

Unemployment, Refugees, Asylum Seekers, and the 2008 Financial Crisis – An Analysis using Structural VAR and Dynamic Panel Models

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Abstract

This paper analyzes the relationships between refugee and asylum seeker flows, unemployment rates, and suicide rates using both structural vector autoregression and dynamic panel models. Specifically, structural VAR is initially used for analyzing data from 1980-2018 in the United States, and a random effects dynamic panel model is utilized for analyzing post-2008 financial crisis data of these four variables in the United States, France, and the United Kingdom. While the structural VAR model found a significant negative bi-directional relationship between unemployment and refugee growth rates in the United States from 1980-2007, the random effects dynamic panel model exhibits a strongly significant and positive relationship between unemployment and suicide, and unemployment and refugee flows from 2009-2016. Furthermore, the effects of unemployment on suicide rates, and refugee flows on unemployment rates were found to have a uni-directional relationship. This suggests that the lasting effects of the 2008 financial crisis pose new challenges for developed Western nations seeking to balance low unemployment rates with policies which assist refugees in need of protection from dangerous conflict regions.

I. Introduction

The effects of forced migration on unemployment in developed nations has become a frequently discussed topic in the last decade, due in large part to recent events such as global refugee crises. In addition, the effects of the 2008 financial crisis further complicates our understanding of the relationship between refugees, asylum seekers, unemployment, and suicide rates. This paper investigates the relationships of these four variables using two econometric methods – structural vector autoregression and dynamic panel data – to gain a better understanding of how these variables interact. Specifically, structural VAR will initially be used to evaluate the relationship between refugees, asylum seekers, unemployment, and suicide rates in the United States from 1980-2018, and the dynamic panel model will be used to

analyze the relationship of these four variables in the post-2008 financial crisis era of the United States, France, and the United Kingdom. By analyzing pre-financial crisis data in structural VAR, and post-Great Recession data across three regions using a dynamic panel model, this paper seeks to contribute to our existing knowledge of the relationships between these four variables, thereby assisting in the development of more effective legislation for refugees and civilian populations in various regions.

II. Literature Review

Previous literature has addressed the relationships of immigration/migration, unemployment, and suicide rates, primarily before and during the Great Recession. Breuer (2014) identifies a statistically significant positive relationship between unemployment and suicide mortality rates

across 275 regions in the EU, using data from 1999-2010. He finds a negative relationship between life expectancy (for both males and females), as well as for real GDP growth and suicide rates across these European regions. Boubtane, Coulibaly, and Rault (2012), using panel VAR and data from 22 OECD countries from the years 1987-2009, find a positive bi-directional effect between immigration and host country GDP per capita, as well as a negative bi-directional relationship between immigration and a host country's total unemployment. They also identify a positive uni-directional effect of migration on host countries' total employment rate, indicating that migration does not discourage native-born job hunters. Becker and Ferrara (2019), through an extensive literature review, identify random assignments of large groups of refugees into European host countries as one of the causes for economic shocks within these host regions. This is significant because this shows how large-scale migration flows, such as those experienced during numerous refugee crises after the Great Recession, can also influence the relationship between refugees and economic indicators like unemployment rates. Ao et. al (2012) focuses on the relationship between Bhutanese refugees in the United States from 2009-2012, and the significant number of suicides occurring within the first year of settlement. Specifically, they point to mental health issues, including stress associated with high rates of unemployment among these refugees, as a driving factor of the high suicide rate within this specific refugee population. Similarly, Trovato (1986) identifies a strong positive relationship between Canada's suicide rates and male refugees aged 15-34, who exhibit significant sensitivity to their economic conditions and

opportunities. Corballo and Nerukar (2001) identify a positive relationship between depression and suicide rates among refugees. The authors point to several examples across Europe, including the relatively high suicide rates among Indian girls compared to the native-born population, ages 15-24, in the United Kingdom. These articles conclude that stress experienced by refugees results in an increased national suicide rate, due to refugees taking their own lives, while also demonstrating that refugees do not increase unemployment for native-born residents, a topic about which many host countries in Europe and North America have expressed concerns.

This paper extends the analysis to 2016, in an effort to build upon articles such as these by analyzing how the effects of the Great Recession and the recent refugee crises around the world have potentially affected the relationships between these variables. Given the previous literature, we should expect to find a positive effect of unemployment on suicide rates, and a negative relationship between unemployment and refugees/asylum seekers.

