Chapter 1: RESEARCH OVERVIEW

Introduction

The aim of this research is to determine the elements that affect the performance of the Islamic banks as well as the conventional banks in GCC, and these elements are broadly categorized into internal and external factors. On one hand, internal factors play a role in controlling the management with CAMEL rating, and it includes Capital Adequacy, Asset Quality, Management, Earnings and Liquidity. On the other hand, external factors are the economic factors which are out of the management control which include inflation rates, economic growth and the laws & regulations. The outlines and context of the whole study pertaining to GCC banking sector as well as the key factors that prompted this research are considered in this chapter. In particular, this chapter covers the research background, statement of the problem, the research objectives viewed from the general and the specific perspectives, and the research questions. In addition, the hypotheses of the study are extracted from the internal and external factors of both Islamic banking and conventional banking. Finally, the significance of the study is given in this chapter, and it is followed by the chapters' layout which describes the layout of each chapter and then a conclusion.

Research Background

The banking industry plays a very important role in our lives and the growth of the economy as it is one of the main factors influencing the global economy. The role played by banks in our economy can be viewed from numerous perspectives. For example, commercial banks collect savings from customers and give them back some amount of return or interest made from lending to organizations that need capital for expansion which can lead to the creation of new job opportunities that can enhance the economic growth. The monetary policy of commercial banks are usually in consonance with the Central Bank's objectives. Commercial banks are the custodian and distributor of liquid capital in the country, which is the foundation of all business and economic activities of the country (BusinessStudyNotes, 2017). The major concern as regards to the profitability of the banking industry depends on the robustness and safety of the banks. Therefore, it's important to assess the bank's profitability based on the stability of the economy, stakeholders' interest, internal management, and government.

In this regard, the bank's performance is often measured using profitability (Demirgüç-Kunt and Huizinga, 2001). The bank profitability plays a vital role in the bank performance, and it is calculated by dividing the profits by the assets. But the question is does the bank profitability depends on the traditional measures which are the (return on assets) ROA and the (return on equity) ROE? ROA can be calculated by dividing the net Income by the average total assets. Assets are the factors that deal with how the bank generates its cash inflows. For instance, products like loan and securities are some of the main factors of assets that generate income. However, to create and offer such products and service to clients, there should be an availability of capital obtained from the bank's owner which is the real capital of the bank, the savings from depositors who seek interest or profits at the end of every annual year cycle as well as the money borrowed from other

banks in the case where there is not enough liquidity in the bank to supply (Spaulding, 2017). ROE is conventionally measured by dividing the net income in the most recent year by the end-of-the-book value of year before (Damodaran, 2012). In other words, this is the return on each contribution from shareholder's stake which is a reflection of the buildup of amounts received by the bank from securities, shares issues, and profits held by the company. In conclusion, it is simply the profits and returns that shareholders make on their investment (Lexicon.ft.com, 2017).

From a microeconomic point of view, a commercial bank is differentiated in a number of ways. Firstly, according to TIME magazine, a commercial bank is differentiated by its brand name which is the reputational view from the internal and external economies perspective. Secondly, the level of trust built by the commercial bank in its clients makes it different. Thirdly, the fees imposed by the commercial bank on its customers is another factor. For instance, the fees it charges for account maintenance and transaction as well as the interest rate are important figures to both creditors and depositors when deciding to make an investment. Lastly, the customer service based on how customers are treated by the relationship manager as well as how they are guided on new account offers that suit their personal needs is another factor that distinguishes a commercial bank. However, this differentiation is based on the perspective of the average customers who are less knowledgeable about banks. Thus, to examine how banks are really affected by the micro economy, the CAMELS rating has to be employed. CAMELS ratings are the results of Uniform Financial Institutions Rating System. It is an internal rating system used by regulators to assess financial institutions that need special supervision and attention (Schiff Hardin, 2017).

Now, let's considers the factors that are beyond the control of bank management. From a Macroeconomic prospective, factors like inflation and economic growth are out of the control of bank management. Thus, by having a stable financial performance, the banks should be ready to

face unexpected crisis. While the banking sector is affected by Inflation, the relationship is vice versa as it can either be in favor to or against the banking industry (G. J. Santoni, 1986).

Economic growth is the increase in stock of economic assets, including consumption goods and service, producer's goods and the skills or non-human capital over a given period of time (Ahiakpor and Rugman, 2008). Therefore, when the economic growth is good, banks can as well benefit from this situation since consumers will tend to purchase more services from them.

Problem Statement

In 1975, the Dubai Islamic Bank became the first Islamic bank on private initiative in United Arab Emirates (Iqbal and Molyneux, 2016), and the products it was offering were basic and could be found in the conventional banks. However, in recent years it started introducing its own Islamic products that made other banks to open their own Islamic subsidiaries that increased competition between the banks in United Arab Emirates.

The essence of this research is to study the factors that affect the performance of both conventional and Islamic banks due to the increase in number of both banks in the GCC. The outcome of this research will be useful to different stakeholders such as bank managers, investors, central bank, and depositors as it helps them to decide on the banks that can meet their needs.

Hence, the objective of this study is to figure out the factors that affect the performance of both Islamic and Conventional banks in GCC as well as to determine the level of these effects. While the research is based on five conventional banks and five Islamic banks and the reason behind choosing 5 banks in both departments is to bring us well calculated results which will be used in the data analysis, the data analysis however, is based on GCC Banking Indicators report. Although an extensive discussion of the effects of macroeconomic factors on bank performance is given in this research, more emphasis is given to conventional bank due lack of researches on Islamic

banks. The modus operandi of conventional banks and Islamic banks as well as the central bank's regulation and rules stipulated by the government are entirely different. Therefore, there are some factors that may affect only one of these banks without affecting the other or both can be affected, and as such, this research is carried out to help the top management of the banks to take effective decisions regarding these factors.

Research Objectives

The objective of this research is to examine and evaluate the bank performance based on the critical factors in GCC banking indicator from the central bank report.

General Objectives

The General objective of this research is to find the critical factors that affect conventional banks and Islamic banks ROA (return on assets) in GCC. The factors are classified into internal and external factors. While the internal factors consist of the six component of CAMELS rating, the external factors include inflation and economic growth.

Specific Objectives

The specific objective is to determine the impact of the internal and external factors (i.e. CAMELS ratings, Inflation and economic growth) on the return of assets on both conventional banks and the Islamic banks.

1. The first Objective is to evaluate the relationship between the six components of CAMELS and ROA in both conventional banks and the Islamic banks.
2. The second objective is to find the association between Inflation and ROA in both conventional

banks and the Islamic banks.

3. The third objective is to examine the connection between Economic growth and ROA in both conventional banks and the Islamic banks.

Research Questions

The research attempts to answer the question regarding if both the conventional banks and the Islamic banks in the GCC are significantly affected by those factors. The questions are:

1. Does the CAMELS rating have a significant impact on the performance of both the conventional banks and the Islamic banks?
2. Is the performance of the conventional banks and the Islamic banks significantly affected by Inflation?
3. Does the Economic Growth significantly affect the performance of the conventional banks and the Islamic banks?

Hypotheses of the Study

CAMELS Rating

When CAMELS rating was introduced in 1979, it had only five components. The sixth component, which is the Sensitivity of Risk, was introduced in 1996. The six components are Capital Adequacy, Asset Quality, Management, Earnings, Liquidity and Sensitivity to Market Risk (Schiff Hardin, 2017). From a regulation point of view, there is no other measurement or calculation for evaluating bank performance other than the CAMELS rating, and as such the management of banks should consider and focus on achieving lowest score on the composite rating. According to Federal Reserve Release, composite and component ratings are structured based on a numerical

scale of 1 to 5, where 1 represents a high rated composite which implies strong performance, high risk management and lowest degree of supervision. On the other hand, 5 represents the lowest rate composite which indicates low performance, high exposure to risk and weak management which requires a high level of supervision.

Capital Adequacy

In order to get prepared for any kind of risk, banks are expected to record and maintain their capital ratio and the management should have the ability to recognize, evaluate, and control the risk factors before it hits the banks. Furthermore, market and credit should be considered when taking any decision pertaining to capital ratio (Federalreserve.gov, 2017).

Asset Quality

The rating gives a reflection of the quality of assets and the amount of current credit potential associated with the investment risk and loan portfolio, other owned real estate as well as off-balance sheet transactions. In essence, this implies that the bank management should have the ability to recognize, measure, monitor and control credit risk (Federalreserve.gov, 2017).

Management

It is the responsibility of the board of directors as well as the management to identify, measure, monitor and control the risks of the organization's activities, and to ensure that its operations are safe and are in accordance with stipulated laws and regulations in the industry (Federalreserve.gov, 2017).

Earnings

It reflects the sustainability or quality of profits (i.e. the amount and direction of profit). The amount and quality of profits may be affected by excessive or insufficiently manageable credit risks which may result in loan losses, increase in additional loan, lease loss allowance, increase in

exposure to high levels of market risk and fluctuations in profit/interest rate (Federalreserve.gov, 2017).

Liquidity

To assess the adequacy of the liquidity position of a financial institution, the current level and potential sources of liquidity should be taken into account in relation to funding needs and the adequacy of fund management practices for the size, complexity and risk of the institution. Generally, banks should ensure to employ fund management practices that are capable of maintaining a level of liquidity which is sufficient enough to meet its financial obligations in a swift manner as well as meet the legitimate needs of the banking community. (Federalreserve.gov, 2017).

Sensitivity to Market Risk

The component of Sensitivity to the market risk reflects the impact of changes in interest rates, foreign currency exchange rates, commodity prices and equity prices negatively on the profits of bank or economic capital. In assessing this component, the following should be considered: Management's ability to identify, measure, monitor and monitor market risk. The size of the enterprise; the nature and complexity of its activities; and the adequacy of its capital and profits in relation to its level of exposure to market risk (Federalreserve.gov, 2017).

Inflation

Inflation is the increase of the prices in the economy, and it is usually measured by the annual growth rate of the consumer price index or retail price index. The inflation in the product or wholesale prices can also be measured. Inflation means the loss of consumer purchasing power despite a corresponding rise in wages. It leads to a reduction in the value of a country’s currency since more currency units are needed over time to buy the same goods (Lexicon.ft.com, 2017).

Economic Growth

The economic growth component captures the productive capacity of the country, and it is measured by comparing the gross national product (GDP) in the current year with the gross national product in the previous year. Economic growth is usually caused by increase in capital, technological advancement, and improvement in the quality and level of literacy. In recent years, the idea of sustainable development has led to the consideration of new factors such as environmentally sound processes in the growth of the economy (BusinessDictionary.com, 2017).

Importance of the Study

There is no denying the fact that banks, as a financial institution, play a very important role in our lives by making funds available to meet the liquidity or future expansion plan of individuals or organizations. The banking sector also plays an important role in the economy as it helps to fund big organizations leading to job creation, increase in exports and increase in the consumer's spending which is also beneficial to the banks as consumers will tend to either save more in the bank or spend more as well as use the loan services. Due to the fact that there is a link between the banking sector and the economic growth, I intend to figure out as well as show how the factors affecting the bank performance can be handled by bank managers, regulators and other financial authorities.

The literature aspect of this research focuses on the factors that affect both conventional banks and Islamic banks in the GCC with emphasis on both the internal and the external factors that affect bank performance. The internal factors will be examined using the components of CAMELS rating while economic growth and inflation will be used to address the external factors. An analysis will be done to determine which of the factors (internal or external) has more impact on the

performance of both the conventional banks and the Islamic banks as well as which might lead to risks that should be monitored.

The fact that these factors will be very influential to the performance of both Islamic banks and conventional banks has prompted the analysis conducted in this research. The results will be recommended to the bank stakeholders especially bank managers to help them increase the bank's performance as well as minimize risks.

Furthermore, this research also includes formulations that will help regulators and financial intermediaries to monitor both types of banking system as well as to assist them to understand how these banks affect the economy and the economic factors that affect the banks. In addition, shareholders and investors can also benefit from this research as it will give them better understanding regarding conventional banks and Islamic banks as well as help them make informed decision about their current or future investments in different economic circumstances.

Chapter Layout

As outlined below, the structure of this research is based on a five-chapter layout.

Chapter 1: Research Overview

This chapter gives an introduction to the research. It contains the research background, what prompted the research, the research objectives, the research questions, the research hypotheses and significant of the study.

Chapter 2: Literature Review

What the author has researched on and read from diverse sources will be presented in this chapter. In addition, theoretical models as well as literature from past researches will be reviewed, and performance measures will also be discussed. The theoretical study and the relationship between the variable components will also be treated.

Chapter 3: Methodology

This chapter describes the method employed in the research such as the research design, data collecting method, and it also shows how these methods are developed.

Chapter 4: Data Analysis

The results and the finding of the data analysis are presented in this chapter. The performance of both the conventional banks and the Islamic banks will be discussed. The results of the regression analysis showing the relationship between the dependent and the independent variables will be explained in details.

Chapter 5: Discussion, Conclusion and Implications

This is the final chapter of the research, and it contains the summary of the findings regarding the research hypotheses as well as the conclusion. It also includes the implication of study, limitations encountered during the research and recommendation for the bank management which can improve the bank's performance.

Conclusion

The research is targeted at finding the factors that affect the performance of conventional banks and Islamic banks in the GCC. The internal and external factors are focused on in the research to examine the difference in the bank performance, due to these factors, from that observed in past studies considered by the author. The chapter that follows gives more details about the entire research.

