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### The Misery Index: An Evaluation on Fragile Five Countries

Sefalet Endeksi: Kırılgan Beşli Ülkeler Üzerine Bir Değerlendirme

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**Abstract:** It is seen that various indices are used to measure the macroeconomic performance and life satisfaction of countries. The misery index is one of the commonly used indices in this regard. The aim of this study is to evaluate the macroeconomic performance of the Fragile Five (Brazil, India, Indonesia, South Africa and Turkey) countries between 2010-2021 by calculating the misery index and to reveal the position of Turkey among these countries. According to the results, it is determined that while Indonesia shows the best performance, Turkey shares the last place with South Africa.

**Keywords:** Fragile Five, Macroeconomic Indicators, Misery Index

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**Öz:** Ülkelerin makroekonomik performansları ile yaşam memnuniyetlerini ölçmede çeşitli endekslerin kullanıldığı görülmektedir. Sefalet endeksi de bu konuda yaygın olarak kullanılan endekslerden biridir. Bu çalışmanın amacı, 2010-2021 yılları arasında Kırılgan Beşli (Brezilya, Hindistan, Endonezya, Güney Afrika ve Türkiye) ülkelerin sefalet endeksini hesaplayarak, ülkelerin makroekonomik performanslarını değerlendirmek ve Türkiye'nin bu ülkeler arasındaki konumunu ortaya koymaktır. Elde edilen sonuçlara göre, Endonezya en iyi performansı gösterirken Türkiye, Güney Afrika ile birlikte son sırayı paylaştığı tespit edilmiştir.

**Anahtar Kelimeler:** Kırılgan Beşli, Makroekonomik Göstergeler, Sefalet Endeksi

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## 1. Introduction

The term “Fragile Five” was for first time used in 2013 by James Lord, economist of Morgan Stanley. These five countries included Brazil, India, Indonesia, South Africa and Turkey. The classification was made by taking into account exchange rate volatility, inflation, commodity prices, current account deficit position and balance of payment indicators, and the first five countries where these indicators are the most fragile were named as the Fragile Five (Sökmen, 2021: 1428-1429). The common features of these countries are stated as high current account deficit, high inflation, low growth rate, political problems and high external financing needs. Similar problems experienced in these countries increase their uncertainty and risks thus their fragility (Oskay, 2018: 47-48).

The economic discomfort index or misery index was first introduced by Arthur Okun. The Okun Misery Index is equal to the sum of the unemployment rate and the inflation rate. The misery index was later developed. One of them is the Barro Misery Index developed by Robert Barro in 1999. The misery index created by Barro consists of the growth rate subtracted from the sum of inflation, unemployment and the long-term interest rate. The misery index is widely used to measure and evaluate the macroeconomic performance of countries and the life satisfaction of individuals (Yöyen, 2018: 174-175). Accordingly, as the misery index value increases, it is understood that the misery or discomfort in the relevant country increases.

The aim of this study is to determine the macroeconomic performance between 2010-2021 with the help of Okun Misery Index and Barro Misery Index of the countries described as the Fragile Five by Morgan Stanley in 2013. And then to reveal the position of Turkey among these countries. This study is important in terms of evaluating the macroeconomic indicators of the countries which are called fragile and which are similar to each other, and to identify the points of similarity and divergence. Besides, this study is also significant in terms of determining the policies that policy makers and experts will develop and implement. When the literature is examined, no study has been found that deals with the macroeconomic performance of the country group discussed in this study with both Okun misery index and Barro misery index. Therefore, it is thought that the study will contribute to the literature. After the introduction, the concept of fragility and Fragile Five will be explained in the second section of the study, and in the third section, the misery index will be described. After the mentioning of the literature in the fourth section, the macroeconomic indicators of the Fragile Five countries will be examined in the fifth section. In the sixth section, the macroeconomic performance of the Fragile Five countries will be evaluated through the Okun misery index and Barro misery index. The study will be completed with a general evaluation and conclusion.

## 2. The Concept of Fragility and the Fragile Five

The definition of fragility can vary according to the view and perspective of the researchers. In addition, the definition of fragility differs according to the economic unit examined and according to which events these units may be under risk (Karakurt et al., 2015: 285). The common features of fragile economies are generally inability to create sustainable working areas and thus employment, insufficient infrastructure investments, dependence on short-term foreign investments, inability to attract foreign direct investments to the country, inability to manage natural resources with appropriate policies, weak financial systems, not adopting the rule of law, and political instability (Yeşilçiçek and Karabacak, 2020: 131). The common points of the economies that are considered as fragile are that they are mostly fragile due to events that develop against their will, such as economic crisis, internal and external shocks. In other words, fragility is the risk of being harmed or negatively affected by unforeseen events in general and economic terms (Çan and Dinçsoy, 2016: 200). The fragility level of the country is determined by taking into account the country’s growth figures, interest rates, inflation, current account deficit, budget deficit and changes in the domestic currency (Cinel, 2018: 63). According to Frankel and Saravelos (2010) fragility expresses to the concept of risk and can be defined as the negative impact of a system as a result of disturbances or sudden fluctuations. A country is considered fragile if it experiences problems such as

a sudden drop in production, a large depreciation in the stock market, sudden fluctuations in the value of its currency, high reserve losses, excessive need for IMF funds (Yeşilçiçek and Karabacak, 2020: 126). The concept of fragility, as a word meaning, is to be fragility to any blow. Economic fragility which is an important problem that makes economies vulnerable to shocks and disrupts the functioning of the system is divided into two as microeconomic fragility and macroeconomic fragility. While microeconomic fragility examines the impact of shocks on households, macroeconomic fragility examines the impact of shocks on the country's economy (Hacıgökmen, 2019: 194-195; Akın, 2017: 89). In the literature, there are many indicators used to measure fragility and these indicators play a significant role in the definition of fragility (Şeker, 2021: 160). There is no common view in determining the indicators of economic fragility. However, generally accepted indicators to understand whether there is fragility in the economy can be listed as; external fragilities, fiscal fragilities and financial fragilities (Çan and Dinçsoy, 2016: 201; <http://www.hakanozyildiz.com>):

