The effect of a generous welfare state on immigration in OECD countries

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Abstract

This thesis looks at the relationship between immigration and welfare in OECD countries. The first part sums up relevant literature and theory. In the literature, two main approaches to testing the “welfare magnet” hypothesis originating in Borjas (1999) can be identified. One approach focuses on whether states with high welfare levels attract more migrants while the other focuses on whether immigrants are more likely than natives to receive welfare benefits. In general, empirical results have been mixed, which may reflect problems of estimation due to reverse causality and omitted variable bias. The second part explores the issue empirically by setting up two regression models and estimating them separately for three different proxy variables intended to measure the generosity of the welfare state in destination countries. The results indicate that a more generous welfare system have had a positive impact on immigration flows and that this impact is larger in the long run. The results are strong for the period 1995-2005, but more mixed for the period 1980-1994.
Preface

This thesis marks the completion of the two-year Master’s Program in Economics at the University of Oslo.

I want to thank my supervisor, Andreas Moxnes, for excellent advice and guidance throughout the writing process.

I also want to thank my family, friends and my fiancé for their encouragement and support.
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1 Introduction

International migration is a topic that has received increasing attention in recent years. According to the 2015 Eurobarometer, immigration is now regarded as the most important issue facing the EU by the public in the member countries (European Commission, 2015, p.38.) One of the topics that are being debated is the relationship between migration and the welfare state. There are concerns that generous welfare states attract more migrants and that the increased immigration can make the welfare states less sustainable. In the 2009 Eurobarometer, 51% of the respondents believed that immigrants benefited more from welfare services than they contributed in taxes (The European Commission, 2009, p. 61). In this thesis, I explore the relationship between immigration and the generosity of welfare systems, using economic theory.

In the first part of the thesis, I review relevant studies and economic theory concerning migration and welfare. Two main approaches to testing the “welfare magnet” hypothesis are identified and discussed. One approach focuses on whether states with high welfare levels attract more migrants while the other focuses on whether immigrants are more likely than natives to receive welfare benefits. In general, empirical results have been mixed, which may reflect problems of estimation due to reverse causality and omitted variable bias. The economic theory of migration and the “welfare magnet” model from Borjas (1999) is reviewed in the theory section. Next, I use an extensive data set to do a regression analysis relating immigrant flows to the generosity of the welfare state in OECD countries. To check the robustness of the results, the regression analysis is done for three different proxy variables for the generosity of the welfare state. The data set contains observations for the period from 1980 to 2010 for one of the proxy variables, and from 1995-2010 for the two others. GDP per capita and the unemployment rate of the destination countries are included in the regressions to minimize omitted variables bias.

I find that having a generous welfare system, as measured by the three proxy variables, tends to have a positive effect on immigration in OECD countries. The effect of an increase in the generosity of the welfare state on immigration flows is estimated to be larger in the long run than in the short run. The other explanatory variables included in the analysis are also estimated to be significant and to have a larger effect in the long run than in the short run.

---

1 In Stata/MP 14
GDP per capita in the destination seems to be the most important of the included variables in determining immigration flows. When the period from 1980 to 2010 is divided into 4 sub-periods and the regression estimating the effect of long-run changes is repeated for these periods, the results indicate that the effects of welfare generosity and GDP per capita have become stronger and more consistent in the last 15 years. Possible reasons for this are discussed.

Generally, many of the studies that look at the effect of welfare on immigration aim to explain as much as possible of the variation in migration flows between countries. They therefore try to estimate the effect of as many as possible of the economic variables that influence migration and include many independent variables from both source and destination countries. The purpose of the empirical investigation in this thesis, however, is to focus on the effect of a generous welfare state on immigration flows. I am not aware of any other studies that use different proxy variables for the generosity of the welfare state. Advantages of this approach is that it encourages discussion of the definition of a generous welfare state and the potential problems of estimating the casual relationship between the welfare state and immigration. It also provides a way to test the robustness of the estimates.

The rest of this thesis is organized as follows: Section 2 contains information about the data sources and the most important variables of the data set and look at trends in the main variables of interest over time. Section 3 gives an overview of the empirical literature on migration and welfare. Section 4 explains the relevant theory. In Section 5, two different regression models aiming to estimate the effect of a change in the generosity of the welfare state on immigration flows are set up. Section 6 contains the regression results and a discussion. Section 7 concludes.
2 Data

2.1 About the dataset

The data set used in this thesis was originally collected by the authors and used in Adserá & Pytliková (2015). This data set covers the period from 1979 – 2010 and contains information on immigration flows and stocks, public social spending, GDP per capita, the unemployment rate and several other variables for 30 OECD countries and 223 source countries (both former and existing countries). This data set has been supplemented with variables from Eurostat and UNU-WIDER for the period 1995 - 2010.

2.2 Classification of country groups

To provide an overview of how the variables vary between countries, a sub-sample of countries are divided into four different country groups, based on the type of welfare state regime that they are considered to be part of.

Traditionally, the literature has distinguished between three different welfare-state models: the Nordic, the Conservative and the Liberal, as described in Esping-Andersen (1990). Fenger (2007) classifies the European countries based in this system and adds two new categories for the Eastern European countries: The Post-Communist model and the model of former USSR-countries. Here, 27 out of the 30 destination countries in the full sample have been categorized into four groups based on the type of welfare state they represent. The four types that are relevant for the countries in the data set are: the Nordic (or Social-Democratic) type, the Conservative (-Corporatist) type, the Liberal type and the Post-Communist type.

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2 See Adserà & Pytliková (2015) for details on data collection and sources.
The European countries are classified based on Fenger (2007), and the non-European based on Esping-Andersen (1990, p. 74). Below follows an overview of the 4 categories and a brief description of the characteristics of each type. The descriptions are based on Fenger (2007).

**Nordic** (Social-Democratic) states: These countries have the highest levels of taxes and redistribution of all the groups and living standards are high.

Countries in this group: Norway, Sweden, Denmark, Finland, Iceland.

**Conservative** states: This type of welfare state relies more on social contributions and less on taxes, and have a moderate level of income redistribution. Other characteristics of countries in this group are relatively high unemployment is relatively high, and low female labor market participation.

Countries in this group: Germany, Greece, France, Austria, Belgium, Italy, Portugal, Spain, Luxembourg, Netherlands, Turkey.

**Liberal** states: Liberal states have higher income inequality and lower levels of total state spending than the other types of welfare states.

Countries in this group: The United Kingdom, Switzerland, Ireland, Australia, Canada, New Zealand, the United States.

**Post-Communist** states: The states in post-communist Europe have a high standard of living compared to other Eastern European countries, but lower levels of economic growth.

Countries in this group: Czech Republic, Poland, Hungary, Slovakia.

### 2.3 Data on welfare

In the empirical analysis, three different proxy variables will be used to represent the variation in the level of generosity of the welfare state. Table 2.1 gives an overview of these variables. Data on total social spending and the Gini coefficient was not available for the full sample of countries in the original dataset, so there are two different sub-samples for these variables, each containing 22 countries.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
<th>Source</th>
<th>Observations</th>
<th>Mean</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
<th>Time-period</th>
<th>Number of countries in sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ln(psep&lt;sub&gt;jt&lt;/sub&gt;)</td>
<td>Ln Public social expenditure as a percentage of GDP in destination j at time t</td>
<td>OECD SOCX Database</td>
<td>190,848</td>
<td>2.879</td>
<td>0.480</td>
<td>0.531</td>
<td>3.575</td>
<td>1979-2010</td>
<td>30&lt;sup&gt;5&lt;/sup&gt;</td>
</tr>
<tr>
<td>Ln(tsep&lt;sub&gt;jt&lt;/sub&gt;)</td>
<td>Ln Total social spending as a percentage of GDP on destination country j at time t</td>
<td>Eurostat ESSPROS Database</td>
<td>76,832</td>
<td>3.158</td>
<td>0.190</td>
<td>2.542</td>
<td>3.493</td>
<td>1995-2010</td>
<td>22&lt;sup&gt;6&lt;/sup&gt;</td>
</tr>
<tr>
<td>Ln(gini&lt;sub&gt;jt&lt;/sub&gt;)</td>
<td>Ln of the Gini coefficient of destination country j at time t</td>
<td>UNU-WIDER WIID Database</td>
<td>75,264</td>
<td>3.370</td>
<td>1.139</td>
<td>3.068</td>
<td>3.837</td>
<td>1995-2010</td>
<td>22&lt;sup&gt;7&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>5</sup> The countries in the full sample are: Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, South Korea, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States.

