

# **What affects migration and does immigration affect the labor market? -A Norwegian outlook**



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**June 2010**  
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This thesis was written as a part of the Master of Science in Economics and Business Administration at NHH. Neither the institution, the advisor, nor the sensors are - through the approval of this thesis - responsible for neither the theories and methods used, nor results and conclusions drawn in this work.

## Abstract

Today immigration affects most of us in some way. In this thesis it is the effects which immigration has on the domestic labor market which is in focus. With basis in a Norwegian outlook the question I wish to answer is “what affects migration and does immigration affect the labor market?”

This by looking at what type of migration there is, what affects the immigration level and in turn how it affects the labor market. I also look closer at some of the models which try to find the expected negative effect from immigration. I find that EEA/EU immigration is likely to have the largest effect in a Norwegian context. In general it seems difficult to estimate the true effect of immigration, though when comparing competing skill groups in the market directly one can find some negative effect on the indigenous' labor outcome.

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## 1. Introduction

In 2008 the number of immigrants coming to Norway reached an all-time record. Naturally immigration is a hot topic both in the media, among politicians and to the population as a whole. The reason for this is simply that immigration affects us, both culturally, socially and pecuniary.

In this thesis it is the effects which immigration has on the domestic labor market which is in focus. With basis in a Norwegian outlook the question I wish to answer is

“ what affects migration and does immigration affect the labor market?”

This I will try to do by first looking at some theories pertaining to migration in chapter 2. The first part defines the different types of immigration, where the common group denominator is the reason the individual had for migrating. Second I will look at what factors affect the individual migration choice. The last paragraph looks closer at how immigration might affect the labor market. In chapter 3 I will use these theories in order to first see what affects the level of immigration to Norway. Second I will look at how the different immigration groups are likely to affect the labor market in Norway.

Next, in chapter 4, the focus is on how the impact of immigration can be measured quantitatively. I will here look closer at the econometrical basis for three models which are commonly used within the immigration impact literature. Chapter 5 looks closer at the practicality of these models and see how good these models actually are at capturing the true effect of immigration. In chapter 6 I narrate the empirical findings of some of the analysis which have used these models.

In chapter 7 I will see what empirical findings there are for the Norwegian labor market. The conclusions and answer to my main question will be given in chapter 8.

## 2 Migration theory

Migration is the act of moving from one region to another, both short term and for longer periods of time. Migration takes different forms and in the first section of this part the types of migration will be defined. Second I will look closer at explanatory factors of both individuals choice to migrate and of the level of migration which a country experiences.

### 2.1 Different types of migration

Migrants from different countries and regions will have different characteristics and legal rights and duties. In a Norwegian context the legal differences can crudely be divided into two; those which immigrants arriving from the EEA (European Economic Area)/EU (European Union) have, and those coming from the rest of the world. This is due to the special rights which EU/EEA residents have in connection with the common market agreement between countries in the EU/EEA.

The character of migration will furthermore differ according to the reason the individual has for moving to a different country, and these reasons are often divided into four different main types; labor, humanitarian, family reunion and educational.

Different characteristics of the individual, such as age, sex, formal education and experience will also affect a persons rights and opportunities in connection with migration. Both in regards to their legal possibilities and as to which individuals choose to migrate.

### 2.1.1 EEA migrants

The EU dates back to 1968, but have had different names throughout the decades. In addition to the hard core of member states, other European countries have an agreement, the EEA agreement, which in effect makes them semi members of the EU. There are at the present 27 members in the Union; Portugal, Spain, France, Ireland, United Kingdom, Luxembourg, Belgium, the Netherlands, Germany, Italy, Slovenia, Austria, the Czech Republic, Hungary, Slovakia, Poland, Lithuania, Latvia, Estonia, Finland, Sweden, Denmark, Romania, Bulgaria, Greece, Malta, Cyprus. The EEA members are Norway, Iceland and Lichtenstein (europe.eu 2010). The EU and EEA constitute a common market which permits the free movement of labor and capital as well as goods and services between states (Baldwin and Venables 2004).

The EU/EEA agreement makes it easier for residents of member countries to enter and live in other member countries. EU and EEA citizens are free to travel into a country and can start to work immediately for three months without making any formal notification to the country's authorities. During a job looking process the immigrant can stay for six months, but nevertheless needs to notify the police that they are in the country within three months. If the immigrant is non- Nordic and his stay exceeds three months the person is required to have a work permit and a residence permit. (udi.no 2010)

Certain transitional rules have applied for new members of the EU/EEA-area. For the first few years after EU expanded toward the east with 10 new member nations in 2004 several countries enforced limitation to the general rule of free movement between borders. Migrants from countries such as Poland, Estonia, Latvia, Lithuania, Slovakia, Slovenia, the Czech Republic, and Hungary had stricter demands to their work relation in order to get a resident permit. As a main rule the labor immigrant was required to obtain an EEA-permit before starting to work in Norway. In order to get an EEA-permit the applicant had to have an offer of full-time employment at normal rates of pay and under normal working conditions. (Thorud et al 2008). In Norway the initial period for the transitional rules were to be valid for two years but has later been expanded with three years (until May 2009). When Bulgaria and Romania joined the EU on January 1<sup>st</sup>

2007 these rules applied for them, and these rules are still in affect for these countries. (udi.no 2010)

The reasoning behind the transitional rules is two fold. First it was seen as necessary to institute some barriers against social dumping. It is defined as social dumping when workers from other countries receive considerably less pay or have worse working conditions relative to native workers in the same sector (arbeidstilsynet.no 2010) An other reason for making such transitional rules was a common fear that the national labor markets would be overflowed by eastern workers if the borders were opened fully too fast. (ec.europa.eu/enlargement, 2009). As a result many countries introduced a transitional period, including Norway.

### **2.1.2 Humanitarian migrants**

A person coming to a country on humanitarian reasons is often called a refugee. Typically refugees come from a high conflict region and are fleeing their home country because they are afraid of their lives. Refugees who come to Norway on such humanitarian grounds do not have the opportunity to work before they have formally been given residence, a process which can take years for many (udi.no, 2010). Immigrants seeking residence on this ground are in the great majority from countries outside the EU/EEA and therefore do not have the rights agreed upon for EU/EEA-inhabitants.

### **2.1.3. Labor migrants**

In Norway there are several different types of work permits that can be issued. These are divided into seven unique categories; specialist, seasonal workers, working guest, au pair, trainee/apprentice, fish-industry worker and EU/EEA workers. The period length for which these are valid varies, as do the criteria for the different permits.

### ***2.1.3.1 Specialist work permits.***

In order to qualify for the specialist work permit the applicant needs to have formal skills or have qualifications which are in demand in Norway. Unless formal education can be verified the demand for the specific qualifications as measured by the pay level the worker will achieve, i.e. the worker must have a yearly salary of NOK 500 000 or higher. Furthermore, the person must have a specific job offer and the permit is valid for one specific employer and work place. The work permission lasts for one year at a time and can be renewed. If the requirements are otherwise satisfied it is possible to apply for family reunion with a specialist work permit.

An ordinary work permit demands the worker to have a formal education. It is also a requirement for the work permit that the worker earns a minimum of what is considered normal in the specific industry (in accordance with tariff pay) (udi.no 2010).

### ***2.1.3.2 Seasonal workers***

For seasonal workers the time limit on the work permit is restricted to six months and it can only be renewed 6 months after the previous one expired. In this time period the person must leave the country. There are no formal requirements as to the applicant's skill level. Such work permits are issued in order to alleviate short term surges in demand for labor due to seasonal variations in production level, such as in agriculture or due to scheduling of vacation. The work permit has as a requirement that the pay is on par with what is normal in Norway. For workers within the EEA this permit is unnecessary as it is legal to apply and work in Norway for up to six months without having a work permit (udi.no 2010).

### ***2.1.3.3 Working guest permits, fish industry work permit and au pair***

The working guest permit is an option for individuals whose main motive is not work, but to learn more about the Norwegian culture. The permit lasts for only 3 months and cannot be renewed.

The fish industry work permit applies only to Russians who wish to work in the fish industry in Troms and Finnmark. In order for such work permits to be issued it is required that the supply of Norwegian and EEA workers is nonexistent.

An au pair will in general have much of the same motive as a guest worker for coming to Norway, as the main pay is room and board, with some additional spending cash. The permit can be valid for up to two years (udi.no 2010).

#### **2.1.3.4 Trainee/apprenticeship**

This work permit is designed for those who wish to learn a specific trade in Norway, which they intend to practice in their native country. In order to qualify for the permit, it is required that the internship plays a significant part of the persons training. The permit can last up to two years (udi.no 2010).

#### **2.1.3.5.EU/ EEA work permits**

See the rules for EU/EEA-members further up, section 2.1.1.

#### **2.1.4 Educational migrants**

Most studies from secondary school and upwards gives enrolled students the right to a study permit which can be extended to last through the whole study time, given that they can provide for themselves. Persons with a study permit are allowed work part time (up to 20 hours a week) during the school year and full time during holidays or other shorter periods of time. (udi.no 2010)

#### **2.1.5 Family reunion migrants**

Relatives and family members of individuals who live in Norway can apply for a family reunion. Whether a family member is entitled to such a residence permit depends mainly on which citizenship or permit the person living in Norway, the sponsor, holds and whether he can provide housing and support the relative financially. The sponsor

needs to have a permanent residence permit or have one that forms a basis for a permanent stay. This often requires that the Norwegian resident has worked or studied in Norway the last 4 years. Family reunion can in other words be granted to humanitarian, student and work immigrants (udi.no 2010).

