The effect of immigration on labour market outcomes in Norway

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Preface

I would like to thank my supervisor Erling Barth. He helped me a lot to work over the thesis . He organized my ideas, helped me to get data.

I am grateful to Marianne Roed, she gave me some ideas about the structure of the paper in the beginning of my work and some literature advices.

I know that I can't thank enough my parents and my sister. Without their support I would have never finished this program.

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Abstract

The focus of the paper is the influence of immigrants' distribution on unemployment in Norway. This seems to be the one of the important factors that has been considered in a lot of discussions recently in many countries.

The economic situation all over the world has been changed dramatically. It has become easier for people to change the place of living. A lot of people have migrated recently.

What happens when people move? The study of labour flows across labour markets – whether within or across countries – is a central ingredient in many discussion of labour market equilibrium. These labour flows help markets reach a more efficient allocation of resources.

New immigrants flow into labour market and come into a competition with native workers for better vacancies; they apply for different jobs and try to get highest possible wage. Due to relatively better job opportunities in Norway, there are presently higher immigration inflows then in other Scandinavian countries.

The focus of this paper is an investigation of the impact of migration on unemployment in Norway. It was concerned with an empirical analysis of the results of relationship between immigrant concentration and unemployment based on county level data.

The two groups of models were considered with different explanatory variables. In the first group of models it was estimated the relationship of ratio of immigrants to the total population and unemployment. In the second group of models it was analysed the impact of inflow of immigrants on the change in the unemployment level.

I used six model specifications to analyse the dependent variable and estimated long- and short-run coefficients of the changes in the unemployment due to immigrant inflows.

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Chapter 1 Introduction

The term "immigrant" means a person, who born abroad, permanently is a resident in Norway, both parents born abroad. People born in the country by foreign-born parents are also defined as immigrants. Migration denotes any movement by humans from one locality to another, sometimes over long distances or in large groups. Migration covers both an individual migration process (preparation, decision and the move itself) as well as the aggregate sum of all movements between a place of origin and a destination over a given period.

There are two basic kinds of migration—internal and external.

Internal migration occurs when someone moves from one section of a country to another, usually for economic reasons. The most notable example of internal migration has been the movement from rural regions to cities. This kind of migration has occurred since the earliest recorded periods of civilization. Since the end of World War II, there has been another type of internal migration—from cities to suburbs. Many major cities in the United States and Europe have lost population because their residents have chosen to live in suburbs.

External migration involves leaving one country to live in another. This is also an age-old phenomenon, but the most dramatic example of it took place in modern times. Between 1800 and 1970 more than 40 million persons left Europe for North America. The Atlantic Migration, as it is called, was perhaps the most extensive movement of peoples in history.

Nowadays we face the international migration as it become easier for people to change their place of living and move to another country for working or studying purposes. International migration is affected by the increasing interdependence among countries caused by economic liberalization, continued income disparities among nations, cheaper and more accessible means of transportation, and growing demographic disparities between developed and developing countries, all this in addition to the geo-political factors that changed the configuration of major states during the 1990s. And as a result, during the recent years there was a large shift in the distribution of international migrants between developed and developing countries.

The migration debate in Norway focuses on Norwegian asylum policy and says little about the diversity of reasons causing people to migrate. The perspective should be expanded, because migration is about some of the most central questions of our time: the need for labour, financial and democratic development, trade, integration, human rights and community security.

At the moment it is estimated that there are approximately 200 million people who have lived outside their home country for more than a year. [1] A common designation for them is migrants. Migration, immigration and emigration, cover both voluntary and forced movement, legal and illegal. Students, construction workers, asylum seekers, directors in international companies and illegal migrant labour are all part of the international migration picture.

Increasing globalisation with growing travel activity, internationalisation of the education system and increased international trade give more and more people the opportunity and need to reside outside their home country periodically. Other important reasons for migration are conflicts and poverty, which sends millions of people in search of a better life.

Experience shows that people will move, regardless of whether states attempt to close their borders or not. In this reality, one must attempt to manage and handle migration in the best possible way in order to take advantage of the benefits and minimalise the negative effects of migration.