Chapter 2: LITERATURE REVIEW

Introduction

The aim of this chapter is to discuss the literature that are related to this research. While there are several studies on the banking performance, these studies did not consider both conventional and Islamic banks. However, in this research, both conventional and Islamic banks in relationship with the internal and external factors that affect both banks in the GCC economy are considered. The internal factors are the CAMELS rating components which include capital adequacy, asset quality, management, earnings, liquidity and the sensitivity to risk as they are mainly used by the bank management to monitor and control the bank's activities. The external factors which include inflation and economic growth are usually employed by financial intermediaries, regulators and investors. In order to get a clearer picture of the bank profitability parameters or performance measures, it is important to review several researches that are related to this study. In examining the performance parameters, the formulation regarding both conventional banks and Islamic banks is better understood in this review process. The existing studies to be reviewed will serve as a basis as well as an evidence to support the theoretical model. This will help to provide a better and stronger research finding that can be used by researchers or readers in the future.

Review of the Literature

The literature reviewed in this section deal with the relationship between the independent variables (i.e. internal and external factors) and the dependents variables (i.e. bank profitability and other measures of performance). According to Zimmerman (1996), the determinants of bank profitability can be classified into internal and external factors. The Internal factors of bank profitability are known as those factors that can be influenced by the bank's management policies, aims and evaluations. Management implications refer to the differences in the Bank's management decisions, aims and actions which are reflected in the differences in the banking policies and operating results such as profitability. Unlike the external factors, the internal factors are within the control of the bank management, and can affect the economic growth of a country. The internal factors consist of the components of the CAMELS ratings which are capital adequacy, Assets quality, management, earnings, liquidity and sensitivity to risk. However, the variables that make up the external factors are quite different from those of the internal factors, and they are more related to economic growth, inflations, interest rate and employments. Similar components of the factors used in this current research were employed by some of the previous studies that are related to this research. As stated by Dash and Das (2009), the CAMEL framework was introduced by Basel Committee on Banking Supervision of the Bank of International Settlements in 1988 to examine and evaluate the financial and banking intuitions. They also stated that the CAMELS model is an effective, efficient and accurate tool for assessing performance in the banking industry as well as for anticipating future and relative risk. In his publication, Lopez (1999) mentioned that CAMELS rating as an evaluation is assigned to supervisors and are disclosed only directly to the senior staff of bank management. With regard to the views of both authors, the CAMELS framework is a very important factor that effects the bank's performance from an internal

perspective. Gul, Irshad and Zaman (2011) the bank' performance gets strong impact from the external factors those are macroeconomic factors which includes the GDP (gross domestic product), Inflation and the market capitalization. However, Elisa and Guido (2016) stated that bank profitability depends on both the internal and external variables but is more affected by internal factors. Furthermore, it is calculated that the banks that have high capital ratio are less affected by external factors (i.e. economic growth, market capitalization and inflation). Hence, well-capitalized banks achieve greater profits because less risk increases the capital of the bank and the cost of financing researches to avoid future risk is reduced. In this research, the author uses the Capital adequacy, Assets quality, Management, Earnings, liquidity and sensitivity of risk as internal factors while the economic growth and inflation are used as macroeconomic factors. In the following sections, the variables that make up the internal and external factors which affect GCC banking will be described in detail.

Performance Measures

Bank's performance measurement is one of the most important areas considered in any research work on banking which shows that the banking industry plays a vital role in our economy as banks are one of the main player factors of economic growth. Profitability is the banks' first weapon against any unexpected risk that may lead to tremendous losses. It shows the strength of capital and liquidity, and improve from the profitability from future investment (ECB, 2010).

The main purpose of any organization that seeks profitability is to generate and create wealth for its owners. In other words, the return of equity needs to be more than the cost so it can create wealth for the shareholders as well as motivate them to invest more (ECB, 2010). Profit also helps to increase the competitive advantage of a bank (Muda et al., 2013). The performance evaluation of a bank is a compound procedure that involves both internal and external factors. Profitability

ratio in the banking sector is also calculated the same way as the other industries using return on assets (ROA), return on equity (ROE) and cost-to-income ratio. In addition, the net interest margin is typically monitored by the banks (ECB, 2010).

Return on assets (ROA) and Return on equity (ROE) are the main key players when it comes to measuring profitability in any industry or organization, and they are always present in any financial statement. There are many researches and studies on ROA and ROE relating to the banks industry. Return on assets is also known as return on capital which is the measurement of the operating efficiency of a firm prior to effective financing (Damodaran, 2002) while the Return on equity ratio is the rate of return to the management and investors based on the amount of equity invested in the organization (Ledgerwood, 1999). Illustratively, if a company's net income is $1 million and its assets are worth $10 million, then this gives a 10% ROA. If the net income is $ 2 million, the ROA becomes 20% which is twice that obtained in the previous case. Thus, it can be concluded that a higher net income coupled with a lower worth of assets gives a better ROA. A higher ROA is also a good indicator for the management of the banks when the assets are converted into profits. On the other hand, for an illustration on ROE, if the net income of a company ABC is $1million and its shareholder equity is $5million, then it means that 20% (i.e. $1m/$5m) goes to the shareholders, which implies that they made $0.20 profit on each $1 worth of stock. However, if the net income of a company XYZ is $1million and the shareholders equity is $2million, then the shareholders gets 50% (i.e. $1m/$2m) which implies that they made $0.50 profit on each $1 worth of stock. By comparing their ROE's, company XYZ has a better performance than company ABC, and as such, it can be concluded that the higher the net income or shareholder equity, the better the ROE. A better ROE shows that the bank's management has a greater capability to use shareholders' funds effectively, leading to higher management performance.

In both Islamic banks and conventional banks, profitability as a bank performance measure is often evaluated through ROA and ROE. According to Rivard and Thomas (1997) based on their research involving 218 commercial banks, ROA is a better profitability measure than ROE because of its high equity multipliers, which makes it more accurate, and it gives a better assessment on the ability of an organization to generate profit or returns in the asset financial statement. As regard the measurement of profitability in Islamic banks, Bashir (2003) stated that several regulators believe that ROA is a better measure to check the bank's efficiency than the ROE because it solely depends on the shareholders' funds. ROE is also effected by the ROA due to the extent at which banks leverage equity/assets. As ROA might bring lower, banks tend to leverage their investment to gain more return on equity at a competitive level, and as a result, ROA is more desirable than ROE. The views of Rivard and Thomas (1997) and Bashir (2003) on ROE and ROA are also supported by a number of researchers such as Tafri et al. (2009), Jamal et al. (2012) and Dawood (2014).

Considering the Net Interest Margin (NIM), it is not as widely researched as ROA and ROE. The wall street journal sample defines the NIM as a bank profitability measure in which a wider margin implies more profit to the bank. In a more technical term, NIM is defined as the difference between the interest given by banks on deposits and the fees taken on loans from creditors (Constable, 2017). In addition, Demirgüç-Kunt and Huizinga (1999) defined NIM as the interest income minus interest expense over total assets. However, NIM can only be found in the conventional banks because Interest is prohibited in Islamic religion as given in the sharia laws. As stated by Saeed (1999), Islamic banking is meant to provide services to clients without interests. Since it was developed in the 1950s, Islamic banking has been committed to maintaining an interest free policy by introducing the concept of Musharakah and Mudaraba which represents the profit and loss

sharing. Thus, NIM or interest spread does not fit in the Islamic banking as it is in disagreement with the sharia law.

In summary, the views of authors ECB (2010), Muda et al. (2013), Damodaran (2002), Ledgerwood (1999), Rivard and Thomas (1997), Bashir (2003), Tafri et al. (2009), Jamal et al. (2012), Dawood (2014), Constable (20170, Demirgüç-Kunt and Huizinga (1999), Saeed (1999) show that ROA is more used as a profitability measure than ROE and NIM as it can be utilized in both conventional banks and the Islamic banks.

CAMELS ratings

It's a system that is basically designed for monitoring and screening. Due to the proliferation of financial institutions, it is hard for regulators to monitor each bank on daily basis, and as such, the CAMEL rating was introduced. This system has the capability to recognize the problem or risk likely to be faced by any bank in the future which may not be identified by the management of the bank. While some banks may improve and recover from any given failure and be removed from the problem list, others may fail to recover and will continue to be included in the problem list. With the evaluation carried out by the regulators, the rating saves the bank's time and resources as well as saving the bank itself but there are also some problems which cannot be addressed, and they might surface in a later time. Some of the problems tend to be mixture of problems because financial ratio used the current and past performance as well as the future performance since they might not identify the problem at the same time but could also favor bank as it can save time and identify the problem as both of those cases will depend on the situation of the banks (Madura, 2008).

Song and Oosthuizen (2014) stated that Islamic banks also need a risk based supervision. Supervisory authorities apply the same basic administrative structure to both conventional banks

and Islamic banks as they use the same approach, process, methodology, and procedures. While Islamic banks also use the generic CAMELS rating framework due to its suitability, it needs to be related to the risks likely faced by Islamic banks. Thus, it must be improved and developed to accommodate the main areas like the sharia compliance because an increase in the understanding of the Islamic laws will ensure more compliance. The six components of the CAMELS rating framework are discussed below.

Capital Adequacy

As a critical factor of the banks, capital plays the most important role in the banking industry since it reflects the value of assets including cash, securities and loans as well as the availability of funds to meet up the daily cash flows and the ability to handle any expected risks that may lead to tremendous losses. Hence, it is an important factor for explaining the performance and profitability of banks in GCC (Stolz, 2007). In addition, if there is a lot of capital in the banks, they may tend to provide loans to other banks to eliminate any exposed risk event. As stated by Pathak (2017), the concept of Capital Adequacy is associated with the risk weights assigned to an asset raised by the bank in the process of conducting business as well as the portion of capital to be allocated to combined risky assets.

Furthermore, higher capital can both be an advantage and a disadvantage to the management of the bank. This is because a high capital ratio may lower the risk of insolvency but reduce the rate of return, and the bank must decide between risk of insolvency and short-term profitability. From another perspective, banks may use less capital and more leverage (liabilities) which increases both the rate of return and the risk of possible insolvency (Thomas, 2006). Curak et al. (2012) pointed out that higher capital to assets results in lower profitability but it makes the solvency risk to be negative. Thus, high capital reveals higher safety level for the bank but reduces the

profitability. In order to decide on a favorable situation for the bank, the capital should be tested to a level at which it can take risks. Hence, the bank also has more credit in terms of their deposits which implies that its sources are more inflated into high yield assets that give more profitability.

Dietrich and Wanzenried (2011) found that there is no relationship between equity over total assets, as an alternative to capital adequacy. The Coefficient is continuously negative but never statistically significant when the return on average shareholders' equity is used. On the contrary, when the Coefficient is positive, Net Interest Margin are never statistically significant. Conventional banks are operating better than Islamic banks in capital terms. However, the Islamic banks are least exposed to crisis because they employ the concept of high capital to be on the safe side rather than taking leverage which is also prohibited. The reason for high capitalization in conventional banks is due to the fact that they use leveraged money which implies lower capital and high liabilities resulting in more profitability but high exposure to solvency risk (Wasiuzzaman and Tarmizi, 2010).

In view of the researches done by Stolz (2007), Pathak (2017), Thomas (2006), Curak et al. (2012), Liu et al. (2010), Suminto and Yasushi (2011), banks should examine their Capital Adequacy to decide on the situation that is more efficient (i.e. either using high capital which makes them safer or using less capital and high liabilities which gets them exposed to risk of crisis). However, from the comparison done by both Wasiuzzaman and Tarmizi (2010) and Dietrich and Wanzenried (2011), the option of using more capital rather than being exposed to risk is more suitable for Islamic banking. Nevertheless, both conventional banks and Islamic banks generally expects positive and negative on capital adequacy.

Asset quality

This component of the CAMELS rating is one of the critical factors that affect both conventional banks and Islamic banks. Several studies such as Demirguc-Kunt (1989) and Barr and Siems (1994) found that asset quality is a statistically significant indicator of insolvency leading to bank failure, and that failed banking institutions always had a high level of non-performing loans prior to their failure. Assets quality refers to the ratio of loan loss provisions over total loans (asset quality ratio), and is analyzed to measure the effect of a bank's asset quality on profitability (Menicucci and Paolucci, 2016). On a balance sheet, asset is usually found on the left side under loan. Because loan and assets are one of the main sources of generating the bank's profitability, it is significantly important for investors and depositors to know the quality of the assets or loans. Asset quality is also a measure of the creditworthiness of the bank.

If the banks tend to operate more in a risky and uncertain environment, it might be more difficult to control lending operation which implies lower credit quality and lower profitability. A decrease in the quality of loans will have a negative effect on the bank's profitability which may lead to a reduction in the interest income and an increase in cost allocation. Thus, the banks' profitability would expect negative correlation due to bad loans and loan losses which are expected to fall from the total ratio (Elisa and Guido, 2016). In assessing the quality of assets, the extent of loan losses and the adequacy of the lease should be taken into account as well as distributing exposure corresponding to the party or the issuer or borrower involved in the contractual agreements.

According to Rosman et al. (2014), most Islamic banks in the Middle East and Asia (79 banks between 2007 and 2010) made efforts to expand the use of DEA but discovered that both profitability and capitalization were the key determinants of the efficiency of Islamic banking. Beck et al. (2013) asserted that Islamic banks have more capital, better asset quality, and are more

likely to survive during crises than conventional banks. From the views of the researchers Demirguc-Kunt (1989), Barr and Siems (1994), Menicucci and Paolucci (2016), Faizulayev (2011) and Elisa and Guido (2016), asset quality is an important factor that affects the banks, and it is given as the loan loss provision over total loss.