#### **2.1.6 General characteristics of an immigrant**

The typical immigrant to Norway is younger than the average and in the time period between 1990 and 2007 two thirds were under 30 and nine out of ten were under 40 years of age. Roughly 34 percent of the native population are in that age bracket comparatively. The distribution between men and women is roughly even and similar to that of the population as a whole. Between 1990 and 2007 male immigration dominated slightly. The reason for migrating, however, is very different among the sexes. Men dominate among immigrants who come to Norway on humanitarian grounds and to work. Women dominate among family reunion migrants (Daugstad og Sandnes, 2008).

The level of education varies depending on where the immigrant comes from. Some immigrants have much less education than the average in Norway, however other immigrants have a higher level education. Immigrant from the Philippines, Poland, Russian, India, China and Iran has in the age group 30-44 on average higher educational attainment than Norwegian in the same age group has. Whereas only a third of Turkey and Pakistani have more than high school (ssb.no/utdanning, 2010).

## 2.2 What affects the individuals migration choice

The push-pull framework can be used in order to find what factors affect migration. These variables can in turn be determinant for the level of migration, where push factors can give an indication to why individuals choose to emigrate and pull factors can help explain a country's immigration level.

### 2.2.1 Push-pull framework

A traditional framework used to explain migration looks at what forces have a push or pull effect on the individuals who choose to migrate. Push factors are elements which increase the incentives for the person to leave his or her home country. This could vary in form, from war to having difficulties finding a job. The pull factors are characteristics with the country which the person wishes to migrate to. Such attributes could be a higher wage level, better climate or a interesting culture. In sum such individual choices can have an effect on the aggregate level of migration and help explain the magnitude of migration.

#### 2.2.1.1 Push factors

The push factors affecting labor immigrants are per definitions very different from those who come to Norway as humanitarian reasons. Such factors will be innately linked with the immigration reasons which the individual has.

The push factor for humanitarian immigrants is a fear for their lives in their home country, either due to personal persecution or war actions in the region. The effect of this factor can therefore be very strong, driving many thousands of people to flee there domestic country in hopes of finding a safe place to live.

For labor immigrants a probable push factor is the likelihood of getting a job in the person's home country. The unemployment rate in a country or region will give an expression to how difficult it is for an individual to find employment. A high unemployment rate signals that the demand for workers is lower than the number of people offering their labor recourses. In such a market the willingness to move is likely to be higher, due to the lack of work possibilities at home. Thus a high probability of not finding a job is a push factor towards emigration.

The demographical distribution in the work force might also be indicative for the strength of this push factor. If the unemployment rate is high among the older segments of the work force, these might choose early retirement to leaving their native country in search of a job. Meanwhile if the level of unemployment rate is high among young adults, the consequences might be more distinct in connection with emigration. A young person will in general be both more willing to move, as a youth will have fewer obligation and thus be more mobile and have more vocational options. The youth unemployment rate in a country will therefore be a relative strong force towards emigration.

### **2.2.1.2 Pull factors**

Most people do not migrate during their lifetime and those who do often return to their native country eventually. Such home bias prevails in many different areas, from a willingness to pay more for domestically reared meet to the inherent value of the work place being located in ones home country. This effect seems to often be quite large and is sometimes called the home bias puzzle. It is considered a puzzle because even when controlling for different factors an unexplained bit seems to consistently remain (Faini and Venturini, 2008 ). This means that the remuneration of work in the foreign country needs to be that much higher than what a domestic job pays in order for a person to consider immigrating.

Basic economic theory yield a similar picture when stipulating that the marginal utility of higher pay is positive, but diminishing. Consequently, the higher the pay is in the

home country the less incentive there is to immigrate, no matter how high the wages are elsewhere. The home bias effect and the diminishing return of wages on peoples wellbeing indicate that the wish to immigrate would be lower the richer a country becomes in absolute terms.

A commonly used hypothesis within migration studies is that the main cause for migration is a net difference in economic advantages, often measured in terms of wages (Dustmann et. al, 2003). This assumption suggest that immigration is mainly due to a pull factor. Furthermore, it implies that with high incentives, i.e. a high wages differential, the level of immigration should be high. Countries with a high wage level would in that case have a high degree of immigration (especially labor immigration) and countries which relatively have a low wage level would experience a high degree of emigration. This basic idea is often moderated with assumptions of no institutional or legal barriers. Thus the disparity between the wage level in the sending and receiving country is the prime determinant for the level of migration the countries experience.

The hypothesis of wage being the main reason for migration is tempered with what costs are accrued from migrating. Such costs can be narrowly or widely defined. Migration costs often involve direct costs, forgone earnings while looking for new job in host country and psychological cost. The direct costs are for instance expenses in relation with traveling, administration fees and so forth. Psychological cost are those which stem from having to leave family and friends, learning a new culture ect.

Immigration has certain non avoidable cost associated with it which demands the immigrant to have money saved up beforehand. In order to save up sufficient funds to immigrate the person needs to be sufficiently affluent, i.e. basic needs must be met before extra saving is possible. Thus, on average the possibility of migrating will increase with the rise in a countries income levels. As such one would expect that immigration will increase as a country gets richer and its people can afford to move to a different country.

Faini and Venturini (Faini & Venturini, 2008 ) have made a more formal model with basis in the assumption of income disparities and the observation of the home bias effect. The model stipulates that higher wage level in the sending country will increase migration numbers and the home bias will effect immigration levels negatively.

They find that there are typically two turning points in immigration numbers, which correspond to these observations. That is, the level of emigration increases with rising living standards but at some point turns and decreases as living standards continue to improve. From this one can find a hump shaped graph showing the level of emigration at different levels of income and at what income level the emigration is at its max.

The strength of the home bias is likely to be different from country to country, and thus the concaveness of the hump is likely to be more pronounced in countries with a lower preference for the domestic.

Part of the preference for domestic goods and services can be attributed to the difference in information known to the worker about his home country compared to that of a foreign country. Thus the degree of information concerning a potential receiving country will increase with the level of immigration to that country. Former immigrants will through telling friends and family about the opportunities and practicalities around migration increase the information level. This will reduce the risk connected with traveling to a foreign country, thus making it more likely for others to take a chance.

Other factors that might appear favorable for a person planning on migrating are the labor conditions present in the host country. Labor conditions are things such as health, security and environment (HSE) regulations and institutional security nets towards unemployment or sickness/injuries. An active stance on social dumping might also be considered as a positive for an immigrant as it gives an extra security to the labor

immigrant in regards to being taken advantage of. It might however make it more difficult to find a job in the host country, thus increasing the cost associated with migrating.

For humanitarian immigrants an important pull factor will be the likelihood of getting a permanent resident permit in the country where they seek asylum. Thus a country's migration laws and practices will be a main characteristics for refugees (Forfang, 2003). However, seeing as many humanitarian immigrants will have a wish to stay indefinitely in their new home country, many of the pull factor which are listed above will also be relevant for refugees.

### 2.3 What affects the labor market

The labor market outcome is dependent on the supply and demand for labor. Just as with other assets the clearing price is where supply and demand are equal, and will be the wage. However, the good on this market, i.e. labor, is highly diversified which might yields very different outcomes. Normally there will not be a perfect match between supply and demand in this market and some workers will not find employment at a wage rate that they can accept. Thus, some unemployment will almost always be present.

Basic economic theory dictates that an influx of supply will press the price of the good down and a new equilibrium is found. Thus an increase of workers in the labor force, due to for instance immigration, will have a downward pressing effect on the price of labor, i.e. wages.

This is the fundamental idea behind factor price equalization which predicts that differences in factor prices will be evened out by opening up the market and allowing for more immigration. That is, as high wage countries have a net influx of workers and low wage countries a similar reductions in their work force, the changes in supply of labor will change the price of work. The high wage country will have a relative fall in wages and vice versa for the sending country.

“Integration may change both the barriers to, and the incentives for, labor migration. In a perfectly competitive environment the story is, once again, provided by factor price equalization. (...) And if migration does occur, then it promotes convergence in income levels, raising wages in the source economy and reducing them in the host.” (Baldwin & Venables, 2004)

Due to the way the market functions, with work contracts being a dominant feature, the price for labor is more sticky than in other markets. Sticky prices is a term used to show

that the nominal prize level has a static quality to it and changes in a relatively slow pace (wikipedia.org/sticky 2010). That means that if market conditions change it is hard to alter the nominal wage of an employee, even if the true worth of the labor is lower. Often a termination of contract is necessary in order to get the nominal wage level on par with the value. The termination of contract can often be costly and time consuming, as most work contracts stipulates certain right to the employee.

Furthermore, different types of immigration will have different effects on the labor market, as integration in to the work force will correlate with the reason for migrating both due to characteristics with the individual and due to differences in judicial terms as mentioned above.

In countries with high degree of unionization in the labor market, the market is less flexible in regards to pay, and often have centralized negotiations. This distorts the information which lies inherent in the pay level. National pay agreements make the pay structure more rigid and thus making it more likely that the effect of immigration is more visible in the employment level and not in the wages given.

### 3. Migration in Norway

In this section I will look closer at immigration in Norway and see what factor might affect the level. Next I will see how the different types of migrants can affect the labor market.

#### 3.1. What affects the level of immigration in to Norway

In order to assess the factor which likely affects the level in to Norway one must first look at where many immigrants come from. In total numbers Poland, Sweden, Germany, Denmark and United Kingdom are the dominating European sending countries. Pakistan, Iraq and Somalia are big emigration nations to Norway. When looking at labor immigrants Poland, Germany and United Kingdom continue their dominance.

