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THE EFFECTS OF GLOBAL ECONOMIC CRISES ON PERFORMANCE OF PARTICIPATION BANKS: THE CASE OF THE COVID-19 OUTBREAK

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ABSTRACT

The efficiency of Islamic banking practices operating under the name of Participation Banks in Turkey and their share in the financial system have gradually increased, and thanks to the products offered by these banks, significant progress has been made in bringing savings into the financial system, in obtaining resources from abroad as well as from within the country, and in the diversification of resources. Determining the impact level of global crises to the Islamic banking system, which is built on interest-free transactions, will enable the efficiency of the system to be determined and the necessary improvements to be made for the faulty aspects. In this context, in our study, the developments in the performance of participation banks operating in Turkey in the face of global economic/financial problems caused by the 2008 global financial crisis and the Covid-19 pandemic are discussed in comparison with deposit banks. By using the Gregory-Hansen cointegration test, which considers the structural breaks in the system, the effects of the ratio of operating expenses to assets, financing-deposit (participation fund) ratio, non-performing financing ratio, and capital adequacy ratio indicators on the return on assets were analyzed. According to the findings, there was a break in the performance of participation banks in 2010 (the period when the crisis turned into a debt crisis in Europe) after the 2008 global financial crisis, but no break in the pandemic process. In terms of deposit banks, a break occurred in 2009, right after the global financial crisis. Other findings of the study include that the Covid-19 process did not create a break on deposit banks.

Keywords: Islamic finance, Participation banks, Covid-19 pandemic, Financial ratios, Gregory-Hansen Co-integration Test.

Jel Kodları: G01, G20, G21.

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KÜRESEL EKONOMİK KRİZLERİN KATILIM BANKALARININ PERFORMANSI ÜZERİNDEKİ ETKİLERİ: COVID-19 SALGINI ÖRNEĞİ

ÖZ

Türkiye'de katılım bankaları adı altında faaliyet gösteren İslami bankacılık uygulamalarının etkinliği ve finans sistemi içerisindeki payı giderek artış göstermiş, söz konusu bankaların sundukları ürünler sayesinde, tasarrufların finansal sisteme kazandırılmasında, yurtiçinden olduğu kadar yurtdışından da kaynak temininde ve kaynakların çeşitlendirilmesinde önemli ilerlemeler sağlanmıştır. Faizsiz işlemler üzerine inşa edilen İslami bankacılık sisteminin küresel nitelikli krizlerden etkilenme düzeylerinin tespit edilmesi, sistemin etkinliğinin anlaşılmasına ve aksayan yönlerine yönelik gerekli iyileştirmelerin yapılmasına imkân verecektir. Bu çerçevede çalışmamızda 2008 küresel finans krizi ve Covid-19 salgını kaynaklı küresel ekonomik/finansal sorunlar karşısında Türkiye'de faaliyet gösteren katılım bankalarının performanslarında ortaya çıkan gelişmeler mevduat bankalarıyla karşılaştırmalı olarak ele alınmıştır. Sistemdeki yapısal kırılmaları dikkate alan Gregory-Hansen eş bütünleşme testi kullanılarak, işletme giderlerinin aktiflere oranı, finansman-mevduat (katılım fonu) oranı, sorunlu finansman ve sermaye yeterlilik oranı göstergelerinin aktif karlılığı üzerindeki etkileri analiz edilmiştir. Elde edilen bulgulara göre, 2008 küresel finans krizinden sonra katılım bankalarının performansında 2010 yılında (Krizin Avrupa'da borç krizine dönüştüğü dönem) bir kırılma meydana gelmiş, küresel salgın sürecinde ise herhangi bir kırılma oluşmamıştır. Mevduat bankaları açısından ise, küresel finans krizinin hemen arkasından 2009 yılında bir kırılma oluşmuştur. Covid-19 sürecinin mevduat bankaları üzerinde bir kırılma oluşturmadığı çalışmanın diğer bulguları arasında yer almaktadır.

Anahtar Kelimeler: İslami finans, Katılım bankaları, Covid-19 salgını, Finansal rasyolar, Gregory-Hansen Eş-bütünleşme Testi.

Jel Codes: G01, G20, G21.

INTRODUCTION

After the 2008 global financial crisis, the world began to struggle with the economic problems caused by the Covid-19 pandemic. The outbreak caused significant damage to the economic and financial structures of all countries; It created the basis for economic stagnation and crises in many countries. The financial sector, especially banking, is one of the sectors most affected by this process.

The efficiency and stability of the financial system is a very important factor for the sustainability of economic growth. Due to its links with the real economy, it is important that the financial system, in general, and the banking sector, in particular, be stable and operate at a high level of performance.

Within the banking system, interest-free banking applications are spreading on a global scale and their share in the financial sector is gradually increasing. With the help of this system, which operates under the name of "participation banking" in Turkey, it is possible to use the idle funds of those who cannot transfer their savings

to the financial system due to interest rate sensitivity, in the financing of economic development and growth by bringing them into the economy.

Numerous studies have been conducted in the literature regarding the costs of past epidemics and pandemics. However, due to the fact that the Covid-19 pandemic has not yet ended, studies that compare the economic costs of the outbreak with the financial crises experienced in the past or other pandemics are quite new. In the related literature, the effects of the outbreak on macroeconomic factors such as economic growth, unemployment, inflation, and foreign trade are discussed, and strategies to minimize these effects and get out of the crisis are evaluated. At this point, it is important to determine how and to what extent the Islamic finance sector was affected by this crisis.

Although there have been significant improvements in the position, growth rates and performance of the global interest-free banking system in the financial sector in recent years, the Covid-19 outbreak has had some negative effects on the sector. During the outbreak, there was a decrease in performance in the Islamic banking sector as well as traditional banking in general. In the few studies on the subject, the performance of Islamic banks before and during the Covid-19 pandemic was compared and it was observed that there was a decrease in performance during the outbreak.

The aim of this study is to analyze the developments in the performance of participation banks in global crisis situations. In this context, the effects of the economic crisis caused by the Covid-19 pandemic on the performance of participation banks will be examined in Turkey in comparison with the 2008 global financial crisis. In order to make sound evaluations, the situation of deposit banks during these crisis periods will also be the subject of comparison. With the help of these comparative analyzes, it is expected that the study will contribute to the relevant literature.

The study consists of three parts. In the first part, the subject of Islamic banking will be briefly evaluated in the theoretical and historical context; in the second part, the effects of the current Covid-19 pandemic process on economies in general and the Islamic finance sector, in particular, will be examined, and in the third part, the effects of this pandemic on performance of participation banks in Turkey will be analyzed comparatively with the help of the Gregory-Hansen cointegration test.

I. ISLAMIC BANKING IN THE WORLD AND IN TURKEY

The financial system refers to a structure consisting of markets, institutions, and regulations that ensure the transfer of funds from those with surplus savings to those with shortfalls. Banks are among the most important actors operating in this system. Within the framework of technological developments and legal regulations, especially since the last quarter of the twentieth century, there have been significant

increases in the competition of the banking sector both within itself and with other components of the system. In this context, in order to ensure that savings can be attracted to the financial system, especially in the Islamic geography, the Islamic banking system, which operates on an interest-free basis, has been developed. Thanks to the products offered by these banks, significant progress has been made in bringing savings into the financial system, in obtaining resources from abroad as well as from within the country, and in the diversification of resources.

Banks are classified under different categories in terms of the collection and usage of funds. One of these classifications is traditional banking and Islamic banking. While traditional banks collect and use funds based on interest; participation banks were built on an interest-free basis, based on partnership and profit/loss sharing since interest is prohibited in Islamic law. In this context, interest-free banking refers to the activities of financial institutions whose main business is to provide credit and other services in payment traffic and money circulation that operates on Islamic principles (Ichsan, Suparmin, Yusuf, Ismal, & Sitompul., 2021, pp. 299,300). Conceptually, interest-free banking, which is also known by different names such as "Islamic banking" and "participation banking", is a type of banking that collects funds with the logic of profit and loss sharing instead of interest and uses the funds collected with the logic of trade and partnership instead of using them directly as loans (Akdağ and Ekinci, 2018, p. 155). Islamic finance is based on wealth distribution, not wealth accumulation; relies on equity financing rather than debt financing; it is about risk-sharing, not risk-taking (encourages risk-sharing and avoids imposing excessive risk on only one party); offers investors safe, socially responsible, and ethical investment options (Rabbani et al., 2021, p. 4). Islamic finance enables the valuation of idle funds and the savers to get profit by including the funds that do not enter the financial system into the system. Thus, it contributes to the financing of economic development and growth, to the process of increasing employment and to the reduction of informal economic activities. On the other hand, the System is also effective in creating a different form of integration between Islamic countries, especially among themselves, and with other countries of the world and increasing capital movements.

Although the history of Islamic finance applications is not that old, its steady growth, increasing its share in the global financial system and its high performance especially in the period after the 2008 global financial crisis make this system important for the global economy. Table 1 shows some indicators regarding the outlook of the Islamic finance sector on a global scale.