III. Data and Methodology

1. Structural VAR

A. Endogenous Variables

The four main variables of interest are refugees, asylum seekers, unemployment, and suicides in the United States. Data for all four variables was collected for the years 1980 to 2018.

Refugees and Asylum Seekers

Annual data on refugees and asylum seekers was collected from the Department of

Homeland Security. According to the DHS website, “A refugee is a person outside his or her country of nationality who is unable or unwilling to return to his or her country of nationality because of persecution or a well-founded fear of persecution on account of race, religion, nationality, membership in a particular social group, or political opinion. An asylee is a person who meets the definition of refugee and is already present in the United States or is seeking admission at a port of entry.” By including both, we want to capture any possible additional effects of difficulties associated with assimilation experienced by asylum seekers, or any complications experienced by refugees who had not yet arrived in the United States.

Unemployment Rates

Annual unemployment rates from 1980-2018 were downloaded from the Bureau of Labor Statistics. According to the BLS website, “Persons are classified as unemployed if they do not have a job, have actively looked for work in the prior 4 weeks, and are currently available for work..” Specifically, the unemployment rate is calculated by the BLS as:

$$\text{Unemployment Rate} = \frac{\# \text{ of unemployed}}{\text{labor force}},$$

where labor force is defined as “the sum of employed and unemployed persons.”

Suicide Rates

Suicide data was downloaded from the OECD Data website. The suicide death rate is given per 100,000 people, and is not age adjusted (past literature has shown that suicides in people over 65 years old is not affected by unemployment, so leaving in

this section of the suicide data is mainly for the purpose of assessing any potential relationship between suicides and refugees/asylum seekers 65 years or older).

2. Dynamic Panel Data

A. Endogenous Variables

The four main variables of interest were the number of refugees, number of asylum seekers, unemployment rates, and suicide rates of the United States, France, and the United Kingdom. Annualized data was collected from 2008-2016 (2008 was included to calculate the 2009 growth rate for each variable).

Refugees and Asylum Seekers

Data on refugees and asylum seekers was collected from the United Nations High Commissioner for Refugees website for France and the United Kingdom. For the United States, annual refugee and asylum data was collected from the Department of Homeland Security (the same data from structural VAR model). Due to the more permanent nature of asylum seekers’ circumstances compared with refugees’, running these as separate variables allows us to analyze whether the more uncertain nature of refugees’ circumstances compared with asylum seekers has an additional impact on unemployment and suicide rates across the three regions.

Unemployment Rates

Annual unemployment data for France and the United Kingdom was downloaded from the OECD Data website, and United States annual unemployment data was collected from the Bureau of Labor Statistics’ website

(the same data from the structural VAR regression).

Suicide Rates

Suicide rates were collected from the OECD Data database for all three regions, and rates are given in terms of 100,000 persons. The OECD also indicates that because the methods of determining whether a death is deemed a suicide can vary across regions/countries, this must be taken into consideration when comparing suicide rates across different nations.

B. Exogenous Variables

Real GDP

Macroeconomic theory indicates that real GDP and unemployment are inversely related. Since suicide rates, refugees, and asylum seekers may all be significantly affected by unemployment rates, real GDP is included as a control variable in these regressions. Specifically, higher unemployment may lead to increases in suicides, and decreases in refugee and asylum seekers flows. Therefore, annualized data on real GDP was collected for all three regions from the OECD Data website, and translated into a growth rate variable for the regressions.

Life Expectancy

In line with previous literature, life expectancy in years of the population is included as a control variable, particularly in reference to suicide rates and unemployment within a region. This category was further distinguished between life expectancy of the total population, male life expectancy, and female life expectancy, since previous papers have indicated a strong inverse

correlation between male life expectancy and suicide rates. Annual data was collected from the OECD Data website for all three regions, and translated into growth variables.

Divorce Rates

Divorce rates for each of the three regions were included as a control variable for unemployment and suicide rates, since divorce can directly impact the mental health of civilians in a country, and may also be influenced by unemployment rates (a possible bi-directional relationship). Annual data on divorce rates was collected from the CDC for the United States, EuroStat for the United Kingdom, and EuroStat and INSEE for France. This was then translated into an annualized growth rate.

