

GEOG3006 - Quantitative Methods

Exam paper

Candidate no: 10026

Abstract

Migration is one of the most important issues in Europe and Norway. This makes it important to understand what affects the attitude of people towards immigrants. Hence this paper aims to explore how the number of years of education affects attitudes towards immigration in Norway. The study uses the data from European Social Survey (2018) to analyse related variables and test the hypothesis of whether the number of years of education have any effect on immigrant attitude. The dependent variable used was 'Immigrants make country worse or better place to live', while the independent variables were 'Years of full-time education completed', 'Age', 'Gender', 'Placement on left-right scale' and 'How religious are you'. The study performed a multivariable linear regression and found that higher number of years education does have a positive effect on how one perceives migration. The study used four different models to test the hypothesis. For future research, it could be interesting to see how people in Norway view immigrants from diverse backgrounds and if it makes the results any different.

1. Introduction

Migration has become one of the most important social issues in Europe, as it is one of the most widely chosen destination for immigration (Schmidt, 2021). This decade has been the time where migration has become an extremely delicate topic within politics of European nations due to Syrian and Afghan civil wars. Now with the war in Ukraine, it is again a topic that needs to be understood better, and how the citizens perceive migration and migrants. Although European nations were initially welcoming, we saw a change in their acceptance after few years. Some felt their 'europeanness' is being stolen.

Higher educated people are expected to be more tolerant and empathetic, and also tend to have a more secure future and easier resource availability (Schahbasi, Huber and Fieder, 2021). (Blom, 2010) in their study in 2010 found how highly educated people in Norway who have more contact with immigrants and tend to have a more positive attitude towards immigration. However, it was found that people still fear if immigrants will exploit the social benefits in Norway, and how few want an increase in immigrants. (Schahbasi, Huber and Fieder, 2021) also found how higher education in Europe plays a significant role in not only having a positive attitude towards immigrants, but also towards immigrants from backgrounds different Europe. (Hello, Scheepers and Slegers, 2006) in their study found how more educated people in the Netherlands tend to keep less distance from other ethnic minorities.

This makes studying the effects in a Norwegian context interesting, as Norway has been a place that has taken many refugees due to wars in other countries and is also one of the few countries that offered free education to students from outside the European Economic Area. With the recent events of the government planning to impose a fee on the students from outside the EEA, and universities, including their Norwegian students and faculties protesting around it, makes this an interesting study to conduct (regjeringa.no, 2022). Hence this study wants to explore if having more years of education has a positive effect to immigration in Norway.

Hypothesis testing will be used for the analysis, with the null hypothesis defined as -

H_0 = Years of education does not have an effect on how people perceive migration in Norway

While the alternative hypothesis is:

H_a = Years of education has an effect on how people perceive migration in Norway

(Schmidt, 2021) in their study about how cohort affects the attitudes towards immigrants in Western Europe, found how the attitude towards immigrants changed over the years of 2002-2018 as older cohorts were replaced by younger generation. This could be understood as the older generation in Europe was the one that faced the World War 2 in their younger age while the current generation was more or less been secured and has a higher opportunity for education. Hence age could be a relevant variable to use in this study.

(Dempster, Leach and Hargrave, 2020) in their study about public attitude towards immigrants found how people prefer immigrants who have a similar background like them. This makes taking in account the religious background interesting, as major immigrant background in Scandinavian countries is from the global south, which do not share the same religious values.

(Ponce, 2017) in their study to assess the role of gender towards immigrant attitude, found how contrary to popular belief, in some cases woman can have more negative attitude towards immigrants than men. (Schahbasi, Huber and Fieder, 2021) in their study however found that men have a more negative attitude, and it tends to increase with age. Hence it can be interesting to see if age and gender also determine how people perceive immigrants.

It is already well known, and various studies have also shown that people who have an alignment towards the right of the political scale, tend to have a more negative attitude towards immigration. (Yılmaz, 2012) in their study found how right-wing politics has damaged reputation of Muslim immigrants all around Europe. Hence the study would also use the variable defining the respondent's alignment on the political scale to assess the effects on immigrant attitudes.

The data used in this study is from the European Social Survey 9 (2018). ESS is an academically driven survey that is conducted every two years and looks at the attitudes and behaviours of the citizens of European countries (ESS, n.d.). A multivariable linear regression analysis would be performed on the chosen variables, to test if the null hypothesis will be accepted or rejected.

