

**REPUBLIC OF TURKEY
ISTANBUL GELISIM UNIVERSITY
INSTITUTE OF GRADUATE STUDIES**

Department of Economics and Finance

**THE IMPACT OF FINANCIAL TECHNOLOGY ON
FINANCIAL PERFORMANCE: AN EMPIRICAL STUDY
ON THE TELECOM COMPANIES IN IRAQ**

Master Thesis

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DECLARATION

I hereby declare that in the preparation of this thesis, scientific ethical rules have been followed, the works of other persons have been referenced in accordance with the scientific norms if used, there is no falsification in the used data, any part of the thesis has not been submitted to this university or any other university as another thesis.

Aymen MISHAAL

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The thesis study of Aymen Faraj Mishaal MISHAAL titled as the Impact of Financial Technology on Financial Performance: An Empirical Study on the Telecom Companies in Iraq, Asia Hawala and Zain Cash from 2017-2022 has been accepted as MASTER THESIS in the department of Department of Economics and Finance by our jury.

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SUMMARY

This study mainly aims to know what is the impact of the use of financial technology through the portfolios allocated to mobile phones in telecommunications companies on the financial performance in the context of return on assets (ROA) and return on equity (ROE) from 2017 to 2022. Data was collected from the following sources: The Central Bank of Iraq, the Iraqi Stock Exchange and Asiacell Iraq and Zain Iraq Telecom companies in Iraq. This thesis will use the ARDL model bound testing approach proposed by Pesaran, Shin and Smith (2001) the goal of using this model is to analyze the short and long-run relationship between financial technology and financial performance for the period 2017-2022. To test the relationship between the variables the Eviews statistical program will be used.

The bounds test of the four models showed that there is a common integration and long-term balance between financial technology and financial performance in Zain Cash and Asia Hawala for the period (2017-2022).

The results of the study show that there is a positive relationship between financial technology and financial performance.

Keywords: FinTech, financial performance, Zain Cash, Asia Hawala, portfolios, financial ratios.

ÖZET

Bu çalışma temel olarak telekom şirketlerinde mobil portföyler aracılığıyla finansal teknoloji kullanımının finansal performans üzerindeki etkisini 2017'den 2022'ye kadar aktif karlılığı (ROA) ve özkaynak karlılığı (ROE) bağlamında incelemeyi amaçlamaktadır. Veriler aşağıdaki kaynaklardan toplanmıştır: Irak Merkez Bankası, Irak Borsası, Asiacell Irak ve Irak'taki Zain Irak Telekom şirketleri. Bu tez, Pesaran, Shin ve Smith (2001) tarafından önerilen ARDL modeliyle ilişkili test yaklaşımını kullanacak ve bu modeli kullanmanın amacı, 2017 dönemi için finansal teknoloji ile finansal performans arasındaki kısa ve uzun vadeli ilişkiyi analiz etmektir. -2022. Değişkenler arasındaki ilişkiyi test etmek için Eviews istatistik yazılımı kullanılacaktır.

Dört modelin sınır testi, dönem (2017-2022) için ZainCash ve AsiaHawala'da finansal teknoloji ile finansal performans arasında ortak bir entegrasyon ve uzun vadeli bir denge olduğunu gösterdi.

Çalışmanın sonuçları, finansal teknoloji ile finansal performans arasında pozitif bir ilişki olduğunu göstermektedir.

Anahtar Kelimeler: FinTech, finansal performans, ZainCash, Asia hawala, portföyler, finansal oranlar.

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ABBREVIATIONS

ICT	:	Information and Communication Technology
ROE	:	Return on Equity
ROA	:	Return on Assets
IPO	:	Initial Public Offering
Y2K	:	The Year 2000 Problem
C2FO	:	Collaborative Cash Flow Optimization
GDP	:	Gross Domestic Product
IMF	:	International Monetary Fund
P2P	:	Peer-to-peer
AI	:	Artificial Intelligence
SIC	:	Standard Industrial Classification
ETFs	:	Exchange-Traded Funds
MPT	:	Modern Portfolio Theory
SR	:	Sharpe Ratio
ATM	:	Automated Teller Machine
PIN	:	Personal Identification Number
QR	:	Quick Response code
NGOs	:	Non-Governmental Organizations
MENA	:	Middle East and North Africa
ROI	:	Return on Investment
EVA	:	Economic Value Added
EPS	:	Earnings Per Share
CFO	:	Cash Flows from Operations
CFI	:	Cash Flows from Investing
CFB	:	Cash Flows from Financing
PMPT	:	Post-Modern Portfolio Theory
POT	:	Pecking Order Theory
M&M	:	Modigliani-Miller theory
DCR	:	Dividend Coverage Ratio
DSCR	:	Debt-Service Coverage Ratio

Q2	:	Second Quarter
Q3	:	Third quarter
PP	:	Phillips and Perron
ADF	:	Augmented Dickey and Fuller
AIC	:	Akaike Information Criteria
LM	:	Levenberg–Marquardt
ARCH	:	Autoregressive Conditional Heteroskedasticity



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INTRODUCTION

FinTech refers to financial services and items that use technology to raise the calibre of conventional financial products and services. This technology is quicker, less expensive, simpler, and more accessible to a wider range of users. This term, which relates to technological innovation used in the financial services industry, was created to describe the nexus between the domains of finance and technology. It can also be conceptually defined as a new type of financial service that is based on information technology and financial technology. Fintech also refers to new solutions gradually emerging and revolutionizing innovation for applications, processes, products, and business models in the financial services industry.

The improvement of business practices nowadays is a result of the growth of information and communication technology (ICT) (Stiroh, 2001). According to the Institute for Digital Research in the Polish capital, Dublin, financial technology is a recent technological invention and innovation in the field of the financial sector. These inventions include digital programs used in financial operations, including transactions with customers and financial services such as money transfer, currency exchange, and other operations (Hamdi and Awqasim, 2018). In general, it is: “Any technological invention that is employed in financial services and these innovations that have been used in this industry and have developed new technologies that compete with traditional financial markets.

Fintech acts as a catalyst for efficiency improvement and economic expansion at the firm level (Brynjolfsson & Hitt, 1996). In the modern era, the use of financial technology has become not limited to banks and the banking sector, as telecom companies have sought to take advantage of financial technology to provide greater services to customers to raise operational efficiency and overall performance and raise both the return on assets (ROA) and the return on equity (ROE).

The telecommunications sector is witnessing many developments related to financial services and the relationship with banks in all countries of the world regarding money transfers and facilitating electronic payment methods. Financial technology, in its different forms, is the most recent stage in the evolution of the

financial services sector. It is about providing financial services in a new way that is flexible, fast, and low-cost. In this field, telecom companies have emerged that provide various financial and banking services based on modern technology. As a result, these companies have become strong competitors to the services provided by banks, where interest in and investment in financial technology has witnessed a strong turnout since the beginning of 2014, as is the case in the AsiaHawala wallet in AsiaCell and ZainCash wallet for Zain in Iraq.

According to the great development and services provided by companies to the customer such as money transfer, lending, currency exchange, online shopping, and others, companies, and institutions tend to invest in financial technology and benefit from financial technical services offered by this field, and the impact of this was clear, even though companies that invest in financial technology are fierce competitors to banks. Fintech functions as a catalyst for firm-level efficiency improvement and economic progress (Brynjolfsson & Hitt, 1996) therefore, financial technology has created a new field that combines financial knowledge and technological skills in providing financial services and improving the internal performance of companies and institutions. The financial performance of a firm may also be used to identify the company's financial condition during a certain period of time. Additionally, it can be used to compare similar companies within the same industry or to compare companies or divisions.

Some define financial performance as the process of calculating the monetary value of the results of the company's policies and activities. Financial performance, in a larger sense, relates to the extent to which financial goals are met or exceeded, and it is an essential part of financial risk management, it is used to evaluate a company's overall financial health over time and may also be used to analyze competitors within the same industry or across industries or sectors (Verma, 2022).

According to what has been mentioned, the study problem was formulated in the light of the following query: What effect does the use of financial technology represented by mobile phone portfolios, through Mobile payments in telecommunications companies, and its impact on the financial performance in the framework of the return on assets (ROA) and return on equity (ROE)?

The main objective of this study is to find out the effect of using financial technology through mobile phone portfolios in telecommunications companies on financial performance. In this context, we believe it is critical to investigate the influence of this technology on the financial performance of telecommunications firms, particularly in Iraq, where research in this field is limited. It is expected that the results and recommendations of this study will be of great benefit to researchers in the same field.

This study consists of the introduction, then the first chapter, which will deal with financial technology, the meaning, and importance of financial technology, measurement of financial technology, the concept of portfolios, financial portfolios, and financial technology in telecommunications companies in Iraq. The second chapter will deal with financial performance, the meaning and scope of financial performance, dimensions of financial performance, theories about financial performance, financial performance measurement, as well as the connection between financial technology and financial performance. The third chapter will include methodology, modelling, and data collection. The fourth chapter will include an applied study by building a standard model to study the impact of financial technology on the financial performance of Iraqi telecom companies through the ARDL model bound testing approach proposed by Pesaran, Shin, and Smith (2001) for the goal of using this model is to analyze the short and the long-run relationship between the financial technology and financial performance for the period (2017-2022). To test the relationship between the variables the Eviews statistical program will be used. The researcher evaluates the research findings and discusses them in the context of other research findings at the conclusion of the study. The study will also review important recommendations of the study.

CHAPTER ONE

FINANCIAL TECHNOLOGY

1.1. Financial Technology Meaning, And Importance

1.1.1. Historical development of financial technology (1866-2011)

Fintech has a long history that begins in the 19th century and even before. A tool called the PENTELEGRAPH was created in 1860 to validate bank signatures. According to historians, the year 1866 represents the beginning of financial technology. The installation of the cables across the Atlantic Ocean this year marked the beginning of the age of establishing global network infrastructure and connectivity. The first modest step in the digitization of money was made in 1918 when Fedwire invented electronic financial transfers using Telegraph & Morse Code. The Economic Consequences of Peace's 1919 release was seen as offering the first glimpse into a world powered by financial technology.

Fintech historians miss the Diner's Card as a significant and transformative event. This was the first sincere attempt to eliminate cash payments in 1950, however, it was initially only available for restaurant payments. The invention of the credit card by Amex in 1958 followed this. With the debut of screen-based stock data by Quotron in the 1960s, the financial market advanced (Agrawal, 2021).

In 1967 the automatic teller machine was introduced by Barclay's. Telegraph had just superseded international information transmission the previous year, in 1965. Hence ushering in a time of financial and telecom interactions. The creation of the Nasdaq Stock Exchange, the first computerized stock exchange, in 1971 marked a tremendous advancement in financial technology. It has drastically streamlined the initial public offering (IPO) process and altered how the bidding is conducted. This is considered one of the most important financial technology developments of all time. This was followed by the introduction of SWIFT in 1973, another revolutionary service standard. The 1980s saw the development of e-commerce and online banking systems. Trade Plus (e-commerce) first introduced electronic commerce in 1982. 1983 was the year when mobile phones were first launched as well. Complex computing

system development has facilitated the introduction of newer, more dynamic processes and products. The growth of electronic commerce in the middle of the 1990s, which increased the importance of reliance on digital finance, was one of the significant accomplishments. The establishment of PAYPAL in 1998 marked the beginning of cashless transactions in later years. After the bubble of 2000 (Y2K) burst, the financial sector experienced a tremendous advancement in technology, which was mostly used by traditional banks to maintain their primary channels. The 2008 financial crisis fundamentally altered how people saw the financial technology industry, and the subsequent demand for innovation produced the genuine boom that surfaced in the following years.

The 2008 financial crisis prompted, among other things, the following demands:

- Post-crisis reforms called for conventional banks to adhere to stronger regulatory criteria and opened up a new market for smaller firms. The public's mistrust of large money aided in this
- The industry's general focus has been on employing technology to cut operating expenses.

Due to these demands and advancements, the financial services industry entered a new age, giving rise to fintech as we know it today. Peer-to-peer (P2P) payment systems and the creation of Bitcoin, the first cryptocurrency, in 2009 and 2011 respectively, were two significant occurrences. Since then, the world has changed due to several new advancements and discoveries. RegTech, digital lending, Insurtech, portfolios, and many more fields experience constant expansion and innovation (Zeidy, 2022).

In 2013, Chime was launched as a fully digital, fee-free alternative to traditional banking. It has since grown to over 8 million account holders. Also, Plaid was launched as a platform that connects apps to users' bank accounts. 2014 and beyond saw a non-linear rise in two of the most populous countries in FinTech: China and India, devoid of large chains of complex physical banking infrastructures, these two countries have experienced very rapid growth in the FinTech sector. This, along with fintech developments in Africa, is the growth driver for the 2014-2018 period. This is

driving SaaS developments such as financial software for Indian IT companies, m-Pesa in Africa, payment banks in India, and Alipay in China.

One of the most important developments in the history of financial technology after 2014, is what happened in 2019 when the market witnessed a boom in emerging financial technology companies with a value of more than one billion dollars. Advancements in artificial intelligence (AI), robotic process automation, big data, and cloud computing also enable greater efficiency and faster access to cash. The occurrence of the global crisis or what is known as Covid-19 (Corona) had a significant negative impact on the economies of the world, but it had the opposite in the financial technology juncture in many ways, as customer demand increased and the shift to electronic payment as an alternative to traditional payment, as it prompted individuals to use banking alternatives via the Internet or through a mobile phone. And recent research confirms that the biggest beneficiaries of this behavioural shift are banks and financial institutions that have committed themselves to providing electronic services.

The Banking Retail World (2020) report indicated that the Corona pandemic contributed to accelerating the shift to electronic payment platforms and directing customers to electronic payment, as this report showed that 57% of customers now prefer electronic payment via the Internet, compared to 49% before this pandemic, and 55% of customers now prefer mobile banking applications, compared to 47% previously (Marous, 2020), and 21% of customers now prefer chatbots and voice assistance when interacting with banks, compared to 15% before this pandemic. Fintech continues to grow despite the COVID-19 pandemic with increased demand for services such as digital payments. The industry is also seeing a rise in financial inclusion as more unrepresented customers, such as women and small and medium-sized businesses, are using financial technology to access financial services. In 2022 collaborative cash flow optimization (C2FO) launched Cashflow + Card, an innovative working capital solution that allows companies to speed up bill payments without having to offer customers a discount. (EFMA & Capgemini, 2020). Through Figure (1), we can see the significant increase in the value of investments in the field of financial technology companies around the world until 2019, and despite the great

fluctuation in the value of investments in subsequent years, it remains much larger than the years before 2018.

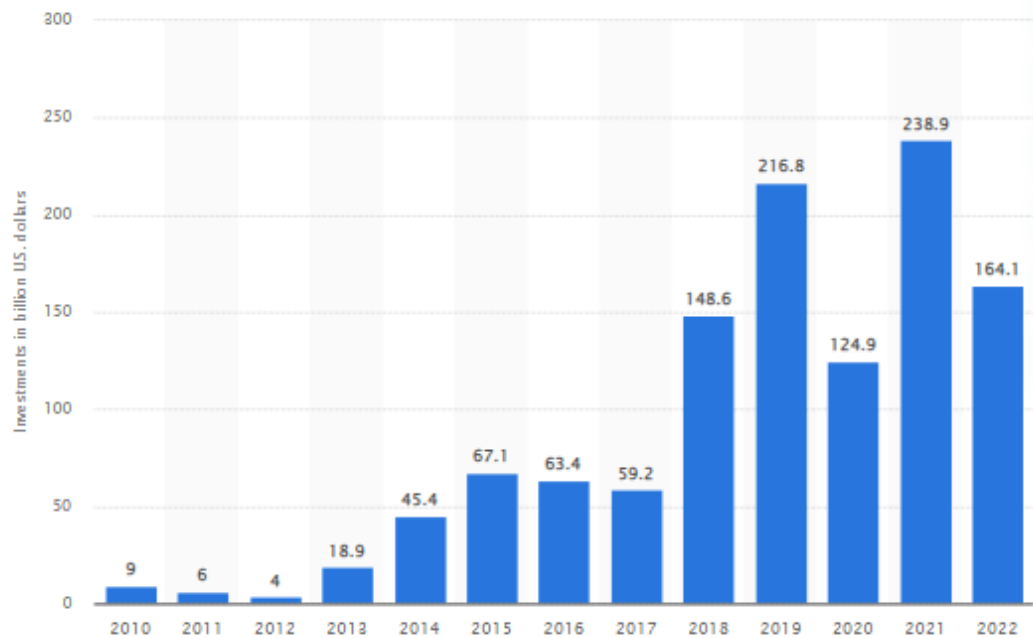


Figure 1. Total value of investments into fintech companies worldwide from 2010 to 2022.

The global financial technology market is expected to reach \$681.6 billion by 2028, with industry experts anticipating significant growth in virtual cards, embedded financing, and alternative financing solutions.