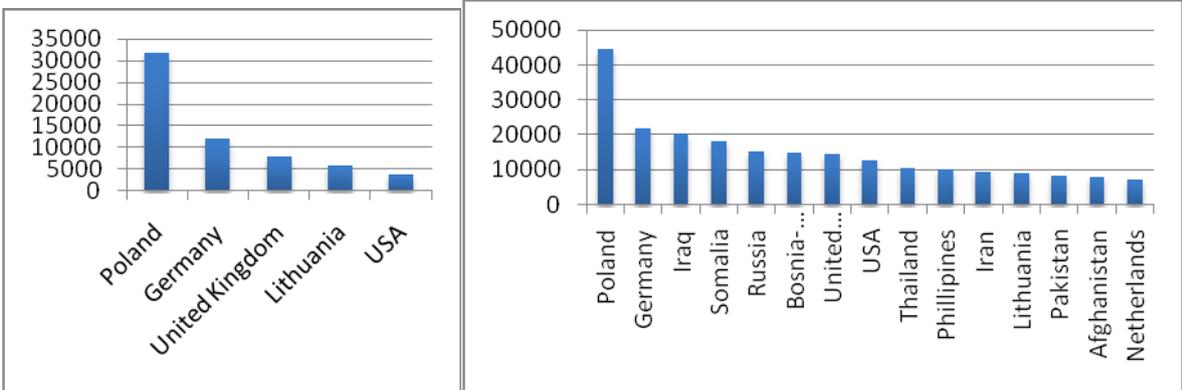


Table 1 a) Top 5 sending country, by labor immigration, 1990-2008 and b) Top 15 sending country, in total, 1990-2008 (ssb/innvgrunn, 2009)

##### 3.1.1 Changes in legal boundaries

In 1990 only 1027 persons, ca 9 percent of total number of immigrants, migrated to Norway for work related reason. The level of work immigrants stayed fairly consistent between 6 and 16 percent until 2004. After 2004 the number has steadily increased and the share of work immigrants has been close to 50 percent in 2007 and 2008, with a

total number of 23 205 labor immigrants coming in 2008, the highest number as of yet. (ssb.no/innvgrunn, 2009)

Two thirds of the labor immigrants who arrived in 2008 were from the new EU-members (Poland, Lithuania, Estonia, Czech Republic , Hungary, Latvia, Slovenia, Slovakia, Bulgaria and Romania), with Poland being the biggest donor country by far, and is the biggest sending nation in total . Since 1990 the number of workers from eastern Europe has increased 166 times.(ssb.no/innvgrunn, 2009)

The obvious reason for this dramatic escalation is the enlargement of the European common market, the European Union. In May 2004 ten new member countries entered the European Union, which opened up for the free movement of both goods and labor. Due to the European Economic Area (EEA) agreement Norway has with the EU, this also opened up the Norwegian market to the new economies in the east. This also means that changes in the migration policies within the EU towards immigrants outside Europe will have consequences for immigration into Norway (Nordby, 2006).

### **3.1.2 Unemployment in sending countries**

Compared to most other nations in Europe, the unemployment level in Norway is very low, ranging from 2,5-3-5 in the period between 2000 and 2008 (table 2 a).

In 2000 the unemployment rate in countries such as Poland, Estonia, Latvia and Lithuania was very high, ranging from 12,8 to 16,8 per cent (table 2 b). Such a high unemployment rate indicates that it was difficult for many to get a job in their home country, creating an incentive to immigrate for labor reasons. Although Germany and the United Kingdom by far has as high a rate as the Baltic countries, the unemployment rate is very high compared to Norway.

The picture becomes even more distinct when looking at youth unemployment. A common similarity is that the unemployment rate for young people is higher than the total unemployment rate.

Sweden is an especially striking example where the total unemployment rate is not high compared to the EU average, but where the youth unemployment in 2008 is higher than the EU youth unemployment average. Denmark has also seen a slight increase in their youth unemployment, in contrast to the total unemployment which fell somewhat from 2000 to 2008.

The Eastern European countries started out with a very high youth unemployment in 2000, laying close 8-20 percentage points over the EU average. By 2008 these countries were on par with the average in Europe. The push factor in 2000 was likely very high for young people in these countries. In combination with that the social and family obligations are fewer for a young person, such a high unemployment rate in this age group would increase the incentive for emigration.

a) Unemployment rates 2000 and 2008			b) Youth unemployment rates (%), 2000 and 2008		
Country	Unemployment rates(%)		Country	Unemployment rates (%)	
	2000	2008		2000	2008
Norway	3,2	2,5	Norway	9,8	7,2
Denmark	4,3	3,3	Denmark	6,2	7,6
Sweden	5,6	6,2	Sweden	10,5	20
Germany	7,5	7,3	Germany	7,5	9,9
Poland	16,1	7,1	Poland	35,1	17,3
Estonia	12,8	5,5	Estonia	23,9	12
Latvia	13,7	7,5	Latvia	21,4	13,1
Lithuania	16,4	5,8	Lithuania	30,6	13,4
United Kingdom	5,4	5,6	United Kingdom	12,2	15
EU-27	8,7	7	EU-27	17,4	15,4
Eu-16	8,5	7,5	Eu-16	16,3	15,4

Table 2, a) Unemployment level in Norway's biggest sending countries, 2000 and 2008

b) Youth (15-24) unemployment, 2000 and 2008 (Labour market statistics, 2009)

### 3.1.3 Income disparities

The average income level is higher in Norway than in many other countries. Compared to other European nations Norway had the third highest income level, only beaten by Switzerland and Denmark. However, when looking at purchasing power Norway is ranked as number eight (after Denmark, Belgium, Germany, the Netherlands, Switzerland, Luxembourg, and Great Britain). (Svenneby, 2005). Norway has no minimum wage level, but have national norms which are often used in setting salaries in different sectors.

Especially compared to countries in Eastern Europe (in particular Hungary, Slovakia, Poland and the Czech Republic) who have on average a purchasing power of under half of the Norwegian average. The incentive for workers in these countries to immigrate, short or long term, to Norway is likely to be high.

From table 3 we can see that the wage level in Norway is much higher compared to what Eastern European countries have. The difference is especially striking for work which is considered to demand less formal skills.

Average gross monthly earnings by occupation, In Euros, for some EU/EEA countries- 2006					
Country	Total	Legislators/senior officials/managers	Professionals	Clerks	Service workers/ shop workers
Norway	3938	6024	4760	3337	2924
Denmark	3268	5928	4497	2979	2311
Sweeden	2856	4728	3465	2357	2419
Germany	2770	5876	4376	2822	1851
Poland	672	1527	835	544	381
Estonia	627	1209	844	506	420
Latvia	465	832	651	406	293
Lithuania	472	842	569	384	288
United Kingdom	3284	5373	4894	2319	1903
EU-27	2222	4363	3150	2079	1605
Eu-16	2313	4624	3365	2216	1661

Table 3 Average gross monthly eanings in 2006, (Labour market statistics 2009)

### 3.1.4 Labor conditions

The labor market in Norway is considered to be highly regulated, both in regards to working hours, HSE (Health, Security, Environment) and pay. Even though working hours are highly restricted, it is still possible for short term worker to work relatively long days and thus earn more money in a shorter time period. Short term immigration to Norway can therefore be pecuniary lucrative, and at the same time keeping the personal social costs fairly low for the individual as the time spent away from ones family is relatively short.

For some immigrants the high focus on HSE can be a a favorable quality with working conditions in Norway, and thus being a possible pull factor. However, it is unlikely that immigrants beforehand know much about the degree of work place safety in a country. A high level of focus on HSE can therefore contribute to an increased desire to stay longer in the receiving country.

The social safety net incase of injury or unemployment is considered very high in Norway compared to most other nations. This is a benefit which all workers are entitled to after working 6 months in the country. Immigrant workers also qualify for benefits in case of injury or unemployment, and this solid safety net might add to a preference for choosing Norway as the destiny for labor immigrant.

As a result of a large number of labor immigrants coming from just a few countries, the Norwegian state has set up special offices and information sites with information in the native language (e.g. Polish, Lithuanian ect) of these immigrant. In some of the bigger cities different government agencies; the police, tax authorities, labor inspection authorities and the directorate of immigration, have a joint guidance office(Service centre for foreign workers, 2010). This simplifies the process for the newly arrived worker in that they only have to go to one place and the process is more efficient. If the immigrant has his paper in order the process should take no longer than one week to complete. Such measures makes the transition into working life easier for immigrants

coming to Norway. Arrangement such as these might make Norway a favored country to immigrate to compared to other nations which do not offer this sort of service.

### 3.2 How do different types of immigration affect the labor market

The participation of refugees in the work force is often relatively low the first years after coming to Norway, though it increases somewhat over time. (Thorud et al, 2008). In the first few years after their arrival their potential to put pressure on the wage structure is therefore limited.

The conditions linked to the specialist work permit, such as the requirement of a NOK 500 000 salary for workers without formal education, suggest that the downward pressure from specialists is likely to be small or non-existent. Furthermore the labor market within occupations where specialists are employed is likely to be fairly tight. Specialist workers might reduce the upward wage pressure within the industry somewhat, and as such provide a downward pressure on the potential earnings of local workers. However, such effects would be rather hypothetical as predictions of what could have been are often flawed in essence.

