THE RELATIONSHIP BETWEEN SUSTAINABLE DEVELOPMENT GOALS AND MIGRATION. AN EU-28 PERSPECTIVE

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Abstract

This study approaches migration from the perspective of an effect of the attainment of Sustainable Development Goals. In order to analyse this relationship, several indicators used to measure the SDGs attainment level were employed. These indicators are also the ones related to migration. The results show that most indicators that are used to measure the achievement of SDGs have an impact on the migration flow. Consequently, GDP per capita and unemployment rate, as main indicators used to measure the Goal 8 (Sustainable economic growth, productive employment and decent work for all), have significant impact on migration, being main factors of immigration.

The main conclusion is that there is a bilateral relationship between migration and SDGs. Not only that migration can influence the achievement of sustainable development, but, at the same time, it is itself influenced by how well the Sustainable Development Goals are attained.

Keywords: migration, SDG, panel data, sustainable development, EU-28

JEL Classification: C23, F22, O15, Q01

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1. Introduction

Migration is a very complex and difficult issue to standardize, but it can be summarized as a process of seeking the best ways to survive. Over time, the changes in the reasons of migration have been in line with the evolution of society. Nowadays, given the reasons and motivation to migrate, migrations can be viewed from several perspectives. Faist (2011) has a synthesized approach regarding the reasons to migrate, and describes three levels of analysis: micro (which refers to individual decision usually the reasons arise from expectations and aspirations), mezzo (in this case the migration decision is related to the social relationships and the desire to join their families or a social group) and macro (which are related to economic and political aspects when they consider the decision to migrate). This paper explores the migration flows related to the decisions to migrate generated by macro reasons, which are also some of the indicators of sustainable development goals.

Migration is seen as a part of sustainable development, but isn't this an actual interconnected relationship? Isn't sustainable development also a part of migration? Looking at the reasons of migration, we could say that migrants are in search of a better quality of life (Hagen-Zanker, 2008), therefore achieving a sustainable development may be a pull factor for migrants. Most studies analyse the migration as an explanatory variable for achieving the SDS's (Bali Swain and Yang-Wallentin, 2020; Holliday et al., 2019; Laczko, 2016).

This paper enriches the actual literature by analysing the relationship between Sustainable Development Goals and migration from a reversed perspective. The main objective is to determine if there is an inverse connection between migration and SDGs.

The main focus of this study is on European Union countries before Brexit, and, due some data retrieving limitations described in the following sections, it only covers the period between 2012 and 2017. To show how migration is influenced by the SDGs indicators was applied a panel data analysis based on panel data regression models.

Results confirm that there is a bilateral relationship between migration and SDGs and that migration itself is influenced by how well the Sustainable Development Goals are attained.

The paper is organised as follows: section two focuses on the main literature regarding migration ad SDGs, the third section moves on the methodology employed and gives a description of the data retrieving and the variables, section four presents the results obtained and the conclusions.

2. Literature review. Migration and SDGs

When it comes to the relationship between migration and development many studies have considered the existence of a strong relationship between them (Haas, 2010; Skeldon, 2014). The main development channel associated to migration is through remittances, though the

governments started to show full attention at the beginning of 1990 when in some developing countries the remittances were exceeding the foreign direct investments (Sharma and Knio, 2011; Anghel et al, 2017). However, the studies shifted between a positive and negative perception of the influence of migration towards development, hence researchers on migration and development can be divided in migration optimists and migration pessimists (Haas, 2010). Balkyte and Tvaronavičiene (2011) observed that migration is viewed positively in the European Union and that it has positive effects on the development of a country, but it cannot be said if it is such a long-term effect as to influence sustainable development. Migration can also positively contribute to economic development of both country of origin and the receiving country (Beine et al, 2001; Taylor, 2006), especially if the migrants are skilled workers and/or highly educated, and if the human capital gap between natives and immigrants is small (Dimian, 2011; Chen and Fang, 2013).

In literature, the relationship between migration and sustainable development is mostly treated from the perspective of the migration role in order to achieve the SDGs. IOM Director General William Lacy Swing stated that “*migration is an issue to act upon to enhance sustainable development*”¹, so migration is seen as a determinant factor of SDGs.

According to the Migration Data Portal², not all Sustainable Development Goals are related to migration. For an easier understanding, Table 1 brings together all migration-related SDGs, with their descriptions and main targets as identified by Osborn et al. (2015).

