

## Macroeconomic impacts of refugee inflows in OECD countries: A panel data analysis

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**Abstract.** The increase in refugee inflows due to war and violence in the world has revealed the necessity of dealing refugee inflows internationally. The aim of the study is to investigate the impact of refugee inflows on host economies. In this study, 36 OECD countries were analyzed with panel data method for the period 1993-2017. In the model, the number of refugees is independent; economic growth, inflation and government expenditures are dependent variables. In the first stage of the analysis, panel unit root tests were applied to test the stationary of the variables. Then, Gengenbach, Urbain and Westerlund panel cointegration tests were performed to test the cointegration relationship between the variables. To estimate the long-term relationships between variables, the Dynamic Ordinary Least Squares Mean Group (DOLSMG) estimator was used and a negative relationship was found between refugee inflows and economic growth, while a positive correlation was found between refugee inflows and inflation, also between refugee inflows and government expenditures. Finally, the Dumitrescu-Hurlin panel Granger causality test was used to estimate the causality relationship between the variables. According to the causality test results, while there was no causality relationship between refugee inflows and economic growth, a mutual causality relationship was found between refugee inflows and government expenditures. However, it has been observed that unidirectional Granger causality running from refugee inflows to inflation.

**Keywords.** Refugee inflows, Economic development, Macroeconomics, Panel data analysis.  
**JEL.** F22, O10, E20, C33.

### 1. Introduction

Refugee inflows are one of the issues that need to be addressed internationally for both developed and developing countries. Especially in recent years, the number of refugees has increased considerably and exceeded the borders of the country due to violence, war or other incidents. Thus the latest refugee crises in Syria, Iraq, Myanmar, Egypt, Yemen, and Libya have been the largest wave of refugee inflows since World War II. It is observed that the countries hosting the most refugees are generally neighboring countries. In this context, clearly assessment of the causes and effects of refugee migration in the world has a great importance for both developed and developing countries.

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Although there are many studies in the field of international migration in the literature, the number of studies dealing with the effects of the refugee population is limited. Most of the studies in the refugee field were analyzed using microdata and only one sample. Some studies reveal that refugee inflows have a positive impact on the economies of the host countries and some of them reveal that refugee inflows have a negative impact on the economies of the host countries. In this context, it is necessary to evaluate refugee inflows for the world countries and to deal all aspects of their impact on the economies.

The study addresses the impact of refugee inflows on host economies and contributes to the literature. Most of the previous studies analyze refugee inflows by using the data obtained from the survey results, whereas this study evaluates the macroeconomic effects of refugee inflows, unlike previous studies. Accordingly, 36 OECD countries were analyzed by panel data method for the period 1993-2017 to investigate the impact of refugee inflows on economic growth, inflation and government expenditures in this study.

The findings of the study show that there is a negative relationship between refugee inflows and economic growth, and a positive relationship between refugee inflows and inflation rate and a positive relationship between refugee inflows and government expenditures. Besides, there was no mutual causality relationship between refugee inflows and economic growth, but there was a mutual causality relationship between refugee inflows and government expenditures. On the other hand, it was understood that unidirectional Granger causality running from refugee inflows to inflation.

## 2. Literature review

The literature on the economics of migration and the impact of refugees on macroeconomic factors is still thriving. When the studies on economics of migration are examined, it is seen that the effects of migrants on social, economic and political factors in host countries are discussed. The current empirical literature focuses on the impact of refugees on the economies of host countries. In this context, it is important to evaluate the studies on the effects of refugees on the economies of the host countries.

Morley (2006) examined the causality relationship between migration and economic growth in Australia, Canada, and the United States in his study covering the period 1930-2002. It has been found that economic growth leads to more migration in the long run, but migration does not have as much impact on GDP per capita as expected.

Gomez *et al.*, (2010) examined the effects of refugees on neighboring countries covering 2009 in their study. They concluded that refugee inflows do not always have a negative impact on the host country. Accordingly, refugee inflows have had a negative impact on public expenditure and economic infrastructure spending, but have had a positive impact by enlarging national markets and lowering commodity prices. However, they

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have shown that money is being transferred to refugees from their relatives in other countries and that these funds contribute to economic growth.

Boubtane *et al.*, (2011) analyzed the relationship between the number of immigrants between unemployment and the number of immigrants between GDP per capita for 22 OECD countries and the period 1980-2005. Accordingly, it was found that none of the countries included in the analysis had a causality from the number of migrants to unemployment, and that there was no causality from unemployment to the number of migrants except Portugal. However, no causality relationship was found in from the number of immigrants to GDP per capita in any of the countries included in the analysis, while had a positive causality from GDP per capita to the number of immigrants only for France, Iceland, Norway and the United Kingdom.

