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The relationship between migration flows and ageing populations across Europe

A research about the relationship between the ageing populations in Europe and migrations flows across Europe.

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Abstract

This research will look at the relationship between migration flows and the ageing population across Europe. Data measuring the Migration Effectiveness Ratio (MER), gross-, net-, inflow- and outflow migration and the population aged 65 years and over, are gathered to explore this relationship. The relationship is explored by means of the Pearson's correlation. Geographical patterns of the ageing population across Europe, and the migration factors associated with an ageing population are also explored. The results of the analysis show that there is no correlation between the MER and net migration per 1.000 inhabitants, and the population aged 65 years and over. However, there is a negative correlation between the variables gross- and inflow migration. This means when the gross- or inflow migration increases, the ageing problem will decrease. On the other hand, there is a negative correlation as well between the outflow migration and the population 65 years and above. This means that if the outflow migration increases, the ageing problem will decrease. Furthermore, to see if there are any geographical patterns, maps are made by GIS. There is a pattern visible in the ageing populations across Europe. Especially Italy, Greece and Portugal are showing high percentages of old-age population. This pattern does not match with the pattern of migration flows in Europe. Namely, especially in the Eastern part of Europe there is more outflow migration than inflow migration, while the opposite is the case for Western Europe. An explanation could be that since the accession of the A8, a lot of people from the Eastern countries in Europe, migrated to the Western part. Especially Poland shows that it has a lot of outflow migration and countries like the United Kingdom and Germany receive a lot of Polish migrants. Those migrants are mostly labor migrants and it may be that without this positive net flow the population ageing issues in the UK and Germany would be more severe than they currently are.

Keywords: migration, ageing populations, Europe, geographical patterns ageing populations

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Part I: Introduction

1.1 Background

Population ageing was one of the most important demographic events in the twentieth century, and this will remain the case in the twenty-first century (United Nations, 2002). Population ageing is the process by which the share of older individuals becomes proportionally larger in comparison to the working-age population (Eurostat, 2017). It is a consequence, among other things, of lower fertility and the longer life expectancy (Bijak et al., 2007). Figure 1 presents the old-age dependency ratio of the EU-28 in 2016. The old-age dependency ratio is the number of persons 65 years and over per one hundred persons 15 to 65 (United Nations, 2002). As shown, the share of the population aged 65 years and over, is expected to rise significantly in the European Union.
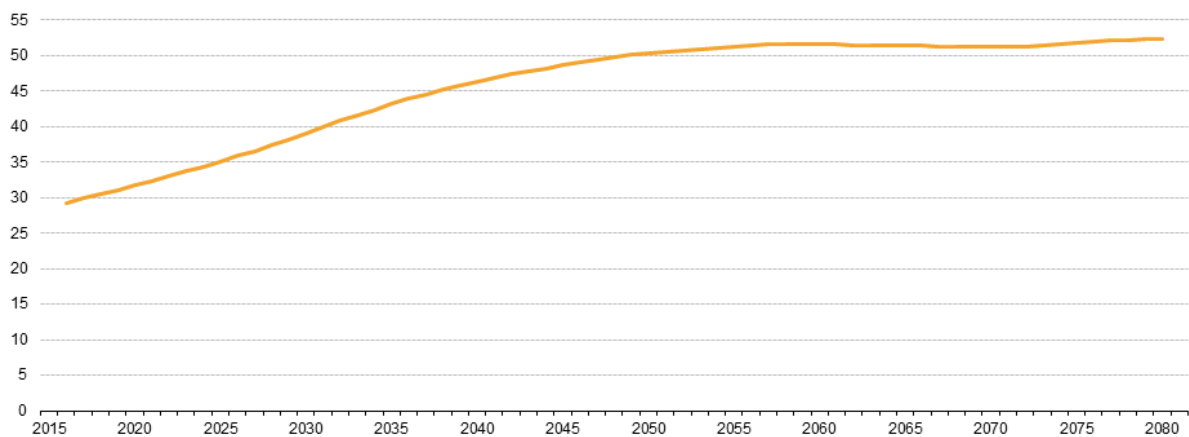

Figure 1: Old-age dependency ratio, EU 28 in 2016 (%).
Data source: http://ec.europa.eu/eurostat/statistics-explained/images/f/fc/Projected_old-age_dependency_ratio%2C_EU-28%2C_2016-80_%28%25%29.png

While this is a European wide issue, certain countries are experiencing more rapid and profound population ageing. According to Eurostat (2017), Greece for example has one of the highest shares of population aged 65 years and over in 2016, with the share at 21,3%. Ireland, on the other hand, has one of the lowest shares of population aged 65 years and over in 2016, namely a share of 13.2%.

There are a lot of side effects of this ageing process according to the United Nations (2002). Some of the implications are for pensions and social care and health costs policies where the proportionately ever smaller working age population is paying for the benefits of a proportionately growing retired population (Tinker, 2002). Although some of these side effects are not yet critical, appropriate measures have to be implemented soon, to prevent possible consequences of ageing in the future (Bijak et al., 2007).

A solution to this ageing problem, according to Bijak et al. (2007), could be migration. International migration has been increasing for the past five decades. This will even increase furthermore due to the growing gap in wages, living standards and demographic features between developed and developing countries (Abubakar & Normaz, 2013). According to Ginsburg (1994), migration is a global and a local issue. There are recipient and sending countries on every continent, which leads to local

consequences on sending and recipient communities (Ginsburg, 1994). An example of a sending country is Greece. As The Guardian (2015) states, the people who left Greece are often young, talented and high skilled. Therefore, Greece is facing the biggest 'brain drain' in modern history (Guardian, 2016). This brain drain could be caused by the balancing of economic prospects in the origin country and destination country by young highly skilled individuals. The moves typically take place towards countries offering better economic prospects, such as in most OECD countries (Abubakar & Normaz, 2013). This has resulted in a dramatic surge in migration among highly educated populations away from less economically developed countries. A brain drain is a major obstacle to the development of countries, where the needs of labor of local expertise are not fulfilled (Abubakar & Normaz, 2013).

The countries that are receiving the migrants, as Rowthorn and Coleman (2004) state, do have benefits. Those benefits include fiscal advantages, increased prosperity, a ready supply of labor, and improvements to the age structure.

Years after the Second World War, a rapid economic recovery in Western Europe was initiated in the beginning of the 1960s. Large numbers of people from Mediterranean countries migrated to the Northern and Western part of Europe to work there (Ginsburg, 1994). This movement is still visible today and its side effects, like ageing population in sending countries, will soon be sensible, which makes this research of theoretical relevance. The social relevance of this research is to explore whether there is a relationship between the migration flows and the ageing population across Europe.

1.2. Research problem

The aim of this research is to explore the relationship of migration flows and ageing populations across Europe. As mentioned earlier, Europe is already facing an ageing problem and it is expected to rise significantly more. However, some countries are experiencing more rapid and profound population ageing than other countries. Therefore it is interesting to research what the relationship is between migration flows and the ageing populations across Europe. The main question of this research is: '*What is the relation between migration flows and ageing populations across Europe?*'

The secondary question that arise logically out of this question are:
1. Which factors have been used to explain population ageing in Europe?
2. What are the geographical patterns of ageing populations across Europe?
3. In what ways do migration flows vary across Europe (geographically) and is there evidence that these flows are influencing (positively or negatively) population ageing across Europe?