 In October 2005 The Global Commission for International Migration (GCIM) published its final report "Migration in an interconnected world: New directions for action, written on commission by the UN". The report concludes that international society has neither been able to realise the potential nor grasped the challenges which lie in international migration. The Commission is looking for a greater coherence in the migration policy on a national, regional and global level. The report leads up to a high-level dialogue on international migration and development in the UN General Assembly in the autumn of 2006.[2]

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[1] *Norwegian Directorate of immigration, Report of international migration ,10.04.2006*

[2] *The Global Commission for International Migration , "Migration in an interconnected world: New directions for action, written on commission by the UN",10.2005*

There is a clear connection between migration and development. This becomes clear when one looks at the contribution made by migrants to economic growth in their home country. It is estimated that migrants' registered financial transfers to their country of origin is significantly high. In addition, it is estimated that unofficial transfers can be two times higher then registered transfers every year. The registered transfers alone amount to nearly three times as much as official development aid. In addition, migration leads to the circulation of knowledge and experience.

The one of the questions that was considered that there is an effect of migration on the local labour market. The increase in number of immigrants leads to higher unemployment rate in the country. What is the effect of changes in economic situation all over the world to the local market due to flows of immigrants?

Chapter 2 Description of the problem

1. Foreign nationals arriving in Norway

Norway has a short history of immigration. Net immigration of foreign citizens was stable from 1960 to 1970 at a low level, 3000 persons a year. A rising number of Asian immigrants in the early 1970's contributed to higher net immigration, reaching a level of 5000 in 1975. The net immigration was then constant for about ten years, increased to nearly 15000 in 1987-88, fell back to 5000 in 1990 and returned to about 10000 persons in 1993.[3]

Nordic citizens have had free access to the Norwegian labour market since 1954 and the right was extended to EU citizens in 1994. Before 1975, permission to stay on a permanent basis was given to foreign persons holding a contract with a Norwegian employer. This general access was abandoned in 1975 due to the implementation of the immigrant stop. Exemptions were made for key personnel, which in practice meant highly skilled workers from OECD countries. As skills level became an important criterion for immigration, it practically closed the border for low and medium-skilled workers, reducing the flow of economically-motivated immigrants from developing countries. Immigration motivated by family reunification or marriage was still accepted. Refugees and asylum seekers were also

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[3] **Pål Longva, Oddbjørn Raaum, "Unemployment and Relative Earnings of Immigrants** Norway", 1997

given permanent residence permit, based on individual applications. In spite of the tighter immigration policy, the relative number of Non-OECD immigrants has increased since the mid seventies. Moreover, the composition has changed from first generation economic immigrants to persons arrived through family reunification/marriage and refugees.

The number of permits granted does not, for several reasons, tell us how many foreign nationals arrive in Norway or who is staying here:

• very many visitors who come to Norway for less than three months do not need a permit;

• some of those who have been granted a permit do not use it (for example, due to illness);

• some of those who arrives to stay in Norway illegally after their permit have expired;

• few arrive without a valid permit;

• some applicants receive more than one first-issue permit, for example by applying for a family immigration permit after having first been granted a study or work permit;

• visa granting entry into Norway may be issued by any country participating in the Schengen agreement;

• citizens of Nordic countries do not require a permit from, or to be registered by, the immigration authorities;

• EU nationals can stay in Norway as jobseekers for six months without needing a permit.

2. Migration to Norway

The past five years have seen considerable changes in the EU's migration policy and handling, and there are warnings of even greater changes in the years to come. With the Hague programme, which was adopted in November of 2004, the EU countries have set definitions. From now on they will not only cooperate on asylum and immigration policy, but in the whole of the field of migration. The programme outlines a vision for the future regarding a common policy on asylum, a common approach to labour immigration, common return policy and improved border controls and partnership with refugee-producing states by 2010.

The changes which are taking place in the EU are relevant for Norway because we are affected by developments in the EU through the Schengen agreement. This was the theme at

the UDI's spring conference in 2005, EU's asylum and immigration policy undergoing change – what consequences will this have for Norway?