Akgündüz *et al.*, (2015) examined the relationship between the number of Syrian refugees and food and housing prices involving 2012-2013 in terms of Turkey's economy. They found that the refugee crisis led to an increase in food and housing prices, especially food price inflation having a significant coefficient. On the other hand, they found that refugee inflows did not affect employment.

Del Carpio & Wagner (2015) discussed the relationship between refugee inflows and native employment, and the relationship between refugee inflows and inflation for the years 2011-2014 context of the Turkish economy. Accordingly, refugee inflows have been found to have a positive impact on native employment. Increases in informal labor supply increase the demand of Turkish workers for official jobs. However, it has been concluded that refugee inflows increase consumer prices, namely inflation.

Rother *et al.*, (2016) analyzed 179 countries in the context of the relationship between conflicts and economic growth for the years 1970-2014. They concluded that conflicts reduced economic growth by 2% for all countries involved in the analysis and by 1.5% for MENA countries. Also, they found that conflicts increased the consumer price index by 1.6% for all countries involved in the analysis and by 2.3% for MENA countries.

Ceritoğlu *et al.*, (2017) analyzed the relationship between Syrian refugee inflows and Turkish native employment for the years 2010-2013. They found that refugee inflows had a significant impact on Turkish native employment, and that refugee inflows especially reduced informal employment. However, they concluded that refugee inflows had no statistically significant effect on wages.

Kancs & Lecca (2018) analyzed the long-term social, economic and financial impact of migrants on EU member states. They conclude that refugees have increased current government expenditures due to an increase in labor market integration costs and a reduction in disposable household income. On the other hand, they found that refugee inflows increased labor supply in EU member states.

Kuoni (2018) examined the relationship between increases in refugee rates and GDP per capita, unemployment, and R&D activities for 21

developed and developing countries for 1990-2014 years. It was concluded that the increase in the refugee rate had a negative effect on GDP per capita in middle-high income and low-income countries, while positively in low-middle and high-income countries. They also found that increases in refugees in middle-high-income and low-income countries positively affected both labor and R&D activities.

### **3. Historical background of the international refugee system**

The history of the asylum seekers is mainly based on groups displaced by war and colonialism in the 16th and 17th centuries. However, it can be stated that the origins of the current international refugee system emerged in Europe in the 21st century. The First World War created large-scale refugees, even though newly established or restructured states tried to create more homogeneous populations through the “ethnic mix”. The League of Nations has appointed the High Commissioner for Refugees to solve this humanitarian crisis. This initiative created an official refugee status by granting identity certificates to stateless persons and has initiated negotiations on the exchange, repatriation or resettlement of refugees (Jaeger, 2001).

In the 1930s, countries which receiving immigration tightened border controls and migration policies due to the deterioration in economic conditions. In particular, with the outbreak of World War II, more than thirty million people were displaced and a severe refugee crisis emerged in Europe. The United Nations established the United Nations Relief and Rehabilitation Administration in 1943 to resolve the refugee crisis, and about seven million refugees were repatriated. It was decided to establish the International Refugee Organization in 1947 to increase the assistance provided to refugees and facilitate their relocation and registration (Jaeger, 2001).

In 1951, as a result of negotiations in Geneva, the United Nations Convention on the Status of Refugees was adopted for refugees displaced in Europe before 1950. However, a more comprehensive agreement was needed to solve the problems of immigrants after 1950. For this purpose, at the United Nations Conference held in New York in 1967, a new protocol was prepared to regulate the situation of non-European countries and refugees after 1950. The number of countries that signed the Protocol is 22 in 1960, increased to 83 in 1980 and to 147 in 2010 (Hatton, 2012).

