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FOREWORD

Cryptocurrency markets have recently been discussed in global economies.Countries such as the USA, China and Turkey have announced that they are considering regulating the crypto money markets. The fact that the transaction volume is so high in the crypto money markets is seen as an attractive investment for individual investors.

On the other hand, exchange rate markets are at least as important as crypto money markets. Changes in foreign exchange markets, which directly affect the foreign investments and international trade of countries, have an impact on the economies of the countries in many ways.

This book covers current issues related to both crypto money markets and foreign exchange markets. I would like to thank all the authors who contributed to the preparation of the book and hope that the book will contribute to the literature.

Assoc. Prof. Dr. Erkan ALSU

CHAPTER 1

INSIDE A CRISIS: THE IMPACT OF 2008 GREAT RECESSION ON MULTINATIONAL CORPORATIONS AND FINANCIAL INSTITUTIONS

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INTRODUCTION

The unprecedented nature of the 2008 financial crisis caused great concern about the prospect of international investments. Thanks to steady global economic growth and greater liberalization of international investment, the world witnessed an increasing trend in the number of multinational companies between 2003 and 2007. Worldwide foreign direct investment (FDI) reached $ 1.8 trillion in 2007 (UNCTAD, 2008). Not later than a year, however, the number of international investments dropped significantly due to the financial crisis triggered by the US mortgage crisis. Investors' confidence sharply fell consistent with the fall in global economic growth (State Street, 2009). The crisis significantly damaged the investment spending of multinational companies (OECD, 2012).

During the first half of 2008, the world's financial system was stable showing a relative relief from a global economic crisis, the sign of which was taken by 2007 summer. Although the initial stability led to optimism about the impacts of the projected crisis, it broke out when some major U.S. financial firms, like Lehman Brothers and AIG, showed signs of bankruptcy. Then the entire world has come to believe that these were the early indications of a wider financial collapse that would impact the entire world. The crisis which began in the world financial system soon spread to the whole world, beginning to influence both developed and emerging economies. Some of the emerging countries, such as Iceland, Ukraine, and Hungary, called the IMF for financial assistance to save their plunging economies (IMF, 2008a; IMF 2008b; IMF2008c). The global financial crisis then spread to the real economy, going far beyond the financial markets. Credit conditions have become so tight that internationally-trading investors had to halt their spending on new investments. The U.S. Consumer Confidence Index saw its historic lows since 1978 (OECD, 2009). Sales declined in most industries affecting companies of every size.

The financial crisis hit many industries from manufacturing companies to service providers. Most experts agreed on the opinion that the crisis was one of the severest people had seen of that size since 1929. Therefore, the crisis was named *great recession* to emphasize the severity of the problem. The IMF forecasted that consumer goods, automobiles, aircraft, steel, and transportation were among the industries that were likely to be

affected most. The underlying reasons for the crisis varied, but most experts agreed on the fact that global financial markets had long been left unregulated (Financial Crisis Inquiry Commission, 2011). In a conference held by OECD on "Financial Markets and the World Economy", participant G-20 countries agreed upon the underlying reasons of the current crisis in their concluding remarks:

> During a period of strong global growth, growing capital flows, and prolonged stability earlier this decade, market participants sought higher yields without an adequate appreciation of the risks and failed to exercise proper due diligence. At the same time, weak underwriting standards, unsound risk management practices, increasingly complex and opaque financial products, and consequent excessive leverage combined to create vulnerabilities in the system. Policy-makers, regulators and supervisors, in some advanced countries, did not adequately appreciate and address the risks building up in financial markets, keep pace with financial innovation, or take into account the systemic ramifications of domestic regulatory actions (U.S. Office of the Press Secretary, 2017).

This paper extensively discussed some of the problems identified in this conference and their future implications. Further, it presented the impact of the crisis by regions and countries and how severely multinational corporations (MNCs) and financial institutions were affected in the early months of the crash. Furthermore, governments' recovery plans were extensively discussed. Finally, the paper concluded with recommendations on government policies.

THE IMPACT OF CRISIS BY REGIONS AND COUNTRIES

The 2008 financial crisis was distinguished from the previous ones in that it predominantly affected developed countries. The 1997 Asian financial crisis crashed the developing economies of Asia and hindered FDI inflows into these countries. The 2008 financial crisis, however, broke out in developed countries first and rapidly spread to the developing and transiting economies. The impact of the crisis on the FDI inflows to the countries varied in different regions. As the problems in financial institutions and money markets deepen in developed countries, FDI inflows to these countries

dropped almost by 30 percent. In 2008 the decline in FDI inflows to developed countries was not that sharp in the case of Germany and Italy, but severe enough for the United States, England, and France (UNCTAD, 2009a).

On the other hand, FDI inflows to developing and transition economies were more stable contrary to those of developed economies. In 2008 FDI inflows to the developing countries increased by an estimated 4 percent. Compared to the 2007 statistics, FDI inflows to Africa were expected to grow by $60 billion despite the crisis and its negative impact on the region. Similarly, FDI inflows to the developing countries in East, South, and South-east Asia was expected to rise. Countries in this region were the largest beneficiaries of FDI among developing countries attracting almost half of all inflows towards developing economies. The situation in West Asia, however, was different with a projected decline of 20 percent due to the declining demand for oil. On the other hand, the flow to Latin America was expected to increase by 13 percent contrary to the global economic slowdown. FDI inflows to Central America and the Caribbean, however, were projected to decline due to their strong economic dependence on the United States. FDI inflows to transiting economies in East Europe was projected to increase by 6 percent. Although the decline in FDI inflow was mostly experienced by developed countries, developing economies with an open but fragile financial system were also susceptible to the economic shocks created by the crisis. They faced a record financial cutback from both official and private sources. As a result, FDI inflows were projected to see a severe decline in such economies as Indonesia, Turkey, and Singapore (World Bank, World Development Indicators, 2009a).

THE IMPACT OF CRISIS ON MNCs

MNCs' capacity to invest was severely harmed as a result of the declining availability of finance. Also, their willingness to invest was affected due to uncertain economic prospects. As credit conditions became tighter and firms' financial resources were drying up due to the declining profits, their capacities to invest both internally and externally also diminished. Credits became more and more expensive which made them less available. Similarly, external funding became less available for firms with foreign operations and for firms that were planning to initiate a foreign investment. Corporate bonds

spread increased dramatically, especially in the last couple of months of 2008 (OECD, 2019). On the other hand, the earnings of large companies in the United States, Japan, and Europe declined so sharply that their financial capacity to support their standard operations reduced significantly. For instance, the earnings of S&P 500 Companies fell by 46 percent between October 2007 and March 2009. The loss of Dow Jones reached 34 percent in the same period. Similarly, worldwide stock traded in 2008 dropped by 25 percent, making it difficult for MNCs to turn stock markets to support their operations using stock shares (World Bank, World Development Indicators, 2009b).

The sharp decline in financial markets, worldwide economic recession, and heightened risk reduced MNCs' willingness to invest both domestically and internationally. According to IMF forecasts, world output, as indicated by the growth rate, decreased by 0.6 percent in 2009, which represented almost 5.6 and 4.3 percent drop as compared to 2007 and 2008, respectively. For advanced economies, the growth rate fell by almost 3.2 percent in 2009, which represented the first drop in this size in the post-war period. For emerging and developing economies, the growth rates rose by 2.5 percent, which, however, represented 5.5 and 4.1 percent drop compared to 2007 and 2008, respectively. Both World Bank and United Nations statistics showed similar trends to those of IMF (see Table 1).

Table 1 World GDP growth 2007-2009

Sources and Regions	2007	2008	2009
IMF: World	5	3.7	-0.6
Advanced Economies	2.6	1.4	-3.2
Emerging and Developing Economies	8	6.6	2.5
World Bank: World	3.7	2.5	-1.3
High Income Countries	2.6	1.3	-3.2
Developing Countries	7.9	6.3	3.2
United Nations: World	3.9	1.9	-2.2
Developed Economies	2.6	0.5	-3.5
Economies In Transition	8.4	5.5	-6.5
Developing Economies	7.6	5.4	1.9

Source: IMF (2010), World Bank, World Development Indicators (2009c), and UN Department of Economic and Social Affairs (2010).

The decline in MNCs' willingness to invest abroad took different forms during the crisis. MNCs either chose to disinvest or restructure their operations abroad in the form of closing factories completely or selling some of the assets to other companies. The world's largest companies such as General Motors and Ford of the United States and PSA and Renault of France went to cut costs by taking different measures ranging from closing factories abroad altogether or reducing the number of jobs in factories in other countries. Orders of new aircraft fell as the world's leading companies like Boeing declared that they canceled new orders. French L'Oreal cosmetics group announced that they were planning to close two of its factories in Europe. After steel prices reached their highest level, steelmakers in the U.S., Japan, and United Kingdom decided to reduce their productions. Another form of decline in MNCs' willingness to invest abroad was seen in their cross-border acquisition decisions. There was evidence showing that cross-border acquisitions were severely affected. The decline could be attributable to the considerable falls in buyouts, which was a common method of transaction in cross-border acquisitions. Buyouts fell due to the sharp drops in world stock markets. Since cross-border acquisitions played a central role in the flow of FDI, the deterioration in cross-border acquisition accounted for a significant portion of the decline in FDI worldwide (UNCTAD, 2009a).

Another indicator of MNCs' willingness to invest abroad was their foreign operations regarding new investments and expansion of existing facilities or what was known as Greenfield investment. The number of such investments peaked in 2008 with a record number 15,500 (FDI Intelligence, 2009). However, in 2008, most of the world's well-known Greenfield locations were expected recorded net outflow due to the investors' unwillingness. Accordingly, Ireland was expected to record a net outflow of minus $6.1 billion, Finland by minus $6.3 billion, the U.S. by almost minus $11 billion, and Japan by minus $17.4 billion. Indeed, the exact impacts of the crisis on MNCs' decisions to new investment or expansion were felt in 2009 since the results of cancellation or temporary halt took some time to fully exert their impacts (UNCTAD, 2009b).

MNCs’ investment plans were harmed due to the perceived risk and uncertainties in financial systems and economies. They had to review their future investment projects and readjust them by their worst-case scenarios.

As aforementioned, confidence indicators experienced their historic lows parallel to the falls in the world's economic indicators. MNCs went to implement budget-cutting plans such as layoffs, postponing, or canceling investment projects. On the other hand, postponement or cancellation differed by the types of investment.

THE IMPACT OF CRISIS ON FINANCIAL INSTITUTIONS

The world's largest financial institutions came under heavy attack by the crisis. In the United States two government-sponsored financial enterprises, Fannie Mae and Freddie Mac, as well as AIG, Lehman Brothers, and Washington Mutual were severely affected by financial distress and cut off from access to capital and funding markets. Fannie Mae and Freddie Mac only held almost half of all mortgage loans, which adds up to $5 trillion. These two companies were also the issuers of trillions of dollars of bonds which were bought by the world's largest financial institutions and central banks of many countries. The U.S. Government, therefore, seized control of these two mortgage companies in September 2008 (United States, 2011).

AIG, on the other hand, was among the financial institutions hit by the crisis most. The company was world's one of the largest insurance company holding $1 trillion in assets and operating in more than 100 countries. Other than financial markets, AIG had a significant role in other markets since the company insured risks for many other companies. Global financial stability was seriously threatened by AIG's financial distress. Therefore, the U.S government had to rescue the company by providing $85 billion initially in return for 80% equity ownership of the company. The government bailout then was raised to $150 billion after the initial support was provided. Two other U.S. financial institutions, Lehman Brothers and Washington Mutual had to file bankruptcy since they were not provided any government support.

Financial distresses faced by the world's largest financial institutions shattered the unfettered image of the world's financial markets. In the United States, 16 banks filed bankruptcy between September 2007 and October 2008. The crisis soon spread to Europe bringing some of Europe's major banks to the edge of collapse. In Iceland, the collapse of three major banks resulted

almost in the bankruptcy of the entire country since the total liabilities of the banks were way above the country's GDP (Harrington, 2009).

The global financial crisis raised the risk of a total collapse of the world's financial system. Fear of further deterioration led to massive financial sectors bailouts in many countries. The total amount of governments' bailout reached trillions in US dollar worldwide. Government bailouts for financial sectors aimed at releasing credits and money by bailing out banks with public money and thus guaranteeing future lending and insuring current deposits. However, there was still uncertainty due to the erosion of confidence and massive destruction of financial institutions.

OPPORTUNITIES FOR MNCs

While negative impacts of the financial and economic crisis were expected to remain dominant during 2009, there were hopes for the recovery of FDI for the future. Nobody was sure about the exact date of a recovery as it was dependent on many factors that cannot be foreseen while financial and economic turmoil was still in effect. For one thing, the crisis was widely considered different in nature and magnitude from the past crisis. The crisis was originated in developed countries and rapidly spread to the rest of the world due to the global nature of the economy and financial systems. The crisis was of course not one of the business routines but disclosed the weaknesses that were inherent to the global financial system such as lack of transparency, lack of control, and excessive concentration of short-term profitability. The crisis might be a reflection of the change in economic power between developed and developing economies. Even though the economic and financial setback created uncertainty concerning the future flow of FDI, still there were enough reasons as to why MNCs should continue to remain committed to their foreign operations.

First, interestingly enough, some developing and emerging economies such as Russia, China, India, and Brazil continued to be attractive for international investors especially those who were looking for new market opportunities. Despite the crisis, they were able to maintain their growth rate compared to developed countries (IMF, 2010; World Bank, World Development Indicators, 2009c). If the economic situations deteriorate further for developed countries, investors would have to direct some of their foreign

operations to the emerging economies, especially to those who maintained their growth rate. According to a survey conducted jointly by the American Chamber of Commerce in Shanghai and management consulting firm Booz & Company, MNCs in China were not willing to relocate their facilities out of China despite higher costs and global economic crisis. MNCs were optimistic about China's ability to adapt themselves to the changing economic conditions believing that China would remain to be the center of world manufacturing center (American Chamber of Commerce in Shanghai and Booz & Company, 2009). Pepsi Co. announced that it would make an additional investment of $1 billion in China for the upcoming four years, while it shut down some of its factories in the United States (Reuters, 2008).

Second, the 2008 financial crisis offered some opportunities-like buying assets at reasonable prices from economically suffering companies-such that companies would not find otherwise. MNCs who held adequate cash for investment could acquire new assets way below their market prices. For instance, Namura Holdings of Japan acquired the Asian and European operations of Lehman Brothers of the United States (Namura Holdings, Inc., 2008).

Third, some industries continued to grow despite the current trends in global financial systems and the economy. Among them, information and communication technology, energy and environmental conservation, and textiles of certain qualities were some of the industries that were still growing (UNCTAD, 2009b). Of course, the question regarding whether these positive factors could make up for the impact of the financial problems that firms were facing was still there. No single solution could offset the impacts that were created by the ongoing economic and financial crises. Solution depended on the nature of the problem as well as the time that was needed for the recovery.

The 2008 financial crisis had an impact on the availability of financial resources as firms face intense credit constraints. This in turn affected firms' profits and their ability to compensate for losses. Financial constraints on investment were growing as no one knew when these constraints would end due to the high level of uncertainties. Most probably the biggest falls were experienced by stock markets since asset prices were significantly decreased. This in turn reduced acquisition activity like leveraged buyouts. On the other hand, companies with enough cash in their books were encouraged to acquire

with lower prices. The crash in asset prices was deep, but there were patterns of recovery in the long run. World economic growth slowed down, therefore, investors' market-oriented foreign investment plans were either canceled or temporarily halted. That is, a reduction in market growth was unavoidable during 2009. Perception of uncertainty was still prevalent and companies were not willing to implement their projected plans to cut further costs.

HOW EFFECTIVE WERE GOVERNMENT RECOVERY PLANS FOR MNCs?

When it comes to public policy, many countries attempted monetary and fiscal policies to stimulate their recessed economies. Of course, macroeconomic policies were expected to affect the business environment and consequently the flow of foreign investment. Yet, no one could predict, especially in the short run, whether public policies would achieve the expected results.

MNCs' future foreign investments were heavily dependent on the effectiveness of public policies. To be successful, public policies should create favorable conditions by rebuilding the trust that was already lost in this turmoil. The difficulty of doing effective public policies lies in rebuilding the trust in the international financial system, giving a stimulus to the economy to achieve growth, reinforcing the measures that will promote an open economy, and encouraging both investments and innovations. When the steps taken by governments were examined, one could not see that measures were directly related to MNCs' foreign operations.

MNCs and their foreign operations had nothing to do with the origination of the crisis. Hence, any government initiative on MNCs' foreign operations might not cure the problems of recession. However, policies that would be crafted to regulate financial systems and offer financial aids to some industries might have indirect impacts on MNCs. One can break down these policies into three categories. First, many developed countries attempted sweeping bailout plans to rescue financial systems. This would potentially cause a crowding-in effect on foreign investments because government guarantees on financial institutions created a safe investment image for these institutions. Second, some developed countries including U.S., France, and Germany started large public investment projects to restore confidence in the

economy. Such policies also offered new investment opportunities to MNCs. Third, several countries adopted fiscal policies to stimulate their economies. For instance, the UK introduced a value-added tax cut, and France made credit easily available for small and medium-sized businesses. The U.S. Fed cut the interest rate reducing it to almost the level of zero, and the bailout plan was extended to rescue major U.S. automotive companies (Chen et al., 2019).

On the other hand, there were developing countries that introduced various public support programs. The Chinese government released a large public investment plan ($600 billion) in November 2008. The investment would last three years and provide an 8-9% GDP growth annually. The plan would also attract foreign investment inflows to China by restoring investors' confidence. As mentioned earlier, foreign investors stated that they were willing to stay in China believing that the country would remain as the center of manufacturing in the world. In southeast Asia, other developing countries such as India ($4 billion), Thailand ($8.6 billion), and Malaysia ($2 billion) introduced similar stimulus packages (UNCTAD, 2009a).

In addition to domestic policies, several international initiatives are worth mentioning. For instance, the leaders of so-called G-20 countries renewed their commitment to the global economy stating that they would not impose any restrictive policies on international trade in the following 12 months (U.S. Office of the Press Secretary, 2017). Another international policy was initiated by nine Asian countries (Thailand, Malaysia, Indonesia, Philippines, China, Japan, Australia, Republic of Korea) by agreeing to reinsure the export by foreign companies which were insured by local authorities (World Trade Organization, 2009).

Some of the national policies might hurt foreign investments. Policies to aid financial sectors by acquiring shares in banks and insurance companies might potentially reduce the number of private investments including FDI. Examples of such policies were seen in the United Kingdom, Netherland, the United States, and Germany. The financial sector accounts for a significant portion of FDI and the nationalization of finance might negatively affect FDI. On the other hand, there were even policies restricting some of the operations of financial institutions such as the payment of dividends in return for public assistance. The trend towards the greater government interference in business for protecting the public interest might scare away foreign investment inflow

to the countries. Some states introduced state financial aids on the condition of not locating production outside. An example of this was the French government's aid to the automotive industry (Regan & Guernigou, 2008).

CONCLUSION

The 2008 financial crisis might both be a source of threat and opportunity for MNCs at the same time. The most immediate threat was the risk of governments adopting protectionist policies to rescue their domestic economy. The crisis also created an opportunity in the sense that both domestic and international regulations could enhance the stability of financial systems and help to achieve long-term economic growth. Most economics experts supported the efforts taken by governments that went far beyond the simple management of the crisis. These experts advocated policies that would bring more regulations in banking and restrictions on financial institutions, hedge funds, and commercial banks. The crisis warranted more coordinated efforts at the international level to restore the global financial system, promote stronger standards for more transparency, and reconsider the significance of public policies and regulations. At the domestic level, there was a need for regulations that would promote more investment. The crisis not only had an impact on the investments but also created an environment of uncertainty. The crisis indicated that governments had to emphasize policies favoring business and investment and equally avoid those promoting protectionist policies and regulations.

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CHAPTER 2

OPEN BANKING CONCEPT
and OPEN BANKING PRACTICES in TURKEY

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INTRODUCTION

In the last decade, there have been revolutionary developments in the field of financial technologies. With the application of information technologies in the financial services sector, each transaction from national and international financial operations to portfolio management processes is carried out more effectively, efficiently and is able to meet expectations of the customers in terms of both quantity and quality. It is also possible to present the transactions to the customers at a more reasonable cost due to the increasing competition in the sector. In addition to these, it can be observed that innovations implemented in the field of financial technology enhanced number of alternative financial instruments for investors in money and capital markets.

In addition to the advantages mentioned above, these technological advances in the financial services sector also may have some disadvantages. Certainly, the leading of these disadvantages is data security and the cyber security vulnerability related to it. Thanks to financial technologies, financial operations are carried out, managed and reported in a very short time period, such as seconds, at a relatively more affordable cost, providing ease of use, but consumers may suffer serious damage due to factors such as security vulnerabilities, software bugs, etc. that will arise during the application of these technologies.

Blockchain-based payment systems, artificial intelligence-based budget, portfolio and investment programs, electronic money, cryptology and cryptocurrency, digital banking applications, etc. are one of the most debated subject among mentioned innovations that observed in the financial system nowadays. It is possible to add open banking applications to these innovations mentioned in the financial services sector.

As a result of open innovation, open banking is, in the simplest terms, sharing the data set created by the transactions between the customer and the bank with third parties. Since the data is shared with another party, in other words, others are allowed to access the data, the term open is used. The most expected contribution of open banking to the sector is to improve the user experience by analyzing customer needs more analytically and producing customized solutions for customers with data mining applications, and also to provide cost advantages to customers through more efficient processes.

In this study, the concept of Open Banking, which emerged with the entry of fintech companies into the sector, will be discussed in detail. Fintech and digital banking, the concept of open banking, its parties, legal process and the current situation of open banking in Turkey will be reviewed.

1. FINTECH COMPANIES and DIGITAL BANKING

In the financial services sector, digitalization, or digital transformation, is increasing day by day. Nowadays, thanks to mobile banking applications, the business circulation of branch banking has decreased significantly and even the use of internet banking has been affected by this process. With the rapid developments in information technologies, machine learning, internet of things (IOT) and artificial intelligence technologies, both competition and service quality in the financial services sector have gradually increased.

Digital banking is the provision of all classical and modern banking services to customers through electronic interactive communication channels in the digital environment in order to reduce operational risks in financial transactions and improve customer experience through effective, efficient and customized solutions (Demirel, 2021). It is obvious that digital banking applications are beneficial for both parties in the bank and customer relationship, both for the convenience of bankers and for the improvement of customer experience. Thanks to digital banking applications, customers can perform their transactions anywhere in the world where internet accessible, without being obliged to communicate with bank employees. Users can perform all operations such as transfer of the funds in the digital environment, track and pay invoices and perform balance control, trading on financial instruments (buying – selling), etc.

Many digital banking services are now offered not only by banks, but also by fintech companies, especially with the entry of fintech companies that produce industry-specific solutions and offer customer-oriented customized solutions to the industry.

Fintech, as it is known, consists of the abbreviation of financial and technology words. Compared to banks, their financials, especially asset sizes, are relative less / low. Although they are relatively small organizations, creating a problem for customers in terms of credibility, it is still observed

that these companies have grown quite rapidly. As in the rest of the world, the number of these companies and the amount of investment that they have received, increased significantly in our country. With the participation of fintech companies in the financial sector, they started to develop alternative services for banks. Instead of providing all financial services like banks, they try to turn the disadvantages of being relatively small into an advantage by producing customized solutions that are specialized in one or a few areas that they focus on and that meet customer expectations exactly and even go beyond customer expectations. In terms of customers, higher quality, more solution-oriented and lower-cost services in certain areas have really started to become an alternative to banks.