<sup>6</sup> The countries in this sub-sample are: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland and the UK.

<sup>7</sup> The countries in this sub-sample are: Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Netherlands, Norway, Poland, Portugal, Spain, Sweden, the UK and the US.
Figure 2.1 shows the development of the mean value of $psep_{jt}$ for all the countries in the sample over the period 1979 - 2010. It is evident from the figure that there has been a positive trend in public social spending in the OECD countries in this period. There are sharp increases in the mean value in the early 90s and around 2008. These short-term fluctuations are most likely correlated with downturns in the business cycle. For example, increased unemployment as a result of a general economic downturn means that more people are eligible for unemployment benefits and other types of welfare, and therefore public social expenditure may rise. The long-term positive trend, however, more likely reflects changes in the extent and type of welfare policies in the countries in the data set.

FIGURE 2.1

Figure 2.2 shows the development of $psep_{jt}$ for the different country groups\(^8\). The observed differences in public social spending is consistent with the traditional typology of welfare states as it is described above. Towards the end of the period covered by the data set, there seems to be convergence within groups, so that spending levels are now almost the same in Nordic and Conservative states and in Liberal and Post-Communist states. For the Nordic,

\(^8\) There is no data for the Post-Communist countries before 1990. For the rest of the countries and periods, missing observations for individual countries has been replaced by country means for the whole period.
Conservative and Liberal states, there is a clear positive trend in the period covered by the data set.

**FIGURE 2.2**

The OECD defines public social expenditure (the variable $psep_{jt}$ in the data set) as social expenditure where the general government controls the financial flows. This includes both cash benefits and direct in-kind provision of goods and services. The second proxy variable is the Eurostat measure of “total social expenditure” ($tsep_{jt}$). This variable considers social expenditure by both public and private sources. Private sources include for examples private employer pension funds and organizations like the Red Cross (Eurostat, 2016). For this reason, $tsep_{jt}$ is generally somewhat higher than $psep_{jt}$, but the two variables are strongly positively correlated\(^9\). The data set contains yearly values of the variable $tsep_{jt}$ for a sub-sample of 22 countries for the period 1995-2010.

Figure 2.3 is a time-series diagram of the sample average values of $psep_{jt}$ and $tsep_{jt}$ for the sub-sample in the period 1995-2010. The difference between the two variables vary, but the

---


\(^{10}\) Correlation = 0.8615
average value of $p_{\text{sep}_j}$ is consistently lower than the average value of $t_{\text{sep}_j}$. The development of the two variables over time are also very similar.

FIGURE 2.3

Figure 2.4 shows the development of total social spending in the four country groups. Towards the end of the period covered by the data set, there seems to be movements towards convergence for the Nordic, Conservative and Liberal countries. The Nordic countries have a similar spending level in 2010 and 1995, while spending in the Conservative and especially the Liberal countries have increased between 1995 and 2010. This is what is causing the convergence of the three countries. However, total social spending in the Post-Communist countries has been relatively low and stable over the whole period. This is a contrast to the development in public social spending (shown in Figure 2.2), where the spending level in this group has been more like that of the other groups, especially the Liberal countries.

---

11 Hungary was removed from the sample, due to many missing observations. The Post-Communist group in Figure 5 therefore consists of Poland, the Czech Republic and Slovakia.
The third proxy variable is the Gini coefficient, a measure of the level of income inequality. The data set contains yearly values of the Gini coefficient for a sub-sample of 22 countries for the period 1995-2005. All estimates of the Gini coefficient used in the data set are classified as “high quality”, and similar methods for calculation of income have been used. All estimates are based on net income, so that taxes and transfers have been deducted from gross incomes. Whenever possible, common sources have been used. The main sources are the European Commission, Eurostat and OECD StatExtract, but in a few cases other sources have been used.

The starting point when estimating the Gini coefficient is the Lorenz curve. A country’s’ Lorenz curve plots the cumulative income share against the cumulative population share (World Bank 2016). The Gini coefficient is defined as the area between the Lorenz curve and the straight line of total equality where the cumulative income share is always exactly equal to the cumulative population share (World Bank 2016). The Gini coefficient is usually expressed as a percentage of the total area under the curve, so that a Gini coefficient of 0 corresponds to perfect equality and a Gini coefficient of 1 corresponds to perfect inequality (World Bank 2016). In the extreme case of perfect inequality, all the income in the population goes to one
individual while in the case other extreme case of perfect equality, all individuals have the same income (World Bank 2016).

Figure 2.5 gives a graphical representation of the relationship between Lorenz curve and the Gini coefficient. The Gini coefficient is calculated as the area A divided by the area A + B in the figure (World Bank 2016).

FIGURE 2.5


Figure 2.6 shows the development of the mean value of the Gini coefficient for the relevant sub-sample in the period 1995-2010. There is not much variation in the mean value of the Gini coefficient in this period: the minimum value is 28.82, the maximum value is 30.47. This is relatively low values compared to the rest of the world12.

---

Figure 2.7 shows the development of the Gini coefficient over time for the four group of welfare states defined above. The Nordic countries have the lowest level of inequality, while the Liberal states have the highest. This is in accordance with the traditional definitions of the different welfare states. Over time, there seems to be a common trend for the Nordic and Liberal countries where the Gini coefficient reaches a peak level in the early 200s and then stabilizes to a slightly higher level than before. For the Conservative countries, the Gini coefficient was highest at the beginning of the period. This is also the group for which the value has been the most stable, with only one relatively sharp decline in the first few years. For the Post-Communist countries, there is a positive trend until around year 2005, and then a decline in the value of the Gini coefficient.
While both public social spending and immigration have increased in the period covered here, income inequality in the source countries, as measured by the mean value of the Gini coefficient has remained stable over the same period. However, Figure 2.7 shows that there have been substantial changes in this variable within country groups.

### 2.4 Data on immigration flows

Figure 2.8 shows the mean total immigration flow for the countries in the data over the period 1979 – 2010. The immigration flows have been normalized by dividing the gross flows on the population of the destination country. It is evident from the figure that the size of the immigration flows to this area has increased in the period covered in the data set. Generally, there was a positive trend in immigration from 1980 until 1990. This was followed by a period of smaller flows, but by year 2000 the mean immigration flow was back at the 1990 peak level. After year 2000, the positive trend has continued, but there with a sharp decrease towards the end of the period, around the time of the 2008 financial crisis.
Figure 2.9 shows the mean value of the total immigration flow divided by the population in the destination country for the 4 groups of welfare states in the period from 1979 – 2010. Throughout the period, there is a general positive trend in the size of the immigration flows for all four groups. The relative size of the immigration flows is lowest in the Post-Communist states. Based on the description of the different welfare states given above, this is not surprising since the standard of living is generally lower in these countries than for the other groups. The liberal states received the largest flows of immigrants relative to the size of the population. The Nordic and Conservative states have had quite similar levels of immigration flows for most of the period, until the early 2000s, when the Nordic countries experienced a relatively sharp increase. Because of this increase, the relative size of the yearly immigration flows in the Nordic countries rose almost to the same level as for the Liberal countries.
2.5 The relationship between immigration and welfare

From Figure 2.1 and Figure 2.8 above, it is evident that the two variables public social spending and immigration flows have both had a positive long-run trend in the period 1979-2010. The cyclical variation in both variables, however, are not generally the same. For example, in the early 1990s public social spending increased while immigration flows declined. This could be because many of the destination countries experienced a recession in this period. The development is similar after 2008, which could be related to the financial crisis. As explained earlier, a recession may lead to short-term increases in social spending. At the same time, the recession is likely to make migration less attractive. If an increase in social spending is due to a recession, social spending and immigration flows can therefore be expected to change in opposite directions in the short run.

Figure 2.10 shows a scatter plot of the mean value of public social spending in the period 1995-2005 and the 2005 stock of immigrants in the 30 destination countries in the data set.
The immigrant stock has been normalized by dividing the total stock by the population in the destination country. The fitted linear line in Figure 1.14 shows a positive relationship between the size of the immigrant stock in a country and the level of public social spending. At first glance, therefore, there seems to be a positive relationship between immigration and the generosity of the welfare state.