Management

Management, which is the third component of the CAMELS rating, is one of the important aspects of both conventional banks and Islamic banks. Management is the ability of the Board of Directors and management in their respective areas of competence to identify, measure, monitor and control the risk activities of the institution as well as to ensure that its operations are safe, sound, effective and in compliance with the laws and regulations in the given industry. After the financial crisis that occurred in 2008, risk management became very important because it can help an organization to monitor and avoid risks that are likely to be encountered. Bessis (2015) stated that risk management resulted in substantial development as more financial institutions were forced to implement it as stipulated in the regulations, and this eventually made the banks more reliable. With an effective risk management system, banks can better identify, assess, and control the risks that are associated with their resources, and as such risk management has become an indispensable tool. There are three main aspects of risk management which are asset liability management, market risk and credit risk.

The asset liability management deals with managing the assets and liabilities of the bank as well as controlling the interest rate risk and liquidity risk (Bessis, 2015). While Islamic banks offer financing backed by assets which results in the creation of capital formation and bigger productive economic activities, it does not affect inflation. Therefore, Islamic banks provide underlying collateralized assets loans. In addition, Islamic banks do not offer clean borrowing but it only

offers financing to create assets as seen in the fact that they do not offer credit cards, personal loans and overdraft. Islamic banks are strictly restricted to financing backed by assets. There are basically seven important risks that Islamic banks face, and these risks are classified into dependent and independent variables. Asset Backed Financing, Double Audit, Gharar Free Transactions, No Clean Borrowing and Derivatives-less Investments make up the hyindependent variables. The dependent variables consist of Adequacy of Risk Management in IBs and Maximizing Profit After Tax (PAT). While adequate risk can affect the long run success of Islamic banks, it does not only depend on risk management procedures. The success of Islamic banks can come from quality of the products, its marketing, cultural and political disposition, and macroeconomics as well as the creation and marketing of new products. Hence, an attempt is made here to separate both concepts to avoid the need for a reform of an effective risk management system when it does not result in profitability in the short term for any other reasons (Shaikh and Jalbani, 2008)

Earning

Earning is a critical factor that affects both Conventional banks and Islamic. It's an important parameter for measuring the financial performance of banks. It major focuses on productivity of the bank, profitability, speculation of future growth. Banks also depend on earnings for their daily operations such as maintaining capital adequacy, funding dividends, offering funds to banks for investment growth opportunity, strategizing on how to fetch in new activities and increase its competitive advantage (Ahsan, 2016).

Earning ability ratio is measured as the net interest income to avg. asset. It is a parameter for measuring financial profitability which indicates the earning ability. Earning ability could also be measured by the return on assets and return on equity. As shown by researches, the higher the ratio the higher the bank's earning capability. According to Faizulayev (2011), earning quality is the

cost associated with the operating revenue. It involves the categorization of operating costs such as wages, salaries and property, operating revenue into fixed and administrative expenses. Moreover, it measures the efficiency of the bank in the sense that the lower the ratio, the bigger the profit generated by bank.

The quality of earning can be reduced by the nonrecurring events, or favorable tax effects as well as unexpected gains from unjustifiable sources. Future earnings may be greatly affected by wrongly executed or misguided business strategies, inability to forecast or control funding and operating expenses, and poorly managed or uncontrolled exposure to risks.

Liquidity

Liquidity is the ability and the power to turn assets into cash. In other words, it refers to the ability of the bank to sell its assets to get cash if it runs into shortage of cash. It can also be defined as the excess of cash in the bank. Liquidity is very critical factor to any bank because any failure in liquidity might lead to insolvency problem, which implies that the bank can go bankrupt at any given moment (Faizulayev, 2011).

Milhem and Istaiteyeh (2015) defines liquidity ratio as the ability of a firm to meet its obligations in a short term. Current liabilities and current assets are the main parameters that are employed in the liquidity ratio. Other parameters of liquidity ratio include cash deposit, loan deposit, Current Asset Ratio, Risk and Solvency Ratios, Debt Equity Ratio, Debt to Total Asset Ratio, Equity Multiplier and Loan to Deposit Ratio. The liquidity and funding capacity of banks is critically important when measuring banking performance and risk management as highlighted during the financial crisis in 2008. Thus, market participants are likely to pay more attention to the liquidity and funding structure of banks including measures such as the loans-to-deposit ratio, share of

short-term (or wholesale) funding and maturities table when assessing the relative funding strength of a bank and its dependency on short-term funding (ECB, 2010).

Next is liquidity risk management which is an aspect of risk management. Due to crisis, liquidity risk management has become an efficient tool used by banks, governments and corporates to monitor liquidity risk under normal and stressful conditions. There some areas to consider when examining liquidity risk such as time horizon, the origin and the economic condition at a given time. It is difficult to measure liquidity risk as it depends on many factors that capital requirement should prevent. However, the model of measurement involves classifying and indicating factors to monitor as regard suitable operating limits and related organizational issues. Therefore, it highlights managerial and economic regulations that are instrumental to the bank management.

Because liquidity management is interest-based, it is not applicable to Islamic banks but only to conventional banks. Therefore, this is a serious barrier to liquidity management. Nevertheless, Islamic financial center provides good liquidity opportunities for Islamic banks (Fahim Khan and Porzio, 2010).

Sensitivity of risk

Finally, the sixth and last component of CAMELS rating is the Sensitivity of Market Risk which is a critical internal factor. According to Federal Deposit Insurance Corporation, it reflects the changes that occur in the market and economy such as foreign exchange rates, interest rates, security prices or commodity price that can critically affect the earnings and capital of banks or financial institutions. However, changes in interest rate is the primary risk in this aspect.

Rostami (2015) and Dincer et al (2011) identified the key measures of sensitivity of risk to include Total Assets to Sector Assets, Loans and Receivables to Sector Loans and Receivables, and

Deposits to Sector Deposits. Roman and Şargu (2013) said the key term is the ratio of its assets to the assets while Rozzani and Rahman (2013) considered sharia risk as the main term. Furthermore, Rodica-Oana (2014) regarded the main aspects to be Loans granted and commitments assumed by bank in some currency while Venkatesh and Suresh (2014) stated that interest rate/ exchange rate and risk/ risk stocks are the key measures of sensitivity of risk.

There are regulations set by the Basel Committee in 2016 to fix the minimum capital requirements for market risk which addresses some key points such as using the risk of market illiquidity, risk value and expected shortfall to measure risk under stress. The standardized approach for market risk involves the use of the boundary between the trading book and banking book as well as the internal models approach.

Sensitivity of risk was added in the CAMELS rating in 1996 as its last component but there is lack of literature to show the reason that led to this inclusion.

Economic Growth

Economic growth is a critical external factor that affects the performance of both conventional banks and Islamic banks. It refers to the Increase in a country's productive capacity compared to the previous year's productivity measured by the GNP (Gross national product) and GDP (Gross domestic product). The principal causes of economic growth include increase in the capital stock, technological development and improvement in the quality and level of literacy. In recent years, the concept of sustainable development was included as one of the factors to consider when assessing economic growth rates (Business Dictionary, 2017).

According to Bashir (2000), it is a good ratio of economic growth to improve the determinants of profitability, and they said that the ratio of loans to assets is positively related to the determinants

of profitability. In a different light, Sufian and Habibullah (2009) said that during an economic growth, the banks tend to lend more with higher fees which improves the quality of assets. In 2012, Basel Committee on Banking Supervision stated that loans have an impact on economic growth since the monetary policy affects the supply of bank credit and banks. According to Faizulayev, A (2011), GDP (Gross Domestic Product) is also a part of the economic growth. He explained the importance of economic growth to the performance of both conventional banks and Islamic banks. Furthermore, he gave a dummy measurement to show the difference in performance measures between Islamic banks and Conventional banks.

On the other hand, Sufian (2009) said that economic growth can affect banks because it can decrease the capability of the consumer spending and investment on banks as consumers tend to focus on other personal investments such as mortgage. Thus, banks are likely to suffer from low demand on loans, which negatively affects the bank's performance.

Ben Khediri et al (2009) identified that the efficiency of Islamic banks is positively associated with economic growth. The study revealed that the determinants of Islamic bank profitability in the MENA region GDP growth create a positive relationship between both the bank profitability and economic growth, and due to the fact that Islamic banks offer products such as Murabaha, Ijara and Bai-Muajjal, the rate of return in profitability from economic growth will tend to increase. In a similar vein, Chua (2013) performed a research to determine the internal and external determinants of profitability of Malaysian Islamic banks using different Islamic banks. He found that economic growth was positively connected with Islamic banks implying the existence of a positive between the ROA and GDP. This consequently leads to more demand on the bank loans as the bank tends to lend on high fees which increases profitability during a positive economic growth.

Considering the views of Bashir (2000), Sufian and Habibullah (2009), Faizulayev (2011), Ben Khediri et al (2009) and Chua (2013) on economic growth, It can be concluded that economic growth positively affects both conventional banks and Islamic banks as it leads to higher profits and better performance.

Inflation

Inflation is the second external factor that affects the profitability of both conventional banks and Islamic banks. According to Dwivedi (2001), inflation refers to the considerable and persistent rise in the general level of price in the long term. He further said that inflation occurs when money income increases more than an increase in earning. Similarly, he said that inflation refers to a situation where too much money chases too few good. Therefore, inflation is an important factor that affects the economy of a country, and it may have different views as well as different pros and cons.

Inflation depends on the trade investment of banks, the behavior of revaluation on fixed assets and the response of economic agent to changes in the business mix. Banks would generally benefit from inflation because if they pay zero interest on deposits, clients will gradually switch to the interest-bearing instrument. On the other hand, banks might lose from inflation if they offer free capital as it might increase their equity capital which becomes more than the fixed assets and traded investments in loans. In addition, inflation may be observed in the banking industry when the client tends to do more transaction between accounts (Dwivedi, 2001).

In the views of Pasiouras and Kosmidou (2007), banks should adjust their interest rate at the appropriate time when they perceive inflation in the near future so that profitability will be positive and the revenue can rise above the cost. However, if the expected inflation doesn't occur, then the profitability might be negative because it will take time to adjust the interest rate and that will

make the cost more than the revenue.

For Islamic banks, in period of inflation, the price level tends to surpass the non-financial assets and the prices of certain goods. For example, Murabaha (an Islamic product) will generate risks linked to nominal debts from inflations. Inflation affects the price of goods and merchandise purchased by bank as the Salam contract will appreciate (Bellalah, 2014). In conclusion, inflation has a positive and negative effects. Starting with positive the performance of banks as people will tend to save more due to the high price in the markets, and this is beneficial to the banks. However, the negative effect will lead to people stop spending and concentrate more on saving as in the long run the prices will drop which will affect the profitability of any organization.

Proposed Theoretical / Conceptual Framework

This section describes the conceptual Framework which has been investigated and identified from the literatures reviewed. The framework reveals the relationship between explanatory variables and depended variable.

As regard the factors affecting performance of conventional banks and Islamic banks frameworks, they are classified into external factors and internal factors. The external factors refers to macroeconomic elements that affect both the conventional banks and the Islamic banks which include economic growth and inflation. On the other hand, the internal factors are the CAMELS ratings components which include capital adequacy, assets quality, management, earnings, liquidity and sensitivity of risk.

In this research, ROA is used as the depended variable because it is the best parameter for measuring performance and profitability in both the conventional banks and Islamic banks. The explanatory variables are the external factors and internal factors.

Hypotheses Development

H1: Islamic banks have better capital adequacy measures than Conventional banks in GCC.

H2: Islamic banks have better asset quality measures than Conventional banks in GCC.

H3: Islamic banks are better than Conventional banks in management quality in GCC.

H4: Islamic banks have higher earnings than Conventional banks in GCC.

H5: Islamic banks manage their liquidity more efficiently than Conventional banks in GCC.

H6: Islamic banks are lower sensitive to risk than Conventional banks in GCC.

H7: Islamic banks are more effected by the economic growth than Conventional banks in GCC.

H8: Islamic banks are more sensitive to inflation than Conventional banks in GCC

Conclusion

In this chapter, studies related to how the internal factors and the external factors affect the profitability performance of conventional banks and Islamic banks in GCC have been reviewed. The internal factors are capital adequacy, assets quality, management, earnings, liquidity and sensitivity of risk while the external factors are economic growth and inflation. The effects of these factors on both conventional and Islamic banks will be investigated in line with the eight Hypotheses that have been addressed in previous researches. In the next chapter, the index methodology as well as notes used in this research will be discussed in details.

Chapter 3: METHODOLOGY

Introduction

This chapter describes the methodology employed in this study to collect data, information as well as definitions to develop a critical and valid theory. Specifically, the chapter explains the methods that were used to gather the information as well as the research framework and the data analysis.

Research Design

A quantitative data analysis based on a secondary model was used to assess the bank's performance. Secondary data refers to information obtained from published article, books, researches and journals. In this regard, the internal factors were extracted from financial statements, and the external factors were taken from recent sources related to this research and central bank report of GCC. The aim of this research is to investigate the internal and external variables that affect both the performance and profitability of Islamic banks and conventional banks in the GCC. Specifically, the factors used to measure the banks' profitability are capital adequacy, asset quality, management, earnings, liquidity, sensitivity of risk, economic growth and inflation. While the transverse data consists of five conventional banks including Emirates NBD bank, National bank of Abu Dhabi, Samba Financial Group, National Bank of Kuwait, and Ahli United Bank, the banks' performance from 2012 to 2015 were used. Similarly, five banks including Dubai Islamic bank, Abu Dhabi Islamic bank, Al-Rajhi Bank, Kuwait Finance House and Bahrain Islamic Bank were used as representatives for the Islamic banks. The specified data includes both time series and transverse data which is also known as panel data. It helps to determine the time effect that does not illustrate the identity of time series data and transverse data as well as to eliminate problems that may occur in time series data.