1.3 Structure of the thesis

In this research, part II will show the theoretical framework. Herein it will show which factors have been used to explain population ageing in Europe, which will answer the first sub-question. Besides, it will show what the consequences of ageing population are, and how migration has varied from time to time. Part III is the methodology, which will explain how the data is gathered and how it will be used. Furthermore, part IV is the results of this research, which will answer if there is evidence that the migration flows are associated (positively or negatively) with population ageing. Besides, it will show how migration flows and old-age population shares vary across Europe. Finally, part V will show the conclusions of this research.

Part II: Theoretical framework

2.1 Factors that could explain population ageing

As mentioned above, the population ageing is the process by which the share of older individuals becomes proportionally larger in comparison to the working-age persons (United Nations, 2002). This is a consequence of, among other things, the lower fertility rate and the longer life expectancy (Bijak et al., 2007). The fertility rates have declined since the mid-1960s in the European Union (EU) (Eurostat, 2017). A replacement level of 2.1 will ensures that the population will stay stable in the long run (Champion, 1991). The current fertility rate in the European countries (1.6) would mean that the populations would start decreasing in 2050/2060 (PMS, 2012). There are a variety of explanations for the low fertility rate. An example is the Second Demographic Transition (SDT) (Bijak et al., 2007). The SDT refers to a new stage in the demographic history, which goes along with new lifestyles (Champion, 1991). In the last two decades, this process is particularly associated with changes in the social and sexual behavior and especially the attitude of woman towards having children and entering the labor market (Champion, 1991).

According to Rechel et al. (2013), the main contributor to population ageing is the decrease in the mortality rate among older people. The mortality rate has been fallen since the 1970s. Reduced mortality is largely a result of improved lifestyles, prevention and the treatment of diseases. This improved health care, might been especially important in the decreases in the mortality rate among older people, during the 21st century (Rechel et al., 2013). As Goll (2010) states, there is a pattern visible of the ageing populations across Europe. The age group of 65 years and above grew more in the EU-15 member states, than in the New Member States (NMS-12) member states in the period of 2001 to 2006. The NMS-12 member states are member states that on May 1st 2004 and on January 1st 2007 acceded the European Union. Besides, Goll also states that the youngest age group has declined more in the NMS-12 member states in comparison to the EU-15 member states

According to Bijak et al (2007), the process of ageing in Europe is progressing in the second half of the 20th century. A commonly used measure is the Potential Support Ratio (PSR), which indicates how many people in the working age (15-64) in a population can potentially support one person aged 65 and over. The average PSR for the countries in the EU decreased from 6.49 in 1960 to 4.19 in 2002. These numbers are strongly interrelated with past fertility changes (Bijak et al., 2007).

There are a lot of side effects of this ageing process according to the United Nations (2002). The public expenditure on pensions, health services and social security will increase and there will be less people in the working age which will cause a shrinkage of the labor force and thus an increase in the burden on the working population in terms of for example taxes and family support. Moreover, despite the elderly people are becoming relatively more fit and healthy than previous generations, the demands of a large ageing population, for social and health care will increase.
There is also an increasing risk of the emergence of intergenerational conflicts, due to the changes in the patterns of resource distribution between the generations (United Nations, 2002).

These issues and burdens are already observable, though they are set to get considerably worse in certain countries, which means appropriate measures have to be implemented soon to prevent possible crises in the future (Bijak et al., 2007). These measures are embracing areas like economy, social security systems, health care, education and attitudes and practices towards the elderly, which makes it an important policy challenge.

2.2 Possible solution for the ageing problem

A key demographic solution to the ageing population, according to Bijak et al. (2007), could be immigration. Espenshade et al. (1982) support the suggestion by Bijak et al (2007) by stating that as long as the fertility rate is below the replacement rate, a constant flow of immigrants can help to maintain a stable population. However, on the other hand, Kosinski (1994) states that migration would not be a solution in the long run, because as soon as the population who migrated to a country becomes aged, the ageing problem may be exacerbated in certain areas. Feld (2000) agrees in some degree with Kosinski. Feld explored the 'replacement migration' idea, and states that a number of immigrants required in order to sustain a population structure would have to be very high. Therefore, migration would influence the ageing population only to a limited extent. According to Feld (2000), fertility is a much more important factor, especially in the long run. However, as Bouvier (2001) states, it is difficult for a country to raise its fertility rate, and just as difficult to lower it. This leaves migration the most workable and realistic option.

As Ravenstein (1885) states as number five in his 'Laws of Migration', migrants proceeding long distances generally go by preference to one of the great centers of commerce or industry. Lee (1966) confirms this statement. He states that the business cycle of a country is an important factor in the decision to migrate. During periods of economic expansion, new businesses and industries are created and industries begin to recruit workmen from afar. However, during periods of depression, some of the new created companies fail and others stop expanding; the result will be the other way around (Lee, 1966). Hadler (2006) agrees with Lee's statement. Hadler states that economic factors are the most important ones in the decision of people to migrate. Individuals try to improve their utility to migrate from countries with a low demand for labor, to countries with a higher demand for labor. These supply-and-demand sides can also be seen as push-and-pull sides. Examples of push factors could be the labor market and economic structures (Hadler, 2006). As Black et al. (2010) state, a lot of Polish migrants are labor migrants, which confirms the statement of Hadler (2006). They are looking for a better labor market. Besides, as Rowthorn and Coleman (2004) state, receiving countries have benefits in improving their age structure. Especially when countries receive a lot of working-age people, the old-age dependency ratio could be reduced, which will avoid an ageing problem.

2.3 History of migration flows in Europe

As Ginsburg (1994) states, there were a lot of forced migrants in Europe after the Second World War. A lot of countries in Western Europe were slowly recovering from devastation. In the beginning of the 1960s, there was a rapid economic recovery in Western Europe. Large numbers of people from Mediterranean countries migrated to Northern and Western Europe to work there. Today, this is still visible in the ethnic composition of the recipient countries (Ginsburg, 1994).

In the early 1990s, there were migration flows from countries such as Poland, Romania, Ukraine and Bulgaria towards the Western and Southern Europe. The receiving countries were especially Germany, Italy and Spain (Van der Velde, 2007). Besides, countries as Germany, France, Britain, Belgium, and later Spain, Greece, and the Netherlands as well, introduced programs to facilitate labor migration (Van der Velde, 2007). Germany received a lot of East Europeans, which had grown significantly since the early 1990s (Okólski, 2004). As Bijak et al. (2007) state, immigration could be a solution to the ageing problem. Therefore, the countries in the West would have less old-age population, and thus a smaller ageing problem compared to the sending countries. Without this immigration, it may be that the population ageing issues would be more severe than they currently are.