The five basic principles developed by Chuen and Teo (2015) to be followed by fintech companies in order to show a sustainable presence and increase their income level as a social purpose are summarized below (Menteş, 2019):

- **Low margin:** It is a principle that underlines the necessity for Fintech businesses to operate with low profit margins. One of the most important common features of successful fintech businesses is that they work with low profit margins. Most internet users do not want to pay for internet applications and they want all applications to be free. Fintech companies can only make a profit through advertising and/or subscription revenues after reaching a certain loyal customer base.
- **Asset light:** Başarılı olmak isteyen fintek işletmeleri yüksek sabit maliyetler olmadan yenilikçi olmayı başarabilmelidir. Düşük marjinal maliyetlerle çalışabilme becerisi fintek işletmelerinin varlığını sürdürebilmesi için kritik öneme sahiptir. Fintech businesses that want to be successful must be able to be innovative without incurring high fixed costs. The ability to operate at low marginal costs is critical to the survival of fintech businesses.

- **Scalability:** Even if the Fintech business is small at the initial stages, it should make preparations by anticipating that the business volume and the number of users will increase in the future while developing technology or introducing an innovation.
- **Innovative:** A successful fintech business must be innovative both in the services and products it offers and in its operations.
- **Ease of compliance:** Another issue that determines the success of Fintech companies and is important in terms of financial inclusion is legal regulations. Fintech companies have to comply with the laws and regulations that the banking sector is obliged to comply with, as well as the legislation related to telecommunications. While determining the laws that Fintech companies must comply with, legislation should be created by consulting the industry. Laws must be both strict enough to prevent fraud and flexible enough to support financial inclusion.

The World Bank and G-20 countries have given increasing importance to financial inclusion in order to reduce poverty in developing countries since 2010. In this context, digital finance has emerged as an important tool to achieve the goal of financial inclusion (Menteş, 2019). The contribution of fintech companies to the sector is seen in financial inclusion, apart from the improved service quality. Today, the credit volume of fintech companies all over the world has exceeded 400 Billion USD and their share in credit volume has reached very high levels, especially in countries such as the USA, Korea, England and France (Palglobal, 2020). Fintech companies provide support for individuals and institutions to access credit in these countries, in other words, they increase the scope of the credit pool. It is seen that fintech institutions do not play a role in credit distribution in our country yet. However, it is thought that these institutions will start to contribute to financial inclusion in our country in the future. Considering that capital needs and corporate governance are among the most fundamental problems of start-ups and SMEs in the entrepreneurial ecosystem, the importance of the benefits

that fintech firms will provide in SMEs' access to capital can be better understood.

Increasing digitalization and changing business models, especially after Covid-19, have brought many challenges for banks. It can be stated that 2020 is a year in which a great transformation started for banks. The challenges that took place in 2020 are summarized below (Deloitte, 2020):

- Social isolations/lockdowns - Coronavirus: Digital banking is not optional anymore,
- Loan defaults/bankruptcies - “World’s Banks Brace for Rise in Loan Defaults”,
- Interest rates reduction - ”Negative Interest Rate May Not Help In Economic Recovery From COVID-19”,
- Profitability hurdles/Challenges on Profitability - ”Banks may not be profitable until 2025 even as major economies recover”,
- Global recession/shrinks forecasts - ”World Bank forecasts worst recession in eight decades on COVID-19”,
- Remote working/home based working - ”41% of employees likely to continue remote working after pandemic”,
- Process automation/robots/machine learnings/AI - ”Coronavirus: will call centre workers lose their 'voice' to AI?”,
- Branches remodelling - ”'Phygital': a banking strategy for the new isolation economy”,
- Digitalization fast track - ”COVID speeds up digital banking revolution in 10 weeks not five years”

As a result of the factors mentioned above, the growth of fintech companies in the field of financial technology has been accelerated. Their entry and penetration into the market has been realized much easier. With the outbreak of the Covid-19 pandemic all over the world, revolutionary changes were experienced in the production and consumption processes, while fintech companies, the largest representatives of open banking, continued to grow. In

the first and second quarters of 2020, when the epidemic was declared as a global pandemic, the sector grew by 13% and 11% on average, respectively, in terms of both business volume and number of jobs compared to the same period of the previous year (World Economic Forum, 2019).

Fintech companies can access all customer information by connecting to the information pool created by the banks, under the control of the bank and with the approval of the customer, through secure systems such as API, and can develop customer-oriented products by analyzing the profile and needs of the relevant customers. These companies can also share the data they have obtained with other companies called 3rd parties after processing them. In this way, the process of making customer data available to certain parties from a closed system is called Open Banking.

2. OPEN BANKING CONCEPT

The financial system is one of the sectors most affected by the advances in information and communication technologies. There are dizzying revolutionary technological developments in the financial sector. This speed in technological innovation has created a convergence and increasingly dense network of relations in sub-sectors of the financial system and in all financial services over time. As seen in Figure 1 below, the interaction and convergence between financial services has increased (Fintech Istanbul, 2019):

Figure 1. Financial Service Functions
Source: World Economic Forum, 2015

It can be obviously seen that from figure above, there is mutual interactions and intensively increased convergence between financial services.

Banks and other financial institutions have a lot of data about the customers they serve. They have a data set that can be used in many areas such as customers' ability to pay, their income profiles, expenditure items and consumption trends. Nowadays, data management (data mining) is one of the most important issues. From the perspective of the marketing discipline, customer data has vital importance in determining the current and potential consumption preferences of customers and even in directing these trends by companies. As a result of the sharing of the data in the banking system with other companies other than the bank, called 3rd parties, it can be expressed about the concept of open banking today. Thanks to the open banking application, other companies will gain a serious advantage in identifying the

profiles of their customers through banks and creating a marketing mix accordingly.

Open banking refers to the sharing of customer data in the system with 3rd party providers (Third Party Provieders - TPP) after customer approval (Taştan and Saruhan, 2020).

Open banking offers more flexible, integrated and customized solutions compared to classical banking. The biggest advantage of open banking to customers is that different bank accounts of customers can be managed in an integrated manner on a single platform. Thanks to the integrated system, high-security and fast payment services will be offered to customers. In addition, customers' entry into the integrated payment market will provide an opportunity to reduce transaction costs. Thanks to the integrated system, customers will be able to get the best price offers for themselves while making transactions and even have the opportunity to change their banks flexibly to work with the bank that offers the best offer.

It is seen that open banking, as a type of open innovation, allows customers to make better wealth management. The open innovation mentioned here refers to the sharing of the information produced as a result of the technology used with others or the inclusion of others from outside in the information production process (Demirez et.al, 2021).

The biggest advantage of open banking transactions for other companies is knowing the consumption trends of current and potential customers and their changes over time. Thanks to this very valuable data management, many companies will have the chance to see in advance how customer expectations are evolving and they will be able to shape their product trees accordingly. As a result, these companies will achieve sustainable cash flows thanks to more advanced customer experiences, and customers' expectations will be met.

This system also benefits banks. Banks will also be able to provide financial intelligence on customers much more easily and on a large scale. Loan and deposit interest and amount adjustments related to customers will be made more optimally. As can be seen, instead of the closed system of the classical banking system, the open banking system creates added value for all stakeholders. In this way, it can be stated that open banking creates a new digital ecosystem in the field of financial services (Demirez et.al, 2021).

Thanks to these contributions of open banking, it is expected that the number of players in the system will be much higher than in classical banking. The increasing number of players brings with it increased competition. It is observed that chain retail giants and many Fintech companies have entered the open banking system seriously. As a result of the increasing competition in the sector, thanks to open banking applications, individual customers will be able to obtain higher quality financial services faster and at lower cost (Fintech Istanbul, 2019).

Despite the advantages it offers as an alternative to traditional banking, there are some concerns in the market regarding the open banking system. First of all, the issue of sharing customer data with another party is discussed a lot and it is stated that it can damage the trust relationship between the bank and the customer. In addition, this system is in relation with more than one legal regulation such as personal data protection law, banking law and competition law. In other words, this issue falls under the jurisdiction of more than one regulatory body with administrative and financial autonomy. Due to this situation, according to some experts, a conflict of authority or the necessity of running more than one approval mechanism at the same time may arise, and therefore, there is a possibility that the system will run slowly in the future. Due to the disadvantages mentioned above, it can be seen that some banks are a little more reluctant to provide APIs to the system.

With open banking applications, the degree and understanding of competition in the banking sector also changes completely. In open banking, with the opportunity to initiate payments to third party companies that receive customer data through API, customers will be able to initiate their payments directly to the seller in the form of a payment order, using APIs without using a credit card in the system.

3. HISTORY of the OPEN BANKING

The first examples of digital banking were implemented by Barclays Bank in England in 1967, with a system called Cash Dispenser, which allows the customer to receive money in his account without the need to go to a bank branch (Beybur and Çetnikaya, 2020). This system was later followed by ATM platforms. Many users are still able to perform basic banking transactions via ATM platforms, thus saving time without going to the branch

and performing their transactions more easily. According to the May 2021 report of the Banks Association of Turkey, titled Our Banks, there are 46,886 ATMs in Turkey as of December 2020. In addition to using ATMs, customers can obtain many services from banks via telephone banking. Telephone banking provides a faster solution, especially in security-related issues.

The most basic criterion in the development of banking services is the competition of banks on applications that improve customer experience. Banks have started the POS service with the idea of going to the customers and performing the payment transactions at the most convenient location for them. According to the May 2021 report of the Banks Association of Turkey, titled Our Banks, there are 3,364,699 POS and 3,773,939 merchants in Turkey as of December 2020. Today, POS devices are actively used today. Thanks to the developments in financial technologies over time, financial services have evolved from ATM to mobile banking, where users carry out their transactions over their mobile phones. Today, many users carry out their collection and payment transactions through mobile banking applications of banks, almost without touching physical money. Nowadays, when the transition to virtual / digital money is discussed about, it can be said that users have already switched to digital. It can be stated that the digitalization process in financial technologies has accelerated especially with Covid-19.

The stages in the transition of banking services from classical branch banking to digital banking are shown in the table below:

Table 1: Stages in Transition from Classical Branch Banking to Digital Banking

1998 – Egg credit card launches in the UK using client-side aggregation technology from vendor, eWise.
1999 – Fineco Bank in Italy, ING Spain, and Smile in the UK, launch.
2000 – Discover Financial Services and ING Direct launch in the US and in France. Skandiabanken launches across the Nordics.
2001 – Yodlee launches first account aggregation in the US using sever-side technology. Bank of America reports over three million customers now use online banking.
2005 – Rabobank launches Rabo-direct in the Netherlands.
2007 – Apple launches first iPhone.
2008 – Jibun Bank, a joint venture between Bank of Tokyo-Mitsubishi and wireless operator KODI, launches in Japan. NAB launches Ubank in Australia.
2009 – Fidor launches in Germany, original 'bank as a marketplace' business model. Simple and Ally launch in the US.
2010 – Rakuten Bank launches in Japan.
2011 – First Direct launches first smartphone banking app in the UK, shortly followed by Natwest.
2012 – Alior Sync launches in Poland. Knab in the Netherlands.
2013 – N26 gets its banking license. Hello Bank (France), Instabank (Russia) and mBank (Poland) launch.
2014 – Tencent launched WEBank and Ant Financial launches MYBank.
2016 – Monzo and Revolut launch in the UK using the Bank of England's two-step licensing process.
2017 – Atom and Starling launch in the UK.
2018 – Monzo raises a record £1m in one min 36 seconds funding round.
2019 – First series of open banking propositions hit UK market resulting in sharp spike in API calls across incumbent banks.
2020 – Facebook launches Facebook Bank, offering anonymised spending comparisons across social networks, backed by its down cryptocurrency.
2021 – Amazon launches a checking account with 'people like you' spending recommendations, POS financing options, and access to Amazon Go branches.

Source: https://www.retailbankerinternational.com/

Each innovation in financial technologies has significantly reduced the volume of use of the previous business model in the chain, or even ended it, thanks to the ease of use that improves the experience of users. ATMs have reduced branch banking, internet banking has reduced the ATM density, and mobile banking has reduced internet banking services.

4. PARTIES of OPEN BANKING

There are 4 main actors operating in the open banking system. These are the customer, the payment service provider, the companies referred to as 3rd parties in the legislation, and the system operator, respectively. There is also an electronic system platform, which brings all parties together and where transfers take place. The system operator is responsible for the smooth operation of this platform.

Customer refers to natural and legal persons who obtain service from the system and is defined as a payment service user by Law No. 6493. Customers can benefit from the open banking system as a sender, receiver or both. In the system, customers will be able to access their accounts in all payment service providers from a single platform thanks to 3rd party providers and they will be able to make money transfers to third parties through these accounts.

As the name suggests, payment service provider refers to all financial institutions, including the bank where the customer has an account. In accordance with the Law No. 6493, these organizations are obliged to give the data of the customers to the companies called 3rd parties and to integrate the applications required for this data transfer into their own software, upon the instruction of the customers.

Third-party providers are also essentially a payment service provider. It refers to companies that can access another payment service provider on which the customer has an account, through API and similar applications, with the approval of the customers. These institutions cover all financial institutions, including banks. In particular, fintech companies have gathered in this area and serve their customers as an account information service provider (AISP) or payment initiation service provider (PISP).

The players of the open banking system and the interaction between them are shown in the figure below:

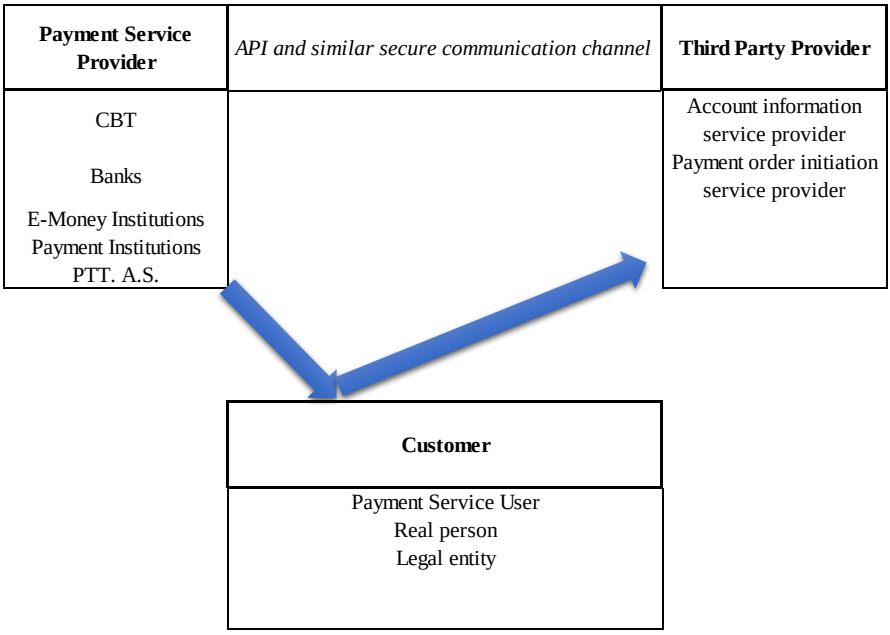


Figure 2: Players of the Open Banking System and Their Interaction
Source: (Taştan ve Saruhan, 2020)

Organizations allowed to operate as payment service providers in Turkey pursuant to Law No. 6493:

- Banks,
- Electronic Money Institutions,
- Payment Institutions
- Post and Telegraph Organization Inc.

In this part of the study, brief information will be provided about Electronic Money and Payment Institutions, which is one of these institutions, and electronic money in general.

5.1 Electronic Money and Payment Institutions

Electronic money is the use of the national currency released by the Central Bank in the digital environment or via a prepaid card (Turkrating, 2019).

Electronic money institutions that are implementing some services such as prepaid card, virtual POS, money transfer and bill payment etc. are companies that were established before the Law No. 6493 published on 27.06.2013 in order to regulate and control the electronic money sector and to harmonize with the European Union (Turkrating, 2019).

Electronic money institutions established before January 1, 2020 in Turkey operate under the Banking State Regulatory Authority (BRSA) license, and those established afterward operate under the Central Bank of the Republic of Turkey (CBRT) license. As of 2021, there are 26 active electronic money institutions in Turkey. While almost all of them (23) are organized as both payment and electronic money institutions, 3 of them operate only as electronic money institutions. The list of active (operational) electronic money institutions is shown in the table below:

Table 2: Active Electronic Money Institutions Established in Turkey

No	Firm Title
1	Ahlatcı Payment and Electronic Money Services Inc.
2	Aköde Electronic Money and Payment Services Inc.
3	BELBİM Electronic Money and Payment Services Inc.
4	Birleşik Payment and Electronic Money Services Inc.
5	BPN Payment and Electronic Money Services Inc.
6	CEMETE Electronic Money and Payment Services Inc.
7	D Electronic Money and Payment Services Inc.
8	ERPA Payment and Electronic Money Services Inc.
9	Fastpay Electronic Money and Payment Services Inc.
10	Faturamatik Electronic Money and Payment Services Inc.
11	Hızlıpara Payment and Electronic Money Services Inc.
12	IQ Money Payment and Electronic Money Services Inc.
13	İninal Payment and Electronic Money Services Inc.
14	İyzi Payment and Electronic Money Services Inc.
15	Lydians Electronic Money and Payment Services Inc.
16	Ozan Electronic Money Services Inc.
17	Paladyum Electronic Money and Payment Services Inc.
18	Papara Electronic Money Services Inc.

19	Paytr Payment and Electronic Money Services Inc.
20	Sipay Electronic Money and Payment Services Inc.
21	TT Payment and Electronic Money Services Inc.
22	TURK Electronic Money Services Inc.
23	Turkcell Payment and Electronic Money Services Inc.
24	UPT Payment and Electronic Money Services Inc.
25	Vodafone Electronic Money and Payment Services Inc.
26	Wirecard Payment and Electronic Money Services Inc.

Source: CBRT (2014)

In electronic money and payment institutions, the BSRA was responsible for electronic money and payment institutions, and the CBRT was responsible for payment systems and securities settlement systems. However, in order to create a more effective structure that can take decisions faster instead of this dual structure, the CBRT was appointed as the sole authorized supreme institution in the whole process with the amendment made in Law No. 6493.

Currently, electronic money and payment institutions carry out transfer transactions using the electronic infrastructure provided by the CBRT. The CBRT provides services to system users through Electronic Funds Transfer (EFT) and Electronic Securities Transfer (EST) systems, which are operated on a real-time and gross settlement basis (TCMB, 2014). Thanks to the real-time system used by the CBRT, payment transactions and reconciliation transactions are carried out simultaneously, as the amount of money in the central bank's account is instantly matched (Özdemir and Kükmen, 2020).

The electronic money sector emerges as a rapidly growing dynamic sector. Increasing digitalization in financial services, especially with the Covid-19 global pandemic that started in 2020, accelerated the growth of the sector. As of the end of 2020, the prepaid card industry has grown by 43% (Hürriyet, 2020).

The critical success factors of electronic money institutions can be listed as follows (Geçer, 2014):

1- E-money institutions should use incentive-loyalty programs intensively. Within the scope of incentive-loyalty programs; instant discount,

discount–rebate, cash–back, freebies, reward (coupon, bonus, points, premium, miles, gift–gift/prize, etc.).), upgrades, free shipping can be included.

2- E-money institutions should develop applications that are valid in multi-channels/omni-channels.

- It should have national and international validity (interoperability) and acceptability in an open system (acquiring) within the framework of EMV standards.
- E-money should be valid in public transportation, which is a crucial application (killer application) in the success of all card/mobile payment systems.
- E–money must also have the feature that it can be used over mobile phones/devices (acceptable by GSM operators).

3- Theoretically, e-money, which is located closer to the fiat money, between cash and fiat money, has a very low chance of competing with bank money (fine money). As a means of payment, e-money should rival cash, not bank money (debit money), credit or debit cards.

4- E-money institutions should prioritize small-micro payments below the spending amount that does not require a PIN (PIN) in credit and debit card use. This priority should focus on the middle and low income groups, unbanked and under-banked populations.

5- The feature of E-money that does not require a bank account and its anonymity should be emphasized.

6- Trust is vitally important in the financial industry. Banks are institutions of trust. Convergence of e-money institutions to the banking sector and cooperation with banks will strengthen the "perception of trust".

Like electronic money institutions, payment institutions established before January 1, 2020 operate under the BRSA license, while payment institutions established after this date operate under the CBRT license. As of 2021, there are 30 active payment institutions in Turkey. The list of actively operating payment institutions is shown in the table below:

Table 3: Active Payment Institutions Established in Turkey

No	Firm Title
1	Aypara Payment Institution Inc.
2	Ceo Payment Services Inc.
3	Dgpara Payment and Electronic Money Inc.
4	Efix Payment Services Inc.
5	Elekse Payment Institution Inc.
6	Faturakom Payment Services Inc.
7	Föy Fatura Payment Institution Inc.
8	Global Payment Services Inc.
9	GönderAl Payment Services Inc.
10	İstanbul Payment Institution Inc.
11	Klon Payment Institution Inc.
12	Moka Payment Institution Inc.
13	MoneyGram Turkey Payment Services Inc.
14	N Kolay Payment and Electronic Money Institution Inc.
15	Nestpay Payment Services Inc.
16	Octet Express Payment Institution Inc.
17	Ödeal Payment Institution Inc.
18	Paragram Payment Services Inc.
19	Pay Fix Electronic Money and Payment Services Inc.
20	Paybull Payment Services Inc.
21	Paynet Payment Services Inc.
22	Paytrek Payment Agency Services Inc.
23	Pratik İşlem Payment Institution Inc.
24	Ria Turkey Payment Institution Inc.
25	Sender Payment Services Inc.
26	Trend Payment Institution Inc.
27	Tronapay Payment Services Inc.
28	Vezne24 Collection Systems and Payment Services Inc.
29	Vizyon Electronic Money and Payment Services Inc.
30	Western Union Turkey Payment Services Inc.

Source: TCMB (2014)

While the operating licenses of 3 companies, which were previously granted operating permits, were revoked, the operating permit of one company was put into passive due to its expiry date.

Upon the increasing number and activity volume of electronic money and payment institutions, an association was established to point out the problems of companies operating in this sector, to provide support in developing solutions, and to operate on information sharing, analysis, ethical problems and training within the sector. The name of the association is Payment and Electronic Money Association (ÖDED) and its headquarters is in Istanbul (Öded, 2020). According to the current practice, companies that will operate in the sector must apply to become a member of the association within 1 month from the date of establishment. Firms that started operating before had to apply within one month after the establishment of the association. Developing strategic plans for the sector and creating a sectoral database are among the most anticipated contributions of the association to the sector.

5. BASIC OPERATIONS and PROCESSES in OPEN BANKING

There are two main services offered to customers in open banking. The first of these is the payment service, and the other is the sharing service of the account information of the customers. As the providers of these services, companies go to a different organizational structure. If the companies in the sector are going to provide services on Payment services, then they are called Payment Service Provider while companies are going to perform the information transfer service, then they are called Third Party Provider.

Within the scope of Law No. 6493, the following activities are defined as Payment Services (Masak, 2020):

- Money transfer transactions that occur depending on a payment account,
- Money transfer transactions without any account,
- All necessary transactions for the operation of the payment account,

- Issuance or acceptance of the payment instrument,
- Mobile payment services offered by GSM operators,
- Activities aimed at mediating invoice payments

As stated in the relevant sections, the payment service listed above is provided by banks, payment institutions and electronic money institutions in accordance with the Law No. 6493. Among these institutions, banks can offer both payment services and electronic money issuance services without obtaining an additional permission within the framework of the permissions they have since the their establishment.

There are 5 basic transactions performed by companies operating as payment service provider and account information service provider in the open banking system (Masak, 2020):

1. **Mobile payment:** It is the direct reflection of the product price to the invoice amount of the customer without using payment tools such as credit card etc. in the process of purchasing products and services.
2. **Money transfer:** Sending money to any place in the country or abroad by using an intermediary or transferring money from abroad to the country.
3. **Payment service provider:** It refers to companies that provide virtual pos for SMEs or electronic pos services that are provided via open credit cards for internet use.
4. **Bill payment:** It is the payment of the institutions that produce invoices through their representatives throughout the country.
5. **Electronic money:** By opening an electronic money account, it provides the transfer of funds for individuals to use in payment transactions.

