NEAR EAST UNIVERSITY
INSTITUTE OF GRADUATE STUDIES
GRADUATE SCHOOL OF SOCIAL SCIENCES
BANKING AND FINANCE PROGRAM

THE IMPACT OF MONETARY POLICY ON PROFITABILITY OF BANKING INDUSTRY IN IRAQ

HOSHMAND QADER MOHAMMAD

MASTER'S THESIS

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Approval

We certify that we have read the thesis submitted by Hoshmand Qader Mohammed entitled «THE IMPACT OF MONETARY POLICY ON PROFITABILITY OF BANKING INDUSTRY IRAQ" and that in our combined opinion it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Business Administration.

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ABSTRACT

THE IMPACT OF MONETARY POLICY ON PROFITABILITY OF BANKING INDUSTRY IN IRAQ

Monetary policy is considered as a set of measurements put in place to economically adjust the supply, cost, and value of money. The association between profitability of bank and monetary policy has constantly attracted the attention of the researcher. Monetary polciy is the authority of Central Bank to intervine the economy and finance particularly through the regulations to banks to control mony supply and this can effect the profitability of banking sector and then the economy in general.

The purpose of this study is to investigate the performance of the Iraqi banking sector and the effect of monetary policy in the performance the sector in that developing country. In order to understand that potential impact, this study follows a quantitative research design. Annual data is used in the study that will be collected for the period 2009-2020. Data collected from various sources online. Pooled OLS, RE and FE models are used to examine the impact of monetary policy on bank profitability.

The monetary variables used here are cash reserve rate, change in discount rate, open market operations and inflation rate. Bank profitabity is measured using accounting data; return on assets and return on equity. The study controls for some bank-specific characteristics in the regression models. The results of data analysis show that monetary policy positively affects bank profitability with with different size of effect for the different measurements.

Based on the results, it is recommended that the Central Bank should try to implement economic policy, especially monetary policy, in Iraqi commercial banks to further control the profitability of banks and in turn simulate the overall finance and economy of the country. As for future study, the impact of monetary policy in cross-country sample can be considered with taking into account the possible impacts of other intervining variables such as corporate governance and sustainable development.

Keywords: bank profitability, monetary policy, change in discount rate, cash reserve rate, open market operations, and inflation rate.

ÖZ

THE IMPACT OF MONETARY POLİCY ON PROFİTABİLİTY OF BANKİNG INDUSTRY İN IRAQ

Para politikası, paranın maliyetini, arzını ve değerini ekonomik olarak ayarlamak için uygulanan bir dizi ölçüm olarak ifade edilebilir. Banka karlılığı ile para politikası arasındaki ilişki, sürekli olarak araştırmacıların ilgisini çekmiştir. Para politikası, Merkez Bankası'nın özellikle bankalara para arzını kontrol etmeye yönelik düzenlemeler yoluyla ekonomiyi ve finansmanı birbirine bağlama yetkisidir ve bu durum bankacılık sektörünün ve ardından genel olarak ekonominin karlılığını etkileyebilir.

Bu çalışmanın amacı, gelişmekte olan ülkede Irak bankacılık sektörünün performansını ve para politikasının sektörün performansına etkisini araştırmaktır. Bu potansiyel etkiyi anlamak için, bu çalışma nicel bir araştırma tasarımı izlemektedir. Irak bankacılık sektörlerinden 2009-2020 yıllarında toplanacak yıllık verileri kullanacağız. Çeşitli kaynaklardan toplanan veriler. Havuzlanmış OLS, RE ve FE modelleri, para politikasının banka karlılığı üzerindeki etkisini incelemek için kullanılır.

Burada kullanılan parasal değişkenler nakit rezerv oranı, iskonto oranındaki değişim, açık piyasa işlemleri ve enflasyon oranıdır. Banka karlılığı muhasebe verileri kullanılarak ölçülür; aktif karlılığı ve özkaynak karlılığı. Çalışma, regresyon modellerinde bankaya özgü bazı özellikleri kontrol etmektedir. Veri analizi sonuçları, para politikasının farklı ölçümler için farklı etki büyüklükleri ile banka karlılığını olumlu yönde etkilediğini göstermektedir.

Sonuçlara dayanarak, Merkez Bankası'nın bankaların karlılığını daha fazla kontrol etmek ve dolayısıyla ülkenin genel finans ve ekonomisini simüle etmek için Irak ticari bankalarında ekonomi politikası, özellikle para politikası uygulamaya çalışması tavsiye edilmektedir. Gelecekteki çalışmalarda ise, para politikasının ülkelerarası örneklemdeki etkisi, kurumsal yönetim ve sürdürülebilir kalkınma gibi birbiriyle ilişkili diğer değişkenlerin olası etkileri dikkate alınarak değerlendirilebilir.

Anahtar Kelimeler: banka karlılığı, para politikası, iskonto oranındaki değişim, nakit rezerv oranı, açık piyasa işlemleri ve enflasyon oranı.

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ABBREVATIONS

CBI	Central Bank of Iraq
GDP	**Gross Domestic Product**
CIB	**Commercial international bank**
TBI	**Trade bank iraq**
ISX	**Iraq stock exchange**

INTRODUCTION

Monetary policy is considered as an initial fragment of macroeconomic policy. Basically, it plays an active and vital role in the regulation of money supply and the control of credit and liquidity. It is through this initial effect that embodied by the Central Bank of the country as the highest monetary authority could attain explicit important objectives according to priorities determined by the issues that the economy suffers from. Occasionally, the monetary authorities depend on intermediate objectives, for example interest rate and money supply, in order to reach the goal of regulate inflation and price stability. This is one of the most important and prominent goals that whole economies of the world seek, considering the negative impacts from inflation upon the economy and economic growth.

Monetary policy is defined as the procedure of which money supply could be regulated by the monetary authority in the country to target interest rate aiming to boost economic stability and growth. The core goal behind monetary supply of every possible country should include low unemployment rate and stable prices. Interest rate modification has been mentioned in the literature to possess an initial effect on investment decision makers and consequently will have influence on the overall economy. Thus, mandatory policy is mostly affected by the element of traditional interest rate. Countries adopt various policies in order to achieve their core economic objectives. Conceivably, central bank is the most distinguished party to help in accomplishment of the targeted milestones, through the projected and applied monetary policy, which aims to preserve healthy level of economic indicators. Inflation is one of the common indicators in which it leads to a reduction in the currency’s purchasing power. Consequently, citizens are heavily burdened, if the descending pressure that effects consumer spending is not mentioned, which is one of the economy locomotives.

In the case of Iraq, the challenge faced by the Iraqi's monetary authorities after 2003 is hyperinflation and rather uncontrolled. Therefore, it must be controlled through drawing monetary policies independent of political decision. Moreover, the necessity for the monetary authorities to possess freedom and flexibility in using their numerous tools to compete hyperinflation. After 2003, the Central Bank of Iraq implemented different mechanisms and tools compare to the previous period. There are several reasons behind these differences in mechanisms. The first reason is the independence that attained by the Central Bank under the Law No. 56 published in 2003. The second factor is the access to resources of foreign exchange by Iraq government (mainly from the export of oil) after these sources of revenue had dramatically declined since the 1990s due to the obstruction conditions. Finally, another reason is the unification of the categories of the Iraqi Dinar after the issuance of the new currency with global stipulations, and to practice the new currency across the country from south to north in a uniform manner. Therefore, these reasons partially helped in shaping the novel monetary policy to start the pace in achieving the targeted objectives.

Restoring stability to the money market has been considered the main entry point for controlling inflation rates. As it provides opportunities for stability of the money demand function and a decrease in the speed of money circulation. The promise of the Iraqi dinar, the main cash located, is more attractive to carry out the functions of cash, and that this approach is no less important than the means of controlling the levels of cash liquidity according to the available monetary tools. As the persistence of the phenomenon of individuals hedging in foreign currency and considering it a stable store of value and a means to protect their wealth or to avoid thousands of transactions, all factors impose the characteristic of instability on the demand function on the dinar. As this demand became subject to the balance of the portfolio between the various returns on assets held, which express the individual behavior.

This means that interest rate differentials, inflationary expectations, and expectations about changes in the exchange rate of Iraqi Dinar against the US dollar are all towards the phenomenon of (dollarization) and generate a trade-off between keeping the dinar or the dollar. Therefore, the volatility of monetary demand and the widening of the state of instability in it has become important in generating the phenomenon of inflationary expectations and exacerbating them, which means the continued weakness of stability in that monetary demand, which increases the pressure of the surplus monetary mass on the rise in the general level of prices. This was negatively reflected in an increasing (dollarization) form or a surplus commodity demand that was not appropriate for the movement of economic growth.

Previous studies in the literature identified various problems of banking which are vital in the transition of monetary policy. These problems might be defined as factors damaging the sector of bank in different ways. Stein (2000) argued that large-sized banks which potentially have substantial liquid assets are more likely accomplish economic growth particularly when the monetary policy is tough. Kishan and Opiela (2000) claim that banks with high ratio of equity can assign resources from worldwide actions. Monetary policy depends upon the relationships between the interest rates in a country which are money borrowed and total money supply. Several tools can be employed in monetary policy to regulator, to influence consequences such as the rates of growth, inflation, exchange and unemployment.

Changes in interest rate would have impact on the revenue and thus the performance of the financial institutions including banks. It is vital to investigate the association between monetary policy and bank's profitability in developing economies. There is a vast literature investigated the determinants of bank profitability in which some of them focused on the potential effect of monetary policy (Altavilla et al., 2018; Borio et al., 2017; Kumar et al., 2020). The association between monetary policy and bank's profitability has continuously gained the interest of scholars in the field. This issue has been investigated in numerous studies in which the relationship between the structure of interest rate and bank profitability is showed,

generally followed the model of Demirgüç-Kunt and Huizinga (1999). Nevertheless, to the best of our knowledge, there is limited literature investigating the impact of monetary policy on profitability of banks operating in Iraq.

Problem Statement

Over the last two decades, Iraq economy went through numerous ups and downs and several key modifications took place aiming to align with the changes and to better catch the objectives of the country. The country's political situation shifted in 2003 and several changes took place afterwards. Iraq is more dependent on natural resources as main revenue generator for the country. This significantly affected the stability of the overall economy. Many foreign companies are currently working in the country mainly in the sector of oil and gas and in other sectors such as construction. As a result, the condition of investment in the country has changed dramatically and this had impact on the sector of banking and developed regarding the number of banks, size of capitalization and their offered services. Thus, stakeholders are enlarged in number and kinds which care about the performance of this sector. The monetary policy is believed to possess vital marginal effect on the profitability of the banking sector.

The study problem focuses on understanding the nature of the role that the central bank can play - through its traditional quantitative monetary policy - on the performance of banks in developing countries, particularly Iraq. This study raises the following questions:

- What are the major modifications in the monetary policy of Iraq?
- What is the development pace of banking sector in Iraq?
- What is the size and direction of the impact of the Iraq Central Bank policy on the profitability of banks?

Research Significance

This study has potential to make valuable contributions to the growing literature on the connection between monetary policy and profitability of

banking sector in third ways. First, to our best of knowledge this is the first study that examine the effect of monetary policy on the profitability of banks in Iraq using a panel dataset of 10 banks for a time span of 12 years; 2009–2020. Banking sector with high profitability ratio is crucial for economic growth. Additionally, modifications in interest rates are more likely to drive profitability of banks. It is suggested in the literature that low interest rates decrease banks profit margins, which in turn creates pressure on their investments. Second, it is argued that profitability of bank is persistent. This study performs adequate and efficient data analysis method, such as fixed and random effect model, to account for the persistence of profitability indicators of banks, and to control for endogeneity issue which can arise because of omitted variables and the existence of causality between explanatory and dependent variables. Finally, this study has ability to inform policy makers concerning the impact of monetary policy upon profitability of banks and help them in making significant decisions with regard to modifications in monetary policy instruments.

Research Purposes

The purpose of the current study is to examine the effectiveness of the banking system in Iraq and the role that monetary policy can have in shaping the profitability of banking sector in the country. Furthermore, another purpose of the study is to provide valuable insight regarding the economic, monetary policy modifications in Iraq over the last several years. It also aims to capture the marginal impact of some other explanatory variables as determinants of banks profitability among others. Matters such as increase in interest rate would result rise in inflation rates and bank's loan rates which in turn make it worth investigating the impact of monetary policy on bank profitability. Thus, it is vital to conduct research investigating bank performance in developing countries with unstable economy and shifted monetary policy.

In this study, the mechanisms and outcomes accomplished from the novel monetary policy in Iraq will be investigated. Whereas, the issue of evaluating the failures and successes that accompanied the implementation of the current monetary policy for the period of post-2003 is very sensitive and

complex, in addition to the period of slowdown that accompanies the application of monetary policy to accept the outcomes. Generally, this study provides insight concerning the evaluation of the performance and efficiency of the new monetary policy. It burdens the means of the hard-economic situations that Iraq went through previously, the accumulated decisions about economic and monetary issues and the matters of the Iraqi economy in the various sectors.

Research Hypotheses

According to the past literature and based on the theories, we set a number of hypothses. The purpose here is to hypothesis the relationship between monetary policy and the profitability of banking sector in Iraq. In doing so, it is possible to perform tests whether the changes in monetary policy of a country have potentials on the profitability of banking industry. The hypothese of this study is set as follows:

Monetary policy has a statistically significant effect on the profitability ratios of banking sector in Iraq over the period 2009-2020.

This main hypothesis can be written as the following sub-hypotheses to be tested later.

H1.1: Change in discount rate has influence on the ROA of banks in Iraq

H1.2: Change in discount rate has influence on the ROE of banks in Iraq

H2.1: Cash reserve ratio has a significant impact on the ROA of banks

H2.2: Cash reserve ratio has a significant impact on the ROE of banks

H3.1: Open market operations has a significant impact on ROA ratio

H3.2: Open market operations has a significant impact on ROE ratio

H4.1: Inflation rate has a significant impact on the ROA of Iraqi banks

H4.2: Inflation rate has a significant impact on the ROE of Iraqi banks

To achieve these objectives, the reminder of this study is divided into four main chapters. Chapter one will critically review the literature around the association between monetary policy and profitability of banking sector and so provides detailed theoretical background on that. Chapter two is the methodology in with it describes the population, sample, data collection and methods will be applied in the later chapter. Chapter three analyses the research data and interprets the results on subjectively; descriptive statistics, correlation coefficient, different types of regressions analysis and robustness checks are performed. In chapter four, the results would be discussed, and the conclusion will be provided along with possible implications and recommendations.

CHAPTER 1
LITERATURE REVIEW

This chapter is literature review. It presents general theoretical background on the main variables of the study; monetary policy and bank profitability. The major concentration is on the case of developing countries particularly Iraq which has its form of monetary policy and banking system. Then, most related and contemporary studies from the literature would be reviewed in order to identify the potential literature gap. Furthermore, it presents and discuss the grounded theories that explain the relationship between monetary policy and profitability of banking sector.

1.1. Monetary policy

As the ultimate aims of economic policy, monetary policy plays a significant part in the growth of the economy; in order to establish monetary stability in the country, as well as battle inflation and economic stagnation. Given the importance of these goals, the Central Bank, whose monetary policy is a tool for achieving them, must be owned by the government, so that government intervention in economic activity - through the formulation of monetary, financial, and development policies - contributes to the achievement of these goals. The government controls these banks in nations where they are not completely owned by the government.

1.1.1. Conceptual framework of monetary policy

The term monetary policy appeared in economic literature during the nineteenth century and developed in the twentieth century. The role of monetary policy emerged after the occurrence of economic cycles and the resulting economic problems. As for the concept of monetary policy, it is the intervention of monetary authorities for manipulating the money supply and directing credit using certain monetary means, and the aim of that is to reach the application of some economic goals.

Countries adopt various policies in order to achieve their core economic objectives. Possibly, central bank is one of the key players to help reach the projected milestones in a country. This is achieved through the regulating tasks such as monetary policy. Such policy aims to preserve several economic indicators at their strongest conditions. Inflation is among these vital economic indicators which is basically defined as the continuous increase in the prices of goods and services. It is argued that if inflation is not controlled in a country, it will cause the purchasing power of the currency to decline dramatically. Consequently, citizens are highly burdened with difficult conditions, if the downward pressure is not mentioned that this circumstance leaves on consumer spending.

Monetary policy is defined as the actions of central banks to regulate and manage liquidity in the country, which might be shaped from cash, checks, credit, or mutual funds with the purpose of encouraging growth in the economy. Normally, the purpose of this policy is to control the money supply to attain the macroeconomic objectives in the country, such as regulating inflation, managing consumption and driving growth. This can be achieved through procedures such as the adjustment of interest rate. High interest rate will motivate investment via since savers prefer to deposit their savings in banks, whereas a low interest rate will force savers to seek investment alternatives. Consequently, this is the mean of liquidity management, and the tools of monetary policy include regulation of foreign exchange rates, selling and buying government bonds, and the determination of the size of required reserves.

Inflation rates have fallen sharply in several countries such as the United States, Japan and Europe, in which they have been affected by the recent global financial crisis and have stagnated economies. Consequently, the goal of central banks, which is yet in place until now in most of them, is to increase the rate of inflation, not to reduce it. Increasing inflation rate in this circumstance is aimed at promoting economic growth. Note that the declaration of the target warns about the impression of increase in prices and thus motivates spending at the present time.

1.1.2. Monetary Policy Objectives

The monetary policy is separated in two kinds of policies; expansionary and contractionary. As for the first policy, the central bank will resort to it to arouse the economy through the increase of the money supply and the reduction of interest rates in a way that enhances the aggregate demand that drives the GDP to increase. However, the second type of the policy aims to reduce inflation through the reduction of the money supply and the increase of the cost of borrowing, a step that may reduce gross domestic products or slow down economic growth.