Table 1: Outlook of Global Islamic Finance

Year	Islamic Financial Assets	Islamic Banking Assets	Value of Sukuk Issued	Value of Islamic Funds	Takaful Assets (Billion USD)

	(Billion USD)	(Billion USD)	(Billion USD)	(Billion USD)	
2012	1,761	1,305	260	58	31
2013	2,060	1,560	284	61	36
2014	1,975	1,444	299	66	36
2015	2,201	1,600	342	71	47
2016	2,307	1,673	345	99	48
2017	2,461	1727	426	120	46
2018	2,513	1,745	470	108	46
2019	2,875	1,993	538	140	51

Source: ICD-Refinitiv, (2020), Islamic Finance Development Report 2020: *Progressing Through Adversity*, Islamic Corporation for The Development of The Private Sector, https://icd-ps.org/uploads/files/ICD-Refinitiv%20IFDI%20Report%2020201607502893_2100.pdf (15.09.2021)

According to the table, the assets of the Islamic finance sector increased steadily between 2012 and 2017, despite the 4% decrease in 2014. The rate of increase decreased to 2% in 2018, and it achieved a 14% growth in 2019, recapturing its long-term trend. The 248 billion dollars' increase in the assets of the Islamic banking sector had a great impact on achieving this increase. In addition, double-digit growth of Islamic funds in countries such as Malaysia, Indonesia, Iran, Saudi Arabia, Turkey and Luxembourg contributed to this increase. Within the Islamic finance system, the Islamic banking segment currently accounts for 69% of the asset value of the global Islamic financial services industry. This is followed by the issuance of sukuk with 19%. Iran, Saudi Arabia and Malaysia source approximately 66% of total Islamic finance assets. The share of Islamic banking assets in total global banking assets is around 6% as of 2019 (ICD-Refinitiv, 2020).

Contributing to the high increase in assets in the Islamic finance sector, the Islamic banking sector grew by 14% in 2019, approaching the value of 2 trillion dollars in global assets. Considering that this sector grew by 5% in 2015-2018 and only 1% in 2018, it will be seen that this increase in 2019 is an extraordinary value (ICD-Refinitiv, 2020).

Islamic funds, which increased regularly between 2012 and 2017, decreased by 10% in 2018 to 108 billion dollars. This has come as a result of subdued global problems, in addition to the poor performance of equities in Asia. The two major Islamic fund markets, Malaysia and Indonesia stock markets, suffered losses in 2018 (ICD-Refinitiv, 2019). After this collapse in 2018, thanks to a total of 127 funds (including Islamic mutual funds, pension funds, insurance funds and exchange-traded funds) launched in 2019, Islamic funds increased by 30% from $108 billion to $140 billion, the highest growth rate of the last 10 years (ICD-Refinitiv, 2020).

In order to bring the savings that are not included in the financial system due to interest sensitivity in Turkey to the economy, in 1983, the activities of intermediary institutions under the name of "Private Financial Institutions" that conduct interest-free transactions were allowed and, in this direction, these institutions started their activities in 1985. In 1999, these institutions were included in the scope of the Banking Law; with the regulation made in 2005, they were defined as institutions authorized to provide all kinds of banking services under the name of "participation banks". The name of the Association of Private Finance Houses has been changed to "Participation Banks Association of Turkey" and all participation banks in Turkey have become members of this association.

Participation banks, which are starting to have a larger share in the banking sector, benefit from the techniques used in the traditional banking system in their activities and bring unused funds to the economy with a different perspective (Tetik and Şahin, 2020: 296). While privately owned participation banks were operating in the sector until 2015, Ziraat Katılım Bank in 2015, Vakıf Katılım Bank in 2016 and Türkiye Emlak Katılım Bank in 2019 went into operation as state-owned participation banks. In addition to these, three private capital participation banks, namely Albaraka Türk Katılım Bank, Kuveyt Türk Katılım Bank and Türkiye Finans Katılım Bank, continue their activities. Table 2 shows some indicators of participation banks operating in Turkey.

Table 2: Selected Indicators of Participation Banks Operating in Turkey

Year	Return on Assets Ratio[1] (ROAR)	Return on Equity Ratio[2] (ROER)	Capital Adequacy Ratio[3] (CAR)	Expenses to Assets Ratio[4] (EAR)	Financing to Deposit Ratio[5] (FDR)	Non-Performing Financing[6] (NPF)
2006	2,15	20,55	14,60	2,70	97,18	3,75
2007	2,10	20,11	15,97	2,66	110,43	3,58
2008	1,76	15,00	14,25	2,77	107,02	4,14
2009	1,66	12,85	15,17	2,52	95,95	5,27
2010	1,40	11,39	15,38	2,31	97,18	4,31
2011	1,10	9,52	13,93	2,05	101,15	2,98
2012	1,12	10,69	13,38	1,96	106,91	3,12
2013	0,85	8,85	14,36	1,80	108,57	3,08
2014	0,65	7,02	15,10	1,76	109,86	4,96
2015	0,43	4,92	14,53	1,66	105,47	5,55
2016	0,68	7,69	15,59	1,54	111,97	3,55
2017	0,74	8,93	17,32	1,46	100,96	4,01
2018	1,02	13,32	18,42	1,38	91,28	3,57
2019	0,76	9,97	18,06	1,36	75,71	4,92
2020	0,83	12,33	18,42	1,15	77,78	3,27

Source: BDDK, (2021), Monthly Banking Sector Data https://www.bddk.org.tr/BultenAylik/en/Home/Gelismis, (20.09.2021)

1) Return on Assets Ratio (ROAR) = Net Income / Average Total Assets

2) Return on Equity Ratio (ROER) = Net Income / Average Shareholder's Equity
3) Capital Adequacy Ratio (CAR) = Capital Adequacy Standard Ratio
4) Expenses to Assets Ratio (EAR) = Operational Expenses / Average Total Assets
5) Financing to Deposit Ratio (FDR) = Total Cash Loans / Total Deposit (Funds collected)
6) Non-Performing Financing (NPF) = Non-Performing Loans (Gross) / Total Cash Loans

The share of participation banks in the sector increased under the conditions of the 2008 global financial crisis. Return on assets ratio tends to decrease in the period between 2006 and 2015, excluding 2012. The aforementioned rate, which started to increase again after 2015, decreased again in 2019; In 2020, when the effects of the Covid-19 crisis were felt, the downward trend did not continue. Similarly, the return on equity ratio decreased continuously except for 2012; the improvements seen in 2017 and 2018 turned into a decrease again in 2019 and started to increase in 2020. Although capital adequacy ratios follow a fluctuating course, it is noteworthy that the upward trend is stronger. The period average of this rate, which increased above 18% after 2018, was 15.63%. The ratio of operating expenses to assets showed a downward trend in the entire period, except for 2008. The ratio of finance to deposit, which followed a fluctuating course throughout the period, took the lowest values below the period average in the 2018-2020 period. Non-performing financing ratio reached the highest values in 2009 (5.27) and 2015 (5.55), and the period average was four. This ratio, which had the lowest value of 2.98 in 2011, decreased compared to the previous year in 2020, when the effects of the Covid-19 crisis were felt.

II. COVID-19 OUTBREAK AND ISLAMIC FINANCE

The Covid-19 outbreak, which affected the whole world, draws attention as the biggest health problem after the great pandemic in 1918; in terms of its economic effects, it is compared with the global financial crisis in 2008. Since the pandemic has not yet been terminated, it does not seem possible to clearly determine its economic effects. In this context, there has not been enough work on the subject at the academic level yet.

Although their causes were different, the two major crisis that emerged succession in the first quarter of the 21st century had severe effects on a global scale. While the internal speculative bubbles created by the excessive risks taken by the market players and the excessive increases in the indebtedness levels were effective in the 2008 global financial crisis, the global Covid-19 crisis resulted from external factors that directly affected the real sector of the economy (IsDB, 2020, p. 14). This external shock caused significant damage to the fragile world economy. The global economy contracted by 3,5 percent in 2020 according to the April 2021 World Economic Outlook Report published by the IMF, a 7 percent loss relative to the 3.4

percent growth forecast back in October 2019 (Cited by Yeyati & Filippini, 2021, p. 1).

The pandemic had a devastating effect on the real sector; significant disruptions occurred in production and sales activities and supply chains due to the reasons such as movement and travel restrictions, job losses, reduced demand for goods and services (Adewale, 2020:1). Considering these effects, the impact of the Covid-19 outbreak on real GDP is expected to be more severe than the effects of the global financial crisis (IsDB, 2020, p. 14).

The Covid-19 outbreak, which started as a health problem and quickly gained a global dimension, has turned into one of the severe economic crises in the recent past. While various restrictions put into practice to combat the outbreak had positive results in terms of the health-related part of the problem, they brought many negative effects in terms of economic activities. Some of the mentioned economic effects can be listed as follows (Rabbani et al., 2021):

- Sudden lockdowns in many economies, leading to unemployment and shutting down of businesses
- A steep fall in equity markets across the globe
- Liquidity problems in banks and other financial institutions
- Injecting large amounts of liquidity into markets by governments as part of economic stimulus packages to stimulate liquidity and stimulate the economy
- Biggest drop in oil prices of all time (towards the end of 2021, this trend reversed)
- Aggressive monetary policy interventions by the central banks to increase liquidity and to bring back normalcy in the financial markets.
- Volatility in the cryptocurrency market

Interruption of supply chains and production shutdowns could potentially lead to more widespread liquidity problems in many industries; the prolongation of the process may cause the global recession to deepen. The pandemic triggered a health and fiscal response unprecedented in terms of speed and magnitude. Under these unprecedented conditions, there has been intense intervention by central banks and governments in the markets. The risks stemming from deterioration of the fiscal front –funded by the issuance of debt or base money – were regarded as secondary for most governments in 2020. While some measures aimed at reducing the sharp tightening of financial conditions in the short-term, others sought to bolster the flow of credit to companies, either by direct intervention of credit markets (e.g., government-backed lines of credit and debt guarantees) or by loosening restrictions on banks' use of capital buffers (Demirguc-Kunt, Pedraza, & Ruiz-Ortega, 2020; Yeyati & Filippini, 2021). In this context, monetary policies were loosened; tax relief packages and asset purchase programs were introduced; cash transfers were made; government-supported loan programs have been implemented for small and medium-sized businesses affected by the pandemic (IsDB, 2020, p. 19).

