Empirical Applications to Research the Levels of Affected by the 2008 Crisis According To The Macro-Economic Structures of Developing and Developed Countries

2008 Krizinden Gelişmiş ve Gelişmekte Olan Ülkelerin Makroekonomik Yapılarına Göre Etkilenme Düzeylerinin Araştırılması Üzerine Ampirik Uygulamalar

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Abstract

In this study, the impact levels of the 2008 crisis were investigated according to the macroeconomic factors of selected developed and developing countries classified according to OECD data. First of all, the level of being affected by the crisis according to the macro factors of developed and developing countries and the dynamic relations of macroeconomic factors over time were examined. Then, it was researched that developed and developing countries were more affected by the crisis according to which macroeconomic factors. The hypothesis of this study is that while underdeveloped and underdeveloped countries were more affected by the previous crises, developed countries may have been more affected by the 2008 Mortgage Crisis, which is one of the new generation financial crises. In the research, VAR Analysis method was applied by using quarterly unemployment rates, inflation rates, Current Account Deficit/GDP, FDI/GDP data of 18 developed and 13 developing countries between 2008-2019. According to the findings obtained as a result of the analysis, it was determined that developing countries were affected more strongly by the unemployment factor in the first periods after the crisis, and developed countries were affected more than developing countries in the following periods. According to the findings obtained from the inflation rate factor, it is seen that developing countries react more negatively in all periods compared to developed countries, while the reaction of developed countries is positive in all periods and the severity of the reaction decreases with time.

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Öz

Çalışma kapsamında analize dahil edilmiş olan gelişmiş ve gelişmekte olan ülkeler, OECD verileri baz alınarak sınıflandırılmıştır. 2008 krizinden ülkelerin makroekonomik faktörlerine göre etkilenme düzeylerinin araştırılması hedeflenmiştir. 2008 krizinden önce meydana gelmiş olan krizlerden az gelişmiş ya da gelişmemiş ülkelerin daha güçlü etkilenmiş olduğu bilinmekte iken yeni nesil kriz olan 2008 krizinden gelişmiş ülkelerin daha çok etkilenmiş olabileceğinin araştırılması bu araştırmanın hipotezini oluşturmaktadır. Öncelikli olarak gelişmiş ve gelişmekte olan ülke ekonomilerinin 2008 krizinden etkilenme düzeyleri ve makroekonomik faktörlerin zaman içinde gözlemlenen dinamik ilişkilerinin ortaya konması hedeflenmiştir. 18 gelişmiş ve 13 gelişmekte olan ülkenin, 2008-2019 zaman aralığında çeyrek dönemlik işsizlik oranları, enflasyon oranları, Cari Açık/GSYİH, DYY/GSYİH verileri kullanılmış ve VAR Analizi ile analize edilmiştir. Bulgular detaylıca çalışma içinde açıklanmıştır. Etki tepki analizleri ile her bir değişkenin maruz kaldığı şoka, diğer değişkenleri verdiği tepkiler araştırılmıştır.

Jel Codes: *G01, C20, O11.*

Keywords: *Finansal Krizler, 2008 Mortgage Krizi, Makroekonomik Faktörler, VAR Analizi.*

1. Introduction

With the effect of globalization, economic relations between countries have gained a rising momentum. Globalization paved the way for the financial crisis that started in any country to gain a global dimension and spread to the whole world. The 2008 Mortgage Crisis, which was observed as a new generation crisis model, was effective all over the world in a very short time, and it was observed that it had more serious effects especially on developed countries.

As it is known, a significant majority of the countries in the world have switched to the free exchange rate regime system as of the 1970s. With the transition to free exchange rate regime practices, countries have become more macroeconomically dependent on each other and their vulnerability to external shocks has increased. Countries that do not have a free market economy have faced serious problems in the process of integrating their financial markets with the liberal economy, and these problems have caused currency crises.

By eliminating local and foreign government regulation, financial liberalization is assumed to increase the efficiency of financial markets, increasing the amount of loanable funds for investments. For example, with the removal of the interest rate ceiling, banks can attract deposits more easily and are more willing to lend accordingly. From this point of view, it is concluded that financial stability should increase with financial liberalization (Weller, 1999: 2-3).

Financial liberalization has begun to be based on the "Financial Instability Hypothesis" of the famous economist Minsky (1992). The economic developments observed after financial liberalization are generally extremely well-intentioned expectations, but they are not sustainable in the long run. The additional liquidity that comes with financial liberalization does not go to the most efficient areas and can be spent on speculative projects; Thus, while

gaining profits in the short term, it also creates an unstable environment for the local and foreign banking sector (Weller, 1999: 3).

As of the 1990s, there have been many crises in the financial system one after the other. The crises that arise are defined as crises that are contagious as a result of globalization. Contagion can be expressed as the rapid spread of a shock which take place in one country to other countries due to financial integration. 1992-1993 European Monetary System Crisis, 1994-1995 Mexican Crisis, 1997 Asian crisis and 1998 Russian crisis were contagious crises. The last global crisis, the 2008 Mortgage Crisis, started in the United States and suddenly engulfed the whole world and produced a devastating result. The European debt crisis, which is seen as an extension of the Mortgage Crisis, has been experienced and the European Union countries such Ireland, Italy, Greece, Spain and Portugal have been strongly affected by this crisis. The European debt crisis affected other European Union countries as well as other countries with which it interacted financially.