Since 2004, with the accession of the A8 (Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia), the migration from East to West rose further. As Black et al. (2010) state, almost half a million Polish citizens had moved to the United Kingdom, alone, by 2007. The Polish migrants are generally young, mostly man and highly skilled. Poland is facing a brain drain, and therefore the majority of employers in Poland are facing problems in recruiting new employees caused by the labor outflow (Black et al., 2010). As Espenshade et al. (1982) states, as long as the fertility rate is below the replacement rate, a constant flow of immigrants can help to maintain a stable population. However, if there is not a constant flow of immigrants, but emigrants, then the ageing problem would be worse. As in Poland, mostly people in the working-age are leaving the country; this could reinforce the ageing problem in Poland (Rowthorn and Coleman, 2004).

Bulgaria and Romania are part of the European Union since 2007, and are confronted by large-scale outflow migration. Those migrants are mostly temporary workers, which are having huge economic and socio-cultural issues in their societies (Black et al., 2010). As mentioned earlier, this outflow migration could reinforce the ageing problem in Bulgaria and Romania. On the other hand, as Rowthorn and Coleman (2004) state, the receiving countries of those labor migrants have a lot of benefits due to this. Especially improving their age structures.
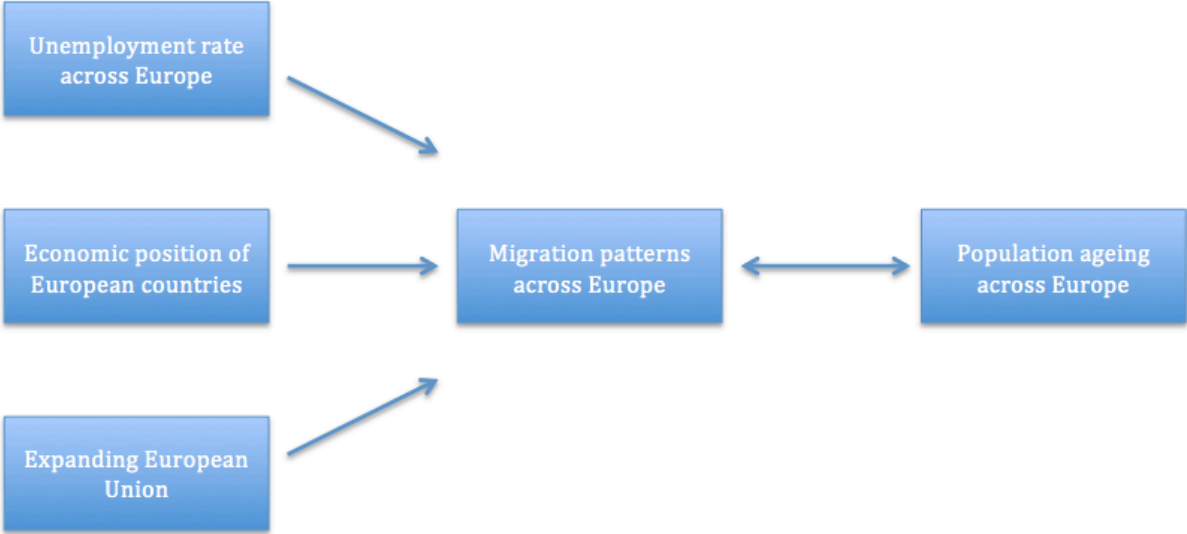
2.4 Conceptual Model

Figure 2: Conceptual model

In figure 2 is the conceptual model shown. This model is supposed to be read from left to right. The two boxes on the left, the economic position of European countries and the expanding of the European Union, are two factors that could influence the migration patterns across Europe. This will be tested through literature. The migration patterns across Europe could influence the population ageing across Europe, and vice versa. To explore if there is a relation between these two, a Pearson correlation will be used.

Part III: Methodology

This research consists of the use of secondary data to explore the relationship between migration flows and the ageing populations across Europe. In this research there will be descriptive comparisons/analyses between charts, tables and maps of the data of the European countries. The secondary data consist of databanks, which will provide data about population ageing, its consequences and migration flows. An important source in this research is Eurostat. It is the statistical office of the European Union and is located in Luxembourg. Eurostat's mission is to provide Europe with high quality statistics that makes it able to do comparisons between member countries and regions (Eurostat, 2018). The data of Eurostat makes it possible to explore how the population structure looks like in the European countries. The information about migration flows and the population structures of the European countries will be used in this research. Analyses will be based on descriptive statistics, correlations between migration flows and population ageing, which will be visualized in order to observe any spatial patterning using Geographical Information Systems (GIS). GIS is a framework for gathering, managing and analyzing data. It analyses spatial locations and layers of information into visualizations using maps (Esri, 2018). This will make it able to get deeper insights into the data, such as patterns and relationships. The data of, among other things, Eurostat about the migration patterns and population structures will be used to make maps in GIS.

3.1 Amount of inflow and outflow migration

To research the amount of inflow and outflow migration in a country, this research used the data of Pew Research Center (2017). It shows per country how many people has left and entered the country in 2015. However, it is not a annual rate, but it refers to the cumulative stocks of migrants born or living in European Union countries.

3.2 Different methods of migration

In this research, different methods of migration will be used: Net- migration is the difference between the people leaving a country and those entering it (Eurostat, 2015). The gross-migration is the sum of the people leaving a country and those entering it. Besides, the migration efficienct ratio (MER) is the ratio of net migration in area *i* to the sum of its inflows from all other areas (*Di)*, and outflows to all other areas (*Oi)* (Lomax, 2013). It is represented in percentages:

$$MER_i = 100(D_i - O_i)/(D_i + O_i)$$

3.3 Pearson correlation

On the basis of the Pearson correlation is the relationship between different methods of migration and the population 65 years and above in 2015 calculated. The correlation is two-tailed. The different methods of migration are: Gross-migration, the migration efficiency ratio (MER), net-migration, inflow migration and outflow migration. Besides, the different methods are calculated per 1.000 inhabitants to be correct to say something about a country. In order to be able to name the strengths of the correlations, the categorization of Cohen (1988) will be used. These categorizations are as follows: weak R<0.3, medium level 0.3≤ R <0.5 en strong ≥0.5.

Part IV: Results

4.1 Geographical patterns of ageing populations

Using the Geographical Information Systems (GIS), the geographical patterns of the ageing population across Europe are shown in figure 3. The map is based on the percentage of people aged 65 years and above of the total population in 2015. The figure shows that there is some pattern. Southern European countries (Portugal, Italy and Greece) have a relatively high share of old age populations. Besides, the countries Poland (15,61%), Ireland (13,23%), Luxembourg (13,99%), Slovakia (14,06%) and Romania (17%) have the lowest percentage of people aged 65 years and above. However, these five countries are scattered across Europe, which makes it not possible to see a pattern.