Table no. 1: Main SDGs related to migration

SDGs	Description and main targets
Goal 1. End poverty in all its forms everywhere	Continues the MDG targets to eradicate extreme poverty. This goal is mainly intended for low-income countries, but developing countries are also targeted due to the fact that some sectors of the society are dealing with poverty.
Goal 3. Ensure healthy lives and promote well-being for all at all ages	Health services are poorly developed in developing countries. Due to this aspect, the main targets are to promote a healthy life, to reduce mortality due to major causes of illness or due road accidents, and to improve the access to medical care.
Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	For the developing countries, this goal implies easy access to all types of education. The developed countries have already achieved this goal.
Goal 5. Achieve gender equality and empower all women and girls	This goal is as relevant for developed countries as it is for developing countries, the main purpose being to adopt adequate policies in order to reduce gender disparities of all kind (related to work, jobs, businesses, politics or different types of physical exploitation).

¹ https://www.iom.int/sites/default/files/our_work/ICP/MProcesses/IOM-and-SDGs-brochure.pdf

² <https://migrationdataportal.org/sdgs?node=0>

SDGs	Description and main targets
Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	This goal is seen as a pillar for achieving the other goals, being important for both developed and developing countries. The main targets refer to increasing the level of GDP per capita. Developed countries are well known to already have high levels of GDP per capita. Other targets within this goals are related to creating new jobs or increasing employment rates, which are considered as weakness for developed countries.
Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	Developing countries need massive investments in infrastructure and industrialization, while developed countries must focus on the sustainable development of their existing industries and infrastructures.
Goal 10. Reduce inequality within and among countries	This goal is addressed to all countries in order to unify the differences between them, due to the fact that developed countries tend to have similarities, but developing countries tend to have significant differences within and between them.
Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable	The main focus of this goal involves affordable housing, investments in public transportation or creating green recreational spaces which concern both developed and developing countries.
Goal 13. Take urgent action to combat climate change and its impacts	A worldwide concern and the main target of this goal is to reduce the greenhouse gas emissions.
Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	This goal impacts on justice, the main target being to promote impartiality and transparency of justice.
Goal 17. Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development	This goal implies all the countries and refers to “ <i>the power of togetherness</i> ”.

Source: Osborn, Cutter, and Ullah, 2015.

3. Method and Data

3.1. Method

Migration is considered usually a cause for SDG, but what if the migration is indeed the effect for setting the SDGs? Are the SDGs actually important determinants on migration? Do they actually influence the migration wave and in which direction? To respond to this questions, this research uses a panel data regression model that implies two dimensions, both cross-sectional and time. Hsiao (2014) describes the linear regression equation for panel data as a function of the following form:

$$y_{jt} = \beta_{0j} + \sum_{i=1}^k x_{ijt} \cdot \beta_{ij} + \varepsilon_{jt} \quad (1)$$

Where: $j = 1, \dots, N$, N represents the crossectional entity, in this case country;

$t = 1, \dots, T$, T represents the time observations, in this case year;

i represents the index of independent variables;

y_{jt} represents the dependent variable for country j and year t ;

x_{ijt} represents the independent variable i ($i = 1, \dots, k$) for country j and year t ;
 β_0 represents the intercept which is common for all countries;
 ϵ_{jt} represents the residual term independently and identical distributed with mean zero and continuous variation.

There are various types of linear regression models to estimate when referring to panel data. This article will consider the following:

- pooled regression, which in fact refers to the classic linear regression model by not taking into consideration both the variation between and within, and actually pooled all the data together;
- fixed effects model highlights how the variables vary over time, taking into consideration the variation within;
- random effects model highlights how the variables vary over individuals (in this case over countries) by taking in consideration the variation between (Torres-Reyna, 2007).

Panel data is known to be used in the analysis of migration determinants (Mayda, 2010; Condratov, 2018; Přívara, 2019) thus can be applied to analyse whether the SDGs determine migration.

In order to analyse the relationship between migration and some of the indicators related to SDGs, were estimated three types of panel data regression models: pooled regression, fixed effects and random effects. To decide the favoured model were applied the following test: the Hausman for fixed vs random effects test and the Breusch-Pagan Lagrange multiplier for pooled vs random effects test. The analyses consist in three stages of estimations:

- First stage includes all the variables of interest with no intervention on the variables regarding stationarity or heteroscedasticity.
- Second stage was study the presence of unit root and to estimate by using all variables that contained unit root without unit root applying the first difference operator in the second model;
- Third stage was to re-estimate the second model with robust standard errors in order to correct heteroscedasticity (StataCorp, 2015).