1.1.2. Fintech meaning

FinTech refers to financial services and items that use technology to raise the calibre of conventional financial products and services. This technology is more user-friendly, quicker, less expensive, and more widely available. This phrase was created to highlight the nexus between finance and technology, and it relates to technological advancement used in the financial services industry. It can also be conceptually defined as a new type of financial service that is based on information technology and financial technology. Fintech also refers to new solutions that are gradually emerging and revolutionizing innovation for applications, processes, products and business models in the financial services industry. It is known that financial technology can be referred to as the use of smartphones in banking services or what is known as cellular

banks, as well as investment services via mobile phones, encrypted digital currencies and the operation of financial services. Financial technology uses any creative ideas that improve financial services operations in any idea that works in different business conditions, as well as creative ideas that also work in business models or even new businesses (Feyen, et al, 2021). As for the National Center in Ireland, FinTech was defined as innovation in the field of financial services from new entrants competing with existing players in the financial sector who were able to issue new models such as digital currency BITCOIN (Chuang, et al, 2016). Alt indicated that fintech is a term that refers to new solutions that denote a process of developing or innovating additional or radical applications (Alt & Puschmann, 2012).

Fintech appears to have particularly thrived in markets where the financial system was less developed (FSB 2020; Didier et al 2021). Mobile banking, blockchain, cryptocurrency, stocks, etc. Can all be put into the sense of innovation in financial technology. Fintech is a phrase that is not a short term and its importance cannot be denied. Over many years, a dramatic change has been seen in the way we conduct our personal finance business- all thanks to the ever-growing financial technology company.

The COVID-19 pandemic has accelerated digital transformation. In particular, the need for digital connectivity to replace physical interactions between consumers and service providers, and in the processes that produce financial services, will be even more important as economies, financial service providers, businesses and individuals deal with the pandemic and ultimately post-COVID-19 world. For example, the pandemic has already accelerated the shift to digital payments (Auer, Cornelli, & Frost, 2020). It has also intensified e-commerce (BIS 2020; Alfonso et al 2021), which may benefit big technology companies and their financial activities. Countries with stricter policies on COVID-19 and less community mobility experienced a larger increase in downloads of financial apps in the aftermath of the outbreak (Didier et al 2021).

After the concept of financial technology has been identified, it is necessary to address the ranking of the three best companies in the field of financial technology, which are Wealthfront, Personal Capital, and Kabbage, which are at the top of the list

at present. All of them have significantly provided unparalleled fintech services to the financial services sector and the retail banking industry.

1.1.3. Leading Fintech Examples

- Digital Lending and Credit
- Crowdfunding Platforms
- Mobile Banking
- RegTech
- Robo-Advising and Stock-Trading Apps
- Blockchain and Cryptocurrency
- Payments
- Insurtech

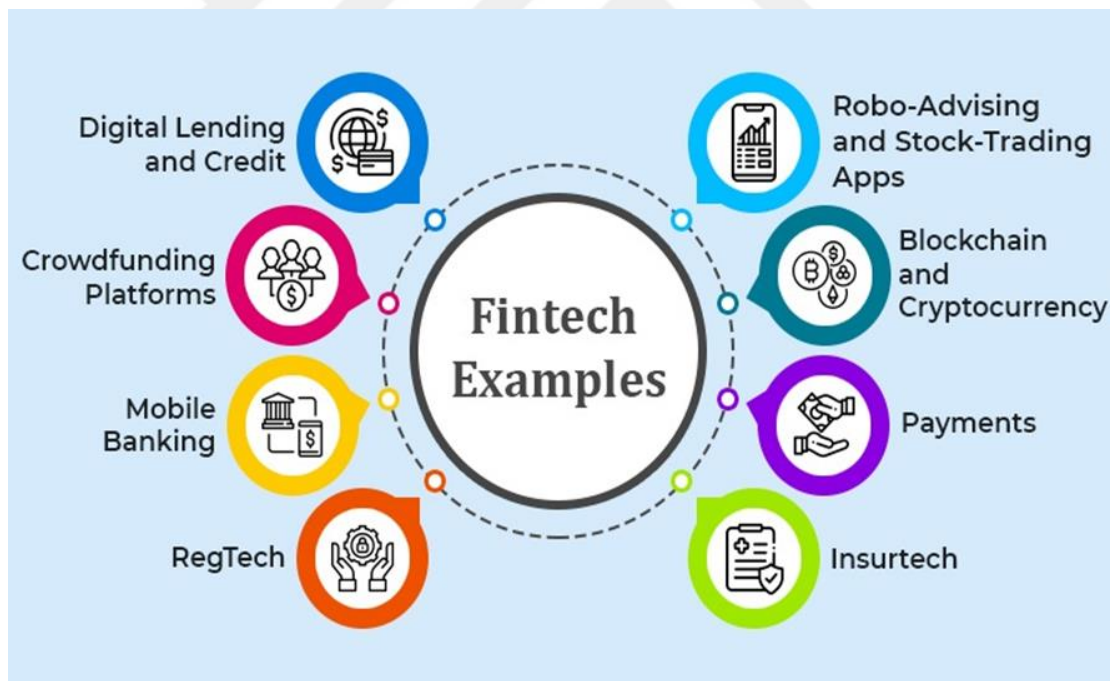


Figure 2. Leading Fintech Example

Table1. list of fintech categories and corresponding application examples

No	FinTech categories	Example	References
1-	Banking	Bank of America	(Scott, 2021)
2-	Budget management	Intuit Mint	(Scott, 2021)
3-	Buy now and pay later	After pay	(Scott, 2021)
4-	B2B services	Bar	(Scott, 2021)
5-	Credit management	Credit Karma	(Scott, 2021)
6-	Crypto	Coinbase	(Scott, 2021)
7-	Financial education	Zogo	(Scott, 2021)
8-	Insurance	Geico	(Scott, 2021)
9-	Investing	Robinhood	(Scott, 2021)
10-	Credits	Brigitte	(Scott, 2021)
11-	Bank online	Ring	(Scott, 2021)
12-	Payments	Apple Pay	(Scott, 2021)
13-	Personal or commercial tax	TurboTax	(Scott, 2021)
14-	Money transfer	Western Union	(Scott, 2021)

1.1.4. Fintech importance

The ability of financial technology to change the structure of traditional financial services has enabled it to make financial services faster, cheaper, more transparent, secure and abundant, especially for users who do not deal with banking sectors. The innovations that financial technology provides nowadays are a boon such as; Financial inclusion, Promoting the growth of the Gross Domestic Product (GDP), reducing costs and time required for banking operations, and compliance & security.

1- Financial Inclusion

Millions of consumers have benefited from financial inclusion as a consequence of the simple access to financial services made possible by financial technology.

2- Promoting the growth of the Gross Domestic Product (GDP).

Financial technology enhances the growth of the gross domestic product through the easy access of society members to a wide variety of financial products and services and credit facilities, whether individuals or companies.

3- Reducing costs and time required for banking operations.

These are the preparations required for the various banking operations, as a result of automating a number of banking operations, automation processes, and dispensing with human intervention as much as possible in those operations, as financial technology enables banks to provide low-cost, convenient, safe, and easy-to-access banking services to customers, compared to traditional financial transactions (“Egyptian Banking Institute”, 2023).

4- Compliance + Security = Fintech

There are some doubts and concerns about the safety and compliance of financial technology, but traditional banks cannot be compared to financial technology in terms of safety and compliance with international laws and regulations.

Many of you may not agree that Fintech is very safe in terms of security. Fintech is safer and more secure than traditional banking.

According to many sources, traditional financial services companies have lagged behind when it comes to security. Unfortunately, it is true! Now that the fundamentals of Fintech include the effective use of technology, compliance and security will not be such an issue.

For an illustration let's find out the top three countries by the number of FinTech startups.

USA- which is distinguished by the presence of a large number of companies providing cryptocurrency services.

United Kingdom- Rapid transfers of securities have been taking place in the UK, especially after the massive blow of COVID-19 and it shows no signs of slowing down.

Singapore- The Singapore government has already invested an amount in FinTech projects and is coming up.

So far, the fact that fintech innovations can make everything easy and efficient is irrefutable. In this regard, a recent IMF report titled the promise of FinTech: Financial Inclusion in the post-Covid Era reveals that those countries often have high annual GDP growth and believe in investing in higher levels of Digital financial inclusion.

(Vasiljeva & Lukanova, 2016) classified the activities carried out by Fintech companies into:

1- Data-Oriented activities include technical solutions that collect, process and analyze data.

2- Service-oriented activities that include the development of technologies related to services provided by traditional financial institutions such as money transfers, payments, lending and investment, lending in the P2P common market, crowdfunding, and foreign exchange.

3- Process-Oriented activities after the financial crisis of 2008, banks around the world redefined their operating models. At present, banks are introducing so-called cost caps, as well as seeking to increase efficiency and process automation.

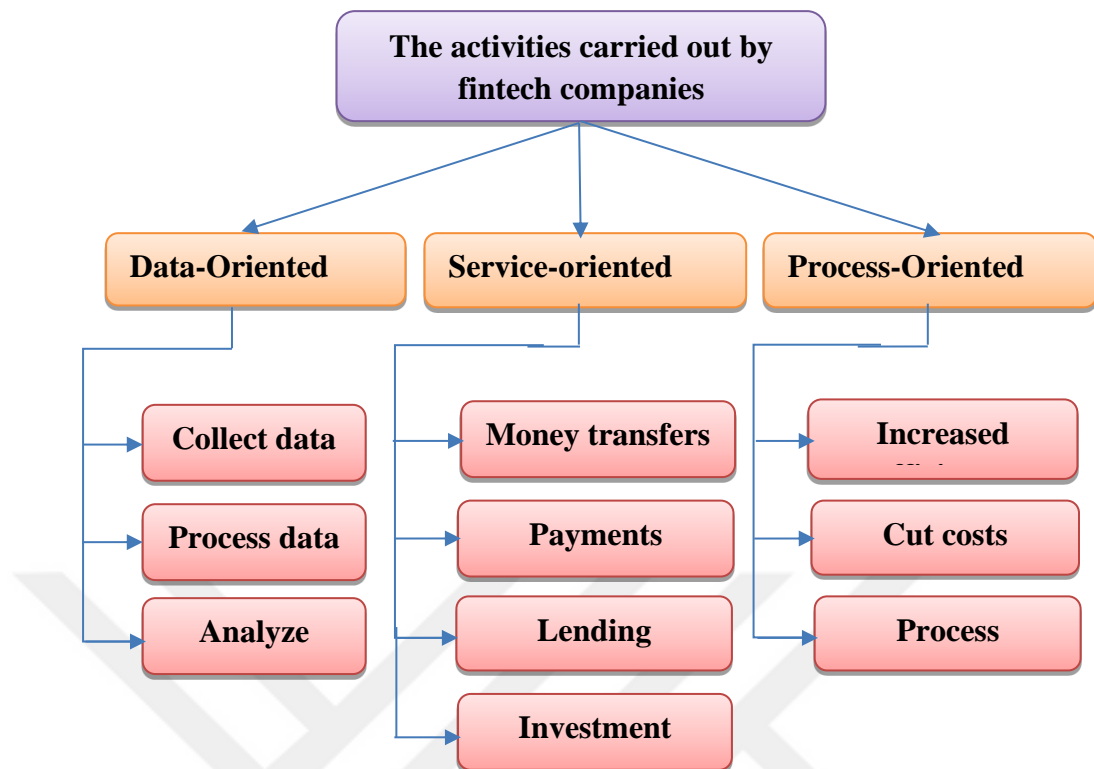


Figure 3. The activities carried out by fintech companies
Source: (Vasiljeva & Lukanova, 2016)

1.2. Measurement of financial technology

In fact, there is no approved and unified method for measuring financial technology, and the reason is due to the great development in this field in addition to its use in all fields. But some were able to explain some of the ways in which some types of financial technology were measured in line with their studies.

How can you measure the value that FinTech generated or how do you measure FinTech? This is one of the most common questions that everyone working in FinTech hears today, and it is difficult to answer.

There are no Standard Industrial Classification (SIC) codes by which a FinTech business can be identified, nor is there a standard classification of what constitutes a FinTech job (Wells, 2020). So, it gets difficult, but the important question is should you know how FinTech is measured? In simple terms, if FinTech is an important source for the current and future advancement of the economy in a country, then there must be some metrics to accurately measure FinTech. Because of its great impact on

charting the right path in making local and international decisions about strategies and investments, as well as setting accurate and clear criteria through which current and future progress is known.

In 2020, Julian Wells conducted a UK study called “How do you measure FinTech? (And why should we care?)” He built a regional statistical technique to estimate the number of businesses, employment, and value produced in the FinTech industry in order to understand how to quantify it, and he applied it uniformly to every location.

After conducting a set of analyzes of research, interviews and stakeholder comments to list these companies, this was done by:

1- Measurement of activities in FinTech rather than the companies themselves that are considered FinTech by three types of organizations in the field of FinTech, namely:

FinTech startups and scale-ups- pure FinTech business models, frequently with a focus on disrupting the industries in which they operate.

Established financial and fintech companies that provide financial goods and services.

Tech firms- businesses operating in multiple markets (must include serving financial services or FinTech)

2- The number of FinTech jobs

The number of employees was calculated by:

The estimated FinTech workforce is equal to the total number of employees inside FinTech startup and scaleup companies (from Whitecap primary research) plus 5% of the combined FS and tech workforces (from Tech Nation and TheCityUK data).

3- The value created by FinTech

This value was determined by a calculation related to Gross Value Added (GVA).

Estimated fintech workforce × Contribution of gross value generated per worker
= Estimated regional fintech gross value added.

Therefore, in order to "measure" fintech, one must first specify the realistic parameters that will "define" it using SMART (Specific; Measurable, Attainable, Appropriate or Attributable; Relevant, Realistic, or Reliable; and Timebound) indicators. Depending on what you want to measure in the fintech sector, you may want to measure the input, throughput (processes), or output. Afterwards, you can ask questions such as:

a. Input: how many fintech businesses are there (by area, country, and globally), how many people do they employ, where are they invested, in which companies or sectors do they invest, and how much cash do they have to invest.

b. Throughput: how much capital do they process, how many projects do they complete, what kind of operations do they do, and what new technologies do they employ that are comparable to banks?

c. Output: how much money they've loaned to a certain industry, how their actions impact the development and innovation of the industries they deal with, etc. (Rudi, 2019).

1.3. The concept of a wallet and financial wallet

A wallet is a group of financial assets owned by an individual or an institution that includes stocks, bonds, investments in businesses, commodities, cash and cash equivalents, including closed-end funds and exchange-traded funds (ETFs). Where the owners manage it and develop its work or appoint financial experts (Financial Professionals) to do so, and it is widely believed that the wallet depends mainly on stocks, bonds and cash, although this is often the case, it is not necessary that this be the basis, because a wallet can contain a wide range of assets including real estate, and private investments. You can own and manage the wallet yourself, or you can let a money manager, financial advisor or other financial professional manage your portfolio. These investment wallets are prepared to suit the investor's risk tolerance, in addition to the available time frame and investment objectives. In the sense of not putting all your eggs in one basket, here we mean diversity, which is the basic concept in wallet management. This diversity is necessary to reduce risks through the

diversification of financial and industrial instruments and others. Investing in different fields would increase returns due to the divergence of these investments. There are different ways to diversify, it is up to the investor depending on your goals and your ability to risk and change them, all of which determine the method of building the wallet. This term is also used in the field of project management and is referred to as (a project portfolio). These investment portfolios contain a group of financial assets that are divided into categories, as investors must ensure that there is a good mix of assets in the wallet in which they want to invest their money to maintain the required balance, which helps increase capital growth with relatively less risk. The concept of managing investment wallets emerged to facilitate the process of controlling investment tools. For example, it is not desirable to put all the eggs that you own in one basket, which means that you do not have to take the risk of investing all your money in one wallet or entity to avoid loss exposure (Tardi, 2021; Beattie, 2021).

Regardless of your wallet's asset mix, all wallets must contain some degree of diversification and reflect the investor's risk tolerance, return goals, time horizon, and other relevant constraints, including tax status, liquidity needs, legal situations, and unique circumstances.

1.4. Financial Technology in Iraqi telecom companies

In the wake of three industrial revolutions the world witnessed, our world is living today in the era of the fourth industrial and technological revolution, which is based on unprecedented developments in the field of telecom, information networks, digital technologies, big data, currencies, digital wallets, digitization of accounts and payments, big data series, the use of digital identity and electronic signature.

It was not limited to the financial institutions that are considered the most affected sectors and to benefit from the opportunities imposed by this revolution through the need to use modern technologies in its operations, but the matter was not limited to these financial institutions only but also exceeded that to include the telecom companies. As they advance consumer interactions, telecom firms are now among the top FinTech enablers.