- External Fragilities: Current account deficit / GDP, International monetary reserves / Country's short-term external debt, International monetary reserves / GDP, Total external debt / GDP, Total external debt / Total annual export, Real exchange rate overvaluation
- Fiscal Fragilities: Budget deficit / GDP, Public deficit / GDP, Total public debt / GDP, Debt due within 12 / GDP, Public external debt / GDP
- Financial Fragilities: Credit / Deposit rate, Annual credit growth, Total credits / GDP, Foreign banks debt of the financial sector / GDP

The original Fragile Five has been first coined by Morgan Stanley in 2013. The countries grouped as the Fragile Five by Morgan Stanley were Brazil, India, Indonesia, South Africa and Turkey. These countries, which are described as the Fragile Five, are the countries most affected by the monetary policies of the U.S. In addition, problems such as high current account deficit rates, high inflation rates, worsening budget balance, increasing external debt burden and slowing growth performances, low employment and high unemployment rates played a role in their inclusion in this group (Hayaloğlu, 2015: 133; Erkan and Batbaylı, 2018: 306). At the same time, since these countries have both fiscal and current account deficits, it can be said that twin deficits are also among the common feature of these countries. Besides, the development of these countries is largely dependent on foreign investments (Kamacı and Konya, 2016: 139; Göçer and Akın, 2016: 200).

At the end of 2016, Morgan Stanley revised its Fragile Five grouping. Accordingly, Brazil and India got out of the group and were replaced by Mexico and Colombia. Thus, the new Fragile Five became Indonesia, South Africa, Turkey, Colombia and Mexico (<https://www.mahfiegilmez.com/2017>). Six basic factors were used in this classification. These are: current account balance, foreign exchange reserves to external debt ratio, foreign holdings of government bonds, U.S. dollar debt, inflation and real rate differential (Yıldırım and Çelik, 2020: 149).

International credit rating agency Standard & Poor's (S&P) redetermined the scope of the Fragile Five in November 2017. Accordingly, the countries within the scope of the Fragile Five became Turkey, Argentina, Egypt, Pakistan and Qatar. These countries are the ones that will be most adversely affected by the rise in the interest rates in international markets. India, Indonesia, Brazil and South Africa, previously called the Fragile Five are excluded from the Fragile Five (Yükseler, 2017). Turkey is the only country on the old list whose fragility continues. S&P announced that Turkey is the most fragile country in its new classification (Kamacı, 2019: 63-64).

Danske Bank, one of the largest banks in Denmark made a new Fragile Five classification in its 2018 report. The classification consists of Turkey, Argentina, Russia, Brazil and South Africa (Christensen, 2018; Yıldırım and Çelik, 2020: 149). Scope Ratings classified Turkey, Georgia and Argentina as the "Risky-3" in the biennial update of its external vulnerability and resilience framework amid the 2020 global COVID-19 pandemic (Kameryan and Shen, 2020). Thus, it is seen that Turkey has always been among the fragile economies since the first classification made in 2013.

According to Eğılmez, one of the ways for Turkey to get out of the Fragile Five countries category is to reduce the external debt burden and finance its current account deficit with foreign direct investment instead of debt. The way to this is to ensure the rule of law, to raise the standards of democracy, to avoid creating risks and to realise social reconciliation (<https://www.mahfiegilmez.com/2018/02>).

### 3. The Misery Index

Changes in growth, unemployment and inflation rates which are among macroeconomic indicators are important for economic decision makers and policy makers. These variables, which are especially used to measure the economic performance of countries are analysed and interpreted with various approaches and indices. One of them is the misery index (Ergin Ünal, 2020: 46). The misery index, also known as the economic discomfort index is a concept first proposed by Arthur M. Okun. It became popular in the 1970s with the emergence of stagflation, that is simultaneously high inflation and unemployment. The misery index, developed by Okun is the sum of unemployment rate and inflation rate. Generally, the index is widely used for quantifying the financial well-being of a population. Both a higher unemployment rate and a worsening inflation rate are assumed to create economic and social costs for a country (Wu et al., 2013; <https://www.investopedia.com>). A low misery index value reflects a better economic performance, while a higher index value represents a poor economic performance (Yılmaz and Özmen Yılmaz, 2018: 72; Al and Baday Yıldız, 2019: 304). The higher the index value is the greater the misery is felt by the average citizens (<https://www.investopedia.com>). The original misery index proposed by Arthur Okun is calculated as follows:

$$MI=U+\pi$$

Here, MI is the misery index, U is the unemployment rate, and  $\pi$  is the inflation rate. The misery index developed by Okun actually endeavors to summarise the most evident costs for society, as unemployment prevents people from earning an income, whereas high inflation rates increase the cost of living by reducing purchasing power (López, 2022: 2). In other words, a higher level of unemployment and inflation will influence the citizens' welfare negatively (Anaele and Nyenke, 2021: 31). Such negative economic effects can also have negative social effects. In other saying, a connection can be made between economic discomfort and social discomfort. Because the deterioration of the economy can lead to the formation of social discomfort. Problems such as migration, divorce, suicide, increase in the number of criminals, decrease in trust in the state and decrease in interest in the political system can happen in societies with a high level of discomfort. Besides, people's life satisfaction, happiness and hope levels may decrease based on the loss of income and welfare (Çondur, 2016: 1311). The misery index developed by Okun has faced some criticism. Most of the criticisms of the misery index are due to its simplicity, as it embodies an oversimplification of the socio-economic problems affecting society (<https://www.investopedia.com>; López, 2022: 2). It takes into account only two aspects of the economic performance of a country and it gives equal weights to the unemployment rate and the inflation (Cohen et al., 2014: 3). Some believe that it is not a sufficient indicator of economic performance because it does not include economic growth data, since the economic performance of a country is calculated with only two macroeconomic indicators (<https://www.investopedia.com>). In addition, the misery index neglects many factors that affect discomfort, such as poor-quality education system, inadequate health system, insufficiently functioning pension system, poverty and environmental pollution. Despite all this, it is an index used to evaluate the macroeconomic performance of countries and to compare countries (Özer, 2019: 5).

The misery index has been developed over time. The misery index, which was developed over time, was also reformulated by the American economist Robert Barro (1999). Barro argues that increases in the long-term interest rates and economic growth below the average also lead to misery. The Barro Misery Index is calculated as follows (<https://www.mahfiegilmez.com/2018/06>; López, 2022: 3; Lechman, 2009: 2-3):

$$BMI=\Delta\pi+\Delta u-\Delta Y+\Delta i$$

Here, BMI stands for Barro Misery Index,  $\pi$  for annual inflation rate, U for total unemployment rate, Y for annual GDP growth rate, and i for nominal long-term interest rate.

According to Barro, misery increases if the inflation rate rises, if the unemployment rate goes up, if long-term interest rates increase, and if the growth rate of real GDP is below average (Barro, 1999: 22). If the economy has grown, then this ratio needs to be lowered, because economic growth reduces misery. On the contrary, if the economy has shrunk, then this ratio should be added to the total (<https://www.mahfiegilmez.com/2018/06>). According to Lechman, the misery index is not a perfect measure of poverty, but its changes over time and in different countries, definitely reflect changes in society's economic performance (Lechman, 2009: 9). The misery index modified by Hanke (2015) is the sum of the unemployment, inflation, and bank-lending rates, minus the percentage change in real GDP per capita. A higher index value means a higher level of misery (Belke, 2020: 121; <https://www.cato.org>).

#### 4. Literature Review

Since the misery index was first introduced, it has attracted a lot of attention by researchers. As a matter of fact, when the literature is examined, it is seen that many studies have been carried out using both the Okun misery index and the Barro misery index. In this section, some of these studies are tried to be summarised.

Lovell and Tien (2000) examined the validity of the Okun misery index through the Michigan Consumer Sentiment Index and stated that the index is a simple and readily available method for measuring misery.

Grabia (2011) calculated and ranked the Okun misery index values by considering the period of 2000-2004 and 2005-2009 of EU countries and compared the index values with the GDP per capita according to purchasing power parity. Accordingly, while the countries with the best index value, that is, the lowest misery index were Luxembourg, Denmark, the Netherlands, Austria, United Kingdom, and Sweden in both periods; the countries with the highest misery index value were Hungary, Slovakia, Estonia, Poland, Lithuania, Latvia, Romania, and Bulgaria. In addition, it was concluded that Okun misery index levels showed great similarity with GDP per capita according to purchasing power parity.

Ünver and Doğru (2015) analysed the determinants of fragility in terms of long-term fiscal sustainability and sovereign ratings for Brazil, India, Indonesia, South Africa and Turkey, referred to as the Fragile Five by Morgan Stanley. The study covers the period of 1980-2012 for fiscal sustainability and 1990-2012 for sovereign ratings. FMOLS approach developed by Phillips and Hansen (1990) was used in the study. A statistically significant relationship between fiscal sustainability and current account balance, GDP, total reserves, energy imports, exchange rate, external debt and credit to the private sector was found. In addition, they found that the findings associated with sovereign ratings demonstrate significantly that the leading determinants of sovereign ratings are exchange rates, total reserves, energy imports, foreign direct investment net inflows, current account balance, GDP and external debt stocks.

Çan and Dinçsoy (2016) examined the interactions between fragility and crisis conceptions for Brazil, Indonesia, India, South Africa and Turkey which are called the Fragile Five. In the study, growth, inflation, unemployment, budget balance and current account balance data for the period of 2005-2013 were taken into account and compared. The results show that while Turkey is in the middle in terms of growth, it has been determined that the most fragile country is South Africa. While India is the most fragile country in terms of inflation, Turkey ranks second. It was found that India is in the worst position in terms of budget balance and Turkey is the most fragile country in terms of current account balance. South Africa and then Turkey is the most fragile country in terms of unemployment. According to the results obtained, as a result of fragility indicators examined, it has been revealed that the five countries in question have a fragile structure and that their macroeconomic indicators can create financial crisis. Besides, these fragile structures will make it inevitable for them to feel the crisis more deeply in the face of an economic shock.

Çondur (2016) analysed the relationship between the economic misery level and social misery level: and how social misery indicators are affected by the periods of high inflation and unemployment rate in

Turkey. Although the changes in social parameters differ from region to region, it is concluded that as economic discomfort increases, negative developments in social parameters also increase.

Özcan (2016) investigated whether the misery index values can be used in measurement of poverty for the period of 2003-2013 for Turkey and EU countries. In order to achieve this purpose, panel cointegration tests was used. As a result of the study, it is concluded that Okun's misery index can be used simply in measurement of poverty.