FIGURE 2.10

However, there are many factors other than the level of generosity of the welfare state that influence the number of migrants that a country receives. This means that the observed relationship in Figure 2.10 is not sufficient to draw any conclusions about the causal relationship between the two variables. The goal of the rest of this thesis is to examine the relation between immigration and welfare more closely.
3 Overview of the literature

3.1 Push and pull factors

The size and composition of migration flows between countries are determined by both supply-side and demand-side factors that influence how attractive migration will be. Push factors are factors in the source country that affect the supply of migrants. Important push factors for developing countries are population growth, the unemployment rate, political instability and poverty (Gubert & Nordman, n.d.). Emigration rates and GDP per capita in the source country have been shown empirically to have a “reverse U-shaped” relationship. The common explanation for this (found for example in Adserá & Pytlíková (2015)) is that the costs of migrating might be too high for most people when GDP per capita is very low. As GDP per capita increases, it becomes feasible for more people to migrate. The result is that the emigration rate increases as GDP per capita increases. After a certain level of GDP per capita is reached, however, less people will find it worthwhile to bear the costs of migrating, and the emigration rate decreases. Factors in the destination country affecting the number of immigrants are called pull factors Important pull factors for immigration to OECD countries have been shown to be the level of political stability, high wages and a high level of social security (Gubert & Nordman, n.d.). Studies (Adserà & Pytlíková, 2015; Pedersen et al, 2008) have also found the stock of immigrants from the source country already present in the destination country to be an important pull factor. A large stock of previous immigrants is thought to give easier access to information and lessen the psychological strain of moving, so that it in effect lowers migration costs.

3.2 Migration and welfare

Many empirical studies have investigated welfare generosity in destination countries as a pull factor. In this literature on “welfare magnets” (a term first coined in Borjas (1999)), both the skill composition and the size of the flow of immigrants to different countries have been studied. There have been two main approaches to studying the relationship between the generosity of the welfare state and migration (Giuletti & Wahba, 2013; Wadensjö, 2007, p.2). The first approach studies whether immigrants are more likely than natives to use welfare
programs. The second approach looks at whether countries with more generous welfare systems attract more migrants.

Borjas & Hilton (1996) find evidence of a “welfare gap” in the United States, meaning that a larger percentage of immigrant households receive some type of social assistance compared to natives. They also find that the types of benefits common among earlier immigrants influence the types of benefits received by more recent immigrants and that immigrants from more recent immigrant waves have a higher probability of receiving benefits than those from earlier waves.

Wadensjö (2007) finds no significant differences between immigrants and natives in Sweden regarding participation in welfare programs, but immigrants are shown to have somewhat lower earnings than natives.

Borjas (1999) makes use of the fact that different states in the US offers different levels of welfare benefits. Borjas finds that immigrant welfare recipients are more heavily clustered in the states with the highest welfare benefits than both immigrants that do not receive welfare and natives. Specifically, Borjas (1999) finds a clustering of immigrants receiving welfare in California, a state that also have a high level of welfare benefits compared to other states. This result is in line with predictions from the model of the “welfare magnet” effect in Borjas (1999). Borjas (1999) also estimates that the “benefit elasticity” of immigrants are larger than for natives. The “benefit elasticity” is defined as the change in the probability that a household receives welfare when the welfare level increases marginally (Borjas, 1999, p 624). This finding is also supportive of the theory presented in Borjas (1999).\footnote{This theory is presented in section 4.}

Zavodny (1997), however, finds no evidence of migrants in the US choosing location based on the level of welfare generosity. She argues that the most important factor for the locational choice of new immigrants is the size of the immigrant population already in the area.

Adserà & Pytlíková (2015) (using the same data set as this thesis) finds that public social expenditure in the destination country has positive and significant effects on migration to OECD-countries.

Giuletti & Wahba (2012, pp. 500) argues that focusing on the locational choices of migrants is a better test for the welfare magnet hypothesis from Borjas (1999) because there are several
alternative explanations for immigrants being more frequent users of welfare services. This can be linked to unobservable characteristics of the immigrants, or discrimination in the labor market may make it more difficult for immigrants to get a job (Giuletti & Wahba, 2012, p.500).

In general, the empirical evidence regarding the effect of welfare on immigration is mixed. Giuletti & Wahba (2012) argues that this possibly reflects difficulties of estimation. They consider the effect of immigration policy regimes and the possibility of reverse causality between welfare spending and immigration to be the two main challenges for research on this subject\textsuperscript{14}.

### 3.3 Migration and the Gini coefficient

Studies relating inequality to migration often focus on how relative income inequality affects the characteristics of migrants, building on Borjas’ (1987) theory on the self-selection of migrants. Fewer studies have looked at income equality in destination countries as a pull factor.

Mayda (2010) finds an “inverse U”-relationship between the relative inequality in the source country and the emigration rate, when the relative inequality is measured by the Gini coefficient of the origin country divided by the Gini coefficient of the destination country.

Hatton (2005) finds a small negative effect of relative inequality measured by the Gini coefficient (UK to foreign) on immigration to the UK. This indicates a negative relationship between the value of the Gini coefficient of destination country $j$ and migration flows from $i$ to $j$, for a given level of inequality in source country $i$.

\textsuperscript{14} See Section 5 for more information about these estimation problems.
4 Theory

4.1 The migration decision

Borjas (2016, pp. 313-314) sums up the modern theory of migration, in which the action of migrating is seen as a form of human capital investment. Individuals contemplating migration are assumed to calculate their prospective lifetime earnings in the alternative locations, subtract migration costs and move to the destination that maximizes the present value of their lifetime earnings (Borjas, 2016, p.313). In the example in Borjas (2013, p. 313), a 20-year-old individual has two alternatives: stay in New York (NY) or move to California (CA). If \( r \) is the discount rate and \( w_t^p \) is the income in place \( p \) at age \( t \), then the individual’s present value of earnings if he stays in New York is given by:

\[
P_{\text{NY}} = w_{20,\text{NY}} + \frac{w_{21,\text{NY}}}{(1+r)} + \frac{w_{2r,\text{NY}}}{(1+r)^2} + \ldots
\]

The present value of lifetime earnings if the individual moves to California is given by:

\[
P_{\text{CA}} = w_{20,\text{CA}} + \frac{w_{21,\text{CA}}}{(1+r)} + \frac{w_{2r,\text{CA}}}{(1+r)^2} + \ldots
\]

If the cost of moving to California is given by \( M \), the net gain to migration for the individual is given by:

\[
\text{NG} = P_{\text{CA}} + P_{\text{NY}} - M.
\]

The individual moves if the net gain is positive, i.e. if the (expected) income is higher in the destination than in the source.
4.2 Welfare magnets and immigration

In a seminal paper, Borjas (1999) analyzes the existence of “welfare magnets” in the United States. The economic model in Borjas (1999) relies on two important assumptions. The first is that there are relatively high, fixed costs associated with migration. Immigrants to the United States will therefore be a self-selected sample of individuals who have chosen to take on these costs. The second important assumption is that for these migrants there are small costs associated with choosing one state over another once they have arrived in the United States. For natives, however, these costs are assumed to be larger, and therefore many will choose to stay in the state where they were born. The theory in Borjas (1999) predicts that new immigrants receiving welfare will be clustered in states where the welfare benefits are high and that the change in the participation rate of immigrants in welfare programs should be larger than the change in the participation rate for natives for a given change in the benefit level.

In the “welfare magnet” model in Borjas (1999), the world consists of two countries, the United States and a source country. In this model, Borjas (1999) assumes the following relationship between the (log) wages of a worker and the workers’ skills in state $j$:

$$\log w_j = \mu_j + \eta_j \nu.$$ 

Where $w_j$ is the wage and $\mu_j$ is mean log earnings in state $j$. $\nu$ is interpreted as a measure of skills that are perfectly transferable across state borders and $\eta_j$ is the rate of return to skills in state $j$.

Wages in the source country are determined in a similar way:

$$\log w_0 = \mu_0 + \eta_0 \nu.$$ 

The source country’s mean wage is given by $\mu_0$ and $\eta_0$ is the source country’s rate of return to skills.

Borjas (1999) then assumes that each state offers income $\overline{w}_j$ in welfare to all its residents (if they do not work), both immigrants and natives. It is also assumed that there are no welfare benefits in the source country.
Figure 4.1 shows how income-maximizing natives will behave when there are no migration costs. In the figure, the return to skills is assumed to be higher in State 2 than in State 1 (so that $\eta_2 > \eta_1$). Welfare recipients who do not work will be clustered in the state that offers the highest welfare benefits. These welfare recipients will be all individuals with skill levels below a threshold, $v_A$.