As Bijak et al. (2007) state is population ageing a consequence of the lower fertility rate and the longer life expectancy. Table 1 shows the total fertility rate in 2015 of the countries in Europe. As the figure shows, Portugal (1.31), Italy (1.35) and Greece (1.33) have a relatively low fertility rate. Besides, as shown in figure 4, all countries have a relatively high life expectancy at birth. This reinforces the statement of Bijak et al.
On the other hand, Poland, Slovakia, Luxembourg and Romania have a relatively low fertility rate, which would mean that there is an ageing problem, according to Bijak et al. (2007). However, this is not the case as mentioned earlier. Furthermore, the countries Poland, Slovakia and Romania have a lower life expectancy at birth (figure 4). Therefore it is in agreement with the statement of Bijak et al. (2007), and could explain why these countries have a lower percentage of old-age population. However, Luxembourg does not have a lower life expectancy at birth. Therefore, it is in contradiction with the statement, because Luxembourg does not have a high percentage of old-age population.

Notable countries are Italy and Ireland, which have the highest and lowest percentage of people aged 65 years and above. As shown in table 1, Italy has a relatively low total fertility rate (1.35) and has a relatively high life expectancy at birth, compared to the other countries. This is in line with the statement of Bijak et al. (2007). This could be the explanation why Italy has the highest percentage of people aged 65 years and above.
Ireland, on the other hand, has a relatively high total fertility rate (1.92) and has high life expectancy at birth as well. According to Bijak et al. (2007), Ireland then should have a high percentage of people 65 years and above. However, Ireland has the lowest percentage of people aged 65 years and above. This is, again, in contradiction with the statement of Bijak et al. (2007).
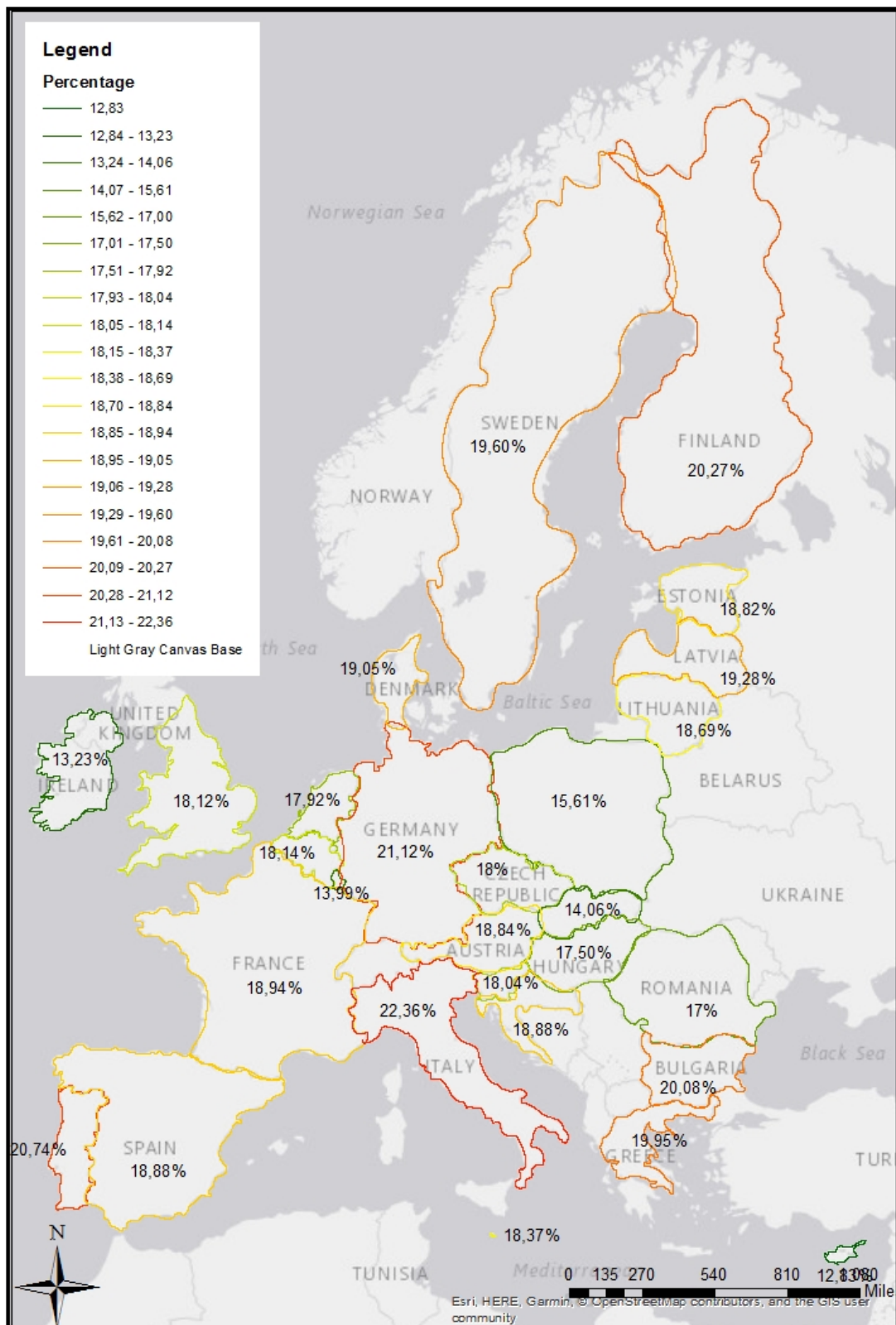
Figure 3: Percentage people aged 65 years and above in 2015

	2015
EU- 28	1.58
Portugal	1.31
Poland	1.32
Cyprus	1.32
Greece	1.33
Spain	1.33
Italy	1.35
Croatia	1.40
Slovakia	1.40
Hungary	1.45
Malta	1.45
Luxembourg	1.47
Austria	1.49
Germany	1.50
Bulgaria	1.53
Romania	1.56
Slovenia	1.57
Czech Republic	1.57
Estonia	1.58
Netherlands	1.65
Finland	1.65
Belgium	1.70
Latvia	1.70
Lithuania	1.70
Denmark	1.71
United Kingdom	1.80
Sweden	1.85
Ireland	1.92
France	1.96

Table 1: Total fertility rate 2015 (live births per woman)
Source: http://ec.europa.eu/eurostat/statistics-explained/index.php/Fertility_statistics

(years)

EU-28 = 80.6

⬜	< 78
🟨	78 – < 80
🟧	80 – < 81
🟧	81 – < 83
🟥	>= 83
⬛	Data not available

Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat
Cartography: Eurostat - GISCO, 07/2017