The pandemic affected all sectors, albeit at different levels. The financial sector, and especially banking, is at the forefront of the sub-sectors affected by the pandemic. When social mobility was restricted within the framework of the closure measures taken (social restrictions, quarantine practices, introduction of remote working models, temporary suspension of activities in many sectors, etc.), there were serious contractions in the volume of economic activity on a global scale. Thus, the problem that emerged in the field of health led to crisis pressure on the financial and real sectors in many countries; the contagion speed of the virus created a panic atmosphere in the markets; has negatively affected the production, investment and consumption decisions of economic actors by increasing uncertainties.

With the crisis, concerns about the asset quality of banks in general started to increase and an upward trend in basic risk indicators started. In the Covid-19 outbreak, there has been a noticeable increase in risks such as credit risk, market risk and operational risk faced by the banking sector. The outbreak has been especially effective in areas such as micro-finance, small and medium-sized enterprises, and retail loans, where Islamic finance has a large market share (Hassan, Rabbani, Asad & Ali, 2020, p. 93). The increase in the number of businesses affected by the outbreak, company bankruptcies, and decrease in production led to a weakening in the use of funds. These developments are expected to result in significant decreases in the performance and profitability of banks (Sutrisno, Panuntun, & Adristi, 2020, p. 127). The increase in non-performing financing due to the loss of jobs of many people also negatively affects the financial performance of banks (Ichsan et al., 2021, p. 301). This may result in banks having to operate with a low level of profitability for a long time.

According to Hasan (2020), who examined the effects of the Covid-19 outbreak on the Islamic banking in Indonesia, there are risks on the banking sector in three different areas: financing, deterioration in asset quality and tightening of profit sharing. Regarding financing, Islamic banks and conventional banks may face similar problems (financing/credit slowdown). Regarding the decrease in asset quality, legal regulations on the subject will help Islamic banks and traditional banks. With the mechanisms to be established, it will be possible to support Islamic banks and traditional banks that are preparing to compensate for asset losses. In terms of tightening profit-sharing margins, Islamic banks are predicted to have an advantage over conventional banks.

Evaluations are made that Islamic finance was less affected by the 2008 global financial crisis than traditional financial institutions. Considering the positive performance of Islamic financial institutions after the 2008 global crisis, there is an expectation that they will emerge from the current crisis environment without experiencing at least a significant decrease in performance (Rabbani et al., 2021, p. 4). Islamic banks were caught in the current crisis caused by the Covid-19 pandemic in a relatively well-capitalized, more profitable, and more liquid situation than at the time of the global financial crisis (Adewale, 2020, p. 1). However, parallel to the

contraction in economic activities, there may be a lower-than-expected growth in the Islamic finance sector. In this context, it is predicted that Islamic banks can be potentially affected in various dimensions, including income, asset quality, and liquidity coverage (Sakti & Malik, 2020). As the pandemic increases the risk of asset quality for Islamic banking, it may also lead to pressures on capital adequacy. On the other hand, Islamic financial instruments can contribute significantly to providing the liquidity needed by the market. In this context, Islamic financial institutions are expected to make a significant contribution in the field of finance during the recovery period after the Covid-19 pandemic (Hassan et al., 2020, p. 99).

III. LITERATURE REVIEW

Studies based on the analysis of the performance of the banking sector over financial ratios have an important place in the relevant literature. For example, in a study by Antonioa, Sanrego and Taufiq (2012), the performances of the Islamic banking sector in Indonesia and Jordan were compared with the help of the Maqashid Index. In the study, it was concluded that the Islamic banking sector in Indonesia outperformed banks in Jordan. Setyawati et al. (2017), analyzed the internal and external factors affecting the performance of Islamic banking in Indonesia and tried to determine the effects of the global crisis on the financial performance of Islamic banks. According to the results obtained, although problematic financing and inflation significantly affected the performance of Islamic banks, the performance of these banks improved after the crisis. In the study of Khan et al (2018), the performances of Islamic banks and traditional banks operating in Pakistan were compared for the period 2006-2015 by using financial ratios. According to the findings of the study, there is no significant difference in terms of capital between Islamic banks and conventional banks in the period in question. On the other hand, Islamic banks are less profitable, more liquid, less risky and less efficient. Istan and Fahlevi (2020), analyzed the macroeconomic and internal factors affecting the performance of Islamic banks operating in Indonesia. According to the findings of the study, while the GDP variable has a significant positive effect on Return on Assets (ROA), the inflation variable has no significant effect on ROA. It has been determined that the effect of financing deposit rate (FDR) on ROA is weak, while operational efficiency ratio (OER) has a negative effect on ROA. In the study by Ali, Bashir and Afridi, (2021), the performances of Islamic and conventional banks in Pakistan for the period 2007-2016 were compared. According to the findings, while Islamic banks perform effectively in terms of asset quality, management adequacy and market risk sensitivity variables, conventional banks are effective in capital adequacy and liquidity.

Some studies are focused on the performance of participation banks in Turkey. In the study of Doğan (2013), the performance of participation banks operating in Turkey and traditional banks were analyzed comparatively for the period 2005-2011 with the help of profitability, liquidity, risk, solvency, and capital adequacy ratios. According to the results of the analysis, traditional banks are in a

better position than participation banks in terms of liquidity, solvency and capital adequacy, and their risk levels are lower. In terms of profitability, no statistically significant difference was determined between the two banks. Çalışkan and Eren (2016) analyzed the financial performance of banks with the help of the data obtained from the financial ratios for the years 2010-2014. In the ranking, they find that Ziraat Bank displayed the best financial performance. In the study of Akdağ and Ekinci (2018), the relationship between financial ratios and return on equity was tested by dynamic panel data analysis method, using the data obtained from the consolidated financial statements of participation banks operating in Turkey between the years 2013-2017. According to the results of the analysis, the capital adequacy ratio has a positive and significant effect on the return on equity, the ratio of loans / total assets has a positive and significant effect on return on equity, and the ratio of the equity / total assets has a significant and negative effect on the return on equity. In the study of İslatince (2018), the performance of participation banks and deposit banks were compared based on the financial indicators for the period 2010-2017 and their developments in the sector were tried to be revealed. It has been determined that the profitability levels of participation banks in the sector from 2010 to 2017 have been stable and there is no difference between the two groups of banks in asset quality measurements. In the study conducted by Gezen (2019), by using the Entropy method, one of the multi-criteria decision-making techniques; after determining the weights of total assets, loan size, equity size, paid-in capital, number of branches, and number of employees, the performance ranking of participation banks operating in Turkey was determined with the WASPAS method. In the study of Akyüz et al. (2020), it was tried to measure the performance of the participation banks operating in Turkey by comparing the data with the CAMELS Analysis between the years 2013-2017. As a result of the analysis, it has been determined that there has been a decrease in the CAMELS scores of participation banks in general since 2015.

On the other hand, there are many studies in the literature on the effects of economic crises and pandemics on banking in general and the Islamic banking system in particular (See Goodell 2020 and Sutrisno et al., 2020). Studies on the effects of the Covid-19 outbreak on financial institutions and markets are still limited. In the literature on the subject, performance comparisons of participation banks among themselves and with traditional banks have been made and different results have been reached. In general, in studies examining the effects of the 2008 global financial crisis, it was emphasized that the financial crisis had a negative impact on banking indicators, but Islamic banks performed better than traditional banks in times of crisis (Cited by Toraman, Ata, & Buğan, 2015, p. 303). Canbaz and Dur (2019) note that during the global financial crisis in 2008, participation banks were in a better position than traditional banks in terms of return on assets and return on equity; at the end of the period, traditional banks are very close to participation banks in terms of return on assets; in terms of the change in net profits, traditional banks followed a highly volatile course while participation banks followed a partially stable course. Zehri et