Before the financial crisis, high level of activities were observed in the national economies. There was high inflation in the markets, overvalued local currency, expansionary monetary policy, strong growth in domestic credit volume. Insufficient foreign currency reserves resulted in increasing debts of the banking system, decrease in asset prices, increase in interest rates in the world, increase in foreign trade deficit, decrease in international reserves cause financial fragility level of economies to increase and trigger financial crises (Caramazza & Salgado, 2000: 24).

2. 2008 Global Mortgage Crisis

Mortgage, bank etc. It can be expressed as the type of loan secured by the mortgage of the real estate as a result of the loans given by the financial institutions to the individuals who demand a loan in order to own a house (Fabozzi & Yuen, 1998: 11). In other words, mortgage represents the debt given to individuals or businesses for the purpose of purchasing a real property such as a house or land (Saunders & Cornett, 2001: 189).

It is accepted that the financial crisis emerged in the USA at the beginning of 2006, when mortgage loan rates started to increase in the Subprime Mortgage "high risk, subprime mortgage loan, sub-prime mortgage loan" market. This increase in loan rates has led to a decline in housing prices in the USA after the extraordinarily high real estate prices in the previous decade.

2.1. Factors Causing the 2008 Mortgage Crisis

• **Mortgage Loans Given Without Precaution:** In conditions where housing prices have risen, interest rates have fallen, and credit is plentiful, the loosening of lending conditions has created a ground where people can buy houses that they would normally not be able to afford. The decline in housing prices and the deterioration of loan debt payments caused a serious shock in the financial system. It is accepted that loans given without precaution played an important role in the crisis (Jickling, 2009: 4-5).

Low interest rates facilitated borrowing to buy houses and house prices increased significantly. The decline in interest rates between 1978 and 2010 is presented below.

**Figure 1: Decline in Interest Rates in the USA and Germany**
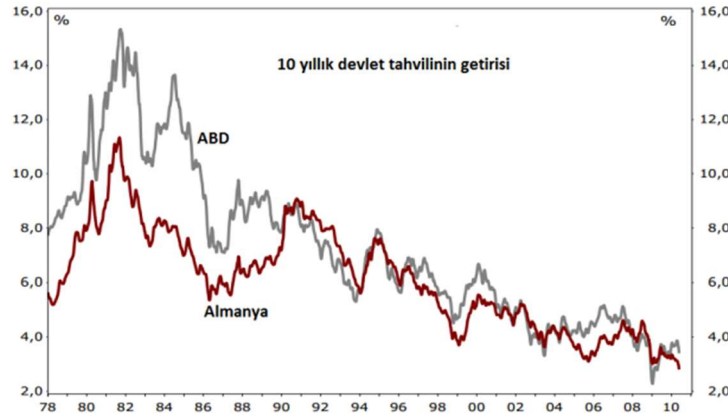
Source: Norgren, 2010: 18.

• **Real Estate Bubble Formation and Bubble Burst:** The financial crisis, which occurred in the USA and reached a global dimension by 2008, created a bubble effect when the housing market and derivative products issued accordingly rose much higher than the value they should have over time. After the bubble burst, the crisis gained a deep dimension.

Another noteworthy claim is that the Fed, which allowed housing price levels to climb to unsustainable levels with the loose monetary policy implemented, played a triggering role in the crisis. It is very difficult to accurately detect the price bubbles that occur until the truth emerges. This causes the limitation of timely and effective response developments against price bubbles formed by decision makers. It has been observed that price bubbles have significant effects on the economy. Due to asset price bubbles, volatility is observed in investment expenditures and consumption levels. In the worst-case scenario, financial instability is inevitable. Some critics argue that the FED should take more aggressive decisions in order to prevent the damage caused by the bubbles. It is argued that following an aggressive policy by the FED will distract the FED from its missions of ensuring stable economic growth and inflation stability. For this reason, it is stated that if bubbles affect economic growth and inflation, only in such a case the FED will react against the bubbles (Labonte, 2007: 21).

• **Global İmbalances:** Global imbalances refers to the deficit or surplus of the relative large dimensions and continuity of countries (Chinn, 2013: 68).

Figure 2: The Sum of the World Current Process Balances (absolute value, as the rate of World GDP)
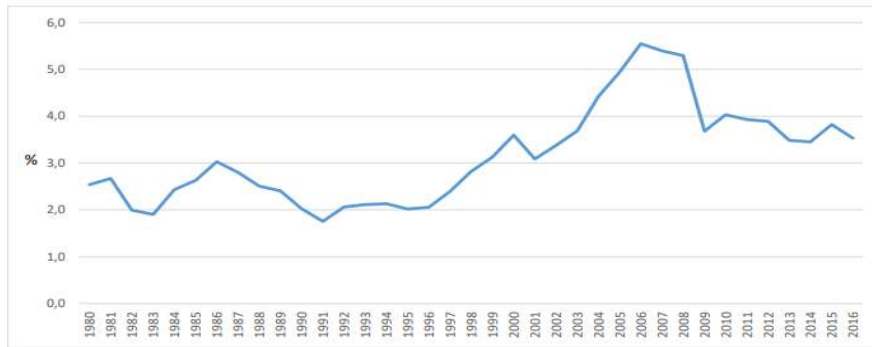
Source: World Economic Outlook, October 2016.