A central theme concerning migration to Europe is the need for labour. Prognoses show that the EU's labour force will be reduced by 20 million by 2030. At the same time, the number of elderly will increase drastically. This could have serious consequences for the economic development in our part of the world. Therefore, there is discussion on whether one should establish a more pro-active system for labour immigration within the EU.

Norway's immigrant population consists of people from more than 200 different countries. They have come to Norway as refugees, labour immigrants or through family relations with other immigrants or Norwegians.

The immigrant population is now nearly 460 000. This group accounts for 9.7 per cent of Norway's population. Broken down by country, 56 000 are immigrants from other Nordic countries, 57 000 come from other countries in Western Europe and North America, 48 000 from the ten new EU-countries in East Europe, 52 000 from the rest of Eastern Europe, and 246 000 come from Turkey and countries in Asia, Africa and South America. .[4]

The majority of first-generation immigrants are from Sweden, Poland and Denmark. 47% of the immigrant population has Norwegian citizenship.

The number of immigrants has increased in the last 50 years. The first immigrants to Norway came from Eastern Europe after the Second World War, followed by labour immigrants from Europe and the rest of the world. Since Norway introduced the ban on labour immigration in 1975, the number of refugees from non-western countries has increased. With the EU enlargement immigration from Poland has peaked over the last two years. The number of immigrants varies with the immigration policy pursued by the government, the needs of the labour market and global crises. Immigration increased during and after the Balkan wars of the 1990s. In recent years, the majority of new immigrants have come to Norway as a result of family reunions, to start a family with other immigrants or with Norwegians.

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[4] *Statistics Norway, Immigrants population report,2007*

The total population in Norway increased by 29 000 persons from 1 January 2006 to 1 January 2007, the largest annual increase ever. They are 415 300 persons in Norway with immigrant background, or 8.3 % of the total population. At the beginning of 2007 there were 341 800 first-generation immigrants in Norway and 73 500 persons born in Norway with to two foreign-born parents.[5]

It can be seen from the figure 1 that the largest group of immigrants is people from Pakistan, than it follows Sweden. The third place is to immigrant from Iraq. The majority of immigrants living in Norway are first generation immigrants without Norwegian background.

Figure 1 *The 15 largest groups in the immigrant population. 01.01.2007 (number in 1000)*

The largest immigrant groups in Norway. 1.1.2007. Absolute numbers
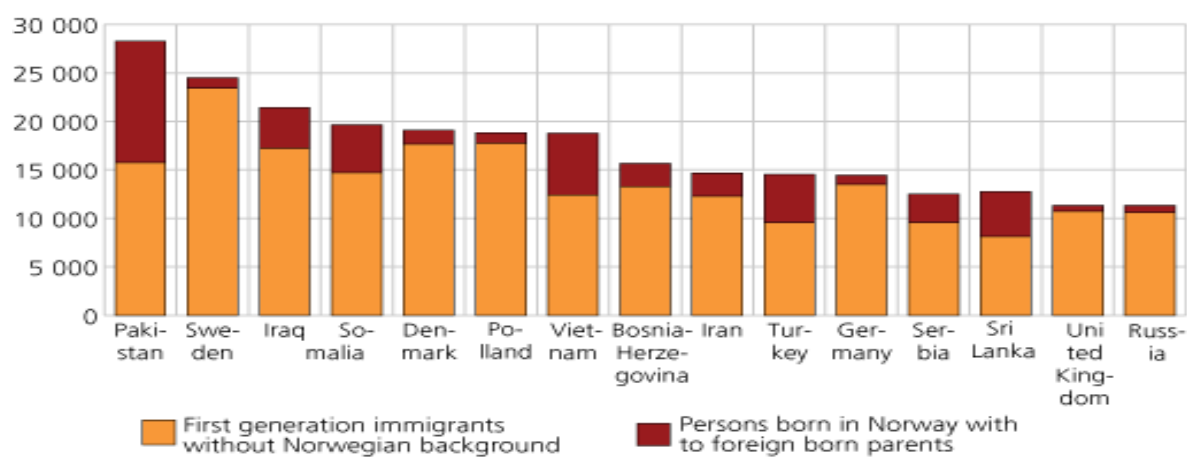
Source : Statistic Norway, Immigrants population report, 01.2007