Alper (2017) examined the countries within the scope of Fragile Five for their macroeconomic fragilities. The period of the study is 2002-2015. It is concluded that the external fragility index generally decreased and took a negative value in 2009, while it increased in the following years and remained at positive values even though it fluctuated. In addition, it has been determined that the real effective exchange rate has decreased in all countries in recent years.

Yöyen (2018) dealt with the Barro misery index for Turkey's economy. According to the calculated index value in the last decade, firstly decreased the economic misery and then it began to increase in Turkey. Barro misery index has increased since 2013. In this context, it has been determined that the macroeconomic performance of the Turkey's economy is getting worse over the past five years and life satisfaction has decreased in parallel with this.

Bayar and Aytemiz (2019) investigated the interaction among misery index, corruption and income inequality in Latin American countries from 2002 to 2014. Westerlund and Edgerton (2007) LM bootstrap cointegration test and the Kónya (2006) bootstrap panel Granger causality test was used in the study. As a result of the applied tests, it was concluded that increases in both the misery index and corruption played a part in the increases in income inequality. In addition, according to the results of the causality test, one-way causality from the misery index to income inequality and two-way causality between corruption and income inequality was determined.

Keçeligil (2019) examined the situation of Turkey among the Fragile Five in terms of debt issues. In the study, it is suggested that Turkey should primarily close the current account deficit, and for this, policies that increase export revenues and reduce import expenses should be implemented. It has been stated that Turkey's external debt problem is mainly caused by the inadequacy of domestic savings, and therefore, policies to increase domestic savings should be implemented in order to reduce the need for external debt, and the most important solution is to increase export revenues.

Akduğan and Yıldız (2020) used the VAR model to examine the relationship between external borrowing and economic growth from 1970 to 2018 in Brazil, Indonesia, India, South Africa and Turkey, which are called as Fragile Five. They found a one-way causality relationship from the GDP to the external debt stock in Brazil. Besides, they found that economic growth has a significant positive impact on external borrowing. They did not find a statistically significant relationship between external debt stock and GDP in Indonesia and India. A one-way relationship from external debt stock to GDP was found in Turkey and South Africa and it has been seen that external borrowing has a positive impact on growth in these countries.

Akay and Oskonbaeva (2020) investigated the interaction between economic growth and misery index in selected 16 transition countries. Panel ARDL was used in the study covering the period of 1996-2017. A long-run relationship between the misery index and economic growth was found in the study. It was concluded that economic misery deteriorates economic growth.

Kırca and Canbay (2020) investigated the relationship between inflation and unemployment for Fragile Five countries which includes Brazil, Indonesia, India, South Africa and Turkey in the period from 1991 to 2019. For this purpose, Kónya (2006) panel causality test was used in the study. They found a negative causality from the unemployment rate to the inflation rate in India and a negative causality from the inflation rate to the unemployment rate in Turkey. They found no causality in other countries.

Ergin Ünal (2020) analysed the effect of foreign direct investment on the Barro misery index for Turkey. For this purpose, Barro misery index was calculated over the period of 1985-2017 and its relationship with FDI was analysed by the SVAR model. It was concluded that the share of FDI in the GDP as well as the real exchange rate shocks have an adverse impact on the Barro misery index.

Açıcı and Çuhadar (2021) examined the link between misery index and crime for the Fragile Five, using dynamic panel data analysis. The study covers the period of 2004-2017. According to the results, increases in the misery index cause rising crime rates.

Aishwarya et al. (2021) analysed the impact of the health indicators and the human development index over the globe's misery index. They concluded that there is a strong correlation between the misery index, human development index, and health indicators.

Tunçay (2021) used VAR analysis to determine the mutual interactions between economic discomfort index and non-performing loan rates in the Turkish economy. According to the results, it was concluded that the changes in the economic discomfort index and the changes in the non-performing loan rates affect each other mutually, but the impact of the index changes on the changes in non-performing loan ratios is longer term in Turkish economy.

## 5. Indicators of the Fragile Five Countries' Okun Misery Index and Barro Misery Index

In this study, both Okun misery index and Barro misery index of Brazil, Indonesia, India, South Africa and Turkey, which were called as the Fragile Five by Morgan Stanley in 2013 are calculated and compared. The study covers the period of 2010-2021. Inflation, unemployment and growth data used in the analysis were obtained from the World Bank database and the ten-year bond interest data was obtained from Investing.com. Since the World Bank's database does not contain growth figures for 2021, the growth data for this year and India's 2021 inflation data were taken from the IMF. The inflation rate is the year-end value of the consumer price index. Unemployment and growth rates are the percentage values realised at the end of the year.

The reason we started the analysis in 2010 is that Turkey started issuing ten-year bonds of this date. Another reason is that the impact of the financial crisis, which affected whole world started to decrease in the indicators in 2010.

Table 1 shows the inflation rates of the Fragile Five countries. As can be seen from the table, the country with the highest inflation by years is Turkey. In the half of the 2010s, the inflation rate, which was close to other countries, increased significantly in 2017 and dissociated negatively compared to other countries. The country with the lowest inflation rate by years is Indonesia. Especially in recent years, it is observed that the inflation rate has remained within acceptable limits. While India has double-digit inflation rates in 2010, it has steadily decreased inflation by the years.