Central banks and modern governments hardly print and distribute currency to stimulate the money supply. As an alternative, they rely on control mechanisms such as interbank lending and interest rates, for the most important reason being that historical involvements have confirmed the catastrophic unleashed of the printing procedure, as it led to increase inflation rate and occurrence of possible recession. Inflation is defined as the rate at which the prices of services and goods increase. With the increase in the interest rate, the borrowing cost will increase accompanied by the savings yield. Consequently, consumers will prefer to save income rather than spending it, and this is likely to limit loans, that can be spent in a number of ways that boost expenditure as well. In the short term, monetary policy influences inflation and demand for services and goods within the country. Moreover, it impacts the demand for employees who deliver these services and goods. This is because it is reflected in the financial circumstances of both companies and families (Yellen, 2017).

Normally, the central bank of the country intervenes to regulate the interest rate that banks charge other banks to acquire loans for short term. This rate of interest is approved to alternative short-term interest rates, which eventually influence the cost of borrowing for businesses and households. While central bank monitors the movement of inflation, they seek to indicies that eliminate the measures with high volatility such as the prices of food and energy. They take into account the modification in the cost of commodities

such as oil to be outside their authority and regulating the interest rate consistent with the modification in the prices of these indicators may have more disadvantage. Fluctuations in short-term interest rates potentially influence the long-term investments provided by the financial intermediaries, such as mortgage rates and corporate bond. Eventually, these impacts are burden to other assets, particularly exchange rate and stocks (Ferrari et al., 2018).

1.1.3. Credibility and effectiveness

Through the presented scenarios, central bank has become a key body in controlling the rates of unemployment, inflation and economic growth. The effectiveness and success of monetary policy pursued by central bank are measured. The implementation of monetary policy relies on the raw data gathered by the central bank from various sources. These data include acroeconomic indicies such as growth of private sector, inflation, GDP, concerns about groups and unions representing industries, geopolitical growth in international markets, outcomes of surveys of well-known institutions, and some data released by the government.

Monetary policy is believed to have a long-term impact on a country's economy. However, it will solely be effective to the extent of the authority’s credibility on which it is relied on, and the data utilised in the preparation of the policy. With regard to the contemporary healthy environment, the authority of monetary policy operates dependent from governmental and political pressures. Normally, monetary policy must operate in tandem with the fiscal policy implemented by a government. Nevertheless, this rarely occures in prictice and reality. The leaders of a government are normally elected according to their pledges to cut taxes which will encourage increase in spending, and this often makes fiscal policy expansionary.

To avoid exacerbating inflation in such circumstances, the central bank can be forced to pursue somewhat restrictive or contractionary monetary policy, as in the US. Ironically, in the United States, during the Great Recession, politicians became concerned about the national debt that exceeded 100% of

GDP. At that time, management was forced to pursue a contractionary fiscal policy. In order to offset the effects of this modification, the Central bank pumped massive amounts of money into the economy through quantitative easing.

1.1.4. Expansionary Monetary policy

This policy is a form of macroeconomic monetary policy which its purpose is to rise the monetary expansion rate to stimulate economic growth. Growth of domestic economy should be reinforced by increase in money supply. The infusion of money expands consumer spending, and increases capital investment by corporations and organisations. Expansionary monetary policy is usually taken by a central bank or alike regulatory authority.

In the case of expansionary monetary policy, the central bank uses its tools to encourage the economy. This normally indicates decreasing the base rate to expand the money supply. This could lead to lower mortgage rates, appreciating consumers and increasing businesses, thus hiring more workers who would consume more (Israel and Latsos, 2020). Moreover, expansionary monetary policy, which is also called monetary policy easing, is the attempt to utilise monetary policy to reduce or boost aggregate demand, employment and outputs. This usually includes cutting interest rates for official policy by the central bank. In addition, it may involve easing credit controls in some economies. Depreciation is a decline in the rate of exchange is also an expansionary monetary policy.

Expansionary monetary policy is initially carried out through open market operations, reserve requirements and interest rates. The expansionary monetary policy employs the instruments through a number of methods in which they can be summarised in few aspects. First is the reduction in short-term interest rates. This adjustmnet in interest rates is the main instrument in monetary policy for the central bank. Normally, banks are able to obtain short-term loans from the central bank to cover their deficit of liquidity. In exchange for loans, a short-term interest rate is charged by the central bank. This may indicate that the central bank can reduce the cost of borrowing for

commercial banks through decreasing short-term interest rates. After that, the bank, who borrowed with low interest rate, can lower the interest rates they charge on the loans provided to consumers. Thus, the money supply in the economy increases when the central bank minimize interest rates (Ahiabor, 2013).

Second aspect is the reduction of reserve requirements. Commercial banks are obligated to keep a minimum level of reservation with the central bank of the country operating in. The central bank may decrease the reserve requirement aiming to boost the money supply in the economy. In such a situation, commercial banks will have additional funds to lend to their customers (EngELhardt, 2012). Moreover, the third aspect is expanding open market operations which is also referred to as purchasing of securities. Moreover, central bank is possibly utilise open market operations with securities issued by government to influence the money supply in the country. Purchase of securities issued by government, for example government bonds, in large amounts from institutional investors results in injection of additional cash into the local economy (Israel and Latsos, 2020).

Expansionary Monetary Policy Effects

Under expansionary monetary policy, some fundamental changes can be brought into the economy. Bordo and Landon-Lane (2014) mention the most common effects of expansionary monetary policy. First is the stimulation of economic growth. This type of monetary policy is supposed to reduce the cost of borrowing. Consequently, consumers prefer to increase spending whereas companies are motivated to increase their investments as capital. Second effect of expansionary monetary policy is increased inflation. Inflation level is increased through the injection of additional money into the economy. It can be both beneficial and unhelpful to the economy. An extreme rise in the money supply can result is unsustainable inflation levels. Contrarily, exessive increase in the level of inflation can prevent the possibility of deflation, which may be more harmful than modest inflation levels. Devaluation is another effect of expansionary monetary policy. The greater the money supply, the lower the value of the currency of the local country.

Devaluation of currency is advantageous to the ability of a country to export since the products and services will be cheaper and attract foreign countries increasingly. Lastly, low unemployment rate is another affect of this kind of monetary policy. Stimulating capital investments provides extra jobs opportunities in the country. Hence, expansionary monetary policy can lower unemployment rate in general.

1.1.5. Contractionary Monetary Policy

Contractionary is a kind of monetary policy as opposed to expansionary monetary policy. The goal is to reduce the money supply in the economy. This will be achieved by increasing interest rates and normally dependent on aiming to correct the problems of inflationary to expand the business cycle. This form of monetary policy is usually supported by contractionary form of fiscal policy. It is a reduction in the amount of money circulating in the economy, with corresponding rises in interest rates, for the express purpose of curbing excessive expansion of the business cycle and tackling the inflation problem. Traditionally, monetary policy tends to result in the reduction of the amount of paper currency circulating in the country. In modern era of economy, monetary policy is implemented by regulating the process of money formation which is conducted through fractional reserve banks (Ahiabor, 2013).

Contractionary Monetary Policy Effects

The major tools that every monetary policy uses are open market operations, reserve requirements and short-term interest rates. Contractionary monetary policy uses several forms of these tools. Increasing the short-term interest rate, also called discount rate, is one of the effective and primary monetary policy tool of the central bank. Normally, commercial banks possibly obtain short-term loans from the central bank to meet the shortage of short-term liquidity. In exchange for loans, the central bank charges the borrowing bank a short-term interest rate. The central bank can raise the cost of short-term debt through the increase of the interest rate aiming to reduce the money supply. A rise in interest rates will also have impact on consumers and businesses in the country as commercial banks will increase interest rates,

and they are charging their customers fees (Nelson et al., 2018). Second tool is the rise of reserve requirements by commercial banks since they are obligated to maintain minimum reserves in the treasury of the bank and with the central bank as well. An increase in the reserve requirement will lead to a reduction of the money supply in the country. Another tool is the expantion of open market operations, which is also called selling securities. The central bank participates in open market operations though buying and selling securities issued by government. The money circulating in the economy can be reduced by the central bank through selling large proportion of state securities, such as government bonds, to investors (Mallick and Souza, 2012).

An economy have been broadly affected by contractionary monetary policy. Such common effects are presented by Gravelle and Hungerford (2011). Firs possible effect is low rate of inflation. The level of inflation is the key objective of the contractionary method of monetary policy. Lawmakers seek to decrease inflation and obtain stable prices in the economy through the reduction of money supply. An additional effect is slowing down economic growth through decreasing the money supply. Generally, when the money supply declines, people and businesses stop significant capital expenditures and investments, and businesses reduce their output. Rise in unemployment rate is another potentail impact of contractionary monetary policy. Increase in unemployment rate is an undesirable side effect of a contractionary monetary policy. The lower production and economic slowdown mean that corporations hire smaller number of employees. Thus, unemployment rate increases in the country.

1.1.6. Instruments of Monetary Policy

Mankiw (2010) points out that the central bank directly controls and monitor the money supply in the economy. Actually, the central bank indirectly controls the money supply through regulating the ratio of reserve-to-deposit or the monetary base. To do so, the central bank has at its disposal the three tools of monetary policy: the discount rate, reserve requirements and open market operations.

The discount rate is defined as the interest rate charged by the central bank when it lends funds to commercial and other banks. The central bank provides loans to a bank who has shortage with their reserve requirements. Low discount rate will result in the occurance of cheaper reserves borrowed by banks form the central bank, this then leads to increase banks borrowing. Therefore, a decrease in the discount rate leads to an increase in the money supply and monetary base.

Reserve requirements are rules and regulations of the central bank in which it requires banks to have a minimum ratio of reserve-to-deposit. A raise in the reserve requirement increases the ratio of reserve-to-deposit and hence reduces the money supply and the money multiplier. The central bank uses modifications in reserve requirements as the last option among the three available policy tools (Alvarez et al., 2017).

Open market operations are the process of buying and selling of bonds of the government though the central bank. When the central bank purchases governmnet bonds from people, the amount paid for bonds increases increases the money supply and the monetary base as well. If the central bank sells bonds to people, the amount received reduces the money supply and the monetary base too. The policy tool that the central bank uses frequently is open market operations. Practically, the central bank of USA uses open market operations in the bond markets in New York almost every day of the week (Alvarez et al., 2017).

These three mentioned policy tools - the discount rate, reserve requirements and open market operations - provide the central bank great ability to have control on the money supplyin the economy (see Figure 1.1). However, the central bank is unable to perfectly control the money supply. The discretion of banks in doing business could lead the money supply to modify in ways that the central bank could not predict. Banks may select to maintain extra reserves beyond the required level of reserves. The excess amount of reserves will result increase in the ratio of reserve-to-deposit, thus lead to

decline the money supply. In addition, the central bank is unable to accurately regulate the amount that the discount window encourages the banks to borrow. Small number of borrowing banks is associated with tight money supply and low monetary base. Thus, the money supply occasionally goes in a direction that the central bank did not plan (Goodhart, 2013).

Monetary Policy Tools, Targets & Objectives

Policy Tools	Operating Target	Intermediate Targets	Objectives
Open Market Operation	Interest Rate, Short-term	Aggregates of Monetary (M1, M2, …)	Low rate of unemployment
Reserve Requirement	Monetary Base (Reserve Money)	Interest Rate (Short and Long term)	Low rate of inflation
Discount Rate	Required Reserve and Non-borrowed Reserve …	Demand, Aggregate	Financial market constancy
			Constant exchange rate

Figure 1. 1: Tools, targets and goals of monetary policy

(Okotori, 2019)

Open market operations and financial performance

Keynesian theory was developed by Keynes in 1937. Keynesians believes that expansionary open market operations responses will decrease interest rates, increase spending, increase aggregate demand and output and

therefore decrease unemployment. Keynes argued that the solution to the great depression was to stimulate the economy “inducement to invest” through some combination of two approaches: a reduction in interest rate and government investments in infrastructure. Investment by government injects income, which results in more spending in the general economy, which in turn stimulates more production and investments involving still more income and spending. The initial stimulation starts a cascade of events whose total increase in economic activity is a multiple of original investments (Banda, 2020).

A central conclusion of Keynesian economics is that, in some situations no strong automatic mechanism moves output and employment towards full employment levels. This conclusion conflicts with economic approaches that assume a strong general tendency towards equilibrium. In the neoclassical synthesis, which combines Keynesian macro concept with a micro " benchmark foundation, the condition of general equilibrium allows for price adjustments to eventually achieve this goal. More broadly, Keynes saw his theory as a general theory, in which utilization of resources could be high or low, whereas previous economic focused on the case of full utilization (Brunnermeier, 2009).

Monetary policy such as open market operations transmission through the interest rate channel is based on the traditional Keynesian interpretation of the role of money for real interest rate movements. A change in interest rates affects firm’s investment spending, consumer spending on housing and personal consumption of durable goods. A problematic observation noted by scholars in the literature is that interest rate cannot be identified as the most quantitatively important cost-of-capital variable for aggregate spending. The shortcoming in the traditional interest rate channels are explained with financial market imperfections and the credit view of the transmission mechanism.

Madura (2013) spells out the variances in the expression of credit channel. A monetary contraction leads to a drop in bank lending due to fall in the bank

deposits, 17 and due to a corrosion of borrowing firms balance sheets and a decline in collateral value. Degeneration in aggregate credit reduces output. (Madura, 2013) mentions consumer liquidity preferences as well, for example consumers would rather hold more liquid assets after a drop in the stock market following a monetary contraction, thus decreasing spending on illiquid assets such as real estate and on durable goods.

Additionally, the Neo-Classical Theory, which is also known as the Loanable fund theory of interest, was developed by Knut Wicksell in 1968. Under Neoclassical theory of interest, the rate of interest is calculated based on demand and supply of loanable funds present in the capital market. The nominal rate of interest is determined by the interaction between the demand and supply of loanable fund, keeping the same level of supply, an increase in the demand for loanable funds would lead to an increase in the interest rate and vice versa. An increase in the supply of the loanable funds would result in the fall in the rate of interest. If both the demand and supply of loanable funds change, the resultant interest rate would depend much on the magnitude and direction of movement of the demand and supply of the loanable funds. The demand for loanable funds is derived from the demand for final goods and services which are again generated from the use of capital that is financed by the loanable funds. The demand for loanable funds is also generated from the government (Banda, 2020).

The loanable funds theory of the rate of interest has similarity with liquidity preference theory of interest in the sense that both identify the significance of cash balance preferences and the role played by banking sector to ensure security of the investment funds. Madura (2013) in his work titled alternative theories of the rate of interest criticizes the liquidity preferences theory by pointing out that the rate of interest is not purely a monetary phenomenon. Real forces like productivity of capital and prudence of saving by the people also play an important role in the determination of the rate of interest which is ignored by Keynes liquidity preference theory. scholars add that liquidity preference is not the only factor governing the rate of interest.

There are several other factors which influence the rate of interest by affecting demand the demand for and supply of investible funds. The liquidity preference theory does not explain the existence of different rate of interest prevailing in the market at the same time. He further notes that Keynes ignores saving or waiting as a mean or source of investible fund. To part with liquidity without there being any saving is meaningless. Keynesian theory only explains interest in the short-run and gives no clue to the rates of interest in the long run. He finally says that Keynes theory of interest, like the classical and loanable funds theories, is indeterminate as one cannot know how much money will be available for the speculative demand for money unless they know how much the transaction demand for money is (Sun & Sutcliffe, 2003).

The Loanable Fund theory is considered as an improvement of the classical theory of interest. However, it has been criticized for assuming that saving is a function of the rate of interest; it ignores the influence of the changes in the level of investment on employment, income and on savings (Banda, 2020).

Inflation Rate and financial performance

According to Wamucii (2010) one theory of inflation is called monetarism. This theory says that inflation is always present and that it is a monetary problem. This theory also says that the amount of money that exists will determine the amount of money that people spend. The idea is that the price of items will go up only if the supply of the items is lower than the demand for the items. The price of items will also go down if the demand for the items is higher than the supply of the items. This theory also says that since the amount of spending is determined by the amount of money in circulation the demand for items can be determined by calculating the amount of money in existence. Because of this theory, one could assume that if the amount of money in circulation goes up so does the amount of spending and so does the demand for consumer goods. Using this theory, the only reason that prices would go up is if the amount of money in circulation goes up.

Another theory of inflation is called the rational expectations theory. This theory says that inflation must be looked at as a long-term projection and not just due to the here and now. Although it is a lot like monetarism the rational expectations theory believes that the monetarism theory reacts too quickly to what is occurring now and that what happens down the road is more important. One reason that the rational expectations theory wants to avoid reacting too quickly to slight changes in inflation is that when people react too quickly, they often cause drastic changes in inflation simply by trying to avoid them. The Austrian theory of economics says that as people will spend more money as they get more money to spend. This is kind of a spend that one earns philosophy. The lifestyle and spending habits of people are equal to their disposable income. This theory is different from the others because it doesn't believe that the production of goods will increase in order to meet an increase in demand. This theory believes that these kinds of changes in the economy don't happen as quickly as some of the other theories believe they do. And this theory also believes that the distribution of goods and money will not always seek to achieve some sort of balance. The Marxist theory of economics says that the value of money is determined by the relationship between those that produce the goods and those that buy the goods. This theory says that it is the value of the labour required to produce the goods and not the price of the goods themselves that determines the real cost of the goods. This theory also says that the only important factor in the cost of goods is how the cost of labour goes up and down compared to the demand for the product (Sargent, 2013).