Data Collection Methods

This section explains the methods used to achieve the aim of the research. In order to evaluate the performance of both the conventional banks and the Islamic banks in GCC, the techniques used to collect data were structured to capture the factors affecting the profitability component between 2012 and 2015.

Secondary Data

Secondary data obtained from sources such as recent studies related to the current research as well as from GCC's central bank report were used in this research. However, data associated with the internal factor were obtained from financial statements and financial market analysis. In addition, the author reviewed some previous researches in order to know the methods and techniques often used by most researchers.

Return on Assets

ROA (Return on Asset) is the main measure used by the banks to calculate their profitability and revenue from the products they supplied as well as to determine whether the year was profitable, breakeven, or costly. It also reflects the strength of the management to take informed decisions towards enhancing profitability. The higher the Return on asset, the better the bank's efficiency.

The Return on asset is calculated via:

Return on Assets	Net income/ Total Assets (ROA)

Capital Adequacy

Capital Adequacy is the first component of CAMELS rating, and it is an important factor that affects the profitability of banks in GCC. Capital Adequacy refers to the amount of money the bank should have in reserve in case of any unexpected or expected risk so as to keep the cash flow cycle healthy and reduce any insolvency risk that might be faced. (Federalreserve.gov, 2017). The banks can also benefit from the reserved surplus of cash by lending to other banks (deposits) to meet their obligations. The ratio used in this research is total equity over the total assets since it gives a reflection about the capital strength and the alternative of risk (Wasiuzzaman and Tarmizi, 2010). According to Gabilondo (2016), investigating the themes associated with these dynamics results in a nucleus of ideas linking secondary market condition, the bank's short term financial position, its leverage, its Capital adequacy and the role of regulation.

Capital adequacy is calculated using:

Capital Adequacy	Total Equity/Total assets (ETAR)

Asset quality

The quality of assets plays an important role in the performance of banks in GCC, and it is one of the components of the CAMELS rating. Asset quality is a statistically significant index of insolvency leading to bank failure, and failed banking institutions always have a high level of non-performing loans before failure. The ratio of loan loss provisions over total loans (asset quality ratio) is used to measure the effect of a bank's asset quality on profitability (Menicucci and Paolucci, 2016). According to Kumar and Harsha (2016), asset quality is used to calculate the

extent of non-asset performance in the portfolios of banks as well as the extent of damage this category of assets can have on financial performance.

It is evaluated as given below:

Asset Quality	Loan Loss Reserves/ Total Loans (LLR)

Management

Management quality is one of the strongest internal factors that affect the performance of both the conventional banks and Islamic banks. It refers to the ability of the Board of Directors and management to identify, measure, monitor and control the risks activities of an institution as well as to ensure that the operations of the financial institution are safe, effective and in compliance with the laws and regulations stipulated in the given industry (Federalreserve.gov, 2017). It is calculated as the Loans over Deposits. Kumar and Harsha (2016) asserted that the management dimension in CAMEL analysis has become more important than it has ever been.

It is measured as given below:

Management Quality	Loans/Deposits (LDR)

Earnings

Earning gives the main results that show the actual performance of the banks. It is the fourth component in the CAMELS rating, and is one of the critical internal factors that affect the performance of both banks. It reflects the sustainability or quality of profits as well as the amount

and quality of profits that may be affected by excessive or little manageable credit risks which can lead to loan losses. The ratio used is the total expense over the total revenue. Mishra and Aspal (2012) stated that earning is the actual measure that reflects the profitability of the bank, and it explains the sustainability and profit growth in the future.

Earning is calculated as shown below:

Earnings Quality	Total expenses/Total revenue

Liquidity

Liquidity helps to show the capital surplus of the bank. It is the fifth component in CAMELS rating, and is one of the internal critical factors that affect the performance of the banks in GCC. It is the ability and the power to convert assets into cash, that is, the sales of some of the bank's assets to get cash when there is a shortage of cash. Liquidity is also defined as the excess of cash in the bank. The ratio used to estimate liquidity is net loans over total assets. Kumar and Harsha (2016) said liquidity management in banks is of utmost importance because of the competition caused by the availability of foreign capital in the local market.

The calculation used to measure liquidity is:

Liquidity	Net loans/Total Assets

Sensitivity of Risk

Sensitivity of risk is the last internal factor considered in this research, and it is the sixth component of the CAMELS rating. It is applicable to any bank regardless of whether it is a conventional or

an Islamic bank, and it measures the level of sensitivity of banks to risk. It also gives a reflection of the changes that occur in the market and economy like foreign exchange rates, interest rates, security prices or commodity price, which can critically affect the earnings, and capital of banks or financial institutions.

Economic Growth

This is the first external factor considered in this research that critically affects both the conventional banks and Islamic banks in GCC, as the management of the banks cannot control it. Economic growth is the increase in a country's productive capacity in comparison to the previous year's productivity measured by the GNP (Gross national product) AND GDP (Gross domestic product). It results in a situation where people have excess money that enables them to deposit in banks, and this leads to more lending and funding from the banks.

Economic growth is evaluated as given below:

Gross Domestic Product	Annual Gross Domestic Product (GDP)

Inflation

Inflation is the second external factor employed in this research that effects both conventional and Islamic banks in the GCC, and it refers to the rise in the general level of price. The effect of inflation on the performance of both conventional and Islamic banks was measured and evaluated in this research.

The measure used to calculate inflation is given below:

Inflation rate	Annual average inflation (INF)

Data Analysis

The techniques employed in the data analysis used in the studies done by Menicucci and Paolucci (2016), Wasiuzzaman and Tarmizi (2010), Pasiouras and Kosmidou (2007), Bashir (2000), Sufian and Habibullah, (2009), Faizulayev (2011), Ben Khediri et al (2009) and Chua (2013) is adopted by the author in this research to analyze the data collected from different research studies, financial statements, and government annual reports. In addition, only quantitative data are used in the research, and as such, no qualitative analysis is performed.

Conclusion

The secondary data sources, financial ratios, and the economic model used in this research have been discussed in this chapter. The first source of data was from Invest bank 2015 and the second source from Darien Middle East 2016. Financial ratios are often used to evaluate the profitability of banks. Furthermore, the author uses STATA to fast-track analysis process as well as for data playback. The results from the regression analysis will be interpreted and discussed in the next chapter.

Chapter 4: DATA ANALYSIS

Introduction

In the previous chapter, the model specification, data collection and data processing were presented. This chapter explains the results of the data analysis which was performed using STATA programming which is often employed by many researchers in this field. STATA is a statistical tool that is used to perform simulations, data management, hypothesis testing, graphics and statistical analysis. STATA was used for the analysis because of the differences in the measurement results of the banks between 2012 and 2015.

In order to decide on the model to use in this research, the nature of the data was considered. Firstly, the data were obtained from the financial statements of the banks which helped to figure out the nature of the models. Secondly, the relationship between the independent variables and the dependent variables was examined in order to identify the main variable that affects the banking performance.

Table 1: Normality Test

H0: The error terms are normally distributed

H1: The error terms are not normally distributed.

Rule: Normality must be less than 0.05 level of significances for good results otherwise H0 is rejected.

Using the rule given above, it shows that the independent variables track the distribution of the record. Thus, it is expected that the latter will be replaced by the estimates of its registry to meet the natural assumption. To prove the assumption of normality, the Shapiro-Wilk test is implemented.

Table 2: Normality Hypothesis Test (After Data Transformation)

Shapiro-Wilk W test for normal data (ROE)

Variable	Obs	W	V	Z	Prob>z
R2	39	0.94106	2.285	1.736	0.04126

Shapiro-Wilk W test for normal data (ROA)

Variable	Obs	W	V	Z	Prob>z
R2	39	0.93157	2.653	2.05	0.02019

The results given in table 2 show that the PP-plot for ROE is 0.04126 while that of ROA is 0.02019. Applying the rule for normality, H0 is rejected since the p-values of ROE and ROA are less than 0.05. Thus, the error terms are not normally distributed at 5% significant level, and this implies that the data sequences for ROE and ROA are normally distributed as the normality is 1%.

Impact of ROA and ROE on profit distribution: CAMELS and Macroeconomic.

The table below shows the results of the regression analysis using a Pooled regression model. CAMELS and Macroeconomic were used as the independent variable and the profitable distribution was taken as the dependent variables. In addition, all banks were added as control variable in the model. The importance of this model is to show how sensitive the variables are to the market from a profit point of view.

List of Acronyms:

ETAR- Equity to Assets- To measure Capital Adequacy

LLR- Loan Loss Reserves/ Gross Loans- To measure Asset Quality

COSR- Cost to Income Ratio- To measure Earnings Quality

NLTA- Net Loans to Total Assets- To measure Liquidity

LDR- Loans to Deposits- To measure Management Quality

ROA- Return on Assets- To measure Profitability

ROE- Return on Equity- To measure Profitability

NIM- Net Interest Margin- To measure Profitability

GDP- Gross Domestic Product Growth Rate- Macroeconomic Factor

INF- Annual Inflation Rate- Macroeconomic Factor

Table 3: ROE Model:

LNROE	Coefficient	P>|t|
ETAR	-0.0062007*	0.833
LLR	-0.0117571*	0.592
LDR	-0.0136346***	0
COSR	-0.0239615***	0
NLTA	0.0113408**	0.077
_cons	4.143018***	0

Table 4: ROA Model:

LNROA	Coefficient	P>|t|
ETAR	0.0400256*	0.204
LLR	0.0107683*	0.638
LDR	-0.0155135***	0
COSR	-0.0256604***	0
NLTA	0.0154268**	0.018
GDPGROWTH	-1.115571*	0.594
INF	6.541543**	0.033

_cons	0.951518**	0.038

Note: *** implies it is significant at 1% level, ** implies it is significant at 5% level, * implies it is not significant at 10% level.

The profitability distribution is negatively affected by both the Camels and macroeconomic. For the ROE Model, three p-values are highly significant at 1%, which implies that all aspects of the five operations of the ROE model are effective and can enhance the profit of investment account holders. In addition, the market risk variable sensitivity is also important as it further reveals that investment accounts are affected by ROE. On the other hand, the ROA model has two p-values that are highly significant at 1%, which indicates that the seven operations of the ROA model are not efficient and cannot enhance the profit of investment account holders.

Generally, with regard to the results given in table 3, it can be concluded that capital adequacy has a negative response at 10% level of non-significance. Hence, attention has to be given to capital adequacy in order to achieve a better performance pertaining to ROE. However, in the ROA model, response is negative at a significant level of 10%, which implies that it has a healthy capital adequacy that is capable of withstanding losses that may accrue in the future.

From table 3, the response of asset quality is negative at a significant level of 0.592 for ROE. Thus, there is need to improve the quality of products in the market to attract more sales. On the other hand, ROA has a positive response at 0.638 significant level that makes it sensitive to the market. Thus, in case of market risk, the asset quality will not be affected at a significant level of 10%.

Management and Earning quality in the ROE table has a negative response at a significant level of 1%, which is unhealthy. As a result, the quality of management and earning needs to be improved

on because it is very important at a significant level of 1%. In addition, the ROA table gives a similar result to that of ROE, and should likewise be addressed.

Furthermore, the response for liquidity in the ROE table is negative at 5% significant level, which indicates a good cash liquidity condition that can face any future risk that might be encountered. Similarly, for ROA, the response is likewise positive but it is more sensitive to market condition because it is not significant at level 1%.

As regard to macroeconomics, the response of economic growth in the ROA table is negative at a 10% level of non-significance. This means that ROA is negatively sensitive but with slow response to any economic growth changes. On the other hand, inflation has a positive response at 5% level of significance, which implies that there is a positive between ROA and inflation.

Linearity Hypothesis Test table 5&6

ROE TEST	Obs	F	Prob>F
Ramsey RESET test	30	0.66	0.5856

Ho: model has no omitted variables

ROA TEST	Obs	F	Prob>F
Ramsey RESET test	28	0.42	0.7406

Ho: model has no omitted variables

In view of the results given in table 5 & 6, the p-value for ROE is 0. 5856 and that of ROA is 0. 7406. Since the p-values are greater than 0.05, the null hypothesis is accepted, which implies that there is a linear relationship between the variables (ROE and ROA) and the profit distribution.

Homoscedasticity Test

Breusch-Pagan / Cook-Weisberg test for heteroscedasticity (**ROE**)

Variable	Chi2	Prob > chi2
R	0.12	0.7297

Ho: Constant variance / Variables: fitted values of LNROE

Breusch-Pagan / Cook-Weisberg test for heteroscedasticity (**ROA**)

Variable	Chi2	Prob > chi2
R	1.14	0.2848

Ho: Constant variance / Variables: fitted values of LNROA

It is assumed that heteroscedasticity is fulfilled in both the ROE and ROA tests. As shown in the results, the p-values of ROE and ROA are 0.7297 and 0. 2848 respectively, and are greater than 0.05. Heteroscedasticity indicates the circumstance in which the variable is unequal across the set of values of the second variable predicted.

Multicollinearity Test

ROE

Variable	VIF	1/VIF
ETAR	4.96	0.201675
LLR	4.3	0.232377
NLTA	1.94	0.516087
LDR	1.69	0.593226
COSR	1.44	0.69218
Mean VIF	2.87	

ROA

Variable	VIF	1/VIF
ETAR	5.97	0.167395
LLR	5.03	0.198613
LDR	2.19	0.4562

NLTA	2.06	0.485641
COSR	1.52	0.656705
GDPGROWTH	1.46	0.682731
INF	1.18	0.846653
Mean VIF	2.78	

With regard to the ROE Multicollinearity Test, the variables are not highly linearly related because some of the VIFs are below 5. As a result, it is more accurate to estimate the impact of one of the variables on the distribution of profits while controlling the others.