al. (2012) examined the effects of the 2008 global financial crisis on financial ratios and concluded that Islamic banks remained more stable than traditional banks in the said crisis thanks to their prudent policies. Moazzam and Zaheer (2015) found that less money was withdrawn from Islamic bank branches during financial panic periods in their comparative study on the Pakistan banking system. In the study of Sutrisno et al. (2020), the impact of the Covid-19 pandemic on the performance of Islamic banks in Indonesia was examined. The results showed that the profitability as measured by return on equity and net operating margin has a significant effect, as well as the financing to deposit ratio is also significantly different. Meanwhile, capital adequacy ratio, non-performing financing, return on assets, and operating expenses to operating income ratio were not affected by the Covid-19 pandemic. Ichsan et al. (2021) analysed the comparison of financial performance of Islamic banking in Indonesia during the Covid-19 pandemic. According to results of this study capital adequacy ratio, operating costs to operating ıncome, financing to deposit ratio have a positive and significant effect on financial performance while non-performing financing has a negative and insignificant effect on financial performance. In the study of Demirguc-Kunt et al. (2020), to evaluate the impact of the Covid-19 outbreak on the banking sector, bank stock prices around the world were analyzed. In the study, bank data, including stock prices, balance sheets and ownership, for 53 countries covering 896 commercial banks is used. According to the findings, the adverse impact of the Covid-19 shock on banks was much more pronounced and long-lasting than on the corporates as well as other non-bank financial institutions. In addition, the crisis and the countercyclical lending role that banks are expected to play have put banking systems around the world under stress having a differential impact depending on their characteristics and pre-crisis vulnerabilities. In the study of Adewale (2020), the preliminary effects and consequences of the Covid-19 outbreak in terms of the stability of the Islamic banking sector in eight Islamic Financial Services Board (IFSB) member countries were examined. According to the findings of the study, although the Islamic banking sector is stable in the countries studied and precautionary indicators have been recorded well above the minimum regulatory and historical average thresholds, changes have been observed both on the basis of indicators and on the basis of countries after the Covid-19 outbreak. Akkas and Al Samman (2021), in their study where they analyzed the impact of the Covid-19 outbreak on Islamic financial institutions, traditional financial institutions and Islamic windows in the Gulf Cooperation Council countries, using panel data method, found that Islamic financial institutions are less exposed to the effects of the Covid-19 outbreak than others, but that Islamic banks are not as resilient in the Covid-19 pandemic as they were in the 2008 financial crisis. In the study of Rabbani et al. (2021), a four-stage Covid-19 model was defined and innovative Islamic financial services were proposed for each

stage of the pandemic. It has been analyzed how these services can be used effectively at different stages in order to overcome the economic damage caused by the outbreak. In the study, it is concluded that the current pandemic provides an opportunity to reveal the importance of the Islamic financial system. In the study of Rizwan et al. (2021), it was examined whether there was a difference in the systemic risk profiles of traditional and Islamic banks during the Covid-19 pandemic. As a result of the comparative analysis, it was found that Islamic banks achieved abnormal returns compared to traditional banks, while exhibiting significantly less contagion effects than others. Other findings of the study are that there was a general increase in contagion during the Covid-19 outbreak, the magnitude of systematic risk increased, and higher abnormal return performance exhibited a negative relationship with spillover.

There are also studies on the effects of the pandemic process on participation banks in Turkey. Ersoy et al. (2020) analyzed public, private and foreign-capital deposit banks and participation banks operating in the Turkish banking sector on the basis of loans, non-performing loans, deposits, securities and foreign currency position data during the pandemic period. According to the findings of the study, domestic private and public banks and participation banks contribute with practices that can be summarized as providing liquidity, extending loans, extending the maturity of loans and reducing the follow-up rates in order not to increase the negative economic effects of the pandemic on the real sector and households. In the study of Şensoy et al. (2020), evaluations were made with the help of data obtained by interview method from the Participation Banks Association of Turkey and the managers of participation banks in order to reveal how participation banks were affected by the economic recession. Participation bank managers involved in the study stated that some customers' loans were restructured due to the Covid-19 outbreak, that this does not pose a great risk in the short term, but if the outbreak prolongs, this phenomenon and perception may change; that the pandemic did not affect resource input; that they expect participation banks to be a center of attraction for customers avoiding speculative transactions, thus the resource inflow to increase even more. In the study of Köse et al. (2021), the performance of participation banks operating in Turkey were measured by CAMELS ratios and MAUT technique. The effect of the pandemic was analyzed by evaluating the first quarter of 2020 as pre-Covid-19 and the second quarter of 2020 as post-Covid-19. It was determined that the best performance was shown by Türkiye Finans Katılım Bank in the first quarter of 2020, and by Vakıf Katılım Bank in the second quarter of 2020. In the study of Arzova and Şahin (2021), suggestions against the effects of the outbreak were presented on the application of mudaraba, musharakah, sukuk, zakat and takaful, which are Islamic financing instruments. It was emphasized that the use of the Islamic financing model will have important functions in terms of ensuring efficiency and confidence in the functioning of economies, beyond combating the economic effects of Covid-19. Arslantürk Çöllü (2021) analyzed whether

participation banks and traditional banks in Turkey were affected by the Covid-19 pandemic, and whether the outbreak had a different effect among bank groups. It has been determined that the negative impact of the pandemic on participation banks and traditional banks in Turkey remained at a limited level as a result of the comprehensive measures taken by the relevant institutions and organizations. In the study, there was not enough evidence that participation banks are more durable than traditional banks for the pandemic period. Sarı (2021) examined the effect of the Covid-19 outbreak on the banking sector balance sheets and ratios of 2019-2020 period using statistical data. In the study, it was evaluated that since the beginning of 2020, the deposits in the sector increased rapidly, the ratio of deposits to loans decreased and the downward trend continued, the loans increased due to the loans extended or renewed within the scope of support measures, and the financial leverage ratio increased despite the high capital ratio of the sector.

IV. DATA AND METHODOLOGY

Considering the fact that the crisis has a global scale, that it has many different dimensions, that the uncertainties continue to increase, and that effective policies in the fight against the crisis cannot be put into effect, it seems quite difficult to be able to determine its effects. With this study, it is aimed to contribute to the relevant literature on the evaluation of the sectoral effects of the crisis through the Islamic banking system. It is expected that this study will contribute to the relevant literature with the comparison of the 2008 crisis and the crisis caused by the Covid-19 outbreak with the performance of participation and deposit banks.

In today's increasingly competitive environment, financial performance comes first among the indicators that a company should constantly monitor in line with the aim of profit maximization. In the measurement of financial performance, methods based on the analysis of financial ratios are generally used. In this context, the most commonly used methods are CAMELS, Analytical Hierarchy Process (AHP), Data Envelopment Analysis (DEA), Topsis and Electre. In particular, CAMELS is used as a basic performance criterion in many countries, almost as an audit mechanism, in order to ensure that banks work regularly without making the financial structure volatile in the economic system (Tunalı & Pekcoşkun, 2019, p. 1585). Based on the CAMEL approach, the ratios used in the analysis of the financial statements of banks can be classified as follows (Akgüç, 2012, pp. 457,458):

- Ratios measuring equity adequacy
- Ratios measuring liquidity risk or used in liquidity analysis
- Ratios measuring asset structure and quality
- Structure of the balance sheet in terms of currencies and foreign currency position ratios
- Profitability ratios related to the evaluation of profitability
- Market-based performance measurement rates
- Productivity indicator activity ratios
- Growth rates

Profitability rates are one of the prominent indicators in financial performance measurement. The high profitability of banks can contribute to the capital adequacy ratio by enabling the addition of profits to the capital (Arslan and Bayraktar, 2020, p. 111). In this context, the most important indicator to be considered is return on assets and/or return on equity. Return on assets shows the profitability of banks from financing and investments of their core activities. While profitability ratios increase the financial performance of banks, equities and loans function as determinant financial performance indicators to prevent banks from falling into bankruptcy (Esmer and Bağcı, 2016, p. 23). The return on equity ratio, which is the main profitability ratio of the banking sector and calculated as net profit / equity, can be decomposed into two sub-ratios as return on assets ratio and capital multiplier. While the return on assets, defined as net profit/assets, shows the net profit per unit asset, the capital multiplier, which is defined as assets / own funds, is accepted as an indicator of the bank's capital adequacy and risk level (Bumin, 2009, p. 44). Net interest margin is also among the variables used in this sense.

Fund collection tools of participation banks are participation accounts and special current accounts. Participation funds are included as a variable in studies conducted to measure the performance of these banks. It is not common for the special current accounts and participation accounts, which are the components of the participation fund, to be included in the models as separate variables (Dinç, 2017, p. 68).

In this part of the study, the performance of the participation banks operating in Turkey during the crisis periods will be analyzed comparatively with the help of the performance indicators used by Ichsan et al. (2021), over the financial ratios used in the relevant literature. The said comparison will be made in the form of participation banks and traditional banks in the context of the 2008 global financial crisis and the Covid-19 pandemic. Two different models of participation and deposit banks will be analyzed within the framework of monthly frequency data sets covering the periods 2006:01-2014:12 and 2015:01-2021:08 for the variables given in Table 3.

Table 3: Variables Used in Analysis

Variable	Definition	Source
ROAR	Return on Assets Ratio = Net Income / Average Total Assets (%)	BDDK*
EAR	Expenses to Assets Ratio = Operational Expenses / Average Total Assets (%)	BDDK *
FDR	Financing to Deposit Ratio = Capital Adequacy Ratio = Total Cash Loans / Total Deposit (Funds collected) (%)	BDDK *
NPF	Non-Performing Financing = Non-Performing Loans (Gross) / Total Cash Loans (%)	BDDK *
CAR	Capital Adequacy Ratio = Capital Adequacy Standard Ratio (%)	BDDK *

* BDDK: Banking Regulation and Supervision Agency

"Return on asset is one form of profitability ratio, by using after various capital costs and total assets owned by banks. Expenses to assets ratio is used to determine the level of ability of a bank in carrying out its corporate activities

efficiently. Financing to deposit ratio measures the ability of Islamic banks to meet all their short-term obligations at maturity. Non-performing financing is a financial ratio that shows the financing risk obtained by banks caused by the investment/financing of bank funds in different portfolios. The capital adequacy ratio aims to see certainty to banks to be able to maximize their operations, so as not to suffer losses in the future" (Ichsan et al. 2021, pp. 301-304).