But the important question is, has competition started between the banking sector and telecommunications companies? Who benefits most from this revolution? Is there a winner at the expense of losing the counterparty?

Between integration and competition, the relationship between the banking sector and the telecommunications sector is moving at a fast pace, and between the banks' need for mobile companies as a means of providing services to their customers through smart applications. Telecom companies operating in the local market also need banks to provide digital financial services to their customers, which must be done through an intermediary bank, the researcher finds that Zain Iraq and AsiaCell Iraq provide their services independently, by relying on their branches available in every part of the country, as well as through dealing with financial institutions, especially the Central Bank of Iraq, which is considered the top of the pyramid of financial authority.

Banks mainly rely on their business model to manage customer savings and provide loans, while mobile companies depend on their return on what customers pay for the services they get from voice and data transmission, or for a percentage of the money that is transferred through cash wallets and other services that they provide these companies.

The products and services provided by financial technology (Fintech) in modern ways, of modern quality and quality, and the great impact on financial institutions, such as payment, electronic signature, encrypted currencies, and others, contributed to a qualitative shift in banking methods and methods of dealing and brought about a transformation in the lives of societies and individuals, therefore, it has become difficult for society to refuse or refrain from keeping up with and using the current and imposed financial technology.

These technologies have gained greater momentum and a strong impetus according to the Corona pandemic, the increasing need to implement remote transactions, social divergence, and the total and partial closures of financial institutions (Al-Nasrawi, 2021).

Telecom companies, through their ability to quickly reach the customer, have proven to be more important than financial institutions in providing financial services.

Among the reasons for the success of telecom companies over competitors in attracting customers are:

- Timing, where telecom operators have an opportunity to reach the customer early, as the current generation owns cell phones at a very young age. While telecom firms use phone numbers to identify their consumers, financial technology businesses use account numbers. Telecom businesses may help the unbanked population establish creditworthiness by offering financial services.
- The possibility of reaching the consumer everywhere and at any time, as the possibility of reaching rural and remote areas is one of the reasons for the superiority of telecom companies through the use of the mobile phone as a mobile wallet and enjoying all the services provided by the companies.

The country's endeavor to keep pace with financial technology and its innovations and agree to meet the requirements and suggestions of the financial authority in Iraq represented by the Central Bank necessitated the application of financial technology such as electronic payment via mobile phone in the first place. In addition to the Iraqi market's aspiration for more of this development. Having an average age of 20 is a vital indicator of an individual's interest in financial technology, and this is reflected in the number of social network users.

According to the statistics of some studies, which estimate the population of Iraq to be 39 million in 2021, of whom 50%, or approximately 19 million people, use the Internet. 50% of the population also uses social networks, 17% of whom use smartphones. About 94% of Iraqis own smartphones, which is a very high percentage and promises many advantages. The average age in Iraq is about 20 years, which is a young average age that shows a tendency towards financial technology. Facebook comes on top of the most used social networks in Iraq by 50%, followed by Instagram.

The Iraqi infrastructure for telecom is about 42 out of a 100-point scale. The general index of the Iraqi state in the field of growth and development in the field of telecom reached about 47.5 out of a scale of 100 points. After surveying the users, it was found that 49.73 of them can afford the necessary expenses associated with financial technology developments in Iraq. About 11% of Iraqis own bank accounts, of which 2% own credit cards of all kinds. About 11% of Iraqis use e-commerce applications, most of them men (Yaqoub, et al, 2021).

In addition to what has been mentioned, it is necessary to recognize the important role that profit plays at the local level in private companies (ZainCash, AsiaHawala), which is the basis for their establishment, and was the first catalyst for entering the financial technology revolution, as these companies are expected to generate big profits in the near future.

It is necessary to get acquainted with the financial technology used in each of Zain Iraq (ZainCash Company) and AsiaCell Iraq (AsiaHawala).

1.4.1. ZainCash

ZainCash is a leading company in the field of electronic payment, which was established in 2014 under the supervision of the Central Bank of Iraq. Was launched in 2016 and is affiliated with Zain Iraq Telecom Company. The "ZainCash" service provides Zain Iraq subscribers with the ability to obtain an electronic wallet on their mobile phone number, through which they can benefit from conducting banking transactions at any time. In an easy and fast way (withdrawing and depositing funds, transferring funds from wallet to wallet, recharging prepaid balance and paying bills for postpaid lines). ZainCash was established under license No. 1 from the Central Bank of Iraq. It specializes in providing electronic financial services, and today it performs more than one million financial transactions per month at an exponential growth rate. ZainCash won the 2019 Leading Innovation in Telecom award, and in 2020/2021 it was nominated as the Best Innovation for Humanitarian and Emergency Assistance.

Since the establishment of ZainCash, it has completed billions of electronic financial transactions, whether at the level of individuals or companies, as well as

institutions, including government and organizations. The company has developed a set of packages that have been developed during these years, such as electronic services and solutions to manage various financial transactions in an immediate, fast, safe and effective manner.

ZainCash is an electronic financial account that provides individual users with the ability to convert cash (cash) money into electronic money to transfer money, purchase electronic cards, recharge prepaid lines, pay prepaid lines bills, withdraw and deposit funds, pay bills, and pay bills for merchants through the agent network or any Automated Teller Machine (ATM) in Iraq and the world through Walt Card- Master Card and other solutions to facilitate, speed up and simplify financial transactions. It has also worked to put various packages of solutions and services in the hands of each of the companies, organizations and government institutions, such as the electronic money distribution service for a large number of beneficiaries and employees throughout Iraq, up to the number of beneficiaries from the service exceeded one million Iraqi citizens. ZainCash also allows business owners to add their services and products to the ZainCash application, such as Internet services and e-commerce, with the ability to obtain financial payments and fees for services and products in an immediate, more effective and safe manner. And in a quick way.

1.4.1.1. Advantages and services of ZainCash

1- Western Union, a service provided by ZainCash that works to transfer money globally and make money transfers in different currencies in simple steps through the ZainCash application, you can send and receive money directly through a global network that extends across more than 200 countries around the world.

Features of Western Union service:

- The ability to send and receive money anywhere in the world.
- The ability to check the details of the money transfer process directly from the ZainCash application.
- The ability to send and receive money 24 hours a day, 7 days a week.
- Fast and reliable money transfer.

- Ability to save recipient information for easy retransmission.
- Availability of Western Union outlets in more than 200 countries around the world.

2- Walt Card ZainCash launched this card from the global MasterCard with many advantages to buy what you want from any website on the Internet, withdraw cash from ATMs around the world, shop through websites, and pay in two currencies (Iraqi dinars). And dollars).

WalCard benefits and advantages:

- Buy online from millions of e-commerce sites.
- Supports the currency of the dinar and the dollar at the same time.
- Purchase in US dollars without exchange rate fees when purchasing.
- Supports contactless payment technology.
- It can be used at millions of international locations, points of sale and ATMs around the world.
- Easy to check your balance and transactions through the ZainCash application and SMS messages received with every purchase.
- The ability to freeze the card, stop transactions, and unfreeze is available in the ZainCash application.
- Providing a 24/7 card support team.
- Safe and secured by chips and requires entering a PIN code received via text message on every purchase.

1- A virtual reloadable Visa card, which is a card that enables you to shop online easily and securely, and you can activate it immediately without any additional requirements.

Advantages of the Reloadable Virtual Visa Card:

- It is activated immediately through the ZainCash application.
- Can be used to pay for flight and hotel reservations, subscriptions and online shopping from millions of websites.
- Easy to check your balance and transactions through the ZainCash application and notifications with every purchase.
- Easy to freeze/unfreeze the card.
- Easy to cancel the card.
- The possibility of transferring from the card to the wallet.
- Ease of filling out the card.
- Availability of a support team for the card 24 hours a day, 7 days a week.

4- Depositing and withdrawing funds, which is a service provided by ZainCash to conduct electronic operations by filling the wallet with the balance that the customer wishes to deposit through the customer himself, depositing via Visa and Master Card and depositing from the National Bank of Iraq account, and it is also possible to withdraw funds and make withdrawals Through the agent or withdraw money from an ATM.

5- Transfer and receive money this service allows you to transfer and receive money inside Iraq and from anywhere and at any time through the ZainCash application and wallet. It is characterized by speed and security in transferring money to and from any person inside Iraq without any fatigue. With the possibility of withdrawing money from 10,000 ZainCash agents or ATMs at a low price.

6- Electronic cards through this feature, you can buy all kinds of international electronic cards for games, applications, and programs, such as Apple cards, Google Play, PlayStation, Kareem, Razer, PUBG, and many others, through the “ZainCash” application, and receive them immediately and at any time.

7- Linking the wallet to the bank account through this service, you can link your bank account and wallet to ZainCash, which allows you to enjoy all banking services

through the ZainCash wallet. It also provides you with the service of transferring funds to your wallet from your bank account.

8- Paying government bills through ZainCash, you can easily pay bills or pay part of them, such as electricity, water, internet, social security, passports, housing fund payments and many other services.

9- Charging a mobile sim card, you can recharge your line balance or any other prepaid line within any local network directly through the ZainCash application, and you can also pay your postpaid line bill or any postpaid line within the Zain Iraq network at any time and at any time Anywhere directly via your phone in an easy, fast and secure way.

10- Payment for merchants, where you can shop and pay your purchases and bills from websites that provide the electronic payment service using ZainCash, which allows you to buy various types of goods, services, products, fashion, and airline reservations instantly, easily and safe way. With the possibility of quick payment for stores that accept payment via QR code <https://www.zaincash.iq>.

ZainCash worked on innovations to develop and provide modern electronic services that meet the requirements of users, such as payment and collection services through a QR code, electronic distribution of funds by scanning the iris of the eye, and a control panel for managing electronic distribution. Fund systems and other solutions provided by companies and institutions. And institutions to easily manage their business in a modern and secure technological environment.

ZainCash is not only the first electronic payment company licensed in Iraq, but it is considered today the largest and broadest company covering the regions of Iraq, through a wide network of agents that includes about 8,000 agents throughout Iraq, and the agent network is still constantly growing with more than 500 retail stores that accept Payments through a QR code and hundreds of e-commerce sites that accept online payments through ZainCash, in addition to dozens of companies that pay their employees' salaries through the wallet.

1.4.2. AsiaHawala

AsiaHawala is an Iraqi company registered in (2014). The company is licensed by the Central Bank of Iraq. And it started implementing its activities in (2015) and became the first company that provided new and civilized technical services based on financial solutions. It is a subsidiary of AsiaCell Iraq. The company provides various services such as money transfers, bill payments, and mobile phone top-ups. The use of mobile money transfer services has helped increase financial inclusion in Iraq, especially for those who may not have access to traditional banking services.

AsiaHawala offers a range of services including money transfers, bill payments and mobile top-ups. The company makes it easy for people to access their services through a mobile app that can be downloaded on a smartphone. Customers can easily transfer money to their loved ones or pay bills using their mobile phones. The conversion process is fast and efficient, with transactions completed in just a few minutes. AsiaHawala is a radical solution for those who perform various financial operations

It is worth noting that AsiaHawala provides different types of wallets, including:

1- Temporary wallet

It is a quick wallet for a short period that can be used as its duration does not exceed two months. The temporary wallet can be opened without presenting any documents. The dealing ceiling is 1,000,000 Iraqi dinars within two months.

2- The permanent wallet

It is a permanent wallet for an unlimited period in accordance with the terms and conditions of AsiaHawala. The maximum withdrawal limit is 2,000,000 Iraqi dinars per day, and the transfer limits are a maximum of 5,000,000 Iraqi dinars per month. The upper limit for filling the wallet is 20,000,000 Iraqi dinars.

3- The excellent wallet

It is the wallet obtained by the employer, merchant, agents, or persons with a very high income, as it is subject to procedures determined by the company (each separately) in accordance with the instructions of the Central Bank of Iraq.

4- Portfolio:

- Companies
- Merchants
- Proxies

The dealing ceiling is determined according to existing cases in coordination with the Central Bank of Iraq.

1.4.2.1. The services provided by AsiaHawala include the following

1- Money transfer

This service is provided by AsiaHawala as one of the money transfer options for individuals who own a wallet on their mobile phones, where they can send and receive money among themselves. This service is considered one of the most important options for AsiaHawala, as it provides speed, ease, and security at any time and anywhere.

2- Recharge AsiaCell balance

From now on, you do not have to search for stores at night to buy AsiaCell credit. Now, easily, you can buy AsiaCell credit from home. The process only needs to open an AsiaHawala wallet, and when the wallet is available, you can directly buy an AsiaCell balance from the wallet. The wallet owner can also top up another line from AsiaCell from his wallet.

3- Deposit and withdrawal:

- Depositing money is a free service for the wallet owner to deposit money at AsiaHawala centres to benefit from AsiaHawala services and deal with them.

- Withdrawal of money (cash) is the withdrawal of cash money at will from the wallet with the agents.

4- Buying electronic cards

This service provides types of game cards and electronic cards to purchase various programs through websites, in addition to shopping through websites in a very easy way, also AsiaHawala offers a variety of internet cards that serve all your needs, you can recharge your internet and also renew your monthly subscription.

5- Pay bills, including:

- Recharge Fast Link to recharge the Fast Link anywhere, anytime, without the need to review the sales centres affiliated with Fast Link.

- Charging Earthlink to charge Earthlink and Wi-Fi anywhere, anytime, without the need to visit the sales centres affiliated with Earthlink.

- Payment to the seller this practical method allows its subscribers to pay the value of their purchases of goods and services using their wallet on their mobile phones, starting from paying the transportation fare to the cost of accommodation in 5-star hotels.

- Distribution of salaries, who among us does not dream of receiving a monthly salary without problems and without delay? One of the distinctive services of AsiaHawala is the distribution of salaries to employees. For employees who have an AsiaHawala wallet, their wallet is linked to the system according to salaries. At the time of receiving the salary in their wallet, the employee can withdraw it in cash by visiting an AsiaHawala agent. They can also benefit from the multiple services from AsiaHawala.

- Ticket Reservation AsiaHawala offers a unique service to serve subscribers, which is the service of booking travel tickets from airline websites and paying costs through AsiaHawala with ease and safety.

6- Online payment service

- Manage your invoices and transactions with our simple online reporting tools.

- Acceptance of payment in three languages English, Arabic and Kurdish.
- Easy and simple integration, integration using the connect button and access to payment through our payment gateway.
- Integration solution available for website, mobile app and all other devices.
- Easy and simple steps for your customers to access the payment.

Online Payment Gateway offers a simplified online payment integration solution for businesses with an online presence, Merchant Payment Account is a gateway to get money from customers online in Iraq. When you open a merchant account you can get paid online for products and services. An AsiaHawala merchant account allows businesses to track and manage their transactions, giving you valuable reports and insight into your online payments <https://asiahawala-iq>.

One of the most important global developments during Covid-19 is the rise in the number of consumers participating in global markets, particularly in Iraq. The spread of the coronavirus has sparked a digital revolution that has paved the way for financial technology (fintech).

The Iraqi Economy is gradually recovering in the wake of the serious economic challenges of the past years. However, the lack of infrastructure and public spending dedicated to developing the technology sector has left the burden of investing in this sector on private companies. To encourage the development of the technology industry, the government can take the first step by having clear policies and regulations guiding the sector, as well as a system to avoid monopolies, patent rights, and legal protection against copying. Presently, telecom, online shopping, e-commerce and services, and smartphone applications are among the popular tech businesses operating in the country <https://edf.iom.int/ar/iraq/publications/technology-and-innovation-in-iraq>, a wide range of clients benefits from these services, including individuals, corporations, private companies, NGOs, banks and government institutions. Telecommunications is the technology business category that receives the largest portion of private investment, followed by trade and internet services. However, there are not many similar technology companies.

After getting rid of the Covid-19 pandemic period, financial technology has boomed in the country. But it cannot be compared with the rest of the world, which has risen abnormally, as the electronic payment of users in their daily lives is increasing. Some countries, including Iraq, still lack people's acceptance of dealing with financial technology, such as electronic payment and others, and this is due to reasons including lack of confidence, lack of awareness, and lack of support provided by the government to develop such modern technology.

As a young and growing market, the financial technology sector in Iraq is not subject to particular legal and regulatory restrictions. Fintech businesses are subject to the same rules and regulations that apply to banks, financial institutions, and insurance companies when they engage in regulated activities (Koperly, 2021).

The FinTech business in Iraq is likely to become huge in the coming years, but it is currently limited to a few sub-sectors.

Online shopping, e-commerce and services, and smartphone applications are growing "hot" areas of information systems that are gradually maturing. Despite the fact that the usage of mobile and electronic payment systems is increasing, it is still not as common as in some other nations in the area. When buying products online, cash on delivery and money transfer "hawala" are two of the most typical payment methods, while credit cards are rarely utilized. Electronic commerce (food, real estate, shipping, transportation, and travel services), electronic banking, and digital payments are the most undeveloped areas in Iraq.