Classical Theory of Inflation says that money is the asset which is utilized by people to purchase goods and services on a regular basis. Money is the mode of exchange in every economy at the present day. Inflation occurs in an economy when the overall price level increases and the demand of goods and service increases. The classical theory of inflation owes its genesis to certain factors. Inflation is determined by the quantity theory of money. This theory which is contained in the classical theory of inflation is employed to explain the most important and long run determinants of inflation rate and price level. Inflation is a phenomenon which takes the whole economy into its

grasp. It spreads across the whole of the economy. It is such a phenomenon which impacts the whole of the economy and is concerned about the value of the mode of exchange in an economy that is, it concerns itself with money. With the rise in the supply of money the price rate rises and the value of money falls that is devaluation of money takes place. The supply of money is controlled by the government through a policy of open market. Open market is a powerful tool of controlling the supply of money. The demand of money depends on a lot of factors. These factors include interest rates, average level of prices in the economy. Every economy endeavour to reach equilibrium where the demand and supply of the money becomes equal. Marx defined inflation in terms of its cause; as depreciation of the currency: high prices caused by an over-issue of inconvertible paper money (Ireland, 2014).

Evidence indicates that there is a significant, and economically important, negative relationship between inflation and financial development. This correlation emerges essentially independently of the time period considered, the empirical procedure employed, or the set of variables that appear in the conditioning information set. It is also not sensitive to inclusion or exclusion of countries that have experienced extraordinarily high rates of inflation. Recent empirical work shows that deterioration in financial sector performance has large, negative implications for economic growth. Theory further predicts that the inflation-finance relationship may exhibit strong non-linearity. For example, informational frictions may become binding only when inflation exceeds certain thresholds. When inflation passes these thresholds, some theories suggest that we will observe a corresponding collapse in financial system performance with adverse effects on resource allocation and economic activity. Finally, the negative relationship between inflation and financial sector performance emerges even after controlling for simultaneity and omitted variable biases. Thus, a preponderance of evidence indicates that sustained inflation and financial sector performance display a strongly negative association. In low-inflation countries, the data indicate that more inflation is not matched by greater nominal equity returns. In high inflation economies, however, nominal stock returns move essentially one-for-one

with marginal increases in inflation rates. In terms of banking and stock market development, bank lending activity, bank liability issues, stock market size and liquidity display strong negative correlations with inflation, but only for countries with low-to-moderate rates of inflation. As inflation rises, the marginal impact of additional inflation on banking and stock market development diminishes rapidly. The data suggest that for economies with annual inflation rates above about fifteen percent, there is a large discrete drop in financial sector development relative to countries with inflation rates below this threshold. Since financial sector development is strongly linked with long-run economic performance, our findings are consistent with the view that as inflation – even predictable inflation – passes certain critical values, there will be negative implications for long-run economic performance (Wamucii, 2010).

1.1.7. Monetary Policy in Iraq

It can be said that the qualitative tools or direct tools are more used in order to achieve the goals tagged by the monetary policy before 2003. The monetary policy during that period witnessed submission to the political decisions of the authority, especially with regard to the monetary issuance policy (cheap money policy) followed as the central bank represented (financial leverage) to finance the state budget deficit without restrictions and excessively, which resulted in an accelerated increase in inflation rates. And the general level of prices rises with the growth of the money supply significantly. Noting that the state budget deficit for the year 2002 amounted to (547160) million dinars (Al-Khazraji, 2010).

The method of financing the budget deficit is through cheap cash, which works to lose opportunities for economic growth in the real sectors, which led to increased inflationary pressures in the (Iraqi) economy. In addition, the economic environment of Iraq at that time was repelling domestic and foreign investment, expelling real production, and attracting speculation due to the effects of hyperinflation.

In addition, the unilateral Iraqi economy depends on oil exports, whose revenues cover nearly 90% of the treasury expenditures, and when oil markets are exposed to supply shocks due to changes in oil prices, the shock is transmitted directly to the Iraqi economy and the so-called external supply shock, which in turn affects the budget. The general state of the state, the outcome of this shock and its repercussions on the state budget, its effects appear through the increase in inflation, the negative impact of the local currency (the dinar) and the change of individuals to use other assets as a store of value instead of the dinar and the prevailing trend in Iraq is to use the US dollar as a store of value or sometimes use it as a medium for exchange The so-called phenomenon of (dollarization) or the substitution of foreign exchange instead of local cash and the Iraqi economy has been characterized as a dollarized economy (Al-Khazraji, 2010).

Here another challenge arose in addition to challenges before the monetary authorities represented by the central bank responsible for finding a way out and radical solutions to it and with the limited effectiveness of monetary policy for the period before the year 2003 and the rather modest results at that time can be summarized by some economic indicators for that period: an annual growth rate of inflation 1980-2003, equivalent to 43.18% annually; the growth rate of money supply 1980-2003 is 56.13% annually; the annual growth rate of the exchange rate 1980-2003 is 65.60%; and the internal public debt for the year 2001 amounted to (3,552,885) million dinars.

1.2. Financial sector and banks

1.2.1. Financial sector

The financial sector is a part of a country's economy that is derived from capital outflows and inflows in the financial industry. Financial services, in general, comprise anything from personal banking to the insurance business, and they may account for a significant portion of a country's GDP. Evaluating the real worth of the financial sector may be challenging due to the huge quantity of paperwork involved, which can be difficult to track and measure.

Banks, insurance companies, brokerage houses, investment businesses, and other financial institutions are all part of the financial industry. It can trade money in a variety of methods, including funds, derivatives, investments, debt instruments, and so on, with credit growth being a big part of the industry. When consumers offer a credit card, deposit their income in a bank, or apply for a house loan, they are directly interacting with this sector, and these interactions take place on a much bigger scale between institutions and corporations.

This industry has gradually grown in importance as a source of economic leverage, allowing a small number of well-known individuals and businesses to amass significant wealth. Because financial services are such an important component of the global economy, several governments have attempted to regulate the industry in order to safeguard investors and the economy as a whole. Furthermore, in times of economic crisis, informal activities can generate significant financial issues since they might directly contribute to the crisis.

In the US, the financial sector accounted for about 20 percent of total capitalization on the S&P 500, a common measure of economic performance. In countries such as Iceland and Ireland, financial services formed a larger part of the national economy, which proved to be a fatal problem in the global economic slowdown in 2008. Iceland and Ireland have witnessed a drastic decline from being among the best performing economies in the world to be among the lowest levels.

Financial markets in a country's economy are crucial to its overall development. Banking and stock markets promote growth, which is the key factor in the reduction of poverty. Strong financial systems presents reliable and easy-to-access information, which reduces transaction costs, allocates resources and boosts economic growth. And it attracts foreign direct investment to the country. Because of the rentier nature of the Iraqi economy, the generation of general liquidity in the economy comes mainly from monetizing (transferring) oil revenues in Iraqi dinars, and on this basis,

the degree of the economy’s cash is high or what is called the monetary depth, which is the ratio of the money supply to the gross domestic product. It is estimated at about (40%) in 2008 now that the main problem is the financial depth of the country, i.e. the ratio of shareholding companies' capital or the market value of securities to the GDP, which still does not exceed 2% in the best case (Sabr & Saeed, 2019).

The Iraqi government activities that funded through the general budget is predominantly through all aspects of spending at a rate of more than (70%) of the gross domestic product, and that the remainder of the financing falls within the individual or market share, and it is also a candidate from the effects of the state’s general economic activity in most cases. Through the foregoing, we find that the performance of the financial sector in Iraq in general is linked to increasing the proportion of corporate capital and increasing the market value of securities, as well as managing and directing government activity and the state's general budget to provide opportunities to attract foreign direct investments into Iraq and thus increase the proportion of foreign capital, where it is still Very low, as it amounted to only (9.06) million dollars at the end of 2014 (Obeed and Ashoor, 2016). It is worth mentioning that a small percentage does not reflect the desire to attract this type of investment in Iraq.

Iraq's banking industry is still undeveloped and doing poorly. The banking sector is by far the most significant component of the financial system, accounting for more than 75 percent of assets and being primarily controlled by the government (Nasr et al., 2011). Small and undeveloped non-banking institutions and marketplaces exist. Weak financial infrastructure makes it difficult to obtain credit, and it has to be strengthened in all areas: credit history, collateral framework, legal processes, and accounting and auditing abilities. It's also crucial to think about the political situation. The challenging security environment imposes costs and constraints, the complicated political situation obstructs important policy measures, governance difficulties continue, and the influence of state interference remains despite changes.

1.2.2. Banking sector

Banks are recognized as licensed financial organizations that work to collect deposits, grant loans, and deliver several other banking services, such as: currency exchange, while banking services are known as financial transactions and services provided by banks to institutions, and if the bank deals with individuals, it is known as a bank. Retail The investment bank is the bank that deals with capital markets. Banking services that are provided to businesses include providing loans, credit, savings accounts, and current accounts. Banking services are considered as providing financial advances to individuals through banks, but it is safe and can also be defined as the acceptance of obtaining a loan or investment for financial deposits by individuals, as it is any activity related to the acceptance of money owned by individuals and other entities, so that the purpose is one of lending this money is making a profit. Banks offer many different types of banking services. Such as: various banking services, insurance services, financing services, cash management services, payroll services, as well as fraud protection services.

1.2.3. The Banking System in Iraq

Rafidain Bank and Rasheed Bank are two of the seven state-owned banks that dominate the market. Private banks are often tiny, and many of them have only lately opened their doors. Seven of the 36 private banks are owned by foreigners, while eight of them follow Islamic principles. State banks are expected to hold 86 percent of bank assets and 69 percent of loans. With an adjusted asset-to-GDP ratio of 73 percent compared to 130 percent for the MENA area, the banking industry is relatively modest. Despite strong growth in 2010, loans only accounted for 10% of GDP in 2010, compared to 55% in the MENA area. As a corollary, banks have significant liquidity, foreign assets and re-deposited in the Central Bank of Iraq (CBI) up to 63 percent of assets.

Concerning state-owned banks: Rafidain and Rasheed Banks, the two major government banks, are ineffectual, suffering from prior losses as well as executing quasi-financial transactions. The changes have been substantially

delayed, especially when compared to the timetable set forth in the Memorandum of Understanding between the Iraqi Central Bank and the Ministry of Finance in 2006. Since 2009, the World Bank initiative has been assisting the reform process. The reform process should be accelerated, with contested items being removed from balance sheets and transferred to a new asset/liability management firm. As part of the overall strategy, state banks are under normal supervision of the Central Bank of Iraq.

Above all, the authorities must evaluate the respective positions of state-owned and commercial banks, as well as the function that the TBI would be allocated. CIB began as a specialist commercial bank, but it is now a broad commercial bank with a significant presence in the financial system.

Private banks, on the other hand, are competing on an unequal playing field. State banks profit from the perception of real deposit security as well as the restrictions placed on private banks' operations. Government agencies and state-owned businesses are unable to deposit money in commercial banks. Private banks will not lend to state-owned businesses. Furthermore, payments to the government (taxes, etc.) cannot be made using private bank checks. Private banks are discussing the creation of a self-financed Deposit Guarantee Fund, although discussions are still in the early stages.

The 36 small private banks' strength and commercial experience appear to be improving. Many of them provide a variety of services, including consumer loans. However, staff skills are frequently lacking, many banks' service offerings are restricted, and loans are mostly short-term loans connected to wholesale and retail commerce. Private banks are now unable to finance major projects due to their modest size and the lack of usage of syndicates. Some observers, including CBI officials, have raised concerns about private banks' professionalism and their ability to properly support rapid economic growth.

Foreign banks are increasingly interested in conducting business in Iraq. Many foreign banks are currently concentrating their efforts on foreign firms

engaged in oil and associated industries. However, it should assist to enhance the general banking climate and encourage the financial sector's expansion over time.

Iraq's financial system faces a number of problems. There are fears that banks are not as strong as they look. Accounting and auditing standards are lacking, and banking oversight is in need of improvement. Most banks, on the other hand, look to be well funded, and with improved banking regulation and a level playing field, most private banks should be able to continue to develop and eventually establish the financial foundations for greater non-oil growth. The proposed progressive rise in minimum capital requirements will aid in the consolidation of private banks and their strengthening.

At this time, the banking system does not appear to pose a substantial macroprudential risk. Small, liquid, and with excellent prudential indicators, private banks are a good choice. While Rafidain Bank and Rashid Bank both need to be recapitalized, they are nevertheless extremely liquid, with cash and deposits with the Iraqi Central Bank, as well as foreign assets, covering 97 percent of private deposits. Raising all government banks' capital levels to the new minimum level by June 2013 would necessitate a capital infusion equal to 1.4 percent of GDP.

1.2.4. Profitability of banks

Profits are considered one of the most important goals pursued by commercial banks - they are launched by other economic units (Sultan, 2005). It is necessary for their survival and continuity. It is also considered the main requirement of each of the shareholders, depositors, lenders, management and supervisory authorities, as it is the goal that shareholders aspire to increase the value of their wealth is a source of confidence for both depositors and creditors of the bank, and it is also the goal that the bank’s management aspired to, as it is an important indicator to measure its efficiency in using the resources it has, and it is the focus of the supervisory authorities because of the success of the bank and its ability to improve the adequacy of its capital.

Profitability objective is one of the initial objectives of all firms, and it is necessary to achieve their sustainability condition. The goal of making profit is also considered one of the basic things that investors look to, an important indicator for creditors, and an important tool for the measurment of the efficiency of management in its use of its resources. In order to obtain the profit goal, the financial manager need to obtain the required funds with the lowest possible costs and risks and invest these funds in a way that enables the company, as a single unit, to achieve a return that is not less than what the shareholders can collect from investing their money in other projects that are exposed to the same degree of risk (Xu et al., 2019).

Iraqi banks are typically profitable, although the fall in private bank earnings in 2010 must be closely observed. State banks are effectively free from prudential standards, and some may fail as a result of insufficient capital. The prudential indicators for the majority of private banks, although not all, are quite good. Private Islamic and conventional banks have extremely comparable prudential and performance measures. Islamic banks rely more on capital to fund themselves and provide a higher proportion of long-term loans.

1.2.5. Profitability indicators

A decrease in these ratios could give an indication of problems in the profitability of corporations and financial organizations. Whereas the high increase in these ratios is likely to reflect an investment policy in risky financial portfolios. There are a number of ratios that can be looked at in evaluating the profitability of financial institutions, the most important of which are:

Return on assets: This ratio is measured as net profits to total assets. This ratio can be calculated with different definitions of profits before and after interest, taxes and profits, with the exception of incidental and other gains.

Return on Equity: This ratio, measured by dividing net profits by the capital rate, reflects the rate of return obtained by investors who hold the capital of banking institutions. In all cases, the increase in this ratio may be explained by the increase in prices or the decrease in the capital. The decrease in the ratio can be explained by a decrease in profits or a rise in the capital. In general, this ratio cannot be calculated until its significance is ascertained by taking capital with its different definitions and by taking different definitions of profits.

Income and spending rates: Such ratios can give a clear picture of the composition of profits and expenditures and the extent to which profits are sustainable for financial institutions, and the extent of the risk that these institutions take. These ratios are very useful in that they give an idea of the source of the operations that generate profits, such as if the income is from lending portfolios or financial portfolios or others. And in order to determine which of the investment operations that generate profits; investing in stocks, bonds, exchange rates. Whereas, expense ratios can give an idea of the weaknesses in generating profits and expenditures that absorb these profits. Expense ratios can be calculated according to the type of expenses, such as administrative expenses, wage expenses, interest payments and other expenses.

Structural indicators: There are other measures other than measures of profitability that can be relied upon. They give a future view of the position of financial institutions, including the degree of breadth of the banking institution’s customer base. If the numbers and composition of the banking institution’s clients are modest, this may indicate a narrow competitiveness of the institution and its inability to expand its customer base and expand the scope of its work to include a wider sector of companies, the family sector and even the economic sectors. This has an impact on the overall costs and profitability of the financial institution. Another example of these structural indicators is the widening of the interest rate margin on lending and the interest rate on deposits, and this indicates the environment in which the financial institution operates, the market structure of the banking sector and

the monopolistic power in it, such as a monopolistic competition market or oligopoly.

1.3. Empirical Review

Borio, Gambacorta, and Hofmann (2017) investigate how monetary policy affects the profitability of banks. For the period 1995-2012, the authors utilized data from 109 big multinational banks with headquarters in 14 key advanced nations. They discover a positive link between short-run price levels and the slope of the yield curve (interest rate structure) on the one hand, and bank profitability, or return on assets, on the other. This means that the interest rate structure's beneficial impact on net interest income balances its negative impact on loan loss provisions and non-interest revenue. Furthermore, they discover that when the interest rate is lower and the slope is less steep, that is, when non-linear lines are present, the effect is larger.

Kumar, Acharya, and Ho (2020) use a generalized method of moments (GMM) estimator to investigate the link between monetary policy and bank profitability in New Zealand. During the research period, 19 New Zealand banks were included in the sample. According to the findings, an increase in the short-term interest rate enhances bank profitability, whereas an increase in the long-term interest rate decreases bank profitability. The capital adequacy ratio, non-performing loan ratio, and cost-to-income ratio are all key factors of bank profitability in New Zealand, in addition to monetary policy variables. The capital adequacy ratio has a positive influence on the bank's profitability, but the non-performing loan ratio and cost-to-income ratio have a negative impact on the bank's profitability.