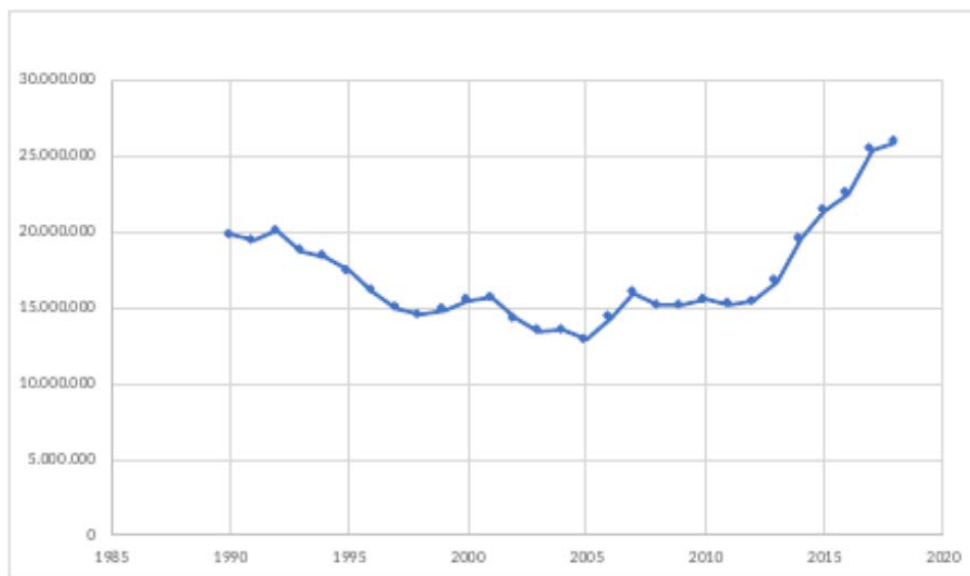
By the 1980s, it was observed that the ongoing conflict on three continents increased the number of refugees. These refugees were caused by the war in Afghanistan and Vietnam in Asia, conflicts in the Great Lakes region in Africa, and conflicts in Nicaragua, El Salvador and Guatemala in South America. The number of refugees increased considerably especially after the fall of the Berlin Wall in 1989 and the disintegration of the Soviet Union. With increased access to international travel, Western European

countries have been seen as a new way for asylum seekers. In this process, the number of asylum applications increased dramatically, while the desire of developed countries to give asylum decreased.

The United Nations is committed to adhering to the Global Compact to maintain security and respect for both refugee and migrant flows and to share responsibility for refugees and migrants for regular migration. The “New York Declaration en adopted by the United Nations General Assembly and heads of government on September 19, 2016, recognizes that all refugees and migrants must be protected for human rights, regardless of their status (Goodwin-Gill, 2016). This declaration proposes more cooperation to address all aspects of large-scale migration movements, to prevent conflicts and to promote mediation.

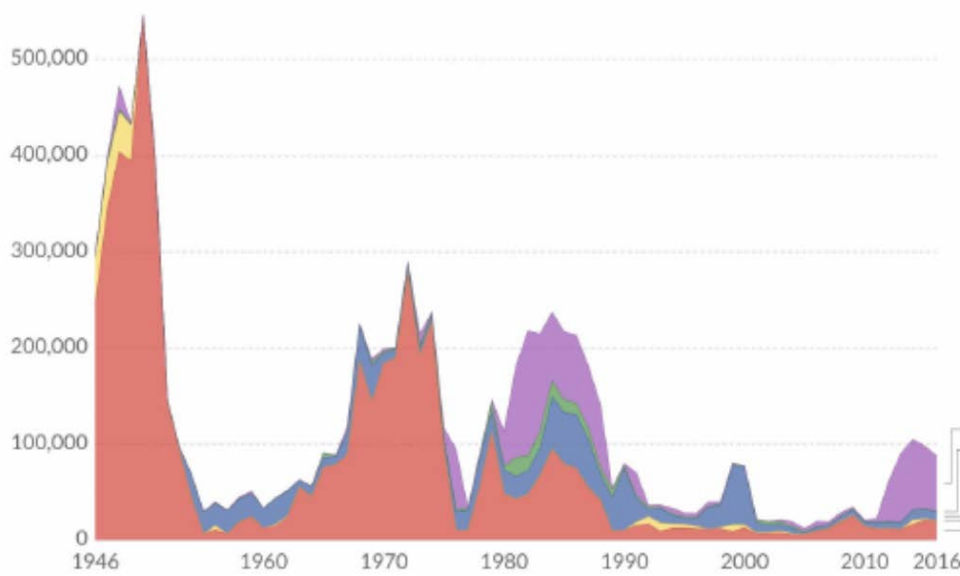
#### 4. Causes and effects of refugee inflows

The most important causes of the refugee movement are the wars and conflicts in the world. Graph 1 reveals the course of refugee inflows in the world and Graph 2 reveals the deaths due to conflicts according to the regions of the world. In Graph 2; purple parts indicate the Middle East, blue areas mean Africa, yellow parts indicate Europe, red parts indicate Asia and Oceania, green parts indicate America. When Graph 1 and Graph 2 are taken together, it is seen that wars and conflicts, which are seen as the main driving force of the refugee inflow, have decreased from the beginning of the 1990s to 2012. In Graph 2, it can be said that the deaths due to the conflicts in the world increased from the mid-1970s to the mid-1980s and the deaths due to the conflicts decreased in parallel with the trend of refugee flow since the mid-1990s. Besides, it can be stated that the refugee movement and the deaths related to the conflicts entered an increasing trend with the impact of the Syrian civil war that started in 2012.