In comparison to other Middle Eastern nations, Iraq is sluggish to adopt fintech, has little public investment in the fintech business, and has passed few related rules.

This is due to a number of factors, including the following:

- A sizable unbanked population Only 23% of Iraqi families have access to a financial institution account, according to the World Bank Group. Government personnel, on the other hand, are now paid by Master Card and bank accounts rather than the previous cash payment systems.

- The relative expense of internet and mobile services in relation to income restricts demand for digital financial services.

- Due to security concerns regarding online payments, Iraqis prefer cash on delivery in e-commerce transactions (Koperly, 2021).

On a geographical basis, the MENA area had the most growth in FinTech in 2020, with a 40% gain. Fintech investment is expected to continue in 2022, propelling development in the MENA region's digital economy as customers migrate to cashless payments and the industry benefits from stronger laws. In the meanwhile, according to a McKinsey poll of the Middle East payments business, 30% believe telecom-enabled wallet users have the most impact on the future of payments. This demonstrates that telecom corporations are formidable rivals in the financial technology business.

The transition to digital is expected to be permanent, as mobile phones increasingly power financial services and payments, offering access to fresh data, embracing technical breakthroughs, and altering the way users think (Transactions, 2022).

Despite the state's tendency to digital payment and the replacement of digital payment cards instead of cash, Iraq still has a long way to go.

CHAPTER TWO

FINANCIAL PERFORMANCE

2.1. Meaning and Scope of Financial Performance

Performance, which is a vital goal for any company, as defined in the first stage of research from the perspective of achieving or not achieving organizational goals, but later, as Lupton said in 1977, the focus was on efficiency, effectiveness, and value creation for stakeholders, after several decades of performance research and in 2005 Kirby notes that few studies use consistent definitions and measures. A few years ago, the literature shows a lack of understanding or sufficient clarification in defining the concept of performance (Jenatabadi, 2015), which makes research results inconclusive in terms of measurement tools and their determinants (Ayako et al., 2015).

Performance in the language: an English word derived from the French, which in turn is taken from Latin and means to accomplish or complete. The concept of financial performance means the outputs and objectives that the system seeks to achieve, so it is defined as a concept that reflects both the objectives and the necessary means, that is, it links the activities between the levels of activity and the objectives that it seeks to achieve within the organization (Buhairi, 2003). Performance is the achievement of the purpose of a particular activity or occupation as measured by the standard (Mardiana et al., 2018). Some define financial performance as the process of calculating the monetary value of the results of the company's policies and activities. It is used to evaluate a company's overall financial health over time and may also be used to analyze competitors within the same industry or across industries or sectors (Verma, 2022).

Financial performance, in a larger sense, relates to the extent to which financial goals are met or exceeded, and it is an essential part of financial risk management. It is the process of calculating the monetary value of the outcomes of a company's policies and activities. It is used to assess a company's overall financial health over time and may also be used to compare similar firms in the same industry or to compare industries or sectors in aggregate.

Financial performance is the extent to which activities contribute to value creation or effectiveness in the use of available resources by achieving financial goals at the lowest financial costs (Qlamin, 2018). Existing research (Golubeva, 2021) indicates that opinions on defining and measuring performance are weakly converging, recommending a more comprehensive and creative approach.

Financial performance is a measure that the company uses to determine the degree of use of assets that generate revenues. Through it, the company's financial position is known through financial variables such as property rights, assets, liabilities, revenues and expenses. The financial department undertakes the task of determining the financial position through planning, organizing and directing.

The scope of financial performance is inconceivable more than the financial objectives that financial managers seek to achieve by setting and following specific and carefully studied steps for the success and development of institutions, that financial objectives differ from one company to another and are not limited to companies only, but can be determined by individuals as well.

Financial objectives are:

1. Maximizing revenues
2. Minimizing costs
3. Maximizing profits
4. Improving cash flow
5. Making better investments
6. Structuring capital in a certain way

2.2. Dimensions of financial performance

The complexity of the concept of financial performance is conditioned not only by the fact that it is addressed by various disciplines but also by its multidimensional character. The study of a wide range of domestic and foreign scientific publications and the study carried out by (Nedelcu, 2017, PP. 13-29), on this concept made it possible to identify the most frequently used dimensions of financial performance they are:

2.2.1. Profitability (return)

Profitability ratios reflect the overall performance of the company and are considered one of the most important financial ratios, in contrast to other ratios that reveal the company's ability to generate profits from its sales, and among these ratios are return on assets (ROA), EBTIDA margin, return on investment (ROI), net income / Revenue, return on equity (ROE) and economic value added (EVA) (Jadouaa and Gyas, 2016). It is among the most popular metrics used in financial analysis. Where it is used to know the quality of business and the efficiency with which the firm's assets are employed; it may also be used by investors to assess the investment in this company. Profitability ratios are also used for comparison, whether compared to competing companies or previous years to see if the company is doing well.

2.2.2. Financial result

The financial results or the financial statement, which is the final result of the company, represents a set of financial statements presented within the financial statements dedicated to the company, and it is one of the main financial indicators. Through these reports, the amount of profit or loss of the company is identified over a period of time. It can also be used to assess investment risks, compare with competing companies, see progress in a particular sector, or as a guide when analyzing trends.

It is worth noting that not all companies are required to announce their financial results, the companies listed on the stock exchanges are required to publish their profits frequently in the form of quarterly, semi-annual and end-of-year reports to know the company's performance during the year.

The financial score is a well-defined performance dimension, which accurately estimates a company's ability to generate profits from its activity. Evaluation of this financial performance dimension includes analysis of sales revenue, gross profit, net result, etc (Nedelcu, 2017).

The financial statements that are prepared by the financial accountant according to the accounting principles are:

1. Income statement
2. List of financial position

3. Statement of cash flows
4. List of Shareholders' Rights
5. Statement of comprehensive income (Saleh, 2022).

2.2.3. Growth

2.2.3.1. Market-Share Growth

It is represented by the market share, which refers to the percentage of business volume available for each good or service. It is the period through which the growth of the company's market share is known by comparing the current period with previous periods to know the growth in the market share, where the difference in market share between the current and previous period represents either negative growth and means a decrease in the company's market share or positive and means there is an increase in the share company's market.

2.2.3.2. Asset Growth

The asset growth rate shows how quickly a company is growing its assets. It is calculated as a percentage of the change in assets over a certain period.

2.2.3.3. Net Revenue Growth

Net Revenue Growth means the company's net revenue increase during the restricted inventory unit's restricted period calculated according to the company's audited financial statements made publicly by that company.

2.2.3.4. Net Income Growth

Net income growth measures the percentage increase or decrease in net income from one period to another, usually years, quarters or months. Net income growth is often seen as a sign of a company's efficiency from an operational point of view and willingness to invest from an investment standpoint, but it is highly influenced by the company's goals and challenges and therefore should be evaluated in conjunction with other metrics such as revenue growth, margins, stage of industrial life, etc.

2.2.3.5. Number of Employees Growth

Measures how much a company's workforce has grown or receded over a specific period (Selvam, et al, 2016).

2.2.4. Capital turnover

Capital turnover is the measure that indicates the efficiency and ability of the enterprise in exploiting capital to generate sales, i.e., measuring the percentage of revenue that can be achieved by the company with a certain amount of equity. It is net sales divided by assets (equity), and the higher the ratio, the better. It is a general measure of investment level that can be used to examine investment levels in assets across an entire industry, to get a general idea of which competitors appear to be making the best use of their stock. Among the capital turnover rates are (inventory turnover rate, debtors' turnover rate, payables turnover rate, and cash turnover rate) (Selvam, et al, 2016).

2.2.5. Financial stability

Financial stability relates to the absence of time gaps at the system level during which the financial system fails to perform its functions, and this time gap is called the financial crisis. The concept of financial stability extends to include the flexibility of the financial sector and its ability to absorb situations of severe stress and turmoil. Financial stability is an essential element for achieving economic growth. On the one hand, a stable financial system can absorb shocks and thus reduce the chances of transmission of the impact of negative events on the real economy or other financial systems. It also has multiple other effects on the real economy, including the allocation of resources and directing them towards optimal uses, reducing morale risks, risks of information asymmetry, facilitating payments, reducing cases of bank runs, reducing the deviation of asset prices from their real values substantially, as well as reducing cases of hyperinflation or collapse of financial markets, all of which are events with devastating effects on the financial and economic system (Kanduz, et al, 2022).

2.2.6. Value-added

Value added is the extra value created over and above the original value of something. It can apply to products, services, companies, management, and other areas of business (CFI, 2022).

2.2.7. Market value

Market value is a term used to express the market value of a company or assets in the financial markets. This expression is used to refer to the market value of a company, which is calculated by multiplying the number of shares outstanding by the current market price. Market value is usually determined by some valuations and multiples such as (Earnings Per Share (EPS), Changes in Stock Price, Dividend Yield, Stock Price Volatility, Market Value Added (Market Value / Equity), Tobin's Q (Market Value / Replacement Value of Assets)) (Selvam, et al, 2016).

The market value also depends on many other factors such as the sector in which the company operates, the extent of its profitability, and the debt burdens it incurs, in addition to the market environment.

2.2.8. Ability to pay

The ability to pay means the company can pay its obligations to creditors and other parties in the long term.

2.2.9. Cash flows

Are a statement of the receipts and payments of a company during a specific period. The information contained in this list differs from other financial statements such as the income statement and the statement of financial position in that it helps users of the financial statements in estimating the company's ability to achieve cash flows in the future (Haddad, 2009).

2.2.9.1. Types of Cash Flow

2.2.9.1.1. Cash Flows from Operations (CFO)

Are cash flow activities that either generate revenue or record money spent to produce a service. These activities include inventory transactions, interest payments,

taxes and rent, as well as employee wages. With operating cash flow, we can understand how much cash is generated from the day-to-day activities of the company. Thus, this cash flow information is useful to users of financial statements as a basis for evaluating a company's ability to generate cash to finance operating activities.

2.2.9.1.2. Cash Flows from Investing (CFI)

It is one of the components of the cash flow statement, which shows the number of gains and losses resulting from various activities related to investment during a specific period. Negative cash flow does not necessarily indicate poor financial performance, it may be negative due to long-term investments such as research and development (Kenton, 2022).

2.2.9.1.3. Cash Flows from Financing (CFF)

It is concerned with recording financial activities and transactions involving debts, profits and property rights in a specific period, as well as showing the net cash flows used to finance the company. However, it does not include interest payments or any interest or dividends received by the company rather interest income, expenses and dividends received are included in cash flows from operations. Cash flow from financing activities provides investors with insight into a company's financial strength and how well the company's capital structure is managed.

2.2.10. Financial equilibrium

It should be noted that financial equilibrium is among the most important goals that the institution seeks to achieve. The idea of financial equilibrium stems from the financial budget, given that it depends on the financial equilibrium between liabilities and assets, that is, the extent to which the institution can pay its necessary debts and the ability to meet the due date, and that its assets allow the payment of its necessary debts on the basis that the funds that remain in the institution for more than a year It is the one that will finance the uses in the long term, and the same applies to the current assets that will finance the debts or obligations of the institution in the short term (Adoun, et al, 2001).

The concept of financial equilibrium appeared in a lot of literature and with different opinions by researchers and writers. Its traditional idea was associated with

the equilibrium of the two sides of the budget or the equality between expenses and revenues. As for modern opinions, it showed the limitations of the traditional thought of financial equilibrium because it reflects the real financial situation according to modern perceptions that link financial equilibrium, financial health, and the ability to survive and fulfil various financial obligations. Therefore, it is necessary to present the traditional and modern views of financial equilibrium in order to form an integrated view of it:

2.2.10.1. The traditional concept of financial equilibrium

Financial equilibrium is one of the financial goals that financial management seeks to achieve because it is directly related to financial stability and represents at a specific moment the equilibrium between permanent funds and fixed working capital in a specific period, and this requires equal revenues and expenditures or equal terms for the sources and uses of funds (Achi, 2004), and the content of the financial equilibrium is summarized in the equality of total expenditures with total revenues without the need to resort to borrowing to finance the deficit or to achieve a surplus that may lead to extravagance (Hassan, 2018).

2.2.10.2. Modern financial equilibrium

The modern concept of financial equilibrium replaced the traditional concept with what is called a temporary or organized deficit, which is the possibility of sacrificing the financial equilibrium temporarily and seeking the help of external sources of financing in order to benefit from it in revitalizing the financial performance in order to reach the financial equilibrium again (Hassan, 2018), and that the financial equilibrium is synonymous with the financial health of the company and is the opposite of bankruptcy (Yehorycheva, et al, 2020).

2.2.10.3. Financial equilibrium as a tool for financial analysis

The financial equilibrium is a financial tool that a financial entity can employ to analyze historical financial performance to find out the causes of imbalances in order to avoid them in the future, to ensure high profitability, and for this purpose, it is possible to use various financial indicators that deal with the financial statements of the balance sheet (Achim, et al, 2008).

The financial equilibrium is referred to as a method of financial analysis that uses modern methods that require defining the primary objective of the analysis that any scientific research seeks through the use of financial ratios (Loachim, 2015). Financial equilibrium can also be defined as a process of technical analysis using statistical methods and methods for data, statements and financial statements, the aim of which is to evaluate past and present financial performance and predict future financial performance, and assist the parties benefiting from the analysis in making sound financial decisions (Damache, 2019).

It can be considered an important criterion for evaluating performance as it is a goal that the financial function constantly seeks to achieve in order to achieve safety for the institution because the financial deficit robs the institution of its financial independence under the influence of resorting to borrowing on the one hand (Zubaida, & Jamal El-Din, 2020).

Ensuring financial balance is a prerequisite for obtaining a profitable activity, and this financial balance can only be obtained through approximate and continuous treatment of the lack of balance that is manifested in the current activity of the company. In other words, the balance at the end of the year must be positive or zero. Financial balance can be measured through ratios, profitability, liquidity, solvency and financial flexibility.

2.3. Measurement Of financial performance

The process of measuring performance in the organization is considered an essential process that does not differ from the rest of the administrative processes in it because it gives a clear picture of the extent of proximity or distance from the desired goal (Ben Ayach, & Walwart, 2021).

Measurement in its comprehensive sense was defined as collecting quantitative information on the subject to be measured (Duff, 1999).

Performance measurement is represented in the quantification of procedures and outputs using performance measures, often the entity responsible for measuring performance is the management that sets the institution's programs, it establishes

meaningful units of measurement that are of great benefit to entities that use or make decisions on the basis of those standards (Terry, 1982). Some of them defined it as the continuous monitoring and recording of the achievements of the institution's programs, as well as monitoring and examining progress towards pre-established goals (Imad, 2020). Also, Financial Measure means any financial measure as defined in this agreement whose calculation and presentation are ultimately approved by any registered public accounting firm appointed by the buyer.

Through the foregoing, we can say that the necessary information needed by the organization in analyzing and knowing the results of the necessary operations and procedures is provided by measuring the performance of the organization, which in turn gives the organization a clear picture to propose appropriate solutions and take appropriate decisions in correcting the negative results to reach the desired goal, which is a high future level of performance.