Assumption of independence has not been achieved because regression is the independence of error conditions as the errors associated with one observation are not related to the errors of any other observation. The test shows that there is an autocorrelation with the first error.

Similarly, for the ROA Multicollinearity Test, only two variables (i.e. capital adequacy and assist quality) were above 5, which implies Multicollinearity. However, the other variables were below 5, which is an average result. Thus, it would be more accurate to estimate the impact of one of the variables on the distribution of profits while controlling the others.

Independence Test

Wooldridge test for autocorrelation in panel data (ROE)

Variable	Obs	F	Prob>F
R	9	3.939	0.0785

H0: no first order autocorrelation

Wooldridge test for autocorrelation in panel data (ROA)

Variable	Obs	F	Prob>F
R	9	3.139	0.1102

H0: no first order autocorrelation

For the independence Test, ROE has a p-value of 0. 0785 and ROA has a p-value of 0.1102. Since their p-values are greater than 0.05, there is no autocorrelation, which is Late link itself, and delayed a certain number of units of time. Autocorrelation helps to define the relationship between the two strings in the time series data.

Fixed vs. Random effect Regression

ROE FIXED

ETAR	-0.0036675
LLR	-0.0194566
LDR	-0.0052476
COSR	-0.0507204
NLTA	0.0053742
GDPGROWTH	-0.0402185
INF	6.923655
Adjusted-R2	49.70%
No. of Observations	39
No. of Groups	10
p-value	0

ROE Random

ETAR	-0.0189249
LLR	-0.00496
LDR	-0.0140699
COSR	-0.0297495
NLTA	0.0169999
GDPGROWTH	-0.3825468
INF	7.040389
Adjusted-R2	68.70%
No. of Observations	39
No. of Groups	10
p-value	0

As regard the regression analysis for ROE, both the fixed and random effects models are highly significant with P values below 1%, and R2 of 47% and 69%, respectively.

ROA FIXED

ETAR	0.0746631
LLR	-0.0200619
LDR	-0.004389
COSR	-0.0513015
NLTA	0.004716
GDPGROWTH	-0.2509774
INF	6.694665
Adjusted-R2	66.28%
No. of Observations	39
No. of Groups	10
p-value	0

ROA Random

ETAR	0.0547806
LLR	-0.0024504
LDR	-0.0137244
COSR	-0.0298502
NLTA	0.0176801
GDPGROWTH	-0.2509774
INF	-0.6225358
Adjusted-R2	79.9%
No. of Observations	39
No. of Groups	10
p-value	0

The regression analysis for ROA shows that both the fixed and random effects models are highly significant with P values below 1% as well as R2 of 66% and 79.9% respectively. Below, the

Hausmann specification test was performed to assess the most appropriate data set model for both ROE and ROA is equal to zero coefficient p-value.

Hausman Test

ROE FIXED ROE Random

ETAR	-0.0036675	ETAR	-0.0189249
LLR	-0.0194566	LLR	-0.00496
LDR	-0.0052476	LDR	-0.0140699
COSR	-0.0507204	COSR	-0.0297495
NLTA	0.0053742	NLTA	0.0169999
GDPGROWTH	-0.0402185	GDPGROWTH	-0.3825468
INF	6.923655	INF	7.040389
chi2	31.87		
p-value	0		

Ho: difference in coefficients not systematic

For the ROE Hausman Test, the P-Value is significant since it's below 5, and as such, the null hypothesis is rejected. This implies that the results do indicate any significant difference in the coefficients. Thus, the fixed effect model should be used. In order to get an idea of the true significance of the regression model, the diagnosis of the regression assumptions is implemented

to avoid getting misleading results.

ROA FIXED		ROA Random	
ETAR	0.0746631	ETAR	0.0547806
LLR	-0.0200619	LLR	-0.0024504
LDR	-0.004389	LDR	-0.0137244
COSR	-0.0513015	COSR	-0.0298502
NLTA	0.004716	NLTA	0.0176801
GDPGROWTH	-0.2509774	GDPGROWTH	-0.2509774
INF	6.694665	INF	-0.6225358
chi2	19.96		
p-value	0		

Ho: difference in coefficients not systematic

As regard the Hausman Test for ROA, the results show that the P-Value is significant as it's less than 5, and as a result, the null hypothesis is rejected. This implies that there is no significant difference in the coefficients. Hence, the fixed effect model should be applied.

Conclusion

In this chapter, several tests were conducted to check the validity of the hypotheses. To evaluate the impact of ROA and ROE on profit distribution, normality test, linearity hypothesis test, homoscedasticity test, multicollinearity test, independence test, fixed vs. random effect Regression were performed. The results obtained are used to identify the independent variables that have more effects on the dependent variables as discussed in the next chapter which is the final chapter of this research.

Chapter 5: DISCUSSION, CONCLUSION AND IMPLICATIONS

Introduction

This chapter summaries the analysis that has been done in the previous chapters with due consideration to the main variables used in this research paper. Also, the sub-section discusses in details the implications of policies. Lastly, this chapter also contains the limitations faced during the course of carrying out this research work as well as recommendations for future study.

Summary of Statistical Analyses

From the data analysis in the previous chapter, it can be concluded that the profitability of return on Assets is higher and more volatile than return on equity. The result of this standard deviation of the ROE is higher than the ROA's standard deviation which indicates that the profitability of ROE is higher than that of ROA. The mean value of ROA (2.78) is less than ROE (2.87). In

addition, the results show that ETAR, LLR and GDP GROWTH are large at the level of importance (5% and 10%) for traditional banks, whereas the results show that there is only a statistically significant level of significance (10%) to ROA. In addition, the value of P-value for the ROA and ROE indicates that at least one independent variable is significant in explaining the traditional banking system in GCC. Consequently, this may indicate that the determinants that may affect the Bank's conventional profitability differ with Islamic banks.

Discussions of Major Findings

The results were reanalyzed starting with Normality Test. This test needed to be re-done due to the fact that the assumption made was unnatural. The Normality Hypothesis Test gave p-value for ROE (0.04126) and ROA (0.02019) which were both less than the significant level of 0.05, showing negative results. However, on the impact of ROA and ROE on profit distribution from the camel and macroeconomic, both ROE and ROA results were not in the good level because most of the independent variable were negatively affected by the profitability distribution as the only positive in ROE was the liquidity and on the ROA side were; capital adequacy, asset quality, liquidity and inflation. Adding to the results ROE average significant level was 1% as compared to ROA whose average significant level is 10%.

Linearity Hypothesis Test results shows the p-value for ROE (0.5856) and ROA (0.7406) are greater than alpha (5%) resulting in holding that the linearity model has no omitted variables and ROA is the higher level according to the p-value when compared with ROE. Moreover, Homoscedasticity Test results showed the results of the ROE (0.7297) and ROA (0. 2848) both of which were greater than the P-value which is 0.05 resulting in positive Constant variance with

ROE in the lead. However, for the multicollinearity Test, both ROE and ROA variables were below 5 except 2 variables in the ROA which are the capital adequacy and asset quality but still, it results in no multicollinearity in both. Independence Test results showed no autocorrelation because ROE (0. 0785) and ROA (0. 1102). P-values are greater than 0.05 resulting late links units as ROA with the greater result.

Lastly Fixed vs. Random effect Regression test was done to determine which regression model to use for both ROE and ROA. Starting with the ROE due to p-value (0.00) and Adjusted - R2 of 47% and 69%, the Hausman Test should be taken to bring up a specific result that shows which regression model should be used. Same results with ROA due to p-value (0.00) and Adjusted - R2 of 66% and 79.9%, the Hausman Test should be taken to bring up a specific result that shows which regression model should be used. Hausman Test results were accurate and showed us which regression model suits both the ROE and ROA. Starting with ROE, the significant p-value was under 5 resulting in difference in coefficients not systematic, which means fixed regression model should be used for ROE. Same result was obtained for ROA significant p-value which was under 5 resulting in difference in coefficients not systematic, which also means fixed regression model should be used for ROA.

Implication of Study

This research was done to provide knowledge for regulators, new researchers, investors and anyone who is concerned with this research for profitability purpose of both conventional banks and Islamic banks in GCC. Bank managers must have an eye on those determinants due to their

significant effective power against both the conventional banks and Islamic banks. Both banks run with different type of system as the conventional is the normal traditional banking system way unlike the Islamic banks that comply under sharia laws (for example the prohibition of interest rates). On the other side, Islamic banks make their money from profits rate, the gain from customers that are provided by Islamic regulators and banks performance. The conventional banks use the interest rate to make their profit on the lending and borrowing cycle. However, even if the banks do not perform well, the loss will be a liability on them. Unlike the Islamic banks the loss is taken by both parties (customers and the Islamic bank) highlighting profit and loss objectives, while IBOR are adjusted from the central bank of the country.

Liquidity is important for banks which is provided by depositors to activate the surplus funds to borrowers with fund deficits to provide financials and products that is needed by individual, organizations and economy itself as this is main reason why liquidity is the most important factor the bank managers and regulators need to put this factor on priority as it’s the real cycle that banks relay on.

This research is useful for bank managers to ensure optimal use of the Bank's resources to increase the profitability of the Bank and to improve the risk management process. Capital adequacy is also important factor that both bank managers and regulators should keep in mind that capital adequacy have a major impact on the profitability on the conventional Banks and Islamic banks. However, increase in capitalization need to be looked

at and researched in depth by the bank managers.

A good knowledge of macroeconomic factors such as inflation and economic growth is highly needed by the bank manager. This is due to the fact that fluctuations in GDP growth rate and

inflation rate will affect the Bank's performance. High volatility and fluctuation in the countries' economy can lead to such great opportunities for banks to take advantage of to make profits. Forecasting research should be also taken into consideration as the more it is used, the easier it will be to forecast the inflation and hence, prepare for how to face its outcome on the economy and help in adjusting the level of interest rate. Also, since on the Islamic banking side as it is known that the interest are prohibited, it will help the management to look further on how they can increase in profit sharing and how to adjust the right prices for the product they offer.

Limitations of the Study

The main limitations faced in the course of this research was the lack of date on the secondary research. However, the GCC banks financial reports were found on PDF produced from Darien middle-east analysts from the year 2012 to 2015. Although, before 2012 most of the banks could not supply the financial reports that were needed which led to the limitation of adding financial reports from 2012 to 2015. Due to developing countries and emerging markets, there were limited sources with limited information and studies to use regarding this research. For example, the Islamic bank which just recently added to the banking field as we can conclude, lack adequate materials on the subject matter maybe due to its young age unlike the conventional bank which had enough sources that were used for this research. The conventional bank also had older financial reports that could have been added but for sake of simplicity of both the size and look of the report they were omitted so that the report can be balanced in professional way.

Since there are no quarterly reports, many banks were released from the sample, resulting in only four passing observations for Islamic and conventional banks, respectively. Separately from a short period of study, the employment of cross-sectional data in this study is also not enough to represent the overall industry as only five conventional banks and five Islamic banks were taken into

consideration. According to UAE central bank however, there are 50 conventional banks and only 8 Islamic banks showing that the conventional banks have been operating since the first stages of the country while Islamic banks landed in 1990s. Therefore, the results obtained may be insufficient to explain the entire banking industry.

Recommendations for Future Research

For any study that will be done in the future pertaining to this research, it is recommended that the study covers a wider spectrum, a longer or different period of observation, and a different set of variables. This is because a large number of researchers who have worked in this area made use of the same variables despite using banks in different countries as a study as well as different time periods.

In addition, a longer-term research that involves a combination of old and new data is recommended. For example, using a time period of more than ten years will give the researcher more information as well as freedom to choose between the quality and quantity in the symmetrical distribution of data. However, choosing the whole GCC instead of an entire country is advisable due to the lack of information, and it helps to explain the actual behavior of the performance of any conventional and Islamic bank in the population.

Conclusion

The aim of this research is to evaluate the impact of internal and external variables on the performance of both Islamic banks and conventional banks in the GCC. The Internal variables include capital adequacy, asset quality, management, earnings, liquidity and sensitivity of risk while the external variables are the economic growth and inflation. Return on equity and Return

on asset were used in the STATA programming to identify the variable with the greatest effect or least effect on the performance of banks in GCC. Specifically, five conventional banks and five Islamic banks from 2012 to 2015 were used in the research.

The linearity test had to be repeated because the results obtained were insignificant, and the assumption of normality was proven using the Shapiro-Wilk test. After the data transformation, the results became significant as it was less than 5%. Capital adequacy and asset quality were found to have an impact on ROE and ROA unlike the other variables. Moving on to the variable. The Linearity Hypothesis Test results were greater than 5% which implied that the null hypothesis be accepted which means that there is linearity. However, The Homoscedasticity Test showed constant variance in the results. For the Multicollinearity Test, the VIF was lower than 5% which indicates that there is no Multicollinearity. The Independence Test revealed that there is no autocorrelation as the result was more than 5%. The fixed and random effects models are highly significant as given by the results. Also, the result of the Hausman Test was significant as it's below 5% which implied that there is no difference in coefficients.

The results for ROA were similar to those of ROE as the linearity test had to be performed again due to insignificant results, and Shapiro-Wilk test was used to prove the assumption of normality. After transforming the data, the result became significant as it was smaller than 5% and was less than the ROE's results. Capital adequacy, asset quality, liquidity, inflation and economic growth were the variables that had impact on ROA. The result of the linearity hypothesis test was greater than 5% indicating that the null hypothesis should be accepted, which implies that there is linearity. The Homoscedasticity Test revealed a constant variance in the results, and the result of the Multicollinearity Test was less than 5% which implies that there is no Multicollinearity. The independence test showed that there is no autocorrelation since the result obtained was more than

5%. The results of the fixed and random effects models are highly significant as well as that of the Hausman Test that was below 5%. The significance of the Hausman test implies that there is no difference in the coefficients.