6. LEGAL FRAMEWORK of OPEN BANKING

Along with the new technologies developing in the Digital World, many ways and methods of doing business have changed radically. Banks are among the institutions most affected by this change in the financial system. Especially in the banking sector, new payment types have emerged. The new payment types also brought with them some ancillary services such as

payment initiation and account notification. The current directive used in the current situation was the revised version in 2014 of the directive published by the EU commission in 2007. Since these payment systems were new, there was no up-to-date legal framework for them and the security risks were particularly high. In the light of all these developments, in order to eliminate these deficiencies in digital finance, the new Payment Services Directive (PSD2), which will replace the current directive in force, entered into force on 23 December 2015. With this directive, it has become mandatory to provide API services in payment services to EU member countries (Şahin and Cantürk, 2020). In accordance with the directive, Technical Standards (RTS - Regulatory Technical Standards) entered into force in February 2017.

With the Directive, payment services within the EU are regulated. As stated above, the Directive has undergone some revisions over time. The change of the directive over time is shown in the figure below:

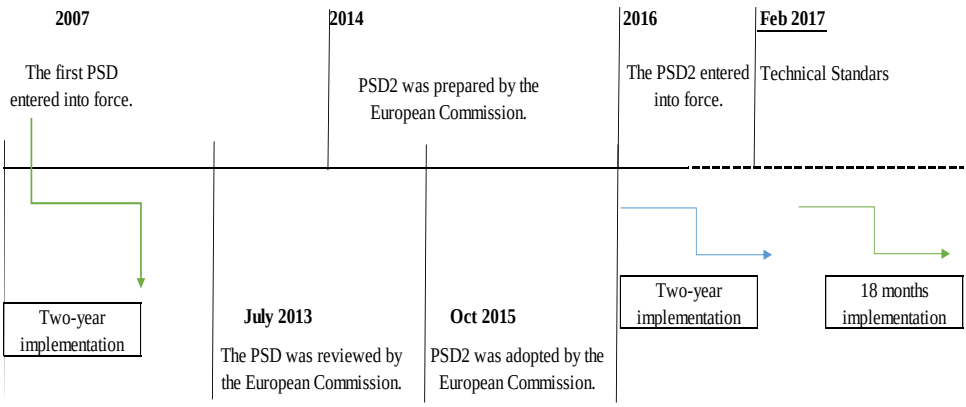


Figure 3: Change of the Directive over Time
Source: KPMG, New Payment Services Directive - PSD2, 2017

This directive encourages new players to enter the payment systems industry as an alternative to banks. In the current practice, 2 new types of companies are emerging, namely Account Information Service Provider (AISP) and Payment Initiation Service Provider (PISP) (KPMG, 2017).

AISP is the party that accesses bank customers' account information with this directive. These companies have the power to access customer account information, collect and analyze data on the consumption behavior of

one or more users and draw meaningful conclusions from them. For example, by accessing a customer's bank account information, the AISP can view the savings in any bank and in any currency, and develop investment advice for that customer based on that customer's savings. The opportunity to suggest the services that the customer may need, based on the basic information of the customer, is of vital importance in terms of marketing. PISP, on the other hand, is the party that pays on behalf of the customer with the customer API provided by the bank, after obtaining the customer's permission. In terms of money transfer between accounts, this feature is revolutionary that will add innovation to the sector. Nowadays, only the account holder has cards belonging to the bank he works with, but with this innovation, systems have been developed where payments can be made without being tied to any wallet.

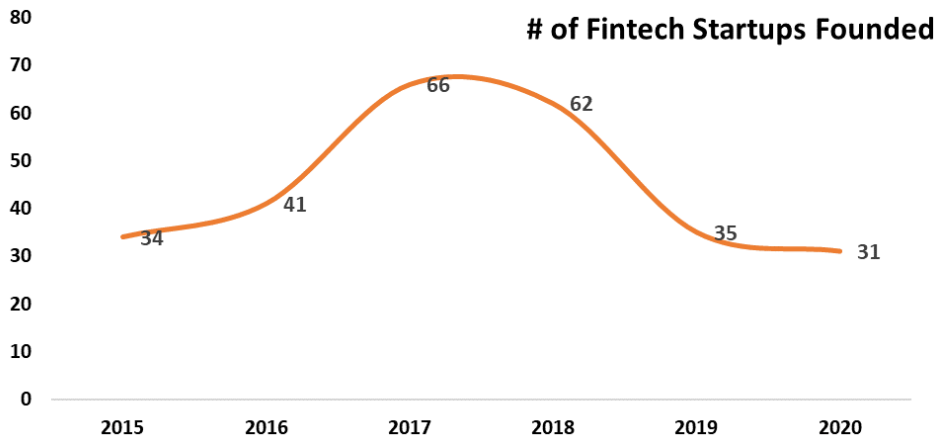
These two new players are actually companies that come between the bank and the customer and produce more customized and creative solutions for the software they develop. Thanks to the services they have developed, these two players are in a position to seriously affect the competition in the Fintech market. AISP offers a customer the service of managing all accounts he/she has on a single platform/interface. It will be possible for a user to instantly report on the balance and transactions of all currencies in all banks owned by a user, according to the desired date and criteria.

7. CURRENT STATISTICS of the OPEN BANKING SECTOR in TURKEY

Huge developments in information and communication technologies have affected the finance sector as well as many business lines. Banks constitute a large part of the financial system all over the world. With the diversification of financial products and services, banks try to provide all services related to these products themselves. As it is known, today, a completely customer-oriented approach to competition, which will meet the expectations of the customers and even go beyond them, is dominant. In this respect, the need to meet customer expectations in financial services with specialized products and services beyond standard solutions has created companies put fintechs firms on the agenda.

Fintech companies are financial technology companies that specialize in one or more of the banking services and can provide higher quality services to their customers in these areas. These companies access customer data by using API (Application Programming Interface) and produce new technologies based on this data (Bilgel and Aksoy, 2019). Fintech companies have shown rapid development in the world and also in Turkey. Fintech companies received a total of 19.2 million USD investment from angel investors and Venture Capital (VC's) in Turkey in 2020. The number of fintech startup companies established in Turkey over the years is shown in the chart below:

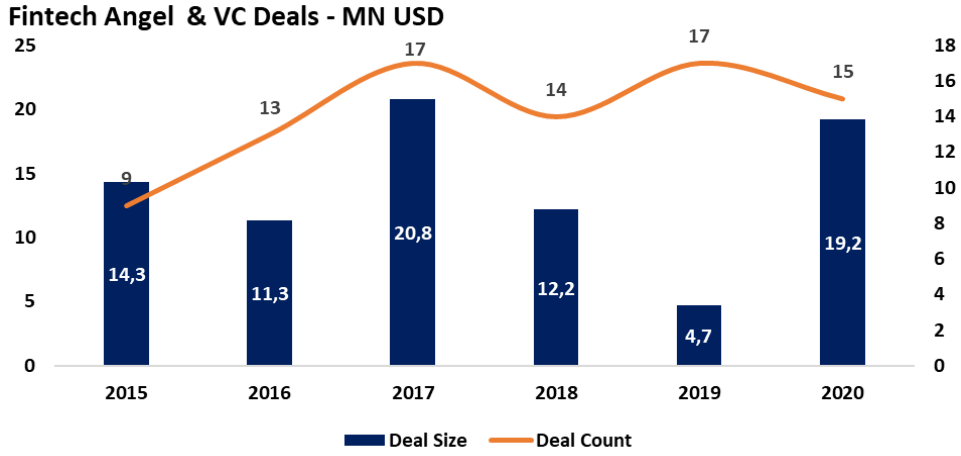
Chart 1: # of Fintech Startups Founded



Source: startups.watch

Information on the investments received by fintech companies operating in Turkey from angel investors is shown in the chart below:

Chart 2: Fintech Angel & VC Deals – MN USD

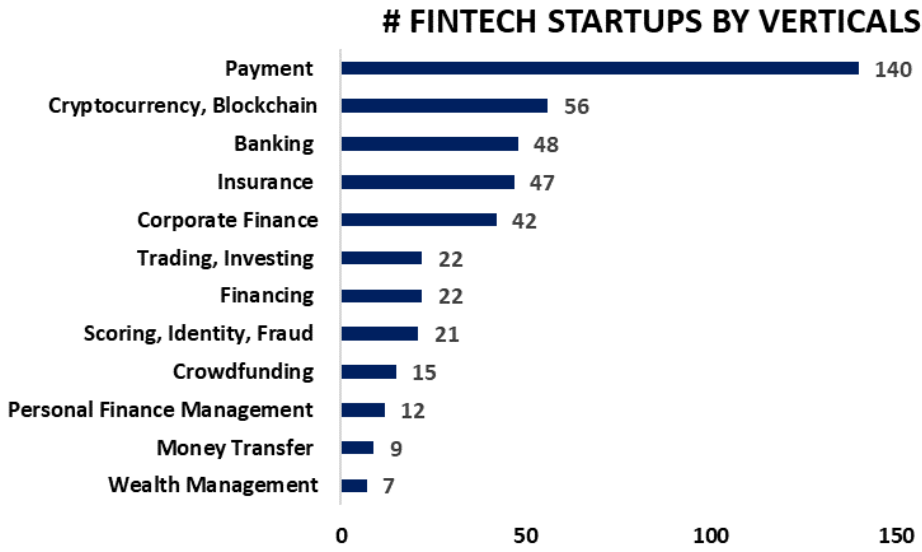


Source: startups.watch

As seen in the chart above, investments in fintech companies continued to increase despite the Covid-19 global epidemic that broke out in 2020. According to many authors, fintech companies have been at the forefront of the companies that came out of the global pandemic stronger thanks to the increasing digital banking applications. Excluding 2018, fintech companies received the highest investment of the last 5 years in 2020.

The vertical distribution of operating fintech companies is shown in the chart below.

Chart 3: # of Fintech Startups by Verticals



Source: startups.watch

When Graph 3 is examined, it is seen that fintech companies are in a very serious concentration especially in payment systems. Approximately one third of the 441 fintech companies are involved in payment systems. Electronic money institutions, which are one of the parties of open banking, which is included in this study, also operate in the field of payment systems. After payment systems, the most concentration is seen in cryptocurrency and blockchain technologies.

8. CONCLUSION and DISCUSSION

Thanks to the open innovation practices carried out in the field of financial technologies, the concept of open banking has emerged. In open banking, data on transactions between the bank and customers are shared with application developer companies, called 3rd parties, via APIs. Fintech organizations come first among these companies, which are called 3rd parties, and thanks to their technical background, fintech organizations have transformed the banking sector from a closed system into an ecosystem open to 3rd parties.

Open banking has many advantages over traditional banking. The most important of ones among these advantages are the ability to manage customers' accounts in different banks and financial institutions in an integrated manner through a single platform, the development of customized solutions that create added value for customers by fintech companies that process shared customer data, and especially with the effect of increasing competition in the sector, these services can be provided faster and at a lower cost. In addition to these advantages of open banking, there are also some disadvantages or drawbacks as mentioned in the relevant sections of this study. In particular, issues such as information security and the privacy of customer information are among the most important issues discussed in the sector. In order to eliminate possible disadvantages in the sector, the legal framework of open banking should be well defined. Especially in open banking, it will be possible to manage the relationship network between the customer, the bank and the 3rd party in a more secure and professional manner, thanks to the implementation of processes such as the definition of sectoral standards, licensing and additional measures to be taken on cyber security issues.

Due to the importance of open banking, it has not escaped the notice of the legal regulators both in the world and in our country, and many regulations have been implemented and revised over time. In particular, the EU took the first step in this regard and published the Payment Service Directive. In our country, legal regulations such as the Law on Payment and Securities Settlement Systems, Payment Services and Electronic Money Institutions and the Regulation on Banks' Information Systems and Electronic Banking Services have been implemented.

Open banking is a process that brings a new breath to the field of financial marketing, takes the competition in the sector to the next level, moreover creates added value for both end-user individuals and institutions and service provider companies. Fintech companies, which are the most important players in the process, become a serious competitor and alternative to banks in increasing the efficiency and quality of classical banking services. When we look at both on a global and local basis in our country, fintech companies are among the companies most preferred by angel investors. Despite the global pandemic that shook the whole world in 2020 and whose

effects are still increasing, the investments and business volumes of fintech companies are increasing. It can be stated that fintech companies emerged stronger from the global epidemic thanks to the increasing digitalization process in all business processes, especially after the Covid-19 pandemic.

It is seen that fintech organizations operate in many fields on a vertical basis. However, the highest concentration is on the payment systems vertical, where open banking applications are used most actively. For this reason, it is seen that fintech companies generally concentrate on open banking. However, fintech firms operate not only in the field of payment systems, but also in many other verticals such as cryptocurrencies. Depending on the development of artificial intelligence and blockchain technologies, it is expected that the size and volume of activities of these organizations will increase significantly over time.

Banks need to take the necessary steps in order not to fall behind in terms of competition in the open banking process. In particular, it is necessary to establish basic units related to open banking and to lead the sector by acting proactively together with fintech companies. Otherwise, banks may experience a very serious loss of customers in the field of financial services, and in this case, it will completely reshape the future banking organization. Both bank managers and owners and bank employees need to take required actions immediately to be ready for this big revolution.

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CHAPTER 3

INTERNATIONAL CAPITAL FLOWS AND ECONOMIC GROWTH: THE MODERATING ROLE OF BANKING SECTOR PERFORMANCE IN EMERGING ECONOMIES

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INTRODUCTION

The global trend to financial liberalization since the 1980s, particularly in emerging countries, has resulted in the free movement of international capital flows (ICF). In the abundant literature relative to the effects of ICF, empirical studies have shown that these capital movements have in turn various effects (positive, negative, or even null) on the general economy in the host countries (Adeola, 2017). For the majority of their results, ICF - including foreign direct investments (FDI)- are most often seen as engines of growth and prosperity for the host economies (Iamsiraroj, 2016; Zhang 2001; Borensztein, et al., 1998). But what is unknown (and constitutes a gap in the literature) is the role of moderating factors amplifying or attenuating the effects of "primary" factors on economic growth. This is indeed an aspect of interesting research that is increasingly explored.

The moderating role of financial sector performance (FSP) has been less studied in the financial literature. While FSP is seen as the increased provision of financial goods and services by a country to its citizens and businesses (Gesaka, 2013; Shaw, 1973), this financial system is seen as a symbol of trust for foreign investors (Liu et al., 2020; Islam et al., 2020). Most importantly, the well-functioning financial system functions as a fair distributor of resources, a provider of quality information at the right time, and a mechanism for reducing costs (Jiang & Ma, 2019).

Researchers agree that the real lasting positive effects of ICFs can only be achieved when a host country has a well-functioning financial system (Mahmood et al., 2018; Desbordes & Wei, 2017). A country's financial system has often been perceived as a crucial and indispensable factor for sustainable economic growth (Paun et al., 2019; Li et al., 2019). Given the importance of international capital flows (ICF) for the sustainable economic growth (ΔGDP) in the host country, the main objective of this study is (1) to examine the main components of ICF having the most significant effects on economic growth in order to (2) apprehend the moderating role of the banking sector performance in the ICF-ΔGDP relationship, for the specific case of the top 20 emerging economies (EM-20) over the 1998-2018 period. To our knowledge, most of the previous studies relative to these countries focused on two main components of ICF, (ie foreign direct investments and foreign portfolio investments), analyzing their effects on economic growth. This study

took into account five components examining their effects before analyzing the role of moderating factors.

The remainder of this article was organized as follows: Sections 2 and 3 dealt with the literature review and methodology, respectively. Section 4 presented the results of the study and finally, the conclusion was provided.

LITERATURE REVIEW

International Capital Flows and Their Different Components

In international economic relations, one of the most important constituents in terms of volumes is the international capital movement (Yalçıner, 2012). Following the World Bank (2018) classification, the five main components of International Capital Flows retained in this study were: the Foreign Direct Investments (FDI), the Foreign Portfolios Investments (FPI), the External Debts (EDBT), the External Aid (EAID), and the Remittances (REM). From the point of view of the funds' ownership, one can distinguish:

(1) Public capital movements, which are official and in the form of subventions or credits intended to finance the economic development of the countries. Generally, these official capital movements are carried out directly between governments, between government agencies; between international credit institutions and governments, or between international credit institutions and government agencies. In this category, EDBT and EAID can be cited.

(2) Private international capital flows; this is a type of capital movement that has been on the rise since the late 1980s. In this category FDI, FPI, and REM can be cited. Other classifications also exist: for example, the classification according to the direct or indirect mechanism (function) of the funds; or rather the classification according to the type of instruments used for investments.

The following conceptual flow chart (figure 1) provides an overview of different components of International Capital Flows retained in this study.

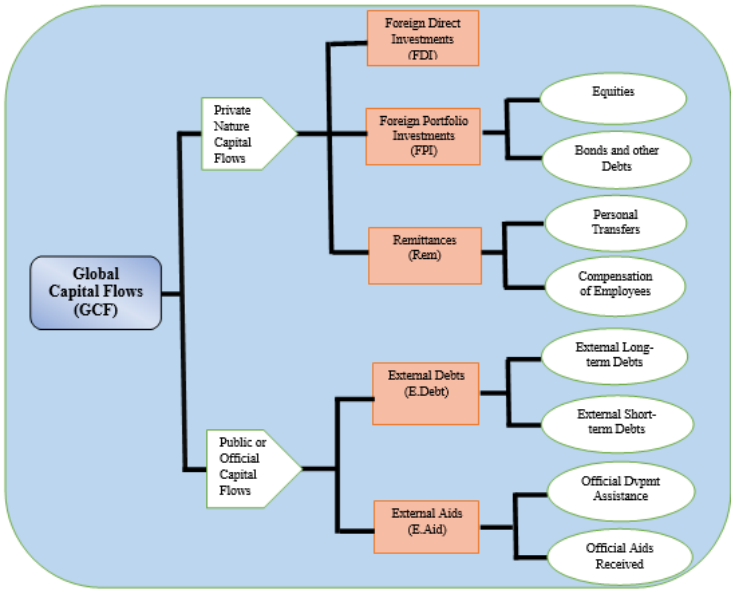

Figure 1: Conceptual Framework of International Capital Flows
Source: Created by the author based on the literature review

The interest in researches concerning the international capital flows - the effects of each of their components as well as the factors stimulating or mitigating these effects - is growing for researchers, managers, and policymakers.

Previous Empirical Studies

The literature is filled (replete) with various studies dealing with the impacts of international Capital Flows on economic growth. However, to our knowledge, those focusing exclusively on the banking sector seem very scant. As it is well known, in each country the banking sector plays a crucial role in the financing of activities contributing to economic growth. To this end, a synthesis of previous works is presented in this section through tables 1 to 3.

Table 1: Summary of Empirical Literature review on Foreign Direct Investments and Foreign Portfolio Investments' Effects

Author, Year	Methodology					Results
	Sample of countries	Period	Dependent variable	Independent variable	Technical estimations	
Foreign Direct Investments' Effects						
Adeola, 2017	4 countries studied in SSA (sub-Saharan Africa)	1970 to 2011	Real GDP per capita	FDI÷GDP, Portfolio Equity÷GDP, External debt÷GDP, ODA÷GDP, Remittances÷GDP	OLS; Co-integration tests; VECM; SUR (Seemingly Unrelated Regression) Model.	FDI had a positive impact on Economic growth in host countries.
Li et Liu, 2005	84 countries: 21 developed, 63 developing	1970 to 1999	GDP per capita growth	FDI inflow (% of GDP)	Panel data, Cross-sectional analysis	Promotion of Economic growth.
Alfaro et al., 2004	20 OECD + 51 non-OECD = 71 countries	1975 to 1995	Real GDP per capita (Growth rate)	FDI inflow (% of GDP)	Cross-section OLS regression,	Great positive effect on Economic growth in host countries where financial markets are developed.
Zhang, 2001	11 economies in East Asia and Latin America	1960 to 1992	Annual growth rate of real GDP	FDI stock/GDP (in log form)	Error correction model	Positive effects depending on country's macro-economic (stability, trading liberalization, improved education, and human capital).
Carkovic & Levine, 2005	72 selected countries	1960 to 1995	Real GDP per capita growth rate	FDI (% of GDP)	Panel data; OLS + GMM dynamic estimator	Negative and no robust effects of FDI on Economic growth
Konings, 2001	3 countries: Bulgaria, Poland, Romania	1993 to 1997	Output	FDI; FDI*T (FDI and Time trend interaction)	Panel data; Fixed effect model; OLS; IV in GMM dynamic estimator	Negatively affect Bulgarian and Romanian domestic firms; Insignificant and ambiguous effects in Poland
De Mello, 1999	32 selected countries	1970 to 1990	Growth rate of GDP	FDI	Panel data; Fixed effects model; Mean groups estimation	Effects are mixed depending on FDI and DI substitution and/or complementarity
Foreign Portfolio Investments' Effects						
Adeola, 2017	4 countries studied in sub-Saharan Africa (SSA)	1970 to 2011	Real GDP per capita	FDI÷GDP, Portfolio Equity÷GDP, External debt÷GDP, ODA÷GDP, Remittances÷GDP	OLS; Co-integration tests; VECM; SUR (Seemingly Unrelated Regression) Model.	Positive relationship between portfolio Investments and External aid; some violence periods affected portfolio equity level and official devlopmnt assistance into the country.
Portes and Rey, 2005	14 countries	1989 to 1996	Equity in log form (gross purchase, portfolio equity sale)	Market capitalization	Cross-section gravity model. FE panel data estimation, GLS	Strong and positive evidence of geographical component importance in international asset flows.
Edwards, 2001	65 countries: 21 industrial and 44 emerging economies	1975 to 1997	GDP per capita	Level of capital account restrictions. Debt/GDP, Equity/GDP, FDI/GDP	Panel WLS estimation, IV-WLS, W2SLS, W3SLS, and SUR	Positive relationship after reaching a particular development threshold. A clear improvement is observed in countries with open capital accounts compared to those that are restricted.
Durham, J., 2004	80 countries	1979 to 1998; annual	GDP per capita growth	FDI and EFPI	Cross-sectional OLS regression	The level of financial or institutional develpmt plays a crucial role in the "absorptive capacity" of FDI and EFPI by host countries.
Kodongo and Ojah, 2012	Egypt, South Africa, Nigeria, and Morocco	01/1997to 12/2009; monthly data	Net portfolio flows	Real exchange rate	VAR	For all the countries included in the study, the contribution of (relatively volatile) inflows portfolio investments to economic growth proved to be insignificant.
Oney, B; Halilsoy, H., 2011	21 high-income OECD countries	1980 to 2001	Real GDP; real phys. capital; stock and productivity growth.	Banking development (measured by) Private credit, the liquidity and the size of the stock market.	Cross-country study. OLS technique	No significant effects found on contribution to GDP growth.