When seasonal permits are used within agriculture the skill level needed for the job is often limited, and this is reflected in the pay. Seeing as this type of work is short term in nature and poorly paid it is often seen as unattractive for Norwegian workers. It is unlikely that the pay level could be much higher for these types of jobs as the employers, i.e. the farmers, often have limited resources to spend on labor. Without the possibility to use foreign labor, one might expect these jobs to a large degree to stay vacant all together. Even though social dumping might be a highly relevant problem within seasonal jobs, it is unlikely that an increase in foreign labor will have any effect on the Norwegian labor market as such. The effect from fish industry permits is likely much the same as for seasonal workers within agriculture.

The nature of the guest worker permit, especially its brevity (3 months), makes the potential effect on the labor market insignificant. Likewise with individuals with au pair permits will have a negligible effect as the person is not part of the formal labor market.

The immigration which is likely to have the largest effect on wages in Norway is the immigration from EU/EEA. First of the magnitude of the immigration from Europe is much higher than that of the rest of the world, both in total numbers and in regards to labor immigration. This can also be seen from the work permits which are valid at a particular date (table 4 ); the top ten sending countries the last ten years are all European.

Nationality	Valid work permits at a given date of time							
	2001	2002	2003	2004	2005	2006	2007	2008
Poland	513	1273	1113	4528	8632	20860	34129	41815
Germany	2815	3291	3835	4654	5483	7006	9862	12371
United Kingdom	3871	3718	3323	3230	3312	3749	4100	4785
Lithuania	213	437	353	1535	2754	4517	7593	9180
Nederland	1021	1101	1159	1317	1499	1766	2103	2444
France	1073	1112	1117	1152	1280	1425	1663	1966
Estonia	205	387	373	388	563	888	1252	1766
Latvia	105	137	132	324	490	857	1259	1804
Italia	452	477	496	537	587	684	820	1048
Romania	148	204	214	149	181	296	1356	2452

Table 4 Valid work permits at a given date, 2000-2008 (udi.no, 2010)

Unlike other work permits there are no restrictions to the pay level given to workers with an EU/EEA work permit (except for Bulgarian and Romanian workers). Those with an EU/EEA permit have the possibility to underbid Norwegian laborers, and also the incentive to do so if it increases their chances of getting a job in Norway which pays better than what they experience in their home country.

Thus, worker with an EEA permit have both the possibility and wish to constitute a negative pressure on the wages in Norway. The numbers coming to Norway with work intentions from the EU/EE area are also high, thus has the potential to show an effect on the labor market in aggregate. This might be especially true in certain industries. As we can see from table 6 the construction industry has by far the highest number of valid work permits in 2008. The negative pressure on wages is therefore most likely to be highest in this sector.

Valid work permits at a given time- by industry	
Industry	Valid work permits
Construction	277924
Industrial production	179247
Man power and employment office	169326
Communication, trade-, hotel- and restaurant business	148214
Agriculture and fish industry	99066
Lack registration	98412
Services and education	52173
R&D	51987
Other	26982
Health and social services	26239
Mining and petroleum	23727
It consultancy	17786
Total	1172083

Table 6 Valid work permits at a given date in 2008, by industry (udi.no 2010)

## 4 How can the effect of immigration be measured quantitatively

In this section I will look closer at the theoretical foundation for three empirical methods of estimating the effect of immigration on the labor market. These all try to see if one finds the expected negative effect from an increase in the local labor market which the text book model implies.

First I will look more closely at a model which is often referred to as the spatial correlation model which exploits immigrants tendency towards clustering in certain regions within a country. Next I will see how the spatial correlation model has been used within a natural experiment framework. The last model to be investigated is Borjas framework which is a skill based model.

### 4.1 Spatial Correlation Model

#### 4.1.1 Model

The spatial correlation model takes advantage of the fact that immigrants tend cluster in certain regions within a country. As an example, most immigrants in America reside in just a few areas and in these localities the size of the immigrant population dominates over the number of native residents. For example; 35,4 percent of immigrants live in four major cities (Los Angeles, New York, Chicago and Miami) and only 12,9 percent of natives live in these same areas (Borjas, 1999).

The basic idea behind the model is that a correlation between labor market outcomes in locality and the extent of immigrant penetration will measure the impact of immigration in this region with regards to native's wages. Comparing native wage outcomes between areas abundant with migrant workers with less immigrant intensive areas might make it possible to isolate the effect of immigration on natives work opportunities.

Typically the study regress a measure of indigenous' wages on the relative quantity of immigrations in the given region. The regression coefficient, called spatial correlation, is in this model interpreted as the economic consequence of immigration on domestic wages.

#### 4.1.2 Assumptions

In order for the spatial correlation to be a valid measure of the immigration impact on local work opportunities the regression hinges on two important assumptions; that immigration flows penetrate geographic markets randomly; and that the examined market is closed. (Borjas, 1999)

Random penetration of geographic markets is essential to avoid spurious correlations between economic outcomes and increased immigration. The problem with spurious correlations is that the regression analysis indicates a false relationship between two or more unrelated time series simply because each has a trend, (Wooldridge, 2006). If incomers choose to reside in places with a high degree of economic opportunities and general prosperity, this might influence the regression coefficient and it is difficult to discern the true effect of immigration.

The second assumption is violated if natives respond to these supply shock by altering their migration decision, or if capital flows are changed due to an increase in immigrant residents. Should natives choose to leave the market as a result of the influx of foreigners, the net workforce might not be much altered despite the increase of immigrants in this locality. In that case the supply of labor is unchanged, and from a basic demand-supply perspective one would not expect any change in the wage level and the true effect from immigration would be hidden. The market is in other words no longer closed, and the assumption is violated.

Similar, if capital flows into the region are changed as a result of increased foreign presence, the underlying assumption of a closed market will no longer hold. If the market in question is no longer closed, the underlying economic model is no longer valid.

#### 4.1.3 Regression

The most commonly used regression model within spatial correlation literature is:

$$\Delta employment_{is}(t,t') = \beta_t \Delta immigration_{is}(t,t') + X_{is}(t)\alpha_t + u_{is}(t,t')$$

Where  $\Delta employment_{is}(t,t')$  measures the change in employment opportunities experienced by natives who reside in region  $i$ , and belong to skill group  $s$ , between time  $t$  and  $t'$ .  $\beta_t \Delta immigration_{is}(t,t')$  is a measure of the supply shock of immigrants in the area within the specific skill group over time period  $t,t'$ .  $X_{is}(t)\alpha_t$  is a vector of standardizing variables such as sex, age and size of the labor market. These variables are included in order to control for fixed affects. The stochastic error term is given by  $u_{is}(t,t')$ . (Borjas, 1999)

Using the change of employment opportunities,  $\Delta employment$ , and migration influx,  $\Delta immigration$ , instead of the level is in part an attempt to mitigate problems with possible spurious correlation between immigration and economic outcome due to underlying economic conditions, such as a general degree of prosperity in the region.

However, a region's economic wellbeing might very well fluctuate over time due to reasons unrelated to immigration and thus creating spurious longitudinal correlations. In order to truly isolate the immigration effect one would need a measure for the changes in underlying economic conditions which affect the relative wages. Finding such measures has however proven difficult (Borjas, et. al, 1997).

The change in labor supply due to immigration,  $\Delta immigration_{ist}$ , is defined as the increase of immigrants from one decade to the next over native population at the beginning of the decade;

$$\Delta immigration_{ist} = \frac{immigration_{ist} - immigration_{ist-10}}{natives_{ist-10}}$$

This measure avoids the potential endogeneity in the immigration variable due to the possibility that the native population at the end of the decade is dependent on immigration.

The model further divides the different individuals, both native and immigrants, into different skill groups. Commonly five separate skill groups are identified; less than 9 years of schooling, 9-11 years, 12 years, 13-15 and 16 or more years of school attendance. Skill level is an important variable for the wage level and it is therefore important to control for skill related effects on salary. The reason for separating the individuals into schooling categories is because the degree of immigration is unlikely to be evenly distributed across all ages and skill level. In order to discern effects on wages it is more informative to compare individuals who are similar, as these will be in direct competition with each other.

Borjas et al (1997) suggest purifying the immigration impact coefficient by including different fixed effects. Including a vector for education fixed effects might also improve the regression as the remuneration of education might vary over education level and over time. By including a vector for education fixed effects it is possible to isolate the correlation in wage growth within educational groups. The education fixed effects controls for changes in the national market for workers with that particular educational level.

Another fixed effect can be age, which might be an influential factor on wages. Especially since experience, which is difficult to measure, is likely to be strongly correlated with the person's age. Experience is likely to have a positive effect on wage level and if omitted the result might be biased.

One can also include an area fixed effect to control for the level of economic activity on all natives residing in the region.

## 4.2 Natural experiment

### 4.2.1 Model

Due to the nature of social science it is often difficult to find the true causality between different effects as the researcher has no power to control the setting (Wooldridge, 2006). A natural experiment will come closer to duplicate the properties of a controlled experiment through a natural occurring instance of an observable phenomena (Wikipedia, 2009). By using a natural experiment model one might increase the likelihood of finding the true effect from a shock and thereby to a larger degree reflect the true impact.

The methodology used in the natural experiments studies is based on the framework of spatial correlation. By comparing geographic areas which have experienced different levels of immigration one tries to find the effect of the increased supply of labor on the economic opportunities of both immigrants and natives (see spatial correlation section 4.1). Having such natural experiments gives higher credence to the results from the spatial correlation model if the effects are similar, and are as such interesting cases.