**Table 1:** Inflation Rates of Fragile Five Countries Between 2010-2021 (%)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
<b>Turkey</b>	8.6	6.5	8.9	7.5	8.8	7.7	7.8	11.1	16.3	15.2	12.3	19.6
<b>Brazil</b>	5	6.6	5.4	6.2	6.3	9	8.7	3.4	3.7	3.7	3.2	8.3
<b>Indonesia</b>	5.1	5.3	4.3	6.4	6.4	6.4	3.5	3.8	3.2	3	1.9	1.6
<b>South Africa</b>	4.1	5	5.7	5.8	6.1	4.5	6.6	5.2	4.5	4.1	3.2	4.7
<b>India</b>	12	8.8	9.3	11.1	6.6	4.9	4.9	3.3	3.9	3.7	6.6	6.1

Reference: World Bank Database, International Money Fund Data Mapper (Accessed: 05.05.2022).

Unemployment rates of the Fragile Five are given in table 2. The country with the highest unemployment rate is by far South Africa. It is clearly seen that South Africa has not been able to solve this problem for many years. The second country with the highest unemployment rate is sometimes Turkey and sometimes Brazil. It is seen that the rate has increased significantly in Brazil, especially since 2015. Unemployment rates in India and Indonesia showed a more stable development. The country with the lowest unemployment rate by years is Indonesia. Although the unemployment rate in India increased in 2020, it managed to decrease the rate in 2021.

**Table 2:** Unemployment Rates of Fragile Five Countries Between 2010-2021 (%)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
<b>Turkey</b>	10.6	8.8	8.1	8.7	9.9	10.2	10.8	10.8	10.9	13.7	13.1	13.4
<b>Brazil</b>	7.3	6.9	7.2	7	6.6	8.4	11.6	12.8	12.3	11.9	13.7	14.4
<b>Indonesia</b>	5.6	5.1	4.5	4.3	4	4.5	4.3	3.9	4.4	3.6	4.3	4.4
<b>South Africa</b>	24.7	24.6	24.7	24.5	24.9	25.1	26.5	27	26.9	28.5	29.2	33.5
<b>India</b>	5.5	5.4	5.4	5.4	5.4	5.4	5.4	5.3	5.3	5.3	8	6

Reference: World Bank Database (Accessed: 05.05.2022).

Table 3 shows the long-term government interest rates of the Fragile Five countries. In 2010, the country with the highest interest rate was Brazil. The interest rate in Brazil, which increased until 2015, tends to decrease since then. While Turkey's borrowing costs tend to increase in this process, this situation is seen more clearly in recent years, and there is even a big leap forward in 2021. Therefore, Turkey is negatively separated from other countries in terms of long-term borrowing costs. While the borrowing costs of Indonesia, India and South Africa show a horizontal course, Indonesia and India share the first place with an interest rate of 6.4% as of 2021.

**Table 3:** Interest Rates of Fragile Five Countries Between 2010-2021 (%)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
<b>Turkey</b>	8.6	10	6.6	10.3	8.1	10.5	11.1	11.4	15.8	12	12.5	23
<b>Brazil</b>	12.1	11.1	9.2	13.2	12.4	16.5	11.5	10.3	9.3	6.8	6.9	10.3
<b>Indonesia</b>	7.6	6	5.2	8.4	7.8	8.9	7.9	6.3	8	7	5.9	6.4
<b>South Africa</b>	8.1	7.9	6.4	7.9	7.8	9.8	8.9	8.6	8.9	8.2	8.7	9.3
<b>India</b>	7.9	8.6	8	8.8	7.8	7.7	6.5	7.3	7.4	6.5	5.9	6.4

Reference: <https://www.investing.com> (Accessed: 05.05.2022).

Table 4 shows the growth rates of the Fragile Five countries. As of 2021, Turkey has the highest growth rate of 11%. Turkey is the only country that managed to achieve positive growth throughout the period. Although the growth rate in Turkey lost momentum after 2017, it did not turn negative and increased rapidly in 2021. While other countries grew negatively in 2020, when the COVID-19 pandemic has a great impact, Turkey's positive growth can be considered as an important success. During the period, Indonesia, South Africa and India grew negatively only in 2020 due to the COVID-19 outbreak. In Brazil, negative growth is observed in 2015 and 2016 in addition to 2020.

**Table 4:** Growth Rates of Fragile Five Countries Between 2010-2021 (%)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
<b>Turkey</b>	8.4	11.2	4.8	8.5	4.9	6.1	3.3	7.5	3	0.9	1.8	11
<b>Brazil</b>	7.5	4	1.9	3	0.5	-3.5	-3.2	1.3	1.8	1.4	-4	4.6
<b>Indonesia</b>	6.2	6.1	6	5.5	5	4.9	5	5.1	5.2	5	-2.1	3.7
<b>South Africa</b>	3	3.1	2.4	2.5	1.4	1.3	0.7	1.1	1.5	0.1	-6.4	4.9
<b>India</b>	8.5	5.2	5.4	6.4	7.4	8	8.2	6.8	6.5	4	-7.2	8.9

Reference: World Bank Database, International Money Fund Data Mapper (Accessed: 05.05.2022).

## 6. Evaluation of the Fragile Five Countries' Macroeconomic Performances Using the Okun Misery Index and Barro Misery Index

In this part of the study, Okun misery index and Barro misery index of Fragile Five countries were calculated and interpreted. In the calculation of Barro misery index, the index calculated by Robert Barro in 1999 was not used, but the simpler and more common index today, has been used. While the percentage change in inflation, unemployment, long-term interest rate and growth rate compared to the previous year is taken into account in the first index prepared by Barro, percentage change are not taken into account in the index, which is widely used today, and the calculation is made by taking into account the rate itself.