Summarizing this, the study wants to explore a relation between years of full-time education and how it effects attitude towards immigration. The dependent variable from the ESS dataset will be `imwbcnt` (Immigrants make country worse or better place to live) while the independent variable will be `eduyrs` (Years of full time education completed). The other control variables used will be `agea` (Age of respondent, calculated), `rlgdgr` (How religious are you?), `gndr` (Gender) and `lrscale` (Placement on left right scale).

1.1 Structure of the paper

Chapter 1 introduces to the topic, the hypothesis, the variables and the control variables used.

Chapter 2 explains in detail about the dataset, the variables used and about the methodology to conduct the analysis.

Chapter 3 explains about the models created for the analysis and the results obtained.

Chapter 4 discusses about the results and limitations of the study, and the last chapter concludes the findings.

2. Data and methods

2.1. Dataset

For this paper, the data is obtained from the European Social Survey (ESS). The ESS is a cross-national survey that is conducted every two years in Europe, since 2001 (ESS, n.d.). The survey is academically driven and measures the attitudes, beliefs, and behaviour of the citizens of European nations. The survey is conducted through face-to-face interviews by trained professionals with a structured interview approach. The survey selects new sample members each round, and each country achieves a minimum sample size of 1500. For countries smaller than 2 million inhabitants, 800 is the minimum sample size. The data is available free of charge for non-commercial use (ESS, n.d.).

For the analysis, the data will be filtered for Norway only. Hence, the ESS9 will be used, which is the data collected in 2018 as this is the latest release where data for Norway is available.

The sample size after filtering for Norway is 1406. The survey also filtered values for respondents who refused to answer for a particular question. After removing samples that did not answer for the selected variable and outliers, the effective sample size for the analysis is 1295.

2.2. Variables

The variable to assess the attitude of respondents towards migration in their country is “Is [country] made a worse or a better place to live by people coming to live here from other countries?” (imwbent). The variable is ordinal, with respondents having an option to rate between the lowest value, 0 (Worst place to live) till 10 (Better place to live). The average response was 5.93. This variable is used as the dependent variable in this analysis.

To assess the education level of respondents the years of full-time education completed variable is used. The respondents answered the question, “About how many years of education have you completed, whether full-time or part-time? Please report these in full-time equivalents and include compulsory years of schooling.”. The mean response for this variable was 14.08. The variable had few values with just 1 respondent, which were the ones

that had the number of years of education more than 22 years. These values were dropped from the analysis.

To assess the political leaning of the respondents, the variable, the placement on left right scale was selected. The question was “In politics people sometimes talk of 'left' and 'right'. Using this card, where would you place yourself on this scale, where 0 means the left and 10 means the right?”. The respondents had an option to choose between 0 (Left) to 10 (Right). The mean response was 5.037.

To know about the respondent’s attitude towards religion, the How religious are you variable was used the question was “Regardless of whether you belong to a particular religion, how religious would you say you are?”. The respondents had an option to choose between 0 (Not at all religious) to 10 (Very religious). The mean response was 3.197.

The analysis uses age of the respondents, which was a calculated variable based on the respondent’s year of birth. The minimum age was 15 and the maximum age was 90. The mean age was found to be 47.12.

The analysis also uses the gender of respondents, which will be used as a dummy variable. 55.33 % respondents were males and 44.66% respondents were females. For the dummy variable, males were coded as 1, while females were coded as 0.

The detailed descriptive variables are presented in Table 1.

Table 1: Descriptive statistics of variables used in the study

		Percent	Mean	S.D.	Min	Max
imwbcnt			5.936	2.04	0	10
agea			47.12	18.03	15	90
eduyrs			14.02	4.23	0	22
lrscale			5.037	2.4	0	10
gndr	Male	55.33				
	Female	44.66				
rlgdgr			3.197	2.73	0	10

2.3 Methodology

2.3.1 Cleaning the dataset

All values with responses like ‘Don’t know’, were converted to NA and dropped from the analysis. Other outlier values in the variable ‘Education years’ were also dropped. All the variables then had a few NA values after the filter and the observations were reduced from 1406 to 1295.

Further, correlation plot was created to check for any multicollinearity. No correlation was found more than 0.5 and hence there was no multicollinearity.