In the analysis, "return on assets", which is used as an important performance indicator in the banking sector, was included as a dependent variable. Since the ROAR and EAR variables, which are among the variables used, progress monthly cumulatively throughout the year, monthly changes were obtained by taking the differences with the previous month separately for each year and included in the analysis. In addition, since the data are monthly, the analysis was applied after the variables were seasonally adjusted.

V. MODEL

Since two different bank groups (participation and deposit) were analyzed for two different periods in the study, four different models were established. The models used in the analysis are as follows.

Model 1:

$$ROAR_{kt} = \beta_{0k} + \beta_{1k}EAR_{kt} + \beta_{2k}FDR_{kt} + \beta_{3k}NPR_{kt} + \beta_{4k}CAR_{kt} + \mu_{kt}$$

Model 2:

$$ROAR_{kz} = \beta_{k0} + \beta_{k1}EAR_{kz} + \beta_{k2}FDR_{kz} + \beta_{k3}NPR_{kz} + \beta_{k4}CAR_{kz} + \mu_{kz}$$

Model 3:

$$ROAR_{mt} = \beta_{m0} + \beta_{m1}EAR_{mt} + \beta_{m2}FDR_{mt} + \beta_{m3}NPR_{mt} + \beta_{m4}CAR_{mt} + \mu_{mt}$$

Model 4:

$$ROAR_{mz} = \beta_{m0} + \beta_{m1}EAR_{mz} + \beta_{m2}FDR_{mz} + \beta_{m3}NPR_{mz} + \beta_{m4}CAR_{mz} + \mu_{mz}$$

Here, k represents participation banks, m represents deposit banks, β_i represents the coefficients of the variables, t represents the monthly time for the period 2006:01-2014:12, z represents the monthly time for the period 2015:01-2021:08.

A. UNIT ROOT TESTS

If the variables used in econometric analyzes contain a unit root, that is they are not stationary, the risk of encountering spurious regression is very high. Therefore, it is necessary to examine the stationarity of the variables before starting the analysis. There are many unit root tests in the literature that examine the stationarity of the series. In this study, we used the Augmented Dickey Fuller (ADF) unit root test, which is the most used unit root test in the literature, and the Zivot-Andrews breakpoint unit root test. Results of these unit root tests are given in Table 4 and 5.

Table 4: Results of ADF Unit Root Test

	Variable	2006:01-2014:12 period				2015:01-2021:08 period			
		Intercept only		With trend		Intercept only		With trend	
		T-stat	Prob.	T-stat	Prob.	T-stat	Prob.	T-stat	Prob.
Participation Banks	ROAR	0.532	0.9858	-2.475	0.3404	-2.520	0.1108	-2.463	0.3467
	D(ROAR)	-6.913*	0.0000	-7.063*	0.0000	-6.981*	0.0000	-6.967*	0.0000
	FDR	-1.581	0.4932	1.908	0.6504	-0.087	0.9507	-2.035	0.5821
	D(FDR)	-8.650*	0.0000	-8.614*	0.0000	-4.385*	0.0003	-4.376*	0.0024
	EAR	-2.176	0.2149	-2.195	0.4927	-1.354	0.6041	-3.107	0.1045
	D(EAR)	-14.211*	0.0000	-14.146*	0.0000	-15.457*	0.0000	-15.358*	0.0000
	NPF	-2.212	0.2020	-2.252	0.4608	-1.976	0.2970	-2.434	0.3615
	D(NPF)	-3.447*	0.0095	-3.399***	0.0515	-4.287*	0.0005	-4.252*	0.0037
	CAR	-2.608	0.0914	-2.792	0.1998	-1.742	0.4095	-0.839	0.9623
	D(CAR)	-5.333*	0.0000	-5.289*	0.0001	-5.329*	0.0000	-5.607*	0.0000
		Intercept only		With trend		Intercept only		With trend	
Deposit Banks	ROAR	-2.535	0.1072	-2.815	0.1915	-2.440	0.1308	-3.117	0.1022
	D(ROAR)	-7.102*	0.0000	-7.116*	0.0000	-6.598*	0.0000	-6.545*	0.0000
	FDR	0.318	0.9782	-1.043	0.9380	1.443	0.9973	-1.204	0.9096
	D(FDR)	-6.078*	0.0000	-6.103*	0.0000	-4.776*	0.0001	-5.207*	0.0001
	EAR	-1.280	0.6384	-2.948	0.1472	-2.319	0.1660	-2.457	0.3499
	D(EAR)	-15.598*	0.0000	-15.525*	0.0000	-10.651*	0.0000	-10.600*	0.0000
	NPF	-2.067	0.2579	-3.123	0.1010	-2.047	0.2663	-2.797	0.1981
	D(NPF)	-3.120**	0.0251	-4.209*	0.0043	-2.948**	0.0401	-4.498*	0.0015
	CAR	-1.349	0.6064	-2.744	0.2184	-1.259	0.6478	-1.925	0.6418
	D(CAR)	-5.050*	0.0000	-4.981*	0.0002	-3.944*	0.0017	-3.972*	0.0096

Note: *, ** and *** indicate significance at the 1%, 5% and 10% level, respectively.
The "D()" operator indicates that the first difference of the variable.

According to the results of the ADF unit root test, it is seen that all the variables contain a unit root at the level, while the first differences do not contain a unit root, that is, they are I(1).

Table 5. Results of Zivot-Andrews Breakpoint Unit Root Test

Trend Specification			Intercept only		Trend and intercept					
Break Specification			Intercept only		Intercept only		Trend and intercept		Trend only	
			t-Stat.	Prob.	t-Stat.	Prob.	t-Stat.	Prob.	t-Stat.	Prob.
Participation Banks	2006:01-2014:12	ROAR	-3.78	0.246	-3.21	0.840	-3.66	0.732	-3.44	0.440
		D(ROAR)	-13.55*	<0.01	-13.52*	<0.01	-13.53*	<0.01	-13.35*	<0.01
		FDR	-3.05	0.657	-3.12	0.873	-3.10	0.947	-2.84	0.784
		D(FDR)	-15.62*	<0.01	-15.54*	<0.01	-15.52*	<0.01	-14.16*	<0.01
		EAR	-2.73	0.821	-4.02	0.360	-4.56	0.212	-2.78	0.809
		D(EAR)	-11.82*	<0.01	-11.81*	<0.01	-12.02*	<0.01	-11.21*	<0.01
		NPF	-2.79	0.793	-3.56	0.656	-3.17	0.931	-2.53	0.906
		D(NPF)	-9.57*	<0.01	-11.83*	<0.01	-12.95*	<0.01	-10.01*	<0.01

		CAR	-3.88	0.203	-3.94	0.410	-3.75	0.681	-3.50	0.407
		D(CAR)	-12.86*	<0.01	-12.77*	<0.01	-13.03*	<0.01	-11.26*	<0.01
			t-Stat.	Prob.	t-Stat.	Prob.	t-Stat.	Prob.	t-Stat.	Prob.
	2015:01-2021:08	ROAR	-2.28	0.951	-2.64	0.973	-3.72	0.694	-3.38	0.478
		D(ROAR)	-16.11*	<0.01	-16.10*	<0.01	-16.04*	<0.01	-16.08*	<0.01
		FDR	-1.67	>0.99	-3.61	0.624	-4.11	0.450	-3.98	0.183
		D(FDR)	-15.32*	<0.01	-15.21*	<0.01	-15.11*	<0.01	-15.27*	<0.01
		EAR	-2.67	0.844	-3.78	0.515	-3.51	0.807	-2.67	0.857
		D(EAR)	-8.31*	<0.01	-9.07*	<0.01	-9.03*	<0.01	-8.04*	<0.01
		NPF	-3.90	0.194	-4.60	0.102	-4.52	0.230	-3.33	0.507
		D(NPF)	-19.38*	<0.01	-18.94*	<0.01	-18.82*	<0.01	-8.59*	<0.01
		CAR	-3.43	0.426	-4.02	0.361	-4.29	0.340	-4.16	0.125
		D(CAR)	-11.62*	<0.01	-11.68*	<0.01	-11.54*	<0.01	-10.85*	<0.01
Trend Specification			Intercept only		Trend and intercept					
Break Specification			Intercept only		Intercept only		Trend and intercept		Trend only	
Deposit Banks			t-Stat.	Prob.	t-Stat.	Prob.	t-Stat.	Prob.	t-Stat.	Prob.
	2006:01-2014:12	ROAR	-3.59	0.338	-4.54	0.118	-4.75	0.140	-3.94	0.198
		D(ROAR)	-16.44*	<0.01	-16.38*	<0.01	-16.82*	<0.01	-15.47*	<0.01
		FDR	-4.01	0.155	-4.13	0.296	-4.08	0.467	-3.67	0.315
		D(FDR)	-18.13*	<0.01	-18.09*	<0.01	-18.00*	<0.01	-15.65*	<0.01
		EAR	-2.17	0.967	-3.81	0.492	-3.94	0.561	-3.85	0.235
		D(EAR)	-9.56*	<0.01	-9.78*	<0.01	-10.28*	<0.01	-9.23*	<0.01
		NPF	-3.71	0.280	-4.61	0.100	-4.44	0.267	-3.36	0.491
		D(NPF)	-4.78**	0.019	-5.67*	<0.01	-6.27*	<0.01	-4.52***	0.051
		CAR	-3.86	0.212	-4.09	0.318	-4.02	0.509	-3.31	0.524
		D(CAR)	-11.18*	<0.01	-11.04*	<0.01	-9.10*	<0.01	-8.83*	<0.01
			t-Stat.	Prob.	t-Stat.	Prob.	t-Stat.	Prob.	t-Stat.	Prob.
	2015:01-2021:08	ROAR	-2.52	0.896	-3.72	0.551	-2.83	0.981	-3.60	0.350
		D(ROAR)	-14.95*	<0.01	-14.87*	<0.01	-14.80*	<0.01	-14.71*	<0.01
		FDR	-3.53	0.370	-4.00	0.371	-4.74	0.143	-3.80	0.258
		D(FDR)	-11.42*	<0.01	-11.48*	<0.01	-11.45*	<0.01	-10.99*	<0.01
		EAR	-2.59	0.871	-2.69	0.968	-3.62	0.758	-3.25	0.562
		D(EAR)	-11.18*	<0.01	-11.11*	<0.01	-11.12*	<0.01	-10.19*	<0.01
		NPF	-3.25	0.536	-4.19	0.264	-4.68	0.164	-2.44	0.932
		D(NPF)	-4.41***	0.055	-6.27*	<0.01	-6.39*	<0.01	-4.49***	0.055