When the above figure is examined, it is seen that global imbalances increased rapid and continuously after 1996. The continuous increase trend is only seen in 2001 in 2001. In 2001, it may be disclosed in the low growth rates of the decreasing oil prices, which are partially due to the low growth rates resulting in the low growth rates resulting in the result of the resession in the US (Bracke et al., 2010: 1143).

• **Securitization:** Securitization is a financial tool that aims to convert illiquid assets into marketable financial products. Securitization took place in the US financial system by the 1970s. Securitization is essentially an alternative to transfer the credit risk from the lender to the investor (Alam et al., 2010: 2).

In the US financial crisis, with the non-returning of loans, the financial institutions that gave loans in return for mortgages made losses and became unable to fulfill their commitments. In addition, the fact that the loans did not return due to the fact that the financial institutions issued asset-backed securities based on the issued asset-backed securities had a chain and almost multiplier effect on the finance sector (Akgüç, 2009: 7).

• **Lack of Accountability and Transparency in Mortgage Loan Financing:** In developed countries and especially in the USA, separate financial institutions and financial instruments have been established to fulfill each different function. When these institutions and tools are examined, it is seen that each of them has interrelated and complex relations. Financial tools make it more difficult to understand this complex structure. Another deficiency in transparency is the phenomenon called "asymmetric information". According to empirical studies, it is seen that there is an inverse relationship between the financial crisis and the lack of transparency. With the increase in transparency, the risk of financial crisis decreases (Alantar, 2008: 3).

The increase in financial instruments used in the mortgage loan sector and the development of sophisticated financial techniques in the USA and other developed countries have caused the formation of uncertainty and lack of transparency in this sector. Since it is not known which of the credit institutions are problematic and which ones are not, distrust of these

markets and institutions arose among consumers and the liquidity problem broke out in the markets (Rohde, 2011: 2).

• **Rating Agencies:** In financial markets, credit rating agencies and their ratings play an important role in today's global world order. Ratings given by credit rating agencies appear as a pressure factor on countries and companies. In many countries of the world, funds are evaluated according to the ratings given by these rating agencies. Even if the credit rating agencies declare that the ratings they have made are only an opinion and do not have the meaning of directing and influencing the decisions of the investors, these ratings have a great impact on companies and countries. Companies and countries take investment decisions and borrow and lend accordingly based on the ratings given by the rating agencies. In other words, the evaluations made, even if the credit rating is an opinion, affect the investor's decisions (Toraman & Yuruk, 2014: 127).

The issue of the role of credit rating agencies in the crises that have occurred has been frequently discussed. Expected from credit rating agencies; to anticipate and predict the crisis and to convey information about risk to the investor. However, these institutions were insufficient to fulfill this duty. The fact that the rating agency gave high marks to Enron, one of the American giants, shortly before its bankruptcy brought these institutions to a point where they should be questioned in many respects. The fact that situations similar to Enron become commonplace, the fact that rating agencies are far from competitive, have an oligopoly structure and receive high wages expose these institutions to serious criticism (Toraman & Yuruk, 2014: 128).

• **Deregulation Practices:** Before the first decade of the 21st century could be completed, a deep and widespread economic crisis compared to the Great Depression of 1929 broke out. Consumption, production, capital accumulation and employment levels decreased rapidly due to the financial crisis that started with the collapse of the US mortgage market in 2008 and continued with the collapse of the stock markets of developed capitalist countries, large banks and financial institutions (Tuncel, 2010: 2).

Depending on the wind of deregulation in the financial system that started with the 1980s, high financial profit opportunities were created in the financial system due to continuous financial innovations. In the capital markets, where only private stock market members could trade under very strict rules, the rules were relaxed, and many players had the opportunity to enter these markets, depending on the technological opportunities created. The growth in financial markets due to rapid capital flow has led to the emergence of new financial instruments. In addition to traditional financial instruments such as stocks, bills and bonds, many instruments called derivative instruments were developed, and the growth experienced in financial markets continued rapidly. This process has accelerated the phenomenon of financialization due to the decrease in profits in the producer sector. Financialization can be defined as the increasing role of financial motives, financial markets, financial actors and institutions in the national and international economy (Yeldan, 2009).

Table 1: Periodized Representation of Financial System Regulations

Period	International Financial Structure	Financial System	Banking System Regulation
1950 - 1980	There is limited integration with the world economy.	Financial Pressure Exists	REGULATORY The risk is supervised by public authorities.
1980 - 1990	Economic-Financial Globalization has taken place.	Financial Liberalization Exists	DEREGULATION Measures to regulate markets have been lifted.
From the 1990s to the present	There is an increase in global financial crises.	There is a tendency to seek reforms regarding the problems arising after the financial liberalization.	REEGULATION Auto control systems have been established, public authorities and international organizations have gained surveillance functions.