The influence of standard and non-standard monetary policy on bank profitability is examined by Altavilla, Boucinha, and Peydró (2018). On individual eurozone banks' balance sheets and market rates, the authors use both commercial and private data. Their findings demonstrate that monetary policy easing—a reduction in short-term interest rates and/or a flattening of the yield curve—does not lead to a drop in bank profits provided policy

measures are aligned with predicted macroeconomic and financial circumstances. The impact of accommodative monetary circumstances on major components of a bank's profitability is disproportionate, with a positive impact on loan loss provisions and a negative impact on net interest income from non-interest revenue. Lengthy periods of low interest rates have a detrimental impact on earnings, which are only recognized after a long period of time and are somewhat compensated by improving macroeconomic conditions. During a period of low interest rates, unexpected monetary easing boosted bank stock values and default swaps.

Only a little amount of study has been done on the impact of interest rates on bank profitability. In the UK, a long-term positive link between bank profitability and the slope and level of the yield curve has been begun, and the relationship between interest rate risk and bank interest rate margins has been investigated in 10 industrial cities (English, 2020). (Alessandri and Nelson, 2014). Chowdhury, Hoffman and Schabert (2003) defined monetary policy as a set of measures devised to economically modify the cost, supply and value of money. Further, it is defined as the art of adjusting movement and directing the provision of credit in order to achieve economic development and price stability. Others discussed monetary policy as a measure taken by the central bank to control the money supply such as the discount rate, Open Market Operation (OMO), reservation requirements, moral persuasion, interest rate regulation, and control of the credit systems of banks (Loayza, Schmidt-Hebbel, 2002).

Altavilla et al. (2018) analyzed the effect of standard and non-standard monetary policy on the profitability of banks. The authors use both commercial and proprietary data on the balance-sheets and market prices of specific euro area bank. When the analysis controls for the homogeneity of policy indicators with predicted macroeconomic and financial circumstances, the results demonstrate that monetary policy easing, which reduces short-term interest rates and/or destroys the yield curve, is not linked with reduced bank profits. The fundamental components of a bank's profitability are affected unevenly by accommodating monetary situations, with a positive

impact on loan loss provisions and non-interest revenue countering a negative impact on net interest income. A prolonged period of low rate of monetary policy is likely to have a negative impact on earnings which, however, are realized only after a long-term period and are offset by the strengthening macroeconomic conditions. Monetary policy simplifies surprises throughout the period of low interest rates, offers bank stock prices and default swaps.

Kashyap and Stein (1994) investigated the effect of monetary control on the balance sheet of banks. They collected data from 1963 to 1994 and employed a statistical method such as a regression model. GDP, the consumer price index, and the interest rate were utilized as explanatory factors. They found that when monetary policy is tightened, central deposits fall across the board in all bank sizes. Gould and Kamin (2001) studied the influence of monetary policy on the exchange rate by measuring domestic stock prices and foreign credit to better understand the impact of monetary policy on exchange rates. Stock prices and credit movement, they argued, have a considerable influence on currency rates, especially during economic and financial crises. Cappiello et al. (2010) investigated how monetary policy extensions, such as altering credit criteria and aggregate changes in loan value, might affect a country's GDP growth. There is a positive link between GDP growth and the value of loans, according to the authors.

Staikouras and Wood classified and analyzed the factors that influence bank profitability (2004). They've demonstrated how external variables like the dynamic transfer effect and internal determinants like changes within effects may affect EU banking performance. Between 1994 and 1998, they used data from banks. They discovered that factors such as managerial choices and external macroeconomic developments have an impact on the profitability of EU banks.

The features of banks, as well as the overall performance of Islamic banks' financial impacts, were investigated (Hussain and Bashir, 2019). The goal of their study was to modify financial and economic variables to see if there was

a link between bank features and profitability. He covered the fundamentals of short-term finance, bank profitability overheads, customers, and non-profit asset income.

For the sample period 1970 and 2001, Elhiraika and Ismail (2004) performed research on private and central banks using correlation analysis. Its findings showed that monetary policy has a substantial influence on the rate of return on financial assets, affecting investment demand, the balance of payments, and production. It is also stated that monetary policy and the financing of the budget deficit have a strong link. Furthermore, Haroun, Hassan, and Zaher (2005) demonstrated that commercial banks' monetary policy responses are influenced by the economy. Regression analysis was utilized to combine data from 863 banks from 1989 to 2000. Net income, stock prices, total assets ratio, total debt, total assets, and equity ratio were among the variables and criteria considered. They discovered significant monetary policy elements that impact the circumstances for high-performing firms against those that perform poorly.

Punita and Somaiya looked at the impact of monetary policy on bank profitability in Indian banks (2006). They utilized regression models in which factors like the cash reserve system's lawful ratio and the lending rate were incorporated. They discovered that parameters such as the loan rate were essential, since they discovered that lower lending rates lowered bank profitability. In addition, they discovered that issues like the legal ratio and the cash reserve system hurt the bank's profitability.

1.4. Conclusion

This chapter provided a detailed literature review on monetary policy and profitability of banks. It provides definations for both terms. The literature on monetory policy was reviewed and the expantionary and contractionary types of it are discussed. The monetary policy in the case of Iraq is also presented and discussed. Financial sector in general and banking sector in particular is described with concentrating mainly on the context of Iraq. Moreover, profitability of banks are defined and reviewed. Finally, several related

studies are selected for empirical review purposes in which it shows the trend of the current literature on the relationship between monetary policy and profitability of banks. Thus, the literature gap was identified to conduct this study.

CHAPTER 2
METHODOLOGY

This chapter builds the methodology of the thesis in four mains sections. Section one describes the popolation, sample and data collection method. Section two describes the variables and their measurement in this study. Section three is to build the econometric model of the study which in later chapter will be perfored to test the hypotheses. Section four shows and discucces the methods that are used throughout this study.

2.1. Population, Sample and Data

The population of this study is all the banks listed on Iraq Stock Exchang (ISX) as in the year of data collection 2021. There are 42 banks listed on ISX as on June 2021 (Iraqi Securities Commission, 2021). 20 banks are registed in the primary market of the stock market ans 22 banks in the secondary market of ISX. The islamic banking domains a major part of the market in a way that 19 of the listed banks provides finanacial services under islamic rules of banks. This study selects the the commercial banks listed in the secondary market as its sample of the study.

The Iraqi banking system went through a number of stages starting in 1867. The oldest identified bank in Iraq was the Ottoman Bank. Then, the Iranian Shah Nasha Bank, and the British Eastern Bank were established. Later, the Iraqi national banking began in 1935, which witnessed the formation of the Agricultural Industrial Bank, which split after 1940 into two banks: the Agricultural bank and Industrial bank. After that, particularly in 1941, Al-Rafidain Bank was established as the only state-owened commercial bank. Then, the Central Bank of Iraq is established in 1947 which regulated the sector in the country. Additionally, the Real Estate Bank in 1948, the Cooperative Bank, the Mortgage Bank and many Iraqi private banks started working in the sector.

Iraq issued Banking Law No. (94) in 2004. Based on the market economy methodology, the interest rate was liberalized, credit plans were cancelled, and foreign banks opened the door for business, whether by participating in local banks or opening branches for them (Al-Dabbagh, 2020). Moreover, the country facilitated the law for the transfer of funds and the freedom of external transfer, except for what is related to the requirements of the anti-money laundering and terrorist financing laws.

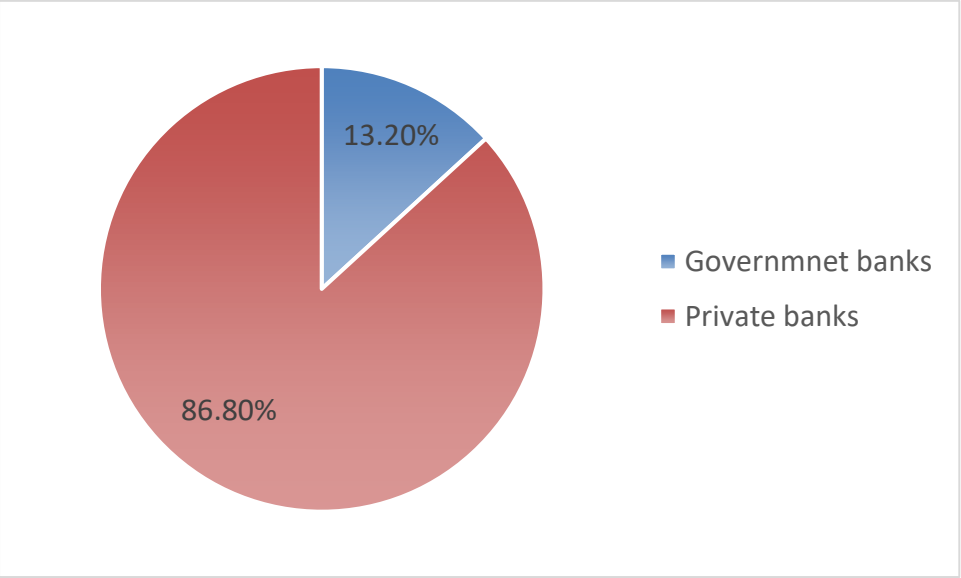

Figure 2. 1: Distribution of Iraqi banking sector

At the end of 2013, the number of banks operating in Iraq reached 53 banks. It included 7 government banks that were distributed between commercial banks and specialized banks and 46 private banks (see Figure 2.1). Private banks are divided into 23 local commercial banks, 12 Islamic banks, and 11 branches of foreign and Arab banks (see Figure 2.2), as it is reported after the liquidation of the Arab Banking Corporation (Union of arab banks, 2015).

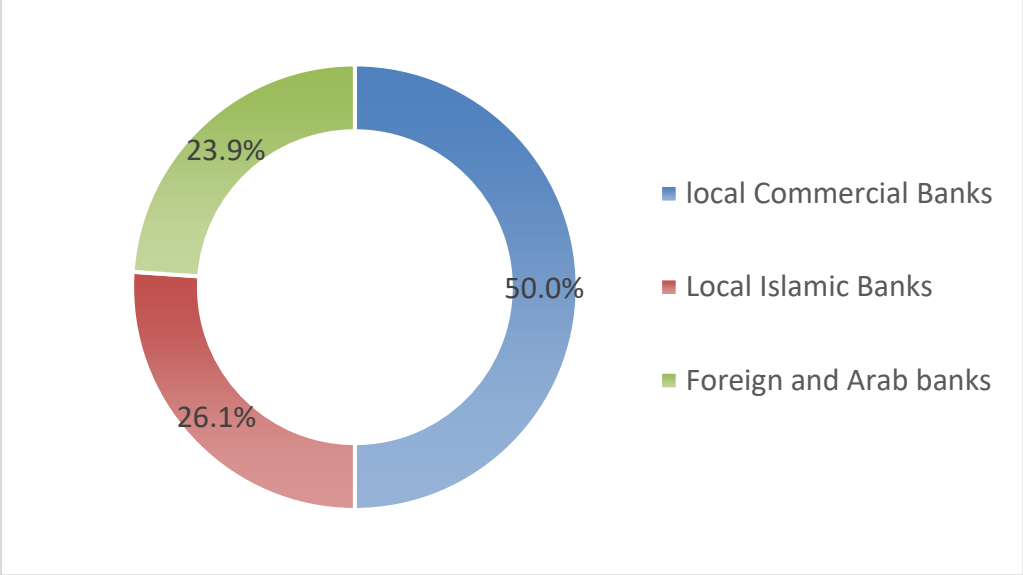

Figure 2. 2: Distribution of private banks in Iraq

In light of the economic and political changes that Iraq witnessed after 2003, the monetary authority took several measures to strengthen and boost the banking sector in Iraq and enhance the competition environment. The Central Bank of Iraq granted a number of Arab and foreign banks work licenses to practice banking activities. In addition, other Arab banks worked to enter the market as shareholders with Iraqi local banks. Despite the presence of a large number of private banks operating in Iraq, their size and activity are still significantly limited, as government banks manage 91.2% of the total assets of the Iraqi banking sector. Iraqi private banks manage 8.2 percent of the market with the operation of branches of foreign banks, and Arab banks dominate only 0.6 percent of the market.

The largest bank operating in Iraq is Rafidain Bank in terms of assets which controlled 26% of the banking sector's aggregate assets, 24% of its deposits, and 20% of credit advances. As it can be seen from Figure 2.3, the market share of only the three largest banks, which are TBI, Rafidain Bank and Rasheed Bank, amounted to approxiamately 77% of total assets, 73% of deposits, and 64% of loans (Shubar, 2020). The two named banks are stae-owend commercial banks operating in Iraq in which they have branched in almost every major cities of the country axcept for the Kurdistan Region.

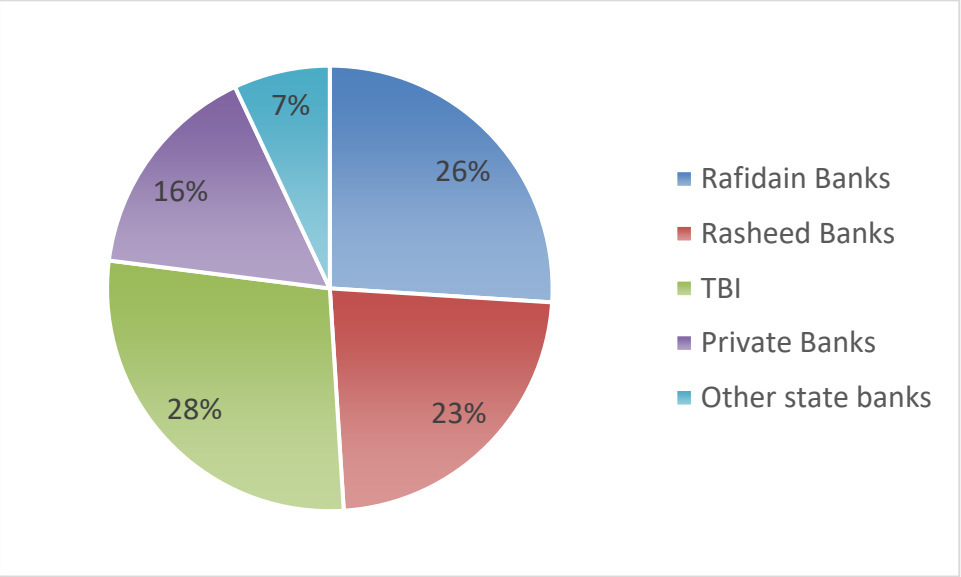

Figure 2. 3: Market share of banks in Iraq in 2015

According to Union of arab banks, studies and research department (2015), the size of the combined assets of the Iraqi banking sector amounted to about 195.7 billion dollars at the end of 2013, an increase of 20.1% over the previous year. Compared to the size of the Iraqi economy, the assets of Iraqi commercial banks amounted to about 116 billion dollars, about 50 percent of the size of the Iraqi GDP in 2012 and 51 percent in the year 2013. This could indicate the gap available to the banking sector for further growth and expansion.

The deposits of the banking sector in Iraq witnessed a considerable growth during the last five years. It increased by 42 percent in 2008, 19.1 percent in 2010, 20.4 percent in 2012, 10.8 percent in 2014, 49 pecent in 2016, and 5 pecent in 2008 (Trading Economics, 2019). As a result, these large increases tripled the volume of deposits, from about $21.8 billion in 2007 to about $97.8 billion in 2018.

As for the distribution of deposits to public and private commercial banks, state-owened commercial banks accounted for about 76% of total deposits, compared to 21% for private banks. Government bank deposits were

distributed in accordance to the source as follows: 26.2% from the central government, 49% from public institutions, and 24.8% from the private sector. On the other hand, private bank deposits were distributed as follows: 0.5% from the central government, 0.8% from public institutions, and 98.7% from the private sector. These figures show that the initial source of state-owened commercial bank deposits is the central government and public institutions, whereas the source of private commercial bank deposits is mainly the private sector. This also indicates the control of state-owened banks on the deposit market in Iraq, as they accounted for 76% of the total deposits, compared to 21% for Iraqi private banks, and 3% for branches of foreign and Arab banks.

İn line with the increase in the size of deposits, loans provided by banks in Iraq witnessed alike increase. In comparison to loans amounted approxiamately $5.7 billion at the end of 2007 and it reached about $25.1 billion by the end of 2013, an increase of 340%. However, it declined dramatically over the years 2014, 2015 and 2016 before it started to rise again in 2017. Hence, it is observed that commercial banks' loan size to the private sector increased during the mentioned period. The percentage of private sector loans out of total loans amounted to 49.5% in 2007, this percentage increased to 72.1 percent in 2018 (Central bank of Iraq, 2021).

As for cash credit or loans provided by the banking sector in Iraq, it is noticed that state-owened commercial banks contributed 80.2% of the total credit provided in 2013, compared to 18.6% contributed by Iraqi private banks and 1.2% by the branches of foreign and Arab bank. The direct cash credit provided by state-owened commercial banks was distributed by 27.3% to the government, 28.3% to public institutions, and 44.4% to the private sector. The direct cash credit provided by private banks was totally provided to the private sector. However, the credit extended by commercial banks remains substandard. For example, it is observed that loans provided to the private sector accounted for 6.2% of Iraq's GDP in 2011, 8.4% in 2012, 8.8% in 2013, and 15% in 2018 (Trading Economic, 2019). According to the World Bank (2020) , Iraq ranked 172 out of 189 in the index with regard to the index of ease of obtaining credit during the year 2019.