Barro misery index is calculated as follows (<https://www.mahfiegilmez.com/2018/06/>; Yöyen, 2018: 177):

Barro misery index = (inflation rate + unemployment rate + long term interest rate) – GDP growth rate

Table 5 shows the Okun Misery Index values of the Fragile Five countries. As it is known, only the inflation rate and unemployment rate are used in the Okun misery index, and the index value is calculated by adding these two rates.

**Table 5:** Okun Misery Index Values of Fragile Five Countries Between 2010-2021 (%)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
<b>Turkey</b>	19.2	15.3	17	16.2	18.7	17.9	18.6	21.9	27.2	28.9	25.4	33
<b>Brazil</b>	12.3	13.5	12.6	13.2	12.9	17.4	20.3	16.2	16	15.6	16.9	22.7
<b>Indonesia</b>	10.7	10.4	8.8	10.7	10.4	10.9	7.8	7.7	7.6	6.6	6.2	6
<b>South Africa</b>	28.8	29.6	30.4	30.3	31	29.6	33.1	32.2	31.4	32.6	32.4	38.2
<b>India</b>	17.5	14.2	14.7	16.5	12	10.3	10.3	8.6	9.2	9	14.6	12.1

Reference: Calculated by the authors.

If we examine graph 1, prepared using table 5, it is seen that South Africa has the highest value (high discomfort/misery) in the index. The unemployment problem, which South Africa has not been able to solve for years, has caused the index value to be high. The second discontented country in the index is Turkey. Although it followed a horizontal course until 2016, and even left the second place to Brazil, the index value increased rapidly after this date and decreased the difference with South Africa in recent years. This situation was caused especially by the increase in the inflation rate. Brazil's index score has been increasing, especially in recent years. This increase is caused especially by the increase in the unemployment rate. India and Indonesia are the two countries that have managed to reduce their index score as of 2021 compared to 2010, the starting year. It is seen that Indonesia is more successful in

reducing discomfort than India and is in the best position in the ranking. Indonesia has achieved this by lowering both the inflation rate and unemployment rate. India, on the other hand, was not very successful in reducing unemployment, while halving the inflation rate caused the index value to decrease.

**Graph 1: Okun Misery Index Values of Fragile Five Countries Between 2010-2021 (%)**

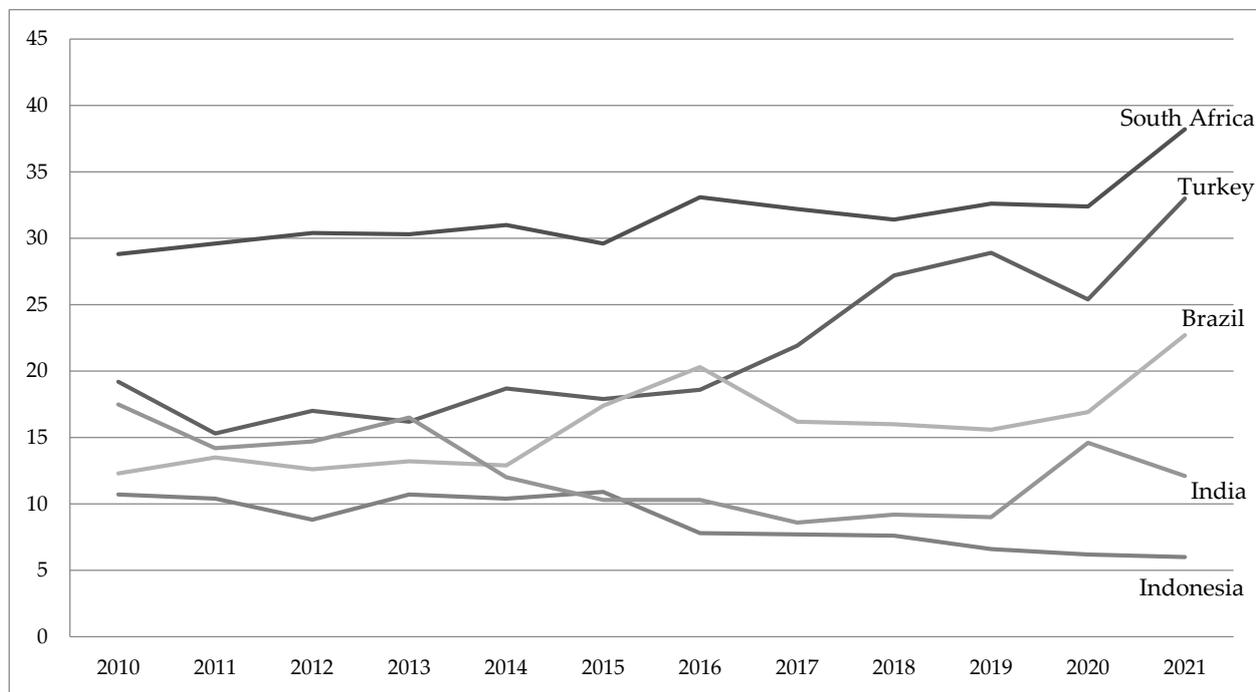


Table 6 shows the Barro Misery Index values of Fragile Five countries. Inflation, unemployment and long-term interest rates are added together in the Barro misery index, and the growth rate is subtracted from this total.