IV. Methodology

1. Structural VAR

This structural VAR model utilizes all four endogenous variables – the growth rates of refugees, asylum seekers, unemployment, and suicide rates – in the formula:

$$Ax_t = A_0 + A_1^*x_{t-1} + \dots + A_p^*x_{t-p} + B\varepsilon_t,$$

where the matrices A_i^* are the coefficient matrices for $i=1, 2, \dots, p$; x_t is a vector of k endogenous variables, ε_t is a vector of exogenous shocks, and B is the coefficient matrix of endogenous shocks vector. The reduced form of the above equation is:

$$x_t = A^{-1}A_0 + A^{-1}A_1^*x_{t-1} + \dots + A^{-1}A_p^*x_{t-p} + A^{-1}B\varepsilon_t$$

$$x_t = A_0 + A_1^*x_{t-1} + \dots + A_p^*x_{t-p} + A^{-1}B\varepsilon_t,$$

and a minimum number of $\frac{k(k-1)}{2}$

restrictions are placed on Matrix A. Suicide growth rate is hypothesized to be affected by refugee, asylum seeker, and unemployment growth rates. Specifically, the hypothesized relationships between the variables is:

$$\text{Refugee} \longrightarrow \text{Asylum} \longrightarrow \text{Unem} \longrightarrow \text{Suicide}, (1)$$

where refugee data affects the other three variables, asylum data affects only unemployment and suicide values, and unemployment affects only suicide rates. We run another regression with the variable flow:

$$\text{Unem} \longrightarrow \text{Refugee} \longrightarrow \text{Asylum} \longrightarrow \text{Suicide}, (2)$$

to examine a possible bi-directional flow between unemployment and refugees. For (1), the restrictions on matrix A are:

$$\begin{bmatrix} 1 & 0 & 0 & 0 \\ * & 1 & 0 & 0 \\ * & * & 1 & 0 \\ * & * & * & 1 \end{bmatrix} \begin{bmatrix} \text{refugee} \\ \text{asylum} \\ \text{unemployment} \\ \text{suicide} \end{bmatrix}$$

and for (2), the restrictions on matrix A are:

$$\begin{bmatrix} 1 & 0 & 0 & 0 \\ * & 1 & 0 & 0 \\ * & * & 1 & 0 \\ * & * & * & 1 \end{bmatrix} \begin{bmatrix} \text{unemployment} \\ \text{refugee} \\ \text{asylum} \\ \text{suicide} \end{bmatrix}$$

Augmented Dickey Fuller and Phillips Perron stationarity tests were run, with refugee and asylum growth rates significant at 1% without lags, and suicide and

unemployment growth rates significant at 5% with 2 lags.

2. Dynamic Panel Model

This dynamic panel model utilizes all four endogenous variables, as well as four exogenous control variables. Therefore, the transformed model is:

$$y_{it}^* = \beta_1 x_{1it}^* + \beta_2 x_{2it}^* + \beta_3 x_{3it}^* + \alpha_1 w_{1it}^* + \alpha_2 w_{2it}^* + \alpha_3 w_{3it}^* + v_{it}^*$$

where x_{it}^* is a dependent variable, w_{it}^* acts as a control variable, and v_{it}^* contains both within entity errors ε_{it} and between entity errors u_{it} .

Stationarity tests were conducted on the initial four variables, each measured with annual data – refugees, asylum seekers, unemployment rates, and suicide rates per 100,000 people – for the United States, France, and the United Kingdom. None of these initial variables passed the unit root stationarity test. Therefore, each was translated into an annualized growth rate, using the following formula:

$$gVariable = \left(\frac{Variable - LVariable}{LVariable} \right) * 100$$

The lagged growth rates for unemployment, suicide, and asylum seekers became stationary at the 5% and 10% significance levels, while the lagged growth rate p-value for refugees was 0.1738. However, given the corresponding Z score values for this variable, and its closeness to the critical values for the Im-Pesaran-Shin (IPS) unit root test, the lagged refugee growth rate

variable was kept in the data set and utilized in the regressions.

Life expectancy (total, male, and female), real GDP, and divorce rates were also translated into growth rates using the above formula. Each of these growth rates passed the IPS unit root test at either the 1% and 5% significance levels.