Source: Tuncel, 2010: 6.

• **Shadow Banking System:** Although shadow banks do not have a cashier and do not have any branches, they are known as financial institutions that borrow and lend money like banks that look and act like banks, make investments, but are not subject to regulation and supervision as in conventional banks (Roubini, 2011: 85-86). In 2007, the concept of shadow banking was first used by Mc Culley in a symposium held in Jackson Hall in the United States through the Federal Reserve Bank of Kansas (Culley, 2007: 2).

Figure 3: Financing from Shadow Banking and Traditional Banking ($ Trillion)
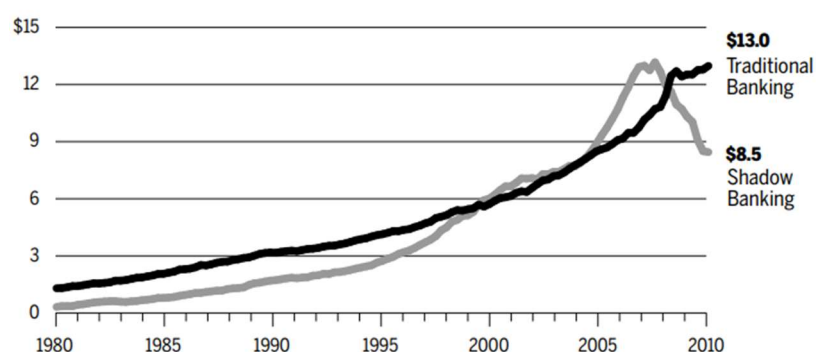
Source: FCICR, 2011: 32.

In the chart above, it is seen that the amount of financing provided by the shadow banking system grew sharply in the 2000s, exceeding the level of financing provided by the traditional banking system in the years before the global crisis (FCICR, 2011: 32).

The main funding source of shadow banking is the repo market, off-balance sheet activities and risk margin. In addition, securitized assets are another important source of funding.

Securitization, which refers to the process of packaging and selling loans to investors, has become a new and important funding source for shadow banking (Adrian & Shin, 2009: 11).

• **Financing Off Balance Sheet Transactions:** Distribution among banks, monetary volume, development, impact on profitability, size and depth of risk they bear, etc. When these issues are taken into consideration, it is seen that off-balance sheet accounts have become an important account group especially recently. In particular, the fact that the bank's total assets are significantly exceeding and this is not included in the balance sheet becomes even more important in terms of profitability and risk assessments. In the 2008 global crisis that broke out, the weak asset structure and off-balance sheet transactions triggered the crisis and caused it to deepen (Duran & Vivas, 2012: 1). It is known that new financial products that have been developed have increased off-balance sheet transactions even more. Therefore, off-balance sheet transactions constitute one of the important issues in restructuring discussions.

Many banks have made risky investments and created special-purpose assets such as structured investment instruments that are not present in the financial records. Although it had the opportunity to lend more in the expansion period with these assets, there was a conditional debt situation that damaged the confidence of the market in terms of the credit worthiness of the banks. While this allowed banks to hold less capital in the face of potential losses, it narrowed the possibilities for the investor to understand the real financial position of the banks (Jickling, 2010: 7).

• **Sub-threshold Mortgage Loans Given by Government Instructions:** With the regulations made by the Federal Government, even low-income individuals were allowed to use subprime mortgage loans, and such loans were also given by institutions other than banks and securitized by private investment banks. As a result of these practices, irregularities occurred in asset prices and interest rates, loans were channeled into faulty investments, and stable financial institutions were moved to the point where they could not maintain their positions (White, 2008: 1-2).

The global financial crisis that broke out at the beginning of the 21st century is considered to be the biggest economic and financial crisis since the 1930s Great Depression. The 2008 crisis started with the collapse of the housing market in 2006 (Nayak, 2013: 6). In 2001, an abundance of liquidity arose with the FED's lowering of interest rates in order to overcome the shock of September 11 and revive the market. This has led to the use of sloppy loans. Mortgage loans, also referred to as mortgage loans, were given to low-income citizens in the USA for the purpose of owning a house. The number of companies under state guarantee has been increased in order to enable them to buy these loans from financial institutions that sell mortgaged housing loans and open new loans. However, in this period, it is seen that these companies started to buy loans not only from low risk groups but also from high risk groups (Özatay, 2010: 543-56).

Securitization in large volumes of high-risk mortgage loans facilitated the outbreak of the global crisis, which spread to the USA and the world, with the soft monetary policy followed

by the FED (Nayak, 2013: 6). Considering the 2000-2006 period, it is noteworthy that there was an abundance of liquidity and it is seen that more than normal loans were obtained through securitization. Lending institutions securitized this debt, causing the risk to spread over other institutions (Aslan, 2008: 7).