The positive relationship between inflation and profitability of banks can be explained by the fact that the management of the conventional banks anticipated correctly that inflation would occur in the future during the study period, and this gave them the opportunity to adjust the interest rate accordingly to achieve higher profits. A negative signal suggests that the operating expenses incurred in the Islamic Banks increase more than its revenues. It is inaccurate to infer that the management of Islamic banks anticipated that inflation would occur in the future, as higher costs cannot be transferred to customers. While the field of Islamic banking services have expressed concerns about the transparency of the Islamic banks, the relationship between the level of transparency of Islamic banks and the distribution of profits to investment account holders as well as the impact of banks' performance on the latter is highlighted.

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Appendix

1. ROE STATA

```
 ___  ____  ____  ____  ____ (R)
/__    /   ____/   /   ____/
___/   /   /___/   /   /___/   13.0   Copyright 1985-2013 StataCorp LP
  Statistics/Data Analysis            StataCorp
                                      4905 Lakeway Drive
     MP - Parallel Edition            College Station, Texas 77845 USA
                                      800-STATA-PC        http://www.stata.com
                                      979-696-4600        stata@stata.com
```

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3-user 8-core Stata network perpetual license:
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Notes:
1. (/v# option or -set maxvar-) 5000 maximum variables

Checking for updates...
(contacting http://www.stata.com)
bad serial number
unable to check for update; verify Internet settings are correct.

. import excel "C:\Users\mai\Desktop\Dependent & Independent 2.xlsx", sheet("Summary") firstrow

. regress ROE ETAR LLR LDR COSR NLTA

```
      Source |       SS       df       MS              Number of obs =      40
-------------+------------------------------           F(  5,    34) =   11.26
       Model |  2768.00226     5  553.600451           Prob > F      =  0.0000
    Residual |  1671.34729    34  49.1572731           R-squared     =  0.6235
-------------+------------------------------           Adj R-squared =  0.5681
       Total |  4439.34954    39  113.829475           Root MSE      =  7.0112

------------------------------------------------------------------------------
         ROE |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        ETAR |  -1.068317   1.150434    -0.93   0.360    -3.406281    1.269647
         LLR |   .4266686   .8608632     0.50   0.623    -1.322816    2.176153
         LDR |   -.153847   .1219758    -1.26   0.216    -.4017316    .0940376
        COSR |   -.883359   .1365733    -6.47   0.000    -1.160909   -.6058086
        NLTA |   .4706607   .2429819     1.94   0.061     -.023138    .9644593
       _cons |   35.74903   15.85402     2.25   0.031     3.529777    67.96829
------------------------------------------------------------------------------
```

. predict r1, residuals

. swilk r1

Shapiro-Wilk W test for normal data

```
    Variable |    Obs       W          V         z       Prob>z
-------------+--------------------------------------------------
```

```
        r1 |     40    0.86061      5.510     3.591    0.00016

. ovtest

Ramsey RESET test using powers of the fitted values of ROE
      Ho:  model has no omitted variables
                F(3, 31) =    131.52
                Prob > F =      0.0000

. generate LNROE=ln(ROE)
(1 missing value generated)

. regress LNROE ETAR LLR LDR COSR NLTA

      Source |       SS       df       MS              Number of obs =      39
-------------+------------------------------           F(  5,    33) =   12.24
       Model |  1.88363629     5  .376727259            Prob > F      =  0.0000
    Residual |  1.01538939    33  .030769375            R-squared     =  0.6497
-------------+------------------------------           Adj R-squared =  0.5967
       Total |  2.89902568    38  .076290149            Root MSE      =  .17541

------------------------------------------------------------------------------
       LNROE |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        ETAR |  -.0062007   .0291022    -0.21   0.833    -.0654095    .0530082
         LLR |  -.0117571   .0216957    -0.54   0.592    -.0558974    .0323832
         LDR |  -.0136346   .0030524    -4.47   0.000    -.0198449   -.0074244
        COSR |  -.0239615   .0043158    -5.55   0.000    -.0327421   -.0151809
        NLTA |   .0113408   .0062206     1.82   0.077    -.0013152    .0239967
       _cons |   4.143018   .3971294    10.43   0.000     3.335052    4.950984
------------------------------------------------------------------------------

. predict r2, residuals
(1 missing value generated)

. swilk r2

                  Shapiro-Wilk W test for normal data

    Variable |    Obs       W          V         z       Prob>z
-------------+--------------------------------------------------
          r2 |     39    0.94106      2.285     1.736    0.04126

. ovtest

Ramsey RESET test using powers of the fitted values of LNROE
```

```
      Ho:  model has no omitted variables
                F(3, 30) =      0.66
                Prob > F =      0.5856

. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of LNROE

         chi2(1)      =     0.12
         Prob > chi2  =   0.7297

. vif

    Variable |       VIF       1/VIF
-------------+----------------------
        ETAR |      4.96    0.201675
         LLR |      4.30    0.232377
        NLTA |      1.94    0.516087
         LDR |      1.69    0.593226
        COSR |      1.44    0.692180
-------------+----------------------
    Mean VIF |      2.87

. xtserial LNROE ETAR LLR LDR COSR NLTA
time variable not set, use -tsset varname ...-
r(111);

. xtset Code Year
       panel variable:  Code (strongly balanced)
        time variable:  Year, 2012 to 2015
                delta:  1 unit


.
. xtserial LNROE ETAR LLR LDR COSR NLTA

Wooldridge test for autocorrelation in panel data
H0: no first order autocorrelation
    F(  1,       9) =      3.939
           Prob > F =      0.0785

. xtreg LNROE ETAR LLR LDR COSR NLTA, fe

Fixed-effects (within) regression               Number of obs      =        39
Group variable: Code                            Number of groups   =        10
```

```
R-sq:  within  = 0.6452                  Obs per group: min =         3
       between = 0.5537                                 avg =       3.9
       overall = 0.5165                                 max =         4

                                    F(5,24)           =      8.73
corr(u_i, Xb)  = -0.7998            Prob > F          =    0.0001

------------------------------------------------------------------------------
       LNROE |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        ETAR |    .004155   .0442333     0.09   0.926     -.087138     .095448
         LLR |  -.0341932    .025721    -1.33   0.196    -.0872787    .0188923
         LDR |  -.0089398   .0075077    -1.19   0.245     -.024435    .0065553
        COSR |  -.0550692   .0107322    -5.13   0.000    -.0772194   -.0329189
        NLTA |   .0090466   .0121143     0.75   0.462     -.015956    .0340492
       _cons |   5.288818   .7965506     6.64   0.000     3.644818    6.932817
-------------+----------------------------------------------------------------
     sigma_u |  .29698271
     sigma_e |  .11554738
         rho |  .86852578   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(9, 24) =     5.78                 Prob > F = 0.0003

. xtreg LNROE ETAR LLR LDR COSR NLTA, fe vce(robust)

Fixed-effects (within) regression               Number of obs      =        39
Group variable: Code                            Number of groups   =        10

R-sq:  within  = 0.6452                         Obs per group: min =         3
       between = 0.5537                                        avg =       3.9
       overall = 0.5165                                        max =         4

                                    F(5,9)            =      8.82
corr(u_i, Xb)  = -0.7998            Prob > F          =    0.0028

                                (Std. Err. adjusted for 10 clusters in Code)
------------------------------------------------------------------------------
             |               Robust
       LNROE |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        ETAR |    .004155   .0304558     0.14   0.894    -.0647407    .0730507
         LLR |  -.0341932   .0190484    -1.80   0.106    -.0772838    .0088973
         LDR |  -.0089398   .0070541    -1.27   0.237    -.0248973    .0070176
        COSR |  -.0550692   .0143345    -3.84   0.004     -.087496   -.0226424
        NLTA |   .0090466   .0125719     0.72   0.490     -.019393    .0374861
```

```
      _cons |   5.288818   .9899421     5.34   0.000     3.049413    7.528222
------------+----------------------------------------------------------------
    sigma_u |  .29698271
    sigma_e |  .11554738
       rho |  .86852578   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. xtreg LNROE ETAR LLR LDR COSR NLTA, fe

Fixed-effects (within) regression               Number of obs      =        39
Group variable: Code                            Number of groups   =        10

R-sq:  within  = 0.6452                         Obs per group: min =         3
       between = 0.5537                                        avg =       3.9
       overall = 0.5165                                        max =         4

                                                F(5,24)           =      8.73
corr(u_i, Xb)  = -0.7998                        Prob > F          =    0.0001

------------------------------------------------------------------------------
      LNROE |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
------------+----------------------------------------------------------------
       ETAR |    .004155   .0442333     0.09   0.926     -.087138     .095448
        LLR |  -.0341932    .025721    -1.33   0.196    -.0872787    .0188923
        LDR |  -.0089398   .0075077    -1.19   0.245     -.024435    .0065553
       COSR |  -.0550692   .0107322    -5.13   0.000    -.0772194   -.0329189
       NLTA |   .0090466   .0121143     0.75   0.462     -.015956    .0340492
      _cons |   5.288818   .7965506     6.64   0.000     3.644818    6.932817
------------+----------------------------------------------------------------
    sigma_u |  .29698271
    sigma_e |  .11554738
       rho |  .86852578   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(9, 24) =      5.78                 Prob > F = 0.0003

. xtreg LNROE ETAR LLR LDR COSR NLTA, re

Random-effects GLS regression                   Number of obs      =        39
Group variable: Code                            Number of groups   =        10

R-sq:  within  = 0.6148                         Obs per group: min =         3
       between = 0.6802                                        avg =       3.9
       overall = 0.6198                                        max =         4

                                                Wald chi2(5)      =     44.96
corr(u_i, X)   = 0 (assumed)                    Prob > chi2       =    0.0000
```

```
------------------------------------------------------------------------------
      LNROE |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
------------+-----------------------------------------------------------------
       ETAR |  -.0055535   .0350266    -0.16   0.874    -.0742043    .0630973
        LLR |  -.0201681   .0219874    -0.92   0.359    -.0632627    .0229265
        LDR |  -.0139487   .0045024    -3.10   0.002    -.0227733   -.0051241
       COSR |  -.0340194   .0064733    -5.26   0.000    -.0467068    -.021332
       NLTA |   .0180908   .0082628     2.19   0.029     .0018961    .0342855
      _cons |   4.279422   .5630936     7.60   0.000     3.175779    5.383065
------------+-----------------------------------------------------------------
    sigma_u |  .15853932
    sigma_e |  .11554738
        rho |   .6530887   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. xtreg LNROE ETAR LLR LDR COSR NLTA, fe vce(robust)

Fixed-effects (within) regression               Number of obs      =        39
Group variable: Code                            Number of groups   =        10

R-sq:  within  = 0.6452                         Obs per group: min =         3
       between = 0.5537                                        avg =       3.9
       overall = 0.5165                                        max =         4

                                                F(5,9)            =      8.82
corr(u_i, Xb)  = -0.7998                        Prob > F          =    0.0028

                                    (Std. Err. adjusted for 10 clusters in Code)
------------------------------------------------------------------------------
             |               Robust
      LNROE |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
------------+-----------------------------------------------------------------
       ETAR |    .004155   .0304558     0.14   0.894    -.0647407    .0730507
        LLR |  -.0341932   .0190484    -1.80   0.106    -.0772838    .0088973
        LDR |  -.0089398   .0070541    -1.27   0.237    -.0248973    .0070176
       COSR |  -.0550692   .0143345    -3.84   0.004     -.087496   -.0226424
       NLTA |   .0090466   .0125719     0.72   0.490     -.019393    .0374861
      _cons |   5.288818   .9899421     5.34   0.000     3.049413    7.528222
------------+-----------------------------------------------------------------
    sigma_u |  .29698271
    sigma_e |  .11554738
        rho |  .86852578   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. estimates store fixed
```

```
. xtreg LNROE ETAR LLR LDR COSR NLTA, re vce(robust)

Random-effects GLS regression                   Number of obs      =        39
Group variable: Code                            Number of groups   =        10

R-sq:  within  = 0.6148                         Obs per group: min =         3
       between = 0.6802                                        avg =       3.9
       overall = 0.6198                                        max =         4

                                                Wald chi2(5)       =    192.93
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000

                                (Std. Err. adjusted for 10 clusters in Code)
------------------------------------------------------------------------------
             |               Robust
       LNROE |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        ETAR |  -.0055535    .028952    -0.19   0.848    -.0622984    .0511914
         LLR |  -.0201681   .0159257    -1.27   0.205    -.0513819    .0110458
         LDR |  -.0139487   .0036301    -3.84   0.000    -.0210636   -.0068338
        COSR |  -.0340194   .0046793    -7.27   0.000    -.0431907   -.0248482
        NLTA |   .0180908   .0076339     2.37   0.018     .0031286     .033053
       _cons |   4.279422   .5039181     8.49   0.000     3.291761    5.267084
-------------+----------------------------------------------------------------
     sigma_u |  .15853932
     sigma_e |  .11554738
         rho |   .6530887   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. estimates store random

. haussman fixed
unrecognized command:  haussman
r(199);

. hausman fixed
hausman cannot be used with vce(robust), vce(cluster cvar), or p-weighted data
r(198);

. xtreg LNROE ETAR LLR LDR COSR NLTA, fe

Fixed-effects (within) regression               Number of obs      =        39
Group variable: Code                            Number of groups   =        10

R-sq:  within  = 0.6452                         Obs per group: min =         3
```

```
      between = 0.5537                        avg =       3.9
      overall = 0.5165                        max =         4

                                    F(5,24)           =      8.73
corr(u_i, Xb)  = -0.7998                    Prob > F          =    0.0001

------------------------------------------------------------------------------
      LNROE |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
------------+----------------------------------------------------------------
       ETAR |    .004155   .0442333     0.09   0.926     -.087138     .095448
        LLR |  -.0341932    .025721    -1.33   0.196    -.0872787    .0188923
        LDR |  -.0089398   .0075077    -1.19   0.245     -.024435    .0065553
       COSR |  -.0550692   .0107322    -5.13   0.000    -.0772194   -.0329189
       NLTA |   .0090466   .0121143     0.75   0.462     -.015956    .0340492
      _cons |   5.288818   .7965506     6.64   0.000     3.644818    6.932817
------------+----------------------------------------------------------------
    sigma_u |  .29698271
    sigma_e |  .11554738
        rho |  .86852578   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(9, 24) =      5.78              Prob > F = 0.0003

. estimates store fixed1

. hausman fixed1
the two models need to be different
r(198);

. xtreg LNROE ETAR LLR LDR COSR NLTA, fe

Fixed-effects (within) regression               Number of obs      =        39
Group variable: Code                            Number of groups   =        10

R-sq:  within  = 0.6452                         Obs per group: min =         3
      between = 0.5537                                        avg =       3.9
      overall = 0.5165                                        max =         4

                                    F(5,24)           =      8.73
corr(u_i, Xb)  = -0.7998                    Prob > F          =    0.0001

------------------------------------------------------------------------------
      LNROE |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
------------+----------------------------------------------------------------
       ETAR |    .004155   .0442333     0.09   0.926     -.087138     .095448
        LLR |  -.0341932    .025721    -1.33   0.196    -.0872787    .0188923
        LDR |  -.0089398   .0075077    -1.19   0.245     -.024435    .0065553
```

```
       COSR |  -.0550692   .0107322    -5.13   0.000    -.0772194   -.0329189
       NLTA |   .0090466   .0121143     0.75   0.462     -.015956    .0340492
      _cons |   5.288818   .7965506     6.64   0.000     3.644818    6.932817
-------------+----------------------------------------------------------------
    sigma_u |  .29698271
    sigma_e |  .11554738
        rho |  .86852578   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(9, 24) =     5.78                 Prob > F = 0.0003

. estimates store fixed2

. xtreg LNROE ETAR LLR LDR COSR NLTA, re

Random-effects GLS regression                   Number of obs      =        39
Group variable: Code                            Number of groups   =        10

R-sq:  within  = 0.6148                         Obs per group: min =         3
       between = 0.6802                                        avg =       3.9
       overall = 0.6198                                        max =         4

                                                Wald chi2(5)       =     44.96
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000

------------------------------------------------------------------------------
      LNROE |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       ETAR |  -.0055535   .0350266    -0.16   0.874    -.0742043    .0630973
        LLR |  -.0201681   .0219874    -0.92   0.359    -.0632627    .0229265
        LDR |  -.0139487   .0045024    -3.10   0.002    -.0227733   -.0051241
       COSR |  -.0340194   .0064733    -5.26   0.000    -.0467068    -.021332
       NLTA |   .0180908   .0082628     2.19   0.029     .0018961    .0342855
      _cons |   4.279422   .5630936     7.60   0.000     3.175779    5.383065
-------------+----------------------------------------------------------------
    sigma_u |  .15853932
    sigma_e |  .11554738
        rho |   .6530887   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. estimates store random1

. hausman fixed2

                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |    fixed2       random1       Difference          S.E.
```

```
-------------+----------------------------------------------------------------
        ETAR |     .004155    -.0055535        .0097085        .0270133
         LLR |   -.0341932    -.0201681       -.0140252        .0133462
         LDR |   -.0089398    -.0139487        .0050089        .0060078
        COSR |   -.0550692    -.0340194       -.0210498        .0085602
        NLTA |    .0090466     .0180908       -.0090442         .008859
------------------------------------------------------------------------------
                     b = consistent under Ho and Ha; obtained from xtreg
          B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                      =    -1.33    chi2<0 ==> model fitted on these
                                    data fails to meet the asymptotic
                                    assumptions of the Hausman test;
                                    see suest for a generalized test

. xtreg LNROE GDPGROWTH INF ETAR LLR LDR COSR NLTA, fe vce(robust)

Fixed-effects (within) regression               Number of obs      =        39
Group variable: Code                            Number of groups   =        10

R-sq:  within  = 0.8025                         Obs per group: min =         3
       between = 0.4718                                        avg =       3.9
       overall = 0.4970                                        max =         4

                                                F(7,9)            =     11.64
corr(u_i, Xb)  = -0.7377                        Prob > F          =    0.0007



 (Std. Err. adjusted for 10 clusters in Code)
------------------------------------------------------------------------------
             |               Robust
      LNROE |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  GDPGROWTH |  -.0402185   .6599638    -0.06   0.953    -1.53316    1.452723
        INF |   6.923655   2.044714     3.39   0.008     2.298189    11.54912
       ETAR |  -.0036675   .0274773    -0.13   0.897    -.0658255    .0584905
        LLR |  -.0194566   .0174501    -1.11   0.294    -.0589313    .0200182
        LDR |  -.0052476   .0061131    -0.86   0.413    -.0190765    .0085813
       COSR |  -.0507204   .0088962    -5.70   0.000    -.0708449   -.0305959
```

```
       NLTA |   .0053742    .008307     0.65   0.534    -.0134175    .0241659
      _cons |   4.698991   .7221848     6.51   0.000     3.065295    6.332686
-------------+----------------------------------------------------------------
    sigma_u |  .28808013
    sigma_e |  .09004731
        rho |  .91099193   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. estimates store fixed3

. xtreg LNROE GDPGROWTH INF ETAR LLR LDR COSR NLTA, re vce(robust)

Random-effects GLS regression                   Number of obs      =        39
Group variable: Code                            Number of groups   =        10

R-sq:  within  = 0.7414                         Obs per group: min =         3
       between = 0.6904                                        avg =       3.9
       overall = 0.6875                                        max =         4

                                                Wald chi2(7)       =   1358.45
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000

                               (Std. Err. adjusted for 10 clusters in Code)
------------------------------------------------------------------------------
             |               Robust
       LNROE |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  GDPGROWTH |  -.3825468    1.04856    -0.36   0.715    -2.437687    1.672593
         INF |   7.040389   3.163778     2.23   0.026      .839498    13.24128
        ETAR |  -.0189249   .0261092    -0.72   0.469    -.0700979    .0322482
         LLR |    -.00496   .0154879    -0.32   0.749    -.0353157    .0253958
         LDR |  -.0140699   .0027194    -5.17   0.000    -.0193997   -.0087401
        COSR |  -.0297495   .0039272    -7.58   0.000    -.0374466   -.0220524
        NLTA |   .0169999   .0056798     2.99   0.003     .0058676    .0281322
       _cons |   3.940471   .4573941     8.62   0.000     3.043995    4.836946
-------------+----------------------------------------------------------------
    sigma_u |  .09285778
    sigma_e |  .09004731
        rho |  .51536213   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. estimates store random

. hausman fixed3
hausman cannot be used with vce(robust), vce(cluster cvar), or p-weighted data
r(198);
```

```
. xtreg LNROE GDPGROWTH INF ETAR LLR LDR COSR NLTA, re

Random-effects GLS regression                   Number of obs      =        39
Group variable: Code                            Number of groups   =        10

R-sq:  within  = 0.7414                         Obs per group: min =         3
       between = 0.6904                                        avg =       3.9
       overall = 0.6875                                        max =         4

                                                Wald chi2(7)       =     74.85
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000

------------------------------------------------------------------------------
       LNROE |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  GDPGROWTH |  -.3825468   1.374371    -0.28   0.781    -3.076265    2.311171
         INF |   7.040389   1.987447     3.54   0.000     3.145064    10.93571
        ETAR |  -.0189249   .0301275    -0.63   0.530    -.0779738     .040124
         LLR |   -.00496   .0196591    -0.25   0.801    -.043491    .0335711
         LDR |  -.0140699   .0036972    -3.81   0.000    -.0213162   -.0068236
        COSR |  -.0297495   .0051453    -5.78   0.000    -.0398341   -.0196649
        NLTA |   .0169999   .0067834     2.51   0.012     .0037046    .0302952
       _cons |   3.940471   .4825155     8.17   0.000     2.994758    4.886184
-------------+----------------------------------------------------------------
     sigma_u |  .09285778
     sigma_e |  .09004731
         rho |  .51536213   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. xtreg LNROE GDPGROWTH INF ETAR LLR LDR COSR NLTA, re

Random-effects GLS regression                   Number of obs      =        39
Group variable: Code                            Number of groups   =        10

R-sq:  within  = 0.7414                         Obs per group: min =         3
       between = 0.6904                                        avg =       3.9
       overall = 0.6875                                        max =         4

                                                Wald chi2(7)       =     74.85
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000

------------------------------------------------------------------------------
       LNROE |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  GDPGROWTH |  -.3825468   1.374371    -0.28   0.781    -3.076265    2.311171
```

```
         INF |   7.040389   1.987447     3.54   0.000     3.145064    10.93571
        ETAR |  -.0189249   .0301275    -0.63   0.530    -.0779738     .040124
         LLR |    -.00496   .0196591    -0.25   0.801     -.043491    .0335711
         LDR |  -.0140699   .0036972    -3.81   0.000    -.0213162   -.0068236
        COSR |  -.0297495   .0051453    -5.78   0.000    -.0398341   -.0196649
        NLTA |   .0169999   .0067834     2.51   0.012     .0037046    .0302952
       _cons |   3.940471   .4825155     8.17   0.000     2.994758    4.886184
-------------+----------------------------------------------------------------
     sigma_u |  .09285778
     sigma_e |  .09004731
         rho |  .51536213   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

. xtreg LNROE GDPGROWTH INF ETAR LLR LDR COSR NLTA, fe