The Pedroni cointegration test was used to identify long-run cointegrations between the four variables (Table 1). Specifically, refugee and unemployment rates were unidirectionally cointegrated, with unemployment as the dependent variable. The growth rate of asylum seekers as the dependent variable with the growth rate of suicides was bi-directionally significant at 1%. In line with economic theory, the growth rate of suicides was not cointegrated with the growth rate of unemployment, but when the test was inversely conducted, a strongly significant cointegration was identified with suicide as the dependent variable and unemployment as the independent variable. From these results, we can conclude that the growth rates of refugees and unemployment across the United States, France, and the United Kingdom do have a long-term equilibrium trend, as well as refugee/asylum seekers and suicide rates. One of the strongest indications of cointegration comes from the unemployment and suicide rates, and is unidirectional.

V. Results

1. Structural VAR

The initial regressions were run using data from 1980-2018 with 2 lags for both (1) and (2). However, in every case, the coefficients on each variable were not significant at any

critical value. Therefore, to analyze whether information from the Great Recession and forward was affecting these results, the data was trimmed to exclude values of all four variables from 2008-2018. Again, two lags were initially used for these regressions. Using the variable order from (1), refugees were found to have a negative impact on unemployment, with a coefficient value of 0.1292 at a significance level of 10%. Asylum seekers were also found to have a negative impact on unemployment, with a coefficient value of 0.1220, also at the 10% significance level. The same variable order regression was run using four lags. In this case, refugees were found to decrease unemployment by 0.1644%, and asylum seekers decrease unemployment by 0.1606%, at the 1% and 5% significance levels, respectively. Additionally, refugees have a positive impact on suicide with a coefficient of 0.035, significant at 5%, and unemployment positively affects suicide with a coefficient of 0.1505, significant at 1%.

Using the variable flow from (2) and running the regression with two lags, unemployment is found to decrease growth of asylum seekers by 1.1012%, significant at the 5% level. Using four lags, unemployment decreases the growth rate of refugees and asylum seekers by 1.2423% and 1.3404%, and increases suicide rate growth by 0.1505%. Refugees' growth rate also positively affects the growth rate of suicides by 0.0354%.

In both (1) and (2), using four lags, unemployment and refugees/asylum seekers are found to have a negative impact on each other, suggesting that before the 2008 financial crisis, refugees and asylum seekers decreased unemployment, while high

unemployment possibly discouraged refugees and asylum seekers from coming to the United States. Additionally, unemployment is found to have a significant impact on suicide rates, which is in line with economic theory and previous articles' findings.

In all of the regressions, it was necessary to trim the data to pre-2008 financial crisis, indicating the possibility of a more systematic shock resulting from the Great Recession and impacting the relationships between the four main variables in this analysis. To shed light on this question, we analyze the results from the dynamic panel model.

2. Dynamic Panel Model

The first set of regressions used suicide growth rates as the dependent variable, with refugee, asylum seekers, and unemployment growth rates as the independent variables, and life expectancy (total), life expectancy (male), life expectancy (female), real GDP, and divorce rate growth rates as control variables. After running a Hausman test, the random effects model was determined to be a better fit than fixed effects. When including either total or male life expectancies, which were also significant at 1%, refugees' growth rate was found to decrease the growth rate of suicides, while unemployment had a positive effect. However, when only using life expectancy of females, the impact of refugees and unemployment became insignificant. This regression also suggests that in line with previous literature, life expectancy is strongly correlated with suicide rates in a region.

The next set of regressions utilizes unemployment growth rate as the dependent

variable, and the same variables from the first set of regressions were used. Suicide rate was excluded as a regressor, since both the Pedroni cointegration tests and economic theory suggest that suicide rates do not impact unemployment. Additionally, to further assess the different effects of refugees' and asylum seekers' growth rates on unemployment, these variables were run separately. Table 7 shows the positive effect refugees have on unemployment, as well as the positive impacts of life expectancies for all three groups. The life expectancies' results are logical, since people who are expected to live longer will want or need to work more years, thereby increasing the number of people in the workforce available to fill the same number of positions and creating a higher unemployment growth rate. However, the positive impact of refugees and asylum seekers on unemployment contradicts previous literature, since past results have shown that refugees and asylum seekers actually decrease unemployment. These results may stem from a systematic change resulting from the 2008 financial crisis, since this data is from 2008-2016. Another possible explanation may be that changes of refugees and asylum seekers' growth rates is unrelated to the growth rate of unemployment. We know that unemployment increased significantly from 2009-2012 (and in France, continued to increase after this time period), and due to refugee crises occurring around the same time, this may have led to results which may falsely appear to be related. However, given the results of the Pedroni cointegration tests, it seems highly illogical to conclude that these variables are completely unrelated. It is more realistic to conclude that there are additional variables involved with

unemployment, refugees, and asylum seekers that may be directly and indirectly influencing these variables' current relationships, and that the Great Recession did in fact cause or contribute to these additional variables.