If State 2 offers the highest benefit level (as shown in the right panel of Figure 4.1), all individuals with skill levels between $v_A$ and $v_B$ live in State 1. The rest of the population live in State 2, but they are split into two groups with different motivations for doing so. Those with skills below $v_A$ chooses State 2 because it has the highest benefit level, while those with skills above $v_B$ chooses State 2 because returns to skills are higher here than in State 1. If benefits are highest in State 1 (as shown in the left panel of Figure 4.1), all individuals with skills below $v_B$ chooses to live in State 1. For those with skills below $v_A$, the income-maximizing behavior is to receive welfare benefits in state 1. Those with skills between $v_A$ and $v_B$ chooses to work in State 1 because the income they make from working in State 1 will be higher than in if they work in State 2 or receive benefits in any of the states. Those with skills above $v_B$ all choose to work in State 2, where returns to skills are highest.

**FIGURE 4.1**

![Diagram showing geographic sorting of natives with costless migration.](image)

**Fig. 1.**—Geographic sorting of natives with costless migration; (a) $\bar{w}_1 > \bar{w}_2$; (b) $\bar{w}_2 > \bar{w}_1$

Source: Borjas (1999, p. 611)
The sorting of individuals in the presence of fixed migration costs is shown in Figure 4.2. Migration costs causes the wage-skill function shifts out for the state where an individual does not currently live. Consequently, migration falls compared to the case with perfect mobility. In Figure 4.2, the migration costs are high enough to stop all “welfare migration”, so that all native welfare recipients stay in the state where they were born.

**FIGURE 4.2**

![Graph showing geographic sorting of natives with fixed migration costs](fig.png)

Source: Borjas, 1999, p. 612

Figure 4.3 shows the sorting of individuals from the source country. When \( \eta_2 > \eta_1 > \eta_0 \), all individuals from the source country with skills higher than \( v_C \) migrates to and works in State 2. Those with skills below \( v_A \) migrates to the state that offers the highest welfare benefits. Individuals with skills between \( v_A \) and \( v_B \) stays in the source country and individuals with skills between \( v_B \) and \( v_C \) migrates to and works in State 1.

If \( \eta_0 > \eta_2 > \eta_1 \), the individuals with skill levels above \( v_C \) choose to stay in the source country. However, individuals with skills below \( v_A \) still choose to migrate to the state with the highest benefit level. Individuals with skills between \( v_A \) and \( v_B \) migrates to State 1 and those with skills between \( v_B \) and \( v_C \) migrates to State 2 where returns to skills are highest.
To sum up, in Borjas’ (1999) model on welfare magnets, high levels of welfare attract immigrants. If the state with the highest benefit level also offers the lowest returns to skill, then this state attracts the same number of migrants as it would without the benefits, but the higher the benefit level is, the larger the proportion of those immigrants that receive benefits without working will be. If the state with the highest benefit level is not the state with the lowest return to skills, then it attracts more immigrants than it otherwise would. These “extra” immigrants are welfare recipients, and the higher the benefit level is, the higher the amount if such immigrants will be. In all cases, immigrant welfare recipients will cluster in the state that
offers the highest welfare benefits. The degree of clustering will be higher for immigrant welfare recipients than for both natives and other immigrants. Because immigrants are a self-selected group of people who are willing to pay the cost of migrating from the source country to the destination, their costs of moving are assumed to be lower than for natives. This means that immigrants will be more responsive to changes in the factors that make up their income maximization problem, such as the level of welfare benefits.

Razin & Wahba (2015) argues that free migration is an important assumption for the welfare magnet hypothesis to hold. They argue that if immigration policy is restricted, the restrictions are likely to favor highly skilled immigrants because they are more likely to be net contributors to the welfare state (since the lower the skill level is, the more likely an individual is to become a welfare recipient). If this is the case, then the effect of a high welfare level on immigration might end up being the opposite of what is expected from the welfare magnet hypothesis. Skilled migrants will be attracted to the destinations that offer high returns to skills, not the highest welfare levels. If destinations with high welfare levels have lower returns to skills, migration will therefore decrease if the less skilled migrants are deterred from migrating by restrictive immigration policies.

Giuletti & Wahba (2013) argues that it is not necessarily only the less skilled migrants that will prefer to locate in destinations with a generous welfare system. Welfare acts as a form of insurance against labor market risks, and therefore there may be a “welfare magnet” effect also for the more skilled migrants (Giuletti & Wahba, 2013, p. 496). In a country with generous welfare benefits, an individual will be ensured some income even if he becomes unemployed. In an uncertain world where economic this increases the expected income stream for all individuals. An extended version of the welfare magnet hypothesis might therefore be that a more generous welfare state attracts more immigrants because it represents an improvement of economic opportunities in the destination.
4.3 Motivations for migration

Borjas (2016, p. 313-314) points out that it follows from the economic theory on migration that the likelihood that an individual chooses to migrate increases if the economic opportunities in the destination increases or if migration costs decrease. If the economic opportunities in the current location improves, this reduces the probability that an individual migrates. In the Borjas (1999), the only factors that affect this likelihood is the mean income, the return to skills and the welfare benefit level. However, there are many other factors that also affect the decision to migrate.

Another point is that most migration decisions is made by families, not individuals. The condition for migration then becomes that the sum of all family members’ net gains from moving is positive (Borjas, 2016, p. 319).

In Hatton (2005) migration costs are modelled as also containing an element that is individual-specific, instead of being the same for all individuals. This way, the model reflects the fact that migration is a complex issue and not always a response to international income differentials (Hatton, 2005, p 728).

---

15 See Section 3 for an overview of push and pull factors.
5 Regression Models

The goal of the regression analysis is to estimate the causal effect of the level of generosity of the welfare state on immigration. This can be considered a test of whether there is a “welfare magnet” effect in international migration. If migrants prefer to move to a generous welfare state and the cost of choosing one destination country over another is sufficiently low, then the countries with more generous welfare states will attract more migrants.

The main independent variable that I want to measure the effect of here is “the generosity of the welfare state” in the destination countries. This arguably refers to not just the quantity, but also the quality of welfare in a country. The concept is difficult to capture in one single variable. Therefore, the regression analysis is done with three different proxy variables for the welfare state. Two of the variables are measures of social spending, and the last one is the Gini coefficient\(^{16}\). In the regression analysis, an increase in social spending or a reduction in the value of the Gini coefficient will be interpreted as an increase in the level of generosity of the welfare state. Neither of these variables can be expected to be a complete measure of the quality of the welfare state, but comparison of the results for the different proxy variables might give an indication of the robustness of the results.

Social spending expressed as a percentage of GDP is the most commonly used measure in the literature when the goal is to compare the level of welfare across countries. This information is relatively easily available for many countries, and it seems reasonable that countries that spend more on welfare can generally also be expected to have a more generous welfare state. However, welfare systems can differ between countries even if the level of total spending is the same. For example, in one country more people may be eligible for benefits, while in another, fewer people get benefits, but those who do get more support. Therefore, it is useful to also check the results of the analysis using a more qualitative measure of the generosity of the welfare state. One of the main goals of a welfare state is redistribution of income and wealth so that some level of financial security is guaranteed for all residents (Welfare State, 2015). Based on this definition, a “more successful” welfare state would be expected to have less income inequality, i.e. a lower Gini coefficient. The Gini coefficient is relatively easy to

\(^{16}\) See Section 2 for details
measure and interpret, and is therefore useful for comparing levels of or changes in income inequality across countries (Liberal Arts ITS, 2005).

The two main econometric challenges with this analysis are omitted variable bias and reverse causality. Both problems will cause correlation between the independent variable measuring the generosity of the welfare state and the error term of the regression and lead to biased estimates that are not internally valid (Stock & Watson, 2015). Omitted variable bias arise if there are variables not included in the regression that influence both the variation in the dependent variable (immigration) and the generosity of the welfare state. Reverse causality refers to the possibility that the size of the immigration-flow may also affect the level of generosity of the welfare state, not just the other way around. Giuletti & Wahba (2013) argues that immigrants may affect welfare spending both directly through participation in programs and indirectly if changes in immigration patterns lead to changes in the immigration policy regime.