Source*:* Created by the author based on the literature review

Table 2: Summary of Empirical Literature review on External Debts' Effects

Author, Year	Methodology					Results
	Sample of countries	Period	Dependent variable	Independent variable	Technical estimations	
External Debts' Effects						
Baum, Checherita-Westphal, and Rother, 2013	12 Euro area countries	1990 to 2010	Real GDP growth rate	Ratios of Debt÷GDP, Gross fixed capital formation ÷ GDP	Panel GMM, OLS, IV 2SLS	Positive with low debt ratio (if α < 67%); α represents the debt % to GDP Nul and insignificant effect (if 67%<α < 95%). Negative effect with high debt over 95% (if α > 95%).
Adeola, 2017	4 countries in sub-Saharan Africa (SSA)	1970 to 2011	Real GDP per capita	External debt÷GDP, ODA÷GDP, Remittances÷GDP	OLS; VECM; SUR (Seemingly Unrelated Regression) Model.	External debt negatively influenced economic growth.
Akram, N, 2013	4 South Asian countries: Bangladesh, India, Pakistan and Sri Lanka	1975 to 2011	Real GDP growth; Investmnt – GCF/GDP	PPG external debt/GDP, Domestic debt/GDP, Debt servicing PPG/Export	FE, RE, Pooled OLS, Dynamic GMM, and System GMM	An "over-indebtedness effect" and a possible "crowding out effect" due to negative effects of external public debt on economic growth were found. Negative relationship between domestic debt and economic growth. Similarly for investments.
Reinhart and Rogoff, 2010	44 countries; 20 advanced, 24 emerging economies	200 years of data. 1946 to 2009; 1900 to 2009	Real GDP growth	Average external debt to GDP ratio	Panel data, VECM (Vector Error Correction Model)	Weak relationship between public debt and real GDP growth (if ratios of debt ÷ GDP <90%); But for a threshold> 90%, there was a 1% decrease in median growth rates. In emerging economies, the threshold is lower. For a threshold of 60% of external debt-to-GDP ratio, the annual growth decreases by 2%. With a higher threshold, the growth rate decreases by 50%. Also, the higher the debt, the higher the inflation rate. For advanced countries, no relationship was found.
Rodrik and Velasco, 1999	32 emerging market economies	1988 to 1998	Ratio of Short-term debt to total debt	Debt/GDP; M2/GDP	Probit analysis; cross-section and panel with FE regressions	Short-term external debt options aggravate the economy (especially in times of crisis). In other words, other options should be considered in terms of external capital flows.
Frankel and Rose, 1996	105 countries	1971 to 1992	Per capita GDP growth	External debt/GDP	Panel data, GMM	A high ratio of External Debt ÷ GDP per capita high is always linked to a high risk of negative impacts.
Mody and Murshid, 2005	60 developing countries	1979 to 1999;annual and 3-year period	Domestic investment÷ GDP	FDI, Portfolio flows, and loans of commercial bank	Instrumental variables estimation and dynamic panel (GMM)	Mixed results: positive effects on national investments in countries where better policies are adopted, but negative if not.

Source*:* Created by the author based on the literature review

Table 3: Summary of Empirical Literature review on Remittances and External Aids' Effects

Author, Year	Methodology					Results
	Sample of countries	Period	Dependent variable	Independent variable	Technical estimations	
Remittances' Effects						
Adeola, 2017	4 countries studied in sub-Saharan Africa (SSA)	1970 to 2011	Real GDP per capita	FDI÷GDP, Portfolio Equity÷GDP, External debt÷GDP, ODA÷GDP, Remittances÷GDP	Tests of Co-integration and Vector Error Correction Model (VECM)	In two of the four studied countries in sub-Saharan Africa, the effects of remittances (recognized as a growing form of Foreign capital flows) were positive on economic growth.
Ziesemer, T, 2012	52 countries	1972 to 2005	GDP per capita	Workers' remittances/GDP	Panel GMM, OLS, and FE	The positive influences of remittances were found on the growth rate of GDP per capita, the savings rate as well as education and public expenditures.
Ademutsi, 2009	31 developing countries: 15 SSAs and 16 LACs	1996 to 2006	Log of Real GDP per capita	Log of remittances per capita	System GMM	Positive long-term contributions of remittances to economic growth more in LAC than in SSA were found. From a dynamic point of view, growth is delayed by short-term remittances, but in the long run the overall influence becomes positive.
Acosta, et al., 2008	54 industrial and developing countries	1970 to 2000; 5yperiod	GDP (per capita)	Remittances÷GDP	GMM estimation	Remittances have helped reduce poverty, inequality and increase the rate of economic growth.
Rao and Hassan, 2011	40 countries	1960 to 2007;	Output growth rate per worker (average of 5-year)	Ratio of remittances to GDP	FE and RE estimation, SGMM	Direct negative effects of remittances but insignificant were found on growth; however, possible minor indirect effects may exist.
Buch and Kuckulenz, 2004	87 developing countries	1970 to 2000	GDP per capita	Remittances/GDP and Remittances per capita	GLS estimator	Ambiguous results: at first, negative; however, when the data from the 1990s were excluded from the analysis, the effects found became positive. Developing countries recorded a stable influx of money.
External Aids' Effects						
Adeola, 2017	4 countries studied in sub-Saharan Africa (SSA)	1970 to 2011	Real GDP per capita	FDI÷GDP, Portfolio Equity÷GDP, External debt÷GDP, ODA÷GDP, Remittances÷GDP	OLS; Co-integration tests; VECM; SUR (Seemingly Unrelated Regression) Model.	The results indicate that external aid positively and significantly influences equity and Real GDP per capita; however, in certain periods of violence incidences could appear on results.
Dalgaard, Hansen, and Tarp, 2004	65 Countries; SSA and EA	1974 to 1997; 4year periods	Average growth rate in real GDP per capita	Aid/GDP	OLS regression and panel GMM regression	In tropical countries with large areas of land, the effects of external aid on growth seem less significant. In other words, the influence of the aid depends on the conditions of the host environment.
Moreira, S, 2003	48 developing countries	1970 to 1998; 6y averages	Per capita GDP growth rate	Domestic saving, ODA, private flows and other official flows (% GDP)	GMM estimator	The analysis showed that deadlines play an important role in aid influences. The effects of long run aid are more positive and significant than the short term one.
Papanek, 1973	85 countries	1950 to 1970	Annual rate of increase in GDP	Savings, Aid, Foreign private investment (FPI) and Other foreign inflow (OFI)	Cross country regression analysis. Pooled cross-section. Simple least square estimate	Overall, the results indicate positive and significant effects.
Ram, 2004	56 aid-receiving countries	1970 to 1993	Real GDP per-capita growth rate	Aid, Bilateral aid and Multilateral aid	OLS regression	The influence is positive when the help interacts with the policy variable; this observation turns to negative in opposite the case.
Mosley et al., 1987	80 less developed countries	1960 to 1980	GNP (Growth rate)	Aid inflows (gross ODA), domestic savings, foreign priv cap inflows (all as % of NI)	Cross-section OLS, 2SLS, 3SLS	Effects of aid on the GNP growth rate are insignificant. So, high-efficiency countries with policies favoring high investment returns should be favored by aid donors.

Source*:* Created by the author based on the literature review

From the literature review summarized in tables 1-3, it is clear that the results of previous studies are not only divergent but, most of them are limited to the analysis of the effects of foreign investment on economic growth in the host country. Besides, given that researches related to the moderating factors'rôle are continuing their constructive phases in the economic and financial literature, there is a gape in the framework to unite the various tools and pieces of evidence in the field leading to unanimous theoretical foundations. That is indeed an aspect of interesting researches that are increasingly explored in recent times. Some previous researches analyzed the role moderating of some other variables on relationships with economic growth (Islam et al., 2020; Muli et al., 2017), but in different contexts. This study is specifically interested in the moderating role of the banking sector in the International capital flows - Economic growth relationship in EM-20.

METHODOLOGY

Period, Sample, and Variables

The study covered the 1998-2018 period. This period was chosen according to the high appearance frequency of the countries selected in our sample as emerging economies, and deals with the post period of "financial liberalization reforms". The sample consisted of countries recognized in 2018 as the top 20 emerging economies and dispersed across Europe, Asia, Latin America, and Africa continents. These countries have regularly appeared with a high number of presences on lists compiled by different groups of analysts during the past decade. Iran's banking data was not available so that it was replaced by Peru, a country fairly close to the first 20 emerging countries.

Concerning the dependent variable, the growth in the home nation (ΔGDP) per capita was considered as an approximation of the economic growth measurement. The international capital flows (ICF) were assessed in this study by distinguishing their five main components provided by the World Bank (World-Bank., 2018) and for which data exist for each selected country. The measures used to assess performance in the banking sector are chosen in accordance with recent trends (Mishkin & Eakins, 2016). Besides, additional control variables were used. The banking sector performance (BkSP) is used as a moderating force of the ICF-GDP relationship mainly for the following reasons. Firstly, the performance of a country's banking system is closely associated with the quality of its financial system, which in turn is strongly linked to the transparency, the reliability of financial transactions, and the performance of contracts, which are possible only when the country has a satisfactory quality of institutions (Islam et al., 2020). Secondly, foreign investors are more attracted to countries with an efficient financial and banking system (Buchanan et al., 2012; Masron & Nor, 2013). Better absorptive capacities are offered by good quality institutions (Jude & Levieuge, 2017), which is also a fair precondition for attracting ICF into a country (Durham, 2004). Table 4 gives a synthetic presentation of the variables, their definitions, and their sources while Figure 2 shows the synthesized framework of the study.

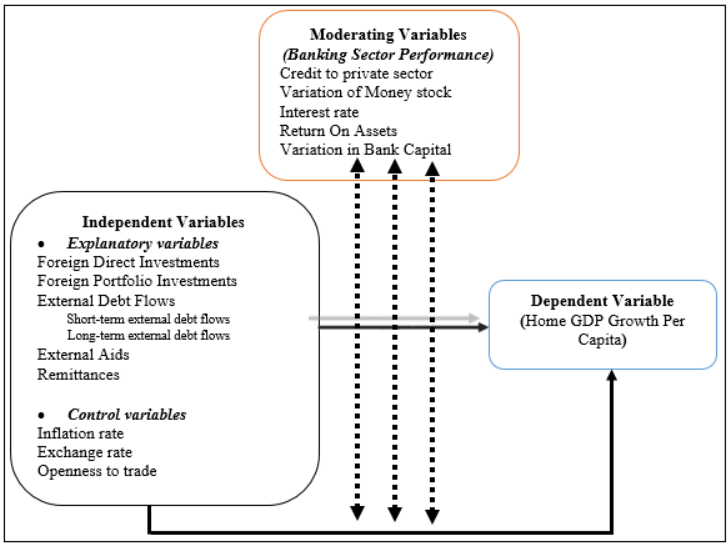

Figure 2: Synthesized framework of the study
Source: Created by the author based on the literature review

Table 4: The variables used, their definitions, and their sources The variables used, their definitions, and their sources

Variable	Symbol	Definition (Calculation)	Expected Effect	Data Sources
1)- Dependent variable				
Economic Growth	ΔGDP	Growth in home nation GDP per capita in country *i*, from year t-1 to year t (%)		FRED, and World Bank Databases
2)- Independent variables				
2.a)- Explanatory variables				
International Capital Flows *(Aggregate to be broken down)*	ICF	Total of International Capital Flows into the country *i* in year *t* in American dollars (% of GDP)		
Foreign Direct Investment	FDI	Foreign Direct Investment Inflows (% of GDP)	+	
Foreign Portfolio Investment	FPI	Foreign Portfolio Investment Inflows (% of GDP)	+/-	
External Debts	EDBT	External Debt Inflows (% of GDP) - ELTDBT for Long-Term External Debt Flows - ESTDBT for Short-Term External Debt Flows	+/-	
External Aids	EAID	External Aids Inflows (% of GDP)	+	
Remittances	REM	Remittances Inflows (% of GDP)	+	Databases of World Bank, FRED, Central Banks, IFS, IMF, OECD
2.b)- Controle variables				
Inflation rate	INFL	Annual growth rate of consumer price index; GDP deflator (%)	+/-	
Official effective exchange rate	EXCHG	Annual average dollar price	+/-	
Openness to trade	OPNS	Exports + Imports (% of GDP)	+	
3)- Moderating variables Banking Sector Performance	BkSP	Banking Sector Performance Indicators in the country *i*		
Banking Credit	CREDIT	Credit to private sector by banks, adjusted for breaks (compounded annual change rate)	+	
Money Stock	ΔM3	Variation of Money stock in economy, seasonally adjusted for country *i*, (percent change from year ago)	+/-	
Interest Rate	INT	Commercial bank deposit interest rate (%).	+/-	
Return on Assets	ROA	Profits after tax / Total Assets (%)	+	
Banks Capital	ΔBkCap	Variation in Bank Capital for country *i* (percent change from year ago)	+	

Source*:* Created by the author based on the literature review

Models Specification

- Panel Data Method

It is often admitted that the level of bias (related to the variables' stationarity) for panel data is low, given the large number of data points. Indeed, the ability to study the dynamics increases due to the high degree of freedom. There are two main approaches used in panel regressions, which are different from the Restricted Least Squares Regression (ROLS) method. These methods are Fixed Effects Model (FEMo) and Random Effects Model (REMo). Before applying the Hausman test (1978), to choose among these models, the panel data regression model can be written as bellow.

$$Z_{it} = \alpha_{1it} + \alpha_{2it} + \alpha_{2it}\mathrm{X}_{2it} + \ldots\ldots\ldots\ldots\ldots\ldots + \alpha_{pit}\mathrm{X}_{pit} + \varepsilon_{it} \qquad (1)$$

The above general model has '*p*' variables where *i* = 1,2, ..., *G* is the cross-sectional unit and *t*= 1,2, ..., *n* is the time series data. α_{2it} to α_{pit} represents the slope of unknown coefficients. The coefficients α_{1it} and α_{2it} which represent fixed-term contain both time and cross-sectional effects and it provides differentiation opportunity for periods and units. In addition, the non-probable error term ε_{it} is assumed to have zero mean and a constant variance $E[\varepsilon_{it}] = 0$ and $Var[\varepsilon_{it}] = \sigma_e^2$. The slope of coefficients is unknown and they vary for different cross-sectional units and different periods. However, when estimating the model, it is assumed that the error term and the coefficients' slope are constant.

- Fixed Effects Model (FEMo)

$$Z_{it} = \overline{\alpha} + \beta_i + \alpha_{2it} + \alpha_{2it}\mathrm{X}_{2it} + \ldots\ldots\ldots\ldots\ldots\ldots + \alpha_{pit}\mathrm{X}_{pit} + \varepsilon_{it}$$

(2)

FEMo can be expressed as follows:

i =1, 2……. *G*, and *t*=1, 2……. *n*

From equation (2) above, the $\alpha+\beta_i$ represents a unit-specific constant; $\bar{\alpha}$ has a constant mean. β_i represents the difference from the average constant term for the unit.

The appropriate estimation method for estimating equation (2) depends on whether β_i is fixed or random (Judge and al., 1985). If there is a relationship between the error term in equation (2) and explanatory variables, FEMo is considered as the appropriate model. Because in this case, FEMo estimators are unbiased.

- Random Effects Model (REMo)

Contrary to the assumption of FEMo, if individual effects are not related to the explanatory variables in the model, it is more appropriate to assume that the fixed terms are distributed randomly according to the units and make modeling accordingly (Wooldridge, 2002). Thus, the constant term in equation (1) α_{1it} is not constant and therefore the mean of $\bar{\alpha}$ will be a random variable. In this case, the fixed term value for each unit will be $\alpha_{1it} = \alpha+\mu_i$; and μ_i is a random error term with zero mean and constant variance. The equation for REMo can be written as follows:

$$Z_{it} = \bar{\alpha} + \beta_i + \alpha_{2it} + \alpha_{2it}X_{2it} + \ldots\ldots\ldots\ldots\ldots + \alpha_{pit}X_{pit} + \varepsilon_{it} + \mu_i \quad (3)$$

From equation (3) above the error term (ui) is the compound error term and its components are the individual error term (ui) and the panel error term ε_{it}. The main difference between FEMo and REMo can be seen by comparing equations (2) and (3). In FEMo, each cross-sectional unit has its own fixed term; In REMo, the constant term gives the mean constant term (β) for all cross-sectional units, and the error term ui represents the random deviation of the constant term for each cross-sectional unit from this average constant term.

- Generalized Moments Method (GMM)

In the model, potential autocorrelation and heteroscedasticity problems that may arise when examining the relationship between variables can be solved by the Generalized Moments Method (GMM) proposed by Hansen (1982). Unlike least squares (OLS) or maximum likelihood (ML) methods, the GMM method does not need to know which processes the data should use. When a parameter is estimated by the GMM method, the estimators are supposed to be strong and robust. To minimize the scale function, the general equation is expressed as follows:

$$q = \bar{m}(\theta)' \, W_m \, \bar{m}(\theta) \qquad (4)$$

W, (weighting matrix), is proportional to m, the variance of the moment. However, the optimal weighting matrix is shaped like:

$$W_{GMM} = \{Asy.Var\,[\sqrt{n} * \bar{m}_n(\theta)]\}^{-1} \qquad (5)$$

In calculating the GMM weights, White's method using the period weights can be used to solve the problem of heteroscedasticity. At this point, it is important to consider which variables are externally accepted as instrument variables.

- The Explicit Form of the Model

Initially, we considered the following equation:

$$\Delta GDP_{it} = \lambda_i + \sum_{j=1}^{6} \alpha_j X_{it} + \sum_{k=1}^{3} \beta_\tau K_{it} + \sum_{\tau=1}^{5} \gamma_\tau \Phi_{it} + \lambda_t + \varepsilon_{it} \qquad (6)$$

Where,

The dependent variable is (as described in table 4):

- ✓ ΔGDP_{it}: the Economic Growth in country *i* from year *t-1* to year *t*,
- ✓ And the independent variables are:
- ✓ X_{it}: the matrix of international capital flows for country *i* in year *t*,
- ✓ K_{it}: the matrix of the control variables for country *i* in year *t*,
- ✓ Φ_{it}: the matrix of the moderating variables for country *i* in year *t*,

The country and time fixed effects are respectively λ_i and λ_t while ε_{it} is the error term.

Then in accordance with the practice in the literature, the following functional equations forms are retained for the estimates:

$\Delta GDP_{it} = f\,(FDI_{it}, FPI_{it}, ELTDBT_{it}, ESTDBT_{it}, EAID_{it}, REM_{it}, INFL_{it}, EXCHG_{it}, OPNS_{it}, BkSP_{it})$ …… (7)

Other than their percentage and ratio forms, the nonlinear model i.e. the natural logarithm form (*ln*) of the variables are used. In the literature, a common practice (to capture the moderating effect) consists in forming interaction terms between the variables concerned (Aibai et al., 2019) and (Agbloyor et al., 2014). Following the example of (Islam et al., 2020), a similar strategy is adopted in this study, by forming an interaction term between ICF and BkSP variables, to capture the moderating effect of the performance of the banking sector on the ICF-ΔGDP relationship. Thus, the explicit forms of the empirical model are as follows:

$$ln\Delta GDP_{it} = lnFDI_{it} + lnFPI_{it} + lnELTDBT_{it} + lnESTDBT_{it} + lnEAID_{it} + lnREM_{it} + lnINFL_{it} + lnEXCHG_{it} + lnOPNS_{it} + lnBKSP_{it} + ln(ICF_{it}*BKSP_{it}) + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots \quad (7a)$$

In equation (7a), ICF represents the components of international capital flows that have the most significant impact on economic growth, and may therefore be written in the following forms:

$$ln\Delta GDP_{it} = lnFDI_{it} + ln(FDI_{it}*BKSP_{it}) + lnBKSP_{it} + lnFPI_{it} + lnELTDBT_{it} + lnESTDBT_{it} + lnEAID_{it} + lnREM_{it} + lnINFL_{it} + lnEXCHG_{it} + lnOPNS_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots \quad (7b)$$

$$ln\Delta GDP_{it} = lnFDI_{it} + ln(FDI_{it}*BKSP_{it}) + lnBKSP_{it} + lnFPI_{it} + ln(FPI_{it}*BKSP_{it}) + lnELTDBT_{it} + lnESTDBT_{it} + lnEAID_{it} + lnREM_{it} + lnINFL_{it} + lnEXCHG_{it} + lnOPNS_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots \quad (7c)$$

$$ln\Delta GDP_{it} = lnFDI_{it} + ln(FDI_{it}*BKSP_{it}) + lnBKSP_{it} + lnFPI_{it} + ln(FPI_{it}*BKSP_{it}) + lnELTDBT_{it} + lnESTDBT_{it} + lnEAID_{it} + lnREM_{it} + ln(REM_{it}*BKSP_{it}) + lnINFL_{it} + lnEXCHG_{it} + lnOPNS_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots \quad (7d)$$

Econometric Process, And Data Analysis Techniques

The study is largely quantitative and builds on existing techniques and methodologies. Given that the case in this study concerns a Dynamic Panel Model, for robustness sake in the results, a pairwise estimation method was adopted: (1) the Fixed Effect Model and the Panel Generalized Method of Moments (FEMo-GMM); or (2) the Random Effect Model - and the Generalized Linear Model (REMo-GLM). The GMM can overcome the limitations of POLS and FE estimates with the application of instruments. Each pairwise estimation methods are chosen according to the results from the preliminary tests. For this reason, the following econometric procedure is adopted:

- ✓ Firstly, application for diagnostic checking which is related to Unit root test for variables' stationarity; after what, the Panel Least Square (PLS) was applied as the first model;
- ✓ Secondly, application for diagnostic checking related to the specification test proposed by Hausman (1978). This test makes it possible to decide the best choice between the Fixed Effect Model "FEMo" (if p-value < 5%) and the Random Effect Model "REMo" (p-value ≥ 5%);
- ✓ Thirdly, (if GMM is chosen), application for two tests diagnostic checking: (1) the Hansen test (1982) for instruments validity, and (2) the AR(n) test for no second-order serial correlation of the error term, proposed by Arellano and Bond (1991);
- ✓ Finally, estimations of "corrected data" after preliminary tests by applying the most suitable between (GMM and GLM) as the second model.

The moderation effect is judged using the interaction terms between the component variables of the ICFs and those of the BkSP.

Robustness and Additional Analyzes Justification

Although - to some extent - the use of a dynamic fixed-effects panel method alleviates some of (1) the problems with endogeneity (in OLS model) by capturing country-specific characteristics at time constant, and (2) the concern for simultaneity by adding the delayed response, one could admit the possibility of a deeper character concerning the endogeneity issue in the model. Moreover, assuming that the bias problem raised by Nickell (1981), could be attenuated by the use of (balanced panel) data over a 21 years period,

the problem never really goes away, causing sometimes biased coefficients in the model (Bond, 2002).

For these reasons, like Buch and Neugebauer (2011), a one-step system GMM approach proposed by Blundell and Bond (2000), was implemented. In this approach, the lagged variables and the lower (ICFs, BkSP) and higher-order (ICF*BkSP) multiplicative terms were defined as variables that are instrumented with their lagged observations. All valid instruments in a collapsed form were included to avoid instruments proliferation (Roodman, 2009a).

RESULTS

Summary Descriptive Statistics and Preliminary Tests

Table 5 shows the summary of descriptive statistics while table 6 shows the correlations of the main variables. Most variables have 1280 observations for 20 countries over 21 years, from 1998 to 2018. We find that the dependent variable (GDP growth) and each of the main independent variables like (FDI, FPI, and REM) have reasonable correlations of 0.743; 0.605, and 0.534 respectively, and are therefore acceptable (Gujarati, 2009). Thus, they can be used for further analysis without any high risk of multicollinearity.

Table 5: Descriptive Statistics

Variable	Observations	Mean	Std. Dev.	Maximum	Minimum
GDP	1280	4.368126	3.718595	14.23139	-10.89448
FDI	1280	2.791042	2.053154	11.65435	-2.589811
FPI	1280	0.478409	1.118700	6.587810	-3.799592
ELTDBT	1124	0.904726	1.701418	6.192091	-5.093308
ESTDBT	1209	0.240605	1.548080	8.607351	-10.62529
EAID	1021	0.158264	0.219697	1.430682	-0.067830
REM	1280	0.858727	0.947122	4.210553	0.000000
INFL	1129	10.42130	15.58615	143.6925	-1.836558
EXCHG	1280	1021.722	2558.911	13389.41	0.081405
OPNS	1280	51.77648	17.17344	110.0001	15.63559
CREDIT	1052	12.76011	17.13288	62.90000	-67.68900
INT	929	10.74451	12.73660	80.75167	0.570000
M3	1012	16.33244	12.79854	100.6000	-8.289000
ROA	907	91.02905	1161.660	17401.24	-798.9580
BKCAP	969	3.407511	13.57868	160.7100	-28.75000

Source: Authors' estimations

Table 6: Correlation matrix of main variables

	GDP	FDI	FPI	ELTDBT	ESTDBT	EAID	REM	INFL	EXCHG	OPNS	CREDIT	INT	M3	ROA	BKCAP
GDP	1.000														
FDI	0.743	1.000													
FPI	0.605	0.067	1.000												
ELTDBT	0.102	0.040	-0.063	1.000											
ESTDBT	-0.25	-0.017	0.097	0.203	1.000										
EAID	0.304	-0.186	0.025	-0.155	-0.082	1.000									
REM	0.534	0.140	-0.065	0.098	-0.024	0.075	1.000								
INFL	-0.070	-0.267	-0.106	0.066	-0.037	0.047	0.035	1.000							
EXCHG	0.040	-0.194	-0.087	-0.076	-0.058	0.299	0.090	-0.049	1.000						
OPNS	0.094	0.019	0.066	-0.249	-0.023	0.042	0.10	-0.174	0.049	1.000					
CREDIT	0.201	-0.085	0.038	-0.136	0.097	0.139	-0.063	0.047	0.025	0.086	1.000				
INT	-0.216	-0.274	-0.067	0.114	-0.148	0.003	0.019	0.757	-0.044	-0.272	-0.061	1.000			
M3	0.031	-0.241	-0.042	0.076	0.103	-0.001	0.007	0.683	-0.132	-0.166	0.137	0.625	1.000		
ROA	-0.271	-0.027	-0.002	-0.070	-0.460	-0.017	-0.041	0.092	-0.027	-0.042	0.004	0.153	0.092	1.000	
BKCAP	0.052	-0.134	-0.173	0.004	0.014	0.045	-0.028	0.065	0.060	0.109	-0.073	0.101	0.032	-0.056	1.000

Source: Authors' estimations

One of the preliminary analysis consisted of testing which method was appropriate between the fixed effect and the random effect. For that, the Hausman Test was used and the obtained results were presented in the table 7.