The third set of regressions, shown in Table 8, contains refugee growth rates as the dependent variable, with all of the original regressors included. Here, asylum seekers and suicide rates are found to decrease the growth rate of refugees, while unemployment has a positive and weakly significant impact in the regression which includes male life expectancy. Additionally, in the regression including female life expectancy, the growth rate of real GDP has a negative impact on the growth rate of refugees. The most statistically significant results across the three regressions are the suicide rates, which suggest that an increase in suicide rates decreases the growth rate of refugees. This may be due to the relationship between suicides and economic conditions – for example, if a worsening economy increase suicide rates, those same economic factors may cause refugees to choose other countries in which to seek refuge, with the hope that better economic conditions in the other region will increase their chances of safety and survival. However, if refugees are randomly assigned to countries, i.e. they do not have a choice in where they end up, as Becker and Ferrara (2019) discover, this explanation does not apply. In this case, a country's increase in suicide rates may be connected to other factors which make the region less able to voluntarily take in more refugees, so the growth rate of refugees in that host region decreases.

VI. Conclusion

In conclusion, while the structural VAR and dynamic panel data models validated expected relationships between some of the four main variables, they also illustrated new relationships between the growth rates of refugees and unemployment, and refugees and suicide rates. After the initial results from the structural VAR model did not present significant results, further analysis showed that other systematic effects of the Great Recession may be influencing the long-term equilibrium of refugee and unemployment growth rates. Specifically, while refugee growth was found to decrease unemployment in the United States before the Great Recession, the dynamic panel model utilizing data from 2009-2016 displayed a positive relationship between unemployment and refugee growth rates. Since previous literature which has focused on data from before the Great Recession also found a negative correlation between unemployment and refugee rates, it is essential to understand why the relationship between refugee and unemployment growth rates has changed.

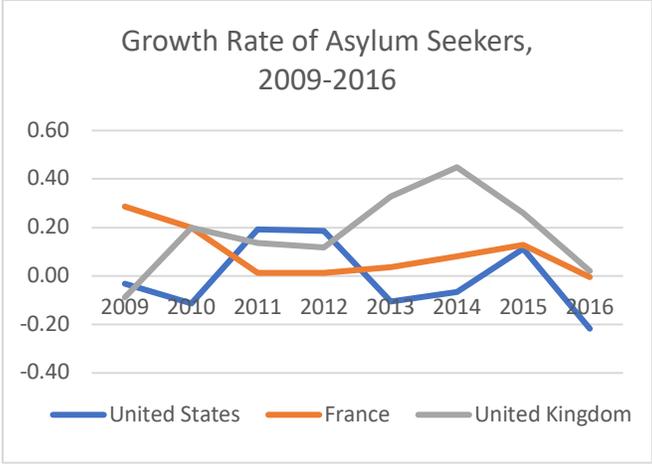
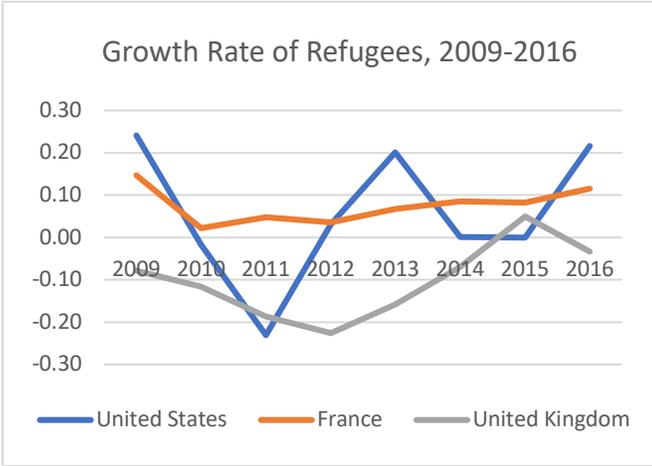
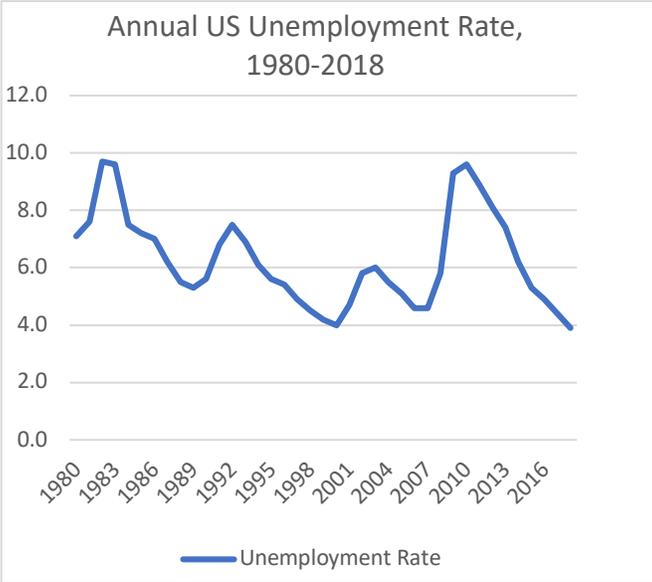
This poses a new question – through what mechanisms did the Great Recession change the long-run equilibrium relationships between unemployment and refugee/asylum seekers?