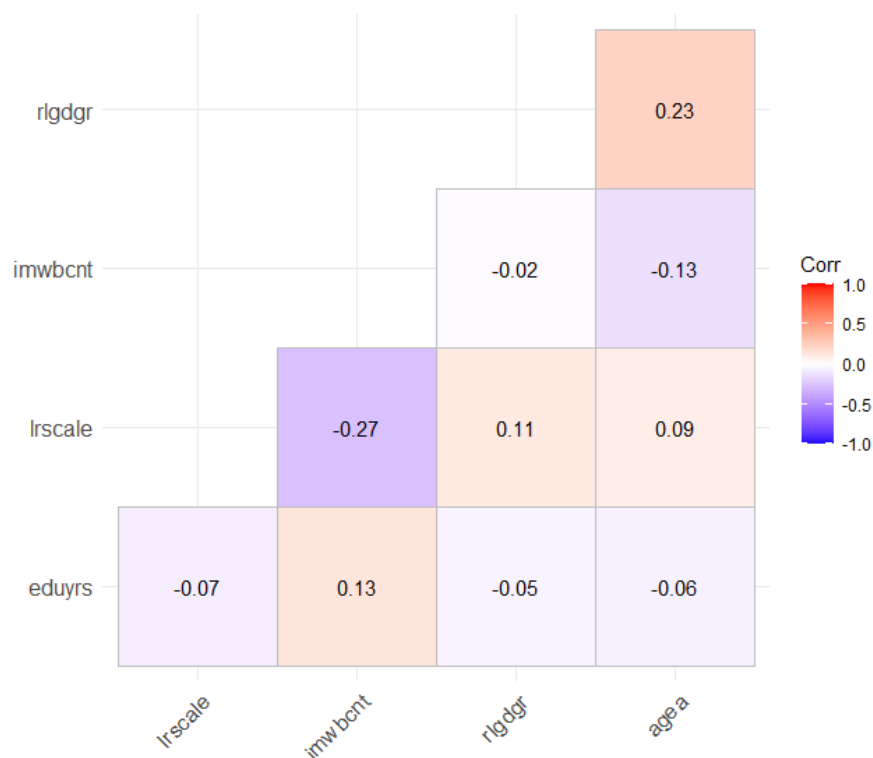


Figure 1: Correlation matrix of variables

Then dummy variable was coded for the gender variable, with female coded as 0 and male coded as 1.

2.3.2 Linear Regression

A linear regression model was performed for the analysis. Four linear regression models were run with separate set of variables as the independent variables. The threshold for statistical significance was chosen as 0.05, which is the value most used in social sciences.

The analysis was performed using the software RStudio. The code written in the R programming language is attached in the appendix.

3. Results

A multivariable linear regression was used for the analysis. Four different models were used with adding more independent variables after every model. y represents the dependent variable, α represents the intercept, βx represents the constants, while ε represents the error.

3.1 Preliminary models

The null model will have the variable `imwbcnt` (Immigrants make a country worse or better place to live) as the dependent variable (y).

$$y = \alpha + \varepsilon$$

The first model was a simple linear regression with `imwbcnt` (Immigrants make a country worse or better place to live) as the dependent variable (y) and `eduyrs` (Years of full-time education completed) as the independent variable.

$$y = \alpha + \beta_1 * education + \varepsilon$$

In model 2, `agea` (the age of the respondents) and a dummy variable of gender are added. In the dummy variable, males are coded as 1 and females as 0.

$$y = \alpha + \beta_1 * education + \beta_2 * age + \beta_3 * gender + \varepsilon$$

The results from the first two models are shown in Table 2.

Table 2: Results from preliminary models

Variable	Model 1			Model 2		
	Coefficient	Standard Error	Significance	Coefficient	Standard Error	Significance
Intercept	5.05485	0.19437	***	5.997641	0.257287	***
Education years	0.06455	0.01327	***	0.057596	0.013172	***
Age (agea)				-0.012801	0.003081	***
Gender (gender) [Male =1]				-0.431398	0.112082	***
Multiple R squared	0.01796			0.04273		
Adjusted R-squared	0.0172			0.04051		
Significance codes	0 '***'	0.001 '**'	0.01 '*'			

3.2 Results from preliminary models

From the results presented in Table 2, we found that the number of year of full-time education has a positive effect on developing a positive attitude towards immigrants, with the results being statistically significant. However, the value of r-squared was low (0.017). Fig. 2 shows the scatter plot between years of full-time education and positive attitude towards immigrants. It can be seen that the model does not have a good fit.