- ***High increase in immigrant population from Poland***

There has been the largest increase in the numbers of people with Polish immigrant background, with 7 000 persons, followed by Germans (1 600), Somalis (1 500) and Swedes (1 100). The Polish immigrant population has showed a large increase over the last two years (8 900 persons), and now it is the one of the largest immigrant groups in Norway. The population growth among people with immigrant background from Eastern Europe was 11 400 persons, while immigrant population from Asia and Africa increased by 12 000 persons.[6]

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[5] *Statistics Norway, Immigrants population report, 01.2007*

[6] *Statistics Norway, Immigrants population report,01.2007*

- *Persons with non-western background dominate*

The increase in immigrant population is mostly a result of immigration from non-western countries. We can see on the figure 2 that three out of four persons in immigrant population have a non-western background in 2007, or 6.6 per cent of the total population. At the beginning of 1986, the non-western immigrant population made up 1.1 per cent of the total population. [7]

Figure 2 *The immigrant population by country background, proportion of the total population, 1986-2007*[8]

The immigrant population's porportion of the total populatio, by western and non-western country background. 1.1.1986-1.1.2007
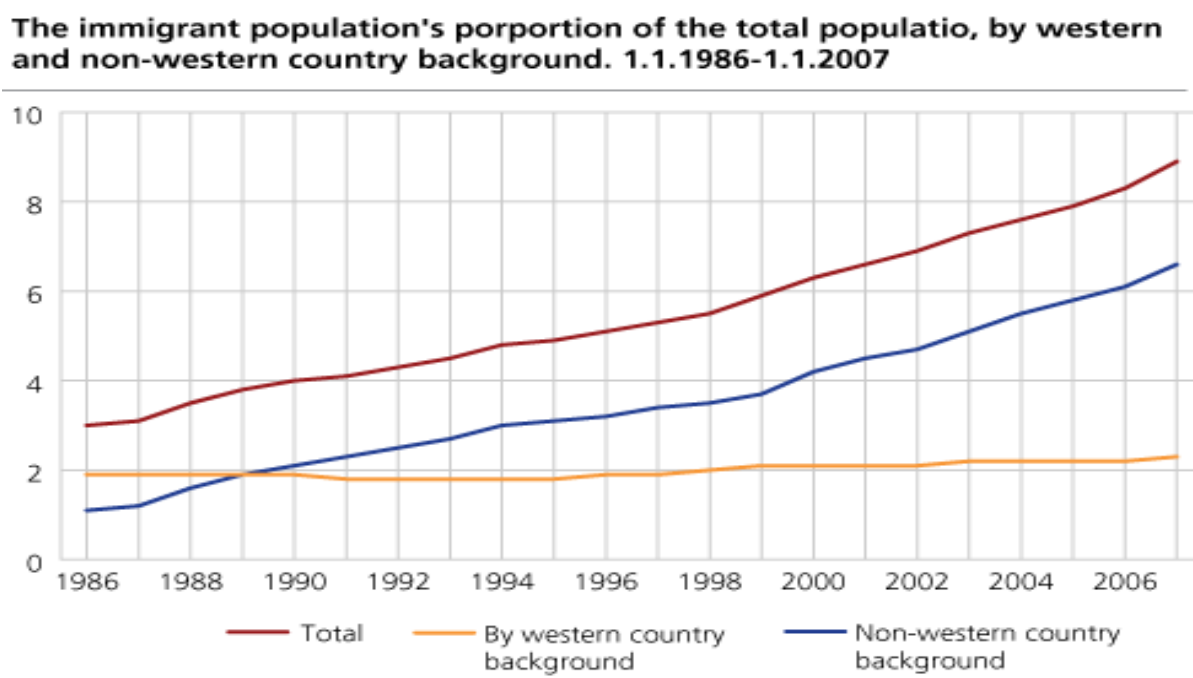
Source : Labour Force Survey 01.2007, Statistic Norway

- *Even gender distribution*

On 1 January 2007, the immigrant population consisted of nearly as many men as women (208 500 women and 206 800 men). Nevertheless, there were considerable differences depending on country background. A larger surplus of men was found among immigrants from Poland, Great Britain and Iraq with 60, 59 and 57 per cent respectively.