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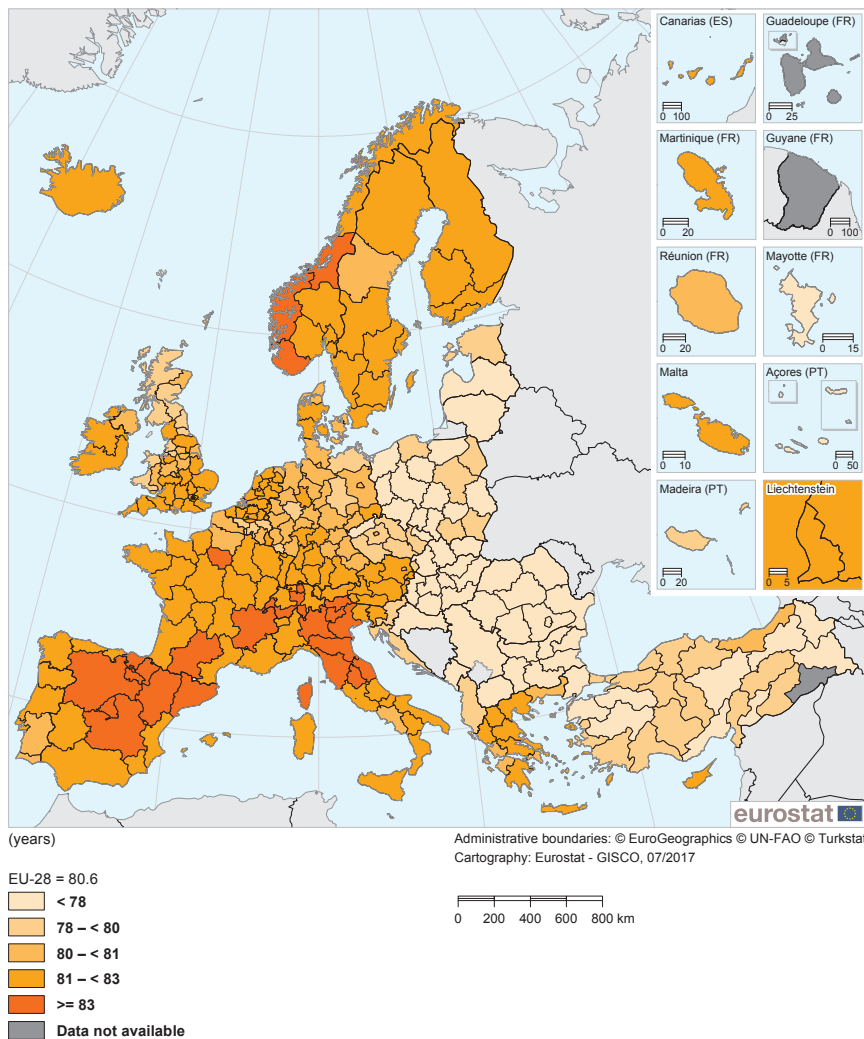
Figure 4: Life expectancy at birth in 2015
Source: http://ec.europa.eu/eurostat/documents/7116161/8112835/0201EN.pdf

4.2 How do migration flows vary across Europe?

As Bijak et al. (2007) state, immigration could be a solution to the ageing problem. One could expect that the geographical pattern in the population aged 65 years and above (figure 3), then should match the pattern of the migration flows. Countries with a high share of old-age population should show a high outflow migration, and vice versa. This is, however, not the case.

Figure 5 shows how the migration flows vary across Europe using the outflow and inflow migration per country. As mentioned before, Italy, Portugal and Greece have the highest share of old-age population. According to Espenshade et al. (1982), the countries should then have a high outflow migration. As shown in figure 5, this is not the case: Italy and Greece are showing a positive net migration.

However, there is a pattern visible between the East and the West of Europe. Especially the countries in the East of Europe are showing that the outflow migration is higher than the inflow migration. Notable countries are Poland and Romania.

On the other hand, in the West of Europe, countries have a higher inflow than outflow migration. Countries with striking numbers of inflow migration are Germany and the United Kingdom.

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An explanation for the pattern that countries in the East of Europe are showing more outflow migration could be the accession in 2004 of the A8 (Black, Engbersen & Okólski, 2010). By this accession, the migration flows from East to West rose further. Especially labor migrants from Poland played a big part in this movement. This could explain why Poland has a striking outflow migration. Therefore, Poland could expect a high ageing problem in the future, as the people in the working-age are leaving the country to the West of Europe (Black et al., 2010).

Another striking country is Romania. Romania became part of the European Union since 2007, and is since then confronted by large-scale out migration flows (Black, Engbersen & Okólski, 2010). Most of the migrants of Romania are temporary workers. This could explain as well why Romania has such a large outflow migration compared to the inflow migration.

If there is not a constant flow of immigrants, but more emigrants, then there could be an ageing problem (Espenshade et al., 1982). The countries Poland and Romania have a striking outflow migration, which would mean that they have a relatively high percentage of people aged 65 years and above. As shown in figure 3, both countries do not have a high percentage of people aged 65 years and above. This is in contradiction with the statement of Espenshade et al. An explanation could be, as shown in figure 4 that both countries have a relatively low life expectancy at birth. This is because, as Bijak et al. (2007) state, an ageing problem is the consequence of the lower fertility rate and the longer life expectancy.

As shown in figure 5, the receiving countries of migration are especially Germany and the United Kingdom. This is in line with the research of Van der Velde (2007). He states that the receiving countries are especially Germany, Italy and Spain. Later on, countries introduced programs to facilitate temporary labor migration, which resulted that other countries in the West of Europe received migrants from the East as well (Van der Velde, 2007). This could be an explanation why the Western part of Europe has more inflow migration compared to the Eastern part of Europe. Besides, the United Kingdom has a higher inflow migration than outflow migration as well. This is in line with the research of Black, Engbersen and Okólski (2010) which state that in 2007, almost half a million Polish citizens had moved to the United Kingdom. This could explain why the United Kingdom has a high inflow migration.