2.3.1. Liquidity Ration

Liquidity ratios are known as short-term financial analysis ratios, and they are considered one of the most important measurement tools specifically for financial performance, by knowing the risks related to the ability to fulfil financial obligations, and among the ratios that fall within the following (Al-Sheikh, 2008):

2.3.1.1. Current Ratio

It indicates the extent to which the company's current assets are able to cover its short-term liabilities (Abu Zaid, 2009), given that the company's assets are a guarantee for liabilities in all cases, and this ratio is calculated by the Formula:

$$\text{Current Ratio} = \text{Current Assets} / \text{Current Liabilities}$$

2.3.1.2. Quick liquidity ratio

Ratio to measure the entity's ability to pay short-term liabilities by using the most liquid current assets and excluding the inventory of current assets. They are calculated as follows:

$$\text{Quick Ratio} = (\text{Current Assets} - \text{Inventory}) / \text{Current Liabilities}$$

2.3.1.3. Cash ratios

This ratio expresses the ability of cash assets to cover short-term liabilities and is calculated by the Formula:

$$\text{Cash ratio} = \text{cash} / \text{current liabilities}$$

2.3.1.4. Working Capital Ratio

It is used to determine the company's ability to finance its daily operations and fulfil its short-term obligations. It is considered an indicator of the company's effectiveness in managing its daily operations and is calculated as follows:

$$\text{Working Capital} = \text{Current Assets} - \text{Current Liabilities}$$

2.3.1.5. Dividend coverage ratio

It expresses the ability of the company's operational activities to pay cash dividends. It is calculated according to the following Formula:

$$\text{DCR} = \text{net income} / \text{dividend declared}$$

$$\text{DCR} = (\text{net income} - \text{required preferred dividend payments}) / \text{dividends declared to common shareholders}$$

2.3.1.6. Capital Expenditure Ratio

It is an indicator of the ability to finance the necessary capital assets based on the cash liquidity resulting from operational activities. It is given by the formula:

$$\text{Capital expenditure ratio} = \text{cash flow from operating activities} / \text{capital expenditures}$$

2.3.2. Profitability ratios

They are used to find out the extent of the company's ability to generate profits during a certain period, and it is an important tool for measuring the management's efficiency in using its existing resources. Among these ratios are the following:

1. Net profit margin

It expresses the net profit achieved after interest and taxes, and is calculated by the formula:

$$\text{“Net profit margin} = (\text{net profit/net sales}) \times 100\text{”}$$

2. Return on Assets (ROA)

It is an indicator of the company's profitability in relation to the range of its assets, and it is an indicator of operational performance (Eawad Allah, 2015), to know the extent to which the company exploits its assets in generating profits, as the rate of return on assets measures the company's operational ability, through the efficient use of invested assets and the ability in order to achieve an appropriate return that covers the costs of investing the assets you own associated with these assets, the rate of return on assets is calculated as follows:

$$\text{Return on assets} = \text{net profit/total assets}$$

3. Return on Equity (ROE)

It is considered an indicator to measure the return achieved from the investment of the owners' funds, and it reveals the management's performance and efficiency through the achieved rate of return. For the increase in financial leverage (Al-Amiri, 2013), its rate is calculated as follows:

$$\text{Return on Equity} = \text{Net Income/Shareholders' Equity}$$

4. Return on invested capital

It expresses the contribution of each dollar of invested funds in sales, and does not necessarily mean that a high rate of return is evidence of an increase in the company's profits, because there may be a part of the invested capital that has not been utilized as required, as it should be like fixed assets. The unemployed and the assets under investment, which requires a study of the profitability of the invested capital (Muhammad, et al, 2008), the rate of return is higher than the rate of borrowing, given the nature of the inverse relationship between borrowing and the profits realized by the shareholders in the company, and the rate of return on invested capital is calculated by the following formula:

The rate of return on invested capital = net operating profit after tax/Invested Capital

5. Coverage ratios

They refer to the extent to which the company can meet its fixed financial obligations from income, and as a result, the company is curious to know how often the management can do so from profits. The most crucial of these are those that enable the financial management to assess the company's financial performance (Ibrahim, 2012):

a. Interest Coverage Ratio:

This ratio measures the extent to which revenues can be reduced before the project loses its ability to meet the interest owed on it.

Interest coverage rate = net income before interest and taxes/interest

Interest Coverage Ratio = Earnings before interest and taxes/Interest Expense

b. Debt Service Coverage Ratio:

This ratio represents the facility's ability to pay its obligations to others, and the management knows very well that its inability to fulfil its obligations may expose the company to bankruptcy.

$$\text{Debt Service Coverage Ratio} = \text{Net Operating Income} / \text{Total Debt Service}$$

c. **Asset Coverage Ratio:**

The asset coverage ratio is similar in nature to the debt service coverage ratio but looks at balance sheet assets instead of comparing income to debt levels. The ratio is measured as:

$$\text{Asset Coverage Ratio} = (\text{Total Assets} - \text{Short-term Liabilities}) / \text{Total Debt}$$

2.3.3. Activity ratios:

These include a set of rates for analyzing the elements of assets, to see how efficient management is in converting these elements into liquidity (Al-Sayyah & Al-Amiri, 2007).

Among these rates, we find:

1. **Asset turnover rate:**

It expresses the company's efficiency in using its assets to generate revenue. It also expresses the company's pricing strategy, and is calculated by the following formula:

$$\text{Asset turnover ratio} = \text{Net sales} / \text{Average total assets}$$

2. **Debtors turnover rate:** It expresses the company's efficiency in converting receivable accounts into liquidity, and it is calculated by the formula:

$$\text{Debtors Turnover Ratio} = \text{Net Credit Sales} / \text{Average Trade Debtors or Receivables}$$

2.3.4. Financial leverage ratios

They express the extent to which the company uses fixed financing costs in order to maximize the impact of the change in net profit before interest and taxes on the net

profit per ordinary share of the realized profits. It is considered an indicator for measuring the degree of use of external financing sources in the financing structure of the company. The size of the risks that the company may face, and among these ratios we find:

1. Debt Ratio

These ratios show the amount of debt contributed to the company's capital, and also allow us to know the extent of its ability to fulfil its financial obligations. They give accurate indicators of the company's financial position in the long term (Karajah, 2006), and they are measured as follows:

$$\textit{Debt Ratio} = \textit{Total Debt/Total Assets}$$

- a. Debt-to-Equity Ratio:

It measures the company's obligations towards its creditors and the extent to which they can obtain their money in the event that the company is exposed to risks such as bankruptcy, for example. Some analysts believe that the maximum limit for this ratio in the industrial field is 1.1, but it cannot be taken as a criterion for all sectors, especially for companies that are active in the banking field, such as banks, as we find that most of their funds are deposits owned by others.

$$\textit{Debt-to-Equity Ratio} = \textit{Total Debt/Total Equity}$$

- b. Short-term debt to equity ratio:

This ratio is used to ensure that the company does not increase short-term borrowing to finance its long-term operations. It is measured as follows:

$$\textit{Short-term debt to equity ratio} = \textit{Short-term debt/equity}$$

c. Equity to Fixed Assets Ratio:

This ratio is an indicator of the type of financing that the company will need in the future, and it expresses the adequacy of the owner's rights in the face of investment to fixed assets, and it is measured as follows:

$$\text{Equity to Fixed Assets Ratio} = \text{Equity} / \text{Total Fixed Assets}$$

2. Coverage ratios:

Aims to know the company's ability to service its debts and its ability to fulfil its obligations. Coverage ratios include the following (Karajah, 2006):

a. Debt-Service Coverage Ratio (DSCR):

It expresses the ability to repay loan instalments from the profits made.

$$(\text{DSCR}) = \text{Net Operating Income} / \text{Total Debt Service}$$

b. Interest Coverage Ratio:

It expresses the extent of the ability to pay interest on loans from the income generated, where the greater the proportion is greater than one, the more the company is able to pay the interest.

$$\text{Interest Coverage Ratio} = \text{Earnings before interest and taxes} / \text{Interest Expense}$$

c. Cash coverage ratio:

$$\text{Cash coverage ratio} = \text{Total cash} / \text{Total interest expense}$$

2.3.5. Market ratios

They largely serve the dealers in the financial markets, and are often issued by international stock exchanges in periodic indicators (Matar, 2016).

Among these ratios, we find:

1. Earnings Per Share:

It is among the most important ratios from the point of view of shareholders, as it measures the returns achieved by shareholders, and this ratio is calculated by the following formula:

$$\text{Earnings Per Share} = (\text{Net Profit} - \text{Preferred Dividends}) / \text{Number of Outstanding Common Stock Shares}$$

2. Dividend Per Share:

This ratio indicates the number of dividends received by the holder of the ordinary share at the end of the year, as it is calculated in the following way:

$$\text{Dividend Per Share} = \text{Total Dividends Paid} / \text{Shares Outstanding}$$

The distribution ratio is used in evaluating the policies followed by the company's management in distributing profits and determining the company's financing policies, by separating between internal and external financing sources (Al-Sheikh, 2008).

Performance analysis is the study of company financial statements to discover a firm's strengths and weaknesses. It also involves the comparative analysis of a company's overall financial health. Company performance in a current fiscal year is compared to previous periods and competitors' performance (Team, 2022).

2.4. Relationship between financial technology and financial performance

The financial world has changed drastically over the past decade. One of the most important developments is the emergence of financial technology or FinTech. This type of technology has had a profound impact on the way financial services are provided, from banking to investments and beyond. Financial technology depends on using technology to improve financial services and facilitate financial operations. Financial technology is one of the recent developments that greatly affect the financial performance of companies and financial institutions. What is the impact of financial

technology on financial performance? To answer this question, it is important to look at the different types of FinTech that are available. For example, mobile banking apps are getting more and more popular and making it easier for people to manage their finances. These apps allow users to check their balance, transfer money and pay bills at the touch of a button. This type of technology is particularly useful for those who have limited access to traditional banking services, as it allows them to take control of their finances without having to visit a physical site. Another type of FinTech is using artificial intelligence and machine learning in financial services. This new technology is beginning to revolutionize how financial services are provided, from automated trading to financial planning to credit scoring. By leveraging these powerful technologies, financial services can become more efficient and cost-effective. As a result, financial performance is likely to improve. Finally, FinTech also helps improve access to financial services, for example, mobile banking applications make it easier for people in developing countries to access banking services. This is especially important for those who may not have access to traditional banking options. It also helps reduce the cost of providing financial services, making them more accessible to people who may not have had access to them before. In the end, financial technology has a significant impact on financial performance. Not only does it make financial services more efficient and cost-effective, but it also makes them more accessible to more people. All of this is likely to lead to better financial performance in the future. According to a report published by the global company "Deloitte" in 2020, companies that invest in financial technology achieve 20% better financial performance compared to companies that do not invest in it. The report also indicated that investing in financial technology helps improve user experience and increase customer loyalty.

Financial technology advantages include the high opportunity for innovation which may have a positive effect on overall economic development. With this opportunity, there is an increased interest in modern financial services which aim to provide quality financial services to clients from anywhere in the world (Saksonova & Kuzmina-Merlino, 2017).

Although financial technology helps improve the financial performance of companies and financial institutions, it faces some challenges and risks that must be faced. Among these challenges and risks: Are financial security and privacy, as

companies and financial institutions must implement strict security measures to protect customers' financial data, and ensure that online banking and electronic payment applications comply with international security standards. Companies and financial institutions must also identify potential financial risks related to FinTech technologies and take the necessary measures to deal with them.

Numerous studies and analyses have been done on the connection between financial technology and the financial success of academics and business professionals.

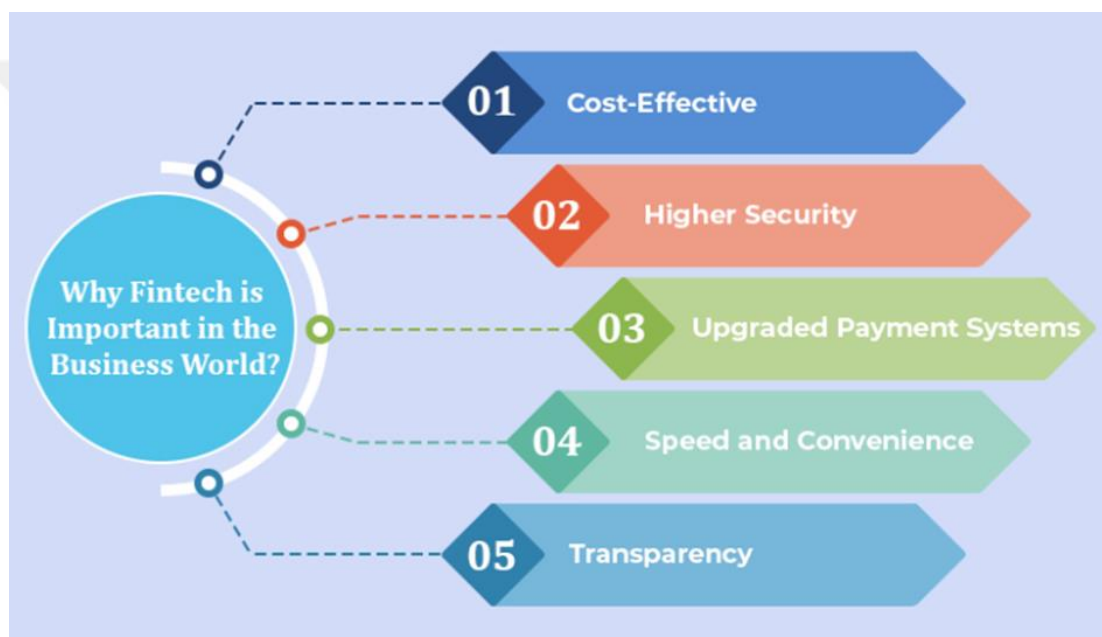


Figure 4. Why FinTech is important?

Through what was mentioned in the previous chapters, it is possible to explain the relationship between financial technology, such as payment by mobile phone used in Iraqi communication companies (ZainCash and AsiaHawala) and the financial performance represented by the return on assets and return on equity in the same company, as well as the relationship of these companies Banks in several ways:

First, fintech can impact financial performance by increasing the efficiency of payment processes and improving customer experience. For example, when customers can pay via mobile phone easily and quickly, this may increase sales volume and reduce transaction costs, increasing the company's return on assets and return on

equity, as in the study that did by Gupta et al analyzed how fintech affects different aspects of banking, including financial performance, and conclude that fintech has the potential to enhance financial performance by increasing efficiency, reducing costs, and improving customer satisfaction (Gupta, R., & Sodhi, M., 2018).

Secondly, financial technology can contribute to strengthening the relationship between telecom companies and banks. For example, financial technology can contribute to facilitating financial transfers between customers and banks, which enhances cooperation between the two sides and enhances the financial return of companies and banks alike, as the World Bank Report, 2017 highlights how digital financial services have expanded access to financial services, particularly for underserved populations, and improved financial performance by reducing transaction costs and increasing efficiency (World Bank Group, 2017).

In addition, financial technology can contribute to expanding the range of financial services that can be provided by telecom companies. For example, companies can provide digital payment services, electronic finance, insurance, and other financial services that can increase the financial return of companies, as in the study that did by Hasan et al find that fintech has a positive impact on financial inclusion, which in turn improves financial performance by reducing poverty and increasing economic growth (Hasan, I., Kim, S., & Wu, E., 2019).

In general, it can be said that financial technology plays an important role in improving the financial performance of Iraqi telecom companies by increasing efficiency, improving customers' financial experience, enhancing cooperation with banks, and expanding the range of financial services provided.

CHAPTER THREE

METHODOLOGY, MODELLING, AND DATA COLLECTION

3.1. Methodology

This is one of several quantitative studies that use time series analysis and econometrics to investigate the Impact of Financial Technology, as represented by electronic portfolios such as AsiaHawala in AsiaCell company and ZainCash in Zain Iraq company, as represented by electronic payment by mobile phone on Financial Performance, as represented by return on assets (ROA) and return on equity (ROE): An Empirical Study on The Telecom Companies, (AsiaCell and Zain Iraq) over the period from (Q2) 2017 to (Q3) 2022 in Iraq.

This thesis aims to examine the long-term and short-term effects of financial technology on the financial performance of telecom companies in Iraq. Co-integration studies were used to look for relationships between two or more time series over long stretches of time, while the vector error correction model was used to look for short-term effects. Two commonly used methods are utilized to conduct unit root analyses: the Phillips and Perron (PP) test from 1988 and the Augmented Dickey and Fuller (ADF) test from 1979.

The researcher employed the ARDL-bound testing methodology established by scholars such as Pesaran, Shin, and Smith (2001) to analyze long-run connections between variables in the study. The ARDL method provides a number of benefits over the standard cointegration model. The ARDL approach can be used in cases where variables are stationary at different levels but standard cointegration cannot be used. Another benefit of the ARDL model is that it may be used for tiny sample sizes, whereas the standard cointegration model only applies to rather high sample sizes. Because the sample size in the thesis is modest, the researcher used the ARDL model for this investigation.

In this thesis, the researcher used ARDL systematic approaches and conducted some analyses to learn about the relationship between financial technology represented by electronic portfolios, such as the AsiaHawala and ZainCash wallets, and financial performance represented by return on assets (ROA) and return on equity (ROE), so the

first analyses involve checking stationarity for time series data. Unit root studies are commonly used to study stationarity.

3.2. Modelling

The primary concept behind this thesis is to investigate the link between financial technology, as represented by electronic portfolios such as AsiaHawala and ZainCash, and financial performance, as represented by return on assets (ROA) and return on equity (ROE).

First equation:

$$Y1 = a + b X$$

Second equation:

$$Y2 = a + b X$$

In equation one, (Y1) indicates financial performance, as represents the return on assets (ROA), (a) indicates the constant term, (b) (Beta) indicates the amount of change and (X) represents financial technology as represented by electronic portfolios such as AsiaHawala and ZainCash portfolios.

In the second equation, (Y2) indicates financial performance, represents the return on equity (ROE), (a) indicates the constant term, (b) (Beta) indicates the amount of change and (X) represents financial technology as represented by electronic portfolios such as AsiaHawala and ZainCash portfolios.

In order to analyze the short- and long-term link between financial technology and financial performance, equation 3 represents the long-run ARDL model and equation 4 represents the short-run ARDL method.