```
Fixed-effects (within) regression               Number of obs      =        39
Group variable: Code                            Number of groups   =        10

R-sq:  within  = 0.8025                         Obs per group: min =         3
       between = 0.4718                                        avg =       3.9
       overall = 0.4970                                        max =         4

                                                F(7,22)           =     12.77
corr(u_i, Xb)  = -0.7377                        Prob > F          =    0.0000

------------------------------------------------------------------------------
       LNROE |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  GDPGROWTH |  -.0402185   1.131938    -0.04   0.972    -2.387714    2.307277
         INF |   6.923655   1.691319     4.09   0.000     3.416075    10.43123
        ETAR |  -.0036675   .0353207    -0.10   0.918    -.0769182    .0695832
         LLR |  -.0194566   .0207226    -0.94   0.358    -.0624326    .0235195
         LDR |  -.0052476   .0060429    -0.87   0.395    -.0177798    .0072847
        COSR |  -.0507204   .0084345    -6.01   0.000    -.0682125   -.0332283
        NLTA |   .0053742    .009551     0.56   0.579    -.0144333    .0251818
       _cons |   4.698991   .6498691     7.23   0.000     3.351245    6.046737
-------------+----------------------------------------------------------------
     sigma_u |  .28808013
     sigma_e |  .09004731
         rho |  .91099193   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(9, 22) =      8.92                 Prob > F = 0.0000
```

. estimates store fixed4

. xtreg LNROE GDPGROWTH INF ETAR LLR LDR COSR NLTA, re

```
Random-effects GLS regression                   Number of obs      =        39
Group variable: Code                            Number of groups   =        10

R-sq:  within  = 0.7414                         Obs per group: min =         3
       between = 0.6904                                        avg =       3.9
       overall = 0.6875                                        max =         4

                                                Wald chi2(7)       =     74.85
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000

------------------------------------------------------------------------------
       LNROE |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  GDPGROWTH |  -.3825468   1.374371    -0.28   0.781    -3.076265    2.311171
         INF |   7.040389   1.987447     3.54   0.000     3.145064    10.93571
        ETAR |  -.0189249   .0301275    -0.63   0.530    -.0779738     .040124
         LLR |    -.00496   .0196591    -0.25   0.801    -.043491    .0335711
         LDR |  -.0140699   .0036972    -3.81   0.000    -.0213162   -.0068236
        COSR |  -.0297495   .0051453    -5.78   0.000    -.0398341   -.0196649
        NLTA |   .0169999   .0067834     2.51   0.012     .0037046    .0302952
       _cons |   3.940471   .4825155     8.17   0.000     2.994758    4.886184
-------------+----------------------------------------------------------------
     sigma_u |  .09285778
     sigma_e |  .09004731
         rho |  .51536213   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. estimates store random4