As Espenshade et al. (1982) state, as long as the fertility rate is below the replacement rate, a constant flow of immigrants can help to avoid an ageing problem. The countries Germany and the United Kingdom are both receiving countries, which would mean that they have a relatively low percentage of people aged 65 years and above. As shown in figure 3, the United Kingdom has indeed a relatively low percentage of people aged 65 years and above, which is in line with the statement. However, Germany has a high percentage old-age population, which is in contradiction with the statement of Espenshade et al. (1982). An explanation for Germany could be as Feld (2000) states, that the number of immigrants required in order to sustain a population structure would have to be very high. Therefore, immigration would influence the ageing population in Germany only to a limited extent (Feld, 2000). Though, it may be that without this positive net flow the population ageing issues in Germany would be more severe than they currently are.
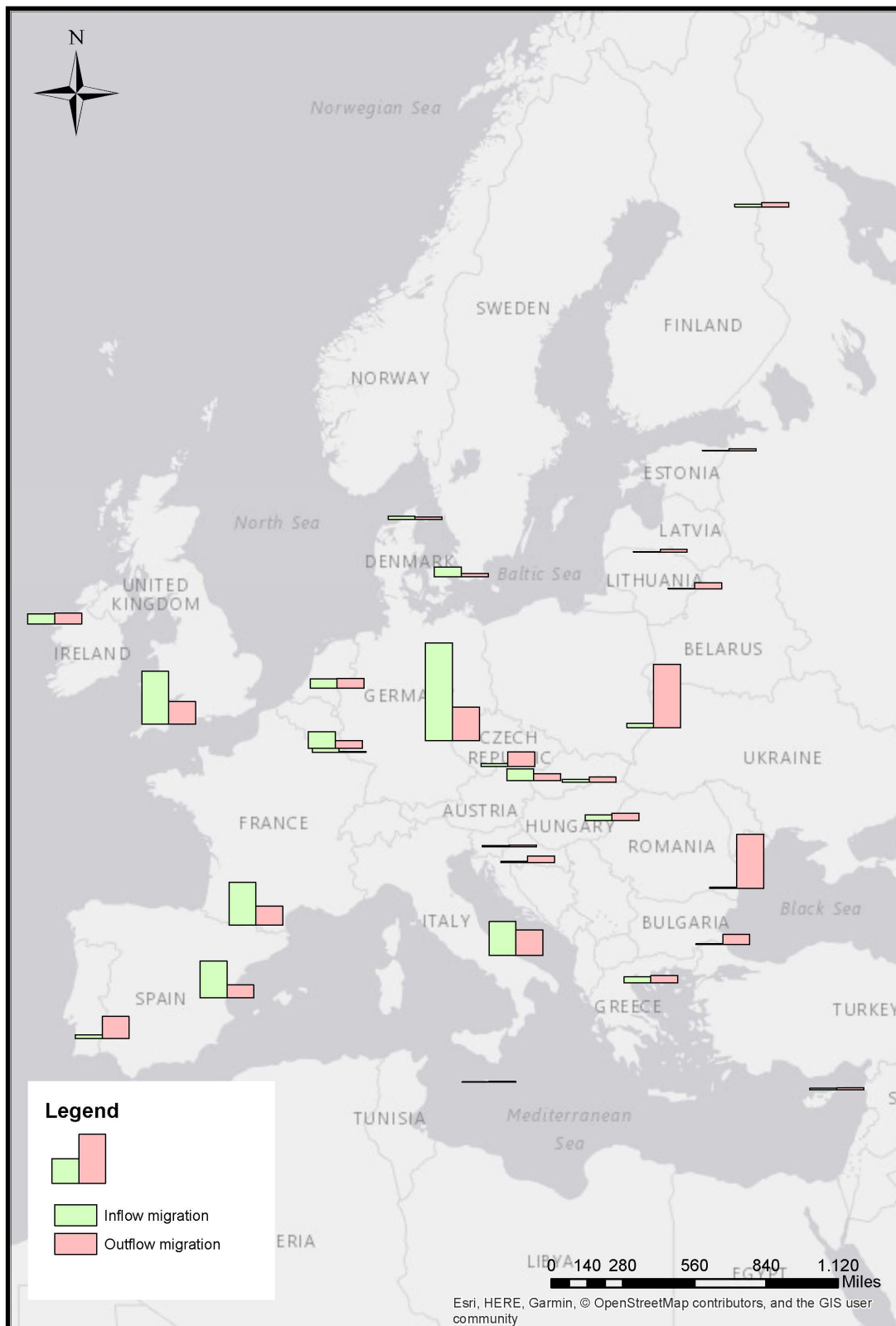
Figure 5: Inflow migration and outflow migration across Europe

4.3 The correlation between migration and the ageing populations

Using the Pearson correlation, the relationship between the gross-migration per 1.000 inhabitants in 2015 (M=110.3, SD=82.8) and the population 65 years and above per 1.000 inhabitants in 2015 (M=181.5, SD = 23.3) is shown in table 2. This correlation is significant at the 0.01 level (2-tailed), namely *p=.001.* There is a negative strong relation between the variables gross-migration and population 65 years and above (*r= -.581)*. Figure 6 shows the scatterplot of this correlation. This confirms the findings of the Pearson correlation, that there is a negative strong relation between these two variables. A higher share of gross migration (more inflow than outflow) is associated with a lower share of the population 65 years and above. This is in line with the statement of Bijak et al. (2007), that immigration could be a solution to the ageing population.

		Gross migration per 1.000 inhabitants	Population 65 years and above per 1.000 inhabitants in 2015
Gross migration per 1.000 inhabitants	Pearson correlation	1	-.581
	Sign. (2 tailed)		.001
	N	28	28
Population 65 years and above per 1.000 inhabitants in 2015	Pearson correlation	-.581	1
	Sign. (2 tailed)	.001	
	N	28	28

Table 2: SPSS outcomes of the Pearson correlation between gross migration and the population 65 years and above.
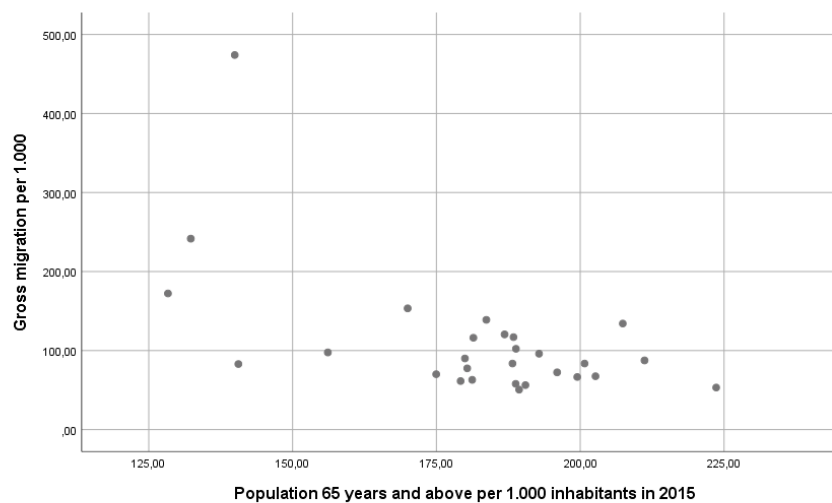

Figure 6: Scatterplot of the significant, negative relation between gross migration and population 65 years and above

The second Pearson correlation (table 3) is between the MER (M=-16.7, SD=50.9) and the percentage 65 years and above of the total population in 2015 (M=18.2, SD= 2.3). This correlation is not significant at the α =.05 level, namely *p=.984.* There is not a relation between the variables MER and the percentage 65 years and above of the total population.

		MER	Percentage 65 years and above of total population in 2015
MER	Pearson correlation	1	.004
	Sign. (2 tailed)		.984
	N	28	28
Percentage 65 years and above of total population in 2015	Pearson correlation	.004	1
	Sign. (2 tailed)	.984	
	N	28	28

Table 3: SPSS outcomes of the Pearson correlation between MER and the population 65 years and above.

Besides, the Pearson correlation between net-migration per 1.000 inhabitants in 2015 (M=-13.1, SD=78.8) and the population 65 years and above per 1.000 inhabitants in 2015 (M=181.5, SD=23.3) is visible in table 4. This correlation is not significant at the α =.05 level, namely *p=.303.*

		Net-migration per 1.000 inhabitants	Population 65 years and above per 1.000 inhabitants in 2015
Net- migration per 1.000 inhabitants	Pearson correlation	1	-.202
	Sign. (2 tailed)		.303
	N	28	28
Population 65 years and above per 1.000 inhabitants in 2015	Pearson correlation	-.202	1
	Sign. (2 tailed)	.303	
	N	28	28

Table 4: SPSS outcomes of the Pearson correlation between net-migration and the population 65 years and above.

Furthermore, the Pearson correlation between the inflow migration per 1.000 inhabitants in 2015 (M=48.6, SD=71.4) and the population 65 years and above per 1.000 inhabitants in 2015 (M=181.5, SD=23.3) is shown in table 5. This correlation is significant at the α =.05 level (2-tailed), namely *p=.017*. There is a negative medium level relation between these two variables (*r= -.448).* In figure 7 is the scatterplot of this correlation visible. As shown, high inflow migration is associated with a lower share of the population 65 years and above. This is in line with the statement of Espenshade et al. (1982) that a constant flow of immigrants can help to avoid an ageing population.