The natural experiment studies which have been carried out in the immigration impact literature are few as relevant cases are hard to come by. The first such study was done by David Card (1990) which focused on the Mariel Boatlift in Miami and the economic impact of the increased labor supply. In 1992 Jennifer Hunt did a similar study of the return of Algerian repatriates to France and the effect on the labor market. Last William Carrington and Pedro de Lima (1996) looked at the repatriates from Africa's effect on the Portuguese labor market (see Empirical evidence, section 6.2).

## 4.3 Skill Based Methodology

### 4.3.1 Model

In order to gauge the effect of immigration on local work opportunities Borjas (2003) looks at how the relative remuneration of different skill groups is affected as a response to changes in supply within these skill groups. He does so by calculating the correlation between the magnitude of immigration and the effect on the wage level of competing native workers.

### 4.3.2 Underlying assumption

In order to estimate the impact of immigration there are a few basic assumption which have to hold.

First, the characteristics of immigrants have to vary while natives' stays fixed, this in order to discern the potential effect immigration has on competing natives. This means that the supply of immigration needs to be imbalanced across experience cells, thus giving the necessary exogenous variation to be able to identify the immigration impact. It is the variation of immigrants' make up which makes it possible to evaluate the supply shock of immigrants on different skill groups.

In order to infer the immigration impact from the data material, a sufficient amount of variation in the data is needed. If one only includes education in order to group the different workers, the variation in the sample will be too small to be able to see how the supply shocks affect relative wages.

Borjas therefore aggregates workers into groups based on education and work experience, where time elapsed since ending ones education is used as a proxy for experience. Including work experience is important as the skill level, and hence the workers remuneration, is likely to be affected by both schooling and degree of

participation in the workforce. In addition to giving the data more independent variation in the immigrant supply shock, it is also intuitively compelling to add work tenure.

The second, important assumption is that workers with similar education, yet different level of work experience are imperfect substitutes. Assuming this, one would expect sufficient exogenous variation to identify an effect of increased immigration on competing natives, with basis in the first assumption; that the immigrant supply shock is not evenly balanced across schooling and experience cells, and over time.

Checking the validity of the assumption that immigrants and natives with similar degree of work experience (given the same level of education) are closer substitutes than natives and immigrants with different degree of experience, Borjas uses an index of congruence introduced by Welch (1999).

$$G_{kl} = \frac{\sum_c (q_{kc} - \bar{q}_c)(q_{lc} - \bar{q}_c) / \bar{q}_c}{\sqrt{\sum_c (q_{kc} - \bar{q}_c)^2 / \bar{q}_c} \sqrt{\sum_c (q_{lc} - \bar{q}_c)^2 / \bar{q}_c}}$$

Where  $q_{kc}$  and  $q_{lc}$  give the fraction employed in occupation  $c$ , and  $\bar{q}_c$  gives the fraction of the entire workforce employed in that occupation. The index  $G_{kl}$  equals one when the two groups have identical occupation distributions and minus one when the two groups are clustered in completely different occupations. This index is basically the same as a correlation coefficient. (Welch, 1999)

### 4.3.3 Regression

The immigrant supply shock within a given skill group is given by the relative change in immigrants with a certain skill level to the number of workers (both native and foreign) in that skill group, with education  $i$  and work experience  $j$  at time  $t$ ;

$$immshock = \frac{immigrants_{ijt}}{natives_{ijt} + immigrant_{ijt}}$$

The basic regression equation used is:

$$\begin{aligned} wage_{ijt} = & \beta immshock_{ijt} + education_i + experience_j + periode_t \\ & + (education_i * experience_j) + (education_i * period_t) \\ & + (experience_j * period_t) + \varphi_{ijt} \end{aligned}$$

Where  $wage_{ijt}$  is often the log of real day salary for native workers with education  $i$  ( $i = 1, 2, 3, 4$ ), experience  $j$  ( $j = 1, 2 \dots 7, 8$ ), and  $t$  for observed year. Education is classified into four different education groups where 1 is for high school dropouts, 2 high school graduates, 3 some higher education, and 4 is college graduate. Experience is grouped into five year intervals, in total 8 groups (assuming an average of 40 years of participation in the workforce).

The hypothesis being tested is if the estimate of the parameter  $\beta$  is significantly different from zero and has the expected negative sign. If this is the case we can infer that higher immigration has a depressing effect on local wages. (Borjas, 2003) As it is likely that the effect of immigration does not have an immediate effect, the result might be more accurate if *immshock* is lagged a year (Edwardsen, 2005).

The other variables; education, experience and period, are linear fixed effects to control for systematic differences in the labor market outcome with regard to different educational attainment, experience and period. Education, experience and time period (which also will capture business cycle related changes) are natural variables to include in any labor outcome regression as it is logical that these will affect the wage level for all individuals.

The equation also includes interaction terms for the different fixed effects. An interaction term is an independent variable that is a product of two explanatory variables (Wooldridge, 2006). The variable  $(education_i * experience_j)$  controls for different profile of experience between different education groups, e.g. experience remuneration might differ for a low educated person relative to one with a higher education. The  $(education_i * period_t) + (experience_j * period_t)$  variables control for possible changes in the importance of education and experience on salary level over time.

## 5 How good are these models

In the next section the potential shortcomings with these quantitative models' ability to predict correctly the impact of immigration will be discussed

### 5.1 Spatial correlation model

The spatial correlation model exploits that statistical data show that immigrant penetration and wages differ across geographic areas. These variations are used in order to see if there is a causal relationship between these two variables and to see if the predictions which the schoolbook demand-supply model makes holds true.

The spatial correlation model hinges on two main assumptions in order to get an unbiased estimate of the impact of immigration on local labor market opportunities. In order to use a *ceteris paribus* approach to isolating the effect of immigration it is implicitly assumed that, (1) the immigrant flows are uncorrelated with the economic situation in the region, i.e. random penetration, and (2) that the different localities have the characteristics of being closed markets. If these conditions fail to be valid, the interpretations of the results are not clear cut, and the true effect of immigration might be lost.

Wage differentials across different markets might be due to different long-run equilibriums of the various labor markets within a country. Some regions seem to consistently be high-wage areas for long time periods, that might imply that there are some underlying factors unrelated to immigration which might affect the analysis if uncontrolled for.

Examples of such high wage regions are California, USA, which has been rather prosperous over several decades (Borjas et al, 1997). In a Norwegian context Stavanger might be an example of a locality with a high wage level due to the strong influence of the oil industry (Vrålstad, et al. 2009). Such underlying regional advantages might give rise to spurious relationships between the immigration effect and wages.

Likewise, an economic area might have time-varying economic conditions that change, such as regional booms and recessions unrelated to migration as such, which might give spurious longitudinal effects on the regression results.

Examples could be regions which discover a valued natural resource previously unknown and as a result experience an economic upturn throughout the local economy and consequently an increased wage level. Such regions will likely both attract and actively seek more workers thus increasing the immigration to the area. When using the spatial correlation model the result would imply that it was the immigration which caused higher wages, and not the discovery of the natural resource and its impact on the economy (unless otherwise controlled for).

Foreign workers' choice of residence is likely to not be random, and will furthermore be affected by the reason the individual has for immigrating to the specific country. Individuals who are motivated by labor market opportunities in the host country will naturally choose areas where labor demand is comparatively high. Such migration will therefore have a greater effect on the potential bias in the estimate from this model. The magnitude of this effect is likely to be related to the relative importance of labor immigration on the total immigration to a country. If labor immigration is a dominating reason for coming to the host country the need for controlling for economic conditions in the different localities is more pressing.

Humanitarian immigration is less likely to be related to economic considerations by the immigrant. Different countries have varying policies in regard to individuals who come

to the host country as humanitarian reasons, e.g. refugees in Norway are not permitted to work during the application period, whereas this is allowed in Sweden (Bauer, Lofstrom og Zimmermann 2000). Furthermore, the localization option is not always the refugees own, especially in the beginning where it is common to be placed in special areas, i.e. where the refugee reception centers are located.

In the case that the application is approved and the refugee receives permanent residence in the receiving country, it is possible that economic considerations might have a larger impact on the choice. However, the participation rate in the labor market of refugees is often lower than that of natives and of labor immigrants (Thorud et al, 2008)

Immigration due to family reunion is related to both the number of labor and humanitarian immigrants as both types of immigrants have the right to apply for such reunification. The residence decision will be given by the original immigrant's residence choice, and if the likelihood of labor immigrants' choosing economically prosperous areas is higher than that of immigrants on humanitarian grounds this will also affect the impact family reunification has on the labor market.

The last type of immigration, with basis in education is likely to have very little impact on the labor market. However, it is not uncommon for students to have part times jobs besides their studies and can as such have some effect. The location decision is however unrelated to economic conditions per se and given that universities' locality are not due to present economic considerations, the residence choice should be random in this context.

Most areas are affected by economic ups and down, and cities with a high degree of immigrant clustering also experience periods of both affluence and less prosperous ones (Borjas et al, 1997). Should the case be that economic conditions have a strong effect on

labor market outcomes, which is likely, the immigrant effect might be over shadowed by the business cycle.

In times of high economic activity businesses often need more workers in order to meet the demand, which might lead to an upward pressure on wages if the businesses need to compete for the best people. Furthermore, in prosperous times companies have more economic freedom to remunerate their workers higher due to increased revenues, thus raising the wage level. In the basic spatial correlation model the economic condition effect is not controlled for and hence might bias the regression result.