More research is necessary to continue analyzing the results found in this paper, and to translate them into understanding the effects future global economic shocks, such as COVID-19, may have on refugees, asylum seekers, and host country populations. Including additional variables, such as changes in a nation's sentiment towards immigration, or new policies and legislation enacted by politicians with different views from their predecessors, may

assist in explaining these results. By understanding how global economic shocks can change the relationships between unemployment, refugees, asylum seekers, and suicide rates, economists and lawmakers

can further develop effective, dynamic policies which protect the safety of refugees fleeing from political instability and warfare, while also balancing the well-being of citizens in these host regions.

Appendix



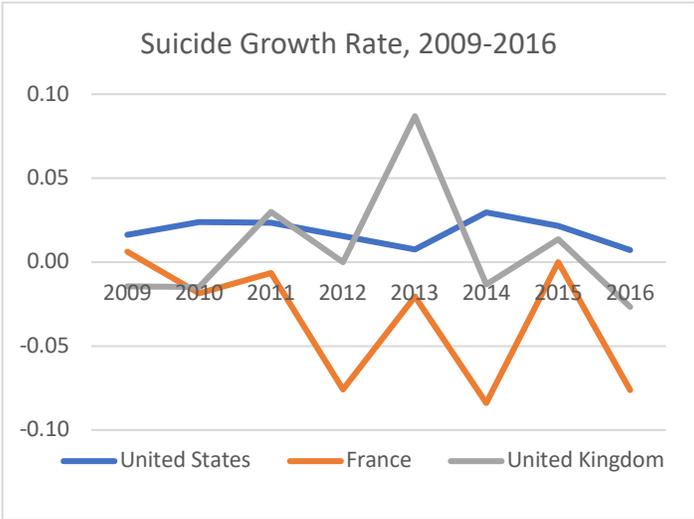
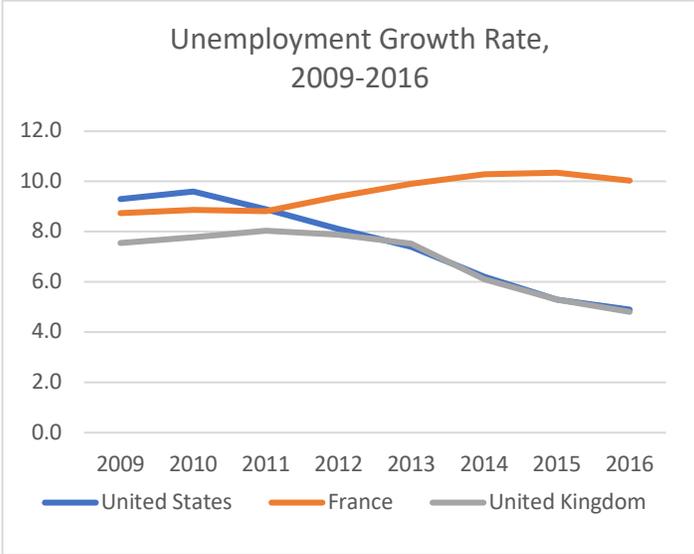