The data set consists of 28 European Union countries (including the United Kingdom before Brexit)— and only covers the period between 2012 and 2017, due some data retrieving limitations described in the following section. The panel data models and the goodness of fit tests were estimated with Stata 13.

3.2. An overview of conceptual issues regarding data retrieving

As previously mentioned, the SDGs main problem is related to inconsistent and missing key indicators that could be used for the analyses of the impact and evolution of the SDGs. However, the transition from the MDGs to the SDGs has shown that room for improvement

always exists. Hence, now, in the period of using the SDGs, there is a chance that new indicators will be developed in order to achieve sustainable development.

According to United Nations General Assembly (2017) most of the key indicators are still in the early stage of methodology and data sources discussions. This may be one of the issues to prevent the deadlines of SDGs from being successfully met. Other aspects regarding data retrieving consist in changed methodologies, as in the case of the Corruption Perception Index. Until 2011, the corruption perceptions index was scored from 0 to 10, where 0 stood for a high perception of corruption, and 10 for a clean country. Starting with 2012, the methodology has been changed and the corruption index has been scaled from 0 to 100, where 0 stands for a high level of corruption and 100 for the lowest level of corruption in a country. Due to the differences in methodology, the Corruption Perception Index computed up to 2011 is not comparable with the Corruption Perception Index computed from 2012 onwards (Transparency International, 2012). Therefore, the analysis period starts with 2012 and ends with 2017, as that was the last year with available data for the gas emission per capita variable.

The dependent variable considered is the crude rate of net migration plus adjustment as the focus of the study is on migration flows as a consequence of achieving the SDGs. The variable is obtained by dividing the difference between immigrants and emigrants by 1000 inhabitants, which means that a negative value shows that the overall phenomenon is inclined towards emigration. The variables of interest are shown in Table 2. with a short description according to Eurostat database tree and Metadata and the SDGs related to the migration as Migration Data Portal present them. Not all previously goals are covered by variables in this study, mainly due to incomplete data series.

Table no. 2: Description of the variables employed in the analysis

Variable	Description	Related SDG
Corruption Index	Refers to the perceived level of corruption in the public sector and is measured on a 0-100 scale, where 100 represents the lowest level of perceived corruption.	Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
GDP per Capita	Is measured for the economic activity and development. It refers to the value of the total output of goods and services produced by an economy and is computed as GDP divided to the average population in a specific year.	Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
Employment of Recent Graduates Male	Persons aged 20 to 34 gender male fulfilling the following conditions: employed according to the ILO definition, have attained at least upper secondary education (ISCED 3) as the highest level of education and not having received any	Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

Variable	Description	Related SDG
	education or training in the four weeks preceding the survey and four, having successfully completed their highest educational attainment 1, 2 or 3 years before the EU Labour Force Survey (EU-LFS).	
Employment of Recent Graduates Female	Persons aged 20 to 34 gender female fulfilling the following conditions: employed according to the ILO definition, have attained at least upper secondary education (ISCED 3) as the highest level of education and not having received any education or training in the four weeks preceding the survey and four, having successfully completed their highest educational attainment 1, 2 or 3 years before the EU Labour Force Survey (EU-LFS).	Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
Early Leavers Male	Persons age 18-24 gender male as percentage of total population, with at most lower secondary education who were not involved in any education or training during the four weeks preceding the EU Labour Force Survey (EU-LFS).	Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
Early Leavers Female	Persons age 18-24 gender female as percentage of total population with at most lower secondary education who were not involved in any education or training during the four weeks preceding the EU Labour Force Survey (EU-LFS).	Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
Overcrowding Rate	Computed as the percentage of the population living in an overcrowded household. Living in an overcrowded household is considered if the household does not have at its disposal a minimum of rooms that not exceed two persons per room for the entire household.	Goal 1. End poverty in all its forms everywhere
Unemployment Total	Number of unemployed persons aged 15 to 74 as a percentage of the labour force based on International Labour Office (ILO) definition.	Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
Tertiary Education Total	Population with tertiary educational attainment level 25-34 years, measures the share of the population aged 30-34 who have successfully completed tertiary studies: ISCED 2011 level 5-8 for data from 2014 onwards and to ISCED 1997 level 5-6 for data up to 2013.	Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
Risk At Poverty Total	The share of persons with an equivalised disposable income below the risk-of-poverty threshold, which is set at 60 % of the national median equivalised disposable income (after social transfers). The indicator is based on the	Goal 1. End poverty in all its forms everywhere