3. Sample of the Research

While underdeveloped and developing countries were more affected by the previous crises, there are arguments that developed countries may have been more affected by the 2008 crisis. The hypothesis of this study is that developed countries may be affected more than developing countries according to some macroeconomic factors. 31 developed and developing countries classified according to generally accepted OECD data were included in the analysis and it was aimed to investigate the effect level of the 2008 global crisis according to macroeconomic factors. First of all, a VAR model in which all countries are together was established, the responses to the crisis and the dynamic relations of macroeconomic factors were discussed. Afterwards, two VAR models were created in which developed and developing countries took place separately, and the level of being affected by the crisis according to the macroeconomic factors of the two country groups was revealed. It was studied with the 2008-2019 quarterly data. The years 2020 and 2021, when the effects of the Covid-19 pandemic were seen, were not included in the analysis. In these years, the opinion that the Covid-19 pandemic is more effective on the economic indicators of the countries is quite strong.

Table 2: Countries Classified by OECD Data Analyzed in the Study

Developed countries	Developing countries
USA	Argentina
Germany	Brazil
Australia	Chile
Belgium	Indonesia
Denmark	South Africa
Finland	South Korea
France	India
Holland	Iranian
England	Malaysia
Ireland	Mexican
Spain	Russia
Sweden	Turkey
Switzerland	Chinese
Italy	
Japan	
Canada	
Norway	
Greece	

Source: OECD Data

Selected countries included in the analysis are presented in the table above. Quarterly data for the years 2008-2019 were included in the analysis. When a literature review was conducted, it was determined that the economic growth rate was used as the most basic indicator to measure the effects of the crisis. For this reason, "economic growth rate" was included in the analysis as a dependent variable, based on the literature. In order to investigate the impact of the 2008 crisis on the macroeconomic factors of the countries, a comprehensive literature review was conducted on which macroeconomic factors to select and include in the analysis. In this context, the effects of the crisis will be examined as independent variables; It was decided to include unemployment rate, inflation rate, foreign direct investment/gdp and current balance/gdp variables in the analysis. The table below contains information on dependent and independent variables included in the analysis.

Table 3: Variables Used in the Study

Variables	Abbreviation	Period	Frequency	Purpose of Use
GDP (%) Growth Rate	GDP	2008Q1-2019Q4	Quarter Term	The economic growth rates of the countries are included in the analysis as a dependent variable.
Unemployment	Unemployment	2008Q1-2019Q4	Quarter Term	It was included in the analysis to observe how the global crisis affected the unemployment data of the countries and to observe the effects of sudden changes in the unemployment rate on the economy.
Inflation	Inflation	2008Q1-2019Q4	Quarter Term	It has been included in the analysis in order to observe the effects of the global crisis on the general price level of the countries.
Foreign Direct Investment (percent of GDP)	FDI/GDP	2008Q1-2019Q4	Quarter Term	It was included in the analysis to investigate how and to what extent the 2008 global crisis affected the FDI levels of countries.
Current Account Balance/GDP	CurrentAccount Balance	2008Q1-2019Q4	Quarter Term	It is aimed to investigate the effects of the 2008 global crisis on the current account balance of countries.

4. Research Methodology

The last global financial crisis observed in the world, the 2008 Mortgage Crisis, started in America and affected all countries of the world with the globalization that abolished international borders. The research subject of this thesis consists of empirical research and

studies carried out to investigate the level of impact of developed and developing countries according to macroeconomic factors in the process from this crisis to the present. Investigating that although underdeveloped and developing countries have been more affected by the old generation crises, the developed countries may have been affected more by some macroeconomic factors than the developing countries from the last new generation crisis; constitutes the hypothesis of this research. In this thesis, first of all, the level of impact of the 2008 crisis on developed and developing countries will be investigated according to their macroeconomic factors. Afterwards, it is aimed to contribute to the finance literature by researching and comparing the levels of impact from the 2008 crisis according to the macroeconomic factors of the economies of developed and developing countries as two separate groups.

Single-equation models are weak in explaining some events due to the fact that there are complex and multi-dimensional relationships between variables in Finance Science studies. Vector Autoregressive Model (VAR) is often preferred to explain these events. The VAR model was developed by Sims in 1980 (Sarıkovanlık et al., 2018: 107). The VAR method is an effective technique for analyzing how monetary shocks affect macroeconomic variables simultaneously (Asteriou & Hall, 2007).

In this study, Granger causality analysis was conducted in order to determine the order in which the variables affect each other and to use this in Cholovsky decomposition. The lagged values of the dependent variables in VAR models (Vector Autoregressive), make it possible to make strong predictions about the future. Variables are considered to be endogenous since all of the variables in the VAR model are affected both by their own historical values and by the past observed values of other variables. The stages of the VAR Model are as follows (Brooks, 2008: 290-291);

A. Selection of variables, determination of properties of variables and ordering of variables,

B. Providing the stationarity condition for each variable,

C. Determination of lag lengths,

D. Performing Impact Response Analysis and Variance Decomposition Analysis and their interpretation.

For a time series to be stationary, its mean and variance should not change over time, and the covariance between 2 periods should depend only on the distance between these two periods, not the period in which this covariance was calculated (Gujarati, 1999: 713).