**Table 6: Barro Misery Index Values of Fragile Five Countries Between 2010-2021 (%)**

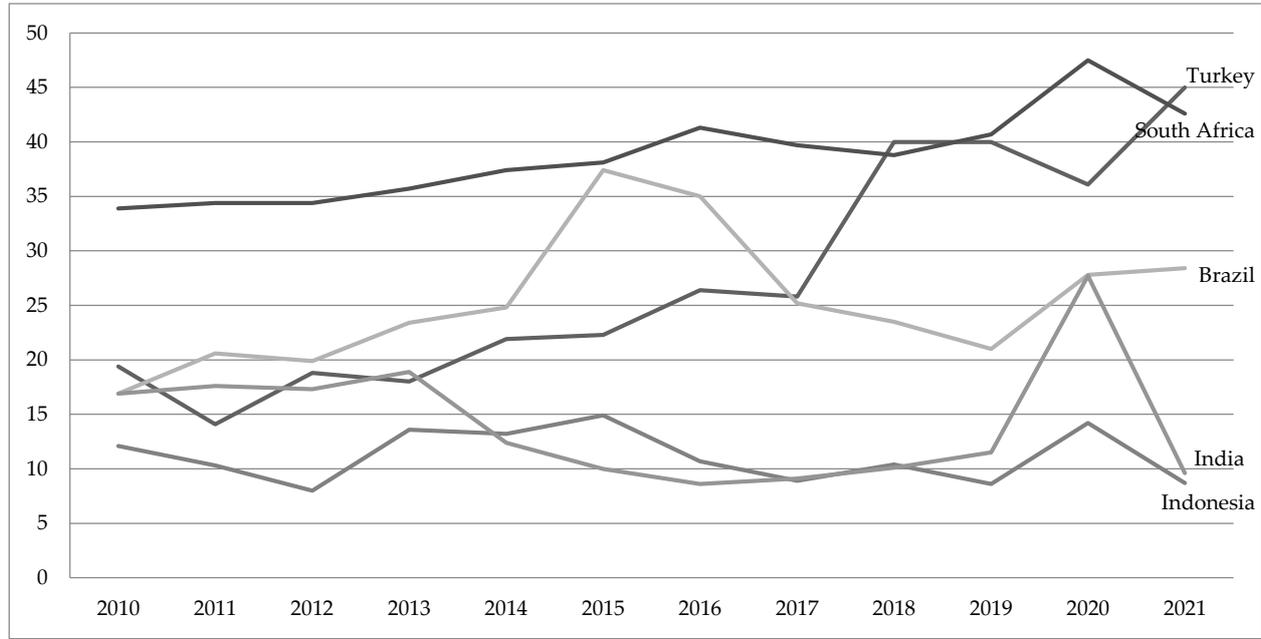
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
<b>Turkey</b>	19.4	14.1	18.8	18	21.9	22.3	26.4	25.8	40	40	36.1	45
<b>Brazil</b>	16.9	20.6	19.9	23.4	24.8	37.4	35	25.2	23.5	21	27.8	28.4
<b>Indonesia</b>	12.1	10.3	8	13.6	13.2	14.9	10.7	8.9	10.4	8.6	14.2	8.7
<b>South Africa</b>	33.9	34.4	34.4	35.7	37.4	38.1	41.3	39.7	38.8	40.7	47.5	42.6
<b>India</b>	16.9	17.6	17.3	18.9	12.4	10	8.6	9.1	10.1	11.5	27.7	9.6

Reference: Calculated by the authors.

When graph 2 is examined, it can be seen that Indonesia has the lowest index value among the Fragile Five countries throughout the period. Although it was switched to India between 2014-2016, it is the country with the best macroeconomic performance by having the lowest value in the following period. India is the second-best performing country. The index value of India, whose economy shrank significantly in 2020, increased considerably, but managed to significantly decrease the index value by showing growth again in 2021. Brazil, which is the third country with the lowest index value, managed to decrease the value especially after reaching the maximum index value in 2015. Considering the beginning of the period, the trend in Turkey, whose index value is in the fourth place, is in the upward direction. It is seen that the value has increased rapidly, especially after 2017 and as of 2021, it became the country with the highest index value. Despite Turkey's high growth rate in 2021, the increase in interest rates,

unemployment and inflation led to an increase in the Barro misery index and thus showed the worst macroeconomic performance. In addition, the fact that unemployment cannot be reduced despite economic growth shows that growth in Turkey is a growth that does not create employment. South Africa, which has the highest index value as of the period, managed to decrease the value in 2021 and was surpassed by Turkey. Especially for South Africa, the high unemployment rate causes the index value to increase. If we look at the general course of the countries from 2010 to 2021, while Indonesia and India managed to reduce the index value, that is, reducing misery; index values have increased in Turkey, Brazil and South Africa, and thus, misery has increased.

**Graph 2:** Barro Misery Index Values of Fragile Five Countries Between 2010-2021 (%)



Işık and Öztürk Çetenak (2018) took the average of the macroeconomic indicators of the BRICS countries and the Okun misery index and Barro misery index values in their study, and then ranked the countries by giving the highest score to the country with the highest average. The same method is applied to the Fragile Five countries, and the results are shown in table 7. It is thought that it would be more inclusive to include such a calculation in the study. According to table 7, while Indonesia is the most successful country in terms of inflation during the period, Turkey is the most unsuccessful country. While Indonesia is the most successful country in terms of unemployment, the most unsuccessful country is South Africa. While Indonesia is the most successful country in terms of interest, Turkey is the most unsuccessful country. In terms of growth, while Turkey is the most successful country, Brazil and South Africa have the lowest growth rates. When looking at the average values of the Okun index and Barro index, Indonesia has the best score, while the country with the lowest score is South Africa.