		Inflow migration per 1.000 inhabitants	Population 65 years and above per 1.000 inhabitants in 2015
Inflow migration per 1.000 inhabitants	Pearson correlation	1	-.448
	Sign. (2 tailed)		.017
	N	28	28
Population 65 years and above per 1.000 inhabitants in 2015	Pearson correlation	-.448	1
	Sign. (2 tailed)	.017	
	N	28	28

Table 5: SPSS outcomes of the Pearson correlation between inflow migration and the population 65 years and above.
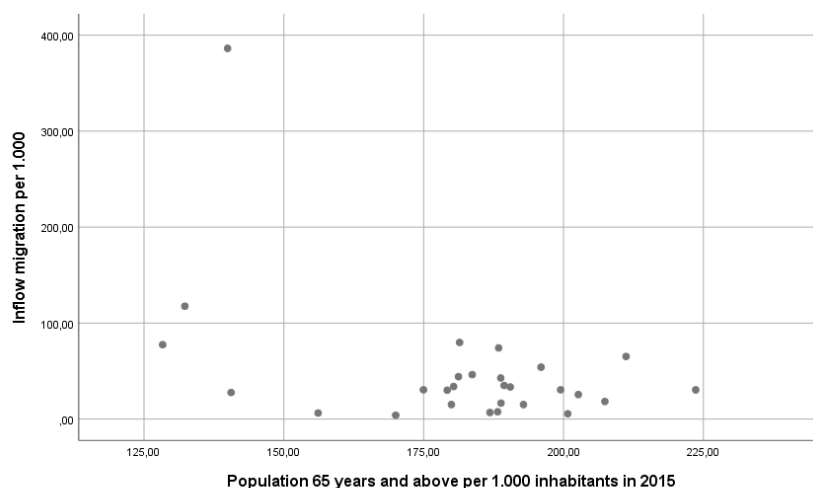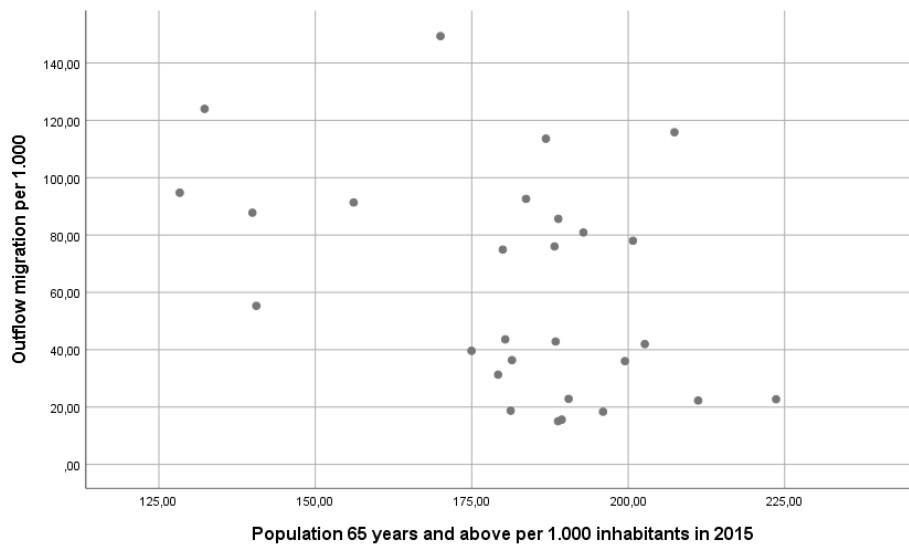
Figure 7: Scatterplot of the significant, negative relation between inflow migration and the population 65 years and above

The fifth Pearson correlation (table 6) is between the outflow migration per 1.000 in 2015 (M=61.7, SD=37.9) and the population 65 years and above per 1.000 inhabitants in 2015 (M=181.5, SD=23.3). This correlation is significant at the α =.05 level (2-tailed), namely *p=,024.* There is a negative medium level relation between the outflow migration and the population 65 years and above (*r=-.424).* The scatterplot (figure 8) confirms this statement. A higher outflow migration is associated with a lower share of the population 65 years and above. This is in contradiction with the statement of Espenshade (1982), where he states that it should be the other way around.

		Outflow migration per 1.000 inhabitants	Population 65 years and above per 1.000 inhabitants in 2015
Outflow migration per 1.000 inhabitants	Pearson correlation	1	-.424
	Sign. (2 tailed)		.024
	N	28	28
Population 65 years and above per 1.000 inhabitants in 2015	Pearson correlation	-.424	1
	Sign. (2 tailed)	.024	
	N	28	28

Table 6: SPSS outcomes of the Pearson correlation between outflow migration and the population 65 years and above.

Figure 8: Scatterplot of the significant, negative relation between outflow migration and the population 65 years and above

Part V: Conclusion

The purpose of this research is to determine what the relation is between migration flows and ageing population across Europe. The literature shows that there are different factors that have been used to explain population ageing in Europe. Population ageing is a consequence, among other things, of the lower fertility rate and the longer life expectancy. The fertility rate in the EU has been declined since the mid-1960s. A replacement level of 2.1 children per women will ensure that the population won't decline, and will stay stable. However, the current fertility rate in the European countries is on average 1.6, which means that the population in the EU will start decline in 2050/2060. An explanation for the lower fertility rate is that there is a new stage in the demographic history, which goes along with new lifestyles. This includes the attitude of woman towards having children and entering the labor market.

The results of the analysis section show that there is not a correlation between the variables MER, net migration per 1.000 inhabitants, and the total population 65 years and above per 1.000 inhabitants in 2015. However, between the gross migration and the total population 65 years and above is a negative strong relation. This is in agreement with the literature, as if the gross migration increases, then the ageing problem would decrease. Besides, between the inflow migration and the total population 65 years and above is a negative medium level. This is again in line with the literature, as when the inflow migration increases, the ageing problem would decrease. However, between the outflow migration and the total population 65 years and above is a negative medium level relation. This is in contradiction with the literature, because when the outflow migration increases, the ageing problem would decrease.

Using the Geographical Information Systems (GIS), there is a pattern visible of ageing populations across Europe. The Southern European countries (Portugal, Italy and Greece) have a relatively high share of old-age population. An explanation could be that all countries have a low fertility rate, and a longer life expectancy. On the other hand, Poland, Ireland, Luxembourg, Slovakia and Romania have the lowest percentage of people aged 65 years and above and are scattered across Europe, which makes it not possible to see a pattern. Explanations for population ageing are the lower fertility rate and the longer life expectancy. However, the results for these countries are in contradiction with this statement. Some countries have a low fertility rate, but have a relatively high percentage of people aged 65 years and above. So, some results of this research are in contradiction with the literature about the factors that have been used to explain population ageing in Europe.