Table 7: Estimation Results of Hausman Test
Test cross-section random effects

	1998-2018	1998-2008	2009-2018
GDP	Ho: Var(u) = 0 chi2(1) = 18.732 Prob. > chi2 = 0.0195	Ho: Var(u) = 0 chi2(1) = 14.232 Prob. > chi2 = 0.02204	Ho: Var(u) = 0 chi2(1) = 25.097 Prob. > chi2 = 0.01531

Source: Authors' estimations

According to the test results showing (P-values < 0.05) in all the three cases, there were no random effects in the model over the 1998-2018 period considered as a whole, and for the sub-periods (before and after the 2008 financial crisis), taken separately. Therefore, the fixed-effect model was applied.

Estimation Results

For the sake of brevity, the results of the estimations are all reported in the same table 8; on the left side, the results from the Fixed Effect Model (FEMo), and on the right side the results from the Generalized Method of Moments (GMM) are presented. In the same way, the results relative (1) to the main components of ICF having the most significant effects on economic growth; (2) to the control variables effects; and (3) to the moderating effects of the banking sector performance in the ICF-ΔGDP relationship, are all presented in the table 8.

Table 8: Impact of International Capital Flows (ICF) on Economic Growth (ΔGDP) with Moderating Effects of Banking Sector Performance

Dependent Variable: ΔGDP

Methods:	Fixed Effect Model (FEMo)					Generalized Method of Moments (GMM)				
Variables	(1) ΔCredit	(2) ΔM3	(3) INT	(4) ROA	(5) ΔBkCap	(1) ΔCredit	(2) ΔM3	(3) INT	(4) ROA	(5) ΔBkCap
lnFDI	0.587***	0.397	0.496***	0.436**	0.404**	0.542***	0.385	0.458***	0.412**	0.451*
	(0.112)	(0.110)	(0.108)	(0.107)	(0.108)	(0.195)	(0.106)	(0.212)	(0.093)	(0.104)
lnFPI	0.337***	0.223*	0.347***	0.345**	0.346**	0.314***	0.266*	0.302***	0.242*	0.353**
	(0.166)	(0.162)	(0.239)	(0.165)	(0.165)	(0.430)	(0.767)	(0.359)	(0.167)	(0.185)
lnELTDBT	0.042	0.114	0.050	0.045	0.051	0.150	0.057	-0.232	-0.139)	-0.068
	(0.102)	(0.117)	(0.102)	(0.101)	(0.101)	(0.269)	(0.405)	(0.172)	(0.103)	(0.113)
lnESTDBT	-0.201*	-0.135	-0.134*	-0.228	-0.211*	-0.227*	-0.104	-0.157*	-0.183	-0.216
	(0.086)	(0.086)	(0.086)	(0.088)	(0.085)	(0.147)	(0.157)	(0.172)	(0.101)	(0.104)
lnEAID	0.232	0.224	0.219	0.181	0.275	1.217	-3.95	3.673*	0.010	0.105
	(0.348)	(0.348)	(0.348)	(0.345)	(0.345)	(0.972)	(3.96)	(4.168)	(0.342)	(0.358)
lnREM	0.263***	0.289*	0.282***	0.365*	0.211*	0.196***	0.327*	0.271***	0.244**	0.129*
	(0.184)	(0.184)	(0.184)	(0.182)	(0.188)	(0.207)	(0.609)	(0.219)	(0.075)	(0.079)
lnINFL	-0.012	-0.0132	-0.008	-0.009	-0.007	-0.003	-0.407	0.959*	-0.007	-0.002
	(0.014)	(0.014)	(0.014)	(0.013)	(0.013)	(0.030)	(0.397)	(0.051)	(0.014)	(0.015)
lnEXCHG (-1)	0.001*	0.001**	0.001	0.001**	0.0001**	7.4^{E}-05**	0.001	0.002**	0.001	-5.84^{E}-05
	(0.0003)	(0.001)	(0.010)	(0.0003)	(0.0002)	(0.001)	(0.001)	(0.001)	(8.8^{E}-05)	(0.0001)
lnOPNS	0.0035*	0.002	0.001*	0.001	0.003	0.012**	0.0546	0.017*	0.001	0.002
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.0536)	(0.011)	(0.005)	(0.005)
lnΔCredit	0.0237** *					0.034***				
	(0.0127)					(0.014)				
lnΔM3		-0.058*					-0.066*			
		(0.021)					(0.023)			
lnINT			0.129***					0.094***		
			(0.028)					(0.025)		
lnROA				0.006**					0.007**	
				(0.0015)					(0.001)	
ΔBkCap					0.017					0.021
					(0.013)					(0.0168)
lnFDI*ΔCredit	0.110***					0.211***				
	(0.005)					(0.005)				
lnFDI*ΔM3		-0.008					-0.013			
		(0.007)					(0.015)			
lnFDI*INT			0.202***					0.376***		
			(0.020)					(0.191)		
lnFDI*ROA				0.105***					0.188*	
				(0.071)					(0.045)	
lnFDI*ΔBkCap					0.014*					0.008

Table 8 *(Continued)*

Dependent Variable: ΔGDP										
Methods:	Fixed Effect Model (FEMo)					Generalized Method of Moments (GMM)				
Variables	(1) ΔCredit	(2) ΔM3	(3) INT	(4) ROA	(5) ΔBkCap	(1) ΔCredit	(2) ΔM3	(3) INT	(4) ROA	(5) ΔBkCap
lnFPI*ΔCredit	0.072***					0.017***				
	(0.005)					(0.008)				
lnFPI*ΔM3		-0.006					-0.057*			
		(0.014)					(0.033)			
lnFPI*INT			0.089***					1.166***		
			(0.073)					(0.349)		
lnFPI*ROA				0.602***					0.304	
				(0.051)					(0.095)	
lnFPI*ΔBkCap					7.87e-05					3.03e-04
					(7.0e-05)					(2.4e-04)
lnREM*ΔCredit	0.207***					0.437***				
	(0.007)					(0.013)				
lnREM*ΔM3		-1.28e-04					-0.002			
		(2.0e-04)					(0.003)			
lnREM*INT			0.160***					0.092***		
			(0.0003)					(0.0007)		
lnREM*ROA				0.041***					0.064*	
				(0.025)					(0.057)	
lnREM*ΔBkCap					0.0009*					0.004
					(0.0003)					(0.003)
Constant	4.217***	4.183***	4.159***	4.113***	4.475***	3.799***	3.266***	2.765***	3.519***	3.489***
	(0.932)	(0.932)	(0.942)	(0.923)	(0.928)	(1.111)	(0.844)	(0.908)	(0.529)	(0.567)
Observations	1280	1112	1280	1218	1156	1280	1112	1280	1218	1156
Countries in sample	20	18	20	20	19	20	18	20	20	19
Country FEMo	YES	YES	YES	YES	YES					
Year Dummy	YES	YES	YES	YES	YES					
Post Estimations										
R-squared	0.5343	0.5324	0.5339	0.5426	0.5430					
Hansen P-value						0.293	0.142	0.189	0.414	0.321
AR(2) P-value						0.426	0.182	0.295	0.391	0.277

Legend: Different specifications reported from column (1) to (5) refer to different moderating factors (BkSP) used. Standard errors are in parenthesis; *** p < 0.01, ** p < 0.05, * p < 0.1.

In order to facilitate the reading and understanding of the results, the synthetic table 9, which seems much more fluid and clear, was elaborated.

Table 9: Impact of International Capital Flows (ICF) on Economic Growth (ΔGDP) with Moderating Effects of Banking Sector Performance

Dependent Variable: ΔGDP											
Methods:	Fixed Effect Model (FEMo)						Generalized Method of Moments (GMM)				
VARIABLES	(1) ΔCredit	(2) ΔM3	(3) INT	(4) ROA	(5) ΔBkCap		(1) ΔCredit	(2) ΔM3	(3) INT	(4) ROA	(5) ΔBkCap
FDI	+++		+++	++	++		+++		+++	++	+
FPI	+++	+	+++	++	++		+++	+	+++	+	++
ELTDBT											
ESTDBT	-		-		-		-		-		
EAID									+		
REM	+++	+	+++	+	+		+++	+	+++	++	+
INFL	-	-	-	-	-				+		
EXCHG(-1)	+	++		++	++		++		++		
OPNS	+		+				++		+		
ΔCredit	+++						+++				
ΔM3		-						-			
INT			+++						+++		
ROA				+++						++	
ΔBkCap											
FDI*ΔCredit	+++						+++				
FDI*ΔM3											
FDI*INT			+++						+++		
FDI*ROA				+++						+	
FDI*ΔBkCap					+						
FPI*ΔCredit	+++						+++				
FPI*ΔM3								-			
FPI*INT			+++						+++		
FPI*ROA				+++							
FPI*ΔBkCap											
REM*ΔCredit	+++						+++				
REM*ΔM3								-			
REM*INT			+++						+++		
REM*ROA				+++						+	
REM*ΔBkCap					+						

Legend: [+++, ++ and +] indicate "Positive effects" while [---, -- and -] indicate "Negative effects" with $p < 0.01$, $p < 0.05$, and $p < 0.1$ statistical significance respectively.

Source: Author's elaboration.

Results Interpretation

The results from table 8 showed that the adjusted R-squared values were around 53%, indicating the part of the variability (as a percentage) in the dependent variable, explained by the independent variables in the Fixed-Effects model. Regarding the effectiveness of the GMM panel estimator, the results from the Hansen tests confirm the validity of the instruments used in the regression while the Arellano-Bond tests AR(2) indicate the absence of autocorrelation between the second-order error terms. The Hansen and AR(2) p-values are presented at the bottom the table 8.

In the same table, the results from FEMo indicate that FDI, FPI, and REM have significant and positive effects on GDP. The effect is such that an increase by one unit in each of these International Capital Flows (ICFs) results in an increase of 0.587; 0.337 and 0.263 respectively in the economy in terms of percentage point ($p < 0.01$). Similarly, the results from GMM indicate that

FDI, FPI, and REM have significant and positive effects on GDP, with an increase of 0.542; 0.314, and 0.196 respectively in the economy. The results can be seen in column 1 for each model. Besides in the table's first line, (a) with FEMo estimation the coefficients of GDP–FDI relationship displayed are 0.496 ($p < 0.01$), 0.436 ($p < 0.05$), and 0.404 ($p < 0.05$), when considering respectively individual BkSP indicators such as "INT, ΔROA, and ΔBkCap"; and (b) with GMM estimation, these coefficients are 0.455 ($p < 0.01$), 0.412 ($p < 0.05$), and 0.451 ($p < 0.05$), respectively. Similar analyzes can be shown for GDP-FPI and GDP-REM lines.

(a) The coefficients and sign of the FDI variable are positive and very significant. This means that the FDI in the EM-20 countries is one of the important components, even the most important component of ICFs having positive effects on economic growth. It is certainly because, FDI provide great opportunities for financing, transferts of technology, know-how, education, marketing, business knowledge, and competitiveness, as well as capital transfers for EM-20 countries. The propitious environments created for attracting FDI into these countries over the last decades has been a determining factor.

(b) According to the results of table 8 among the components of ICFs having the most positive effects on economic growth, the FPI comes in the second position after the FDI. In the FPI volume increase, international equity investments and international bond issuance activities gained a significant place in the EM-20 countries. This contributed to boosting their economic growth, as indicated by the coefficients.

(c) The free movement of households and institutional budgets among the EM-20 countries became more and more intense due to the relaxation of regulations on the liberalization of capital movements. Therefore, this free environment increased the development of remittances. Remittances, being a private capital mostly entering the economy directly through individuals, have only recently been considered capital that would enhance economic growth and financial development of the receiving economy. The results of table 8 show that the present research is in line with this trend of thought.

Among the ICFs proxies, these three variables (FDI, FPI, and REM) show very significant ($p<0.01$) and positive coefficients in the two models (FEMo and GMM); that confirms economic theories, and results are in line

with the conclusions of several authors in the literature; for example: (a) concerning the positive effects of FDI on economic growth, we can cite Adeola, (2017); Li and Liu, (2005); Alfaro et al. (2004); and Zhang, (2001); (b) concerning the positive effects of FPI authors like Portes and Rey, (2005); Durham, (2004); Edwards, (2001); and (c) concerning the positive effects of REM, authors like Ziesemer (2012); Adenutsi, (2009); Acosta, et al. (2008) can be cited.

Interpretation on the moderators' effects

It is generally expected and evident in the literature that a performant banking sector (analysed as a direct explanatory variable or direct determinant) favorably affects the country's economic growth (Zeqiraj, Hammoudeh, Iskenderoglu, & Tiwari, 2020) and (Ferreira, 2016). In the case of this study, it is rather the moderating role of this sector (in the relationship between ICF and economic growth) that is highlighted with positive and statistically significant coefficients ($p<0.01$ in the majority of the cases). This evidence is shown in table 8 by three of the banking sector performance proxies; i.e. (ΔCredit, INT, and ΔROA).

These results stay conform in the two models estimations (FEMo-GMM). A country can become more attractive to foreign investors if the financial system is solid and developed (Nkoa, 2018; Hajilee & Al Nasser, 2015), and the country will gain in terms of growth. The accelerated growth in EM-20 economies propelled by ICF in recent decades could find a part of its explanation in the moderating role of certain factors. By making an analytical reconciliation, it can be deduced that the banking sector performance is one of these factors.

The performance of the financial sector and particularly the banking sector is a major requirement for creating a healthy and conducive economic environment and is equally important for foreign and domestic private investors. A performant banking sector facilitates exchanges in terms of fund transfers (official or private), reduces transaction costs (Kamal et al., 2019), is accessible, and reassures foreign and national suppliers and customers. That finally leads to the positive effects on the relationship between the International Capital Flows and Economic Growth.

CONCLUSION

The existing literature on the relationship between international capital flows (ICF) and economic growth (ΔGDP) is abundant but has focused much on the impact/effects of foreign investments on the economic growth of the host country. Moreover, most of the previous studies have focused on only two components of ICF (in emerging economies' cases), and the divergence of the results is observed not only theoretically, but also empirically. The present study contributes to pushing the research beyond the limits of this traditional position by following a more recent trend in the literature that studies the effect of moderating factors on this relationship.

The main aim of the study was first to examine the main components of the FCI having the most significant effects on economic growth, and then to analyze if and how the performance of the banking sector has a moderating role in the ICF-ΔGDP relationship. The sample consists of the EM-20 countries, considered to be the top 20 current emerging economies; these countries have adopted financial liberalization for years and are entering a new era of integration, foreign trade and mutual development. The study period covers 1998-2018 and a paired estimation method (Fixed effects model - Generalized Method of Moments) was adopted. By disaggregating the ICFs into five main components, the results of the analysis show that: (1) FDI, FPI and REM constitute the components of ICFs having the most positive effects on economic growth for the period considered, and that (2) among all the moderating variables (i.e. the proxies of banking sector performance) examined, bank credit, interest rate and bank profitability (ROA) show statistically significant interaction terms, with conditional positive effects. These results are all confirmed for the two models (FEMo and GMM), used.

It was also found that money supply (M3) and bank capital did not play a significant role in moderating these interactions over this period. The in-depth analysis of the coefficients shows that apart from the banking sector, other factors in the EM-20 countries are potentially moderators. The accelerated growth rate of the EM-20 in recent years is proof of that. However, it is important to note that from one country to another and from one period to another, these potential factors could present variable characteristics to which the effects of ICF on economic growth would be sensitive.

The results have important policy implications. (1) The stability and the improvement which characterizes the macroeconomic and financial, political, institutional, and security environment of the host country, have favored the promotion and the effects of ICFs such as FDI, FPI, and REM during the last decades in the MS-20. (2) However, more than that, when designing policies to attract ICF, policymakers should not only give privilege to the factors for which these capital flows are sensitive; but also pay attention to potential factors that may moderate/influence the effects of these capital flows on sustainable economic growth. (3) The effectiveness of prudential policies, supervisory measures for greater transparency, and better quality of information guaranteeing the banking sector performance in the host country have played important roles.

Limits of the study and suggestions for further researches

Although this study brings some contributions, it presents limits. It would be interesting to consider some thoughts for further researches. (1) Rather than annual data, it would be interesting to deepen this analysis with quarterly data or if available monthly, for more in-depth and refined research. (2) If available, other moderating variables such as (liquidity, or risk ratios, institutional quality indicators) could be taken into account. (3) Besides, groups of emerging countries with (very similar) similarities such as the BRICS, MINTS, etc., could constitute more homogeneous samples. (4) Given that each type of activity sector has its own characteristics, it would be interesting to conduct similar research but on other sectors of the economy (i.e. other than the banking sector).

Discussion: Initially in the past, the inflows of capital were directed towards the advanced countries, then with the saturations of these markets combined with the implementation of financial liberalization policy in emerging countries, the inflows were gradually redirected towards these emerging economies, in search of better profits, and at the same time having positive effects on their economic growth. What will happen if, in the future, the emerging markets were to become saturated in turn? (1) Will the movements of capital inflows reverse towards other large advanced countries (when low world interest rates and risk aversion will no longer prevail)?

Or (2) towards the countries currently in development (those would have improved their macroeconomic and institutional environments over time)?
Or rather (3) Emerging economies will implement policies to continue to attract and retain capital flows?

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CHAPTER 4

DEVELOPMENT AND ACCOUNTING OF CRYPTOCURRENCIES

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INTRODUCTION

Money is a medium of exchange used to carry out economic transactions. Money is also a means of accumulating value. Today, developments in software technologies have also led to the development of electronic payment tools. Today, electronic money with cryptological features is an important means of exchange for economic transactions.

Çetinkaya (2018) stated in his study that payment systems and payment instruments continue to diversify and evolve to meet new user needs arising from emerging financial markets. Çetinkaya (2018) stated in his study that virtual currency can be seen as an asset type that is shaped by new consumer demands that traditional payment instruments and financial services have difficulty meeting. Çetinkaya (2018) also stated that cryptocurrency; It refers to the virtual currency used through the internet, not affiliated with any central authority or intermediary institution. Cryptocurrencies can only be extracted and used through passwords from virtual wallets where they are placed using certain passwords.

Kesebir and Çağdaşer (2019) stated in their study that countries have not yet made an effective regulation against cryptocurrencies. The element that ensures trust in the crypto payment approach is the system that offers a digital signature chain.

1.DEVELOPMENT OF CRYPTOCURRENCIES

Sümer (2021) stated that blockchain offers participants open access and a limited consensus mechanism. The consensus mechanism provides users with proof that the transactions made are correct and valid. Sümer (2021) stated that the blockchain technology was before cryptocurrencies. Sümer (2021), Haber and Stornetta (1990) stated that a system in which the dates of digital records cannot be changed was created, while a system was developed by Hal Finney (2004) that prevents users from using cryptocurrencies more than once.

An important study in the field of crypto money was made by Nakamoto (2008). Nakamoto (2008) stated that an peer-to-peer online, secure, evidence-based payment system that prevents undoing of transactions, without the need for any intermediary, is important for an electronic payment system. Nakamoto (2008) defines electronic money as a chain of digital

signatures. Transaction parties can make electronic payments using the chain of signatures. However, it is necessary to prove that the same transaction is not repeated in order to prevent the same money from being used more than once. A timestamp is used for every transaction to avoid double payment. The timestamp helps users by proving when transactions were made.

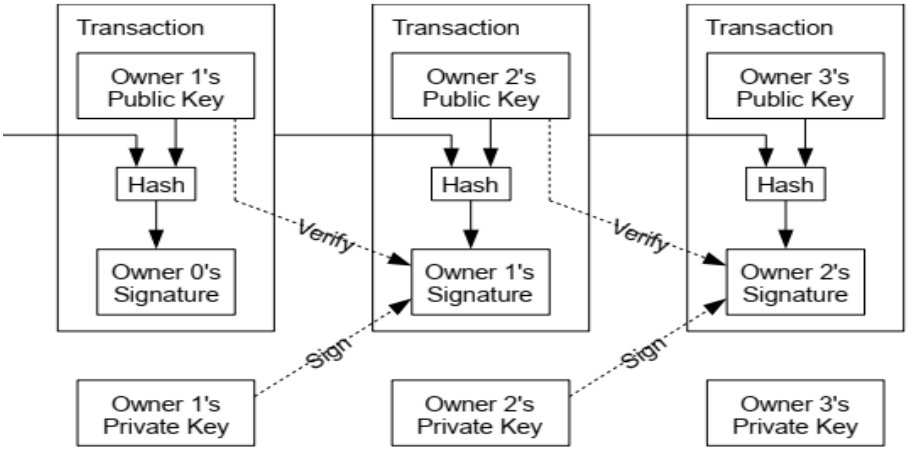

Figure.1.1 Electronic coin transaction process
Source: Nakamoto (2008:2)

Figure.1.2. shows functional diagram of a Blockchain network. The system offers a series of reliable protocol chains to enable reliable payments between users.

Sümer (2021) stated that blockchain technology is a distributed data recording system that is open to everyone and enables the tracking of encrypted transactions and processes. Sümer (2021) also stated that blockchain technology provides solutions to security problems in many areas, especially increasing the use of digital money.

Blockchain system is a reliable information recording system. Every transaction in the blockchain is recorded in the participants' ledgers with reliable algorithms (see Figure.1.3., Euromoney, 2021).