**Graph 1.** *The Trend of the Refugee Inflows in the World*

Source: Arranged from World Bank (WDI) data.



**Graph 2.** Deaths Due to Conflicts by World Regions (1946-2016)

**Source:** Arranged from UCDP / PRIO data.

In addition to wars and conflicts, human rights violations and the absence of the rule of law are considered as a cause of violence and oppression. However, indexes which showing the tendency of violence and oppression may produce different results. The political terror scale increased from the early 1980s to the mid-1990s, and then entered a downward trend. The political rights and civil liberties index tended to develop from the early 1980s to the mid-1990s. Therefore, it is recognized that countries with fragile political institutions, and in particular transition countries, are more susceptible to civil conflict (Goldstone *et al.*, 2010).

The effects of the refugee inflows can be seen both in economic, social and political fields. Refugees put pressure on local resources of host countries. New health institutions, schools, roads, bridges and land uses to meet the needs of the population increase both government expenditures, and the burden of social and administrative services (Miller, 2018). However, while the labor force participation of refugees changes the combination of the unemployment rate, the inflation rate may rise as domestic demand increases. The impact of the refugee inflow on economic growth differs in the short and long term. With the increase in domestic demand, the expansion of the market and the use of the capital that the refugees bring from their own countries in their countries of origin can increase economic growth in the short term (Gür, 2017). In the long term, it can be stated that refugee inflow adversely affects economic growth by disrupting resource allocation.

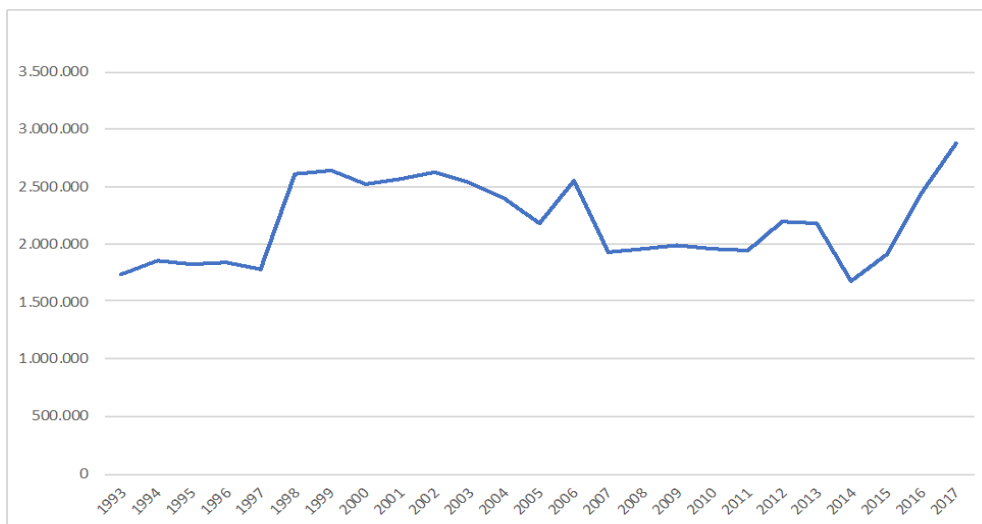
## 5. Assessment of refugee inflows in the context of OECD countries

Refugee flows accelerating in the 1980s peaked in the 1990s, which led to policy responses particularly in developed countries. In this process,

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although all OECD countries have joined the Refugee Convention, governments have had room for action to deter asylum applications. In order to limit access to the territory of the country; border controls were applied such as carrier sanctions, border patrols and advanced inspections and, special zones created at the airport to quarantine potential asylum seekers. In addition, this policy was supported by the aggravation of visa requirements for the countries of refugees. The restructuring of the principles regarding the admission of asylum seekers to refugee status was another limiting policy. These policies; it included controls such as narrowing the definition of refugees, implementing rapid follow-up procedures, and limiting permission to stay on humanitarian grounds. Then, strict controls were implemented by restricting refugee employment, reducing aid payments and increasing custody. Graph 3 below shows the trend of refugee inflows in OECD countries. The graph shows that the number of refugees in OECD countries has increased rapidly since the mid-1990s. The number of refugees followed a fluctuating trend until 2014 and has increased sharply since 2014 with the Syrian crisis.