**Model 1**

The following regression model is estimated:

$$\ln (m_{ijt}) = \alpha + \beta_1 \ln (W_{jt-1}) + \beta_2 \ln (gdp_{jt-1}) + \beta_3 \ln (unemp_{jt-1}) + \Theta_t + \delta_{ij} + \varepsilon_{ijt}$$

where $m_{ijt}$ is the gross flows of migrants from country $i$ to country $j$ in year $t$, normalized by dividing by the population of the destination country $j$ at time $t$. $W_{jt-1}$ is one of the three proxy variables, intended to capture the size of the welfare state in country $j$ at time $t-1$, $gdp_{jt-1}$ is GDP per capita in country $j$ at time $t-1$, and $unemp_{jt-1}$ is the unemployment rate in country $j$ at time $t-1$. The regression also includes year dummies, $\Theta_t$, and fixed effects, $\delta_{ij}$. $\varepsilon_{ijt}$ is a random error term.

The fixed effects variable $\delta_{ij}$ captures time-invariant factors that affect migration from country $i$ to country $j$. There tends to be more migration between pairs of countries if they have some common history, for example if one country has at some point been a colony of the other (Adserá & Pytliková, 2015). Common or similar languages (linguistic proximity) has also been shown to have a positive impact on immigration flows (Adserá & Pytliková, 2015). The fixed effects also partly control for the difference between gross and net migration due to re-migration and out-migration between pairs of countries (Mayda, 2010, p. 1266). Other examples of relevant factors are the degree of language similarity, cultural similarity,
historical ties between countries and any time-invariant migration policies. The year
dummies, $\Theta_t$, control for shocks that affects immigration flows and are common to all the
countries in the sample. This could be for example the state of the world economy or
developments in international politics such as the financial crisis in 2008 or the refugee crisis.
Such events might affect perceptions and beliefs about the desirability of migration to the
source countries and therefore the total effect on immigration might be larger than the effect
that comes indirectly through the effect on other, measurable variables.

GDP per capita and the unemployment rate in the destination countries are included in the
regressions to reduce the problem of omitted variable bias because they are thought to be
correlated to both the immigration flow and the generosity of the welfare state. Higher
unemployment rate in the destination country will reduce the expected gain of migrating from
the source country, and therefore reduce the immigration flow. If the unemployment rate
increases, more people will be eligible for unemployment benefits, and this could affect the
measure of the (change in) the measured generosity of the welfare state. GDP per capita is
typically positively correlated with wages, which is an important pull factor and countries
with higher GDP per capita also tend to have a better developed welfare state.

To reduce the problem of reverse causality, the yearly immigration flow is regressed on one-
year lags of the independent variables. While the number of newly arrived migrants might
influence the measure of the welfare level in the same year, it is less likely to have influenced
the level of welfare spending the preceding year, since it is uncertain in one year what the
number if migrants will be the next year. However, expectations about next year’s
immigration flow might still influence social spending this year to some extent. For example,
policy makers might want to use welfare policy as a tool for influencing the size of the
expected immigration flow.

In addition to reducing the possible problem of reverse causality, the independent variables
better reflect the information available to the migrants at the time of the migration decision
with this method. The decision to migrate will necessarily have to be made some time in
advance of the migrant arriving in the destination country, because both planning (for
example saving up the necessary amount of money and finding a place to live) and traveling
to the destination country takes time.
Model 2

The effect of changes in the explanatory variables on immigration flows might be different over longer time periods. The full effect of changes in the variables included in the analysis may happen over several years. For example, changes in the welfare policies of a destination country might take time to implement fully, and information about changes in the conditions in a destination country might not be available to all migrants right away. To estimate the effect of the independent variables on immigration in the long run, the following regression model is also estimated:

$$(\ln m_{ijt} - \ln m_{ijt-10}) = C + \Upsilon_1 (\ln W_{jt} - \ln W_{jt-10}) + \Upsilon_2 (\ln gdp_{jt} - \ln gdp_{jt-10}) + \Upsilon_3 (\ln unemp_{jt} - \ln unemp_{jt-10}) + \Theta_i + \epsilon_{it}$$

What is estimated here is the relationship between the 10-year change in the explanatory variables on the 10-year change in the immigration flow from country $i$ to country $j$. This regression therefore looks at whether countries that increased the level of welfare generosity in the last ten years also attracted more migrants in the same period.

The definitions of $m_{ijt}$, $W_{jt}$, $gdp_{jt}$ and $unemp_{jt}$ are the same as in the previous model. Dummies for source countries, $\Theta_i$, are included to capture characteristics specific to source countries that determine the size of the migrant flow in the relevant period (push factors). Examples of such factors could be GDP per capita in the source country, the unemployment rate in the source country and shocks such as wars or natural disasters that occurred in the relevant period17.

---

17 See Section 3 for more on push factors.
Regression results and discussion

Table 6.1 gives regression results when the variable $psep_{jt-1}$ is used as a proxy for $W_{jt-1}$ in model 1. In this regression, data for the period 1979 – 2010 for the full sample of 30 OECD-countries is used. $\beta_1$ is estimated to be positive and is significant at the 1% level in all the regressions. The two other coefficients have the expected signs and are also significant at the 1% level. The estimate of $\beta_1$ increases substantially when GDP per capita and the unemployment rate is added in regressions 2 and 3. This indicates omitted variable bias if these variables are left out. $\beta_2$ and $\beta_3$ have the expected signs and are significant at the 1% level.

**TABLE 6.1**

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent variable:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\ln(m_{ijt})$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\ln(psep_{jt-1})$</td>
<td>0.162***</td>
<td>0.400***</td>
<td>0.528***</td>
</tr>
<tr>
<td></td>
<td>(0.035)</td>
<td>(0.036)</td>
<td>(0.039)</td>
</tr>
<tr>
<td>$\ln(gdp_{jt-1})$</td>
<td>1.428***</td>
<td>1.489***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0580)</td>
<td>(0.0632)</td>
<td></td>
</tr>
<tr>
<td>$\ln(unemp_{jt-1})$</td>
<td>-0.059***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.011)</td>
</tr>
<tr>
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<td>-13.13***</td>
<td>-27.93***</td>
<td>-28.74***</td>
</tr>
<tr>
<td></td>
<td>(0.103)</td>
<td>(0.609)</td>
<td>(0.655)</td>
</tr>
<tr>
<td>Observations</td>
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<td>79,940</td>
<td>75,678</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.129</td>
<td>0.137</td>
<td>0.131</td>
</tr>
<tr>
<td>Number of id</td>
<td>5,342</td>
<td>5,341</td>
<td>5,339</td>
</tr>
<tr>
<td>Pair FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Year fe</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1
The same model is estimated for a sub-sample of countries for the period 1995-2010, using the measure of “total social spending” (tsepjt) from the Eurostat. Table 6.2 shows the results of this regression.

| TABLE 6.2 |
|---|---|---|
| Dependent variable: | (1) | (2) | (3) |
| ln (mjt) | ln (tsepjt) -0.104 | 0.476*** | 0.575*** |
| | (0.075) | (0.079) | (0.085) |
| ln (gdpjt) | 1.904*** | 1.883*** | |
| | (0.083) | (0.083) | (0.018) |
| ln (unempjt) | | | -0.056*** |
| Constant | -12.30*** | -33.38*** | -33.37*** |
| | (0.241) | (0.950) | (0.949) |
| Observations | 39,248 | 39,248 | 39,248 |
| R-squared | 0.111 | 0.124 | 0.125 |
| Number of id | 3,871 | 3,871 | 3,871 |
| Pair FE | Yes | Yes | Yes |
| Year fe | Yes | Yes | Yes |

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The regression results are quite similar for the two measures of social expenditure. The coefficients have the same signs as in the regression with the full sample where psepjt was used as a proxy variable, and are all significant. GDP per capita is again estimated to have the largest effect. A regression for the sub-sample using psepjt (results not shown here) give similar estimates of the coefficients.

---

18 See Section 2 for an overview of the countries in the different samples.
19 The estimates for β1 is somewhat more positive and the estimates for β3 is somewhat more negative when the regression is estimated with the tsepjt sub-sample using psepjt as the proxy variables.
The results of the regression when the Gini coefficient is used as a proxy for $W_{jt}$ are shown in Table 6.3. Here, data for a sub-sample of 22 countries in the period 1995 – 2010 is used. If migrants are attracted to countries with more generous welfare systems, $\beta_1$ is expected to be negative in this regression. The results in Table 5.3 shows that there is a negative relationship between the Gini coefficient and the flow of immigrants in the data so that countries with a more equal income distribution receive more migrants. As in the other regressions of Model 1, the coefficient on GDP per capita is the largest one and positive, while the effect of the unemployment rate is estimated to be negative and significant. A regression using $psep_{jt}$ as the proxy variable for the Gini sub-sample (results not shown here) gives similar results to the ones presented in Table 6.1.