The number of banks working in Iraq reached 81 banks in 2020 that are working in providing financial activities. Out of this number, 24 are commercial banks, 8 banks are public sector banks, 28 are Islamic banks and the other 21 banks are branches of foreign banks (Central Bank of Iraq, 2021). As it is showed in Table 2.1, the number of state banks is 8 and their registered capital is 3,401,600,000,000 Iraqi dinars. While the number of commercial banks reached 24, with a capital of 5,388,872,000,000 Iraqi dinars. The number of Islamic banks is 28, with a capital of 7,497,677,600,000 Iraqi dinars. The number of branches of foreign banks operating in Iraq reached 21, with a capital of 894,306,000 Iraqi dinars. As for the total capital of all banks operating in Iraq, it amounted to 17,182,455,590,080 IQD (Iraq private banks leage, 2021).

Table 2. 1: Market share of banks in Iraq in 2020

Banking Sector	**Number of banks**	**Capital in millions of IQD**	**% of Capital**
Public sector banks	8	3,401,600,000	19.80%
Islamic banks	28	7,497,677,590	43.64%
Commercial banks	24	5,388,872,000	31.36%
Foreign and Arab banks	21	894,306,000	5.20%
Total	**81**	**17,182,455,590**	**100.00%**

Table 2.1 presents the data of Iraqi banking sector market share in 2020. İt can be seen that Islamic banks occupied the majority of the market with 43.64% of the total market share of banking sector of Iraq. Commercial banks occupied 31.36 percent of the total market share and then public sector banks comes in the third place by 19.8%.

The sample of this study is selected from the population of listed banks on the primary market of ISX in which the number of quoted banks is 20 banks. These banks are private banks operating in the sections of Islamic and commercial banks. As for the sample selection, we, firstly, eleminated the banks that provide financial services under Islamic rules and regulations of banks, 4 banks, since their financial activities and sources of profit are

argued to be different from the commecial banks (Alharbi, 2017; Olson and Zoubi, 2017). Second, the banks with missing data over the period of the study 2009 and 2020 are eleminated form the sample of the study, 6 banks, in order to collect balanced panel data, consistent with Almaqtari et al. (2019). This eleminations leaves us with a total of 10 banks remaning as the final sample of this study. Therefore, the sample of this study consists of 10 commecial banks listed on ISX during the period 2009-2020. Hence, 120 firm-year observation is the sample size of the study. Date were collected from the financial statements of the banks which is publicly available on the website of Iraq Securities Commission. Data for monetary policy variables is collecte form World Bank and Trading Economics websites.

2.2. Variables

2.2.1. Profitability

The ratios of profitability, return on assets and return on equity, are the response variables of this study. The profitability maximization is a key purpose for all financial sector including banks, as it ensures their survival and long-term viability. In addition, it is a goal that investors strive for. Creditors will be interested in the proxy when dealing with the bank, and it is also a useful tool for assessing the efficiency of manager in terms of resource utilization.

Profitability is defined by Garcia and Guerreiro (2016) as some ratios that indicate a bank's ability to generate income from the available resources and invested. The profitability index is a metric that evaluates a company's investment, operating, and finance strategies and actions. It assesses the capacity of the company to create profits from equity, assets and sales by reflecting the overall performance of the bank, unifying the impact of most manager actions, and examining the ability of the bank to create profits from equity, assets and sales (Li, 2007). Consequently, the ratios of profitability are the most difficult concepts and measurements for the bank, because an integrated method for determining it is not yet known in the case of a profitable bank. Furthermore, several opportunities of investment include forgiving current profit aiming to achieve higher future profit. For instance, the

new service necessitates significant management costs, which basically result in a low profit, resulting in a poor present profit, but this might indicate better future profitability. Return on assets (ROA) and return on equity (ROE) are the most used proxied of bank's profitability in the literature, and we also use them in this study to measure profitability of banks listed on Iraq Stock Exchange.

2.2.1.1. Return on assets

Return on assets is a financial metric that shows the capacity of a bank to make money on the investment of its total assets. Moreover, it is known as return on investment (Jabbar, 2014), since it measures the profitability of bank on the base of all the short-term and long-term investments and is generally based on the amount of earnings earned from the assets invested in the activities of the bank. Additionally, it indicates the efficinecy and effectiveness of management in assets utilization, as well as trust in the manager fund and the investment and operational integrity choices (Kosmidou, 2008). The ratio of return on assets is commonly calculated using the formula of earnings before interests and taxs by total assets multiply by 100, as follow:

$$\text{Return on Asets} = \frac{Earnings\ before\ interest\ and\ tax}{Total\ Assets} * 100$$

2.2.1.2. Return on Equity

The bank's management is very interested in this indicator since it measures how far the bank tries to accomplish the rate of return on the money invested by the owners, which is the requirement for maximizing their wealth. Furthermore, it is a specialized growth and development indicator. This high proportion, on the other hand, demonstrates the bank's managerial efficiency (Abdullah and Tursoy, 2019; Obamuyi, 2013). At the same time, it signifies the high risk associated with increased leverage, the bank's level of borrowing dependency, while its fall reflects the bank's cautious of loan

financing. The ratio of ROE is usualy calculated using the formula of earnings before interests and taxs by total shareholder's equity multiply by 100, as follow:

$$\text{Return on Equity} = \frac{Earnings\ before\ interest\ and\ tax}{Total\ Equity} * 100$$

2.2.2. Monetary policy

The measures used by the central bank to strengthen the economy and minimize cyclical fluctuations are referred to as monetary policy. As a result, monetary policy controls the amount of money in circulation, which has a direct impact on interest rates, the purchase or sale of government bonds, and the dusting of bank reserves. Central banks in different countries undertake the development and implementation of monetary policies by adopting a set of quantitative tools. The central bank commonly controls the money supply through the usage of three tools. These tools are changes in the discount rate, which affect the amount of loans discounted, changes in cash reserve requirements, which affect the cash multiplier, and open market operations, which impact the monetary base. Consistent with Omari (2017), this study uses these quantitative tools in addition to inflation rate to measure monetary policy.

2.2.2.1. Re-discount Rate

It is one of the quantitative tools of monetary policy, and it is defined as the hair that commercial banks concede to the Central Bank to throw back the discount of their commercial papers. It is also known as the declared interest rate, which is determined by the Central Bank according to the objectives of the monetary policy, in which the banks see its change as a directive to follow a certain policy, and a threat to follow effective measures (Ghaniem and Musa, 2019). Figure 2.4 shows that the re-discount rate of Iraq has a downward trend over the period of this study.

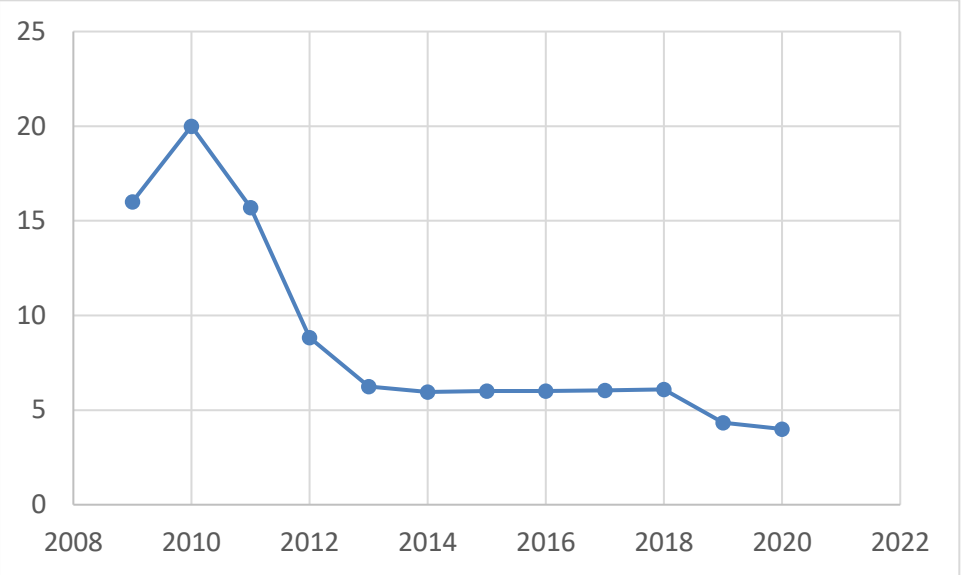

Figure 2. 4: Re-discount rate rate trend of Iraq

The relationship between the rediscount rate and the interest rate on loans is a direct indication of the central bank's policy of following the direction it deems appropriate, and this policy takes one of the following two directions. The first is contractionary monetary policy, stagnation. If the economy is in a state of stagnation, the re-discounting rate is reduced, which leads to a reduction in the discount rate, which gives commercial banks the ability to expand the granting of credit, and the economy moves to a state of recovery that contributes to addressing the situation stagnation. The second is expansionary monetary policy, inflationary situation. If the economy suffers from a state of inflation, the re-discounting rate is raised, which leads to an increase in the discount rate, which limits the ability of commercial banks to grant credit, and the economy moves to a state of deflation that contributes to addressing inflation. The rate of rediscounting is effective in a country with a developed monetary economy, characterized by a high rate of dealing in commercial papers, and therefore this tool does not have the efficiency to influence the money supply in developing countries (Nasrawi, 2020).

2.2.2.2. Cash Reserve Rate

It is considered one of the indirect tools of monetary policy. The percentage is determined by the Central Bank, whereby the Central Bank determines the percentage of the deposit balance subject to the legal reserve (Khazraji, 2010). In fact, the requirements for the legal reserve of the Central Bank of Iraq are three separate requirements in unified instructions. Banks are required to deposit frozen deposits with the Central Bank of Iraq, which is currently 13% (see Figure 2.5) of deposit obligations and/or current deposits for the previous month (Trading Economics, 2021). Moreover, the instructions include two separate basic requirements for holding the securities of the Ministry of Finance, at least at a rate of 10% of the total obligations of bank deposits, and at a rate of no less than 10% of the total obligations of deposits. The request to withdraw from the reserve balances is not compensable. The instructions for the legal reserve requirements are announced by the Board of Directors of the Central Bank of Iraq and directed to the General Directorate of Statistics and Research and to the General Directorate of Credit and Banking Control. The bank report prepared in accordance with the instructions shall be sent to the General Directorate of Accounts (Central Bank of Iraq, 2021).

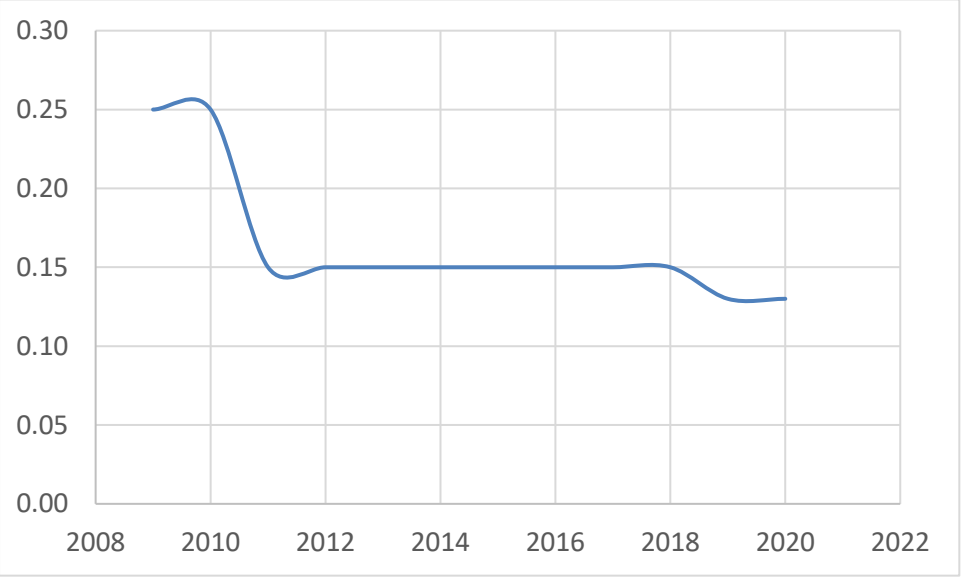

Figure 2. 5: Trend of cash reserve ratio of Iraq

Statutory reserve requirements do not reflect best practices. Accordingly, the Central Bank of Iraq set new requirements for the purpose of providing the monetary policy needs of a market economy. Wherever the legal reserve requirements are created, it is generally viewed as a monetary policy tool and not a banking supervisory tool (Ghaniem and Musa, 2019). Accordingly, the responsibility for controlling each bank is subject to the new requirements that have been transferred from the General Directorate for Credit and Banking Control to the General Directorate for Agreements and Loans, which in turn will bear the primary responsibility for including the monetary policy. It is also preferable to prepare unified requirements for monetary policy purposes, that is, the same ratio for all reserve deposits (Abdelreda et al., 2019).

2.2.2.3. Open Market Operation

Open market operations are the activity of central banks buying and selling government bonds and securities on the open market in order to control the amount of money on reserve in country banks. This is the amount of supply that may be loaned to companies and individuals. It purchases government assets in order to increase the money supply and sells them in order to reduce it (Hariz, 2014).

It is the most contemporary tool in the work of central banks. The central bank intervenes in the market to influence the liquidity of the banking system. The central bank is working on issuing certificates of deposit, which are based on interest for the banking system to invest in, which leads to the withdrawal of excess liquidity at those banks (Luft and Omarkhil, 2018). It represents a short-term investment opportunity available to those conventional banks (Omari, 2017). Banks cannot invest in them, and conventional banks, if they need liquidity, can sell these certificates to the

central bank that issued them, under repurchase agreements, or through trading them with other conventional banks.

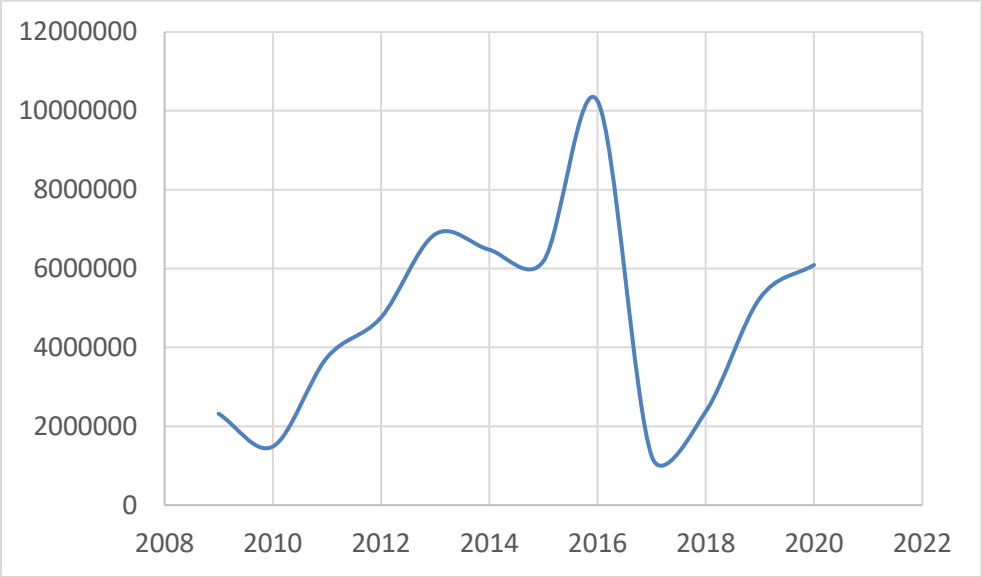

Figure 2. 6: Open market operations trend of Iraq

This tool is considered among the most widely used tools by the Central Banks. The average proceeds of the interest paid by the Central Bank of Iraq to banks on these certificates amounted to approximately 4.75 trillion Iraqi dinars annually on average over 2009-2020. Figure 2.6 shows the trend of open market operations and the amount is reached its peach of 10 trillion IQD in 2016 (Central Bank of Iraq, 2021).

2.2.2.4. Inflation Rate

The annual percentage change in the price to the typical consumer of obtaining a basket of goods and services that may be fixed or modified at defined intervals, such as yearly, is reflected by inflation as measured by the consumer price index (Omari, 2017). In most cases, the Laspeyres formula is employed. Inflation figures are annual averages, not end-of-period figures. It is considered among the most important macro variables on which the pure policy of the country focuses. In the event of high levels of inflation, it will lead individuals to prefer other investment methods without investing through

deposits in commercial banks, which pushes the monetary authorities to reduce the interest rate (Ali et al., 2018). Thus, the impact on the volume of loans granted by banks.

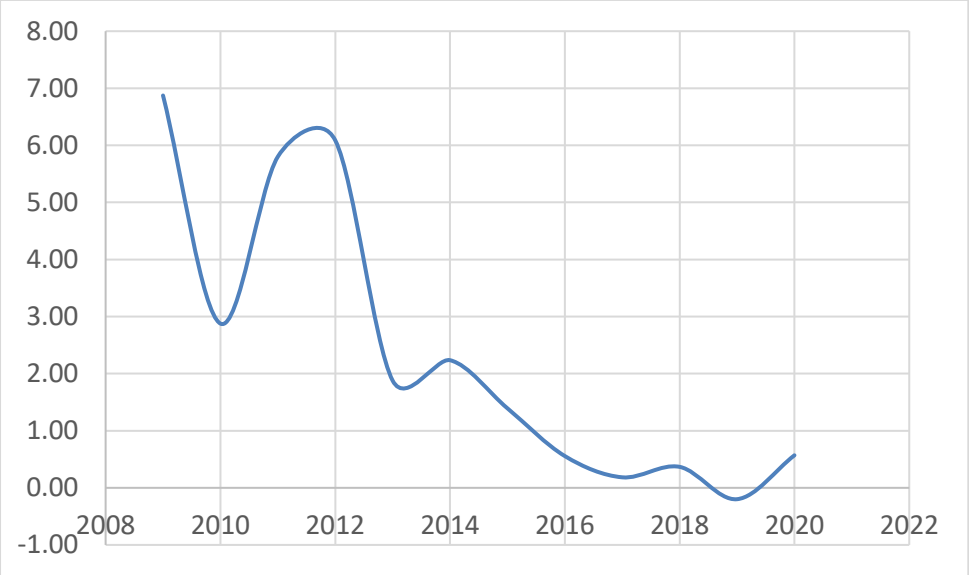

Figure 2. 7: Inflation rate trend of Iraq

Figure 2.7 shows the trend of inflation rate of Iraq over the study period. The trend is downward since 2012. This rate is 0.57% in 2020 and increases to 9.37% in 2021 (World bank, 2021).