Graph 3. Trend of Refugee Inflows in OECD Countries

Source: Arranged from World Bank (WDI) data.

In the 1990s, OECD countries responded to increasing asylum demands through policy packages that included one or more of these restrictive controls. Germany changed the "Constitution" in 1993 to implement more restrictive policies, while Denmark changed the "Foreign Law" in the 1990s and 2002. Britain is another example of countries that are gradually tightening their asylum rules. The 1993 Act introduced a rapid procedure for applicants from "Safe Origin Countries" and the 1996 Act restricted the rights of travelers traveling through "Safe Third Countries". By the Immigration and Asylum Act 1999, asylum seekers were sent to reception centers outside London, and cash aid was replaced by property aid (Hatton, 2012).

Although the attitudes of the refugees to the public can be understood, the relationship with the policy is not sufficiently revealed. Political science literature identifies strong relationships between anti-immigration attitudes and the popularity of far-right parties (Knigge, 1998; Lubbers *et al.*, 2002; Kessler & Freeman, 2005). In the early 2000s, stricter refugee policies were observed, with the revival of right-wing populist parties particularly in Austria, France, Denmark, and the Netherlands. It can be stated that refugee policies affect the general agenda of the parties even in extreme opposition countries. However, most of the studies that analyze the relationship between politics and refugee policies are based on qualitative methods since quantitative indicators are not available. However, a recent study using the refugee policy index revealed a relationship between the election success of right-wing populist parties and a more rigid policy stance (Hatton, 2011).

## 6. Econometric model and data set

The impact of refugee inflows on macroeconomic indicators has been examined for the period 1993-2017 in 36 OECD countries. In the model where the number of refugees (REF) is used as an independent variable, economic growth rate (GDP), inflation rate (INF) and government expenditures (GEXP) are included in the model as dependent variables. Estimated equations for the economic model are as follows;

$$GDP_{it} = \alpha_0 + \alpha_1 REF_{it} + u_{it} \quad (1)$$

$$INF_{it} = \alpha_0 + \alpha_1 REF_{it} + u_{it} \quad (2)$$

$$GEXP_{it} = \alpha_0 + \alpha_1 REF_{it} + u_{it} \quad (3)$$

In the equation, *i* refers to countries, *t* refers to time and *uit* refers to the error term. The variables are;

*REF<sub>it</sub>* is the number of refugees inflowing to the host countries,

*GDP<sub>it</sub>* is the gross domestic product growth rate (%),

*INF<sub>it</sub>* is the consumer price index (%),

*GEXP<sub>it</sub>* is the government expenditures (%).

Dependent variables in the model are economic growth rate, inflation rate, and government expenditures. We are interested in the  $\alpha_1$  coefficient, which is the effect of the number of refugees inflowing to the host countries. In the first equation, the  $\alpha_1$  coefficient is expected to be negative as the number of refugees inflowing to the host countries is expected to have a negative effect on economic growth. In the second and third equation, the  $\alpha_1$  coefficient is expected to be positive, as the number of refugees inflows will increase the inflation rate and government expenditures.

In the model, as OECD countries; Australia, Austria, Belgium, Canada, Chile, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, S. Korea, Latvia, Lithuania, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland,

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Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom and the United States are located. In order to measure the effects of refugee inflows on macroeconomic indicators, unbalanced panel data method was used because of the lack of data for some years. The study covers the 1993-2017 period and covers 25 years. Refugee numbers data were taken from the United Nations High Commissioner for Refugees (UNHCR) data set. The growth rate, inflation rate, and government expenditures data were obtained from the International Monetary Fund (WEO, 2019) data set.

The cointegration tests and estimation methods to be used are determined according to the existence of the cross-sectional dependence in the error term or whether the parameters are homogeneous or heterogeneous concerning the units. Therefore, cross-sectional dependence and homogeneity must be tested before cointegration analysis. In this context, all variables are tested with Pesaran (2004) CD test to test the presence of cross-sectional dependence. Table 1 shows the cross-sectional dependence results. Accordingly, the  $H_0$  hypothesis is rejected because all variables have a significance level of 1% and it is understood that all variables have cross-sectional dependence.