In the second model, we see that both years of education and age have a statically significant relationship with attitude towards immigrants. Age has a negative coefficient, which means that older age group has a lesser positive attitude towards immigrants compared to younger generation. When it comes to gender, the model shows us that males have a more negative attitude towards immigrants than females. There is also some increase in the value of R-squared. The higher the r-squared, the better fit the model is.

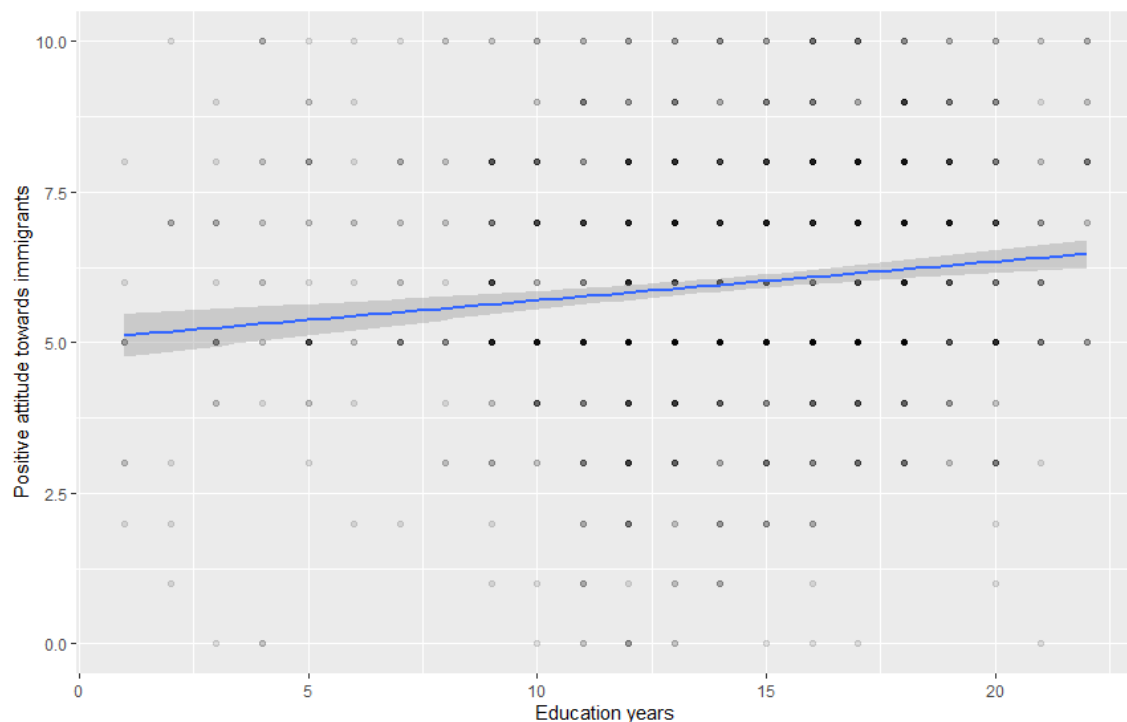


Figure 2: Scatter plot between Education Years vs Attitude towards immigrants

3.3 Improved models

In model 3, two more independent variables are added in order to improve the model. The two variables are rlgdgr (How religious are you) and lrscale (Placement on left right scale).

$$y = \alpha + \beta_1 * education + \beta_2 * age + \beta_3 * gender + \beta_4 * religion + \beta_5 * left_right_scale + \varepsilon$$

In Model 4, the interaction term between age and gender (agea*gndr) is added to the improved model 3.

$$y = \alpha + \beta_1 * education + \beta_2 * age + \beta_3 * gender + \beta_4 * religion + \beta_5 * left_right_scale + age * gender + \varepsilon$$

The results from the two improved models are shown in Table 3.