		CAR	-3.06	0.651	-4.00	0.369	-3.47	0.826	-3.48	0.421
		D(CAR)	-9.44*	<0.01	-9.51*	<0.01	-9.47*	<0.01	-9.07*	<0.01

Note: *, ** and *** indicate significance at the 1%, 5% and 10% level, respectively.
The "D()" operator indicates that the first difference of the variable.

According to the results of the Zivot-Andrews breakpoint unit root test, it is seen that all the variables contain a unit root at the level, while the first differences do not contain a unit root, that is, they are I(1) as in ADF unit root test.

B. CO-INTEGRATION TEST

In econometric analysis, various cointegration tests (Conventional OLS, Engle-Granger (1987), Johansen (1991), ARDL, etc.) are used to examine the long-term relationship between series. "Which of these tests should or should not be used?" is decided according to the stationarity levels of the series. Among these tests, Conventional OLS gives unbiased results in series stationary at level, Engle-Granger (1987), Johansen (1991) cointegration tests gives unbiased results in I(1) series, and ARDL test gives unbiased results in series integrated at different levels (I(0) and I(1)) (Karadaş and Salihoğlu, 2020:73).

Since all of the variables of the 4 models we used in the study are first-order integrated, that is, I(1), the Engle-Granger test should be applied. However, since we aim to examine the effects of two different crises (the 2008 financial crisis and the Covid-19 outbreak) on deposit and participation banks, the structural changes that these two crises may cause in the models should be taken into account. For this reason, it was decided to apply the Gregory-Hansen Structural Break Co-Integration Test, which is an improved version of the Engle-Granger test developed by Gregory and Hansen (1996), which takes into account the structural breaks in the model.

Gregory and Hansen (1996) tried to explain structural breaks using the standard cointegration equation (equation (1)) given by Engle-Granger.

$$y_t = \mu + \alpha_1 x_t + \alpha_2 z_t + e_t \qquad t=1, 2, \ldots, n \qquad (1)$$

Here, y is the independent variable, x and z are the dependent variables, e_t is error term, μ is constant, $\alpha_i$are the variable coefficients; y, x, and z are integrated of order one, that is, I(1).

Gregory and Hansen stated that structural breaks will be reflected in the equation as a change in constant and/or slope coefficients. Therefore, they defined the shadow variable given in equation (2) in order to explain structural breaks (Gregory and Hansen, 1996, p. 102).

$$\varphi_{1t} = \begin{cases} 0, & t \leq [n\tau] \\ 1, & x > [n\tau] \end{cases} \qquad (2)$$

Here, $\tau \in (0,1)$ is the time of the change point. That is, $[n\tau]$ represents the period during which the structural break occurred.

According to Gregory and Hansen (1996), who added a shadow variable to the standard cointegration equation, structural breaks in the model can be observed in different forms. The authors considered three different forms as change in constant, change in constant and trend, and change in slope vector from different forms. The models for these three situations are given below (Gregory and Hansen, 1996, p. 103).

Case one: The model in which the constant changes while the slope coefficients are kept constant (Level shift (C));

$$y_{1t} = \mu_1 + \mu_2\varphi_{1t} + \alpha_1 x_t + \alpha_2 z_t + e_t \qquad t=1, 2, \ldots, n \qquad (3)$$

Where, μ_1 is the constant before the structural break, μ_2 is the constant after the structural break.

Case two: Model formed by adding time trend to change in constant (Level shift with trend (C/T));

$$y_{1t} = \mu_1 + \mu_2\varphi_{1t} + \beta t + \alpha_1 x_t + \alpha_2 z_t + e_t \qquad t=1, 2, \ldots, n \qquad (4)$$

Where, β is the coefficient of the time trend.

Case three: Model allowing slope vector shift (Regime shift (C/S));

$$y_{1t} = \mu_1 + \mu_2\varphi_{1t} + \alpha_1 x_t + \alpha_{11}\varphi_t x_t + \alpha_2 z_t + \alpha_2\varphi_t z_t + \alpha_2^T y_{2t}\varphi_{1t} + e_t$$
$$t=1, 2, \ldots, n \qquad (5)$$

Here, μ_1 and μ_2 are the constants in the case one, α_i are the slope coefficients before the regime change, and α_{ii} are the slope coefficients after the regime change.

In these three models, the structural break dates and the existence of cointegration are examined with the help of ADF and Phillips (Zt, Za) test statistics. The period in which these three statistics have the smallest value according to different τ is chosen as the structural break date. The null hypothesis of these three statistics applied according to the selected structural break date is that there is no cointegration between the variables. The test statistics obtained as a result of the ADF, Zt and Za tests are compared with the asymptotic critical values table given in the study of Gregory and Hansen (1996) and it is examined whether the null hypotheses can be rejected or not. Gregory and Hansen (1996) for the data sets in our study are given in Table 6.

Table 6: Gregory-Hansen Structural Break Co-Integration Test Results[1]

	2006:01-2014:12 period			2015:01-2021:08 period		
Participation Banks	Model: Change in Level					
		Test statistic	Breakpoint date		Test statistic	Breakpoint date
	ADF	-8.91*	2010m6	ADF	-10.73*	2020m1
	Zt	-8.95*	2010m4	Zt	-10.80*	2020m1
	Za	-112.55*	2010m4	Za	-94.83*	2020m1
	Model: Change in Level and Trend					

[1] Asymptotic critical values are taken from Gregory and Hansen (1996).

		Test statistic	Breakpoint date		Test statistic	Breakpoint date
	ADF	-4.56	2008m6	ADF	-10.68*	2020m1
	Zt	-9.10*	2008m8	Zt	-10.74*	2020m1
	Za	-112.34*	2008m8	Za	-94.66*	2020m1
	Model: Change in Regime					
		Test statistic	Breakpoint date		Test statistic	Breakpoint date
	ADF	-10.16*	2013m8	ADF	-11.68*	2019m1
	Zt	-10.21*	2011m12	Zt	-11.65*	2019m1
	Za	-120.08*	2011m12	Za	-100.43*	2019m1
	2006:01-2014:12 period			2015:01-2021:08 period		
Deposit Banks	Model: Change in Level					
		Test statistic	Breakpoint date		Test statistic	Breakpoint date
	ADF	-7.46*	2013m8	ADF	-10.23*	2016m3
	Zt	-7.39*	2009m1	Zt	-10.30*	2016m3
	Za	-72.85*	2009m1	Za	-92.32*	2016m3
	Model: Change in Level and Trend					
		Test statistic	Breakpoint date		Test statistic	Breakpoint date
	ADF	-7.81*	2008m6	ADF	-10.23*	2018m8
	Zt	-7.84*	2008m4	Zt	-10.29*	2018m8
	Za	-78.70*	2008m4	Za	-92.54*	2018m8
	Model: Change in Regime					
		Test statistic	Breakpoint date		Test statistic	Breakpoint date
	ADF	-8.53*	2007m7	ADF	-10.90*	2019m8
	Zt	-8.57*	2007m7	Zt	-10.93*	2017m3
	Za	-87.93**	2007m7	Za	-96.31*	2017m3

Note: * and ** indicate significance at the 1% and 5% level, respectively.

As seen from the table, considering the structural breaks for the 4 models we used in the study, the presence of cointegration was detected in 3 cases (C, C/T and C/S) (a total of 12 models). Here are the break dates for 12 different states.