### TABLE 6.3

<table>
<thead>
<tr>
<th>Dependent variable:</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\ln (m_{ijt})$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\ln (\text{gini}_{jt})$</td>
<td>-0.572***</td>
<td>-0.548***</td>
<td>-0.552***</td>
</tr>
<tr>
<td></td>
<td>(0.063)</td>
<td>(0.063)</td>
<td>(0.063)</td>
</tr>
<tr>
<td>$\ln (\text{gdp}_{jt})$</td>
<td></td>
<td>1.163***</td>
<td>1.121***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.091)</td>
<td>(0.091)</td>
</tr>
<tr>
<td>$\ln (\text{unemp}_{jt})$</td>
<td></td>
<td></td>
<td>-0.073***</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.019)</td>
</tr>
<tr>
<td>Constant</td>
<td>-10.69***</td>
<td>-22.56***</td>
<td>-21.96***</td>
</tr>
<tr>
<td></td>
<td>(0.211)</td>
<td>(0.941)</td>
<td>(0.953)</td>
</tr>
<tr>
<td>Observations</td>
<td>36,664</td>
<td>36,664</td>
<td>36,664</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.106</td>
<td>0.111</td>
<td>0.111</td>
</tr>
<tr>
<td>Number of id</td>
<td>3,957</td>
<td>3,957</td>
<td>3,957</td>
</tr>
<tr>
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<td>Yes</td>
</tr>
<tr>
<td>Year fe</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

---

20 See Section 2 for an overview of the countries in the different samples.
To sum up, the results of the regressions for Model 1 indicate a positive relationship between social spending and immigration flows and a negative relationship between the level of inequality, measured by the Gini coefficient, and migrations flows for the OECD countries in the data set. The estimated effect of a marginal change in the generosity of the welfare state is similar for all the proxy variables in Model 1 and is at around 0.5% -0.6%, indicating a relatively robust result. For example, if public social spending increases from 20% to 22% (a 10% increase) from one year to the next, this is estimated to increase the immigration flow by 5.3%. An increase in GDP per capita is estimated to give a more than proportionate increase in immigration flows the following year. A 10% increase in GDP per capita from one year to the next is estimated to increase immigration flows by between 11.2% and 18.8 %. In the regressions using measures of social spending as a proxy for the generosity of the welfare state, a 10 % increase in the unemployment rate is estimated to reduce the following years’ immigration flow by about 0.6 %, which is a quite small effect compared to the estimated effect of the two other independent variables. When the Gini coefficient is used as a proxy variable, the estimate of this effect is 0.7%, so there are small differences between the regressions for this variable as well.

Table 6.4 shows the results of the regression of Model 2 for the full sample in the period 1985-1995, using psepjt as a proxy variable for the level of generosity of the welfare state. Table 6.5 shows the results of the same regression for the period 1995-2005. In table 6.4, only Y3 have the expected sign, and it is only significant at the 10% level. Y2 is estimated to be negative instead of positive and Y1 is not significant. In Table 6.5, however, all the coefficients have the expected signs. The coefficient on the unemployment rate is only significant at the 10% level, however. In Table 6.5, the estimated coefficients are larger than in Model 1.
### TABLE 6.4

<table>
<thead>
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<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
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<tbody>
<tr>
<td>(ln $m_{ij95} – ln m_{ij85}$)</td>
<td>85-95</td>
<td>85-95</td>
<td>85-95</td>
<td>85-95</td>
</tr>
<tr>
<td>ln ($psep_{j95} – psep_{j85}$)</td>
<td>-1.241***</td>
<td>-1.098***</td>
<td>0.0971</td>
<td>0.329</td>
</tr>
<tr>
<td></td>
<td>(0.304)</td>
<td>(0.309)</td>
<td>(0.327)</td>
<td>(0.365)</td>
</tr>
<tr>
<td>ln ($gdp_{j95} – gdp_{j85}$)</td>
<td>-0.936*</td>
<td>-2.238***</td>
<td>-1.968**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.482)</td>
<td>(0.713)</td>
<td>(0.806)</td>
<td></td>
</tr>
<tr>
<td>ln ($unemp_{j95} – unemp_{j85}$)</td>
<td>-0.122**</td>
<td>-0.128*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.062)</td>
<td>(0.071)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>0.846*</td>
<td>0.958*</td>
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<td>0.632***</td>
</tr>
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<td></td>
<td>(0.487)</td>
<td>(0.500)</td>
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<td>(0.133)</td>
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<td>Observations</td>
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<td>1,322</td>
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<td>948</td>
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<tr>
<td>R-squared</td>
<td>0.378</td>
<td>0.380</td>
<td>0.471</td>
<td>0.007</td>
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<tr>
<td>Source-country FE</td>
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<td>Yes</td>
<td>Yes</td>
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</tr>
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Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

### TABLE 6.5

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<thead>
<tr>
<th>Dependent variable:</th>
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<th>(3)</th>
<th>(4)</th>
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</thead>
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<td>95-05</td>
<td>95-05</td>
</tr>
<tr>
<td>ln ($psep_{j05} – psep_{j95}$)</td>
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<td>1.162***</td>
<td>1.337***</td>
<td>1.294***</td>
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<tr>
<td></td>
<td>(0.142)</td>
<td>(0.149)</td>
<td>(0.172)</td>
<td>(0.184)</td>
</tr>
<tr>
<td>ln ($gdp_{j05} – gdp_{j95}$)</td>
<td>3.303***</td>
<td>3.188***</td>
<td>3.278***</td>
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</tr>
<tr>
<td></td>
<td>(0.305)</td>
<td>(0.320)</td>
<td>(0.337)</td>
<td></td>
</tr>
<tr>
<td>ln ($unemp_{j05} – unemp_{j95}$)</td>
<td>-0.140*</td>
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<td>-0.081</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.084)</td>
<td></td>
<td>(0.088)</td>
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</tr>
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<td>0.146</td>
<td>-0.271***</td>
</tr>
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<td>(0.440)</td>
<td>(0.428)</td>
<td>(0.424)</td>
<td>(0.071)</td>
</tr>
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<td>2,482</td>
<td>2,482</td>
<td>2,482</td>
</tr>
<tr>
<td>R-squared</td>
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<td>0.265</td>
<td>0.053</td>
</tr>
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<td>Source-country FE</td>
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<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
In Table 6.6, $tsep_j$ is used as the proxy variable for the generosity of the welfare state in the regression of Model 2. Neither Table 6.5 nor Table 6.6 show significant differences between the estimates with and without the source country dummy when all the independent variables are included. When comparing the results, I will use the estimates for regression 3, where all the independent variables and a dummy for the source countries are included. The estimated effects of changes in social spending is somewhat larger for $tsep_j$ than for $psep_j$, as it is outside the 95% confidence interval for the first estimate. The estimate of $\Upsilon_2$ when $tsep_j$ is used as a proxy variable is within the 95% confidence interval for $\Upsilon_2$ when $psep_j$ is used as a proxy. The coefficient on the unemployment rate is estimated to be somewhat more negative than the 95% confidence interval of $\Upsilon_3$ in the regression with $psep_j$ indicates. All the estimates are significant at the 1% level.