**Table 1.** *Cross Sectional Dependence Test Results*

Variables	Pesaran CD Test
REF	13.98***
GDP	63.47***
INF	44.63***
GEXP	27.71***

**Note:** Under the null hypothesis of cross section independence  $CD \sim N(0,1)$ . \*\*\* is indicate the %1 level of significance.

After testing the cross-sectional dependence, the variables are tested with the Swamy S test to test whether the constant and slope parameters are homogeneous concerning the units. According to the results in Table 2, the  $H_0$  hypothesis is rejected and it is understood that the parameters are not homogeneous. In this context, it is considered appropriate to use the panel cointegration test of Gengenbach, Urbain and Westerlund, which are among the second generation panel cointegration tests, since the variables have cross-sectional dependence and heterogeneity.

**Table 2.** *Homogeneity Test Results*

Dependent Variable	Statistics
GDP	264.97***
INF	725.95***
GEXP	16644.23***

**Note:** \*\*\* is indicate the %5 level of significance.

Table 3 shows the descriptive statistics of the variables. The Jarque-Bera test shows that none of the variables is normally distributed. The lowest

value of the number of refugees is 1, while the highest value is 3480310. The average number of refugees for OECD countries is approximately 81635.

**Table 3.** Descriptive Statistics of Variables

Descriptive Statistics	REF	GDP	INF	GEXP
Observation	877	892	892	853
Mean	81635.48	2.754148	4.293901	41.80737
Standard Deviation	243145.9	3.203751	9.59191	9.185099
Min	1	-14.814	-1.676	14.244
Max	3480310	25.01	109.2	68.36
J-B Prob.	0.0000	0.0000	0.0000	0.0000

Table 4 shows the correlation matrix of the variables. When the correlation matrix is examined, it is seen that the correlation between the variables is low. The number of refugees and economic growth correlated to -0.0204, the number of refugees and inflation was 0.0007, and the number of refugees and government expenditures were 0.0469. The variable with the highest correlation with the number of refugees is government expenditures with 0.0469.

**Table 4.** Correlation Matrix of Variables

Correlations	REF	GDP	INF	GEXP
REF	1.0000			
GDP	-0.0204	1.0000		
INF	0.0007	0.0789	1.0000	
GEXP	0.0469	-0.3116	-0.1373	1.0000

## 6.1. Method

### 6.1.1. Panel unit root test

In this study, the panel data method was used to investigate the effects of refugee inflows on economic growth, inflation and government expenditures in OECD countries. First, panel unit root tests were applied to test the stationary of the series. The second generation panel unit root tests were used because the series contained unit roots and were heterogeneous. To reduce the effects of cross-sectional dependence, heterogeneous Fisher Phillips-Perron (PP), Fisher Augmented Dickey-Fuller (ADF) and Maddala and Wu tests were preferred.

In the Fisher ADF and Fisher PP tests, conventional ADF and PP tests are applied for time series and the probability values of the obtained test statistics are used to obtain the results of the panel. The ADF-based Fisher test was first adapted to the panel data by Maddala and Wu. Fisher ADF model;

$$Y_{it} = d_{it} + X_{it} \quad (i=1, \dots, N; t=1, \dots, T_i) \text{ and,}$$

$$d_{it} = \beta_{0i} + \beta_{1it} + \dots + \beta_{mit} t^{mi}$$

$$X_{it} = \alpha_i X_{i(t-1)} + u_{it}.$$

The equation assumes that  $u_{it}$  is stationary and can be heteroscedastic.  $Y_{it}$  consists of combinations of non-stochastic  $d_{it}$  and stochastic  $X_{it}$  processes. Null and alternative hypotheses are established as follows;

$H_0: \alpha_i = 1$  (for all  $i$ )

$H_1: |\alpha_i| < 1$  (for at least one  $i$ )

*The alternative hypothesis for infinite  $N$ ,*

$H_1: |\alpha_i| < 1$  (for some  $i$ )

#### 6.1.2. Panel cointegration test

Second generation panel cointegration tests provide more reliable results in the presence of cross-sectional dependence. Second generation cointegration tests are divided into two groups as homogeneous and heterogeneous estimators. Gengenbach, Urbain and Westerlund panel cointegration tests were used, as the series in the model contained inter-unit correlation and were heterogeneous. The model of this error correction based test which is formed by using common factor structure;

$$\Delta Y_i = d \delta_{y,xi} + \alpha_{yi} y_{i,-1} + \omega_{i,-1} \gamma_i + \nu_i \pi_i + \varepsilon_{y-xi} = \alpha_{yi} y_{i,-1} + g_i^d \lambda_i + \varepsilon_{y-xi}$$