2.3. Model

We measure banks profitability using the financial ratios of return on assets and return on equity. Moreover, monetary policy is measured using the three common quantitative tools plus inflation rate. The model of this study is based on the hypothetical argument that money supply management, monetary policy, in an economy can influence profitability of banking sector in that country. Thus, the relationship between banks' profitability and monetary policy can be expressed through equation 2.1.

$$Y = f(RED, RES, OMO, INF) \text{ ..... } 2.1$$

Y is the profitability of banks which depends on monetary policy, and monetary policy is measured through the usage of four proxies of RED, RES, OMO and INF (see table 2.2 for details). This relationship can be written in econometrics form as in equation 2.2.

$$PRF_{it} = \beta_0 + \beta_1 RED_{it} + \beta_2 RES_{it} + \beta_3 OMO_{it} + \beta_4 INF_{it} + \beta_5 Xs + \varepsilon_i \quad \text{.... 2.2}$$

Table 2. 2: Description of variables

Abbreviation	Explanation
PRF	Is profitability of banks measured as ROA and ROE
RED	Is change in discount rate
RES	Is cash reserve ratio
OMO	Is open market operations
INF	Is inflation rate
Xs	Denotes the firm-level control variables selected in this study
B_0	Is constant in the multiple regression model
$B_1, B_2, ..., B_i$	Are coefficient of the explanatory variables in the model
i	Denotes the banks as a point of time
t	Denotes time series
ε_i	Is the stochastic error term which accounts for omitted variables in the regression model

The control variables are bank-level factor which are selected to control for firm-effect variables aiming to better capture the disperse in bank profitability. These variables include bank size, bank age, liquidity and leverage, following the literature (see, for example, Almaqtari et al., 2019; Garcia and Guerreiro, 2016; Petria et al., 2015). Bank size is measured using the natural logarithm of total assets. The difference between the year of observation and the foundation year is the bank age. Liquidity is measured with the ratio of current assets to total assets. Moreover, financial leverage is the ratio of total debt to total assets.

In the later chapter, Eviews is used to run the regression model. Basically, the model will be tested using some dignositic tests such as multicolleniarity, heteroscadasticity, linearity and serial correlation. Then, the outcomes of this multiple regression model can be presented in tables and the impact of each explanatory variable on the response variable will interpreted carefully. Furthermore, the whole model will be checked using the results of F test and adjusted R-square.

2.4. Method

A quantitative research design is applied in this study. The collected panel data is quantitatively analyzed aiming to demonstrate the potential effect of monetary policy on the profitability of banking sector in the case of Iraq. Multiple regression analysis is performed to run the regression model designed in the previous section. Regression analysis is considered as one of the most usually used statistical methods when investigating the effect of a specific variable on another one. Since our data is panel, we will run pooled ordinary least square regression model with random effect and fixed effect model, following (Al-Homaidi et al., 2018; Islam and Rana, 2017).

Before using multiple linear regression, an explanatory analysis will be performed to determine the nature of the data, such as the mean, standard deviation, and correlation between the dependent and independent variables. Furthermore, we perform several pre-test as diagnositic tests. Various panel unit root tests are performed to determine stationary level of the data. Hausman test is used to select the appropriate model between fixed effect and random effect models (Abdullah et al., 2021).

Following the literature, we are first doing a unit root test on the study variables and data. This is necessary to establish the type of data we're working with and to confirm the presence of a long-term possible link between the variables. For panel data, Levin, Lin, and Chu (2002) proposed a common unit root test based on the assumption that the autoregressive lag length, AR(p), is the same across cross-sections. The individual unit root test, on the other hand, allows for heterogeneous AR(p) across cross-

sections (Im, Pesaran and Shin 2003). The null hypothesis of non-stationarity is used in both tests (LLC and IPS). In this study, both types of unit root tests are employed to improve the robustness in the outcomes.

2.5. Conclusion

This chapter has built the methodology of the thesis in four main sections. Section described the population of the study and the sample selection method. In addition, data collection method and the source of the data were presented. Section two defines the proxies used in this study to measure the variables of bank's profitability and monetary policy. ROA and ROE are used to measure profitability, whereas for monetary policy; the quantitative tools were used in addition to inflation rate. Section three presented the model that later will be run to test the hypotheses. Lastly, section four described the methods will be undertaken in this study to draw the conclusion on their basis.

CHAPTER 3
DATA ANALYSIS

In this chapter, data analysis is presented for the study sample data. Various methods are used for data analysis in order to provide logical answer for the hypotheses of the study. Accordingly, we can identify the pattern and nature of the variables separately of our study data. We also examine the relationships among the used variables and investigate directions of impact from the measures of monetary policy to the used measurements of bank's profitability. The chapter split into four main sections. Section one presents the results of several kinds of panel unit root tests and interpret the results. Section two shows the discriptive statistics of the variables used in this study. Section three shows the results of correlation matrix test to provide a basic understanding on the bivariate relationship between the employed variables. Finally, section four demonstrates the outcomes of several types of regression analysis and their interpretations regarding the impact of monetary policy on the profitability of banks in Iraq during 2009-2020.

3.1. Unit root test

As the data used in this study has panel characteristics, it is worth checking for stationary in the variables. If data analysis is performed without ensuring the stationarity, the results of data analysis can be biased (Choi, 2001). Thus, it is vital to run unit root test for data with having time-series feature. The unit root test aims to find out whether the time-series data to be studied is stable or not. It is one of the mathematical models of the relationship between the dependent variable and the independent variable that represents the dependent variable but for a previous period of time. The formula of unit root test is:

$$z_t = pz_{t-1} + a_t \quad t = 1,2,3 \ldots\ldots 3.1$$

Where p is the parameter of the model; a_t is random error. If the regression coefficient of the proposed standard formula = 1, this leads to the problem of unit root, which means the instability of the series. The stability of the series can be known by the value of the model parameter p. If p = 1 this means that there is a unit root in the time series, so the time series is unstable. On the other hand, if p = 0, this indicates that there is no unit root, and therefore the series is stable. However, the estimation of the parameter p does not correctly detect the presence or absence of a unit root in this series since the previous model does not include many stable variables. Therefore, the estimation of the parameter p is not sufficient as a characteristic of the least square method (Rasul, 2019). This is due to the increased probability of the appearance of the autocorrelation with the series of random errors of this model, and the autocorrelation function that other tests are used to detect the unit root in the data.

The most common unit root tests for panel data are Philips and Perron (PP), Augmented Dickey Fuller (ADF) and Levin, Lin & Chu (LLC) (see, for example, Abdullah, 2019; Al-Jafari, Alchami, 2014). PP and ADF are individual unit root tests which allow for heterogeneous AR(p) across cross-sections. However, LLC proposes a common unit root test based on the assumption that the autoregressive lag length, AR(p), is the same across cross-sections. The null hypothesis of non-stationarity is used in the three tests simultaneously whereas their alternative hypotheses indicate that the variable is stationary. Table 3.1 presents the results of these unit root tests that are performed to improve the robustness in the results. In this study, the decisions are made on 0.05 level.

The outcomes of the three used unit root tests are presented in table 3.1. The results illustrare that the probabilities of the tests are mostly smaller than 0.05 for the variables. We performed three kinds of tests and decide on the

base of obtained similar results, at least two. We found that the probability of the chi-square and t* are mostly smaller than 5%. Thus, the null hypotheses stating that the panel variables have unit roots can be rejected in favour for the alternatives. Consequently, we conclude that all the panel variables are I(0), i.e. they are all stationary at their level. On the base of these results, the data of this study is suitable analysed using regression methods such as pooled Ordinary Least Square (OLS) and Fixed-effect and Random-effect to examine the affect of monetary policy on the profitability of banks listed on ISX during the selected period.

Table 3. 1: Panel unit root tests

	PP Fisher χ^2	**ADF Fisher χ^2**	**LLC t***	**Decision**
ROA	330.579 *0.061*	43.164 *0.002*	-4.911 *0.000*	I(0)
ROE	52.055 *0.000*	70.056 *0.000*	-7.774 *0.000*	I(0)
RED	21.920 *0.345*	160.496 *0.000*	-27.098 *0.000*	I(0)
RES	166.166 *0.000*	38.765 *0.007*	-5.592 *0.000*	I(0)
OMO	120.287 *0.000*	36.309 *0.014*	-5.324 *0.000*	I(0)
INF	36.245 *0.042*	27.853 *0.113*	-1.834 *0.033*	I(0)
SIZ	43.555 *0.002*	42.427 *0.002*	-6.409 *0.000*	I(0)
AGE	200.548 *0.000*	193.804 *0.000*	-27.194 *0.000*	I(0)
LEQ	21.823 *0.350*	38.798 *0.007*	-6.283 *0.000*	I(0)
LEV	33.207 *0.032*	30.107 *0.068*	-3.036 *0.001*	I(0)

3.2. Descriptive statistics

It is worth to present the descriptive statistics for the variables used in this study to understand the nature and the pattern of them. Descriptive statistics is the process of utilizing and analyzing descriptive statistics, which is a summary statistic that statistically characterizes or summarizes aspects from a collection of data. Table 3.2 presents summarised information of descriptive statistics such as arithmetic mean, standard deviation, range through the minimum and maximum values, and the probability of the Jarque-Bera normality test. Arethmetic mean show the average value which is used to originate the central tendency of the individual series.

Table 3. 2: Descriptive statistics

	Mean	Std. Dev.	Max.	Min.	Jarque-Bera Prob.	Obs.
ROA	0.021	0.018	0.069	-0.015	0.000	120
ROE	0.058	0.052	0.159	-0.031	0.000	120
RED	8.768	5.129	20.000	4.000	0.000	120
RES	0.163	0.040	0.250	0.130	0.000	120
OMO	4.8 m	2.5 m	10.3 m	1.2 m	0.126	120
INF	2.386	2.413	6.874	-0.199	0.000	120
SIZE	608 b	400 b	2050 b	94.1 b	0.000	120
AGE	16.70	6.325	29.00	4.00	0.124	120
LEQ	0.447	0.221	0.973	0.043	0.144	120
LEV	0.525	0.183	0.876	0.182	0.093	120

Table 3.2 presented summarised information of descriptive statistics far all the variables used in this study. Basically, it can be observed that the arethmetic mean values of the two employed measurements of bank profitability are positive. The value of return on assets mean is 0.021 with a relatively narrow range between minimum -0.015 and maximum 0.069.

Moreover, the arethmetic mean for return on equity is 0.058 with having a standard deviation of 0.052 and slightly wider dispersion compare to what is found for ROA. These positive arethmetic mean for return on assets and return on equity can specify that the profitability of banking sector in Iraq was generally positive over 2009-2020.

Descriptive statistics for monetary policy measurement are also shown. The mean value of re-discount rate is 8.768 in which it ranges between minimum 4 and maximum 20 over the study period. The standard deviation 5.129 is relatively high due to the dramatic change in RED over the period. The arithmetic mean for cash reserve ratio is 16.3% for Central Bank of Iraq over the selected period 2009-2020 with a range between 13% and 25%. The mean for open market operations is 4.8 million Iraqi dinnar. The maximim amount of OMO is 10.25 million IQD and the minimum value is 1.25 million IQD over the study period in Iraq. Additionally, inflation rate mean value is 2.39% for Iraq over 2009-2020 with the minimum rate of -0.19% in 2019 and the maximim rate of 6.87% in 2009.

Furthemore, there are four control variables included in this study which they are firm-level controls; firm size, age, lequidity and leverage level. Since we included both small and large banks in our sample study, according to their total assets, we control for size issue when investigating the impact of monetary policy on bank profitability; similarly, for other control variables. Mean value of total assets of the sample banks is 608 billion IQD over 2009-2020. The largest bank has 2.05 rtillion amount of total assets while the smallest bank holds total assets of 94.1 billion. The age of the banks over the period ranges between 4 years to 29 years of working experience in the Iraq financial market. Arithmetic mean value of lequidity ratio of the sample bank is 44.6%. Based on the used ratio of financial leverage, total debt to total assets, banks are moderately levered with an average total debt ratio of 52.45%. There are banks in our sample with very high rate of total debt, 87.6% whereas there are banks with holding only 18.2% leverage ratio.

3.3. Correlation matrix

The bivariate correlation measures the association between each pair of the chosen variables in this study. Using Pearson correlations matrix, the associations between the variables and their levels of significance are presented in table 3.3. This test is performed for the entire selected variables of our study including response, explanatory and control variables. The significance of this analysis of correlation can be observed as to identify the association between the pairs of the variables and to examine for multicollinearity problem among the independent variables. Correlation coefficient is commonly performed in the literature to investigate the nature of the relationship between two variables. Nevertheless, the direction of the relationship cannot be understand through the correlations analysis. The values of the correlation matrix tend to be between +1 for perfect positive association and -1 for perfect negative association (Rasul, 2019).

The outcomes of correlation matrix, bold values, are shown in table 3.3.The italic values in the table, however, present the probability of the correlations. The outcomes confirm that majority of the relationships are moderate between the pairs of the explanatory variables. However, the relationship between the two selected measuremnts of bank profitability is strong and positive, 0.86, since the two proxies provide similar information, but from different point of view. ROA and ROE both measures profitability of banks. The two measures take earnings before interest and tax against total assets or total shareholders equity respectively. Thst correlation is statistically significant even at level 0.01.

There are correlations between the measures of monetary policy and profitability ratios. The coefficient of profitability ratios with RED, RES and INF are positive and all statistically significant at 0.01 level. However, there is negative correlation between profitability measuremnts and OMO, but statistically do not seem to be significant since their p-value is higher than 5%, the accepted level of significance. According to the high probability values, the correlations of bank size with profitability indicators are not significant at 0.05. Bank age and lequidity have negative and significant

correlations with return on assets; -0.43 and -0.19 respectively. Nonetheless, leverage ratio has positive associations with ROA and ROE; 0.23 and 0.57 respectively which are both significant at 0.01 level.

Table 3. 3: correlation matrix

	ROA	ROE	RED	RES	OMO	INF	SIZE	AGE	LEQ	LEV
ROA	**1.00**									
ROE	**0.857**	**1.00**								
	0.000									
RED	**0.432**	**0.626**	**1.00**							
	0.000	*0.000*								
RES	**0.314**	**0.503**	**0.840**	**1.00**						
	0.001	*0.000*	*0.000*							
OMO	**-0.04**	**-0.17**	**-0.54**	**-0.51**	**1.00**					
	0.680	*0.058*	*0.000*	*0.000*						
INF	**0.411**	**0.570**	**0.599**	**0.515**	**-0.27**	**1.00**				
	0.000	*0.000*	*0.000*	*0.000*	*0.003*					
SIZE	**-0.09**	**0.085**	**-0.22**	**-0.15**	**0.069**	**-0.19**	**1.00**			
	0.310	*0.353*	*0.017*	*0.104*	*0.453*	*0.042*				
AGE	**-0.41**	**-0.43**	**-0.46**	**-0.40**	**0.151**	**-0.47**	**0.136**	**1.00**		
	0.000	*0.000*	*0.000*	*0.000*	*0.099*	*0.000*	*0.137*			
LEQ	**0.012**	**-0.19**	**-0.03**	**0.028**	**0.000**	**-0.12**	**-0.54**	**-0.20**	**1.00**	
	0.900	*0.034*	*0.746*	*0.766*	*0.996*	*0.210*	*0.000*	*0.031*		
LEV	**0.229**	**0.566**	**0.470**	**0.387**	**-0.25**	**0.434**	**0.398**	**-0.07**	**-0.63**	**1.00**
	0.012	*0.000*	*0.000*	*0.000*	*0.006*	*0.000*	*0.000*	*0.476*	*0.000*	

Change in discount rate and cash reserve ratio have strong positive correlation, 0.84, that is statistically significant at 0.01 level. This warns us about the problem of multicolleniarity in our proposer regression model. According to Gujarati (2012), correlations above 0.80 between the explanatory data is the sign of multicolleniarity issue and one possible solution is two run different modul to include the two variables separately in

the regression modles. In doing so, we eleminate the bias that might occur in the regression results. Change in discount rate has negative correlation with open market operations, -0.54, whereas it has positive correlation with inflation rate, 0.70. Furthermore, the correlation between open market operations and cash reserve rate, 0.50, is negative and statistically significant at 0.01 level. Inflation rate is positively correlated with change discount rate and cash reserve rate, while it is negatively correlated with open market operations, -0.27.

The correlation of bank size with bank age is moderate and positive, but statistically not significant at the level of 0.05. Total assets has negative and significant correlation with lequidity ratio while it has positive association with financial leverage, and statistically significant at 0.01 level. Bank age has negative correlations with both lequidity and leverage ratios, but later correlation does not seem to be significant due to high probability value 0.48. Additionally, bank lequidity and financial leverage are negatively correlated and this association is statistically significant, based on the small probability value compared to the accepted p-value of 0.05.

The correlation matrix results show a lot with regard to the pair associations and the possible problem of multicollinearity between the explanatory variables in a regression model. When performing ordinary least square regression model, one of the assumptions that should be taken into account is this issue of multicollinearity (Enders, 2009).