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[7] *Statistic Norway, Labour Force Survey, 01.2007*

[8] *Non-western country -Asia including Turkey, Africa, South and Central America and Eastern Europe.*

Among immigrants from Thailand, the Philippines and Russia there was a surplus of women (84, 77 and 66 per cent respectively).[9]

- *Geographical distribution of immigrant population in Norway*

There were immigrants resident in all the Norwegian municipalities. 31.5 per cent of the immigrant population lived in Oslo at the beginning of 2007. Oslo had the highest proportion of non-western immigrants with 20 per cent, followed by Drammen (16 per cent) and Lørenskog (13 per cent). Just two municipalities in Norway, Beiarn and Osen, didn't have any residents with non-western background on 1 January 2007.

3. General characteristics of migration flows and regulation

The entry of foreigners to Norway and their right to work are regulated by The Immigration Act of 24 June 1988. Four categories are admitted:

- persons with a concrete job offer;
- refugees and other humanitarian cases;
- family relations;
- students

From figure 3 we can see that the largest increase in numbers in work permit granted with long duration (more than 6 months), number of study permits is quit stable over 10 years.

Figure 3 Various types of permits granted, 1995-2006
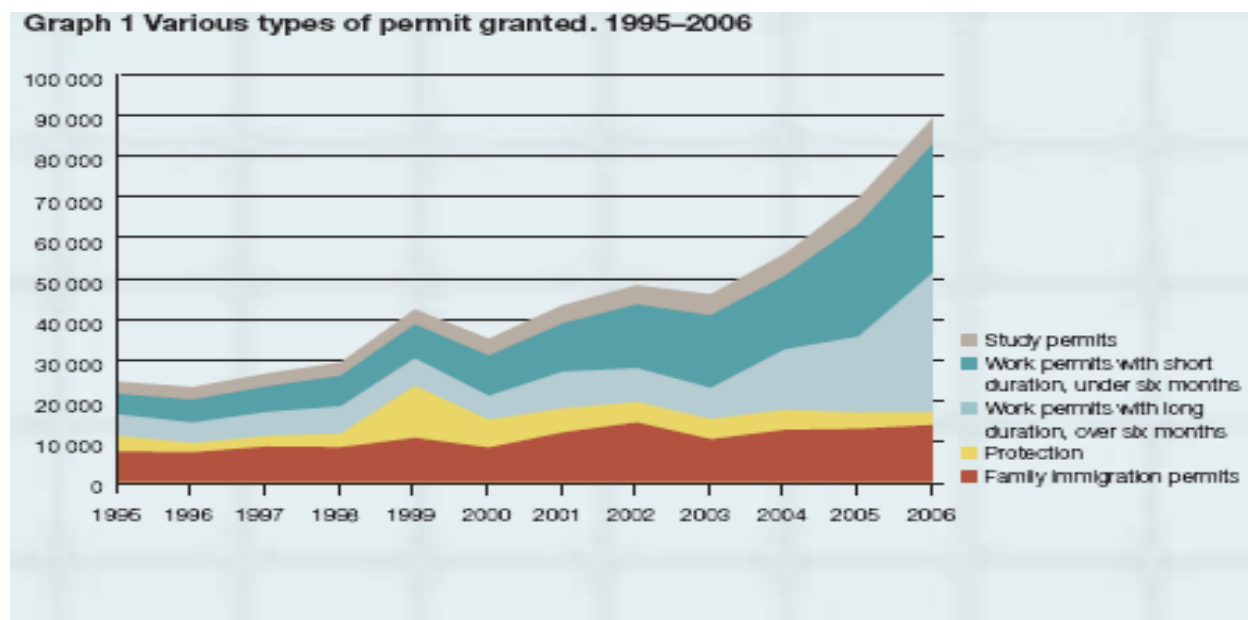
Source : Norwegian Directorate of immigration, Facts and figures, 2006

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[9] *Statistic Norway, Labour Force Survey, 01.2007*

1. Work permits

Since 1996, there has been a steep rise in the number of work permits. This increase has been particularly noticeable over the four years following the EU/EEA agreement; particularly in the number of permits granted to nationals from Poland and the Baltic countries. The increase started before these countries became members of the EU, and generally comprises permits for short-term employment in the agricultural sector. A change in the rules for skilled workers in May 2000, when the requirement for college training or equivalent was removed, led to a rise in the number of permits granted to skilled workers.