It becomes clear from the analysis part, that immigration have a positive effect on the ageing problem. One could expect, that the geographical patterns of ageing populations would match with the patterns of migration. Countries that have a high share of old-age population, should show a high outflow migration, and vice versa. This is however not the case. There is a pattern between the migration flows across Europe visible. This pattern is visible between the East and the West of Europe. Especially the countries in the Eastern part of Europe are showing that the outflow migration is higher than the inflow migration. In the Western part it is vice versa. An explanation could be the accession of the A8 in 2004. Hereby the migration flows from East to West rose. These were especially labor migrations from Poland, and could be an explanation why Poland

has such a high outflow migration. Therefore, Poland could expect a high ageing problem in the future, as the working-age people are leaving the country to the West of Europe. An explanation why the Western part of Europe has a lot of inflow, and are thus a receiving country, could be that these countries introduced programs to facilitate temporary labor migrants. This resulted that countries in the West of Europe received a lot of migrants from the East. Though, the immigrants needed in order to sustain a population structure would have to be very high, therefore immigration would influence the ageing population in the West only to a limited extent. However, it may be that without this positive net flow the population ageing issues in the West of Europe would be more severe than they currently are.

5.1 Discussion

In this research, the data from Pew Research Center (2017) has been used. However, as mentioned earlier, this data about migration is cumulative instead of flows. This makes the outcomes debatable. This is because it does not show the annual inflow- and outflow migration, but the total amount of people living abroad that originate from another country, or vice versa. This makes it hard to measure the gross-, outflow, inflow- and net migration of each country, because it is not from that year.

On the other hand, to use cumulative data instead of flows, avoids year-to-year fluctuations that would have been found from 1-year measures.

Another point, in this research secondary data has been used. That data has been collected for another purpose, so there could be errors in the data collection.

The strengths of this research are that, firstly, it is geographically visible how the migration flows and the ageing populations vary across Europe. This could provide the reader a clear overview how these two concepts vary across Europe. Secondly, another strength is that the migration flows are looked at from different perspectives. This makes the research deeper, and provides the reader more knowledge about how these migration methods differ. Lastly, the theoretical framework is extensive, which provides the reader a lot of knowledge about the migration flows and the ageing populations. Knowledge about how ageing population will occur, what the consequences are, why do people migrate and a little bit about the history of migration flows across Europe.

5.2 Recommendations

For further research, it would be recommended to use a different source for the amount of inflow- and outflow migration. It would be interesting to see if the same outcomes will occur if the migration is calculated annually. Besides, it would be recommended to look at different factors, which could influence this relationship. Think, for instance, about the age and level of education of the migrants, and do not look only at the people aged 65 years and above, but maybe as well the 80 years and above. Furthermore, it would be interesting to research what the motives of the migrants are to migrate.

References

Abubakar, L.N., Normaz, W.I. (2013). The determinants of brain drain in developing countries. *International journal of Social Economics*, 40(8), 744-754.

Bijak, J., Kupiszewska, D., Kupiszweski, M., Saczuk, K. & Kicinger, A. (2007). Population and labour force projection for 27 European countries, 2002-2052: impact of international migration on population ageing. *Springer*, 23(1), 1-31.

Black, R., Engbersen, G. & Okólski, M. (2010). *A continent moving West?: EU enlargement and labor migration from central and Eastern Europe.* Amsterdam: Amsterdam University Press.

Bouvier, L.F. (2001). Replacement migration: Is it a solution to declining and aging populations? *Springer,* 22(4), 377-381.

Champion, A.G. (1991). Urban and regional demographic trend in a developed world. *Urban studies*, 29(3), 461-482

Cheng, H.G. & Phillips, M.R. (2014). Secondary analysis of existing data: opportunities and implementation. *NCBI*, 26(6), 373-375.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences.* 2nd Edition. New Jersey: Lawrence Erlbaum Associates.

Coleman, D. & Rowthorn, R. (2004). The economic effects of immigration into the United Kingdom. *Population and development review,* 30(4), 579-624.

Espenshade, T.J., Bouvier, L.F. & Arthur, W.B. (1982). Immigration and the stable population model. *Springer,* 19(1), 125-133.

Esri (2018). *What is GIS?* Retrieved on May 6, 2018 from https://www.esri.com/en-us/what-is-gis/overview

Eurostat (2018). *Overview: About us.* Retrieved on March 1st , 2018 from http://ec.europa.eu/eurostat/about/overview

Eurostat (2015). *Glossary: Migration.* Retrieved on March 1st, 2018 from http://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Migration

Eurostat (2017). *Fertility statistics.* Retrieved on March 1st, 2018 from http://ec.europa.eu/eurostat/statistics-explained/index.php?title=Fertility_statistics

Eurostat (2017). *Population structure and ageing.* Retrieved on March 1st , 2018 from http://ec.europa.eu/eurostat/statistics-explained/index.php/Population_structure_and_ageing

Feld, S. (2000) Active population growth and immigration hypotheses in Western Europe. *European journal of population*, 16(1), 3-40.

Ginsburg, B.E. (1994). Migration and welfare. *International journal of social welfare*, 3(3), 102-108.

Goll, M. (2010). Ageing in the European Union: where exactly? *Eurostat,* 26(1), 1-15.

Hadler, M. (2006). Intentions to migrate within the European Union: A challenge for simple economic macro-level explanations. *European societies,* 8(1), 111-140.

Kosinski, L.A. (1994) *Impact of migration in the receiving countries.* 2nd edition. Geneva: International organization for migration (IOM).

Lee, E.S. (1966). A theory of migration. *Springer,* 3(1), 47-57.

Lomax, N. M. (2013). *Internal and cross-border migration in the United Kingdom: harmonizing, estimating and analyzing a decade of flow data.* Leeds: The University of Leeds.

Okólski, M. (2004). New migration movements in Central and Eastern Europe. *International migration in the new millennium, Global movement and settlement.* Aldershot: Ashgate.

Pew Research Center (2017). *Origins and destinations of European Union migrants within the EU.* Retrieved on May 6, 2018 from http://www.pewglobal.org/interactives/origins-destinations-of-european-union-migrants-within-the-eu/

PMS (2012). *Third demography report: population is becoming older and more diverse.* Brussels: Newswire.

Rechel, B., Grundy, E., Robine, J.M., Cylus, J., Mackenbach, J.P., Knai, C. & McKee, M. (2013). Ageing in the European Union. *The Lancet*, 381(9874), 1312-1322.

Ravenstein, E.G. (1885). The Laws of Migration. *Journal of statistical society of London*, 48(2), 167-235.

Smith, H. (2015). Young, gifted and Greek: Generation G – the world's biggest brain drain. *The Guardian,* 2015-01-19.

Smith, H. (2016). Greek economic migrants increasing, while joblessness soars. *The Guardian,* 2016-07-03.

Tinker, A. (2002). The social implications of an ageing population. *Elsevier*, 123(7), 729-735.

United Nations (2002). *World population ageing: 1950-2050*. New york: United National Population Division.

Van der Velde, M. (2007). Mobility across borders: Contextualizing local strategies to circumvent visa and work permit reuirements'. *International Journal of Urban and Regional Research,* 31(40), 819-835.