Participation banks (2006:01-2014:12 period)

- 2010m06 (C)
- 2010m04(C)
- 2008m08 (C/T)
- 2013m08 (C/S)
- 2011m12 (C/S)

Participation banks (2015:01-2021:08 period)

- 2020m01 (C and C/T)
- 2019m01 (C/S)

Deposit banks (2006:01-2014 period)

- 2013m08 (C)
- 2009m01 (C)
- 2008m06 (C/T)
- 2008m04 (C/T)
- 2007m07 (C/S)

Deposit banks (2015:01-2021:08 period)

- 2016m03 (C)
- 2018m06 (C/T)
- 2019m08 (C/S)
- 2017m03 (C/S)

In terms of participation banks, while the breaks in 2010 and 2011 in the first period discussed can be associated with the global financial crisis, it seems possible that the breaks in the second period (in 2019 and 2020) can be associated not with the Covid-19 crisis, but with the financial sector problems (especially the problems in foreign exchange markets) that started in 2018 and continued in 2019. In terms of deposit banks, the break in 2009 seems to be significant for the first period, and there is no break that can be associated with the Covid-19 outreak for the second period. In this study, since we aimed to examine the effects of the 2008 global financial crisis and the Covid-19 outbreak, only the long-term coefficients[2] showing the effects of these two crises were examined. For information on the long-term coefficients of other cases, the results in Appendix can be examined.

Table 7: Gregory-Hansen Structural Break Co-Integration Test Long-term Coefficients

Participation Banks (2006:01-2014 period)				
Dependent variable: ROAR				
Model: C (Change in Level)				
Variable	Coefficient	Standard error	t-statistic	Probability
C	0.200864	0.250179	0.802882	0.4239
FDR	-0.003388***	0.001874	-1.808392	0.0735
EAR	1.315893*	0.180724	7.281216	0.0000
NPF	-0.040840*	0.013354	-3.058363	0.0028
CAR	0.006799	0.007886	0.862204	0.3906
Participation Banks (2015:01-2021:08 period)				
Dependent variable: ROAR				
Model: C (Change in Level)				
Variable	Coefficient	Standard error	t-statistic	Probability
C	0.072049	0.186882	0.385534	0.7009
FDR	0.001267***	0.000741	1.709520	0.0915
EAR	-0.971230*	0.289176	-3.358608	0.0012
NPF	-0.016064***	0.008536	-1.882018	0.0638
CAR	0.007767	0.007045	1.102407	0.2739
Deposit Banks (2015:01-2021:08 period)				
Dependent variable: ROAR				
Model: C (Change in Level)				
Variable	Coefficient	Standard error	t-statistic	Probability
C	-0.126247	0.141145	-0.894452	0.3732
FDR	0.000350	0.000732	0.479117	0.6329

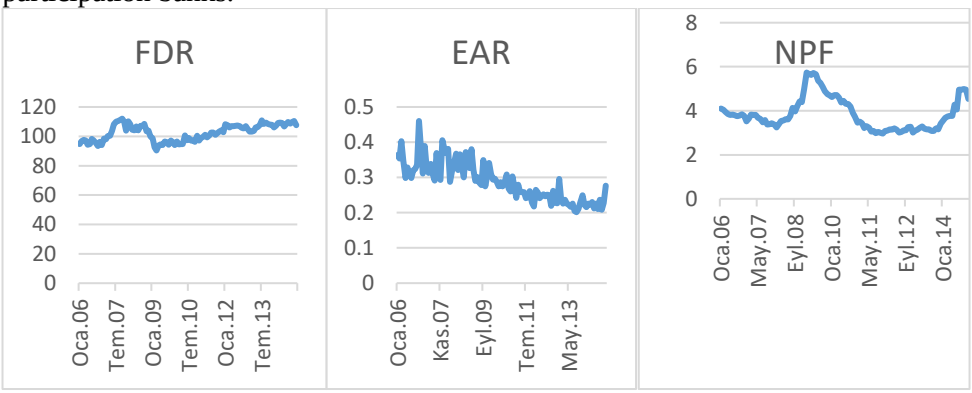
[2] For participation banks, the change in constant for the periods 2006:01-2014:12 and 2015:01-2021:08, and for deposit banks, the change in constant for the period 2006:01-2014:12.

EAR	0.558366**	0.216007	2.584944	0.0112
NPF	0.017675**	0.007960	2.220539	0.0286
CAR	0.005157	0.004218	1.222696	0.2243

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

The coefficients and significance levels of the long-term balances are given in the table according to the break dates that we want to examine. It can be said that the breaks in the three models examined have a significant effect (due to the fact that the long-term coefficients in these two models are mostly significant).

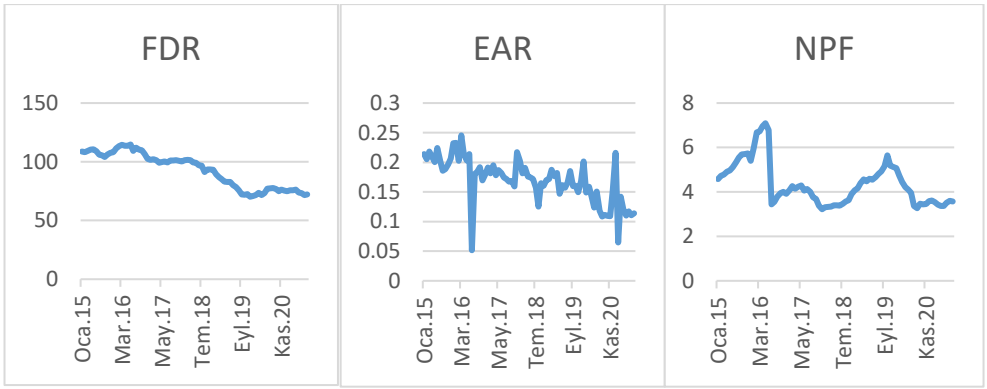
When the coefficients are examined it is seen that FDR, EAR and NPF variables have a statistically significant effect on the ROAR variable in the change in level model with the break date of 2010M04 applied to the period of 2006:01-2014:12 of participation banks. While changes in FDR and NPF variables have an inverse affect, changes in EAR variable have a direct effect. It is seen that a one-unit change of the FDR variable has a 3 per-thousand inverse effect on the ROAR variable, a one-unit change of the NPF variable has a 4 percent inverse effect on the ROAR variable, and a one-unit change of the EAR variable has 130 percent a direct effect on the ROAR variable. When the movements of these three variables in the period 2006:01-2014:12 are examined (Graph 1), it is seen that the FDR variable follows a fluctuating but stable course, the EAR variable follows a decreasing course, and after the break date, the NPF variable follows an increasing course. Considering the movements and coefficients of these three variables in the examined period, it is seen that this structural break had a negative effect on the profitability of participation banks.



Graph 1: FDR, EAR and NPF of Participation Banks in 2006:01-2014:12

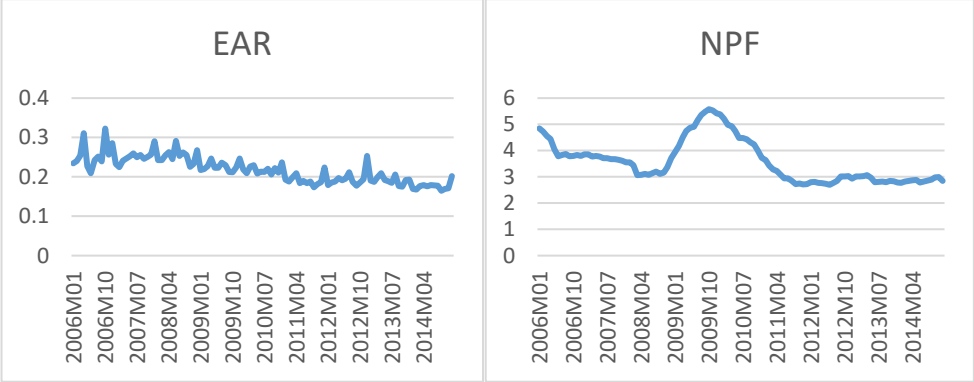
It is seen that FDR, EAR and NPF variables have a statistically significant effect on ROAR variable in the change in level model with the break date of 2020M01 applied to the period of 2015:01-2021:08 of participation banks. While changes in EAR and NPF variables have an inverse affect, changes in FDR variable have a direct effect. It is seen that a one-unit change of NPF variable has a 1 percent inverse effect on ROAR variable, a one-unit change of EAR variable has a 97 percent inverse effect on ROAR variable, and a one-unit change of FDR variable has 1 per-

thousand a direct effect on ROAR variable. When the movements of these three variables in the period 2015:01-2021:08 are examined (Graph 2), it is seen that FDR variable follows a decreasing trend, EAR variable fluctuates but decreases, and NPF variable follows a fluctuating but stable course. Considering the movements and coefficients of these three variables in the examined period, it can be said that this break has a positive effect on the profitability of participation banks, since the negative contribution of the FDR variable is much smaller than the positive contribution of the EAR and NPF variables.