The largest group of permits granted for other reasons than for brief visit (visas) is the permits the permits granted to people applying for residence to take employment.[10]

The number of people permit with a valid work permit constitutes a large proportion of all foreign nationals working in Norway although most persons with a residence permits granted on other grounds may also take employment. The number of persons employed in Norway at any point in time depends on period validity of the work permits. The duration of the work permits is determined in part by the legal authority in the Immigration Act or Immigration Regulations, and in part by the applicant's employment contract. Permits granted pursuant to the regulations for nationals from EEA countries may be granted for up to five years. Nationals from other countries may be granted a permit with up to one year's duration before renewal is required. Short-term permits are primarily granted for seasonal employment in the agricultural sector. The number of persons with work permit varied during 2006, the lowest number being right at the start of the year, while the number peaked at the end of August. The rise from January to August and decline after August especially applied to nationals from Poland and Lithuania. For nationals from Latvia, Estonia, Slovakia and Russia, there was a clear rise throughout of the year, while the number of valid permits remained quit stable over the year for nationals from Germany, Great Britain and The Netherlands.

- *First-issue work permits and renewals*

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[10] *Norwegian Directorate of immigration, facts and figures, 2006*

In 2006 close to 71000 works were granted, 40500 of which were first-issue permits, and 30300 were renewals. Around 20400 more work permits were granted than in 2005. The number of first-issue permits and renewals increased by around 12100 and 8200, respectively. A total of 94% of the work permits (including renewals) in 2006 were granted to nationals from European countries, with the majority going to Poles. Eight of ten granted work permits were men. Of all persons, granted work permits in 2006, 41 % were between 18 and 29 years of age. [11]

- *Different basis for first-issue work permits*

In 2006, 84% of fist-issue work permits were granted pursuant to the EEA- rules. The remaining 16 % were permits constituting the basis for permanent residence, permits that can be renewed and permits that cannot be renewed.[12]