The second condition for an unbiased regression result is that the local labor markets are closed in regard to human- and capital movements. This entails that native's migration choices are not affected in response to immigration. Native workers in areas with high degree of foreign immigration might choose to leave and find work elsewhere, thus making the net supply of workers in the area close to constant.

There are many reasons for natives to wish to migrate away from migrant intensive areas. First of all, natives might predict, wrongly or not, that the increase in the supply of workers in the labor market might have an adverse effect on their wages. Seeing as this is a common concern voiced by labor organization and politicians, it is not unlikely that this is a publicly held dogma and thus gives natives reason to leave due to the increased density of foreigners. In the European Social Survey 2002/2003, close to 40 percent of the respondents agreed or strongly agreed to the statement that natives' wages level is depreciated when people come to work and live here. It is interesting to note that only 12 percent of the Norwegian respondents were of this opinion. (Statistisk sentralbyrå, 2005). An increase of immigrants might also change the cultural presence, which also might influence some natives to leave the region (e.g. white flight in the 1960-s in the USA (Wikipedia, 2009)).

Labor mobility is likely to be different in countries such as the USA and Norway. USA has a long tradition of high labor mobility and the willingness to move from one place to another in order to find a job is likely to be higher than that found in Norway (and parts of Europe). This is perhaps due to the social security net which one finds in Norway, where people still have a relative high income (unemployment benefit) for fairly long time period in the case of a job loss. Furthermore, the unemployment level in Norway is very low, which might imply that it is easier to find a new job in the same region, thus reducing the need to move.

A closed labor market furthermore means that natives' migration patterns stay unaltered. This is naturally difficult to estimate accurately, and model specifications might have a critical role for the results found. One simplistic way of considering this is to see if the native immigration is higher or lower than the expected national work flows in the region. Studies such as Card (2001) checked whether such native movements were changed due to the Muriel boatlift. Card findings indicate that the net migration rate of natives and earlier immigrants into the Miami area slowed considerably. Several studies have tried to estimate whether domestic migration patterns are changed by immigration in the USA, yielding mixed results (Wright et al 1997)

Another violation of the closed market assumption is if capital flows are altered in response to the increased immigration by equalizing the capital/labor ratios across regions, and thereby wages. An increase of low skilled workers, as often is the case with immigration, might shift the focus from capital intensive to labor intensive industries, and thereby alter the capital flows. Such a shift might also in itself eliminate interregional wage differences and thus make it difficult to estimate the wage effect of immigration by using the spatial correlation model.

Seeing as the effect from increased immigration might be diffused across regions, Borjas et al (1997) emphasize that using small geographic regions makes it more likely to miss out any effect due to the problems so far discussed. The idea being that the immigration

effect has a bigger impact on cities closer to where immigrants cluster than those further away.

In short, local markets can adjust in many different ways, rendering it nigh impossible to control for everything so that the model is analogous with the closed market model which underlies the textbook supply and demand framework.

Furthermore, a high degree of unionization can be a problem for the spatial correlation model as centralized pay negotiations will even out differences across regions, thus taking away the necessary variation in the data in order to infer whether there is an impact from immigration on the wage structure.

## 5.2 Natural experiment

The results from the natural experiments which have used the spatial correlation model are especially interesting as they may give credence to the conclusions which might be drawn from the estimates which the spatial correlation model yields. Given that the natural experiments avoid many of the problems, such as native migration, diffusion of the potential immigration effect across regions ect. related to the estimation model.

The natural experiments which have been analyzed; the Muriel boatlift, repatriates in France and returnados in Portugal, have been chosen due to the characteristics of the immigration inflow. First the increase of immigrants to the different countries have been due to historical event (i.e. non economic) and second have constituted a relatively large immigration inflow over a short time period.

The nature of these immigration flows makes it less likely that indigenous inhabitants have been able to predict where the immigrants would settle, thus making it difficult for the natives to adapt their behavior before the inflow of immigrants. This should reduce the problem with native migration as a response to migration. Especially since the inflow of repatriates happen over a relatively short time period, which makes it difficult for natives to react timely to the increase of residence in an area. In most cases a move takes time, both to make the actual decision and make all the necessary arrangements. "If a rapid influx in immigration limits the role of migration of native labor, capital, and production within the receiving country, then that approach [natural experiment] yields more accurate measures of immigration's effect than does a comparison across cites with different immigration absorption rates." (Carrington and de Lima 1996)

The effect from an increase in the labor force should therefore be more easily identified as the closed market assumption behind the spatial correlation model is more likely to be upheld with a natural experiment.

The immigrants' residence decision is in two of these experiments determined more by non economic events than the work opportunities given in a certain region. The benefit with the Algerian repatriate's case is that Hunt could establish that cultural and climatic considerations had a larger influence on the repatriate's choice of geographic placing than unemployment and wage rates. Hunt found that the predominant explanatory factor for repatriates location was earlier repatriates from Algeria's location and the average temperature in the region. The fact that the repatriates clustered in the same region granted the necessary regional variation in order to do a cross-sectional study based on the spatial correlation methodology without the typical problems which are related to this method (see section 5.1).

Similarly, the major settlement determinant for the Muriel boatlift immigrants, was the relative closeness between Miami and Cuba in addition to the historic clustering of Cubans in Miami. The returnados in Portugal decision was to a higher degree influenced by economic factor such as employment opportunities.

As a major drawback with the spatial correlation model has been a problem with the possibility of a strong link between the migrant's location decision and economic prosperity in this locality, being able to find experiments where the location determinant is non economic increases the significance of the results from the natural experiment model.

Even though such natural experiments might give more insight, such cases may have little predicative value outside the specific case because the particular case may be unusual or unrepresentative. Thus transferring the results to other incidents should be handled with care.

### 5.3 Skill based model

Unlike the spatial correlation model, and subsequently the natural experiment model, the skill based model is a more direct method in gauging the effect from immigration. Instead of looking at wage effects due to increased labor supply in a region, it tries to estimate the effect on natives within a specific skill group from an increase of immigrants in the same skill group.

As such, the whole national market is one market and is therefore more analogous to the closed market model which gives the theoretical predictions of increased immigration. Or rather, each skill group is its own separate market. The model is therefore more likely to be able to capture the effects of immigration and not suffer with some of the problems which the spatial correlation models has in this regard.

The measure used, education in combination with years of work tenure, for the different skill groups is crude, but it still gives a fair measure of which individuals will compete towards each other on the labor market. The experience variable is difficult to measure directly and instead the simple proxy used is the number of years which the individual has had the possibility to participate in the labor market. Naturally an employer would not only look at how long an employee has been active in the labor market but also whether the experience is relevant, which in turn will be an important factor in regards to the individual's salary. This again would mean that different experience would be valued differently for different jobs. Further increasing the measurement problem.

Furthermore, the basic model does not take into consideration that experience achieved outside of the recipient country often is less valued. Borjas tries in an extended model to incorporate this perception, but I will not go into the specifics of this model.

## 6.0 Empirical evidence

All three methodologies have been used on American data; the spatial correlation model has examined data from 1970, 1980 (LaLonde & Topel, 1991) and 1990 Census. (Card, 2001). The Muriel boatlift of 1980 which consists of a natural experiment investigates the impact of a surge of Cuban immigrants on the Miami labor market. (Card, 1990) Using the skill based model Borjas (2003) examines data from 1960 until 1990.

Both the spatial correlation model and the skill based model have been used on German data, covering roughly the same time periode. The natural experiment model has been used on the French and Portuguese labor market where certain historical events have made it possible to use this method.

Under I will relate some chosen studies using these methods of finding the effect of immigration. In the last paragraph I will sum up the total impression from these studies.

## 6.1 Spatial Correlation Model

### 6.1.1 Results from the USA; 1970-1990

This model has been used in several analysis over different time periods and with different specifications. I have chosen two studies' results as examples. The first study related is by LaLonde and Topel (1991) and the second is by Card (2001). Lalonde and Topel's methodology is very close to the basic spatial correlation model, whereas Card had modified the model somewhat.

Lalonde and Topel (1991) use employment data for immigrants and native-born worker from the 1970 and 1980 Census in their empirical analysis. The model they use is fairly close to the basic model described (see section 4.1) with basis in three distinct sources of variation in the relative importance of immigrants in local labor markets, 1) the share of all immigrants in a region, 2) the share of new immigrants, and 3) the changes in these immigrant shares between 1970 and 1980.

Lalonde and Topel's find a small, adverse effect of increased immigration on new and old immigrant cohort's earning with their best estimate being a less than three percent reduction in new immigrants remuneration with a doubling of new immigration.

However, this disadvantage seems to dissipate within relatively few years. A natural interpretation of this is that immigrants become assimilated into the broader labor market. The authors find a small, negative effect of immigration on young (16-34) native blacks, but less so for young Hispanics. The upper estimate of reduction in earnings in response to a long term doubling of immigration is about four percent. As it is reasonable to assume that these groups will be the closer substitutes to new immigrants and as such the most sensitive, the authors conclude that the evidence for serious distributional effects of immigration are weak.

Card (2001) continues the empirical analysis of the effect of immigration on the US labor market using data from the 1990 Census. In response to the many criticisms of the Spatial Correlation Model (Borjas et al, 1997, see 5.1), Card modifies the model somewhat with two main changes. First he operates with occupation-specific labor markets so that it is the net inflow of workers within a certain group that affect the structure of wages by increasing or decreasing the relative population shares within different occupation groups.