Table 1. Pedroni Tests for Cointegration, p-values

	<i>gRefugee and gUnem</i>	<i>gUnem and gRefugee</i>	<i>gRefugee and gSuicide</i>	<i>gSuicide and gRefugee</i>	<i>gAsylum and gSuicide</i>	<i>gSuicide and gAsylum</i>	<i>gUnem and gSuicide</i>	<i>gSuicide and gUnem</i>
<i>Modified Phillips-Perron t</i>	0.1193	0.1061	0.1863	0.4502	0.2195	0.3478	0.2024	0.4050
<i>Phillips-Perron t</i>	0.2259	0.0000	0.0895	0.0000	0.0015	0.0000	0.0000	0.0000
<i>Augmented Dickey-Fuller t</i>	0.2593	0.0056	0.4714	0.0000	0.0001	0.0000	0.1882	0.0000

Table 2. Structural VAR Estimated Matrix A for Equation (1), with Two Lags (Standard Error)

	<i>Refugees</i>	<i>Asylum</i>	<i>Unemployment</i>	<i>Suicide</i>
<i>Refugees</i>	1.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)
<i>Asylum</i>	-0.2333 (0.2370)	1.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)
<i>Unemployment</i>	-0.1292* (0.0748)	0.1220* (0.0619)	1.0000 (0.0000)	0.0000 (0.0000)
<i>Suicide</i>	0.0085 (0.0193)	-0.0069 (0.0162)	0.0343 (0.0488)	1.0000 (0.0000)

Table 3. Structural VAR Estimated Matrix A for Equation (1), with Four Lags (Standard Error)

	<i>Refugees</i>	<i>Asylum</i>	<i>Unemployment</i>	<i>Suicide</i>
<i>Refugees</i>	1.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)
<i>Asylum</i>	0.0596 (0.1996)	1.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)
<i>Unemployment</i>	-0.1644*** (0.0613)	-0.1606** (0.0639)	1.0000 (0.0000)	0.0000 (0.0000)
<i>Suicide</i>	0.0354** (0.0162)	0.0029 (0.0166)	0.1505*** (0.0481)	1.0000 (0.0000)

Table 4. Structural VAR Estimated Matrix A for Equation (2), with Two Lags (Standard Error)

	<i>Unemployment</i>	<i>Refugee</i>	<i>Asylum</i>	<i>Suicide</i>
<i>Unemployment</i>	1.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)
<i>Refugee</i>	-0.6079 (0.4759)	1.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)
<i>Asylum</i>	-1.1012** (0.5590)	-0.3443 (0.2276)	1.0000 (0.0000)	0.0000 (0.0000)
<i>Suicide</i>	0.0343 (0.0488)	-0.0085 (0.0193)	0.0069 (0.0162)	1.0000 (0.0000)

Table 5. Structural VAR Estimated Matrix A for Equation (2), with Four Lags (Standard Error)

	<i>Unemployment</i>	<i>Refugee</i>	<i>Asylum</i>	<i>Suicide</i>
<i>Unemployment</i>	1.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)
<i>Refugee</i>	-1.2423** (0.4932)	1.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)
<i>Asylum</i>	-1.3404** (0.5336)	-0.1737 (0.1997)	1.0000 (0.0000)	0.0000 (0.0000)
<i>Suicide</i>	0.1505*** (0.0481)	0.0354** (0.0162)	0.0029 (0.0166)	1.0000 (0.0000)

Table 6. Dynamic Panel model results, with Suicide Rate as the dependent variable

<u>Variables</u>	<u>Dependent Variable: Suicide Rate (growth)</u>		
Refugees	-0.0961* (0.0579)	-0.1112** (0.0483)	-0.0880 (0.0621)
Asylum Seekers	0.0097 (0.0676)	0.0086 (0.0672)	0.0120 (0.0684)
Unemployment	0.0258** (0.0119)	0.0428*** (0.0033)	0.0157 (0.017)
Life Expectancy, Total	-2.8640*** (1.0056)		
Life Expectancy, Male	-4.6397*** (1.4863)		
Life Expectancy, Female	-1.6670*** (0.5475)		
Real GDP	0.0002 (0.007)	-0.1225 (0.0007)	0.0000 (0.0007)
Divorce Rates	-0.1433 (0.2339)	-0.1225 (2.3229)	-0.1540 (0.2241)