4. Results and Discussion
4.1. Stationarity Test with ADF Method
If models estimated with non-stationary time series are used, the results obtained do not reflect the real relationships because in this case the problem of spurious regression is encountered. In this case, the t and F tests lose their validity (Granger & Newbold, 1974). According to the ADF unit root method, the existence of a unit root in the related series is tested with the H0 hypothesis (Sarıkovanlık vd., 2019: 20).

H0: The series contains a unit root, the time series is not stationary.

H1: There is no unit root in the series, the time series is stationary.

According to the VAR model, each time series must be stationary. Whether this condition was met was tested using the statistical method of the ADF (Augmented Dickey-Fuller) test. It is seen that the time series are not stationary at level. In order to perform VAR Analysis, the time series must meet the stationarity condition. For this reason, all time series are made stationary by taking the 1. level difference. VAR analysis was done with stationary time series.

Table 4: ADF Test Results

Variables	t-Statistic	Prob.*
GDP	-6.843438	0.0000
Unemployment	-36.32650	0.0000
Inflation	-4.978438	0.0000
Current Account Balance/GDP	-5.371876	0.0000
FDI/GDP	-4.318241	0.0004

Whether the GDP time series contains a unit root was tested according to the ADF test statistical method. By taking the 1st order difference of the GDP time series, the series in which the economic growth rates are expressed has been made stationary. Since the probability value of the T statistic is -6.843438, 0.0000, it is decided to reject the H0 hypothesis. Accordingly, it is decided that the "GDP" series satisfies the stationarity condition.

Inflation is made stationary by taking the 1st degree difference of the time series. Since the probability value of the T statistic is -4.978438, 0.0000, the H0 hypothesis is rejected and it is decided that the "Inflation" series is stationary.

Whether the unemployment time series contains a unit root was tested with the ADF test statistics method. Since the unemployment time series is not stationary at the level level, the series is made stationary by taking the 1st degree difference. Since the probability value of the T statistic is measured as -36.32650, 0.0039, it is decided to reject the H0 hypothesis. It is decided that the unemployment time series is stationary.

Current Account Balance variable contains a unit root was tested according to the Augmented Dickey-Fuller test statistical method. The current account balance/GDP is made stationary by taking the first-degree difference of the time series. Since the probability value of T statistic is -5, 371876 is 0.0000, the hypothesis of "H0: There is a unit root in the series, the series is not stationary" is rejected and it is decided that the "Current Account Balance" series is stationary.

"FDI" variable is obtained by dividing the foreign direct investments flowing into the country for the 2008-2019 quarters of each country by GDP. The purpose here is; It is to determine how much of the growth observed in the country is realized by foreign direct investments. Whether the "FDI" series contains a unit root was tested according to the ADF test statistics method. The series is made stationary by taking the 1st order difference of the FDI/GDP time

series. Since the T statistic of the first-order difference of the time series is -4.318241, the probability value is 0.0004, the H0 hypothesis is rejected and it is decided that the "FDI" series is stationary.

Figure 4: The Position of the Inverse Roots of the AR Characteristic Polynomial on the Unit Circle

Inverse Roots of AR Characteristic Polynomial
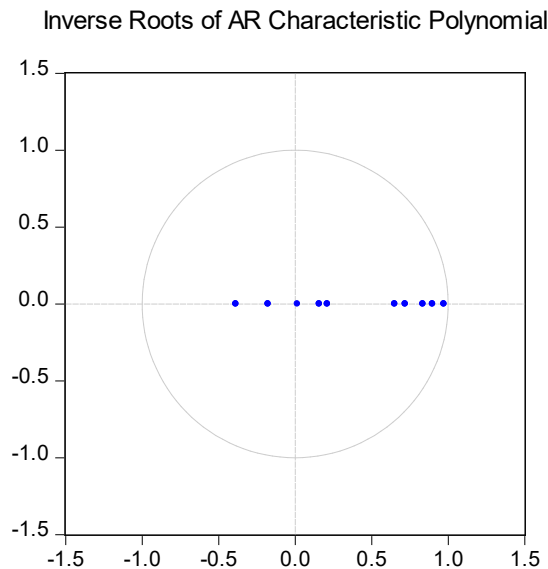
In the figure above, it can be seen that all the inverse roots of the AR characteristic polynomial lie within the unit circle. Thus, it is verified that the created VAR model is structurally stable.

Table 5: VAR Optimal Latency Criteria for Emerging Economies

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-6755.919	NA	22025.34	24.18933	24.22803	24.20444
1	-4703.991	4059.807	15.61099	16.93736	17.16953	17.02802
2	-4449.279	499.4006	6.862878	16.11549	16.54114*	16.28171
3	-4400.785	94.21123	6.309925	16.03143	16.65056	16.27320
4	-4315.905	163.3829	5.093587	15.81719	16.62979	16.13452
5	-4247.146	131.1223	4.356106*	15.66063*	16.66671	16.05351*
6	-4230.810	30.86015	4.494302	15.69163	16.89118	16.16006
7	-4205.191	47.93739	4.485816	15.68941	17.08245	16.23340
8	-4180.880	45.05542*	4.498811	15.69188	17.27839	16.31142

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

In order to perform VAR analysis in developing country groups, first of all, the appropriate lag length should be determined and included in the model. Based on the Schwarz information criterion (SC), it is decided that the optimal lag length is 2 and included in the model.