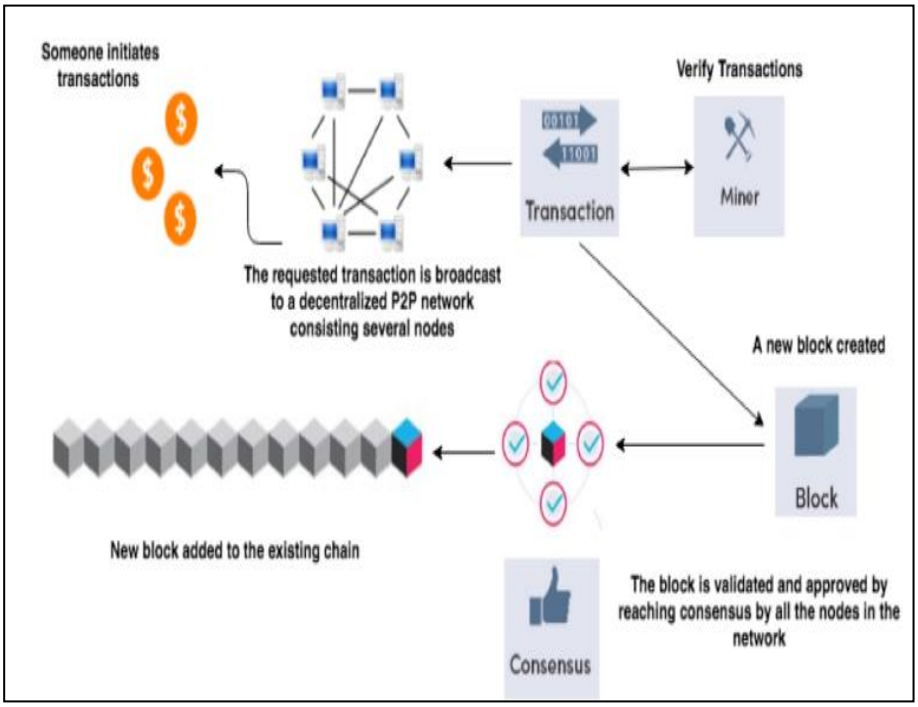

Figure.1.2. Functional diagram of a Blockchain network
Source: Monrat et al (2019)

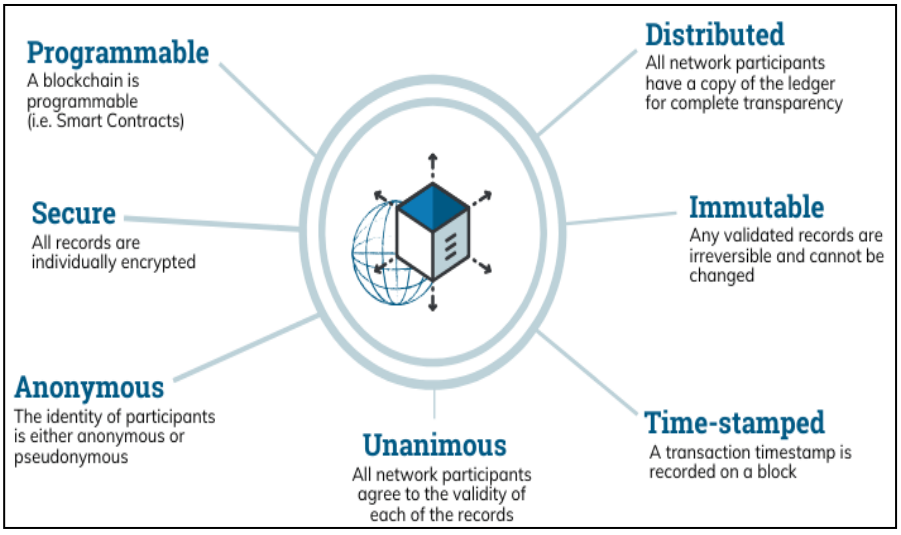

Figure.1.3. Properties of Distributed Ledger Technology (DLT)
Source: Euromoney (2021). What is blockchain?

2. ACCOUNTING OF CRYPTOCURRENCIES

With the starting of use of cryptocurrencies in trade transactions, there is a growing contradiction that whether cryptocurrencies are commercial goods or intangible asset, or whether it is an investment. Mainly a company can gain cryptocurrencies with different transactions; this situation leads to causes confusion about accounting of cryptocurrencies transactions. These transactions that a company earn cryptocurrencies are,

1. Mining cryptocurrencies
2. Obtaining commission income as an intermediary on an exchange by intermediating the buying and selling of cryptocurrencies
3. As an investor buying cryptocurrencies for the aim of making a profit,
4. Using cryptocurrencies as payment in the purchase of commercial goods or services.

The aim of obtain cryptocurrencies changes the accounting of cryptocurrencies transactions. Global Accounting Institutions and Organizations are not fully agree related to how cryptocurrencies are accounted. Table 2.1 shows International Accounting Standards Board (IASB) Association of Chartered Certified Accountants (ACCA), Association of International Certified Professional Accountants (AICPA), Australian Accounting Standards Board (AASB) and Accounting Standards Board of Japan (ASBJ) opinion on accounting of cryptocurrencies.

Table 2.1. Global Accounting Institutions and Organizations' Opinion on Accounting of cryptocurrencies transactions.

	IASB	ACCA	AICPA	AASB	ASBJ
Cash and Equivalents	x	x	x	ü	x
Financial Instrument	x	x	x	ü	x
Inventories	x	x	x	ü	x
Intangible Fixed Asset	ü	x		ü	x
IAS 21 Non-money Item	ü				

Source: Aslan (2020:279)

Although there is no consensus, as can be seen in Table 2.1 the classification of cryptocurrencies under intangible asset group is more dominant. On the other side, Big Four accounting firm opinion has been summarized on Table 2.2.

Table 2.2. Big Four Accounting Firm's Opinion on Accounting of cryptocurrencies transactions

	E&Y	KPMG	PwC	Deloitte
Cash and Equivalents	ü	x	x	x
Financial Instrument	ü	x	x	x
Inventories	ü	x	ü	x
Intangible Fixed Asset	ü	ü	x	ü

Source: Aslan (2020:279)

As shown in the Table 2.2 there is no consensus related to accounting of cryptocurrencies transactions between accounting firms.

2.1 Literature

Literature related to accounting of cryptocurrencies has been summarized on Table 2.3.

Table 2.3. Literature on Accounting of Cryptocurrencies

Researcher	**Results**
Dizkırıcı ve Gökgöz (2018)	As foreign currency under cash Equivalent
Arslantas Ateş (2016)	Petty cash, under cash and cash equivalent
Raiborn & Sivitanides (2015)	Depends on aim of the obtained cryptocurrencies
Sahin (2018)	Intangible Fixed Assets
Yalçın (2019)	Depends on aim of the obtained cryptocurrencies
Kızıl (2019)	Depends on aim of the obtained cryptocurrencies

As we can see in the Table 2.3, there is also no consensus related to accounting of cryptocurrencies among researchers, but common idea is cryptocurrencies transactions should be accounted according to the aim of the obtain.

2.2 Application Example

As discussed within previous chapter opinion on accounting of cryptocurrencies mainly depends on for what aim they are obtained. In this chapter we have performed case studies for each situation.

Case 1: ABC company is a commercial company and selling durable-consumer products. Z company buy total amounting TRY 250.000 + VAT (%18) products from ABC company on February 25, 2021. Z company offers to ABC company paying this amount by using bitcoin that is one of most popular cryptocurrencies. ABC company accept this offer and Z company transfer 1 Bitcoin to ABC Company's cold wallet.

In the case, ABC company and Z company used cryptocurrencies as payment in the purchase of commercial goods. ABC Company's accounting transactions is shown below:

February 25,2021	**Debit**	**Credit**
Trade Receivables	**295.000**	
Z Company	295.000	
Domestic Sales		**250.000**
VAT Payable		**45.000**

Payment of one bitcoin,

February 25,2021	**Debit**	**Credit**
Cash	**295.000**	
Bitcoin- Petty-Cash (1 Bitcoin)		
Trade Receivables		**295.000**
Z Company		295.000

At the end of month bitcoin value increased to 400.000 TRY. ABC company should adjust the value of bitcoin as below,

February 25,2021	**Debit**	**Credit**
Cash	**105.000**	
Bitcoin- Petty-Cash (1 Bitcoin) *increase in value of bitcoin against to TRY*		
Foreign Exchange Income		**105.000**

Case 2: ABC company is a commercial company and selling durable-consumer products. The company intent to make profit from the increase in bitcoin value. For this aim, the company has bought 1 Bitcoin amounting to 400,000 TL on March 05,2021. For ABC company accounting records is shown below:

In this case, ABC company is an investor buying cryptocurrency for the aim of making a profit. ABC company's accounting record for this is shown below:

March 05,2021	**Debit**	**Credit**
Other Marketable Securities	**400.000**	
Cryptocurrency (1 Bitcoin)	*400.000*	
Cash		**400.000**

At the end of month bitcoin value increased to 350.000 TRY. ABC company should adjust the value of bitcoin as below

March 31,2021	**Debit**	**Credit**
Loss On Sale Of Marketable Securities (-)	**50.000**	
Other Marketable Securities		**50.000**
Cryptocurrency (1 Bitcoin)		*50.000*

Case 3: ABC company has started to mining cryptocurrencies to earn profit. At the end of April 30, 2021. The company has earned 1 Bitcoin for this mining activities and the company has consumed electricity amounting to TRY 200.000. ABC company has sell the Bitcoins that earned from mining activities amounting to TRY 350.000 On March 5,2021.

In the case, mining activities is one of operation of ABC company. ABC Company's accounting transactions is shown below:

April 30,2021	Debit	Credit
Cost Of Direct Materials	**200.000**	
Electricity expenses	*200.000*	
Cash		**200.000**

April 30,2021	Debit	Credit
Other Inventories	**200.000**	
Bitcoin	*200.000*	
Cost Of Direct Materials		**200.000**
Electricity expenses		*200.000*

May 5,2021	Debit	Credit
Cash	**350.000**	
Sales		**350.000**
Bitcoins Sales		*350.000*

May 5,2021	Debit	Credit
Cost of Sales	**200.000**	
Other Inventories		**200.000**
Bitcoin		*200.000*

Case 4: ABC company has started to crypto money brokerage services to their customers in June 2021. As of June 30, 2021. The company has earned TRY 100.000 for this brokerage services.

In the case, crypto money brokerage activities is one of operation of ABC company. ABC Company's accounting transactions is shown below;

June30,2021	Debit	Credit
Cash	**100.000**	
Other Income		**100.000**
Bitcoin brokerage sales		*100.000*

CONCLUSION

Electronic money with cryptological features is an important means of exchange for economic transactions and has important role for the financial sector. Electronic money/payment systems have started to serve in more areas around the world. In the future, electronic money/payment systems will be used more intensively with the regulations and support of governments

Apart from being a medium of exchange, there are different approaches for accounting of cryptocurrencies due to differ characteristics such as being an investment tool and being able to be processed like a mine.

In the research, we have discussed accounting process of cryptocurrencies considering opinions and suggestions of global accounting institutions and organizations and have perform an exemplary application. According to our results, despite there are many different approaches to accounting of cryptocurrencies, the main point of accounting of cryptocurrencies depends on what the aim of cryptocurrencies are obtained.

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CHAPTER 5

THE ANALYSIS OF RELATIONSHIP BETWEEN THE POPULARITY AND PRICES OF TRADITIONAL INVESTMENT INSTRUMENTS AND CRYPTOCURRENCIES: A REVIEW FROM AN INVESTOR PSYCHOLOGY PERSPECTIVE

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INTRODUCTION

The concept of investment has been applied in different ways since the first period of history when human beings developed social and economic relations. In the historical process, grain and food products, precious metals, securities and money have been evaluated as investment instruments. Investment instruments, which have been updated in accordance with the spirit of the times, are sometimes as simple as a food product and sometimes they have taken on a technical and complex structure as securities. In the first quarter of the 21st century, investors met a brand new financial asset. This financial asset has been identified as cryptocurrency. Although it was easy to define, it was not equally easy to understand. In fact, it is still a subject of debate whether if it is money or not. In 2008, a person or group thought to go by the pseudonym Satoshi Nakamoto using Blockchain technology, Bitcoin was created, and the first application of a new financial asset was implemented. This new currency, which was not given much importance by traditional investors at the beginning, has increased its popularity thanks to its obscurity. Although the asset is defined as money, the fact that it does not have any physical assets and is not affiliated with any central government or central bank has also been effective in attracting attention. Central banks, who thought that they were the real owners of money, especially in traditional systems, approached these new currencies with suspicion and did not want to lose their power. For this reason, the first test of cryptocurrencies has been with the traditional market and the actors of these markets.

Difficulties or obscurities in the understanding of cryptocurrencies soon became insignificant for the human ambition to win. Especially since the middle of the first quarter of the 21st century, there have been significant developments in the cryptocurrency markets and the interest in cryptocurrencies has increased. By the end of 2021, approximately 10.000 cryptocurrencies with different features are traded in the market. Investors' interest in these new and digital currencies, which emerged as an alternative to traditional investment tools, has increased the number of cryptocurrencies and also significantly affected the value of these currencies. In particular, Bitcoin prices have increased significantly in a short time and have whetted the appetite of investors. However, the increasing price fluctuations as a result of the developments in the direction of the decrease as well as the increase in

prices made the assets more remarkable while at the same time increasing the risk. In particular, the price relations between traditional investment instruments acquired from historical and economic experiences have not been determined for cryptocurrencies yet. While this uncertainty has been an opportunity for risk-loving investors, it has been a nightmare for those who do not like risk. Emerging uncertainties regarding the forecasting of cryptocurrency prices have caused assets to be perceived as speculative. The serious volatility in the prices of cryptocurrencies, especially as a result of the statements made by world-famous people in the fields of technology and investment on social media, strengthened the perceptions that they are speculative assets. Considering this aspect, it can be said that the popularity of cryptocurrencies has increased based on the idea that there's no such thing as bad publicity.

The increasing popularity of cryptocurrencies has also attracted the attention of investors. When the concept of investor is defined as anyone who wants to evaluate their savings, regardless of young or old, educated or uneducated, rich or poor, everyone who has more or less savings, has experienced investing in crypto assets by not being indifferent to the increasing popularity. Especially the ease of access to platforms where cryptocurrencies are bought and sold has accelerated this investment experience. In addition, the appetite for profit brought by the profit opportunities arising from price volatility and the circulating of earnings news in social life started the golden age of cryptocurrencies.

The increasing popularity of cryptocurrencies and the resulting increase in demand highlight several concepts. As mentioned before, individuals with different demographics, from young to old, from the educated to the uneducated, from the rich to the poor, evaluate their savings in cryptocurrencies without knowing exactly what they are investing in, which makes investor psychology and behavioral finance important. In addition, Google searches, which are an indicator of popularity, are among the most important reasons behind the demand for cryptocurrencies, are also important for investor psychology.

In this study, the relationship between traditional investment instruments and Google searches (Google Trends), which is accepted as an indicator of the popularity of cryptocurrencies for Turkey, and their prices,

was examined in terms of causality. For this reason, in order to better understand the subject, firstly, brief information about cryptocurrencies will be given, then some theoretical information on behavioral finance and investor psychology will be presented, and then information about Google Trends will be presented, which is considered as a popularity indicator criterion on the internet. Finally, the popularity and price relations between traditional investment instruments and cryptocurrencies will be examined comparatively in terms of causality.

1. CRYPTOCURRENCY

The concept of cryptocurrency came to the fore with Bitcoin, which was developed by Satoshi Nakamoto, who brought a critical perspective to the financial markets in the first quarter of the 21st century. Although there are different definitions of cryptocurrencies, they are financial assets that are a medium of exchange like traditional currencies but are not tied to a central government or central bank, unlike traditional currencies (Maese et al., 2016: 468). Cryptocurrency literally means encrypted money. The emergence of cryptocurrency has occurred with the merger of technology and finance. Considered the pioneer of cryptocurrencies, Bitcoin consists of the words bit (byte), which expresses the digital transaction unit and coin (Alpago, 2018: 414).

There are some common features of cryptocurrencies and the technologies used in the formation of these currencies (Güven and Şahinöz, 2021: 31):

- They are independent of a central authority.
- There is no state or Central Bank in their background.
- They have a structurally distributed structure.
- The quantities produced or to be produced are certain.

At the end of 2021, approximately 10.000 different cryptocurrencies are traded in the markets. Among these cryptocurrencies, there are those with very high trading volumes as well as very low ones. Since it is not possible to include information about all cryptocurrencies under this title, brief

information about Bitcoin, Ethereum and Dogecoin, which are the subject of the research, will be included.

Bitcoin:

The first currency that comes to mind when the subject is cryptocurrency is undoubtedly Bitcoin. Bitcoin is a virtual currency designed for anonymous payments made completely independently of governments and banks. In recent years, Bitcoin has received great attention in many areas. Bitcoin payments are based on an interesting new technical solution and function differently from traditional payments. Although Bitcoin has advantages such as lower cost, higher speed, and anonymity over traditional payment methods, it is risky because it is not protected by internationally accepted laws yet. This disadvantage is one of the biggest barriers to the general acceptance and viability of Bitcoin as a payment tool (Segendorf, 2014: 71). Bitcoin was produced with blockchain technology by a person or group named Satoshi Nakamoto in 2009, it was started to be used by internet users in 2010, and its popularity began in 2012 (İnci and Alper, 2018:17). By the end of 2021, Bitcoin is the cryptocurrency with the highest market value.

Ethereum:

Ethereum is an open-source blockchain platform used to build and run decentralized applications. Among the reasons for which the platform was designed, it is important that it offers security, speed, and appropriate interaction. All transactions on Ethereum are carried out through the Ethereum Virtual Machine "EVM", where smart contract calculations are performed using a cryptocurrency called Ether (Ünal and Uluyol, 2020: 171) . The most important feature of Ethereum is that it allows trading in the digital environment using smart contracts. At this point, the aforementioned smart contracts represent a structure in which the rules are loaded into the system beforehand and the parties that will make transactions are automatically checked whether they comply with these rules and accordingly, payments are made to the parties (Aksoy, 2020: 103).

Dogecoin:

It is one of the most remarkable cryptocurrencies. One of the main reasons for this is the Shiba Inu dog, which is its mascot. The long-term viability of this currency has been questioned, as it offers high rewards to users for its initial usefulness (DeMartino, 2018: 326). An important feature of Dogecoin, which is produced as a joke coin, is that it supports social assistance. The Dogecoin community took part in fundraising initiatives to build wells in developing countries on World Water Day and under-financed Olympians trying to attend the Sochi Winter Olympics (2014) (Chonan, 2021: 5). In addition, the support of Elon Musk should not be ignored in the increase in the popularity of Dogecoin.

2. INVESTOR BEHAVIOR AND PSYCHOLOGY

The concept of investment, in its most basic expression, is to tie a certain amount of money to an asset or business in order to gain higher income. Investors' decision-making, which investment instruments they will prefer and what scale they will invest refers to the investment process (Karan, 2013: 3). Investors' decision-making processes are both subjective and objective according to the different characteristics of the asset to be invested. Investor behavior deals with the cognitive and emotional characteristics of individuals, experts and investors in the financial planning and management process. In financial matters, individuals make decisions based on past experiences, personal beliefs, and preferences (Baker and Ricciardi, 2014: 7).

Investment decisions are affected by cognitive and behavioral factors. The qualities that a good investor should have can be summarized as follows (Özerol, 2013: 38):

- Should have knowledge about the functioning of the markets and investment instruments.
- Must have sufficient technical knowledge to evaluate the markets.
- There should be enough time to follow the markets.
- Must have discipline.

When evaluated in general, there are three different investor profiles in the markets. These are the victors, the utilitarians and the futiles. The victors are the investors who enter the markets with the aim of making a profit. They have a high level of knowledge, make a good analysis, and provide real liquidity to the markets. Utilitarians are investors whose primary purpose is not to make a profit but who still trade with the expectation of earning. The excitement and fun brought by the trading process rather than making a profit are more important for them. The futile ones in the last group are the group of investors who make up the majority of the investors in the markets, generally end their investments with losses and lack the necessary knowledge and experience. In the markets, the losses of the utilitarians and the futiles make up the gains of the victors (Perşembe, 2010: 315).

Investor psychology is one of the important factors affecting financial markets. Financial and economic indicators are not the only variables that investors take into account in their decision-making processes. In addition to these, their inner worlds, past experiences and the way they perceive opportunities have an impact on their decision-making processes (Taner and Akkaya, 2005: 47). Behavioral factors also need to be taken into account in order to understand how the financial system and markets work, because the fact that investors cannot always make rational decisions, contrary to what classical models advocate, shows the importance of behavioral factors (Doğan and Faikoğlu, 2016: 21).

Traditional finance theory argues that asset prices in the market will not be affected by behaviors and the behavioral approach developed against this approach argues that prices are affected by behavioral factors (Almansour and Arabyat, 2017: 42). This approach, also known as behavioral finance, tries to explain how investors are affected by their emotions in their decision-making processes by including their emotions in their behavior (Güngör and Demirel, 2018: 12).

There are several stereotypical investor behaviors that investors have performed. Prominent among these are overreaction, underreaction, and herding behavior. The overreaction hypothesis refers to the behavior of investors as they overreact to developments in asset prices. According to this approach, investors overreact to developments in asset prices and subsequently cause volatility in these prices. It argues that as a result of the

realization of overreaction, asset prices will stabilize again. The underreaction hypothesis refers to the low and weak reaction of investors to developments in asset prices. According to this approach, the main reason for underreaction is conservatism. Conservatism means that investors are closed to new information and news and do not take them into account in their decision-making processes (Kandır, 2009: 84-85).

One of the notable ones among investor behaviors is herding behavior. Herding behavior is defined as investors imitating the decisions of others instead of their own individual decisions while making investment decisions. There is an important point here. Every similar decision taken by investors should not be considered as herding behavior. In order for herd behavior to occur, investors must be under the influence of other investors while making decisions. In the emergence of herding behavior, the existence of different and special information that the investor thinks other investors posses often plays an important role (Kıyılar and Akkaya, 2016: 206-207). The herding behavior of investors basically emerges in two different ways. These are rational and irrational herding behaviors. Rational herding behavior can be defined as investors consciously and willingly abandoning their own opinions and decisions and applying the decisions of investors whom they think have more reliable information or competence. (Ouarda et al., 2013: 216). Irrational herding behavior occurs when investors with insufficient knowledge and inadequate risk assessment ignore their previous beliefs and blindly follow the actions of other investors. Uninformed herding behavior can lead to market inefficiencies, distract asset prices from fundamental values and cause assets to be mispriced (Lin et al., 2013: 756). The most important factors in the emergence of irrational herd behavior are social pressure and fad. Individuals can adapt to the ideas of the group by giving up their own ideas with the thought of being excluded or considered inadequate by the group members if their own knowledge conflicts with the knowledge of the group they belong to. In this context, group pressure and social pressures affect the decisions of investors. As individuals in the group learn about the decisions of other investors, social consensus is formed, and this consensus causes herding behavior (Kıyılar and Akkaya, 2016: 217).

The development of technology and the increase in the use of the internet create alternative investment areas by directing investors to different areas. Cryptocurrency markets also attract the attention of individuals, central banks and investors, thanks to their increasing popularity in these areas (Chowdhury and Mendelson, 2013: 1).

Fads and herding psychology have an important place among the main reasons for the high volatility in cryptocurrency and especially Bitcoin prices (Al-Mansour, 2020: 159). When evaluated in terms of behavioral finance, it can be said that the increasing transaction volumes and growth in the cryptocurrency markets are due to the irrational decisions of the investors. Despite little knowledge about crypto markets, the perception that is earning opportunities are missed leads investors to invest in these markets in significant amounts. This situation causes serious volatility and herding behavior in the cryptocurrency markets. Decisions made by investors depending on the irrational and herd environment are shaped according to the market movement and behavior, not rational tendencies (Jalal et al., 2020: 28).

3. GOOGLE TRENDS

By reducing psychological or financial uncertainties, investors and consumers avoid risks in the investment and purchasing process and act to maximize their satisfaction. In this case, investors and consumers generally get information by searching the internet, thanks to the increased internet accessibility made possible by the increasing use of smartphones (Jun et al., 2018: 70).

Data on transactions in financial markets consist of a large number of decisions taken by investors. Decision-makers in the markets first, collect information and then apply this information to their decisions. Today, a significant part of the information is obtained from online sources. At this point, Google comes to the fore as the source of information. The search engine Google, through its public service Google Trends, shares aggregate information about the volume of queries for different search terms and how these volumes have changed over time (Preis, et al., 2013: 1).

Google Trends was first introduced on May.11.2006. Then, on August. 5.2008, Google released Google Insights for Search, an advanced and more detailed service that provides users with data on search trends, and on September.27.2012, Google combined Google Insights for Search with Google Trends. This allowed users to track various terms and phrases searched on Google. Thanks to the combination of Google Trends and Google Insights, users are able not only to categorize and organize statistical data on searches but also sort by geographic region (Jun et al., 2018: 70). Google Trends is a feature that allows users to chart the frequency of searches for a term, multiple term strings, or phrases. The data used to create these charts are presented scaled to the average search traffic for the selected term (Seifter et al., 2010: 135).