Firstly, the OLS estimation is made for the units separately and the  $H_0$  hypothesis is tested with a t-test. The basic hypothesis is  $H_0: \alpha_{yi} = 0$  and the alternative hypothesis is  $H_1: \alpha_{yi} < 0$ . In this model, which allows cross-sectional dependence and heterogeneity, uneven lag lengths are also allowed in units (Tatoğlu, 2017).

#### 6.1.3. Long term panel cointegration estimation

In case there is cross-sectional dependence in the remains of the cointegration model, second generation estimators are used since first generation estimators are deviated. However, the second generation long-term panel cointegration estimators are divided into two groups as homogeneous and heterogeneous estimators. The Dynamic Ordinary Least Squares Mean Group (DOLSMG) estimator was used, because the variables in the model are heterogeneous. In this method, variables are converted by taking the difference from the horizontal cross-sectional averages and DOLSMG for units and DOLSMG for panel are estimated (Tatoğlu, 2017).

#### 6.1.4. Panel causality test

The relationship between economic variables can be tested with causality tests. Panel causality tests are divided into two groups as homogeneous and heterogeneous. Due to the heterogeneity of the series in the model, it was considered appropriate to use the Dumitrescu-Hurlin panel causality test. 2000-2017 period can be tested in this test because some data in the panel cannot be obtained and panel causality tests do not allow unbalanced panel.

The Dumitrescu-Hurlin test developed the Granger causality test for heterogeneous panels. The basic equation of the Dumitrescu-Hurlin model is as follows (Tatoğlu, 2017);

$$Y_{it} = \alpha_i + \sum_{k=1}^K \gamma_i^{(k)} Y_{it-k} + \sum_{k=1}^K \beta_i^{(k)} X_{it-k} + \varepsilon_{it}$$

(k) shows the lag length of the panel,  $\gamma_i^{(k)}$  shows the autoregressive parameter and  $\beta_i^{(k)}$  shows the slopes. While the lag length does not vary for the units of the panel, the autoregressive parameters and slopes vary according to the units.

The  $H_0$  hypothesis of the test is constructed as "all  $\beta_i$  is equal to zero" and states that there is no causality from X to Y.

$$H_0 = \beta_i = 0. \quad i = 1, \dots, N$$

### 6.2. Findings

The unit root test results of the variables are shown in Table 5. The optimum lag length for the tests estimated with Fisher Philips Perron (PP), Fisher Augmented Dickey Fuller (ADF) and Maddala and Wu (MW) estimators was determined as one according to the Akaike information criterion. The null hypothesis of the tests is defined as "all units contain unit root". Table 5 shows that all variables are stationary for all estimators at the level and non-trend model. In this context, the cointegration test is required to determine the relationship between the variables.

**Table 5.** Unit Root Test Results

Variables	Fisher PP Chi-Square	Fisher ADF Chi-Square	MW
REF	6.2887*	1.7599*	93.119*
GDP	26.2557*	16.8527*	274.232*
INF	37.1407*	14.8431*	250.118*
GEXP	8.5787*	7.9810*	167.772*

**Note:** \* is indicate the %5 level of significance. Lag lengths are set to 1 according to the Akaike information criterion.

The Gengenbach, Urbain and Westerlund estimators were used to estimate the panel cointegration relationship and the fixed lag length was determined as one. The estimated panel cointegration test results are shown in Table 6. Table 6 shows that all variables are significant at 1% level, and that there is a cointegration relationship between the number of refugees and economic growth, the number of refugees and inflation, and the number of refugees and government expenditures.

**Table 6.** Gengenbach, Urbain ve Westerlund Panel Cointegration Test Results

Independent Variable (REF)	GDP	INF	GEXP
Coefficient	-0.758	-0.646	-0.557
Statistics	-3.378***	-3.328***	-2.779***

**Note:** The fixed lag length is set to 1. \*\*\* is indicate the %1 level of significance.

Table 7 shows the long-term estimation of the panel cointegration model with the Dynamic Ordinary Least Squares Mean Group (DOLSMG) estimator. In the model where the lag length was chosen as one, t statistics

of the long-term parameters were found to be significant at 1% for all variables. Looking at the test results, it is understood that refugee inflows affect economic growth, inflation and government expenditures in the long run. Accordingly, a one-unit increase in the number of refugees reduces economic growth by 0.0000116%, increasing the inflation rate by 0.0000188% and increasing government expenditures by 0.0000136%. Thus, while there was a negative relationship between refugee inflows and economic growth, a positive correlation was found between refugee inflows and inflation and refugee inflows and government expenditures.