Table 6: VAR Optimal Latency Criteria for Developed Country Economies

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-7561.025	NA	32.72838	17.67763	17.70539	17.68826
1	-4646.731	5787.732	0.038295	10.92694	11.09349	10.99072
2	-4522.496	245.2772	0.030370	10.69508	11.00043*	10.81201
3	-4475.084	93.05230	0.028821	10.64272	11.08686	10.81279
4	-4418.708	109.9867	0.026785	10.56941	11.15234	10.79263
5	-4350.473	132.3240	0.024212	10.46839	11.19012	10.74476*
6	-4309.721	78.55158	0.023339	10.43159	11.29211	10.76110
7	-4298.076	22.31127	0.024081	10.46279	11.46210	10.84545
8	-4240.109	110.3812*	0.022298*	10.38577*	11.52387	10.82158

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

In order to perform VAR analysis in developed country economies group countries, first of all, the appropriate lag length should be determined and included in the model. Based on the Schwarz information criterion, it is decided that the optimal lag length is two (2) and included in the model.

Table 7: Granger Causality Analysis Results in Developed Country Economies / Block Externality Wald Test

Aspect of Causality	F Statistics	Probability Value	Explanation
Unemployment ➡ GDP	2	0.0001	It is observed that unemployment and inflation rates in the economies of developed countries have an effect on the determination of the economic growth rates of the relevant countries.
Enflation ➡ GDP	2	0.0000	
Enflation ➡ Unemployment	2	0.0000	Inflation rates and economic growth rates in developed country economies; It is seen that the relevant countries have a statistical effect on unemployment rates.
GDP ➡ Unemployment	2	0. 0000	
GDP ➡ Enflation	2	0.0130	Economic growth rates and unemployment rates in developed country economies; It is seen that there is an effect on the determination of inflation rates of the related developed country economies.
Unemployment ➡ Enflation	2	0.0335	
GDP ➡ CurrentAccount/GDP	2	0.0051	Unemployment rates and economic growth rates in developed country economies; It is observed that there is an impact on the determination of the current account balance data of the related developed country economies.
Unemployment ➡ CurrentAccount/GDP	2	0.0282	

*The values in the table refer only to the statistically significant causality results.

The VAR Granger Causality/Block Externality Wald Test has been applied for the model in which the emerging economies are included, and the result of the analysis is explained with a table. Since all variables are considered internal in the VAR analysis, a test was applied for all variables and the results are presented in Table 5 below. It is aimed to reveal the relationships between the variables.

Table 8: Granger Causality Analysis Results in Emerging Economies / Block Externality Wald Test

Aspect of Causality	FStatistics	Probability Value	Explanation
Inflation ➡ GDP	2	0,0032	It is seen that the inflation rates of the developing country economies are effective in determining the economic growth rates.
CurrentAccount Balance ➡ GDP	2	0,0062	It is seen that the developing current account balance data has an effect on determining the growth rates of countries.
Işsizlik ➡ GDP FDI ➡ GDP	2	0,0007	It is seen that the lagged values of unemployment rates of developing countries have an effect on the foreign direct investment investment levels of the related countries.
GDP ➡ Current Account Balance	2	0,0004	It is seen that the lagged values of the growth rates of developing countries have an effect on the current account balance.

*The values in the table refer only to the statistically significant causality results.

4.2. Impulse - Response Analysis

The GDP variable represents the growth rates of the countries' economies measured in quarterly periods and the dependent variable in which the effects of the 2008 global crisis are measured. In this part of the study, firstly, the responses of the macroeconomic factors of the developing country economies to the crisis, and then the responses of the macroeconomic factors of the developed countries' economies to the crisis will be investigated. The aim here is to observe the reactions of developed and developing country groups and macroeconomic factors to the crisis after the crisis. It will be investigated which country group is affected more by which macroeconomic factor, and in what direction and how this effect has changed over time. It will be investigated in which direction and how strongly the macroeconomic factors of developing and developed countries reacted to the 2008 crisis and how long these reactions last.

5. Conclusions

The 2008 Financial Crisis is the last one in world history and it is a crisis that has severe consequences for all countries of the world. It is known that countries in the category of underdeveloped and developing countries are more affected by the previous generation financial crises. Investigating that the developed countries' economies may have been more affected by some macroeconomic factors than the developing countries' economies from the new generation 2008 financial crisis; constitutes the hypothesis of the study. By using VAR Analysis, it is aimed to contribute to the finance literature by investigating and comparing the levels of impact from the 2008 crisis on the basis of macroeconomic factors in the 2008-2019

period in two separate groups for selected developed and developing country economies classified according to OECD data. The Covid-19 pandemic started in 2020 and affected the whole world and still continues in 2021. The current pandemic process is causing heavy damage to the country's economies. The reason for not including the data of 2020-2021 in the research thesis is the current Covid-19 pandemic process. Macroeconomic data for the years 2020-2021 were not included in the research, as the economic effects of the Covid-19 pandemic process gained weight rather than the effects of the 2008 global crisis in 2020-2021.