**TABLE 6.6**

<table>
<thead>
<tr>
<th>Dependent variable: $(\ln m_{ij05} - \ln m_{ij95})$</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\ln (tsep_{j05} - tsep_{j95})$</td>
<td>0.112</td>
<td>0.940***</td>
<td>1.843***</td>
<td>1.939***</td>
</tr>
<tr>
<td></td>
<td>(0.232)</td>
<td>(0.257)</td>
<td>(0.317)</td>
<td>(0.354)</td>
</tr>
<tr>
<td>$\ln (gdp_{j05} - gdp_{j95})$</td>
<td>3.296***</td>
<td>3.155***</td>
<td>3.354***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.362)</td>
<td>(0.365)</td>
<td>(0.393)</td>
<td></td>
</tr>
<tr>
<td>$\ln (unemp_{j05} - unemp_{j95})$</td>
<td>-0.389***</td>
<td>-0.375***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.106)</td>
<td>(0.113)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>0.574</td>
<td>-0.0907</td>
<td>-0.0651</td>
<td>-0.210***</td>
</tr>
<tr>
<td></td>
<td>(0.579)</td>
<td>(0.552)</td>
<td>(0.552)</td>
<td>(0.081)</td>
</tr>
<tr>
<td>Observations</td>
<td>1,681</td>
<td>1,681</td>
<td>1,681</td>
<td>1,681</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.270</td>
<td>0.312</td>
<td>0.322</td>
<td>0.064</td>
</tr>
<tr>
<td>Source-country FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1
Table 6.7 shows the results when the Gini coefficient of country \( j \) in year \( t \) is used as a proxy variable for \( W_{jt} \). Again, the results indicate that more unequal countries receive less migrants and the results for the other independent variables are as expected, with GDP per capita having the largest effect. \( Y1 \) and \( Y2 \) are estimated to be smaller than the range of the 95\% interval when both \( psep_{jt} \) and \( tsep_{jt} \) is the proxy. However, the effect of the unemployment rate is larger in Table 7 than what is indicated by the 95\% confidence interval when \( psep_{jt} \) is the proxy and just within the range of the 95\% confidence interval for \( Y3 \) when \( tsep_{jt} \) is the proxy variable.

**TABLE 6.7**

<table>
<thead>
<tr>
<th>Dependent variable: ( (\ln m_{ij05} - \ln m_{ij95}) )</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \ln (gini_{j05} - gini_{j95}) )</td>
<td>0.387</td>
<td>-0.083</td>
<td>-0.904***</td>
<td>-0.903**</td>
</tr>
<tr>
<td>(0.246)</td>
<td>(0.273)</td>
<td>(0.316)</td>
<td>(0.354)</td>
<td></td>
</tr>
<tr>
<td>( \ln (gdp_{j05} - gdp_{j95}) )</td>
<td>1.692***</td>
<td>1.497***</td>
<td>1.660***</td>
<td></td>
</tr>
<tr>
<td>(0.368)</td>
<td>(0.360)</td>
<td>(0.391)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( \ln (unemp_{j05} - unemp_{j95}) )</td>
<td>-0.638***</td>
<td>-0.634***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(0.112)</td>
<td>(0.121)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>0.518</td>
<td>0.143</td>
<td>0.070</td>
<td>-0.003</td>
</tr>
<tr>
<td>(0.545)</td>
<td>(0.546)</td>
<td>(0.554)</td>
<td>(0.088)</td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>1,832</td>
<td>1,832</td>
<td>1,832</td>
<td>1,832</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.255</td>
<td>0.266</td>
<td>0.290</td>
<td>0.040</td>
</tr>
<tr>
<td>Source-country FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses

*** \( p<0.01 \), ** \( p<0.05 \), * \( p<0.1 \)
Table 6.4 indicates that for the 10-year period 1985 – 1995 (for which data is only available for one of the proxy variables, \( psep_j \)) there is no evidence of a welfare magnet effect, as the coefficient on \( psep_j \) is insignificant in the regressions where the other explanatory variables are included. In this period, the effect of GDP per capita is estimated to be negative and significant, suggesting that poorer countries attracted more migrants. These results are not in line with the predictions of the economic theory reviewed in Section 4. The coefficient on unemployment, however, is significant and negative, as expected.

The estimates of the effect of a 10% increase in the generosity of the welfare state, measured by either an increase in social spending or a decrease in the value of the Gini coefficient, over the period from 1995 - 2005 on the immigration flow in the same period range between 9% and 18.4% in the three variants of Model 2. So, the variation in the estimated effect of this variable is greater here than in Model 1, but it is still always positive. As in Model 1, GDP per capita is estimated to have a larger effect. The estimated effect of an increase in GDP per capita between 1995 and 2005 is very similar for the two measures of social spending, but significantly smaller for the regression where the Gini coefficient is used a proxy variable for the level of generosity of the welfare state. However, this is still the variable with the largest effect in all three versions of the model. An increase in the unemployment rate from 4% to 6% (a 50% increase) between 1995 and 2005 is estimated to have caused the immigration flow in the same period to be between 7% and 32% lower than it would otherwise be.

For the period 1995 - 2005, the estimated effects are larger in absolute value in Model 2 than in Model 1. So, the explanatory variables have a larger effect on immigration in the long run. There is likely to be much variation in immigration from year to year that is unrelated to these variables. There may be (for example) stronger information or credit constraints in the short run, preventing migrants from taking full advantage of differences in the explanatory variables. For example, many migrants may not have complete information about the latest development in the economic variables when they make the decision to migrate. In the long run, this will be less of a problem. Those who migrate based on wrongful information will presumably re-migrate or take other actions to correct for this when they discover their mistake. Therefore, migration patterns can be expected to be more clearly correlated with economic incentives in the long run. This argument is supported by the fact that the \( R^2 \) are higher for the regressions of Model 2 than for Model 1. For example, regression 3 in Table 6.1 is 0.13, while the \( R^2 \) for regression 3 in Table 6.5 is 0.27. This means that the independent
variables explain more of the variation in immigration flows in the long run than in the short run.

The regressions for Model 2 using $psep_{jt}$ as a proxy variable for the welfare level gives very different estimates for the period 1985 – 1995 and the period 1995 – 2005. To investigate further how the relationship between immigration and public social spending differs in different time periods, 4 distinct time-periods within the data set are defined:


Model 2 was estimated for all possible 10-year periods in the data set (with $psep_{jt}$ as proxy for $W_{jt}$ and including the unemployment rate, GDP per capita and source country dummies). In Period 1, the coefficient $\gamma_1$ is only estimated to be significant in two out of the six 10-year periods. In one of these periods it is estimated to be negative and in the other period it is estimated to be positive. $\gamma_2$ is estimated to be negative and significant in four of the six 10-year periods in Period 1 (from the period 1982-1992 and onwards). $\gamma_3$ is negative and significant in the same 4 years and insignificant in the two other.

In Period 2, $\gamma_1$ is still insignificant in most the regressions. It is significant in one case, with a negative sign. $\gamma_2$ is estimated to be negative and significant in one of the regressions for Period 2 and insignificant in the rest, sometimes with a negative estimate and sometimes with a positive. $\gamma_3$ is always estimated to be negative and significant in Period 2.

In Period 3, $\gamma_1$ is estimated to be negative and not significant for the first 10-year period, 1991-2001. For the four next periods, however, it is always positive and significant at the 1% level. $\gamma_2$ is also insignificant only for the first period; for the rest of the regressions in Period 3 it is positive and significant at the 1% level. $\gamma_3$ is not significant in the period 1993-2003, but it is negative and significant for all the other regressions in Period 3.

Finally, in Period 4, all the regressions give the same general results. $\gamma_1$ and $\gamma_2$ are always positive and significant and $\gamma_3$ is always negative and significant. These results are similar to
the results in Table 6 and 7, where total social spending and the Gini coefficient are used as proxy variables for the level of welfare generosity. Estimations of Model 2 for the years in Period 4 using the other two proxy variables show similar results, except that the coefficient on unemployment is sometimes insignificant.

There are many possible reasons for this pattern in the data. The years for which data are available are generally regarded as part of a period of increased globalization. There has been development towards more open migration policies in many countries and technological innovations like the spread of the Internet and cheaper transportation have significantly lowered the cost of migration. In the period considered here, there were, for example, two enlargements of the EU, which, among other things, meant that more people could move freely within a larger area. So, it is likely that migration costs have decreased in the period covered by the data set, and, at the same time, the realistic choices available to immigrants may also have increased. If this is the case, migration patterns can be expected to become more responsive to economic push and pull factors over time.

The immigration policy regime is an important example of a variable not controlled for here that may cause omitted variable bias. The rules and regulations regarding entry to and the possibility to stay in the destination country can be expected to be very important for the size and composition of immigrants. It is also plausible that there is a non-random relationship between the type of immigration policy in a country and the generosity of the welfare state, as they will both be part of the current governments’ policy. For example, countries with more generous welfare states may consistently have stricter immigration policies. The fact that unemployment seems to be significant for migration in all the periods might be because immigration policy has changed in response to labor market developments, so that migrants have been able to enter the destination countries in periods where demand for labor increased (and the unemployment rate fell). If countries with higher GDP per capita have had a higher level of immigration control, it might give negative estimates of $\gamma_2$.