Table 3: Results from improved models

Variable	Model 3			Model 4		
	Coefficient	Standard Error	Significance	Coefficient	Standard Error	Significance
Intercept	6.930264	0.273677	***	6.780112	0.310603	***
Education years	0.050978	0.012812	***	0.050981	0.012811	***
Age (agea)	-0.011155	0.003078	***	-0.007916	0.004418	.
Gender (gender) [Male =1]	-0.283621	0.111231	*	0.004861	0.303352	
Religion(rlgdgr)	0.016735	0.020579		0.017048	0.020581	
Left-Right-Scale(lrscale)	-0.209134	0.022885	***	-0.209398	0.022886	***
Interaction(agea:gender)				-0.006113	0.00598	
Multiple R squared	0.101			0.1018		
Adjusted R-squared	0.09754			0.09757		
Significance codes	0 ****	0.001 ***	0.01 **			

3.4 Results from improved models

From the results of improved models, presented in Table 3, we find that the left right scale has a statistically significant result, with people on the left side of political preference have a feeling that immigrants make the country a better place to live.

Believing in religion does not have a statistically significant result on how one perceives immigrants. There was some increase in the value of r-squared compared to model 2, showing it makes the model a bit better as compared to model 2, the R-squared has increased from 0.04 to 0.101.

In Model 4 the interaction term was added, however its relation to the dependent variable was not found to be statistically significant. The increase in R- squared was also very small when compared to Model 3.

Even with the full model, we find that the relation between the years of education and attitude towards immigrants stays statistically significant, with higher years of education pointing towards a more positive attitude towards immigration.

4. Discussion

After creating the full model that included five independent variables and an interaction term, it was found that the total years of full-time education has a positive effect on how people perceive migration in Norway. Hence the null hypothesis, that the number of years of education does not have an effect on how people perceive migration in Norway can be rejected. Even after adding several variables, the effect of number of education years and perception towards migration was found positive. However, the overall R square was low even with the full model, but it improved in the final model compared to the preliminary model. The R squared for the final model was 0.10. This shows the model may not have a good fit.

The relation between the political alignment and attitude towards immigrants was also found, with respondents who ranked themselves on the left side of the political spectrum had a more positive attitude towards immigrants compared to the ones on the right.

The relation between age and attitude towards immigrant was also found to be statistically significant in Model 3, with a negative coefficient. This shows that respondents who are young had a more positive attitude towards immigrants compared to the older generation.

In model 2, it was found that the coefficient of the gender variable was negative. This shows that females have a more positive attitude towards immigrants compared to men. No statistically significant relation was found between being religious and attitude towards immigrants.

One of the most significant limitations with this study is that it does not look at the difference of migrant backgrounds. From the literature it was understood that people tend to have a more negative attitude towards people who aren't similar to them (Blom, 2010). So, a study that would have been based on how citizens in Norway perceive migrants from outside Europe would have been much more fruitful.

Another limitation with this study is that it uses the ESS9 dataset which is from 2018, as that was the most latest data available for Norway. The years post 2018 have been much more turbulent due to covid19 and the war between Russia and Ukraine. Hence, with a latest dataset, we may see a change in how people in Norway perceive migrants and migration.

Future research in this topic could be necessary and useful as if there is no more free education for international students, there might be lesser exposure for Norwegian students in higher studies and can thus also affect how they perceive immigrants in the future.

Future research could also focus on if economic situation, that is sometimes correlated with years of education, has an effect on how people view migration in their countries.

5. Conclusion

The study explored if the number of years of education has an effect on how one perceives immigrant's role in Norway. It was found that it does have an effect, with more the number of years of education, the more positive attitude they have towards the immigrants. The study also found how age and political alignment also have an effect on how one perceives migration. Older people and people on the right side of the political spectrum tend to have a more negative attitude towards immigrants. One of the limitations with this study was that it did not take into account the background of the immigrants. Hence, for future research, difference in attitudes of Norwegians between immigrants from Europe and outside Europe could be explored to have a better understanding.