According to the results obtained with the VAR analysis, the research findings on the macroeconomic factors of developed and developing countries and which country group was more affected by the 2008 crisis are presented in tables.

Result Table 1

	Developed Countries	Developing countries
The Response of the Unemployment Variable (see Table Result: 1)	Although developing countries were affected more strongly at the beginning of the crisis, the reactions were equalized in the 7th period, and it is seen that developed countries were more affected in the following periods. It is observed that the effect of the crisis on the unemployment factor in developed countries has increased over time.	At the beginning of the crisis (1st, 2nd, 3rd, 4th, 5th and 6th periods), developing countries were affected more strongly than developed countries, the reactions were getting closer and equal in the 7th period, and the following (8th, 9th and 10th periods) periods, it is seen that developing countries are less affected than developed countries.
The Response of the Inflation Variable (see Table Result: 2)	It is seen that the inflation rates of countries react in a (+) direction in all periods and are less affected by developing countries in all periods. It is identified that the impact of the crisis on the inflation rates of developed countries weakened over time.	It is seen that the inflation rates of the developing countries react in the (-) direction in all periods and react more strongly than the developed countries in all periods. It is observed that the inflation rates of developing countries reacted more strongly in the first periods, and the severity of the reaction gradually decreased in the following periods.
The Response of the FDI Variable (see Table Result:3)	It can be stated that developed countries reacted less than developing countries but at levels close to developing countries. It is seen that a (+) reaction occurred in the first 2 periods and (-) in all other periods. After the 2nd period after the crisis, it is seen that developed economies have difficulties in attracting foreign capital.	According to the level of foreign direct investment, it is seen that developing countries react more strongly in all periods except the 1st and 5th periods. It is seen that developing countries react in a (-) direction in all periods, that is, capital has shifted from developed countries to developing countries with the occurrence of the crisis.

The Response of the Current Account Balance Variable (see Table Result:4)	It is observed that the response of developed countries in all periods is rather weak compared to developing countries. It is observed that even the intensity of this reaction, in which the strongest reaction occurred in the second period, remained quite weak compared to the developing countries, and the severity of the reaction weakened in the following periods. In terms of the severity of the response of developed countries to the crisis, when compared to other macroeconomic factors, it can be stated that the variable that gives the weakest response is the current account balance variable.	It is observed that developing countries are affected more strongly than developing countries in terms of current account balance in every period. While the strongest reaction increase occurred in the 2nd period, it is seen that the increase in the intensity of the reaction continued until the 5th period, and the severity of the reaction continued to decrease as of the 6th period.

The Response of the Unemployment Variable to the Crisis	Response of Developed Countries	The Response of Developing Countries
1. Period	-0.074013	-0.198569
2. Period	-0.139972	-0.342651
3. Period	-0.215276	-0.388728
4. Period	-0.267016	-0.388818
5. Period	-0.301534	-0.372290
6. Period	-0.323026	-0.352030
7. Period	-0.335392	-0.333535
8. Period	-0.341185	-0.317508
9. Period	-0.342422	-0.303865
10. Period	-0.340502	-0.291747

Result Table 2

The Response of the Inflation Variable to the Crisis	Response of Developed Countries	The Response of Developing Countries
1. Period	0.043639	-0.154630
2. Period	0.117099	-0.197614
3. Period	0.127286	-0.204683
4. Period	0.118872	-0.191689
5. Period	0.104531	-0.169886
6. Period	0.089466	-0.144780
7. Period	0.075712	-0.120793

8. Period	0.063899	-0.099059
9. Period	0.054055	-0.080465
10. Period	0.045990	-0.064570

Result Table 3

The Response of the FDI Variable to the Crisis	Response of Developed Countries	The Response of Developing Countries
1. Period	-0.066215	-0.065300
2. Period	-0.029391	-0.088957
3. Period	0.074895	-0.082174
4. Period	0.078866	-0.082954
5. Period	0.074524	-0.074211
6. Period	0.065324	-0.073616
7. Period	0.055185	-0.068786
8. Period	0.046657	-0.068770
9. Period	0.039420	-0.066122
10. Period	0.033746	-0.066010

Result Table 4

The Response of the Current Account Balance to the Crisis	Response of Developed Countries	The Response of Developing Countries
1. Period	0.001160	0.007401
2. Period	0.006331	-0.008850
3. Period	-0.000505	-0.026767
4. Period	0.000615	-0.036127
5. Period	-0.001020	-0.037690
6. Period	-0.000746	-0.034592
7. Period	-0.000949	-0.029538
8. Period	-0.000705	-0.024190
9. Period	-0.000555	-0.019333
10. Period	-0.000325	-0.015224

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