Variable	Description	Related SDG
	EU-SILC (statistics on income, social inclusion and living conditions).	
Life Expectancy At Birth Total	Refers to the mean number of years that a new-born child can expect to live if subjected throughout his life to the current mortality conditions.	Goal 3. Ensure healthy lives and promote well-being for all at all ages
Gas Emission Per Capita	measures total national emissions of greenhouse gases.	Goal 13. Take urgent action to combat climate change and its impacts
EU Imports from Developing Countries	Is defined as the value (at current prices) of EU imports from developing countries.	Goal 17. Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development
Income Distribution	Ratio of total income received by the 20 % of the population with the highest income (top quintile) to that received by the 20 % of the population with the lowest income (lowest quintile).	Goal 10. Reduce inequality within and among countries
Expenditures on R&D	Measures gross domestic expenditure on R&D as a percentage of the Gross Domestic Product.	Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
Household Expenditures	Expenditures with household consumption as percent of GDP	Goal 3. Ensure healthy lives and promote well-being for all at all ages

Source: Author's interpretation based on Eurostat Database and Metadata.

In order to emphasize the gender gap and to tackle *Goal 5. Achieve gender equality and empower all women and girls*, the variables early leavers and employment of recent graduates were computed as new variables by dividing the value of female to the value of male as it follows:

- *EarlyLeaversGenderGap* is the ratio between Early Leavers Female and Early Leavers Male, which means if the value is higher than one, the female early leavers exceeds the male early leavers.
- *EmplRecentGraduatesGenderGap* is the ratio between Employment of Female Recent Graduates and Employment of Male Recent Graduates, also in case a value is over one means that female exceeds the male values of the variable.

4. Results and discussions

In order to analyse the relationship between migration and some of the indicators related to SDGs, three types of panel data regression models were estimated: pooled regression, fixed effects and random effects. The analyses consist in three stages of estimations:

- First stage includes all the variables of interest with no intervention on the variables regarding stationarity or heteroscedasticity, this stage refers to the estimates presented in the Model 1;
- Second stage was to estimate by using all variables without unit root, for this was applied the stationarity test for all variables of interest and those which presented unit root were applied first difference operator presented in the Model 2;
- Third stage was to re-estimate the Model 2 with robust standard errors to correct heteroscedasticity (StataCorp, 2015).

The first step was to study the summary statistics regarding the variables of interest (Appendix), and the results showed that the number of observations for the three types of variation were: Overall variation N=128 (28x16); Between variation n=28; Within variation T=6. This aspect is important for the stationarity analysis. To study the stationarity of the variables involved, the Harris–Tsavalis test was used. The stationarity test confirms that the model estimates are appropriate (Hrazdil et al., 2020; Beyer and Smets, 2014). Harris–Tsavalis test is used for dataset with small time dimension and large cross-sectional dimensions (Harris and Tsavalis, 1999). So, to apply this test, N should be higher than 25 observations. In this case N=28 and T=6, which implies as appropriate the use of the test for this dataset.

The test suggests the presence of stationary only for the following variables: overcrowding rate, risk at poverty, life expectancy at birth, income distribution, early leavers' gender gap and employment of recent graduates' gender gap. All the other variables contain unit root; however, the variable tertiary education is stationary at 10% level of significance. The Harris–Tsavalis test was also applied on the variables with first difference to verify the presence of stationary still persists. The results are presented in Table no. 3 for both dimensions: variable in level and the variable on which was applied the first difference operator.

Table no. 3: Summary results for the stationarity tests

Independent Variables	P-Value for the variable in level	P-Value for the variable with first difference
CorruptionIndex	0.561	0.000**
GDPperCapita	0.989	0.000**
OvercrowdingRate	0.023**	-
UnemplTotal	0.901	0.001**
TertiaryEdTotal	0.074*	-
RiskAtPovertyTotal	0.012**	-
LifeExpectancyAtBirthTotal	0.000**	-
GasEmissionPerCapita	0.320	0.000**
EUimportsFromDevelopingCountries	0.748	0.000**
IncomeDistribution	0.022**	-
ExpenditureonRD	0.735	0.000**

EarlyLeaversGenderGap	0.000**	-
EmplRecentGraduatesGenderGap	0.000**	-

***P-value<0.05, *P-value<0.10*

Source: Author's calculation.