. hausman fixed4

                 ---- Coefficients ----
          |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
          |     fixed4       random4       Difference          S.E.
-------------+----------------------------------------------------------------
  GDPGROWTH |   -.0402185    -.3825468        .3423284            .
         INF |    6.923655     7.040389       -.1167341            .
        ETAR |   -.0036675    -.0189249        .0152574        .0184359
         LLR |   -.0194566      -.00496       -.0144966        .0065534
         LDR |   -.0052476    -.0140699        .0088223        .0047799
        COSR |   -.0507204    -.0297495       -.0209709        .0066833
        NLTA |    .0053742     .0169999       -.0116257        .0067236
------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg
```

Test: Ho: difference in coefficients not systematic

chi2(7) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 31.87
Prob>chi2 = 0.0000
(V_b-V_B is not positive definite)

. save "C:\Users\mai\Desktop\stata example.dta"
file C:\Users\mai\Desktop\stata example.dta saved

. use "C:\Users\mai\Desktop\stata example.dta", clear

2. ROA STATA

___ ____ ____ ____ ____ (R)
/__ / ____/ / ____/
___/ / /___/ / /___/ 13.0 Copyright 1985-2013 StataCorp LP
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4905 Lakeway Drive
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```
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Notes:
     1.  (/v# option or -set maxvar-) 5000 maximum variables

Checking for updates...
(contacting http://www.stata.com)
bad serial number
unable to check for update; verify Internet settings are correct.

. import excel "C:\Users\mai\Desktop\Dependent & Independent 2.xlsx", sheet("Summary")
firstrow

. regress ROA ETAR LLR LDR COSR NLTA GDPGROWTH INF

      Source |       SS       df       MS              Number of obs =      40
-------------+------------------------------           F(  7,    32) =   13.96
       Model |   34.752001     7  4.96457158           Prob > F      =  0.0000
    Residual |  11.3784814    32  .355577545           R-squared     =  0.7533
-------------+------------------------------           Adj R-squared =  0.6994
       Total |  46.1304825    39  1.18283288           Root MSE      =   .5963

------------------------------------------------------------------------------
         ROA |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        ETAR |    .014691   .1078076     0.14   0.892    -.2049058    .2342878
         LLR |   .0408538   .0794069     0.51   0.610    -.1208928    .2026003
         LDR |  -.0239691    .011828    -2.03   0.051    -.0480619    .0001238
        COSR |  -.0829988   .0121432    -6.84   0.000    -.1077337    -.058264
        NLTA |   .0506014   .0213632     2.37   0.024     .0070859    .0941169
  GDPGROWTH |  -.2325698   7.289942    -0.03   0.975     -15.0817    14.61656
         INF |   9.625549   10.30886     0.93   0.357    -11.37292    30.62402
       _cons |   2.523622   1.545064     1.63   0.112    -.6235712    5.670815
------------------------------------------------------------------------------

. predict r, residuals

. swilk r

                  Shapiro-Wilk W test for normal data

    Variable |    Obs       W          V        z       Prob>z
-------------+-------------------------------------------------
```

```
        r |    40    0.87698      4.863     3.328    0.00044

. generate LNROA=ln(ROA)
(1 missing value generated)

. regress LNROA ETAR LLR LDR COSR NLTA GDPGROWTH INF

      Source |       SS       df       MS              Number of obs =      39
-------------+------------------------------           F(  7,    31) =   19.20
       Model |  3.86181067     7  .551687239            Prob > F      =  0.0000
    Residual |   .89082297    31  .028736225            R-squared     =  0.8126
-------------+------------------------------           Adj R-squared =  0.7702
       Total |  4.75263364    38  .125069306            Root MSE      =  .16952

------------------------------------------------------------------------------
      LNROA |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       ETAR |   .0400256     .03087     1.30   0.204    -.0229341    .1029853
        LLR |   .0107683   .0226789     0.47   0.638    -.0354857    .0570222
        LDR |  -.0155135   .0033638    -4.61   0.000    -.0223741   -.0086529
       COSR |  -.0256604    .004282    -5.99   0.000    -.0343935   -.0169273
       NLTA |   .0154268   .0061972     2.49   0.018     .0027876     .028066
  GDPGROWTH |  -1.115571   2.072393    -0.54   0.594    -5.342245    3.111102
        INF |   6.541543   2.935115     2.23   0.033     .5553369    12.52775
      _cons |    .951518   .4398109     2.16   0.038     .0545178    1.848518
------------------------------------------------------------------------------

. predict r2, residuals
(1 missing value generated)

. swilk r2

                  Shapiro-Wilk W test for normal data

    Variable |    Obs       W          V         z       Prob>z
-------------+--------------------------------------------------
          r2 |     39    0.93157      2.653     2.050    0.02019

. ovtest

Ramsey RESET test using powers of the fitted values of LNROA
      Ho:  model has no omitted variables
                  F(3, 28) =      0.42
                  Prob > F =      0.7406

. estat hettest
```

```
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of LNROA

         chi2(1)      =     1.14
         Prob > chi2  =   0.2848

. vif

    Variable |       VIF       1/VIF
-------------+----------------------
        ETAR |      5.97    0.167395
         LLR |      5.03    0.198613
         LDR |      2.19    0.456200
        NLTA |      2.06    0.485641
        COSR |      1.52    0.656705
  GDPGROWTH |      1.46    0.682731
         INF |      1.18    0.846653
-------------+----------------------
    Mean VIF |      2.78

. xtset Code Year
       panel variable:  Code (strongly balanced)
        time variable:  Year, 2012 to 2015
                delta:  1 unit

.
. xtserial ETAR LLR LDR COSR NLTA GDPGROWTH INF

Wooldridge test for autocorrelation in panel data
H0: no first order autocorrelation
    F(  1,       9) =      3.139
           Prob > F =      0.1102

. xtreg LNROA ETAR LLR LDR COSR NLTA GDPGROWTH INF, fe

Fixed-effects (within) regression               Number of obs      =        39
Group variable: Code                            Number of groups   =        10

R-sq:  within  = 0.8399                         Obs per group: min =         3
       between = 0.6768                                        avg =       3.9
       overall = 0.6628                                        max =         4

                                                F(7,22)           =     16.49
corr(u_i, Xb)  = -0.7217                        Prob > F          =    0.0000
```

```
------------------------------------------------------------------------------
      LNROA |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
------------+-----------------------------------------------------------------
       ETAR |   .0746631   .0369133     2.02   0.055    -.0018904    .1512167
        LLR |  -.0200619    .021657    -0.93   0.364    -.0649757    .0248519
        LDR |   -.004389   .0063154    -0.69   0.494    -.0174863    .0087083
       COSR |  -.0513015   .0088148    -5.82   0.000    -.0695823   -.0330206
       NLTA |    .004716   .0099816     0.47   0.641    -.0159847    .0254166
  GDPGROWTH |  -.2509774   1.182977    -0.21   0.834    -2.704322    2.202367
        INF |   6.694665    1.76758     3.79   0.001     3.028927     10.3604
      _cons |    1.63805   .6791717     2.41   0.025     .2295337    3.046566
------------+-----------------------------------------------------------------
    sigma_u |  .29383164
    sigma_e |  .09410755
        rho |  .90696577   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(9, 22) =     8.73                 Prob > F = 0.0000

. estimate store fixed

. xtreg LNROA ETAR LLR LDR COSR NLTA GDPGROWTH INF, re

Random-effects GLS regression                   Number of obs      =        39
Group variable: Code                            Number of groups   =        10

R-sq:  within  = 0.7950                         Obs per group: min =         3
       between = 0.8241                                        avg =       3.9
       overall = 0.7996                                        max =         4

                                                Wald chi2(7)       =    117.43
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000

------------------------------------------------------------------------------
      LNROA |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
------------+-----------------------------------------------------------------
       ETAR |   .0547806   .0310099     1.77   0.077    -.0059978    .1155589
        LLR |  -.0024504   .0203963    -0.12   0.904    -.0424263    .0375256
        LDR |  -.0137244    .003766    -3.64   0.000    -.0211056   -.0063432
       COSR |  -.0298502   .0052302    -5.71   0.000    -.0401011   -.0195993
       NLTA |   .0176801    .006948     2.54   0.011     .0040623    .0312979
  GDPGROWTH |  -.6225358   1.444856    -0.43   0.667    -3.454401    2.209329
        INF |    6.77102   2.086456     3.25   0.001     2.681642     10.8604
      _cons |   .8327126   .4933048     1.69   0.091    -.1341471    1.799572
------------+-----------------------------------------------------------------
    sigma_u |  .09091106
```

```
    sigma_e |  .09410755
        rho |  .48272854   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. estimate store random

. hausman fixed

                 ---- Coefficients ----
           |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
           |     fixed        random       Difference          S.E.
-------------+----------------------------------------------------------------
        ETAR |    .0746631     .0547806        .0198826        .0200244
         LLR |   -.0200619    -.0024504       -.0176115        .0072813
         LDR |    -.004389    -.0137244        .0093354        .0050696
        COSR |   -.0513015    -.0298502       -.0214513        .0070955
        NLTA |     .004716     .0176801       -.0129641        .0071665
  GDPGROWTH |   -.2509774    -.6225358        .3715584              .
         INF |    6.694665      6.77102       -.0763549              .
------------------------------------------------------------------------------
                      b = consistent under Ho and Ha; obtained from xtreg
           B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(7) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =       19.96
                Prob>chi2 =      0.0057
                (V_b-V_B is not positive definite)
```

Banks and Excel calculation

		ROA- Return on Assets- To measu Profitability	ROE- Return Equity- To measure Profitability	ETAR- Equity Assets- To measure Capit Adequacy	LLR- Loan Loss Reserves/ Gross Loans- To measu Asset Quality	LDR- Loans to Deposits- To measur Management Quali	COSR- Cost to Income Ratio- T measure Earning Quality	NLTA- Net Loa to Total Asset To measure Liquidity	GDP- Gross Dome Product Growth Ra Macroeconomic Fa	INF- Annual Inflation Rate- Macroeconom Factor
Conventional Banks in GCC	**YEARS**									
Emirates NBD	2012	0.83	6.99	11.84	15.62	101.98	36.75	70.76	5.10%	0.64%
	2013	0.95	7.80	12.20	16.30	99.47	35.38	69.68	5.79%	1.10%
	2014	1.42	10.99	12.88	17.90	95.24	30.39	67.76	3.28%	2.35%
	2015	1.75	14.04	12.48	17.61	94.20	30.99	66.55	3.83%	4.10%
National Bank of Abu Dhabi	2012	1.44	13.92	10.36	15.55	86.49	33.08	54.76	5.10%	0.64%
	2013	1.46	13.68	10.67	14.61	87.07	34.37	56.55	5.79%	1.10%
	2014	1.48	14.70	10.09	13.70	79.89	35.49	51.66	3.28%	2.35%
	2015	1.29	12.11	10.63	15.33	88.07	38.68	50.65	3.83%	4.10%
Samba Financial Group	2012	2.20	13.65	16.11	20.45	69.00	30.82	52.08	5.41%	2.89%
	2013	2.20	12.91	17.04	20.10	81.99	30.53	63.31	2.70%	3.51%
	2014	2.30	12.88	17.90	20.63	75.75	30.24	57.07	3.65%	2.67%
	2015	2.22	12.92	17.16	20.23	66.20	30.97	48.23	4.11%	2.18%
National Bank of Kuwait	2012	1.87	11.80	15.86	22.87	103.71	28.27	59.79	6.63%	3.20%
	2013	1.35	9.27	14.58	20.79	102.07	33.06	57.50	1.15%	2.70%
	2014	1.26	9.53	13.18	19.93	105.76	32.54	54.67	0.50%	2.91%
	2015	1.26	9.29	13.52	19.53	112.37	32.21	57.43	1.85%	3.27%
Ahli United Bank	2012	1.26	11.95	10.58	14.97	85.10	31.48	53.47	3.73%	2.75%
	2013	1.91	17.51	10.92	15.61	78.56	30.02	53.00	5.42%	3.31%
	2014	1.59	13.87	11.45	15.80	80.26	29.69	55.21	4.35%	2.65%
	2015	1.67	12.99	12.84	17.67	82.37	28.33	56.98	2.86%	1.84%
Islamic Banks in GCC										
Dubai Islamic Bank	2012	1.23	10.37	11.86	17.13	82.70	41.76	55.96	5.10%	0.64%
	2013	1.52	10.51	14.43	23.43	70.92	39.88	49.49	5.79%	1.10%
	2014	2.26	15.84	14.29	19.22	80.11	35.11	59.71	3.28%	2.35%
	2015	2.56	16.84	15.21	19.14	88.40	34.27	64.86	3.83%	4.10%
Abu Dhabi Islamic Bank	2012	1.40	9.49	14.70	22.82	83.48	43.81	59.47	5.10%	0.64%
	2013	1.41	11.09	12.67	19.25	81.76	43.26	59.86	5.79%	1.10%
	2014	1.56	12.79	12.23	17.23	86.12	45.18	65.24	3.28%	2.35%
	2015	1.63	12.83	12.73	17.30	82.59	46.24	66.23	3.83%	4.10%
Al-Rajhi Bank	2012	2.95	21.62	13.64	17.16	77.66	27.03	64.30	5.41%	2.89%
	2013	2.66	19.32	13.76	17.01	80.67	29.31	66.75	2.70%	3.51%
	2014	2.22	16.32	13.62	13.62	80.42	33.06	66.93	3.65%	2.67%
	2015	2.26	15.29	14.78	18.65	82.04	33.89	66.60	4.11%	2.18%
Kuwait Finance House	2012	0.84	7.52	11.15	15.26	101.06	50.17	64.56	6.63%	3.20%
	2013	0.98	7.63	12.78	17.18	99.25	46.03	65.59	1.15%	2.70%
	2014	0.93	7.63	12.20	16.57	104.23	51.26	66.01	0.50%	2.91%
	2015	1.15	9.23	12.44	16.27	104.45	47.81	68.50	1.85%	3.27%
Bahrain Islamic Bank	2012	-4.35	-51.86	8.38	12.95	64.87	80.00	51.47	3.73%	2.75%
	2013	0.67	7.80	8.58	13.97	59.77	55.36	49.67	5.42%	3.31%
	2014	1.06	11.75	9.04	12.21	74.49	50.31	59.92	4.35%	2.65%
	2015	1.15	10.21	11.22	13.97	80.53	51.84	62.42	2.86%	1.84%