Bibliography

- Blom, S. (2010) Attitudes towards immigrants and immigration, *Immigration and immigrants*, 2010, pp. 133-150.
- Dempster, H., Leach, A. and Hargrave, K. (2020) Public attitudes towards immigration and immigrants, *ODI: London*.
- ESS (n.d.) *European Social Survey*. Available at: <https://www.europeansocialsurvey.org/> (Accessed: 14th December 2022).
- Hello, E., Scheepers, P. and Slegers, P. (2006) Why the more educated are less inclined to keep ethnic distance: An empirical test of four explanations, *Ethnic and Racial Studies*, 29(5), pp. 959-985.
- Ponce, A. (2017) Gender and anti-immigrant attitudes in Europe, *Socius*, 3, pp. 2378023117729970.
- regjeringa.no (2022) *Utenlandske studenter skal betale for å studere i Noreg*. Available at: <https://www.regjeringen.no/no/aktuelt/utenlandske-studenter/id2930852/> (Accessed: 14th December 2022).
- Schahbasi, A., Huber, S. and Fieder, M. (2021) Factors affecting attitudes toward migrants—An evolutionary approach, *American Journal of Human Biology*, 33(1), pp. e23435.
- Schmidt, K. (2021) The dynamics of attitudes toward immigrants: Cohort analyses for Western EU member states, *International Journal of Comparative Sociology*, 62(4), pp. 281-310.
- Yilmaz, F. (2012) Right-wing hegemony and immigration: How the populist far-right achieved hegemony through the immigration debate in Europe, *Current sociology*, 60(3), pp. 368-381.

Appendix – R code

```
#loading_libraries
```

```
library(tidyverse)
```

```
library(ggplot2)
```

```
library(ggcorrplot)
```

```
#Loading_dataset
```

```
ess <- read.csv('ESS9.csv')
```

```
#filter_for_norway
```

```
ess <- ess[ess$cntry == "NO",]
```

```
view(ess)
```

```
#creating_dataset
```

```
ess <- select(ess, imwbcnt, agea, eduyrs, lrscle, gndr, rlgdgr)
```

```
view(ess)
```

```
#exploring_variables
```

```
table(ess$imwbcnt)
```

```
table(ess$eduyrs) #few outliers
```

```
table(ess$lrscle)
```

```
table(ess$rlgdgr)
```

```
table(ess$gndr)
```

```
#cleaning_dataset
```

```
ess$agea[ess$agea == 999] <- NA
```

```
sum(is.na(ess))
```

```
ess <- na.omit(ess)
```



```
summary(ess)
```

```
#cleaning imwbcnt dataset
```

```
ess$imwbcnt[ess$imwbcnt == 88] <- NA
```

```
sum(is.na(ess))
```

```
ess <- na.omit(ess)
```

```
summary(ess)
```

```
#cleaning lrscle
```

```
ess$lrscle[ess$lrscle > 76] <- NA
```

```
sum(is.na(ess))
```

```
ess <- na.omit(ess)
```

```
summary(ess)
```

```
#cleaning eduyrs
```

```
ess$eduyrs[ess$eduyrs > 22] <- NA
```

```
sum(is.na(ess))
```

```
ess <- na.omit(ess)
```

```
summary(ess)
```

```
#cleaning rlgdgr
```

```
ess$rlgdgr[ess$rlgdgr == 88] <- NA
```

```
sum(is.na(ess))
```

```
ess <- na.omit(ess)
```

```
summary(ess)
```

```
#correlation test
```

```
ess %>%
```

```

dplyr::select(eduysrs, lrscaler, imwbcnt, rlgdgr, agea) %>%

cor(.) %>%

ggcorrplot(., type = "lower", lab = TRUE)

#recoding gndr as dummy variable

#Recode gndr, 0 = Female, 1 = Male

ess[ess$gndr == 2, "gender"] <-0

ess[ess$gndr == 1, "gender"] <-1

#Regression models

m1 <- lm(imwbcnt ~ eduysrs, data = ess)

summary(m1)

m2 <- lm(imwbcnt ~ eduysrs+agea+gender, data = ess)

summary(m2)

m3 <- lm(imwbcnt ~ eduysrs+agea+gender+rlgdgr+lrscaler, data = ess)

summary(m3)

m4 <- lm(imwbcnt ~ eduysrs+agea+gender+rlgdgr+lrscaler+agea*gender, data = ess)

summary(m4)

#scatter plot

ggplot(data = ess, aes(x=eduysrs, y=imwbcnt)) +

  geom_point (alpha = 0.1) +

  geom_smooth(aes(x = eduysrs, y = imwbcnt), method = "lm", formula = y ~ x)+

  labs(x = 'Education years', y = 'Positive attitude towards immigrants')

```