Here's how Google Trends works. First of all, the searched word or concept is shown with numbers between 1 and 100, not directly as the number of searches. The period with the highest number of searches is expressed as 100, and the period with the least number of searches is expressed as 1. In addition, the obtained data can be collected from the whole country, as well as on a city or region basis. The number of searches for a word expressed with the same index in two different cities or regions may not be the same. For example, a day with 1.000 searches in city A, can be shown with 100 index points for the highest number of searches, while in city B, a day with 100.000 searches can be shown with 100 index points for the highest number of searches (Kocabıyık et al., 2020: 262).

Cryptocurrencies are financial assets that much is heard, but little is known about. Cryptocurrency investors are often thought to gather information over the internet prior to the investment process. Although there are several search engines on an international scale (Google, Yahoo, Bing etc.), Google clearly dominates the market. Google's worldwide search market share is estimated to be 86.6%. Therefore, it can be said that Google Trends can be used as a reliable measure for online searches (Aslanidis et al., 2021: 2).

The increase in worldwide interest in cryptocurrencies and Bitcoin increases the sharing of cryptocurrencies on social media and the internet and as a result of this, there is a serious increase in the daily Bitcoin purchase

amount of users. Also, prices continue to rise as a result of the increase in the number of searches. Thus, the internet and social media arouse curiosity and play an intermediary role between high search volumes and prices. In addition, in case of a negative event, people want to reach all the details about the subject by searching the internet. The sudden increase in searches as a result of this situation can be interpreted as a clue for price decreases (Kutlu et al, 2017:171; Garcia et al., 2014). Kristoufek (2013) concluded that Google search data and Bitcoin prices are linked. It has been determined that Google searches affect Bitcoin prices, and most importantly, the relationship is bidirectional. It can be said that this situation arises as a result of the speculative nature of Bitcoin and the trend-following behavior of people (Kutlu et al. 2017:171; Kristoufek, 2013: 1).

4. A COMPARATIVE ANALYSIS OF THE RELATIONSHIP BETWEEN POPULARITY AND PRICES OF TRADITIONAL INVESTMENT INSTRUMENTS AND CRYPTOCURRENCİES

In this part of the study, the relationship between the popularity of investment instruments in Turkey and their prices will be analyzed comparatively. For this comparison, Gold, USD, Stock Exchange (BIST) and Interest are classified as traditional investment instruments, and cryptocurrencies Bitcoin, Ethereum, and Dogecoin are used to represent innovative investment instruments. Bitcoin and Ethereum are included due to being the first two cryptocurrencies with the highest market value respectively and Dogecoin is included in the analysis due to its increasing popularity with the tweets of Elon Musk. The aim of the study is to analyze the relationship between Google Trends (for Turkey) and price data regarding traditional investment instruments and cryptocurrencies in terms of causality and to examine the findings in terms of investor psychology.

4.1. Data Set

In the research, the price series of Gold, Stock Exchange, USD and Interest variables representing traditional investment instruments and their Google Trends search data, which emerged as a result of searching these words on Google for Turkey, were used. The data on the variables consist of

weekly data between 01/01/2020 and 12/12/2021. Data were included in the analysis logarithmically.

Table 1: Summary Information on Traditional Investment Instruments

Variable	Date Range of Data	Shape of Data	Source of Data
Gold (Price)	01/01/2020 -12/12/2021	Weekly	investing.com
Stock Exchange (Index)	01/01/2020 -12/12/2021	Weekly	investing.com
USD (Price)	01/01/2020 -12/12/2021	Weekly	TCMB / EDDS
Interest (Rate)	01/01/2020 -12/12/2021	Weekly	TCMB / EDDS
Gold (Google Search)	01/01/2020 -12/12/2021	Weekly	Google Trends
Stock Exchange (Google Search)	01/01/2020 -12/12/2021	Weekly	Google Trends
USD (Google Search)	01/01/2020 -12/12/2021	Weekly	Google Trends
Interest (Google Search)	01/01/2020 -12/12/2021	Weekly	Google Trends

The price series of traditional investment instruments used in the research and the graphs of Google search statistics are presented below.

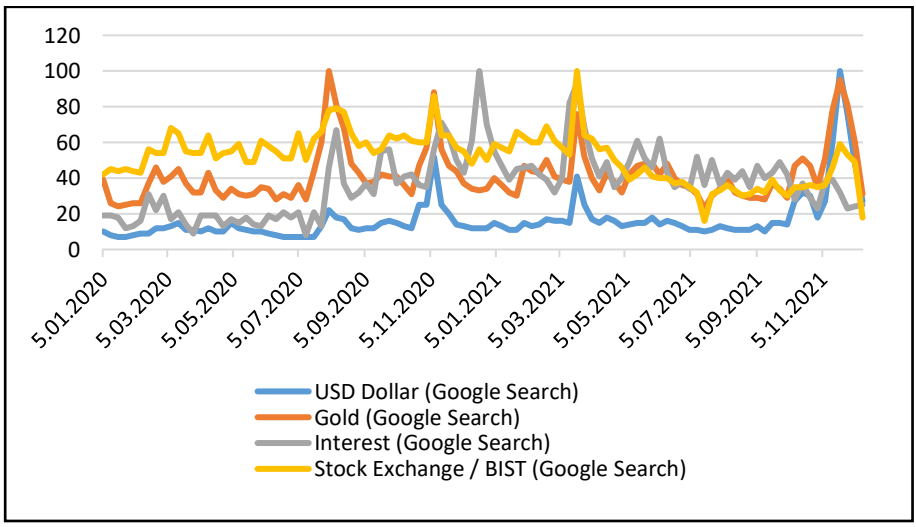

Figure 1: Google Search Data on Traditional Investment Instruments (For Turkey)

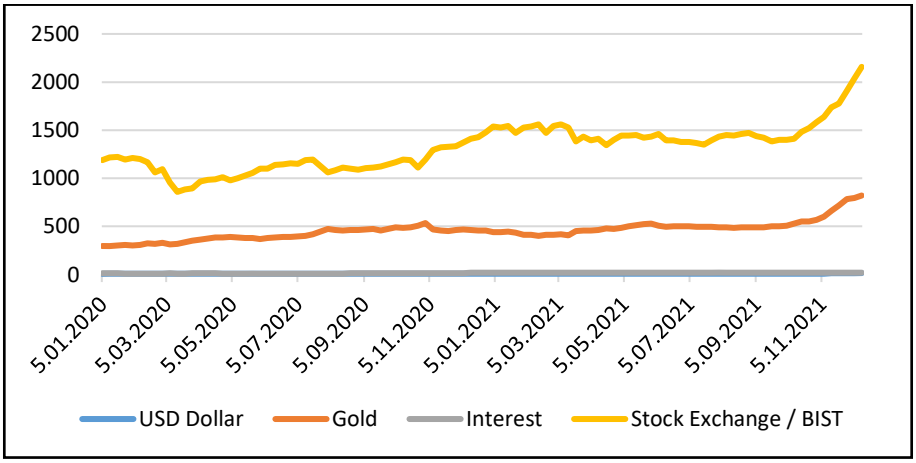

Figure 2: Price Data on Traditional Investment Instruments

In the research, the price series of Bitcoin, Ethereum, and Dogecoin variables and their Google Trends search data for Turkey were used to represent cryptocurrencies. The data on the variables consist of weekly data between 01/01/2020 and 12/12/2021. Data were included in the analyzes logarithmically.

Table 2: Summary Information on Cryptocurrencies

Variable	Date Range of Data	Shape of Data	Source of Data
Bitcoin (Price)	01/01/2020 -12/12/2021	Weekly	investing.com
Ethereum (Price)	01/01/2020 -12/12/2021	Weekly	investing.com
Dogecoin (Price)	01/01/2020 -12/12/2021	Weekly	investing.com
Bitcoin (Google Search)	01/01/2020 -12/12/2021	Weekly	Google Trends
Ethereum (Google Search)	01/01/2020 -12/12/2021	Weekly	Google Trends
Dogecoin (Google Search)	01/01/2020 -12/12/2021	Weekly	Google Trends

The graphs of the price series of the cryptocurrencies used in the research and the Google search statistics are presented below.

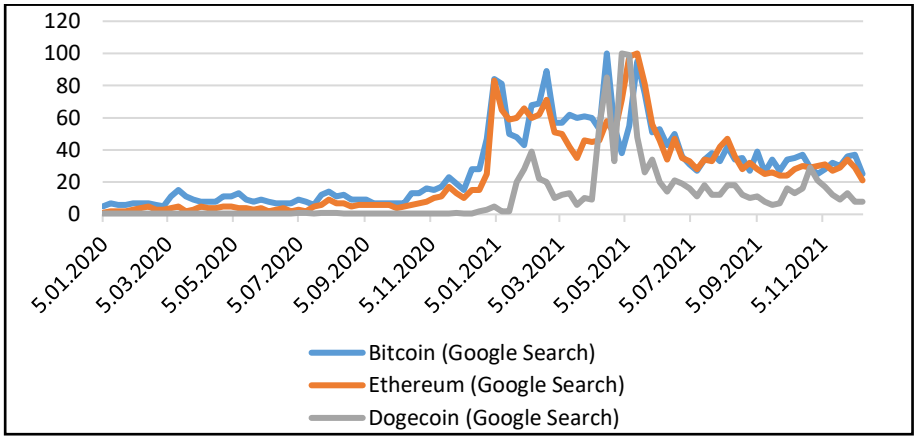

Figure 3: Google Search Data of Cryptocurrencies (For Turkey)

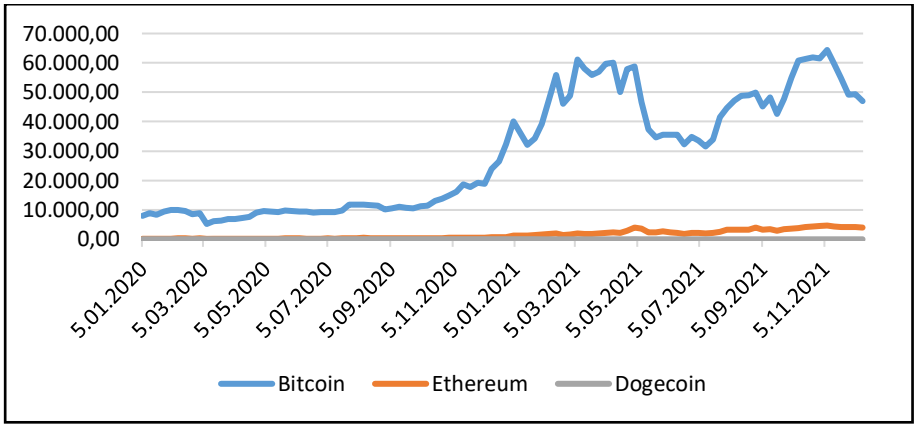

Figure 4: Price Data of Cryptocurrencies

4.2. Analysis Results

In this part of the research, the results of the Unit Root Test for the analyzes carried out and the findings of the Toda-Yamamoto Causality Test applied to determine causality relationships will be included.

4.2.1. Results of Unit Root Test

Unit root tests are applied to determine the stationarity levels of variables which is a crucial element in econometric time series analysis. The stationarity levels obtained from unit root tests are important for the selection of the analysis to be performed and the model to be applied. Before any empirical analysis, it should first be investigated whether the variables contain

a unit root. ADF and PP unit root tests were used in this research to test whether the series are stationary or not. The null hypothesis for ADF and PP tests is that the series has a unit root; in other words, it is not stationary. Stationary series at level are denoted by I (0) and stationarity at first difference level is denoted by I (1) (Gökmenoğlu et al., 2015: 491-492).

Table 3: Results of Unit Root Test

	Level				**First Difference**			
	ADF		**PP**		**ADF**		**PP**	
	With Constant	**With Constant & Trend**	**With Constant**	**With Constant & Trend**	**With Constant**	**With Constant & Trend**	**With Constant**	**With Constant & Trend**
Gold (Price)	0.6785 (0.9911)	-0.3389 (0.9885)	0.0543 (0.9606)	-1.2046 (0.9038)	-8.4682 (0.0000) ***	-8.4943 (0.0000) ***	-8.7698 (0.0000) ***	-8.7888 (0.0000) ***
Stock Excahnge (Index)	0.8863 (0.9950)	-1.3270 (0.8755)	0.1901 (0.9707)	-1.9319 (0.6305)	-8.1842 (0.0000) ***	-8.4696 (0.0000) ***	-8.4304 (0.0000) ***	-8.6199 (0.0000) ***
USD (Price)	2.2677 (1.0000)	1.1028 (0.9999)	1.7057 (0.9996)	0.4160 (0.9989)	-8.3044 (0.0000) ***	-8.5450 (0.0000) ***	-8.5230 (0.0000) ***	-8.7108 (0.0000) ***
Interest (Rate)	-0.9520 (0.7676)	-1.0182 (0.9361)	-0.9474 (0.7692)	-1.2228 (0.9000)	-6.8714 (0.0000) ***	-6.8630 (0.0000) ***	-6.9592 (0.0000) ***	-6.9470 (0.0000) ***
Bitcoin (Price)	-0.9461 (0.7696)	-1.4900 (0.8268)	-0.9840 (0.7567)	-1.7112 (0.7393)	-9.5143 (0.0000) ***	-9.4714 (0.0000) ***	-9.5236 (0.0000) ***	-9.4814 (0.0000) ***
Ethereum (Price)	-0.8552 (0.7985)	-2.3487 (0.4040)	-0.8515 (0.7996)	-2.4867 (0.3341)	-10.012 (0.0000) ***	-9.9621 (0.0000) ***	-10.012 (0.0000) ***	-9.9621 (0.0000) ***
Dogecoin (Price)	-0.5714 (0.8711)	-1.4685 (0.8340)	-0.6359 (0.8567)	-1.6660 (0.7591)	-8.4711 (0.0000)	-8.4282 (0.0000)	-8.4673 (0.0000	-8.4244 (0.0000) ***

					***	***	***	
Gold (Google Search)	-4.0751 (0.0016) ***	-4.1331 (0.0078) ***	-4.2110 (0.0010) ***	-4.2850 (0.0049) ***	-7.3807 (0.0000) ***	-9.2412 (0.0000) ***	-10.222 (0.0000) ***	-10.107 (0.0000) ***
Stock Exchange (Google Search)	-2.7128 (0.0754) *	-3.9103 (0.0150) **	-2.4013 (0.1439)	-3.7050 (0.0264) **	-11.654 (0.0001) ***	-11.682 (0.0000) ***	-12.831 (0.0001) ***	.3240 (0.0000) ***
USD (Google Search)	-2.8779 (0.0515) *	-3.5864 (0.0360) **	-2.8087 (0.0606) *	-3.6164 (0.0333) **	-7.7574 (0.0000) ***	-7.6998 (0.0000) ***	-12.713 (0.0001) ***	-12.566 (0.0000) ***
Interest (Google Search)	-3.4781 (0.0105) **	-3.9357 (0.0140) **	-3.1544 (0.0258) **	-3.9357 (0.0140) **	-8.6298 (0.0000) ***	-8.7031 (0.0000) ***	-20.221 (0.0001) ***	-26.599 (0.0001) ***
Bitcoin Google Search)	-2.0282) (0.2745	-2.2314 (0.4669)	-1.8336 (0.3624)	-2.0024 (0.5928)	-11.269 (0.0000) ***	-11.255 (0.0000) ***	-11.939 (0.0001) ***	-12.089 (0.0000) ***
Ethereum Google Search)	-2.2272 (0.1981)	-2.1263 (0.5248)	-2.2116 (0.2035)	-1.9732 (0.6085)	-11.820 (0.0001) ***	-11.878 (0.0000) ***	-11.917 (0.0001) ***	-12.042 (0.0000) ***
Dogecoin (Google Search)	-1.4962 (0.5316)	-2.2982 (0.4308)	-1.4962 (0.5316)	-2.1736 (0.4987)	-10.645 (0.0000) ***	-10.599 (0.0000) ***	-10.729 (0.0000) ***	-10.680 (0.0000) ***

Note: *** 1%, **5% and * indicate 10% significance level. ( ) denotes probability values.

When the stationarity of the variables is examined, it is seen that all of the price series of the variables contain a unit root at the level; in other words, they are not stationary, and they become stationary at the first difference. At this point, all price series are I (1). When the Google Search series for the variables are examined, it is seen that Gold, USD, Stock Exchange and Interest are stationary at the level, I(0), while Bitcoin, Ethereum, and Dogecoin are stationary at the first difference, I(1).

4.2.2. Results of Toda - Yamamoto Causality Test

Toda and Yamamoto developed a method based on the estimation of the augmented VAR model ($k+d_{max}$) to investigate causality. Here, k represents the lag length of the variables in the VAR model, and d_{max} represents the maximum degree of integration (Dritsaki, 2017: 123). When the application process of the Toda – Yamamoto causality test is examined, first of all, the appropriate lag length (k) is found by using the level values of the variables for the VAR model. Then, using the maximum integration degrees (d_{max}) obtained from the unit root tests, the ($k+d_{max}$) order VAR estimation is performed (Fantazzini, 2020: 6). The Toda – Yamamoto Causality Test can be applied regardless of whether the series are I(0), I(1) or I(2), cointegrated to varying degrees or not (Aziz et al., 2000: 47).

Below, the findings from the Toda – Yamamoto Causality Test are presented separately for traditional investment instruments and cryptocurrencies.

Table 4: Traditional Investment Instruments Causality Test Results

Dependent Variable	Independent Variable	d (max)	k	Chi-sq	Prob.	Causality Relationship and Direction
Gold (Price)	Gold (Google Search)	1	3	2.211785	0.5296	No Causation
Gold (Google Search)	Gold (Price)	1	3	2.320133	0.5087	No Causation
Stock Exchange (Index)	Stock Exchange (Google Search)	1	5	2.817156	0.7281	No Causation
Stock Exchange (Google Search)	Stock Exchange (Index)	1	5	6.428992	0.2667	No Causation
USD (Price)	USD (Google Search)	1	1	2.175765	0.1402	No Causation
USD (Google Search)	USD (Price)	1	1	0.717948	0.3968	No Causation
Interest (Rate)	Interest (Google Search)	1	2	31.15000	0.0000 ***	Google Search → Rate
Interest (Google Search)	Interest (Rate)	1	2	2.490662	0.2878	No Causation

Note: *** 1%, **5% and * indicate 10% significance level.

When the table above is examined, it has been determined that the causality between Google Searches, which is considered as a popularity indicator for traditional investment instruments and prices are at the 1% significance level

and only one-way from Interest word searches on Google to the average 3-month Interest rates applied to TL deposits. No causality was found between the prices of other traditional investment instruments included in the analysis and Google searches.

Table 5: Cryptocurrency Causality Test Results

Dependent Variable	Independent Variable	d (max)	k	Chi-sq	Prob.	Causality Relationship and Direction
Bitcoin (Price)	Bitcoin (Google Search)	1	1	3.321071	0.0684 *	Google Search → Price
Bitcoin (Google Search)	Bitcoin (Price)	1	1	4.444862	0.0350 **	Price → Google Search
Ethereum (Price)	Ethereum (Google Search)	1	1	0.929621	0.3350	No Causality
Ethereum (Google Search)	Ethereum (Price)	1	1	5.833295	0.0157 **	Price → Google Search
Dogecoin (Price)	Dogecoin (Google Search)	1	2	1.681214	0.4314	No Causality
Dogecoin (Google Search)	Dogecoin (Price)	1	2	26.72961	0.0000 ***	Price → Google Search

Note: *** 1%, **5% and * indicate 10% significance level.

When the prices of cryptocurrencies and Google search data, which is considered as a popularity indicator, in the table above are examined in terms of causality, it has been determined that there is a bidirectional causality relationship between Bitcoin prices and Bitcoin searches on Google. The causality from Bitcoin Google searches to Bitcoin prices is 10%, while the causality from Bitcoin prices to Bitcoin Google searches is statistically significant at the level of 5%. When the causality is evaluated for Ethereum and Dogecoin, it has been determined that there is one-way causality from price series to Google searches for both. One-way causality from Ethereum price series to Ethereum Google searches is significant at the 5% level, while one-way causality from Dogecoin price series to Dogecoin Google searches is significant at the 1% level.

CONCLUSION

Although investor behaviors and psychology have changed in accordance with the spirit of the time in the historical process, the idea of making a profit, which is the primary goal, does not change. With the development of the financial system and technology, more complex financial instruments have emerged in the markets, while on the other hand, traditional investment instruments that have been traded in the market for centuries maintain their importance and value. Among the traditional investment instruments, foreign exchange, gold, stock market and interest are the most traded ones, and today they compete with cryptocurrencies, which are innovative financial instruments. Cryptocurrencies are financial assets that emerged in the first quarter of the 21st century by breaking the financial routine and increasing their popularity in a short time. Serious volatility in the value of cryptocurrencies were considered as an important earning opportunity by investors, and this situation led the cryptocurrencies to draw attention.

Investors certainly want to have information, whether they invest in traditional investment instruments or cryptocurrencies. While this information is sometimes obtained from people or experts in social relations, nowadays, it is mainly obtained from the internet. The most used tool to reach the information source is search engines and Google has the highest search share among them. The most popular searches made on Google are shared with users by Google Trends. In this context, Google Trends data can be considered an essential indicator of the popularity of the searched concept or word. This allowed for the consideration of Google Trends data in academic studies. Different studies have been carried out using Google Trends data in many areas such as medicine, finance etc.

This study examined the relationship between the popularity and prices of traditional investment instruments and cryptocurrencies in terms of causality. For this purpose, the relationship between the words Gold, USD, Stock Exchange, Interest, Bitcoin, Ethereum and Dogecoin was searched on Google between 01/01/2020 and 12/12/2021 in Turkey and the prices of these assets were analyzed. In the research, Gold, USD, Stock Exchange and Interest represent traditional investment tools, while Bitcoin, Ethereum and Dogecoin represent cryptocurrencies, which are innovative investment tools.

When the results of the causality analyzes are evaluated in terms of Gold, USD, Stock Exchange and Interest, which are accepted as traditional investment instruments, no causality relationship has been detected between Google Search data and prices of any traditional investment instrument except Interest. In Interest, it has been found that there is one-sided causality towards Interest rates from the word "Interest" searched on Google.

When the analysis results were evaluated for cryptocurrencies, a remarkable result was obtained especially in Bitcoin. According to the causality test results, there is a bidirectional relationship between the word Bitcoin searched on Google and Bitcoin prices. This situation can be interpreted that the changes in Bitcoin prices are reflected in the searches made on Google and the information obtained as a result of increased searches is transformed into financial behavior and affects Bitcoin prices as a result of buying or selling transactions. When the findings are evaluated in terms of Ethereum and Dogecoin, it has been determined that there is one-way causality from the prices of these cryptocurrencies to Google searches and causality from Google searches to price has not been determined.

When the findings are evaluated together for both traditional investment instruments and cryptocurrencies, it can be said that the prices of traditional investment instruments, excluding Interest, are not affected by Google searches. In terms of cryptocurrencies, the situation is slightly different. In particular, a bidirectional causality relationship has been determined between Bitcoin prices and Bitcoin Google searches. This result can be considered an expected result for a cryptocurrency that is the pioneer of cryptocurrencies such as Bitcoin and has experienced serious volatility in its prices. For Ethereum and Dogecoin, the price can be considered a reason for their popularity.

As a result, the coming years will consist of days of new developments and transformations in information and technology. Many transactions will be carried out entirely in digital environments in the future and supply and demand will be determined in digital channels. In this respect, especially asset prices will be affected by their popularity on digital platforms and the related supply and demand. From this point of view, the data obtained from search engines and social media applications used by billions of people, especially on an international scale, will most likely allow the formation of

new financial indicators and these indicators will be among the most fundamental determinants of investor behavior and asset prices.

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CHAPTER 6

EMPIRICAL ANALYSIS OF THE RELATIONSHIP BETWEEN FINANCIAL SERVICES AND REAL SECTOR CONFIDENCE INDEX IN THE TURKISH ECONOMY

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INTRODUCTION

Expectations in the economy have a great role and importance on the course of economic activities. If the future expectations of economic actors and investors are positive, economic activities will move faster and stronger. In case of deterioration in expectations, the policies to be implemented will not have the expected effect. The probability of economic activity going towards recession will increase.