3.4. Regression analysis

In order to provide answers for the proposed hypotheses, we examine the directions and level of affect form the independent variables to the response variables. To do so, we perform some regression models in a number of models, according to the planned method. As a result, the study can provide information regarding the possible effect of monetary policy in Iraq on the profitability of banks working in the country during 2009-2020. Firstly, the study performs pooled OLS regression technique. Secondly, it runs RE and FE regression methods to control for firm specific effect. RE and FE models

are considered to work better in comparision with polled ordinary least square because these two methods can control for firm-specific effects which can commonly exist in non-experimental studies (Abdullah, 2019).

3.4.1. Pooled OLS regression

Table 3.4 pesents the results of pooled ordinary least square regression analysis in two models. The response variable in these two models are return on assets. Cash reserve ratio is dropped in model 1 while change in discount rate is dropped in model 2, due to the existence of multicollinearity issue between RED and RES.

Table 3. 4: Regression analysis of pooled OLS for models 1 & 2

	Response Variable is ROA							
	Model 1				**Model 2**			
Explanatory Variables	Coeff.	Std. Error	t-Statistic	P-Value	Coeff.	Std. Error	t-Statistic	P-Value
C	-0.080	0.030	-2.630	0.010	-0.003	0.027	-0.094	0.925
RED	0.001	0.000	6.013	0.000				
RES					0.048	0.024	1.960	0.053
OMO	0.004	0.001	3.152	0.002	0.003	0.001	2.224	0.028
INF	0.001	0.000	3.102	0.002	0.001	0.000	3.987	0.000
SIZE	0.002	0.001	2.508	0.014	-0.001	0.001	-1.079	0.283
AGE	-0.007	0.002	-4.197	0.000	-0.009	0.002	-4.195	0.000
LEQ	0.001	0.002	0.635	0.527	0.001	0.001	0.626	0.533
LEV	0.002	0.003	0.532	0.596	0.011	0.003	4.374	0.000
R-squared	0.664				0.519			
Adj. R-squared	0.643				0.489			
F-statistic	31.659***				17.287***			
Durbin-Watson stat	1.965				1.962			
Obs.	120				120			

The outcomes of model 1 (see table 3.4) show the impact on profitability measured by return on assets from the explanatory and control variables. Regarding the measurements of monetary policy, the impacts of change in discount rate, open market operations and inflation arte are statistically significant at the 0.01 level. With regard to the effects of the control variables, the results of t-statistics show that the coefficients of bank size and bank age are statistically significant at 0.05 and 0.01 respectively; however, the effects of lequidity and leverage do not seem to be statistically significant at 0.05 level.

Precisely, RED has a positive and significant impact on ROA in a way that one unit increase in change in discount rate would result in an increase in return on assets by 0.001 unit. Similarly, one unit increase in open market operations and inflation rate separately leads to an increase in ROA by 0.004 and 0.001 unit respectively. Bank size has a positive and significant effect on return on assets in which every 1 unit increase in bank size brings about an increase in ROA by 0.002 unit. However, bank age is negatively associated with bank profitability measured by ROA. Precisely, every one year increase in the banks age would result in a decline in ROA by 0.007. The impacts of lequidity and leverage are both positive but statistically do not significant at the level of 0.05.

With regard to the overall fitness and dignostics of the model, the information is presented in the lower part of the table. The adjusted R-squared for model 1 is 0.643. This shows that the variables together can explain 64.3% of the variations in return on assets, the profitabilty measurement. The F-statistics and its probability value (31.7 and 0.000) show the overall fitness of the variables in the regression model. The results show that the variables could fit in the model. Additionally, the result of Durbin_Watson statistics (1.96) show that the model does not suffer from the problem of serial correlation, i.e. the residuals are not serially correlated.

The outcomes of model 2 (see table 3.4) show the impact on profitability measured by return on assets from the explanatory and control variables.

Regarding the measurements of monetary policy, the impacts of open market operations and inflation arte are statistically significant at the 0.05 level whereas the effect of cash reserve rate is not statistically significant at the 0.05 level. With regard to the effects of the control variables, the results of t-statistics show that the coefficients of bank age and financial leverage ratio are statistically significant at 0.01 level; however, the effects of bank size and lequidity ratio do not seem to be statistically significant at 0.05 level.

The detailed results show that RES has a positive and significant impact on ROA in a way that every 1 unit increase in cash reserve rate would result in an increase in return on assets by 0.048 unit. Furthemore, every 1 unit increase in open market operations and inflation rate individually leads to increase in return on assets by 0.003 and 0.001 unit respectively. For firm-specific control variables, bank age has a negative and significant effect on return on assets in which every 1 unit, 1 year, increase in bank age brings about an decline in ROA by 0.009 unit. Nevertheless, financial leverage ratio of bank is positively associated with bank profitability measured by ROA. Precisely, every one year increase in LEV results in a rise in ROA by 0.011. The impacts of bank size and lequidity ratio do not seem to be statistically significant at the level of 0.05.

The adjusted R-squared for model 2 is 0.489. This clarifies that the variables together have ability to explain 48.9% of the variations in return on assets, the uses measurement of profitabilty. The F-statistics and its probability value (17.3 and 0.000) show the overall fitness of the variables in the regression model. The results show that the variables could fit in the model. Additionally, the result of Durbin_Watson statistics (1.96) show that the model does not suffer from the problem of serial correlation, i.e. the residuals are not serially correlated.

The coefficient values of constant in model 1 and model 2 show that profitability of banks measured as return on assets have declined over the period of the study with holding the effects of all the explanatary variables

constant. That means return on assets has a downward trend for banks in Iraq over 2009-2020.

Table 3.5 pesents the results of pooled ordinary least square regression analysis in two additional models. The response variable in these two models are return on equity. Cash reserve ratio is dropped in model 3 while change in discount rate is dropped in model 4, due to the existence of multicollinearity issue between RED and RES.

Table 3. 5: Regression analysis of pooled OLS for models 3 & 4

	Response Variable is ROE							
	Model 3				**Model 4**			
Explanatory Variables	Coeff.	Std. Error	t-Statistic	P-Value	Coeff.	Std. Error	t-Statistic	P-Value
C	-0.580	0.100	-5.804	0.000	-0.323	0.086	-3.743	0.000
RED	0.004	0.001	5.382	0.000				
RES					0.235	0.078	3.025	0.003
OMO	0.011	0.004	2.951	0.004	0.005	0.003	1.322	0.189
INF	0.003	0.001	2.481	0.015	0.005	0.001	4.669	0.000
SIZE	0.015	0.003	5.260	0.000	0.009	0.002	3.847	0.000
AGE	-0.016	0.004	-3.837	0.000	-0.020	0.005	-4.324	0.000
LEQ	0.013	0.006	2.343	0.021	0.010	0.005	2.184	0.031
LEV	0.091	0.014	6.527	0.000	0.111	0.011	10.447	0.000
R-squared	0.785				0.812			
Adj. R-squared	0.772				0.801			
F-statistic	58.485***				69.305***			
Durbin-Watson stat	2.055				1.948			
Obs.	120				120			

The results of model 3 (see table 3.5) show the impacts on profitability measured by return on equity from the explanatory and control variables. Regarding the measurements of monetary policy, the impacts of change in discount rate, open market operations and inflation arte are statistically significant at the 0.01 or at least 0.05 level. With regard to the effects of the control variables, the results of t-statistics and p-value show that the effects of bank size and bank age, lequidity ratio and financial leverage ratio are all statistically significant at 0.05 level.

Change in discount rate has a positive and significant impact on ROE in a way that one unit increase in change in discount rate would increase return on equity by 0.004 unit. Likewise, every 1 unit increase in open market operations and inflation rate separately leads to increase in return on equity by 0.011 and 0.003 unit respectively. Bank size has a positive and significant impact on return on equity in which every 1 percent increase in total assets brings about an increase in ROE by 0.002 percent. However, bank age is negatively associated with bank profitability measured by ROE. Precisely, every 1 year increase in the banks age would result in a decline in ROE by 0.016 unit. The impacts of lequidity and leverage are both positive and statistically significant at the level of 0.05. Every 1 unit increase in lequidity and leverage individualy would result in increase in bank profitability, ROE, by 0.013 and 0.091 respectively.

With regard to the overall fitness and dignostics of the model, the information is presented in the lower part of table 3.5. The adjusted R-squared for model 3 is 0.772. This shows that the considered variables together can explain 77.2% of the variations in return on equity, the employed bank profitabilty measurement. The F-statistics and its probability value (58.5 and 0.000) show the overall fitness of the variables in the regression model. The results show that the variables could fit in the model. Additionally, the result of Durbin_Watson statistics (2.06) show that the model does not suffer from the problem of serial correlation, i.e. the residuals are not serially correlated.

The outcomes of model 4 (see table 3.5) show the effects on profitability measured by return on equity from the used explanatory and control variables. Regarding the measurements of monetary policy, the impacts of cash reserve rate and inflation arte are statistically significant at the 0.01 level whereas the effect from open market operations is not statistically significant at the 0.05 level. With regard to the effects of the control variables, the results of t-statistics and the p-values show that the coefficients of bank size, bank age, lequidity ratio and financial leverage ratio are statistically significant at 0.05 level. The negative coefficient of constant in model 4 identifies that ROE has declined over the study period with holding the impact of the explanatory variables fixed.

The detailed results show that RES and INF have positive and significant impacts on ROE in a way that every 1 unit increase in cash reserve rate and inflation rate individually leaves marginal impact on return on equity to increase by 0.235 and 0.005 unit respectively. Furthemore, every 1 percent increase in open market operations leads to increase in return on equity by 0.005 percent. For firm-specific control variables, the positive coefficient value of bank size shows that every 1 percent increase in bank size results in ROE to increase by 0.009 percent. Furthermore, Lequidity and leverage both positively effect ROE in which every 1 unit increase in LEQ and LEV lead to increase in ROE by 0.01 and 0.111 unit respectively. However, bank age has a negative and significant effect on return on equity in which every 1 year increase in bank age brings about a decline in ROE by 0.02 unit.

The adjusted R-squared for model 4 is the highest compare to what is found in the previous other three models, 0.801. This clarifies that the combination of variables have the ability to explain 80.1% of the variations in return on equity, the uses measurement of bank profitabilty. The F-statistics and its probability value (69.31, 0.000) show the overall fitness of the variables in the regression model. The results show that the variables could fit in the model. Additionally, the result of Durbin_Watson statistics (1.95) show that the model does not suffer from the problem of serial correlation, i.e. the residuals are not serially correlated.

In line with the results of model 1 and model 2 for ROA, the coefficient values of constant in model 3 and model 4 show that profitability of banks measured as return on equity have declined over the period of the study with holding the effects of all the explanatary variables constant. That means return on equity has a downward trend for banks in Iraq over 2009-2020.

3.4.2. FE and RE regression

The use of the fixed effects approach takes into account the change of slope and section from one unit to another for the cross-section views within the studied sample. It assumes that the parameters change in a constant fashion. Thus, it touches both the individual and temporal dimension of the panel model, then, we can estimate the model by comparing individuals with time. The heterogeneity of the cross-sectional units can be calculated in the difference of the fixed term. Therefore, *ai* is considered anonymous and is to be estimated (Omari, 2017). The fixed effect panel model is usually related to the least squares model with pictorial variables.

In contrast, the random effect model treats cross-sectional and temporal effects as random features. This assumption is that the sample used in the application is drawn randomly. The model regression parameters are representative of the entire sample. Therefore, the individual effect *ai* is treated as a random component across the units as well as the mean of the group as a whole (Hamaker and Muthen, 2020).

As differences, the fixed effect looks at the individual effect as the deviation of two parameters of the regression function resulting from the difference of the secant between the units. It assumes that each bank or each year takes a different segment. In this case, the individual effect is related to the independent variables, according to the difference within each group, by taking a deviation in the observations of the time series of unit *i* from its mean, and then inserting the difference for each unit in the model. Thus, the individual effect model is called the ability within the units (Omari, 2017).

However, the random effects approach is more general and comprehensive than the fixed effect, as it assumes that each bank or each characteristic differs in its random limit. So that the fixed effect is seen as a special case within-units within the random effect, because the error components model combines the difference within each unit across time periods in addition to the difference between the between-units (Welz et al., 2021) .

Table 3. 6: Results of Hausman test

	ROA is response		**ROE is response**	
	Model 1	Model 2	Model 3	Model 4
Chi-Sq. Statistic	23.47	26.28	30.75	42.79
P-value	0.000	0.005	0.000	0.000

The Hausman (1978) test is based on the essential difference between fixed and random effects, which is the extent to which the individual effect is related to the variables. Although the standard analysis texts indicate that fixed effects are most appropriate for cross-sectional data across banks, this can only be confirmed after using the Hausman test. In order to find out which of the effects is more suitable for model estimation, whether they are fixed effects models or random effects models. In order to determine which of the two models should be tested and used in the study. The null hypothesis is based on the absence of that correlation. In the case where both the fixed and random effects estimators are coordinated but the random effects estimators are the most efficient. Whereas under the alternative hypothesis of the existence of the correlation, only fixed effects estimators are more coordinated and efficient.

The outcomes of Hausman test in table 3.6 confirm that the null hypotheses can be rejected claiming that random effect model is appropriate in favour for the alternatives. In other words, fixed effect model is appropriate for all the four specified models. The results of FE models are shown in table 3.7 and 3.8 and the interpretations are provided afterwards. ROA is the response

variable in model 1 and model 2 (see table 3.7) whereas ROE is response variable in model 3 and model 4 (see table 3.8). In model 1 and model 3, RES is dropped while RED is dropped in model 2 and model 4 to eleminate multicolleniarity problem among the explanatory variables in a single regression model. See appendices 1 to 4 for the results of RE models.

Table 3. 7: Regression analysis of FE models 1 & 2

	Response Variable is ROA							
	Model 1				**Model 2**			
Explanatory Variables	Coeff.	Std. Error	t-Statistic	P-Value	Coeff.	Std. Error	t-Statistic	P-Value
C	-0.125	0.151	-0.826	0.411	-0.041	0.164	0.249	0.804
RED	0.001	0.000	2.000	0.048				
RES					0.058	0.034	1.907	0.041
OMO	0.006	0.001	5.604	0.000	0.003	0.001	2.293	0.024
INF	-0.001	0.001	-0.894	0.374	-0.001	0.001	-0.889	0.376
SIZE	0.007	0.005	1.388	0.168	0.004	0.005	0.758	0.450
AGE	-0.047	0.011	-4.423	0.000	-0.059	0.012	-5.081	0.000
LEQ	-0.017	0.014	-1.202	0.232	-0.020	0.015	-1.395	0.166
LEV	-0.011	0.013	-0.874	0.384	-0.002	0.013	-0.123	0.902
R-squared	0.463				0.466			
Adj. R-squared	0.447				0.451			
F-statistic	25.557***				26.610***			
Durbin-Watson stat	2.128				2.119			
Obs.	120				120			

The outcomes of model 1 in table 3.7 show the impact on profitability measured by return on assets from the explanatory and control variables. Regarding the measurements of monetary policy, the impacts of change in discount rate and open market operations are statistically significant at the

0.01 level. However, the effect of inflation rate is not statistically significant at 0.05 level. With regard to the effects of the control variables, the results of t-statistics show that only the impact of bank age is statistically significant; however, the effects of bank size, lequidity and leverage do not seem to be statistically significant at 0.05 level.

Specifically, change in discount rate has a positive and significant impact on ROA in a way that 1 unit increase in RED would result in increase in return on assets by 0.001 unit. Similarly, 1 percent increase in open market operations leads to increase ROA by 0.006 unit. The effect of inflation rate is negatibe but statistically insignificant at 0.05 level. Bank age has a negative and significant effect on return on assets in which every 1 percent increase in bank age brings about a decline in ROA by 0.047 unit. However, the effects of the other control variables; bank size, lequidity ratio and leverage ratio, are not statistically significant at the level 0.05.

With regard to the overall fitness and dignostics of the model, the information is presented in the lower part of the table. The adjusted R-squared for model 1 is 0.447. This shows that the variables together can explain 44.7% of the variations in ROA, the profitabilty measurement. The F-statistics and its probability value (25.56, 0.000) show the overall fitness of the variables in the regression model. The results show that the variables could fit in the model. Additionally, the result of Durbin_Watson statistics (2.128) show that the model does not suffer from the problem of serial correlation, i.e. the residuals are not serially correlated.

The outcomes of model 2, in the right part of table 3.7, show that the impacts of cash reserve rate and open market operations are statistically significant at the 0.05 level whereas the effect of inflation rate is not statistically significant. With regard to the effects of the control variables, the results of t-statistics show that only the coefficients of bank age is statistically significant at 0.01 level; however, the effects of other control variables in the model do not seem to be statistically significant at 0.05 level.

Cash reserve rate has a positive and significant impact on ROA in a way that every 1 unit increase in RES would result in an increase in return on assets by 0.058 unit. Furthemore, every 1 percent increase in open market operations leads to increase in return on assets by 0.003 percent. The impact of inflation rate is insignificant. For firm-specific control variables, bank age has a negative and significant effect on return on assets in which every 1 year increase in bank age brings about an decline in ROA by 0.059 unit. Nevertheless, the impacts from other control variables do not seem to be statistically signigicant at the accepted level.

The adjusted R-squared for model 2 is 0.451. This clarifies that the variables together have ability to explain 45.1% of the variations in return on assets, the uses measurement of profitabilty. The F-statistics and its probability value (26.6, 0.000) show the overall fitness of the variables in the regression model. The results show that the variables could fit in the model. Additionally, the result of Durbin_Watson statistics (2.12) show that the model does not suffer from the problem of serial correlation, i.e. the residuals are not serially correlated.