The second change from many of the former studies, is a focus on recent immigration, defined as five years by Card. This constricton is imposed because recently arrived immigrants often concentrate in the same occupations as low skilled natives and tend to settle in enclaves of earlier arrived immigrants. (Card, 2001)

Card finds that the measured effects of immigration on the local wage structure are small. The results imply that the immigrant inflows over the late 1980-s reduced the relative wages of low skilled workers in high immigrant cities with no more than 3 percent. Card's results are in other words consistent with LoLande and Topel's (1991) findings. In addition to looking at wage affects, Card also estimated the effect on employment rates due to immigration inflows. He finds that a 10 percent increase in the population share of an occupation group results in a 0.5 percent reduction in the employment rate. An increased supply of worker in the labor market due to immigration seem to have an adverse affect on native's work opportunities, albeit the effect is rather small.

### **6.1.2. Results from Germany**

Pische and Velling (1997) analyze the impact of immigration on 167 local labor markets using data from 328 counties in West Germany between the years 1985 to 1989. The author chose to end the data sample before the reunification, seeing as this political action also had wider effects on the economy.

As native migration from areas with a high degree of foreign immigration is a concern when using the spatial correlation model, Pische and Velling check for this and find no alterations in natives' migration patterns. Furthermore, the model demands that immigrants' choice of residence is random. The authors assume that this choice will be affected by observable variables, such as past labor market conditions, and hence that it will be possible to control for such endogeneity problems. Due to a high degree of unionization the authors expect more affect on employment level than on wages, and have their main focus on this labor market outcome.

In this data there is some evidence that larger inflows of immigrants lowered the employment level among natives, and depressed overall employment even more. The authors note that this is inconsistent with a competitive labor market, and point to affects of union wage setting as a likely cause. However, the spatial correlation model yields little evidence of displacement effects due to increased immigration in Germany.

## 6.2. Natural experiment

### 6.2.1. Results from the USA; 1980

The Muriel Boatlift was a consequence of different political circumstances which in 1980 led to a short term liberation of Cuban emigration, where those who wished to leave Cuba were free to do so from the Muriel port. Between May and September 1980 between 120 000 and 125 000 Cubans immigrated to Miami, USA.

The Cuban immigrants were a motley crew, including inmates from both prisons and mental hospitals. Most of the immigrants seem to have been relatively young, low skilled and with limited knowledge of English. Fifty percent of these immigrants settled permanently in Miami and constituted a 20 percent increase in the Cuban workforce in this city. The focus of the paper is the effect of this dramatic increase in labor supply on wages and unemployment (Card, 1990).

Card compares the Miami labor market with that of Atlanta, Los Angeles, Houston and Tampa-St. Petersburg. These cities were chosen as they have similar characteristics with Miami, both because they have a relative large share of blacks and Hispanics, and exhibited a similar economic pattern to Miami.

Even prior to the Muriel boatlift the wage level in Miami was lower than that of the compared cities. However, there seems to have been no effect on white, black or Hispanic wages due to the Muriel immigrants. For Cubans on the other hand, it seems that their wage level declined relative to other groups in Miami. The wages of Muriel immigrants and other Cubans differed with a fair amount as well, with an unadjusted wage gap of 34 percent. A large part of this gap can be attributed to the difference in skill level, language skills and the degree of assimilation in the US labor market.

As the Muriel immigrants were mostly low skilled one would expect any impact to be stronger on competing natives, i.e. low skilled individuals. In order to isolate the possible effect of the surge in labor supply, Card analyzed the economic opportunities of these skill groups more closely. This did not alter the conclusion; the Muriel boatlift had no adverse effect on black and whites wages or employment.

### 6.2.2. Results from France; 1962

In 1962 Algeria became independent from France and as a consequence most individuals of European origin left the country soon after. Some 900, 000 repatriates returned within the space of a year. Of these, 330 000 were active in the French labor force in 1968, constituting 1.6 percent of the total work force in France.

The repatriates were slightly under represented in the labor force, with 36.7 percent of them being active compared to 41.1 percent rate for France as a whole. The repatriates were on average younger than the French population, but older than the average immigrant. Furthermore, they were over represented in skilled occupations and under represented among production workers and the self employed. The repatriates were granted special benefits which lasted up to a year to support them during their job search. Repatriates were also given first priority to certain jobs to help them “get back on their feet”. (Hunt, 1992)

The unemployment was in 1962, before the repatriates returned, 1.0 percent and for non-repatriates it was 2.1 percent in 1968 and 4.5 percent for repatriates. In Var, the region which received the greatest share of repatriates, the unemployment in 1962 was 2.9 percent and in 1968 it was 5.5 percent for non-repatriates (Hunt, 1992). In Hunt’s regression analysis on unemployment she finds that the repatriates have a significant, positive effect on the native’s unemployment rate. When using a differenced equation, in order to remove regional fixed effects, without controlling for wages, participation rates, and concentration of foreign immigrants, Hunt finds that a one percent increase in the number of repatriates would lead to a 0.12 percentage point increase in non-repatriates

unemployment rate. This result is fairly insensitive to adding other variables (such as trying to capture the business cycle). If the three regions with the highest proportion of repatriates in 1968 are excluded from the analysis, the repatriates variable is no longer significant at the five percent level. Hunt's conclusion is that unemployment has not been modeled very successfully because there is some evidence that the repatriates variable picks up a business cycle effect. However, the repatriates probably increased unemployment somewhat.

Hunt mentioned three limitations to the data available which makes a wage regression less informative. First, it is not possible to discern the repatriates from the indigenous French which makes it difficult to distinguish composition effects from effects on the natives. Second, as there are no price index for this period nominal and not real wages will have to be used. Last, there are no records of union participation, which might have a separate effect on the wage level.

In the cross-sectional analysis, the repatriates have a significant negative effect on wages. However, the robustness of this result seems to be weak, and Hunt concludes that the evidence for a fall in wages due to the repatriates arrival is shallow.

### **6.2.3. Results from Portugal;1974**

After several years of colonial war the African independence movement ended Portugal's colonial power over states such as Angola and Mozambique in 1974. As a result a flood of refugees came to Portugal in the years 1974-76, with estimates ranging from 500 000 returnados (repatriates) to just over a million.

The relative size of this immigration surge makes this a good case for studying the effects of migration on local labor opportunities. However, the labor market statistics in Portugal in this period are less detailed and accurate than one would find in more developed countries. Furthermore, the return immigration from Africa coincided with

political revolution, colonial war, nationalization of several industries, several labor market reforms, and a Europe wide recession. (Carrington & de Lima, 1996)

In an attempt to try to isolate the returnados effect from that of economic and political turmoil, Carrington and de Lima use two different comparisons. In the first the authors use France and Spain as controls for region wide economic effects. Spain especially is a good candidate for this as they had similar political changes and economic position with Portugal, but did not receive a large share of immigrants in the same period. The second comparison uses the normal methodology from spatial correlation by looking at variations across different regions within Portugal.

The returnados were disproportionately male and of working age with relative high education compared with the indigenous population. In 1981 they were however more likely than non-returnados to be unemployed. A disproportionately large part went to urban areas such as Lisbon, Porto and Setubal. This geographic unevenness makes it possible to compare domestic differences due to immigration. Unlike in Hunt's study Carrington and de Lima offer no non-economic reasons for explaining the returnados choice of settlement, and the endogeneity problem discussed under spatial correlation is likely to be present in this analysis (see discussion 5.1).

The returnados effect might be amplified due to two other demographic shocks in Portugal at the same time. As a result of the European wide recession many Portuguese guest workers in France and West Germany returned home to Portugal, and as a consequence of Portugal's retreat from colonial warfare the military employment was reduced from 300,000 to 100,000 enlisted men. As it is not the returnados effect but the consequence of general increased supply of labor which is of true interest, these shocks are not in themselves troublesome.

The results of the comparison within Portugal suggest a strong adverse effect on the district level labor markets. The authors however asks for caution when interpreting the results from the spatial correlation as the results are mainly driven by three data points, that of Lisbon, Setubal and Faro, the areas which absorbed most of the retornados immigrants. These areas had similar negative developments unrelated to immigration which are not captured in the model, such as a drop in tourism and more severe political and economical conflicts than other regions in the country.

The wage effect might at any rate be distorted by socialistic market reform which introduced higher employment security which made it difficult to lay off workers or reduce wages, both minimum and maximum wages were instituted in 1974, and unionization were in some regions mandatory. Many of these institutional changes were similar to those Spain underwent and using Spain as a control might amend some of the distortion brought about by these reforms. However, Spain's political turmoil was less chaotic than that which Portugal experienced; the transition to a peace-time economy went more smoothly; nationalization was not as widespread and Spanish workers moved out of the agricultural sector at a higher pace than their Portuguese counterparts. In other words it is likely that the Spain variable does not manage to capture the full effect of economic and political changes.

Carrington and de Lima conclude that on the basis of international comparison, the enormous influx of labor supply due to the retornados seems to have had a modest effect on the labor market in Portugal.

## 6.3 Skill Based Model

In order to use the skill based model it is necessary to first confirm if the assumptions underlying the method are fulfilled in the given data sample.

### 6.3.1. Results from the USA; 1960-1990

Borjas (2003) uses the U.S. Decennial Censuses from 1960 to 1990 and the analysis is restricted to men aged 18-64. The reasoning behind excluding women is that the female work participation rate is often lower than men's (due to tradition, child birth ect.).

In the data sample which Borjas uses immigration is not evenly balanced across all experience cells in the group, furthermore the supply imbalances change over time. An important fact is that the size of the native workforce is relative stable, which should make the comparison of outcomes across skill groups more precise. The data reveal substantial variation in both immigrant supply shock and native labor market outcomes across skill groups and thus fulfills assumption no. 1.