Third equation:

$$\Delta Y_t = \xi_0 + \xi_1 EX_{t-i} + \varepsilon_t$$

Fourth equation:

$$\Delta Y_t = \gamma_0 + \gamma_i \sum \Delta X_{t-i} + \phi EC_{t-i} + \varepsilon_t$$

In Equation 3, (ΔY_t) denotes the first difference of the Y series, the long-run coefficient is represented by the parameter (ξ_1), and (EX_{t-i}) refers to the covariance.

$$(EX_t - i) = E(Z_t + \theta_1 Z_{t-1} + \theta_2 Z_{t-2}) = 0$$

In Equation 4, (Y_i) represented the short-run coefficients, whereas (EC) represented the error correction term's coefficient, which measures how quickly adjustments are made in the long run, and (ϵ_t) is the disturbance term.

3.3. Data Collection

This study investigates the Autoregressive Distributed Lag (ARDL) cointegration technique or constrained cointegration approach in Iraq from (Q2) 2017 to (Q3) 2022, taking data availability into consideration. Data was gathered from the Central Bank of Iraq, the Iraqi Stock Exchange, and the Iraqi telecom firms AsiaCell Iraq and Zain Iraq.

The study's variables include financial technology represented through electronic portfolios, such as the AsiaHawala and ZainCash portfolios, as well as financial performance measured by the return on assets (ROA) and the return on equity (ROE).

CHAPTER FOUR

EMPIRICAL RESULTS AND DISCUSSION

4.1. Unit Roots Analysis for Zain

4.1.1 Stability tests for research variables (PP)

Table 2. Unit Root Test Table (pp)

At Level				
		Y1	Y2	X1
With Constant	t-Statistic	-6.55	-4.42	-1.67
	Prob.	0.00	0.00	0.43
		***	***	no
With Constant & Trend	t-Statistic	-6.62	-4.28	-2.02
	Prob.	0.00	0.01	0.56
		***	**	no
Without Constant & Trend	t-Statistic	-3.03	-2.34	-0.02
	Prob.	0.00	0.02	0.66
		***	**	no

Notes: (*) Significant at 10%; (**) Significant at 5%; and (***) Significant at 1%. Also, (no) Not Significant

Source: Output from EViews version (13)

Table 3. At First Difference

At First Difference				
		d(Y1)	d(Y2)	d(X1)
With Constant	t-Statistic	-11.34	-9.87	-5.21
	Prob.	0.00	0.00	0.00
		***	***	***
With Constant & Trend	t-Statistic	-14.42	-12.69	-5.20

	Prob.	0.00	0.00	0.00
		***	***	***
Without Constant & Trend	t-Statistic	-11.73	-10.21	-5.07
	Prob.	0.00	0.00	0.00
		***	***	***

Notes: (*) Significant at the 10%; (**) Significant at the 5%; (***) Significant at the 1%. And (no) Not Significant

Source: Output from EViews version (13)

Table (2) shows the stability tests for the variables (X1, Y1 and Y2) for Zain Iraq Telecom Company from the second quarter of 2017 to the third quarter of 2022. Table (2) shows the stability test according to the Phillips and Perron (PP) method at the original level of the data, and from it, the researcher finds the variables (Y1 and Y2) are stationary at the original level, while the variable (X1) is not stationary at the original level, As shown in Table (3), the first difference is used for (X1) and since the variables (Y1 and Y2) are stationary at the original level and the variable (X1) is stationary at the first difference. It is preferable to use the (ARDL) method to estimate the relationship in such a case.

4.1.2 Stability tests for research variables (ADF)

Table 4. Dickey-Fuller (ADF) Unit Root Test

UNIT ROOT TEST TABLE (ADF)				
At Level				
		Y1	Y2	X1
With Constant	t-Statistic	-1.384	-0.8921	-1.6739
	Prob.	0.5651	0.7665	0.4292
		no	no	no
With Constant & Trend	t-Statistic	-0.5308	-0.3829	-2.0423
	Prob.	0.9709	0.9796	0.546

		no	no	no
Without Constant & Trend	t-Statistic	-0.2796	-0.3259	-0.0197
	Prob.	0.571	0.5536	0.6648
		no	no	no

Notes: (*) Significant at 10%; (**) Significant at 5%; and (***) Significant at 1%. And, (no) Not Significant

Source: Output from EViews version (13)

Table 5. At First Difference

At First Difference				
		d(Y1)	d(Y2)	d(X1)
With Constant	t-Statistic	-13.6441	-9.6318	-5.2068
	Prob.	0.000	0.000	0.0005
		***	***	***
With Constant & Trend	t-Statistic	-15.56	-10.9314	-5.1975
	Prob.	0.0001	0.000	0.0025
		***	***	***
Without Constant & Trend	t-Statistic	-14.1227	-9.9682	-5.0704
	Prob.	0.0001	0.0001	0.000
		***	***	***

Notes: (*) Significant at the 10%; (**) Significant at the 5%; (***) Significant at the 1%. And (no) Not Significant

Source: Output from EViews version (13)

In Table (4), the results of the stability tests and the search variables according to the Unit Root Test (ADF)

From it, the researcher finds, according to the results of Table (4), that all variables are non-stationarity at the level, and become static when taking the first difference for them, as in Table (5).

4.2. The results of the return on assets (ROA) model for Zain

4.2.1. Lag Order Selection Analysis

Estimating the relationship between financial technology and financial performance in (Zain Iraq Telecom Company)

Estimating the impact of financial technology on return on assets (ROA) in Zain Iraq Telecom Company using the (ARDL) method.

Table 6. Initial Estimation of (ARDL) Model

Dependent Variable: Y1
Method: ARDL
Date: 04/11/23 Time: 22:32
Sample (adjusted): 5 22
Included observations: 18 after adjustments
Maximum dependent lags: 4 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (4 lags, automatic): X
Fixed regressors: C @TREND
Number of models evaluated: 20
Selected Model: ARDL(3, 4)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Y1(-1)	-0.921554	0.126117	-7.307122	0.0001
Y1(-2)	-1.019652	0.112410	-9.070812	0.0000
Y1(-3)	-1.038209	0.137238	-7.565031	0.0001
X	0.005497	0.002217	2.479111	0.0382
X(-1)	0.006238	0.002791	2.235179	0.0558
X(-2)	0.000355	0.002712	0.131026	0.8990
X(-3)	0.006581	0.002772	2.373622	0.0450
X(-4)	0.009271	0.002229	4.159229	0.0032
C	3.952159	0.405664	9.742446	0.0000
@TREND	-0.337042	0.040836	-8.253635	0.0000
R-squared	0.939498	Mean dependent var	0.959389	
Adjusted R-squared	0.871434	S.D. dependent var	1.135982	
S.E. of regression	0.407319	Akaike info criterion	1.341741	
Sum squared resid	1.327271	Schwarz criterion	1.836392	
Log likelihood	-2.075671	Hannan-Quinn criter.	1.409947	
F-statistic	13.80308	Durbin-Watson stat	1.143315	
Prob(F-statistic)	0.000567			

Source: Output from EViews version (13)

Table (6) shows the results of the initial estimation of the impact of financial technology on the return on assets (ROA) in Zain Iraq Telecom Company according to the (ARDL) method. From the results, the researcher finds that the best model to be chosen from the rank is ARDL (3-4), and this means that the dependent variable is

affected by return on assets (ROA) for three prior periods while the independent variable is affecting on returns on assets (ROA) for four prior periods and current.

This model was selected based on the AIC standard, as shown in Figure (5).

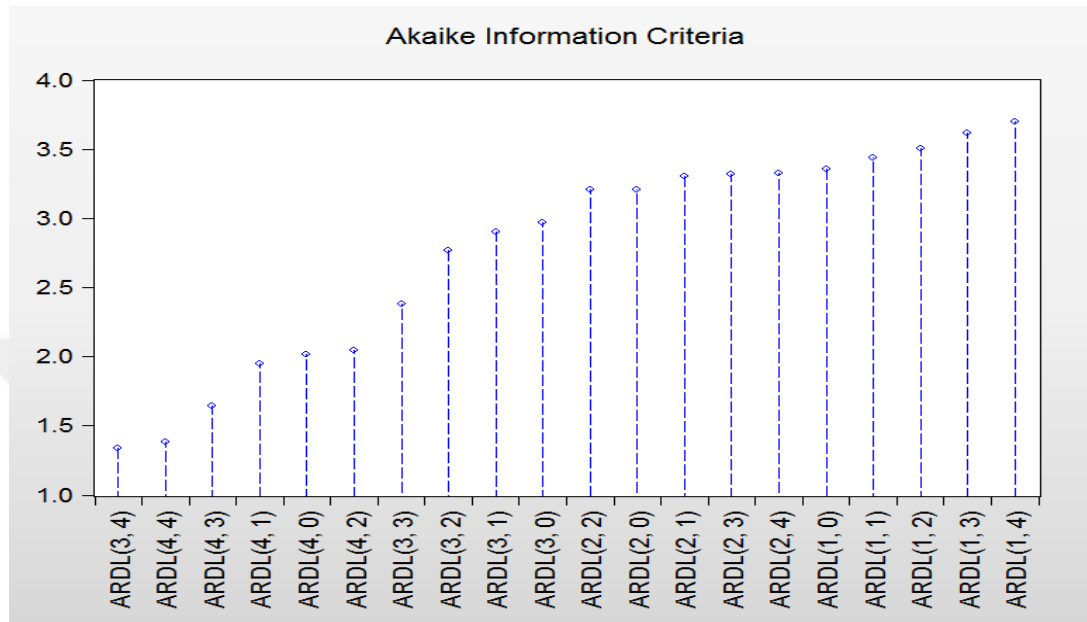


Figure 5. AIC standard
Source: Output from EViews version (13)

Figure (5) shows that the best lag period for the (ARDL) model is ARDL (3-4), as according to this criterion the lowest value of (AIC) is achieved.

4.2.2. Bounds test

Table 7. ARDL Bounds test

ARDL Bounds Test		
Date: 04/11/23 Time: 22:36		
Sample: 5 22		
Included observations: 18		
Null Hypothesis: No long-run relationships exist		
Test Statistic	Value	k
F-statistic	83.75378	1
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	5.59	6.26
5%	6.56	7.3
2.5%	7.46	8.27
1%	8.74	9.63

Source: Output from EViews version (13)

The Bounds test, as shown in Table (7), shows that the F-statistic, amounting to (83.75), which is greater than the critical value band at the upper limit and at the level of (0.01), which means there are a cointegration and long-run equilibrium between financial technology and return on assets (ROA) research period.

4.2.3. Estimating the short- and long-run response

Table 8. Short- and long-run response

ARDL Cointegrating And Long Run Form
 Dependent Variable: Y1
 Selected Model: ARDL(3, 4)
 Date: 04/11/23 Time: 22:52
 Sample: 1 22
 Included observations: 18

Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(Y1(-1))	2.057861	0.212892	9.666217	0.0000
D(Y1(-2))	1.038209	0.137238	7.565031	0.0001
D(X)	0.005497	0.002217	2.479111	0.0382
D(X(-1))	-0.000355	0.002712	-0.131026	0.8990
D(X(-2))	-0.006581	0.002772	-2.373622	0.0450
D(X(-3))	-0.009271	0.002229	-4.159229	0.0032
D(@TREND())	-0.337042	0.040836	-8.253635	0.0000
CointEq(-1)	-3.979415	0.308904	-12.882385	0.0000

Cointeq = Y1 - (0.0070*X + 0.9932 -0.0847*@TREND)

Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
X	0.007022	0.000640	10.978919	0.0000
C	0.993151	0.072174	13.760422	0.0000
@TREND	-0.084696	0.008968	-9.444591	0.0000

Source: Output from EViews version (13)

Table (8) shows the results of the short-run and long-run response between financial technology and the return on assets (ROA) in the Zain Iraq Telecom Company, and from the results, the researcher finds the short-run equation that the Vector Error Correction Model (VECM), here represented as CointEq (-1), is negative with an associated coefficient estimate of (-3.9794) This implies that about (3.9794) of any movements into disequilibrium are corrected within one period (quarterly). Moreover, given the very large t-statistic, namely (-12.882385), we can also conclude that the coefficient is highly significant.

The long-run results show that there is a necessary effect of financial technology on the return on assets (ROA) in Zain Iraq Telecom Company, this effect will continue

throughout the research period as an increase in financial technology by one billion Iraqi dinars leads to an increase in the return on assets (ROA) by (0.007022). From the foregoing, we conclude that there is a long-term equilibrium relationship between the variables during the research period and that both variables have common trends in the long term, meaning they walk together during the research period, despite the occurrence of some imbalances during the short period.

4.2.4. Validity checks

Table (9) shows the results of the Heteroskedasticity test according to the (LM) method. From the results, the researcher found that the null hypothesis was not rejected, which means that the model is free of the problem of Heteroskedasticity at a significant level (0.05).

Table 9. LM Test

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.950509	Prob. F(2,6)	0.4379
Obs*R-squared	4.330877	Prob. Chi-Square(2)	0.1147
Heteroskedasticity Test: ARCH			
F-statistic	1.132006	Prob. F(3,11)	0.3785
Obs*R-squared	3.538496	Prob. Chi-Square(3)	0.3158

Source: Output from EViews version (13)

Table (9) shows the results of the Heteroskedasticity test according to the (ARCH) method, the model is devoid of the problem of the Heteroskedasticity test of variance at a significant level greater than (0.05).

4.3. The results of the return on equity (ROE) model for Zain

4.3.1. Lag Order Selection Analysis

Estimating the relationship between financial technology and financial performance in (Zain Iraq Telecom Company)

Estimating the impact of financial technology on return on equity (ROE) in Zain Iraq Telecom Company using the (ARDL) method

Table 10. Initial Estimation of (ARDL) Model

Dependent Variable: Y2
Method: ARDL
Date: 04/11/23 Time: 22:55
Sample (adjusted): 5 22
Included observations: 18 after adjustments
Maximum dependent lags: 4 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (4 lags, automatic): X
Fixed regressors: C @TREND
Number of models evaluated: 20
Selected Model: ARDL(3, 4)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Y2(-1)	-0.928356	0.125828	-7.377956	0.0001
Y2(-2)	-1.038251	0.108745	-9.547585	0.0000
Y2(-3)	-1.070116	0.141492	-7.563087	0.0001
X	0.006636	0.002258	2.938769	0.0187
X(-1)	0.010016	0.002896	3.458997	0.0086
X(-2)	0.001234	0.002719	0.453905	0.6620
X(-3)	0.008983	0.002865	3.135537	0.0139
X(-4)	0.014454	0.002401	6.019931	0.0003
C	5.180620	0.475489	10.89536	0.0000
@TREND	-0.480999	0.046793	-10.27937	0.0000
R-squared	0.947336	Mean dependent var	1.295389	
Adjusted R-squared	0.888088	S.D. dependent var	1.243856	
S.E. of regression	0.416109	Akaike info criterion	1.384444	
Sum squared resid	1.385177	Schwarz criterion	1.879095	
Log likelihood	-2.459997	Hannan-Quinn criter.	1.452650	
F-statistic	15.98952	Durbin-Watson stat	0.902474	
Prob(F-statistic)	0.000333			

Source: Output from EViews version (13)

Table (10) shows the results of the initial estimation of the impact of financial technology on the return on equity (ROE) in Zain Iraq Telecom Company according to the (ARDL) method. From the results, the researcher finds that the best model to be chosen from the rank is ARDL (3-4), and this means that the dependent variable is affected by return on equity (ROE) for three prior periods while the independent variable is affecting on returns on equity (ROE) for four prior periods and current.

This model was selected based on the AIC standard, as shown in Figure (6).