Decision makers on economic policies are required to meticulously monitor and manage the expectations of economic units. It is important for decision makers to avoid statements and policies that will adversely affect the expectations of economic agents. Maintaining a high level of confidence of economic units in economic management and economic indicators plays a critical role for the sustainable growth of the economy. Loss of confidence in economic units can lead to rapid deterioration of economic indicators and to re-establish economic balance for a long time and at great cost.

In this study, the relationship between financial services confidence index and real sector confidence index was analyzed using time series econometric techniques, using monthly data for the Turkish economy for the period 2012:05-2020:3.

The original contribution of the study to the literature is that it contributes to the gap in the literature as a study that examines the relations between expectation variables in the Turkish economy with current data.

1. LITERATURE

The expectations of economic units are of great importance in the theory of economics and the implementation of economic policies. Expectations have such an important role that the role of expectations has become a very important variable in the investment decisions of economic agents from Keynes to the present. Adaptive expectations approach in Monetarism has developed towards Rational Expectations in New Classical Economics Approach. In this context, the correct management of expectations in the economy has the same importance as the correct management of the economy.

Yavuz and Tokucu (2006) emphasized in their study that there are differences in terms of managing uncertainty and creating expectations in terms of Orthodox economics and Post Keynesian economics approaches.

Öz Sağır (2007) emphasized in his study that trust between economic units has an important role in the healthy functioning of economic activities.

Börke (2009) stated that different approaches are developing in the modelling of expectations in economics, and because the rational expectations approach is not realistic, new approaches such as learning models are developed in her study.

Korkmaz and Çevik (2009) found that there is an interaction between the return on the BIST 100 index and the real sector confidence index.

Aktan (2010) emphasized that the subject of expectations is used in economics, in agricultural production planning in cobweb theorem, Keynesians and Monetarists have adopted the Adaptive Expectations approach, and the Rational Expectations Approach gained importance in economics with the study of Muth (1961).

Güran and Oğuz (2010) emphasized in their study that the rationality of individuals' behaviour can actually differ and that the state should consider these factors in developing optimal policies for social welfare in the field of public economy.

Kansu (2011) emphasized that transparency in monetary policies is important in keeping expectations healthy.

Hacıoğlu and Yerlikaya (2014) emphasized in their study that economic units have more rational expectations by directing their expectations depending on the change in real variables.

Tunalı and Özkan (2016) found in their study that there is a long-term relationship between the consumer confidence index and the consumer price index, and a causal relationship from the price index to the trust index in the short run.

İskeneroğlu and Akdağ (2017) found a one-way causality relationship between the financial services confidence index and BIST 100, and from the financial services confidence index to the CBRT net funding.

Eyüboğlu and Eyüboğlu (2018) found a long-term relationship between the consumer confidence index and 18 Borsa İstanbul indices.

Durgun Kaygisız (2019) found that there is a mutual interaction between Consumer Confidence Index, Real Sector Confidence Indices and selected macroeconomic variables.

Birsen (2019) found in her study that there is mutual causality between the real sector confidence index and the capacity utilization rate.

Dayıoğlu and Aydın (2020) emphasized that adaptive and rational expectations create differentiating results in the management of expectations in terms of economic policies.

Akdağ (2020) found in their study that uncertainties in economic policies for OECD countries are the cause of confidence indices.

2. EMPIRICAL ANALYSIS

2.1. Data and Method

In this study, the relationship between financial services confidence index and real sector confidence index was analysed using time series econometric techniques, using monthly data for the Turkish economy for the period 2012:05-2020:3.

In the empirical analysis, first of all, the stationarity levels of the variables were examined with unit root tests. Since the variables are stationary at the level, long-term relationships are estimated with the OLS estimator for the long-term relationship between them. The short-term causality relationship between the variables was handled with the Granger causality test.

In Figure 1. time series graphs for financial services confidence index and real sector confidence index are given. Accordingly, volatility has increased for the variables after 2018.

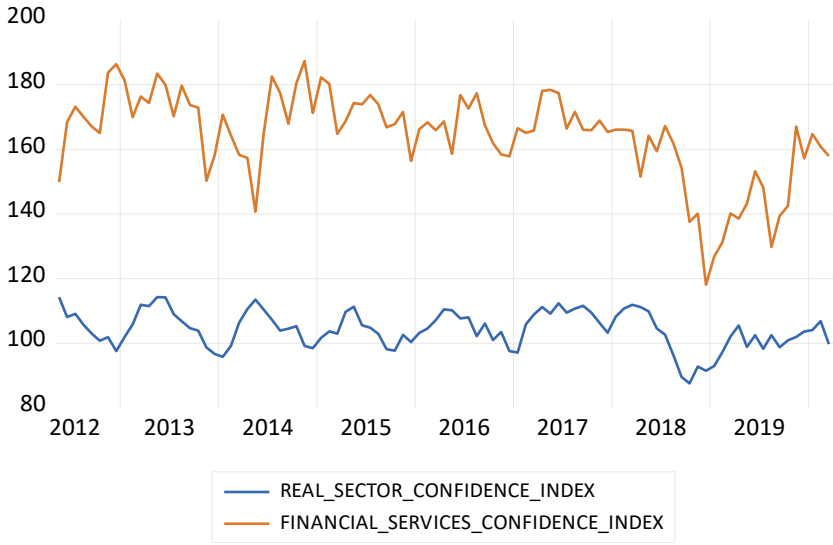

Figure 1. Graphics of financial services confidence index and real sector confidence index (2012:05-2020:3)

Descriptive statistics for financial services confidence index and real sector confidence index (2012:05-2020:3) are given in Table.1. Accordingly, while the average of financial services confidence index was 164.23 for this period, it was 104.3 for the real sector confidence index.

Table.1. Descriptive Statistics for financial services confidence index and real sector confidence index (2012:05-2020:3)

	Financial Services Confidence Index	Real Sector Confidence Index
Mean	164.23	104.28
Median	166.40	104.50
Maximum	187.30	114.30
Minimum	118.10	87.60
Std. Dev.	13.90	5.73
Skewness	-1.03	-0.45
Kurtosis	3.94	2.93
Jarque-Bera	20.22	3.25
Probability	0.00	0.20
Sum	15602.10	9906.90
Sum Sq. Dev.	18167.41	3082.59
Observations	95.00	95.00

2.2. Analysis of Empirical Results

ADF unit root test results for financial services confidence index and real sector confidence index are given in Table.2. Accordingly, the variables of financial services confidence index and real sector confidence index are stationary at the level (Prob<0.05) for With Constant & Trend models.

Table.2. ADF Unit Root Test Results

Unit Root Test Results for Level A Data			
		LTUFE	LYI UFE
With Constant	t-Statistic	-3.5175	-3.4219
	Prob.	0.0095	0.0126
With Constant & Trend	t-Statistic	-4.6412	-4.7881
	Prob.	0.0016	0.001
Without Constant & Trend	t-Statistic	-0.132	-0.436
	Prob.	0.6356	0.523
A. Unit Root Test Results for First Difference Data			
		d(LTUFE)	d(LYI UFE)
With Constant	t-Statistic	-12.0772	-8.8381
	Prob.	0.000	0.000
With Constant & Trend	t-Statistic	-12.0079	-8.7674
	Prob.	0.000	0.000
Without Constant & Trend	t-Statistic	-12.1449	-8.8813
	Prob.	0.000	0.000

OLS regression estimation results for real sector confidence index are given in Table.3. Accordingly, the financial services confidence index affects the variable real sector confidence index in the same direction, the effect coefficient and the model are statistically significant.

Table.3. OLS Regression Estimation Results for Real Sector Confidence Index

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Financial services confidence index	0.269	0.094	2.865	0.005
C	3.276	0.480	6.831	0.000

R-squared= 0.185, F-statistic= 21.140, Prob(F-statistic)= 0.000
Method: Least Squares, Jarque-Bera Prob= 0.765,
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Short-run causality relationships between financial services confidence index and real sector confidence index were analysed using the VAR Granger Causality/Block Exogeneity Wald Test.

In Table.4, the lag length of the VAR model is given according to the information criteria. Accordingly, the optimal lag length appears to be 5 in most of the information criteria.

Table.4. VAR Model lag order selected by the criterion

Lag	LogL	LR	FPE	AIC	SC	HQ
0	225.12	NA	0.00	-5.13	-5.07	-5.11
1	303.45	151.26	0.00	-6.84	-6.66*	-6.77
2	308.94	10.36	0.00	-6.87	-6.59	-6.76
3	315.41	11.89	0.00	-6.93	-6.53	-6.77
4	321.74	11.35	0.00	-6.98	-6.47	-6.78
5	328.58	11.93*	2.99e-06*	-7.04*	-6.42	-6.79*
6	329.19	1.05	0.00	-6.97	-6.23	-6.67
7	330.37	1.95	0.00	-6.91	-6.05	-6.56
8	331.23	1.39	0.00	-6.83	-5.87	-6.44

* indicates lag order selected by the criterion

The stability condition of the VAR model is given in Table 5. Accordingly, VAR satisfies the stability condition.

Table.5. VAR Model Stability Condition

Root	Modulus
0.797659 - 0.417701i	0.900408
0.797659 + 0.417701i	0.900408
0.893797	0.893797
-0.780667	0.780667
0.193639 - 0.730289i	0.755525
0.193639 + 0.730289i	0.755525
-0.246130 - 0.614047i	0.661539
-0.246130 + 0.614047i	0.661539
-0.637884	0.637884
0.424463	0.424463

No root lies outside the unit circle.
VAR satisfies the stability condition.

LM autocorrelation test results for VAR model residuals are given in Table.6. Accordingly, there is no autocorrelation at the 1% significance level.

Table.6. LM Autocorrelation Test Results for VAR Model Residuals

Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	0.462909	4	0.9770	0.115145	(4, 152.0)	0.9770
2	2.612242	4	0.6247	0.654362	(4, 152.0)	0.6247
3	0.616146	4	0.9613	0.153338	(4, 152.0)	0.9613
4	2.590299	4	0.6285	0.648819	(4, 152.0)	0.6286
5	1.733882	4	0.7846	0.433087	(4, 152.0)	0.7846
6	0.812572	4	0.9368	0.202352	(4, 152.0)	0.9368
Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	0.462909	4	0.9770	0.115145	(4, 152.0)	0.9770
2	2.808357	8	0.9458	0.347290	(8, 148.0)	0.9458
3	5.581020	12	0.9357	0.458002	(12, 144.0)	0.9358
4	6.857645	16	0.9759	0.417864	(16, 140.0)	0.9760
5	12.94250	20	0.8798	0.634871	(20, 136.0)	0.8805
6	18.71573	24	0.7670	0.769066	(24, 132.0)	0.7689

*Edgeworth expansion corrected likelihood ratio statistic.

In Table 7. VAR Granger Causality/Block Exogeneity Wald test result is given. Accordingly, there is mutual causality between the variables of financial services confidence index and real sector confidence index in the short run. The economic meaning of this result is that the investors/actors in the real sector and the financial sector follow both sectors closely and the expectations have a mutual effect on both sectors.

Table.7. VAR Granger Causality/Block Exogeneity Wald Test Result

Dependent Variable: L financial services confidence index			
Excluded	Chi-Sq	Df	Prob.
Lreal sector confidence index	15.37258	5	0.0089
All	15.37258	5	0.0089

Dependent Variable: Lreal sector confidence index			
Excluded	Chi-Sq	Df	Prob.
Lfinancial services confidence index	20.67819	5	0.0009
All	20.67819	5	0.0009

3. CONCLUSION

In the study, the relationship between the financial services confidence index and the real sector confidence index for the Turkish economy was analysed.

There is mutual causality between the variables of financial services confidence index and real sector confidence index in the short run.

According to the OLS regression estimation results, the financial services confidence index variable affects the real sector confidence index in the same direction, the effect coefficient and the model are statistically significant.

It has been revealed in the study that the close interaction between the real sector and the financial sector both shapes and is influenced by expectations.

It is seen that the healthy management of the expectations of economic actors by policy makers in economic policy practices is an important factor for achieving successful results.

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CHAPTER 7

EMPIRICAL ANALYSIS OF THE RELATIONSHIP BETWEEN THE REAL EFFECTIVE EXCHANGE RATE AND THE CURRENT ACCOUNT BALANCE IN THE TURKISH ECONOMY

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INTRODUCTION

The Turkish economy has a chronic current account deficit due to its external dependence on intermediate inputs, especially in energy. The chronic current account deficit faced by the Turkish economy also puts a constant upward pressure on exchange rates. However, interest rate policy is important as increasing exchange rates negatively affect price stability. In order to permanently improve the chronic current account deficit of the Turkish economy, the sources feeding the current account deficit need to be improved.

According to the Marshall-Lerner condition, for the depreciation of the domestic currency to contribute positively to net foreign trade, the sum of the foreign demand elasticity of export goods and the domestic demand elasticity of imported goods must be greater than one. In addition, the elasticity of supply of export goods must be high.

In this study, the relationship between the current account balance and the Real Effective Exchange Rate for the Turkish economy for the period 2009:05-2021:10 was analysed using time series econometric techniques.

The original contribution of the study to the literature is that it is a study made with current data and it contributes to the gap about the net effect of the recent depreciation of the Turkish Lira against foreign currencies on the current account balance in our country.

1. LITERATURE

There are many studies on the causes of the current account deficit in the Turkish economy. Studies that analyze the relationship between the current account deficit and the exchange rate are summarized below.

Kasman et al. (2005) found a long-term relationship between current account balance, real exchange rate and growth. It has been determined in the study that the overvalued Turkish Lira is among the important factors affecting the current account deficit.

In their study, Karabulut and Danışoğlu (2006) found that increases in the exchange rate in the short run increase the current account deficit for the Turkish economy.

Erbaykal (2007) analysed the relationship between GDP, real effective exchange rate and current account balance for Turkey. According to

the results of the analysis, it has been determined that economic growth and exchange rate are the causes of the current account deficit.

In their study, Togan and Berument (2011) stated that the interest policy is used in practice for the sustainability of the current account balance through short-term capital inflows.

Oktar and Dalyancı (2011) found in their study that there is an inverse relationship between the CBRT policy rate and the current account balance in the long run.

Okay et al. (2011) found in their study that the real effective exchange rate affects the current account balance negatively in the long run.

Bayar et al. (2014) found in their study that the Real Effective Exchange Rate for the Turkish economy is the Granger cause of the current account balance.

Ersungur et al. (2017) could not detect a causal relationship between the exchange rate and the current account balance in their study.

Bozgeyik and Kutlu (2019) found in their study that the correlation coefficients between the exchange rate and the current account balance are significant in the Turkish economy.

Bozgeyik and Kutlu (2019) found in their study that the real exchange rate is one of the most important variables that determine the current account deficit.

2. EMPIRICAL ANALYSIS

2.1. Data and Method

In this study, the relationship between the current account balance and the Real Effective Exchange Rate for the Turkish economy for the period 2009:05-2021:10 was analysed using time series econometric techniques.

First of all, the stationarity levels of the variables were examined with unit root tests. Since the variables were stationary at the level, long-term relationships were estimated with the OLS estimator. The short-term causality relationship between the variables was handled with the Granger causality test.

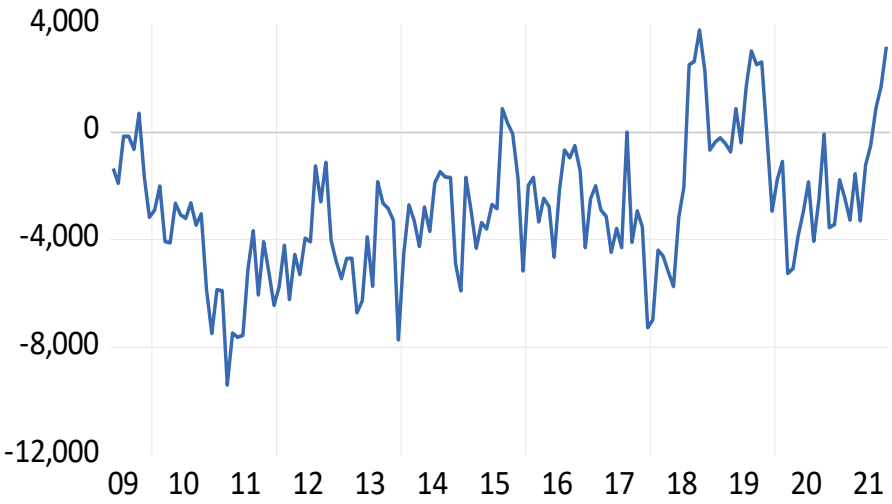
Descriptive statistics for Current Account Balance and Real Effective Exchange Rate (2009:05-2021:10) are given in Table.1. Accordingly, while

the current account balance average was -2.838.147 Million $ for the analysis period, it was 95.048 for the Real Effective Exchange Rate (2003=100).

Table.1. Descriptive Statistics for Current Account Balance and Real Effective Exchange Rate (2009:05-2021:10)

	Current Account Balance (Million $)	Real Effective Exchange Rate (2003=100)
Mean	-2838.147	95.048
Median	-2953.000	100.730
Maximum	3778.000	126.470
Minimum	-9407.000	59.680
Std. Dev.	2490.200	18.266
Skewness	0.256	-0.455
Kurtosis	3.092	2.045
Jarque-Bera	1.697	10.875
Probability	0.428	0.004
Sum	-425722	14257
Sum Sq. Dev.	924000000	49712
Observations	150	150

Current account balance and Real Effective Exchange Rate graphs are given in Figure.1. Accordingly, the current account balance follows a volatile course. The Real Effective Exchange Rate series, on the other hand, has a decreasing trend.



a) Current account balance

b) Real Effective Exchange Rate

Figure 1. Current Account Balance and Real Effective Exchange Rate Charts (2009:05-2021:10)

2.2. Analysis of Empirical Results

ADF unit root test results for Current Account Balance and Real Effective Exchange Rate are given in Table.2. Accordingly, the variables of Current Account Balance and Real Effective Exchange Rate are stationary at the level (Prob<0.05) for the most suitable model, which is with Constant & Trend

Table.2. ADF Unit Root Test Results

A. Unit Root Test Results for Level

		Current Account Balance	Real Effective Exchange Rate
With Constant	t-Statistic	-4.3652	-0.164
	Prob.	0.0005	0.939
With Constant & Trend	t-Statistic	-4.9612	-3.7693
	Prob.	0.0004	0.0209
Without Constant & Trend	t-Statistic	-1.6488	-1.5584
	Prob.	0.0936	0.1117

B. Unit Root Test Results for First Difference

		Current Account Balance	Real Effective Exchange Rate
With Constant	t-Statistic	-2.4649	-8.9398
	Prob.	0.1264	0

Table.2. ADF Unit Root Test Results

With Constant & Trend	t-Statistic	-2.5427	-8.9776
	Prob.	0.3074	0.000
Without Constant & Trend	t-Statistic	-2.4716	-8.7619
	Prob.	0.0135	0.000

OLS regression estimation results for the current account balance variable are given in Table.3. Accordingly, the Real Effective Exchange Rate affects the current account balance in the opposite direction, the effect coefficient and the model are statistically significant. In terms of economic theory, the relationship between the change in exchange rate and the current account balance is compatible.

Table.3. OLS Regression Estimate Results for Current Account Balance Variable

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Real Effective Exchange Rate	-59.779	18.685	-3.1993	0.00
C	2843.7	1849.6	1.5374	0.12
R-squared	0.192268			
Prob(F-statistic)	0.000000			

Method: Least Squares, Jarque-Bera Prob= 0.507, HAC kalıntılar
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 5.0000)

Short-run causality relationships between the current account balance and the Real Effective Exchange Rate were analyzed using the VAR Granger Causality/Block Exogeneity Wald Test.

In Table.4. the lag length of the VAR model is given according to the information criteria. Accordingly, the optimal lag length appears to be 3 in most of the information criteria.

Table.4. VAR Model lag order selected by the criterion

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1905.36	NA	1.59E+09	26.86428	26.90591	26.8812
1	-1586.26	624.7296	18819799	22.42616	22.55106*	22.47691*
2	-1580.27	11.55908	18300352	22.39813	22.60628	22.48271
3	-1573.84	12.22735*	17686242*	2.36389*	22.65531	22.48231
4	-1570.81	5.673104	17933142	22.37757	22.75226	22.52983

Table.4. VAR Model lag order selected by the criterion

Lag	LogL	LR	FPE	AIC	SC	HQ
5	-1569.61	2.215227	18659589	22.417	22.87495	22.60309
6	-1568.49	2.024697	19441483	22.45765	22.99885	22.67757
7	-1565.37	5.582543	19694591	22.47003	23.0945	22.72379
8	-1564.73	1.137371	20662254	22.51727	23.225	22.80486

* indicates lag order selected by the criterion

The stability condition of the VAR model is given in Table 5. Accordingly, VAR satisfies the stability condition.

Table.5. VAR Model the stability condition

Root	Modulus
0.987921	0.987921
0.803308	0.803308
0.074620 - 0.419382i	0.425969
0.074620 + 0.419382i	0.425969
-0.025138 - 0.351127i	0.352026
-0.025138 + 0.351127i	0.352026

No root lies outside the unit circle.
VAR satisfies the stability condition.

LM autocorrelation test results for VAR model residual are given in Table.6. Accordingly, there is no autocorrelation at the 1% significance level.

Table.6. LM Autocorrelation Test Results for VAR Model Residual

Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	4.286415	4	0.3686	1.076071	(4, 274.0)	0.3686
2	1.893249	4	0.7554	0.473218	(4, 274.0)	0.7554
3	2.665891	4	0.6152	0.667278	(4, 274.0)	0.6152
4	3.189136	4	0.5267	0.799009	(4, 274.0)	0.5267

Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	4.286415	4	0.3686	1.076071	(4, 274.0)	0.3686
2	7.015703	8	0.5349	0.878567	(8, 270.0)	0.5350
3	10.22146	12	0.5965	0.852040	(12, 266.0)	0.5967
4	11.80886	16	0.7570	0.734860	(16, 262.0)	0.7572

In Table 7. VAR Granger Causality/Block Exogeneity Wald test result is given. Accordingly, there is mutual causality at the 5% significance level between the Current Account Balance and Real Effective Exchange Rate variables in the short run.

Table.7. VAR Granger Causality/Block Exogeneity Wald Test Result

Dependent variable: Current Account Balance			
Excluded	Chi-sq	df	Prob.
Real Effective Exchange Rate	11.16913	3	0.011
All	11.16913	3	0.011
Dependent variable: Real Effective Exchange Rate			
Excluded	Chi-sq	df	Prob.
Current Account Balance	7.811541	3	0.050
All	7.811541	3	0.050

3. CONCLUSION

The Turkish economy has a chronic Current Account Balance deficit due to its external dependence on its intermediate inputs, especially in energy. In order to permanently improve the chronic Current Account Balance deficit of the Turkish economy, the sources feeding the Current Account Balance deficit must be improved.

In this study, the relationship between Current Account Balance and Real Effective Exchange Rate for the Turkish economy for the period 2009:05-2021:10 was analysed using time series econometric techniques.

According to the empirical results, there is bidirectional causality in the short run at the 5% significance level between the Current Account Balance and Real Effective Exchange Rate variables. On the other hand, according to the long-term OLS regression results, the Real Effective Exchange Rate affects the Current Account Balance in the opposite direction, the effect coefficient and the model are statistically significant. In terms of economic theory, the relationship between the change in the exchange rate and the Current Account Balance is compatible.

It has been determined in the study that exchange rate policies play an important role in maintaining the stability of the Current Account Balance in the Turkish economy. For exchange rate stability, monetary policy, expectations and country risks need to be managed effectively.

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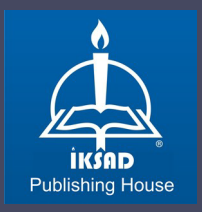

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