The results of model 3 in table 3.8 show the impacts on profitability measured by ROE from the explanatory and control variables. Regarding the measurements of monetary policy, the impacts of change in discount rate and open market operations are statistically significant at the 0.01 level. With regard to the effects of the control variables, the results of t-statistics and p-value show that the effects of bank size and bank age are statistically significant at 0.01 level. The negative coefficient of constant in model 3 identifies that ROE has declined by 0.67 on average over the study period with holding the impact of the explanatory variables fixed.

Table 3. 8: Regression analysis of FE models 3 & 4

	Response Variable is ROE							
	Model 3				**Model 4**			
Explanatory Variables	Coeff.	Std. Error	t-Statistic	P-Value	Coeff.	Std. Error	t-Statistic	P-Value
C	-0.667	0.269	-2.481	0.015	-0.192	0.299	-0.643	0.521
RED	0.004	0.001	5.780	0.000				
RES					0.057	0.091	2.622	0.035
OMO	0.013	0.003	4.044	0.000	0.005	0.004	1.930	0.041
INF	-0.002	0.003	-0.734	0.465	-0.001	0.003	-0.394	0.695
SIZE	0.029	0.010	3.056	0.003	0.019	0.009	2.137	0.035
AGE	-0.108	0.023	-4.783	0.000	-0.135	0.026	-5.257	0.000
LEQ	-0.013	0.027	-0.467	0.642	-0.018	0.030	-0.586	0.559
LEV	0.023	0.031	0.739	0.461	0.056	0.037	1.527	0.130
R-squared	0.659				0.629			
Adj. R-squared	0.646				0.598			
F-statistic	32.439***				30.899***			
Durbin-Watson stat	2.290				2.131			
Obs.	120				120			

RED has a positive and significant impact on ROE in a way that one unit increase in change in discount rate would increase return on equity by 0.004 unit. Likewise, every 1 percent increase in OMO leads to increase in return on equity by 0.013 percent. The impact of INF is insignificant in the model. Bank size has a positive and significant impact on ROE in which every 1 percent increase in total assets brings about an increase in ROE by 0.029 percent. However, bank age is negatively associated with bank profitability measured by ROE. Precisely, every 1 year increase in the banks age would result in a decline in ROE by 0.108 unit. The impacts of lequidity and leverage are statistically insignificant at the level of 0.05.

With regard to the overall fitness and dignostics of the model, the information is presented in the lower part of table 3.8. The adjusted R-squared for model 3 is 0.646. This shows that the considered variables together can explain 64.6% of the variations in ROE, the employed bank profitabilty measurement. The F-statistics and its probability value (32.44, 0.000) show the overall fitness of the variables in the regression model. The results show that the variables could fit in the model. Additionally, the result of Durbin_Watson statistics (2.29) show that the model does not suffer from the problem of serial correlation, i.e. the residuals are not serially correlated.

The results of model 4 (see the right part of table 3.8) show that the impacts of cash reserve rate and open market operations are statistically significant at the 0.05 level whereas the effect from inflation rate is not statistically significant. With regard to the effects of the control variables, the results of t-statistics and the p-values show that the coefficients of bank size and bank age are statistically significant at 0.05 level. However, the effects of lequidity ratio and financial leverage ratio are insignificant.

The detailed results show that RES has positive and significant impacts on ROE in a way that every 1 unit increase in cash reserve rate leaves marginal impact on return on equity to increase by 0.057 unit. Similarly, every 1 percent increase in OMO leads to increase ROE by 0.005 percent. For firm-specific control variables, the positive coefficient value of bank size shows that every 1 percent increase in total assets results in ROE to increase by 0.019 percent. However, bank age has a negative and significant effect on ROE in which every 1 year increase in bank age brings about a decline in ROE by 0.14 unit.

The adjusted R-squared for model 4 is 0.598. This clarifies that the combination of variables have the ability to explain 59.8% of the variations in return on equity, the uses measurement of bank profitabilty. The F-statistics and its probability value (30.90, 0.000) show the overall fitness of the variables in the regression model. The results show that the variables could

fit in the model. Additionally, the result of Durbin_Watson statistics (2.13) show that the model does not suffer from the problem of serial correlation, i.e. the residuals are not serially correlated.

3.1. Conclusion

In this chapter, data analysis and the interpretation of their results were shown. The aim of this chapter is to illustrate the analysis of the sample data of this study according to different used tests to identify the nature and pattern of the data and variables separately, to examine the possible association among the employed variables and to recognize the directions of relationships and level of impacts form the selected country-specific and bank-specific variables to the profitability ratios of the banks in Iraq. The chapter is divided into four major sections. Section 1 shows and discusses the results of employed panel unit root tests. Section 2 presents an overview to the measures of bank profitability and several chosen explanatory variables through the descriptive statistics. Section 3 demonstrates correlation coefficients to deliver an initial understanding about the bivariate association of the variables. Section 4 illustrates the results of regression analyses and interpretations of those results regarding the effect of monetary policy on bank profitability in Iraq during 2009-2020.

CHAPTER 4
CONCLUSION

There are several purposes of this chapter. Firstly, it aims to discuss the results of data analysis in chapter three, compare the results to previous empirical literature and show logical discussions for the obtained relationship between monetary policy nd bank profitability in the case of Iraq. Secondly, it aims to sumarrize the chapters of the thesis is few paragraphs. Finally, it aims at presenting theoretical contribution, policy implication, and recommendations for future research regarding this studied relationship.

4.1. Summary and Discussions

The key purpose of this research was to identify or measure the impact of monetary policy on the profitability of commercial banks. In order to reach the desired goal, it was necessary to identify the variables surrounding the issue, whether monetary policy or the financial performance of banks in general, and then we devoted the practical aspect to the study sample in the case of Iraq. We selected Iraq as a developing country that after 2003 has been through several major changes including the economy at the top. We then select the sample period from 2009 to 2020 on the basis of data availablity and the selection of a balanced panel sample.

The evaluation of financial performance plays an important role in influencing the performance of financial institutions, including banks, whereby banks have ability to identify their weaknesses and strengths and attempt to correct mistakes and correct them. Decision makers in banks seek to examine the best methods and techniques for evaluating their financial performance and

reaching the most suitable results to assist them take the proper decision at the right time.

In the research, we followed a methodology, where we devoted the first chapter to giving an overview of the theoretical aspect of evaluating the monetary policy in Iraq and the financial performance of commercial banks. It turns out that commercial banks, no matter how sophisticated they are fraught with risks, in order to sustain and develop, a proper strategic plan must be developed and identified. Moreover, a suitable financial evaluation system is required to identify and correct deviations. The main objective of the financial performance evaluation is to follow up and monitor the pre-established plans and the extent of their achievement and to find deviations and correct them in a timely manner through a set of financial indicators. However, it remains for the bank to choose the appropriate model for evaluating its financial performance according to a set of considerations. The most prominent of which lies in the freedom of choice due to the financial managers and the extent of their comprehension in judging the position of bank based on the results of the model.

As for monetary policy, the chapter explained the most important objectives of this policy. Through these objectives, the primary and intermediate objectives in the modern strategy of monetary policy are auxiliary tools to achieve the ultimate objectives of this policy. These targets are known for short as the magic square of economic policy. Additionally, the chapter showed the various tools used to control the money supply and bank credit, which are quantitative and qualitative means. It was found that the quantitative tools affected the volume of bank credit provided by commercial banks without paying attention to the quality of credit provided to the economic units. As for qualitative tools, they aim to influence economic activity in general. This makes the Central Bank follow a complementary policy to influence the direction of credit more than its total volume, and thus resort to qualitative control to differentiate between various activities.

As for the second chapter, it is the methodology of the study where the sample and data collection method is presented; the variables are identified, the model is constructed and the methods of the study are showed and discussed. Return on assets and return on equity are used to measure profitability of banks, whereas for monetary policy; the quantitative tools were used in addition to inflation rate. The quantitative measurements of monetary policy include change in discount rate, cash reserve rate and open market operations.

The third chapter, it is the focus of the research and is the dta analysis of the study that was drawn upon in the previous chapters. The theoretical relationship was identified between monetary policy and the profitability of commercial banks. It was found that the use of quantitative means in order to influence the amount of bank credit is reflected in the money supply and the volume of total domestic liquidity. On this basis, monetary policy can influence economic activity through the use of quantitative means in an expansionary manner towards the bank's ability to grant credit. Thus, the results of this policy are tangible in modifying the amount of credit and according to the requirements of the economic situation. Furthermore, it sheds light on the reality of monetary policy in Iraq during the studied period, which passed through stages. The most important of which is the post-structural correction stage, which is considered the most important stations that monetary policy passed through.

Lastly, we presented and interpreted the results of regression analysis for the models to measure the impact of monetary policy on the most important indicator of the profitability of a group of Iraqi commercial banks. It was noted that there is a relationship between monetary policy and the profitability measurements of Iraqi commercial banks.

We further discuss the ustage of variables, methods and the results we obtained in this section. The return on assets and return on equity models are among the most widely used models in evaluating the financial performance; profitability, of commercial banks. Monetary policy is one of the

most important economic policies in every possible country regardless to the level of development. Monetary policy occupies a prominent position in developed countries and aims to ensure the balance of economic activity. And it seeks to achieve the magic square, especially the control of inflation through various direct and indirect tools. However, the fiscal policy is more importantly conserned in the case of developing countries. It is not possible to talk about a real monetary policy except after the issuance of the Monetary and Loan Law, especially after the implementation of economic programs in Iraq, in which the monetary authority was formed, and therefore monetary policy is an essential element. Monetary policy has an effective impact on the profitability of Iraqi commercial banks as it is explained the results of performed models of regression analysis. Cash reserve rate, change in discount rate and open market operations have positive marginal impact on the profitability of Iraqi commercial banks.

4.2. Hypotheses Testing

The first hypothesis states that there is a significant relationship between the change in discount rate and the profitability of Iraqi commercial banks. The rediscount rate is a monetary policy tool that the Central Bank of Iraq charges for making loans to commercial banks. Changing the re-discount rate by the Central Bank is one of the means by which it can control the volume of credit. In Iraq, the re-discounting process is the most widely used method for refinancing banks and the most important means for the intervention of the Central Bank of Iraq to manage monetary policy. The recent re-discount rate was marked a reduction to 4%, and this is due to the increase in liquidity. Thus, there is a relationship between the monetary policy variable and the profitability indicators of banks. This is confirmed by the first hypothesis, and thus the hypothesis was verified.

The second hypothesis states that there is a significant relationship between the cash reserve ratio and the profitability of commercial banks. The Central Bank of Iraq made the cash reserve ratio as an important means of controlling the liquidity of commercial banks and using it to reduce inflation or combat deflation. The central bank changes this percentage, rise and drop,

according to the prevailing economic conditions. Changing this ratio, in turn, changes the ability of the commercial bank to grant bank credit. Therefore, the cash reserve ratio has a positive relationship with the profitability of banks. We find the impact of the cash reserve ratio is significant on the profitability of commercial banks in the case of Iraq. This is what the results are showed in the third chapter, which confirms the verification of the second hypothesis of the study.

The third hypothesis states that there is a significant relationship between the cash reserve ratio and the profitability of commercial banks. This tool is considered among the most widely used tools by the Central Banks. The average proceeds of the interest paid by the Central Bank of Iraq to banks on these certificates amounted to approximately 4.75 trillion Iraqi dinars annually on average over 2009-2020. Through open market operations tool, banks can buy government assets to expand the money supply and sells them to decrease the money supply. We found that this tool of monetarypolicy has a significant and positive impact on the profitability of banks in Iraq. Thus, the null of third hypothesis cannot be rejected.

The fourth hypothesis states that there is an impact of the inflation rate on the profitability of banks in Iraq. The phenomenon of inflation affects the economic level, especially the performance of commercial banks. The economic environment when it guarantees high levels of inflation will hinder or limit the performance of bank, vice versa. Based on the results of regresion models, there is a weak influence from inflation rate upon the profitability of banks in Iraq. This is explained by the statistical results that can be seen using the pooled OLS but not in the use of FE model. Therefore, the fourth hypothesis conditionally accepted.

4.3. Implications and recomendations

Based on the obtained results of theoretical approach and explanatory data analysis, we recommend a number of points for managemnet level, policy implications and future studies. The Central Bank of Iraq must create a developed and stable financial environment for the success of monetary

instruments so that this environment becomes able to keep pace with developments in the use of monetary instruments. Furthermore, the Central Bank should try to implement economic policy, especially monetary policy, in Iraqi commercial banks to further control the profitability of banks and in turn simulate the overall finance and economy of the country.

In this study, we discussed the impact of monetary policy on the profitability of commercial banks in the case of Iraq. This study is considering that this relationship is part of the relationship between the performance of the economy as a whole and the financial performance. Therefore, our findings still need to be supported by the results of other future studies. Therefore, future studies can consider the impact of monetary policy in cross-country sample and considering the possible impacts of other intervining variables such as corporate governance and sustainable development.

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APPENDIX

Appendix 1: RE model 1 when ROA is dependendt

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RED	0.001569	0.000497	3.154164	0.0021
LNOMO	0.007235	0.001143	6.327384	0.0000
INF	0.000340	0.000459	0.740894	0.4603
LNSIZ	0.002830	0.003951	0.716392	0.4752
LNAGE	-0.010678	0.003180	-3.357537	0.0011
LEQ	0.002675	0.007215	0.370743	0.7115
LEV1	0.001482	0.011973	0.123802	0.9017
C	-0.152437	0.123853	-1.230792	0.2210

Effects Specification		
	S.D.	Rho
Cross-section random	0.000000	0.0000
Idiosyncratic random	0.014914	1.0000

Weighted Statistics			
R-squared	0.312049	Mean dependent var	0.021239
Adjusted R-squared	0.269052	S.D. dependent var	0.018252
S.E. of regression	0.015605	Sum squared resid	0.027274
F-statistic	7.257469	Durbin-Watson stat	1.994684
Prob(F-statistic)	0.000000		

Unweighted Statistics			
R-squared	0.312049	Mean dependent var	0.021239
Sum squared resid	0.027274	Durbin-Watson stat	1.994684

Appendix 2: RE model 2 when ROA is dependendt

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RES	0.058848	0.044036	1.336375	0.1841
LNOMO	0.004374	0.001244	3.514760	0.0006
INF	0.001303	0.000708	1.839709	0.0685
LNSIZ	-0.000194	0.004223	-0.045841	0.9635
LNAGE	-0.012333	0.003595	-3.430337	0.0008
LEQ	0.002322	0.007525	0.308577	0.7582
LEV1	0.012115	0.012460	0.972288	0.3330
C	-0.026522	0.132038	-0.200864	0.8412

Effects Specification		
	S.D.	Rho
Cross-section random	0.000000	0.0000
Idiosyncratic random	0.014907	1.0000

Weighted Statistics			
R-squared	0.273500	Mean dependent var	0.021239
Adjusted R-squared	0.228094	S.D. dependent var	0.018252
S.E. of regression	0.016036	Sum squared resid	0.028802
F-statistic	6.023411	Durbin-Watson stat	1.962478
Prob(F-statistic)	0.000006		

Unweighted Statistics			
R-squared	0.273500	Mean dependent var	0.021239
Sum squared resid	0.028802	Durbin-Watson stat	1.962478

Appendix 3: RE model 3 when ROE is dependendt

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RED	0.005569	0.000641	8.686172	0.0000
LNOMO	0.017049	0.002784	6.124927	0.0000
INF	0.001916	0.001664	1.151183	0.2521
LNSIZ	0.020919	0.008070	2.592253	0.0108
LNAGE	-0.026337	0.006391	-4.121237	0.0001
LEQ	0.018576	0.014289	1.300023	0.1963
LEV1	0.072361	0.026176	2.764356	0.0067
C	-0.793026	0.219682	-3.609888	0.0005

Effects Specification		
	S.D.	Rho
Cross-section random	0.006912	0.0435
Idiosyncratic random	0.032424	0.9565

Weighted Statistics			
R-squared	0.595281	Mean dependent var	0.046429
Adjusted R-squared	0.569986	S.D. dependent var	0.051124
S.E. of regression	0.033525	Sum squared resid	0.125880
F-statistic	23.53361	Durbin-Watson stat	2.182560
Prob(F-statistic)	0.000000		

Unweighted Statistics			
R-squared	0.596437	Mean dependent var	0.057716
Sum squared resid	0.130018	Durbin-Watson stat	2.113096

Appendix 4: RE model 4 when ROE is dependendt

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RES	0.307960	0.057492	5.356585	0.0000
LNOMO	0.009485	0.003343	2.837140	0.0054
INF	0.005006	0.001808	2.769273	0.0066
LNSIZ	0.011214	0.008535	1.313835	0.1916
LNAGE	-0.030452	0.006437	-4.730555	0.0000
LEQ	0.016675	0.015449	1.079400	0.2827
LEV1	0.105047	0.027562	3.811254	0.0002
C	-0.430441	0.250835	-1.716030	0.0889

Effects Specification		
	S.D.	Rho
Cross-section random	0.006353	0.0342
Idiosyncratic random	0.033768	0.9658

Weighted Statistics			
R-squared	0.547547	Mean dependent var	0.048353
Adjusted R-squared	0.519268	S.D. dependent var	0.051266
S.E. of regression	0.035545	Sum squared resid	0.141509
F-statistic	19.36276	Durbin-Watson stat	2.078286
Prob(F-statistic)	0.000000		

Unweighted Statistics			
R-squared	0.548439	Mean dependent var	0.057716
Sum squared resid	0.145482	Durbin-Watson stat	2.021529

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