Table 7. Dynamic Panel model results, with Unemployment as the dependent variable

<u>Variables</u>	<u>Dependent Variable: Unemployment (growth)</u>					
Refugees	0.4332*** (0.1649)	0.4621*** (0.1612)	0.4224** (0.1938)			
Asylum Seekers				-0.1355 (0.2945)	-0.1490 (0.2725)	-0.1392 (0.3103)
Life Expectancy, Total	21.2063** (10.5499)			19.6359** (9.1352)		
Life Expectancy, Male	24.4518* (13.0593)			22.0552** (10.1907)		
Life Expectancy, Female				18.6097** (7.4991)		
Real GDP	0.0056 (0.01056)	0.0051 (0.0010)	0.0068 (0.0116)	0.0045 (0.1435)	0.0040 (0.0140)	0.0056 (0.0154)
Divorce Rates	-2.6474 (2.1704)	-0.0630 (0.7369)	0.0780 (0.8939)	-0.1684 (0.8569)	-0.2481 (0.7416)	-0.1104 (0.9146)

Table 8. Dynamic Panel model results, with Refugee as the dependent variable
Variables Dependent Variable: Refugee (growth)

Asylum Seekers	<i>-0.3560**</i> <i>(0.1753)</i>	<i>-0.3355*</i> <i>(0.1746)</i>	<i>-0.3607**</i> <i>(0.1754)</i>
Suicide Rates	<i>-0.8342***</i> <i>(0.2069)</i>	<i>-0.9761***</i> <i>(0.2753)</i>	<i>-0.7629***</i> <i>(0.1993)</i>
Unemployment	<i>0.2679</i> <i>(0.1701)</i>	<i>0.2996*</i> <i>(0.1751)</i>	<i>0.2492</i> <i>(0.1799)</i>
Life Expectancy, Total	<i>-10.4861</i> <i>(8.9311)</i>		
Life Expectancy, Male		<i>-14.6320</i> <i>(13.0202)</i>	
Life Expectancy, Female			<i>-7.7489</i> <i>(5.7087)</i>
Real GDP	<i>-0.0042</i> <i>(0.0026)</i>	<i>-0.0037</i> <i>(0.0028)</i>	<i>-0.0049**</i> <i>(0.0023)</i>
Divorce Rates	<i>-0.5178</i> <i>(0.4275)</i>	<i>-0.4584</i> <i>(0.4034)</i>	<i>-0.5517</i> <i>(0.4173)</i>

References

- Ao, et. al (2012). "An Investigation into Suicides among Bhutanese Refugees in the US 2009 – 2012." Centers for Disease Control and prevention: Stakeholders' Report, October 2012.
- Becker and Ferrara (2019). "Consequences of forced migration: A survey of recent findings." *Labour Economics*, Volume 59, August 2019, pages 1-16.
- Boubtane, Ekrame, Coulibaly, Dramane, and Rault, Christophe (2012). "Immigration, Growth and Unemployment: Panel VAR Evidence from OECD Countries." Discussion Paper No. 6966, October 2012.
- Breuer, Christian (2014). "Unemployment and Suicide Mortality: Evidence from Regional Panel Data in Europe." GFS Working papers, No.2, February 2014.
- Carballo, Manuel and Nerukar, Aditi (2001). "Migration, Refugees, and Health Risks." *Emerging Infectious Diseases Conference Panel Summaries*, Vol. 7, No. 3 Supplement, June 2001.
- Erden, Seyhan. "Structural VAR, Lecture 6" Lecture Slides. 12 Mar. 2020.
- Erden, Seyhan. "Lecture 10 Panel and Dynamic Panel Models." Lecture Slides. 2 Apr. 2020.
- Erden, Seyhan. "Lecture 11 Dynamic Panel Models." Lecture Slides. 9 Apr. 2020.
- Trovato, Frank (1986). "A Time Series Analysis of International Immigration and Suicide Mortality in Canada." *International Journal of Social Psychiatry*. June 1, 1986.