Graph 2: FDR, EAR and NPF of Participation Banks in 2015:01-2021:08

It is seen that the EAR and NPF variables have a statistically significant effect on the ROAR variable in the change in level model with the break date of 2009M01 applied to the period of 2006:01-2014:12 of deposit banks. It is seen that a one-unit change of the EAR variable has a 55 percent, and a one-unit change of the NPF variable has a 1-percent direct effect on the ROAR variable. When the movements of these two variables in the period 2006:01-2014:12 are examined (Graph 3), it is seen that the FDR variable follows a decreasing trend, the EAR variable follows a decreasing course and after the break date, NPF variable follows a stable course. Considering the movements and coefficients of these two variables in the examined period, it is seen that this break has a negative effect on the profitability of deposit banks.



Graph 3: EAR and NPF of Deposit Banks in 2006:01-2014:12

Since the existence of co-integration was not found in the model with the break date of 2019M08 applied to the period of 2006:01-2014:12 of deposit banks, the long-term equation of this model is not included in the table.

CONCLUSION

At the beginning of the 21st century, the world faced two major crises. The problems that emerged with the mortgage crisis in the USA in 2007 turned into a global financial crisis in 2008. It is generally accepted that factors such as uncertainties in the financial system, extremely risky transactions, and audit inadequacies are important factors at the source of the crisis. With the reduction of uncertainties within the framework of the measures taken and the elimination of the problem of confidence to a great extent, the world economy began to normalize. However, the Covid-19 pandemic, which emerging in China in 2019 and affected the whole world, caused more severe financial and economic problems. Since the pandemic continues, it does not seem possible to fully determine the economic effects it has caused. However, it is seen that economies on a global scale are drifting towards a recession within the supply-demand spiral. The financial sector is one of the sectors most affected by this process.

The Turkish economy has also been significantly affected by the pandemic as all countries around the world. Although it is still early to determine the contractions caused by supply and demand shocks in economic activities and the costs of these contractions, the first effects of the shock have been overcome thanks to the measures taken within the scope of fighting the crisis; however, it can be said that medium and long-term risk factors continue to exist. In this study, evaluations were made about the effects of this process to the participation banks operating in Turkey, and the effects of the Covid-19 outbreak and 2008 global financial crisis to the banks in question were analyzed in comparison with deposit banks. According to the results obtained in our study, the 2008 global financial crisis had a negative effect on the profitability performance of participation banks in 2010, and the ratio

of operating expenses to total assets had a significant effect on this effect. It is also among the findings of the study that the Covid-19 pandemic has not had a significant impact on participation banks so far. It is seen that the same variable is effective in the break that occurred in 2020 and is thought to be caused by the financial problems experienced in the 2018-2019 period. When the result is evaluated in terms of deposit banks, the research findings point to a break that can be associated with the global financial crisis in 2009. The ratio of operating expenses to total assets, as in participation banks, was effective in this break. In general, it can be concluded that the increase in operating expenses and to some extent non-performing financing had a negative impact on the performance of participation banks and deposit banks.

As stated in the Islamic Development Bank report (IsDB, 2020, p.10), "A new paradigm is needed to respond to repeated crises and to the pandemic-induced stagnation of the global economy. In particular, institutionalized risk-sharing can help the global economy to resiliently absorb shocks and stimulate stagnated demand. Principles of Islamic finance help the economy to avoid endogenously generated crises, like the Global Financial Crisis, and provide a strong safety net against exogenously induced cycles, like the Covid-19 crisis However, the effective operation of these principles requires effective functioning institutions, and the sector still lacks essential components in this respect. The crisis can be an opportunity in this sense to fill in the gaps."

The services offered by the Islamic banking system can play an active role in the fight against systemic financial problems. The existence of Islamic financial institutions has a reducing effect on the reflection of financial shocks on the real sector of the economy, and this has important consequences in terms of reducing financial instability. In this context, necessary measures should be taken by policy makers and regulatory organizations to strengthen the liquidity and operational infrastructure in order to improve the efficiency of the system. In addition, Islamic finance should be aligned with social and economic goals and participation in the system should be increased. Initiatives to establish accounting, regulatory and auditing standards that can be applied on a global scale should be strengthened.

The working principles and existing infrastructures of Islamic banks can provide important contributions to the global financial system to overcome this crisis by producing effective results in reducing the risks posed by the Covid-19 pandemic. In this direction, the Islamic banking system can increase its share in the sector by turning the current crisis conditions into an opportunity.

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Appendix 1: Long Term Coefficients of Participation Banks

Participation Banks (2006:01-2014:12 period)				
Dependent variable: ROAR; Model: C/T (Level shift with trend)				
Variable	Coefficient	Standard error	t-statistic	Prob.
C	0.335038	0.240170	1.395001	0.1661
@TREND	-0.002271	0.000642	-3.537015	0.0006
FDR	-0.000708	0.001931	-0.366497	0.7148
EAR	0.116631	0.379883	0.307019	0.7595
NPF	-0.022389	0.013691	-1.635245	0.1051
CAR	0.005657	0.007482	0.756013	0.4514
Participation Banks (2006:01-2014:12 period)				
Dependent variable: ROAR; Model: C/S (Regime shift)				
Variable	Coefficient	Standard error	t-statistic	Prob.
C	-0.097540	0.221220	-0.440918	0.6602
@TREND>92-2	-6.980219	1.695102	-4.117876	0.0001
FDR	-0.001128	0.001657	-0.680635	0.4977
EAR	1.263492	0.149934	8.426992	0.0000
NPF	-0.012370	0.012725	-0.972139	0.3334
CAR	0.005158	0.006478	0.796307	0.4278
Participation Banks (2015:01-2021:08 period)				
Dependent variable: ROAR; Model: C/T (Level shift with trend)				
Variable	Coefficient	Standard error	t-statistic	Prob.
C	0.094440	0.215657	0.437916	0.6627
@TREND	-0.000219	0.001032	-0.212267	0.8325
FDR	0.001042	0.001296	0.803654	0.4242
EAR	-0.979495	0.293653	-3.335549	0.0013
NPF	-0.016514	0.008849	-1.866262	0.0660
CAR	0.008373	0.007644	1.095293	0.2770
Participation Banks (2015:01-2021:08 period)				
Dependent variable: ROAR; Model: C/S (Regime shift)				
Variable	Coefficient	Standard error	t-statistic	Prob.
C	0.155063	0.206160	0.752148	0.4545
@TREND>68-2	-0.908676	1.416362	-0.641556	0.5233
FDR	0.001414	0.000794	1.780787	0.0793
EAR	-1.329437	0.333942	-3.981040	0.0002
NPF	-0.013046	0.008781	-1.485679	0.1419
CAR	0.004937	0.007794	0.633499	0.5285

Appendix 2: Long Term Coefficients of Deposit Banks

Deposit Banks (2006:01-2014:12 period)				
Dependent variable: ROAR; Model: C/T (Level shift with trend)				
Variable	Coefficient	Standard error	t-statistic	Prob.
C	-0.058471	0.212516	-0.275137	0.7838
@TREND	0.000396	0.000925	0.427966	0.6696
FDR	-0.000587	0.002310	-0.254051	0.8000
EAR	0.619095	0.259175	2.388711	0.0188
NPF	0.013575	0.012476	1.088066	0.2792
CAR	0.004886	0.004282	1.140951	0.2566
Deposit Banks (2006:01-2014:12 period)				
Dependent variable: ROAR; Model: C/S (Regime shift)				
Variable	Coefficient	Standard error	t-statistic	Prob.
C	-0.086940	0.149194	-0.582736	0.5614
@TREND>92-2	-0.101548	0.711340	-0.142756	0.8868
FDR	0.000175	0.000767	0.228141	0.8200
EAR	0.556440	0.222462	2.501283	0.0140
NPF	0.017886	0.008064	2.217932	0.0289
CAR	0.003727	0.004419	0.843416	0.4010
Deposit Banks (2015:01-2021:08 period)				
Dependent variable ROAR; Model: C (Change in Level)				
Variable	Coefficient	Standard error	t-statistic	Prob.
C	-0.231831	0.298580	-0.776444	0.4400
FDR	0.003097	0.001929	1.605428	0.1127
EAR	-0.167066	0.560655	-0.297984	0.7666
NPF	0.008656	0.015111	0.572819	0.5685
CAR	-0.001101	0.006983	-0.157730	0.8751
Deposit Banks (2015:01-2021:08 period)				
Dependent variable: ROAR; Model: C/T (Level shift with trend)				
Variable	Coefficient	Standard error	t-statistic	Prob.
C	-0.244419	0.298006	-0.820183	0.4148
@TREND	0.000778	0.000662	1.175394	0.2437
FDR	0.002980	0.001927	1.547055	0.1262
EAR	0.377564	0.726240	0.519889	0.6047
NPF	-0.001456	0.017354	-0.083913	0.9334
CAR	-0.003951	0.007375	-0.535772	0.5937
Deposit banks (2015:01-2021:08 period)				
Dependent variable: ROAR; Model: C/S (Change in Regime)				
Variable	Coefficient	Standard error	t-statistic	Prob.
C	-0.727171	0.336181	-2.163032	0.0340
@TREND>68-2	0.844118	0.816034	1.034415	0.3045
FDR	0.006282	0.002147	2.925528	0.0046
EAR	-0.032647	0.549943	-0.059364	0.9528
NPF	0.023979	0.015493	1.547770	0.1262
CAR	0.002057	0.006840	0.300808	0.7645