Using Welch's index of congruence, Borjas finds that the occupation distribution of immigrants and natives with the same degree of experience are in general more alike than the distributions of those with differing levels of experience. With basis in this result one can conclude that assumption no. 2 is also uphold in the dataset. With both assumptions being uphold, one can conclude that the data set contains the necessary variation to perform the regression.

Borjas reports that a 10 percent increase in immigration reduces the wages by 3-4 percent for competing native workers, and that this result is consistent. By 2000 immigration had increased the number of men in the labor force by 16.8 percent. Borjas concludes that the evidence he has found implies that immigration has substantially

worsened the labor market outcomes for many of the native workers. Based on the estimates of the elasticity of the labor demand curve and the degree of immigration to the U.S., Borjas finds that the average native worker's wage is reduced by 3.2 percent.

Individual who drop out of High School are most affected by immigration with a fall of 8.9 percent in wage whereas those with a College degree are barely affected at all (Borjas, 2003). This is in line with the basic text model prediction of labor market outcomes, including that natives with characteristic more similar with those of the immigrants will feel the competitive effect more severely.

### **6.3.2 Results from Germany, 1975-1997**

Bonin (2005) uses data in the time period from 1975 to 1997 drawn from the German Regional File of the IAB Employment Subsample, which is a 1 percent random subsample from the West German Social Security records.

The quota of immigrants show a remarkable variation over time, and there is great dispersion in the immigrant supply shocks, which gives the necessary variation in the data set both within different skill groups and over time. Assumption no. 1 is upheld in the data and the skill based methodology can be used. Assumption no. 2 is not explicitly examined, but it is reasonable that workers in Germany with the same level of education but different degree of work experience will be imperfect substitutes in the labor market, in line with the result Borjas found for the US labor market.

Using the basic model, Bonin finds that a very weak effect of immigration on native wages, with an estimate of about one percent reduction in native wages in response to a 10 percent increase in the share of foreigners relative to the native workforce. This is a much smaller effect than the one Borjas found in the US data, and Bonin suggest that this might be due to immigrants and native workers act as complement to each other. (Bonin, 2005)

## 6.4 Total impression

In the many studies using the spatial correlation model the findings are of a small effect on labor market opportunities of natives. Most find this effect to be negative, however the magnitude is so little that the effect is rather negligible. The findings from the natural experiments seem to support the other findings using the spatial correlation model.

The impression is somewhat different using the skill based model where it seems that one can isolate an adverse effect on local wages for those who are in direct competition with the immigrants. As low skilled, or perceived to be low skilled, immigrants dominate the migration masses, it is the indigenous with a low level of education who face the consequences from immigration.

## 7 A Norwegian outlook

The number of Norwegian studies on the effect of immigration are rather few. There is one analyzing the effect with basis in the years 1997, 1999 and 2001 (Røed 2005) and one using a cross-sectional data from the years 1980 and 1996 (Zorlu og Hartog 2005). Edwardsen (2005) is the latest one which examines data between 1995 and 2003.

Røed found that non-western immigration with higher education had a positive effect on Norwegian wages, and those with low level of education (high school drop-outs) had a negative effect. Zurlu and Hartog used a spatial correlation framework. They find limit effect of immigration on the native wages (Edwardsen, 2005).

Edwardsen uses the skill based methodology and keeps fairly close to the original model. Edwardsen also restricts the sample to men between 18 and 64. Women are excluded as the female participation rate is relatively low, especially among immigrant women, and might therefore be distortive to the analysis. Edwardsen also divides the immigrants in two groups, western (west-Europe and North-America) and non-western migrants (rest of the world). The reason for doing this is that she finds that the characteristics are different for these two groups, with western immigrants having a more similar skill level with indigenous than those from other parts of the world.

Edwardsen finds that the composition of immigrant's education and experience changes over time and the skill based methodology can therefore be used on Norwegian data in order to find the effect of immigration on Norwegians' salary. The author does not check if assumption no 2. is upheld for the Norwegian dataset, but there is no reason to believe that the Norwegian case will be any different than the U.S. case in this regard.

In the basic regression Edwardsen finds that the effect of non-western immigration reduces native wages with 9 percent with a 10 percent increase in the labor force. The

effect of western immigration is lower and a 10 percent increase in the labor force yields a 5 percent reduction on Norwegian wages.

Furthermore, the author checks the effect on the individual education groups. The estimated effect is negative for those with lower education (the three lowest education levels) and a positive effect for those with high education (university). This might explain the more adverse effect from non-western immigration on native wages, as non-western immigrants tend to be relatively higher represented in the low-education group.

Norway has a high degree of unionization compared to USA. Over half of the labor force are members of a union in Norway while in USA under 20 percent of the work force is unionized(Edwardsen, 2005). With basis in the rigidity which centralized wage setting may result in, Edwardsen also divided the data set according to union members and non members to see if this affected the magnitude of the impact. She found that non-member workers were more affected by immigration than union members.

Sadly, this quantitative analysis stops in 2003, before the extension of the common market. As the major change in the immigration pattern to Norway changed in 2004 with a drastic rise in western labor immigration it would have been very interesting to see what a quantitative analysis would yield with later data.

With basis in the potential EU/EEA immigrants have to constitute a negative economic pressure on the labor market outcomes, it is likely that there would be a drop in wages for those who are in direct competition with EU/EEA workers. The industries with the highest level of immigrant laborers are within construction and industrial production (see table 6).

However, this unprecedented level of labor immigration to Norway coincided with a period of high economic activity. Due to the increase in activity it is possible that the increased supply of labor was met by an increase in demand for workers, thus eliminating the potential negative effect.

Without this increase in the labor force within certain sector it is possible that the labor market would have been tight and thus pressing the wage level higher than what has been the case. However, compared to the development of average monthly wages in other industries, the development in immigration intensive industries over the time period from 2003 (before the EU expansion) to 2009 does not seem to be much different and in any case not worse. Both manufacturing and construction, which are the two industries with most foreign workers (see table 6) are among the industries where the wage development has been most positive.

Index for average monthly salary for full time employes, for some industries, 2005=100									
	Oil and gas	Manufacturing	Construction	Commerce	Hotel and dining	IT	Scientific services	Business services	Education
2003	96,75	92,45	93,78	93,28	94,45	92,78	96,78	96,03	92,60
2004	98,50	96,25	96,65	96,73	97,13	97,08	98,63	97,68	96,08
2005	100,00	100,00	100,00	100,00	100,03	99,98	100,00	100,00	100,03
2006	105,00	104,13	104,40	104,25	102,35	104,93	102,70	104,45	102,80
2007	112,68	110,68	110,35	109,93	106,68	112,50	109,80	108,58	107,35
2008	115,80	116,93	116,10	114,88	110,45	119,75	114,08	114,78	112,53
2009	127,05	121,95	118,95	117,40	112,23	124,38	118,50	117,85	118,13

Table 7 Index for average monthly salary within some industries, 2005=100 (ssb.no 2010)

On the surface it seems that the effect of immigration has not been negative after the 2004 EU expansion, despite the increased level of labor immigrant which followed.

## 8 Conclusion

The act of migrating is to move from one region to another. The reason for migrating is often used as a way of defining different immigration groups, commonly divided into humanitarian, labor, educational or family. In addition, immigrants coming from the EU/EEA will have extended rights to enter Norway compared with those who come from other parts of the world. Seeing as these rights are quite extensive it is practical to consider individuals coming from this area as its own group.

The level of labor migration into Norway has increased hundred fold from 2004 and until the present. This is to a large degree due to changes in the legal boundaries of the EU, which extended with ten countries in 2004. The migration level can also be attributed to both push factors in sending countries and pull factors with Norway.

The most common push factors for labor immigrants are likely to be unemployment, especially youth unemployment, in the sending country. The unemployment level in the top sending nations to Norway (Poland, Germany, United Kingdom, Lithuania) do have a high unemployment level, both in total and for youths, compared to Norway and some are substantially higher than the EU-average.

Some pull factors which might attract immigrants to move to Norway can be the wage level; which compared to some of the top sending nations is double as high in Norway, labor conditions such as HSE and a large social safety net.

From basic economic theory one would expect that an increase in the labor force would result in a downward pressure on local wages or increase the unemployment. Different types of immigration are likely to affect the labor market in different ways. Labor immigration, and especially those coming from the EU/EEA, probably will have the greatest effect on labor market outcomes.

Different models have been proposed in order to try to verify and quantify the effect of immigration on the local labor market. The most common models are the spatial correlation model and the skill based model. As the name implies the spatial correlation model exploits that immigrants tend to cluster in certain areas. Should immigration have a negative effect on the local labor market one would expect to see this when comparing immigration intensive areas with areas less abundant with foreign workers. The skill

based model compares individuals more directly and see what the affect of immigration has on the competition within different skill groups, and thus finds the impact of immigration in the specific skill group.

The different studies using the spatial correlation model have had trouble finding a distortive effect from immigration, both when studying data from the US, Germany and different natural experiments in Europe and America. This might be due to the problem with fulfilling the assumption which the methodology is founded on.

The skill based model finds some distortive effect from immigration on native wages when using both US and Norwegian data. However, in Germany the result implies that there is a very little effect from increased immigration.

In conclusion it seems that immigration might have some negative effect on local wages. It is possible that this effect increased with the heightened level of immigration in the latter years, and a deeper analysis of this would be interesting.

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