Akaike Information Criteria

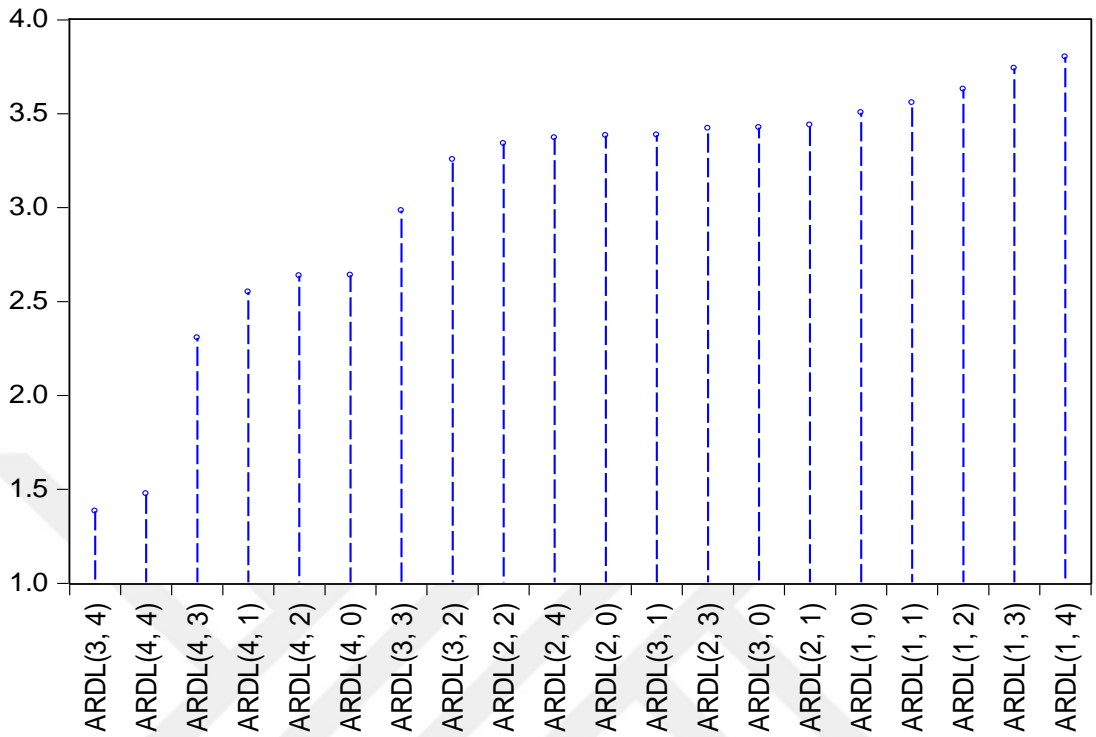


Figure 6. AIC standard

Source: Output from EViews version (13)

Figure (6) shows that the best lag period for the (ARDL) model is ARDL (3-4), as according to this criterion the lowest value of (AIC) is achieved.

4.3.2. Bounds Test

Table 11. ARDL Bounds test

ARDL Bounds Test
Date: 04/11/23 Time: 23:04
Sample: 5 22
Included observations: 18
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	84.88013	1

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	5.59	6.26
5%	6.56	7.3
2.5%	7.46	8.27
1%	8.74	9.63

Source: Output from EViews version (13)

The Bounds test, as shown in Table (11), shows that the F-statistic, amounting to (84.88), which is greater than the critical value band at the upper limit and at the level of (0.01), which means there is a cointegration and long-run equilibrium between financial technology and return on equity (ROE) research period.

4.3.3. Estimating the short- and long-run response

Table 12. Short- and long-run response

ARDL Cointegrating And Long Run Form
 Dependent Variable: Y2
 Selected Model: ARDL(3, 4)
 Date: 04/11/23 Time: 23:06
 Sample: 1 22
 Included observations: 18

Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(Y2(-1))	2.108367	0.214221	9.842043	0.0000
D(Y2(-2))	1.070116	0.141492	7.563087	0.0001
D(X)	0.006636	0.002258	2.938769	0.0187
D(X(-1))	-0.001234	0.002719	-0.453905	0.6620
D(X(-2))	-0.008983	0.002865	-3.135537	0.0139
D(X(-3))	-0.014454	0.002401	-6.019931	0.0003
D(@TREND())	-0.480999	0.046793	-10.279375	0.0000
CointEq(-1)	-4.036724	0.312321	-12.924935	0.0000

Cointeq = Y2 - (0.0102*X + 1.2834 -0.1192*@TREND)

Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
X	0.010237	0.000646	15.842139	0.0000
C	1.283372	0.072819	17.624152	0.0000
@TREND	-0.119156	0.009123	-13.061562	0.0000

Source: Output from EViews version (13)

Table (12) shows the results of the short-run and long-run response between financial technology and the return on equity (ROE) in the Zain Iraq Telecom Company, and from the results, the researcher finds the short-run equation that the Vector Error Correction Model (VECM), here represented as CointEq (-1), is negative with an associated coefficient estimate of (-4.036724) This implies that about (4.036724) of any movements into disequilibrium are corrected within one period (quarterly). Moreover, given the very large t-statistic, namely (-12.924935), we can also conclude that the coefficient is highly significant.

The long-run results show that there is a necessary effect of financial technology on the return on equity (ROE) in Zain Iraq Telecom Company, this effect will continue throughout the research period as an increase in financial technology by one billion Iraqi dinars leads to an increase in the return on equity (ROE) by (0.010237). From the foregoing, we conclude that there is a long-term equilibrium relationship between the variables during the research period and that both variables have common trends in the long term, meaning they walk together during the research period, despite the occurrence of some imbalances during the short period.

4.3.4. Validity checks

Table (13) shows the results of the Heteroskedasticity test according to the (LM) method. From the results, the researcher finds that the null hypothesis was not rejected, which means that the model is free of the problem of eteroskedasticity at a significant level (0.05).

Table 13. LM Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.871415	Prob. F(1,7)	0.2136
Obs*R-squared	3.797079	Prob. Chi-Square(1)	0.0513

Heteroskedasticity Test: ARCH

F-statistic	2.163953	Prob. F(2,13)	0.1544
Obs*R-squared	3.996241	Prob. Chi-Square(2)	0.1356

Source: Output from EViews version (13)

Table (13) shows the results of the Heteroskedasticity test according to the (ARCH) method, the model is devoid of the problem of the Heteroskedasticity test at a significant level greater than (0.05).

4.4. Unit Roots Analysis

4.4.1. Stability tests for research variables (PP)

The results of the variables of financial technology (X1) and financial performance in AsiaCell Telecom Company in Iraq (Y1) (Y2)

Table 14. Unit Root Test Table (PP)

UNIT ROOT TEST TABLE (PP)				
At Level				
		X1	Y1	Y2
With Constant	t-Statistic	-2.74867	-4.11072	-4.37888
	Prob.	0.082844	0.004956	0.002757
		*	***	***
With Constant & Trend	t-Statistic	-2.61377	-10.2519	-9.14
	Prob.	0.278146	4.45E-08	8.23E-07
		n0	***	***
Without Constant & Trend	t-Statistic	-1.45177	-2.08145	-2.36648
	Prob.	0.132939	0.038573	0.020619
		n0	**	**

Notes: (*) Significant at the 10%; (**) Significant at the 5%; (***) Significant at the 1%. And (no) Not Significant

Source: Output from EViews version (14)

Table 15. At First Difference

At First Difference				
		d(X1)	d(Y1)	d(Y2)
With Constant	t-Statistic	-5.64127	-13.7676	-12.746
	Prob.	0.000199	3.27E-21	2.32E-16
		***	***	***
With Constant & Trend	t-Statistic	-5.65704	-12.5346	-13.6956

	Prob.	0.001013	4.43E-10	2.59E-12
		***	***	***
Without Constant & Trend	t-Statistic	-5.8122	-12.4098	-12.1836
	Prob.	5.90E-06	3.26E-06	2.13E-06
		***	***	***

Notes: (*) Significant at the 10%; (**) Significant at the 5%; (***) Significant at the 1%. And (no) Not Significant

Source: Output from EViews version (13)

Table (14) shows the stability tests for the variables (X1, Y1 and Y2) for AsiaCell Telecom Company from the second quarter of 2017 to the third quarter of 2022. Table (14) shows the stability test according to the Phillips and Perron (PP) method at the original level of the data, and from it, the researcher finds the variables (Y1 and Y2) are stationarity at the original level, while the variable (X1) is non-stationarity at the original level, so the first difference is taken for (X1) as in Table (15) and since the variables (Y1 and Y2) are stationarity at the original level and the variable (X1) is stationarity at the first difference. It is preferable to use the (ARDL) method to estimate the relationship in such a case.

4.4.2. Stability tests for research variables (ADF)

Table 16. Dickey-Fuller (ADF) Unit Root Test

UNIT ROOT TEST TABLE (ADF)				
At Level				
		X1	Y1	Y2
With Constant	t-Statistic	-2.7287	0.101113	-1.53737
	Prob.	0.085971	0.956475	0.491208
		*	n0	n0
With Constant & Trend	t-Statistic	-2.61377	-1.32793	-15.9491
	Prob.	0.278146	0.846568	0.0001

		n0	n0	***
Without Constant & Trend	t-Statistic	-1.45177	3.290954	2.889041
	Prob.	0.132939	0.99908	0.997752
		n0	n0	n0

Notes: (*) Significant at the 10%; (**) Significant at the 5%; (***) Significant at the 1%. And (no) Not Significant

Source: Output from EViews version (13)

Table 17. At First Difference

At First Difference				
		d(X1)	d(Y1)	d(Y2)
With Constant	t-Statistic	-5.38965	-15.46	-21.4791
	Prob.	0.000337	9.50E-47	6.39E-58
		***	***	***
With Constant & Trend	t-Statistic	-5.34954	-14.9702	-5.15148
	Prob.	0.001861	0.0001	0.003851
		***	***	***
Without Constant & Trend	t-Statistic	-5.53846	-1.95249	-1.15622
	Prob.	1.05E-05	0.051055	0.214843
		***	*	n0

Notes: (*) Significant at 10%; (**) Significant at 5%; and (***) Significant at 1%. And, (no) Not Significant

Source: Output from EViews version (13)

In Table (16), the results of the stability tests and the search variables according to the Unit Root Test (ADF)

From it, the researcher finds, according to the results of Table (16), that all variables are non-stationarity at the level, and become stationarity when taking the first difference for them, as in Table (17).

4.5. The results of the return on assets (ROA) model for AsiaCell

4.5.1. Lag Order Selection Analysis

Estimating the relationship between financial technology and financial performance in (AsiaCell Telecom Company)

Estimating the impact of financial technology on return on assets (ROA) in AsiaCell Telecom Company using the (ARDL) method.

Table 18. Initial Estimation of (ARDL) Model

Dependent Variable: Y1
Method: ARDL
Date: 04/03/23 Time: 23:05
Sample (adjusted): 9 22
Included observations: 14 after adjustments
Maximum dependent lags: 2 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (8 lags, automatic): X
Fixed regressors:
Number of models evaluated: 18
Selected Model: ARDL(2, 8)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Y1(-1)	-0.202243	0.205692	-0.983233	0.3980
Y1(-2)	-0.703278	0.193644	-3.631809	0.0359
X	0.003674	0.011307	0.324942	0.7666
X(-1)	0.006079	0.013462	0.451525	0.6823
X(-2)	0.009857	0.013152	0.749505	0.5080
X(-3)	-0.013761	0.011786	-1.167587	0.3273
X(-4)	0.029357	0.012174	2.411463	0.0949
X(-5)	0.008735	0.013311	0.656244	0.5585
X(-6)	0.048313	0.014070	3.433778	0.0414
X(-7)	-0.022574	0.013424	-1.681621	0.1912
X(-8)	0.042647	0.011498	3.708946	0.0341
R-squared	0.929613	Mean dependent var		3.755992
Adjusted R-squared	0.694991	S.D. dependent var		3.045654
S.E. of regression	1.682042	Akaike info criterion		3.908878
Sum squared resid	8.487799	Schwarz criterion		4.410994
Log likelihood	-16.36215	Hannan-Quinn criter.		3.862398
Durbin-Watson stat	2.018881			

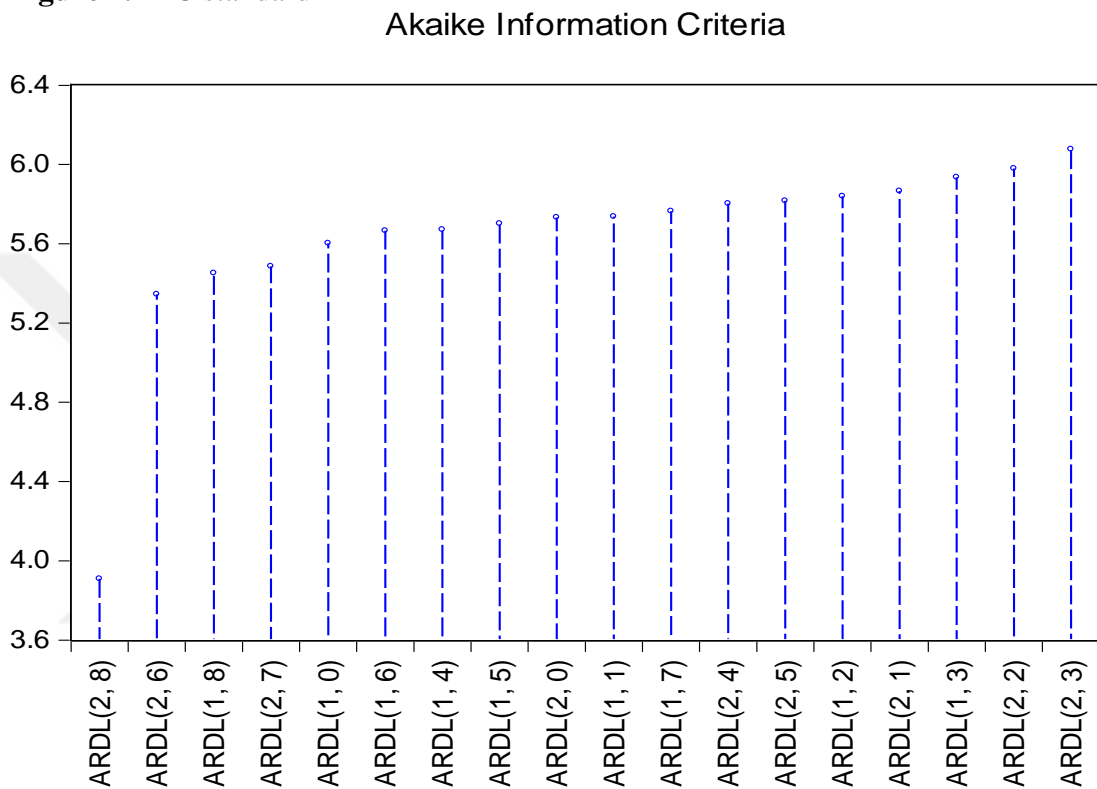
Source: Output from EViews version (13)

Table (18) shows the results of the initial estimation of the impact of financial technology on the return on assets (ROA) in AsiaCell Telecom Company according to the (ARDL) method. From the results, the researcher finds that the best model to be chosen from the rank is ARDL (2-8), and this means that the dependent variable is

affected by return on assets (ROA) for two prior periods while the independent variable is affecting on returns on assets (ROA) for eight prior periods and current.

This model was selected based on the AIC standard, as shown in Figure (7).

Figure 7. AIC standard



Source: Output from EViews version (13)

Figure (7) shows that the best lag period for the (ARDL) model is ARDL (2-8), as according to this criterion the lowest value of (AIC) is achieved.

4.5.2. Bounds test

Table 19. ARDL Bounds test

ARDL Bounds Test		
Date: 04/03/23 Time: 23:09		
Sample: 9 22		
Included observations: 14		
Null Hypothesis: No long-run relationships exist		
Test Statistic	Value	k
F-statistic	19.52992	1
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.44	3.28
5%	3.15	4.11
2.5%	3.88	4.92
1%	4.81	6.02

Source: Output from EViews version (13)

The Bounds test, as shown in Table (19), shows that the F-statistic, amounting to (19.52), which is greater than the critical value band at the upper limit and at the level of (0.01), which means there is a cointegration and long-run equilibrium between financial technology and return on assets (ROA) research period.

4.5.3. Estimating the short- and long-run response

Table 20. Short- and long-run response

ARDL Cointegrating And Long Run Form				
Dependent Variable: Y1				
Selected Model: ARDL(2, 8)				
Date: 04/03/23 Time: 23:10				
Sample: 1 22				
Included observations: 14				
Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(Y1(-1))	0.703278	0.193644	3.631809	0.0359
D(X)	0.003674	0.011307	0.324942	0.7666
D(X(-1))	-0.009857	0.013152	-0.749505	0.5080
D(X(-2))	0.013761	0.011786	1.167587	0.3273
D(X(-3))	-0.029357	0.012174	-2.411463	0.0949
D(X(-4))	-0.008735	0.013311	-0.656244	0.5585
D(X(-5))	-0.048313	0.014070	-3.433778	0.0414
D(X(-6))	0.022574	0.013424	1.681621	0.1912
D(X(-7))	-0.042647	0.011498	-3.708946	0.0341
CointEq(-1)	-1.905521	0.314432	-6.060204	0.0090
Cointeq = Y1 - (0.0589*X)				
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
X	0.058948	0.003891	15.149614	0.0006

Source: Output from EViews version (13)

Table (20) shows the results of the short-run and long-run response between financial technology and the return on assets (ROA) in the AsiaCell Telecom Company, and from the results, the researcher finds the short-run equation that the Vector Error Correction Model (VECM), here represented as CointEq (-1), is negative with an associated coefficient estimate of (-1.905521) This implies that about (1.905521) of any movements into disequilibrium are corrected within one period (quarterly). Moreover, given the very large t-statistic, namely (-6.060204), we can also conclude that the coefficient is highly significant.