The second step was to estimate the panel data multiple regression models. As previously mentioned, the estimates were for three types of panel data: pooled regression, fixed effects and random effects. To choose between the three types of models, Hausman test for fixed vs. random effects and Breusch and Pagan Lagrangian multiplier test to verify if pooled regression is actually appropriate for the analysis were applied.

For the first stage of the analysis, the results showed that fixed effects is the right approach due to the post-estimation tests results. Also, according to Hausman test (Table no. 4), the null hypothesis is rejected and it can be concluded that the random effects model would be inconsistent. For the second and third stage the result of Hausman is not statistically significant so random effects is a better option to the estimates. The results of estimates with random effects must be viewed with reluctance because through first difference the number of T observations is significantly reduced. Also, Breusch and Pagan Lagrangian multiplier test for random effects showed that for the estimated model that the Prob > chibar2 is under the significance level alpha of 0.05, which means that the null hypothesis is rejected and the data cannot be pooled.

Table no. 4: Fixed vs. Random Effects

	Model 1	Model 2
Hausman	23.45*	11.09

**P-value<0,05*

Source: Author's calculation.

Regarding the goodness of fit tests, we can observe the existence of serial correlation, which in case of micro-panels is not an issue and usually apply on macro-panels with more than 20 to 30 T observations (Torres-Reyna, 2007). Also, the presence of heteroscedasticity can be observed, which in this case was applied to a third stage of analysis by estimating the model from the second stage with robust standard errors. The estimation of the regression model with robust standard errors is a way to correct heteroscedasticity (StataCorp, 2015).

Table no 5: Goodness of fit tests

Serial Correlation	F(1, 27) = 6.71*
Heteroscedasticity	chi2 (28) = 5711.94*

Cross-sectional dependence	Model 1= 1.878
Pesaran's test of cross sectional independence	Model 2 = -1.467
	Model 3= -1.467

*P-value<0,05

Source: Authors' calculation.

Also, the cross-sectional dependence was tested using the Pesaran's test of cross sectional independence, which shows if the residuals are correlated across the individuals (in this case we refer to countries) (Torres-Reyna, 2007). The results presented in Table no 5. show there is no cross-sectional dependence due to the fact that Pesaran's test is not statistically significant.

R-Square has different values for the fixed effects model compared to the random effects model. In case of the fixed effects model, the R-Square has a larger value for the variation within. This happens because there is an influence over time on the crude rate migration of the independent variable. As for the random effects model estimated in stage two the value of R-Square is larger for the variation between, which shows that there is an influence on crude rate migration over the countries of the independent variables.

The value of Rho can be explained in two ways depending on the type of the estimated model. Considering the fixed effects model for which we have a value, Rho shows which is the proportion of the variation explained by the individual time-invariant term, which is a component of the residual term. As for the random effects model, Rho refers to the fraction of the total variance owing to error the residual term (Baum, 2006). This means that in case of fixed effects, 97.45% of the variation for crude rate migration is due to the differences across panel. As in the case of random effects for the model from stage 3, the variation of the individual-specific term is explained by the constant term in proportion of 38.88% and 61.12% is explained by the error term.

Table no. 6: Summary statistics from the panel data regression models

	Model 1	Model 2	Model 3
R-sq within	0.3338	0.2437	0.2308
R-sq between	0.1465	0.5113	0.4525
R-sq overall	0.0947	0.4583	0.4095
Rho	0.9745	0.72919	0.61167

Source: Author's calculation.

The first explanatory variable in the model is Corruption Perceptions Index. As was mentioned before, due to the changed methodology starting with 2012 and because the comparison cannot be made with previous values, the panel starts with year 2012. Several studies show that corruption can be an obstacle to sustainable development. Begu et al. (2019)

analysed corruption index in relationship with GDP per capita as an indicator of economic growth. The result showed that countries with high GDP per capita have low levels of corruption perceptions. Also, Cooray and Schneider (2014) analysed the Corruption Perception Index from 1995 to 2010 and showed that corruption has an important influence on increased rates of emigration.