**Table 7.** Long Term Panel Cointegration Estimation Results (DOLSMG)

Independent Variable (REF)	Beta
GDP	-0.0000116***
INF	0.0000188***
GEXP	0.0000136***

**Note:** \*\*\* is indicate the %1 level of significance. The lag length was selected as 1.

Table 8 shows the results of the Dumitrescu-Hurlin panel Granger causality test. Lag lengths were selected according to the Akaike information criterion and the AIC information criterion determined the optimal lag length as one for all tests. According to the test results, there was no mutual causality relationship between refugee inflows and economic growth. However, it has been observed that refugee inflows does Granger cause inflation in, but inflation does not Granger cause inflation. On the other hand, a mutual causality relationship was found between refugee inflows and government expenditures.

**Table 8.** Dumitrescu-Hurlin Panel Granger Causality Test Results

	W-bar	Z-bar	Z-bar tilde
REF does not Granger cause GDP.	1.0950	0.3974	-0.2254
GDP does not Granger cause REF.	1.1480	0.6193	-0.0586
REF does not Granger cause INF.	2.8718	7.8305***	5.3625***
INF does not Granger cause REF.	1.2375	0.9937	0.2229
REF does not Granger cause GEXP.	6.5723	23.3105***	16.9999***
GEXP does not Granger cause REF.	2.2081	5.0538***	3.2751***

**Note:** \*\*\* is indicate the %5 level of significance. Akaike Information criterion is used for lag lengths.

## 7. Conclusion and recommendations

International refugee inflows have been one of the most important agenda items of the migration economy in recent years. Asylum seekers and refugees are generally regarded as a separate field of study rather than a separate issue for economists. Although there are many studies on international migration in the literature, the number of studies on refugees is limited. Most of the studies on refugee flows deal with the Middle East countries and analyze their regions. As refugee flows are generally directed towards more developed countries, OECD countries are considered in the study. The objectively handling the impact of international refugee inflows on host economies and on short and long-term differences is important for

the soundness of the study. In this context, some econometric analysis methods were used to make an objective evaluation.

This study investigates the impact of refugee inflows on national economies. The study examines the relations between economic growth, inflation and government expenditures were analyzed for the period 1993-2017 and 36 OECD countries. The number of refugees as an independent variable and the dependent variable; economic growth rate, inflation rate and the ratio of government expenditures to GDP were used. First, the existence of cross-sectional dependence and heterogeneity was tested to determine the estimators to be used. In the first stage of the analysis, panel unit root tests were applied to test the stationary of the series. In the second stage of the analysis, panel cointegration tests were performed to estimate the short and long term relationships between the variables. In the last stage of the analysis, the panel causality test was used which is based on the prediction of the mutual relationship between the variables.

According to panel unit root test results, it is understood that the series are stationary at the level value. The panel cointegration test reveals that there is a cointegration relationship between the number of refugees and economic growth, the number of refugees and inflation and the number of refugees and government expenditures. According to the long-term estimation of the panel cointegration model with the Dynamic Ordinary Least Squares Mean Group (DOLS MG) estimator, it is understood that in the long run, refugee inflows have negative effects on economic growth and positive effects on inflation and government expenditures. The Dumitrescu-Hurlin panel Granger causality test shows that there is no mutual causality relationship between refugee inflows and economic growth. However, it is seen that refugee inflows does Granger cause inflation, but inflation does not Granger cause of refugee inflows. On the other hand, there is a mutual causality relationship between refugee inflows and government expenditures.

Based on the findings of the study; it can be stated that refugees adversely affect the economies of the host countries in OECD countries. At this point, the implementation of policies to eliminate these negative effects of refugees on the economies of OECD countries is important. Closely examining the refugee profile to be admitted to the country, increasing the productivity and contribution of accepted refugees to human capital may promote positive effects. In particular, developed OECD countries with high cash and humanitarian aid can benefit from the refugee population and contribute to the development of their economies. Therefore, the international legal framework should be developed and the effectiveness of international civil society organizations should be increased to benefit from the refugee inflows optimally.



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