The long-run results show that there is a necessary effect of financial technology on the return on assets (ROA) in AsiaCell Telecom Company, this effect will continue throughout the research period as an increase in financial technology by one billion Iraqi dinars leads to an increase in the return on assets (ROA) by (0.058948). From the




















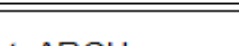
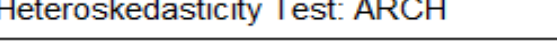
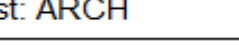

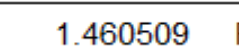
foregoing, we conclude that there is a long-term equilibrium relationship between the variables during the research period and that both variables have common trends in the long term, meaning they walk together during the research period, despite the occurrence of some imbalances during the short period.

4.5.4. Validity checks

Table (21) shows the results of the Heteroskedasticity test according to the (LM) method. From the results, the researcher finds that the null hypothesis was not rejected, which means that the model is free of the problem of Heteroskedasticity at a significant level (0.05).

Table 21. LM Test

Breusch-Godfrey Serial Correlation LM Test:					
F-statistic	7.819240	Prob. F(2,1)	0.2452		
Obs*R-squared	13.15374	Prob. Chi-Square(2)	0.0014		

Date: 04/03/23 Time: 23:16					
Sample: 1 22					
Included observations: 14					
Q-statistic probabilities adjusted for 2 dynamic regressors					
Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob*
		1 -0.181	-0.181	0.5647	0.452
		2 -0.270	-0.314	1.9304	0.381
		3 -0.211	-0.381	2.8392	0.417
		4 0.088	-0.222	3.0140	0.555
		5 0.309	0.111	5.3867	0.371
		6 -0.148	-0.132	6.0031	0.423
		7 -0.224	-0.228	7.6056	0.369
		8 -0.064	-0.234	7.7566	0.458
		9 0.092	-0.305	8.1361	0.520
		10 0.364	0.075	15.539	0.114
		11 -0.265	-0.254	20.772	0.036
		12 0.001	0.045	20.772	0.054

Heteroskedasticity Test: ARCH			
F-statistic	1.460509	Prob. F(1,11)	0.2522
Obs*R-squared	1.523743	Prob. Chi-Square(1)	0.2171

Source: Output from EViews version (13)

Table (21) shows the results of the Heteroskedasticity test according to the (ARCH) method, the model is devoid of the problem of the Heteroskedasticity test at a significant level greater than (0.05).

4.6. The results of the return on equity (ROE) model for AsiaCell

4.6.1. Lag Order Selection Analysis

Estimating the relationship between financial technology and financial performance in (AsiaCell Telecom Company)

Estimating the impact of financial technology on return on equity (ROE) in AsiaCell Telecom Company using the (ARDL) method.

Table 22. Initial Estimation of (ARDL) Model

Dependent Variable: Y2
Method: ARDL
Date: 04/03/23 Time: 23:27
Sample (adjusted): 9 22
Included observations: 14 after adjustments
Maximum dependent lags: 2 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (8 lags, automatic): X
Fixed regressors:
Number of models evaluated: 18
Selected Model: ARDL(2, 8)

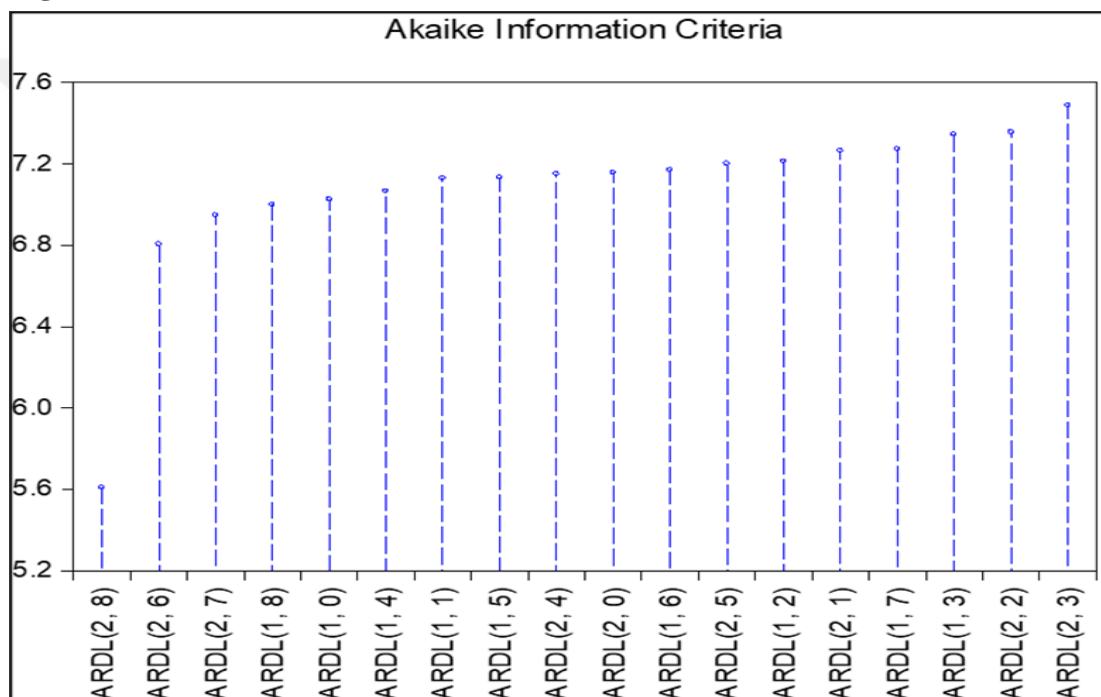
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Y2(-1)	-0.170963	0.221002	-0.773579	0.4955
Y2(-2)	-0.700979	0.212170	-3.303850	0.0456
X	0.012862	0.026415	0.486899	0.6597
X(-1)	0.018733	0.031671	0.591495	0.5958
X(-2)	0.039325	0.030922	1.271732	0.2931
X(-3)	-0.035758	0.028280	-1.264451	0.2954
X(-4)	0.074989	0.029503	2.541766	0.0845
X(-5)	-0.002497	0.031706	-0.078768	0.9422
X(-6)	0.089181	0.032158	2.773215	0.0694
X(-7)	-0.051606	0.029969	-1.722013	0.1835
X(-8)	0.084040	0.026321	3.192959	0.0496
R-squared	0.908988	Mean dependent var	7.699294	
Adjusted R-squared	0.605614	S.D. dependent var	6.265943	
S.E. of regression	3.935025	Akaike info criterion	5.608695	
Sum squared resid	46.45325	Schwarz criterion	6.110811	
Log likelihood	-28.26086	Hannan-Quinn criter.	5.562215	
Durbin-Watson stat	2.010902			

Source: Output from EViews version (13)

Table (22) shows the results of the initial estimation of the impact of financial technology on the return on equity (ROE) in AsiaCell Telecom Company according to the (ARDL) method. From the results, the researcher finds that the best model to be chosen from the rank is ARDL (2-8), and this means that the dependent variable is affected by return on equity (ROE) for two prior periods while the independent variable is affecting on returns on equity (ROE) for eight prior periods and current.

This model was selected based on the AIC standard, as shown in Figure (8).

Figure 8. AIC standard



Source: Output from EViews version 13

Figure (8) shows that the best lag period for the (ARDL) model is ARDL (2-8), as according to this criterion the lowest value of (AIC) is achieved.

4.6.2. Bounds test

Table 23. ARDL Bounds test

ARDL Bounds Test

Date: 04/03/23 Time: 23:28

Sample: 9 22

Included observations: 14

Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	16.47057	1

Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.44	3.28
5%	3.15	4.11
2.5%	3.88	4.92
1%	4.81	6.02

Source: Output from EViews version (13)

The Bounds test, as shown in Table (23), shows that the F-statistic, amounting to (16.47), which is greater than the critical value band at the upper limit and at the level of (0.01), which means there is a cointegration and long-run equilibrium between financial technology and return on equity (ROE) research period.

4.6.3. Estimating the short- and long-run response

Table 24. Short- and long-run response
 ARDL Cointegrating And Long Run Form
 Dependent Variable: Y2
 Selected Model: ARDL(2, 8)
 Date: 04/03/23 Time: 23:32
 Sample: 1 22
 Included observations: 14

Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(Y2(-1))	0.700979	0.212170	3.303850	0.0456
D(X)	0.012862	0.026415	0.486899	0.6597
D(X(-1))	-0.039325	0.030922	-1.271732	0.2931
D(X(-2))	0.035758	0.028280	1.264451	0.2954
D(X(-3))	-0.074989	0.029503	-2.541766	0.0845
D(X(-4))	0.002497	0.031706	0.078768	0.9422
D(X(-5))	-0.089181	0.032158	-2.773215	0.0694
D(X(-6))	0.051606	0.029969	1.722013	0.1835
D(X(-7))	-0.084040	0.026321	-3.192959	0.0496
CointEq(-1)	-1.871942	0.334953	-5.588671	0.0113
Cointeq = Y2 - (0.1225*X)				
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
X	0.122476	0.009222	13.281248	0.0009

Source: Output from EViews version (13)

Table (24) shows the results of the short-run and long-run response between financial technology and the return on equity (ROE) in the AsiaCell Telecom Company, and from the results, the researcher finds the short-run equation that the Vector Error Correction Model (VECM), here represented as CointEq (-1), is negative with an associated coefficient estimate of (-1.871942) This implies that about (1.871942) of any movements into disequilibrium are corrected within one period (quarterly). Moreover, given the very large t-statistic, namely (-5.588671), we can also conclude that the coefficient is highly significant.

The long-run results show that there is a necessary effect of financial technology on the return on equity (ROE) in AsiaCell Telecom Company, this effect will continue throughout the research period as an increase in financial technology by one billion

Iraqi dinars leads to an increase in the return on equity (ROE) by (0.122476). From the foregoing, we conclude that there is a long-term equilibrium relationship between the variables during the research period and that both variables have common trends in the long term, meaning they walk together during the research period, despite the occurrence of some imbalances during the short period.

4.6.4. Validity checks

Table (25) shows the results of the Heteroskedasticity test according to the (LM) method. From the results, the researcher finds that the null hypothesis was not rejected, which means that the model is free of the problem of the Heteroskedasticity at a significant level (0.05).

Table 25. LM Test

Breusch-Godfrey Serial Correlation LM Test:

























F-statistic	3.147479	Prob. F(2,1)	0.3702
Obs*R-squared	12.07516	Prob. Chi-Square(2)	0.0024

Date: 04/03/23 Time: 23:33

Sample: 1 22

Included observations: 14

Q-statistic probabilities adjusted for 2 dynamic regressors

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob*
		1 -0.194	-0.194	0.6495	0.420
		2 -0.254	-0.303	1.8496	0.397
		3 -0.218	-0.390	2.8151	0.421
		4 0.077	-0.244	2.9491	0.566
		5 0.305	0.091	5.2616	0.385
		6 -0.133	-0.132	5.7597	0.451
		7 -0.197	-0.211	6.9964	0.429
		8 -0.058	-0.199	7.1204	0.524
		9 0.115	-0.205	7.7168	0.563
		10 0.368	0.201	15.291	0.122
		11 -0.282	-0.130	21.228	0.031
		12 -0.011	0.156	21.242	0.047

Source: Output from EViews version (13)

Heteroskedasticity Test: ARCH

F-statistic	1.013192	Prob. F(1,11)	0.3358
Obs*R-squared	1.096420	Prob. Chi-Square(1)	0.2951

Table (25) shows the results of the Heteroskedasticity test according to the (ARCH) method, the model is devoid of the problem of the Heteroskedasticity test at a significant level greater than (0.05).



CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.1. Conclusion

The telecommunications sector has witnessed many developments related to financial services and the relationship with banks in all countries of the world with regard to money transfers and facilitating electronic payment methods. Financial technology, in its different forms, is regarded as the most advanced level of development for the financial services business. It is about offering financial services in a new form that is flexible, fast, and low-cost. Telecommunications firms that provide different financial and banking services based on current technologies have evolved in this field.

This study mainly aims to know what is the impact of the use of financial technology through the portfolios allocated to mobile phones in telecommunications companies on the financial performance in the context of return on assets (ROA) and return on equity (ROE) over the period from (Q2) 2017 to (Q3) 2022 in Iraq.

As a result, the researcher used ARDL systematic methodologies and conducted four analyses to find relevant answers to our study challenge.

First, the researcher ran the Phillips and Perron (PP) and the Augmented Dickey-Fuller unit root test to test the constant for the study's variables, which included financial technology represented by electronic portfolios, including the AsiaHawala and ZainCash portfolios, as well as financial performance represented by return on assets (ROA) and return on equity (ROE). The initial difference was fixed.

Second, the researcher used the ARDL model to perform lag order determination in order to choose the ideal lag number to test for long- and short-run impacts. The outcome reveals a lag order of twenty in ZainCash and eighteen in AsiaHawala. As a result, lag (3–4) in ZainCash and lag (2–8) in AsiaHawala are the recommended ideal lags.

Third, the researcher performed a bounds test to detect the presence of cointegration and long-run equilibrium between the research variables.

Fourth, the researcher implemented the long-run and short-run ARDL models.

The bounds test of the four models showed that there is a common integration and long-term equilibrium between financial technology and financial performance in ZainCash and Asia Hawala for the period (2017-2022).

From the data of the results of the study analysis, it is clear that there is a positive relationship between financial technology and financial performance as follows:

1. From the results of the study, it is clear that the impact of financial technology on the return on equity (ROE) is greater than its impact on the return on assets (ROA) by (1.45) in ZainCash.

2. From the results of the study, it is clear that the impact of financial technology on the return on equity (ROE) is greater than its impact on the return on assets (ROA) by (2.08) in AsiaHawala company.

3. When comparing the results of the study between the return on assets (ROA) in the ZainCash company and the return on assets (ROA) in the AsiaHawala company, it turns out that the return on assets (ROA) in the AsiaHawala company is greater than the return on assets (ROA) in the ZainCash company, and this can be explained by the fact that the number of users in the Asia Hawala company is greater of the number of users in ZainCash.

4. When comparing the results of the study between the return on equity (ROE) in the ZainCash company and the return on equity (ROE) in the AsiaHawala company, it turns out that the return on equity (ROE) in the AsiaHawala company is greater than the return on equity (ROE) in the ZainCash company. In fact, this cannot be attributed to a specific reason, as this can be attributed to the fact that the profits of the Asia company are larger, or the volume of its borrowing is greater, and therefore, investment in financial technology works to provide the profit required by the companies concerned.

5.2. Recommendations and the future prospects

5.2.1. Recommendations

1. The need to support the cashless economy by increasing corporate investments in the field of financial technology in the Iraqi environment.

2. The necessity of coming together to remedy the delay in spreading and educating the public, especially low-income people, who represent the largest segment of the country, in using financial technology and enhancing their confidence in it by creating impactful marketing campaigns enhancing the public's awareness.

3. Developing digital payments: With the rise of digital payments, Iraqi telecommunications companies should consider adopting payment solutions such as mobile wallets, payment gateways, and other electronic payment options the more developing than the one currently in use, and is available to the consumer for use in all areas he desires by doing partnerships with banks and other companies, by doing so, they can reduce the cost and risk associated with traditional payment methods such as cash, checks, and wire transfers, this can also increase customer satisfaction by providing a convenient and secure payment option.

4. It is clear from the results reached that the management of AsiaHawala company is superior to ZainCash company in terms of studied returns, and it must continue this progress in order to keep pace with the rapid development in the field of financial technology, and the other hand, important and deliberate measures and steps must be taken by Managing ZainCash to increase competition to achieve the desired returns for the company by increasing investment in the field of financial technology.

5. The financial authority represented by the Central Bank of Iraq must provide real and organized reports and data on telecom companies in Iraq, or by the concerned company, which in turn helps the researcher to save time and effort in obtaining this data.

6. The researcher recommends that those interested in financial technology using of more than one variable of financial technology, as well as using modern analysis such as Panel data.

5.2.2. The future prospects

Studying and discussing the issue of the impact of financial technology on financial performance is one of the few topics that have been addressed in Iraq, but how about if the topic is studying the impact of financial technology on financial

performance in Iraqi telecom companies? It is one of the modern and very broad topics, which cannot be covered by a small number of researchers. In such a topic, we see that there are still some points that can be addressed, which will be the basis for future research that will provide useful results, including:

- Conducting a comparative study between Iraq and other developed countries in this field in order to know and benefit from the experiences of other countries, by studying the impact of financial technology on the financial performance of telecom companies.

- Studying the impact of financial technology on the financial performance of telecom companies through the work of the study on a large number of study samples.

- Work on studying the impact of financial technology on the financial performance of telecom companies by increasing the number of indicators used in the study, as well as measuring with modern indicators and not being satisfied with traditional indicators.

- Make a comparison by studying the impact of financial technology on financial performance between telecom companies and other institutions.

- A comparative study on telecom companies before and after investing in financial technology in order to know and measure the impact of this investment on financial performance.

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