In this study, the results obtained in the first stage shows that corruption has a negative coefficient, which means the higher the corruption index is, the migration flow tends towards emigration. In the second and third stages, the corruption index was estimated using the first difference operator and the result was not statistically significant, though it had a positive coefficient. It appears that a change in a short time of the level of corruption index will generate a migration flow towards immigration. The main limitation of this result starts with the changed methodology, therefore further research is needed on panels with longer time series in order to better highlight the influence over time of corruption index on migration flows.

Table no. 7: Results of the multiple regression models estimates for panel data

CrudeRateofNetMigration	Model 1	First difference	
		Model 2	Model 3 (robust estimation)
	Stage 1	Stage 2	Stage 3
CorruptionIndex	-0.3442**	-	-
RiskAtPovertyTotal	0.48771	0.9741**	0.95405*
LifeExpectancyAtBirthTotal	-2.178**	0.7766*	0.7689**
EmplRecentGraduatesGenderGap	18.311**	9.8732	10.6296
UnemplTotal	-0.4916**	-	-
TertiaryEdTotal	0.23707**	0.0147	0.0147
GDPperCapita	0.00029*	-	-
EUimportsFromDevelopingCountries	0.00002	-	-
IncomeDistribution	-2.075*	-3.921**	-3.4906**
ExpenditureonRD	-2.543	-	-
GasEmissionPerCapita	-0.9056*	-	-
EarlyLeaversGenderGap	8.6625**	10.944**	10.774**
OvercrowdingRate	0.37425**	-0.0598	0.2345
D1.CorruptionIndex	-	0.124	0.1128
D1.GDPperCapita	-	0.00036	0.00037*
D1.UnemplTotal	-	-0.5194	-0.6023
D1.GasEmissionPerCapita	-	-0.2994	-0.2182
D1.EUimportsFromDevelopingCountries	-	-0.000093	-0.000095
D1.ExpenditureonRD	-	3.3532	5.1271*
constant	168.64**	-73.17*	-72.419*
Wald chi2(df)	-	(15)=59.55**	(13)=47.44**

CrudeRateofNetMigration	Model 1	First difference	
		Model 2	Model 3 (robust estimation)
	Stage 1	Stage 2	Stage 3
F test(df1,df2)	(13,127)=4.9**		

**P-value<0,05, *P-value<0,10

Source: Author's calculation.

The same behaviour in all three stages of the analysis can be noticed regarding the statistical significance with the variables: unemployment rate and gas emission per capita. The results in this case are more likely in line with the socio-economic logic, as for both variables it can be observed that the migration flow is inclined towards immigration.

The second variable employed was the risk of poverty. In the first stage of estimation, the variable was not statistically significant, however for the second and third stages, it was significant at 5%, respectively at 10% significance level. The results show that, if the risk of poverty increases, the migration flow is towards immigration. The overcrowding rate is only statistically significant at the first stage of analysis, also generating an immigration flow for the specific country.

Overcrowding rate together with the risk of poverty are some indicators measured for reducing poverty at all its forms. The results are unexpected, due to the fact that for both variables, the migration flow is towards immigration and not emigration. In this case, further investigations need to be done.

Life expectancy at birth is an indicator of health on attainment of SDGs. The results from all three stages of analysis showed that there is a direct and significant impact on crude rate migration. Hence, for a one-year increase in life expectancy at birth, the migration flow is towards immigration, which means that the countries with a higher life expectancy are attraction points for migrants.

The variable “European Union imports from developing countries” has no statistically significant results for any of the three stages of analysis.

In stage one regarding the GDP per capita, it can be observed that there is a direct and significant impact on crude rate migration, while expenditures on Research and Development has no statistically significant result. This result shows that an increase in GDP per capita will generate a migration flow towards immigration. As for the second and third stages, it can be observed that both have the same behaviour, and only for the third stage of analysis are the coefficients statistically significant. It appears that a change in a short time of one year for the GDP per capita and expenditures on Research and Development will also generate an immigration flow for the specific country.

The first difference model shows that the present decisions are influenced by the past determinants.

The variable income distribution actually refers to income inequalities. The results for all the three stage are direct and statistically significant, which shows that an increase in income inequalities will incline the migration flow of a specific country towards immigration.

According to ILO (2015), women represent the highest share population of migrants, about 73.4% worldwide, of which 11,4% are from the European Union. This article involves two indicators regarding gender gap: employment of recent graduates' gender gap and early leavers' gender gap. In the first stage of analysis, both were statistically significant and showed that an increase will generate an immigration flow. For the second and third stages, only the leavers' gender gap ratio was statistically significant, also showing a direct relationship with crude rate migration. These results are accordingly to ILO (2015), as most domestic migrants are women.