**Table 7:** Index Indicators and Average of Indices

	Inflation	Unemployment	Interest	Growth	Okun	Barro
<b>Turkey</b>	10.8	10.7	11.6	5.9	21.6	27.3
<b>Brazil</b>	5.8	10	10.8	1.3	15.8	25.3
<b>Indonesia</b>	4.2	4.4	7.1	4.6	8.6	11.1
<b>South Africa</b>	4.9	26.7	8.4	1.3	31.6	38.7
<b>India</b>	6.8	5.6	7.4	5.7	12.4	14.1

Reference: Calculated by the authors.

Comparatively, the scores of the countries according to their performance are shown in table 8. In the preparation of the table, the country with the best performance is given five points, while other countries are scored towards one according to their place in the ranking. Finally, these scores are added together to reach the total scores of the countries. A total of three score types were calculated: the sum of the index indicators and the addition of the Okun misery index and Barro misery index to these indicators. According to the table, the country with the best performance in all score types is Indonesia. India follows Indonesia in all score types. While South Africa is in the third place in the calculation made with index indicators, when Okun index and Barro index scores are added to the index indicators, it moves to Brazil. While Turkey shares the lowest score with Brazil in the calculation made with index indicators, it shares the lowest score with South Africa in the calculation made by adding the Okun index and Barro index to the index indicators.

**Table 8:** Scoring Table

	5	4	3	2	1
<b>Inflation- I</b>	Indonesia	South Africa	Brazil	India	Turkey
<b>Unemployment- U</b>	Indonesia	India	Brazil	Turkey	South Africa
<b>Interest- i</b>	Indonesia	India	South Africa	Brazil	Turkey
<b>Growth- Y</b>	Turkey	India	Indonesia	South Africa	Brazil
<b>Okun Index- OI</b>	Indonesia	India	Brazil	Turkey	South Africa
<b>Barro Index- BI</b>	Indonesia	India	Brazil	Turkey	South Africa
<b>Score</b>	Indonesia	India	South Africa	Brazil	Turkey
<b>I+ U+ i+ Y</b>	18	14	10	9	9
<b>I+ U+ i+ Y+ OI</b>	23	18	11	12	11
<b>I+ U+ i+ Y+ BI</b>	23	18	11	12	11

Reference: Calculated by the authors.

## 7. Conclusion

In this study, the Okun misery index and the Barro misery index of the countries called as Fragile Five by Morgan Stanley in 2013 were calculated separately and evaluated by scoring according to the average values. Indonesia is the country with the best performance in both Okun index and Barro index values by years subject to analysis. Although it was overtaken by India in 2014, 2015 and 2016, Indonesia took the first place in the following years again. The main factor affecting Indonesia's success is the decrease in inflation and unemployment rates by the years. The country that is in the best position among the Fragile Five countries in these macroeconomic indicators is also in the best position when considering the average in long-term interest rates. Although it lags behind Turkey and India in growth rate, the success in other macroeconomic factors has ensured that it takes the first place as an index value. In addition to being in the best condition among the Fragile Five countries, by 2021 it has managed to reduce its index values compared to 2010, that is, to reduce misery.

Although India ranks first in both index values in some years, it ranks second overall. In this situation, it has been effective in reducing the inflation rate by half and reaching high growth figures over the years.

Although it has achieved a significant success in inflation compared to the beginning of the period, it is noteworthy that it ranks fourth among the five countries. Therefore, if inflation rates are lowered, India will be able to reach better index value. In India, like Indonesia, it is a country that has managed to reduce misery compared to 2010.

The third country in both indices is Brazil. Although Brazil has shown significant success in terms of inflation, it has not been able to reduce the misery due to the increasing unemployment rate, the interest rate that cannot be reduced and the instabilities in economic growth, and both index values have increased compared to 2010. Especially, low growth rate is seen as the biggest problem for Brazil.

While Turkey ranked fourth in both index values over the years, the 2021 value of the Barro index surpassed South Africa and became the country with the highest level of misery. Inflation has become a serious problem for Turkey, especially after 2016. It is observed that Turkey, which succeeded to reduce inflation, unemployment and interest rates in the middle of the period, started to increase in inflation and interest rates as of 2017 and differentiated negatively from other countries. Turkey's most successful macroeconomic indicator is economic growth and it ranks first among the countries subject to analysis. This situation shows that Turkey cannot reflect economic growth to other macroeconomic indicators. This can be considered a failure. Although Turkey achieved a very high growth rate especially in 2021, the increase in inflation and interest rates caused it to fall to the last place in the Barro index. Decrease in inflation rate in Turkey and the decrease in interest rate will reduce the misery. In this context, especially cost increase should be prevented. High unemployment and high inflation are among the biggest problems of Turkey. For this reason, by developing policies based on Turkey's production and job creation, designing and implementing policies that will pave the way especially for its dynamic and young population will be effective in reducing misery index.

While South Africa has the highest index score by years according to the Okun index, it was surpassed by Turkey in the Barro index in 2018 and 2021. The reason for the high index values in South Africa is the extremely high unemployment rate. In addition, there is no stability in the growth rate. South Africa's high employment-creating growth rates are essential for reducing misery.

Macroeconomic variables are given equal weight in the calculation of the Okun misery index and Barro misery index. Hence, the power to explain misery in both indices is controversial. In the study conducted by Blanchflower (2017), it was found that the impact of unemployment on happiness is greater than inflation. Besides, it is not possible to evaluate misery with only a few macroeconomic indicators. Therefore, adding new indicators and calculating the index by weighting the indicators are considered necessary for a better evaluation. For example, the Better Life Index prepared by OECD or the Legatum Prosperity Index prepared by the Legatum Institute may give better results in the evaluation of welfare, misery and discomfort, since they include social indicators as well as economic indicators.

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