However, the results could also be due to better quality and availability of data from the more recent years. There are fewer observations for the first years of the dataset than for more recent years, especially for the variables $m_{ijt}$ and $unemp_{jt}$. It is, of course, also possible that other factors not controlled for or discussed here cause the observed relationships in the data.
A weakness with the analysis is that while the main dataset covers the period from 1979-2010, adequate data for total social spending and the Gini coefficient was only available from 1995. This means that the robustness of the estimates of the effect of the welfare state for the period before 1995 cannot be checked, as only observations of the proxy variable $psepi_t$ are available. Another weakness is that the data set only covers legal immigration. This is a potential problem because illegal immigration is thought to be significant for the OECD countries, and has become more important over time (Coppel et al., 2001).

It is also important to note that the data set does not contain any information about individual’s motivations for migrating or any classification of different types of migrants. For example, some immigrants will be refugees, some come looking for work and some to reunite with family members. The estimated effects are therefore the result of the aggregate reactions of several very different groups, and the effect of the independent variables within groups may vary. Different country also use different definitions of the term “immigrant” and may use data from different sources. This can lead to inconsistencies in the data. Adserá & Pytlíková (2015) provide detailed information on these country differences.

Another problem worth noting is that the measures of social spending used here are aggregate measures, and cover some areas that may not contribute to a more generous welfare state. Also, many of the areas of social spending may not be relevant for migrants when they make the decision to migrate and some areas may be more important than others. For example, if the main motivation for migrating is to work, and the migrant does not have a job at the time of the migration, the possibility of income support while looking for a job might be the most relevant form of welfare to the migration decision. If a country lacks this form of welfare, the costs of migration will be higher than for other countries, even if the aggregate level of social spending is the same. Network effects have been shown to be an important factor in determining international migration patterns, and information about what kinds of welfare that are available is one of the things that earlier migrants can be expected to provide information about. More detailed information on the distribution of social spending over different areas is available for some countries in more recent years.\(^\text{21}\)

There are also possible problems with using the Gini coefficient as a measure of income inequality. Theoretically, countries with very different income distributions can have the same Gini coefficient, meaning that this measure do not give any answer as to whether one of these can be considered to be more equal than the others (Liberal Arts ITS, 2005). This also means that even if the Gini coefficient remains relatively unchanged over time, the underlying welfare distribution may have changed. Another problem with using the Gini coefficient as a measure of the welfare-level is that different benefit systems in different countries may affect the measured income distribution. For example, some types of benefits, such as food stamps, may not be considered when the Gini coefficient is calculated (Liberal Arts ITS, 2005). To reduce such measurement problems, the data used here has been collected from the same sources and been calculated in the same way whenever possible.\(^{22}\)

In the regressions, a given change in the Gini coefficient is estimated to cause a change in the immigration flow that is of the same magnitude (but in the opposite direction) as a similar change in social spending. However, there is generally less variation in the Gini coefficient over time\(^{23}\), and therefore its effect on immigration flows is probably small in practice.

The results from economic theory on migration and welfare indicates that higher welfare benefits will attract the least skilled individuals of the source country. This is also known as negative selection (Borjas, 1987). If this prediction holds empirically, the immigration flow to countries with more generous welfare states will contain a larger proportion of unskilled immigrants. However, this prediction cannot be tested with the data set used here. The basis for the regression models in this analysis is that destination countries with generous welfare states will be more attractive to all migrants. What is found is a tendency for recent immigrants to migrate to countries with relatively generous welfare states, as measured by the three proxy variables.

In the model developed in Borjas (1999) the “welfare magnet” effect is a result of migrants being income maximizers who have chosen to bear the fixed costs of migrating to another country. The extra cost of choosing one location above another once this fixed cost has been paid is assumed to be small. It may therefore be optimal to many migrants to choose the country where they can get the highest income from welfare. However, this may not be the

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\(^{22}\) See Section 2 for details.

\(^{23}\) The variation in the 10-year change is smaller for the Gini coefficient than the variation in the 10-year change for the two measures of social spending.
only reason for the observed “welfare magnet” effect. The assumption in Borjas (1999) is that all migrants only care about maximizing their own income. If this is the case, then the only reason why a migrant would prefer a country with a relatively generous welfare state would be that he maximizes his income by moving there and receiving welfare. However, migrants may prefer a country with a more generous welfare state even if they do not intend to receive as much welfare as they can when they arrive. One reason why this might be the case is that the future is uncertain. For example, risk-averse individuals will appreciate a system where they receive support (monetary and other types) if they lose their job or fail to get one. A generous welfare system offers insurance against economic downturns and reduces the costs of becoming unemployed. Another point is connected to the fact that, as mentioned in the theory section, the decision to migrate is often made by families, not individuals. Some migrants may prefer that their family move to a country with a generous welfare system, for example because it means that they will be better insured against accidents or illnesses, or because they feel that it fits their personal values better.

In Borjas (1999), the costs to migrants of choosing to live in one US state over another is assumed to be negligible for migrants, since they have already chosen to take on the costs of migrating from their home countries to the US. However, this assumption may not hold in the international context. Though all the destination countries in the analysis are members of the OECD, they are quite diverse both economically, culturally and geographically. The area covered is large, and the costs for a migrant of choosing the different areas are likely to vary with distance from the home country, the political regime and many other factors. These factors are to some extent taken care of by including fixed effects in the regression analysis, but they make this analysis different from the one presented in Borjas 1999. There is also a wide variety of welfare systems and rules in the different destination countries, and it is likely more costly and difficult for the migrants to gather information on these: the income maximization problem becomes a more complex problem than simply choosing the country with the lowest fixed welfare level (as in the simplified model in Borjas (1999)).
7 Conclusion

The economic model in Borjas (1999), suggests that income-maximizing behavior will cause a clustering of immigrant welfare recipients in destinations that offer high welfare benefits, given that migration costs are not too high. The empirical literature has typically investigated this claim either by testing whether immigrants have a higher probability of receiving welfare or by testing whether destination with relatively generous welfare systems attract more migrants. The empirical investigation in this thesis follows the latter approach. The results indicate that more migrants choose destination countries with more generous welfare states. The effect of a generous welfare state is estimated to be positive both on average over the entire period in Model 1 and for more recent years in Model 2. However, estimation of Model 2 for the earliest 10-year periods in the data set gives mixed results. GDP per capita is estimated to be a more important pull factor than the generosity of the welfare state in most of the regressions. This is line with many other papers on the determinants of migration (Adserá & Pytlíková, 2015; Ortega & Peri, 2013), but at odds with others, for example Pedersen et al (2008), where no effect is found of any destination pull factors. The effect of GDP per capita on immigration flows is positive and significant, as expected, for recent periods and when the whole period from 1980 – 2010 is considered. However, the estimates for earlier periods are mixed for this variable as well. The relationship between the unemployment rate and immigration seems to be the most robust one across different periods and models; the unemployment rate of the destination country is found to have a negative effect over the whole period that is considered here in almost all the different versions of the two regression models. The size of this estimated effect varies, but is generally relatively modest. The regression analysis give more consistent and stronger estimates of the effects of the independent variables when the 10-year changes in the immigration flow is regressed on the 10-year changes in the independent variables than when yearly values of the immigration flow are regressed on one-year lagged values of the independent variables. This indicates that the included variables have larger effects in the long run than in the short run.

The empirical investigation gives some evidence of a “welfare magnet” effect for OECD countries, in the sense that the level of generosity of the welfare state influences migrants’ locational choices, at least from the early 90s. The data shows that (recent) migrants seem to be attracted to countries with higher levels of social spending and a more equal income distribution. The political implication of this result is that countries that take measures to
increase the generosity of the welfare state can expect increased immigration pressure. Also, if the welfare system in some countries become relatively less generous, migration flows can be expected to change in response to this. If this effect is large enough, politicians in other countries may choose to change their welfare policy in response to changes in other countries. Whether this is thought to be necessary will depend on for example the attitudes toward immigration and the capacity of the immigration system in the destination countries, and could change over time. The tendency towards convergence in social spending for the different country groups in the last few years could possibly be the result of such an effect, and this could be an interesting area for further research.

If it is not reasonable to expect a welfare magnet effect, for example because there are significant differences in the costs of migrating to the different destination countries, then omitted variable bias is most likely the cause behind the correlations found in the data, and an interesting question for further research is what factors may possibly cause this. Other interesting questions that are not considered here are, for example, the extent of reverse causality between immigration and welfare and whether there is a strong selection effect so that a large proportion of immigrants to countries with generous welfare systems are low-skilled.
Bibliography