5. Conclusions

The main focus of this article was on the research of the SDG-migration relationship. The aim was to see if the effects of migration were not unilateral, but bilateral and, in fact what, influenced the migration at macroeconomic level. Although for the achievement of SDGs, migration is considered as a factor that interferes in this process of sustainable development, the process can no longer be seen unidirectional, as the bilateral relationship between development and migration is obvious.

Though the results were mixed, most of the them were in line with the main studies related to the relationship between migration and the main development indicators. One of the most important results that are confirmed is that GDP per capita and unemployment rates are important factors that shape the migration flow (Anaraki, 2018; Přívara, 2019). Also, the gender gap is demonstrated through the perspective of female migrants, as ILO (2015) shows that it represents the majority of domestic migrants.

Regarding the limitations of the study, I want to emphasize a recognized issue: the data availability, or rather their lack and inconsistency. This issue is well known and was debated in connection to the Agenda 2030 (Laczko, 2016). The problem of data collecting should be a main concern for all institutions, especially due to the fact that data can be a common and easy to understand language in the evaluation and description of a phenomenon.

This study gives an insight of how migration can be influenced by achieving SDGs. Albeit not all the predictors were significant in the empirical models, future research on these issues can help on understanding migration phenomenon and also formulating policies that ease the achievement of the Sustainable Development Goals.

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Appendix

Variable		Mean	Std. Dev.	Min	Max	Observations
CrudeR~s	overall	2.139286	6.722774	-17.4	31.3	N = 168
	between		6.107132	-7.48333	19.76667	n = 28
	within		3.00255	-11.1941	16.72262	T = 6
Corrup~x	overall	64.22619	14.86615	36	92	N = 168
	between		14.91948	41.66667	90.33333	n = 28
	within		2.252964	57.39286	69.72619	T = 6
RiskAt~l	overall	16.76786	3.774327	8.6	25.4	N = 168

Variable		Mean	Std. Dev.	Min	Max	Observations
	between		3.746644	9.4	24.21667	n = 28
	within		0.792769	13.90119	19.15119	T = 6
LifeEx~l	overall	79.76429	2.79279	74.1	83.5	N = 168
	between		2.812058	74.58333	83.15	n = 28
	within		0.358835	78.68095	80.86429	T = 6
EmplRe~p	overall	0.953048	0.060508	0.786773	1.095484	N = 168
	between		0.0499	0.855886	1.013736	n = 28
	within		0.035296	0.869025	1.082622	T = 6
Unempl~l	overall	9.742857	5.021374	2.9	27.5	N = 168
	between		4.795779	4.683333	24.75	n = 28
	within		1.703911	4.559524	14.19286	T = 6
Tertia~l	overall	39.72321	9.347727	21.7	58.7	N = 168
	between		9.143236	24.45	54.58333	n = 28
	within		2.506827	30.35655	45.40655	T = 6
GDPper~a	overall	27157.14	11512.32	12000	74500	N = 168
	between		11508.45	13000	71850	n = 28
	within		2013.596	18240.48	37340.48	T = 6
EUimpo~s	overall	31126.1	44324.58	467	172056	N = 168
	between		44852.07	611.3333	155620.3	n = 28
	within		3631.902	19591.27	53916.27	T = 6
Income~n	overall	4.951488	1.168789	3.4	8.32	N = 168
	between		1.150599	3.466667	7.106667	n = 28
	within		0.286052	3.726488	6.164821	T = 6
Expend~D	overall	1.588274	0.862332	0.38	3.4	N = 168
	between		0.867135	0.453333	3.245	n = 28
	within		0.119191	1.196607	2.15994	T = 6
GAsEmi~a	overall	9.409524	3.450735	5	24.3	N = 168
	between		3.462496	5.8	21.46667	n = 28
	within		0.52692	7.742857	12.24286	T = 6
EarlyL~p	overall	0.706373	0.18036	0.258929	1.211765	N = 168
	between		0.166344	0.427649	1.043638	n = 28
	within		0.075419	0.509994	1.097873	T = 6
Overc~te	overall	18.87917	15.47472	1.4	51.6	N = 168
	between		15.65143	2.333333	49.45	n = 28
	within		1.354216	13.02917	25.04583	T = 6