- *Permits granted to skilled workers*

Permits granted to skilled workers constitute a basis for permanent residence and amounted to 5 % of the total number of new work permits in 2006. There was an increase of 64% in the number of fist- issue work permits granted to a skilled workers compared to the previous year. Some of this increase may be attributed to the fact that in 2006 skilled worker permits were granted to more people with special qualifications than has been in the past, but the most important reason was probably the increased demand for more qualified labour. Of the lager countries, nationals from India have had the most dramatic rise in permits. In 2006, the 71% of those granted a permit as a skilled worker were men. Permits granted to persons from 18 to 29 years of age amounted to 41% off the total numbers of permits. [13]
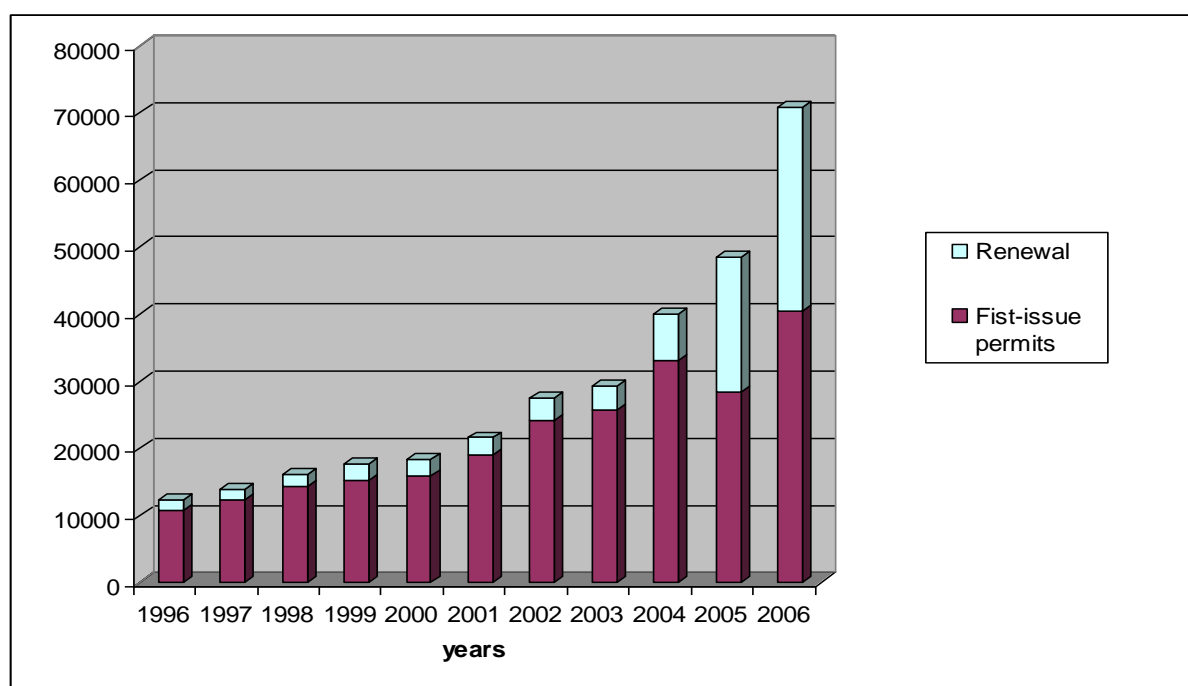
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[11] *Norwegian Directorate of immigration, facts and figures, 2006*

[12] *Norwegian Directorate of immigration, facts and figures, 2006*

[13] *Norwegian Directorate of immigration, facts and figures, 2006*

Table 1. *Work permits* [14]

Years	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Fist-issue Permits	10824	12306	14417	15282	15856	18994	24158	25650	33013	28422	40528
Renewal	1480	1574	1787	2387	2437	2594	3247	3692	6966	20047	30297
Total	12304	13880	16204	17666	18293	21588	27405	29342	39979	50469	70825
Change		1576	2324	1462	627	3295	5817	1937	10637	10490	20356
Change %		13%	17%	9%	4%	18%	27%	7%	36%	26%	40%

Figure 4 The fist-issued and renewal work permits granted to skilled workers, 1996-2006

Source : *Table 1*

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[14] *Norwegian Directorate of immigration, facts and figures, 2006*

2. Study permits

As a general rule, students are only granted temporary residence, but they may work part-time and transform their status after receiving a job offer on completion of their studies. The other categories may, dependent on certain conditions, be granted either permanent or temporary residence. Number of migrants for educational and trainee purposes for the period 2003-2006 is shown on the Table 2

- *Students*

More foreign nations can pursue an education in Norway. In 2006, around 10 200 persons were granted a study permits (including renewals). This was 10 per cent more than the year before. Around 6 800 persons were granted first-issue permits, and 3400 renewed their permit.

Total of 74000 received permits (including renewals) to study at an upper secondary school, college or University. This represents an increase of 10% compared to the previous year. Approximately the same number renewed their permit in 2005 and 2005. A quarter of study permits in 2006 were granted to students from Germany and China. In general, there were slightly more female students than male students, although from France and Spain the proportion of male students was higher.[15]

- *Au pair*

Au pair permits constituted the largest number of work-related study permits in 2006 with around 1243 permits (not including renewals). This represents an increase compared to preceding year. A total of 98 per cent of au pair permits were granted to females. Philippines nations constituted of 44% of all those who were granted an au pair permit in 2006 and all were female. Compared to 2005, there was an increase in the total number of permits granted to au pairs from the Philippines. Next to the Philippines, the most au pair permits were granted to people from Ukraine and Russia. [16]

- *Trainee and other study permits*

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[15] *Norwegian Directorate of immigration, facts and figures, 2006*

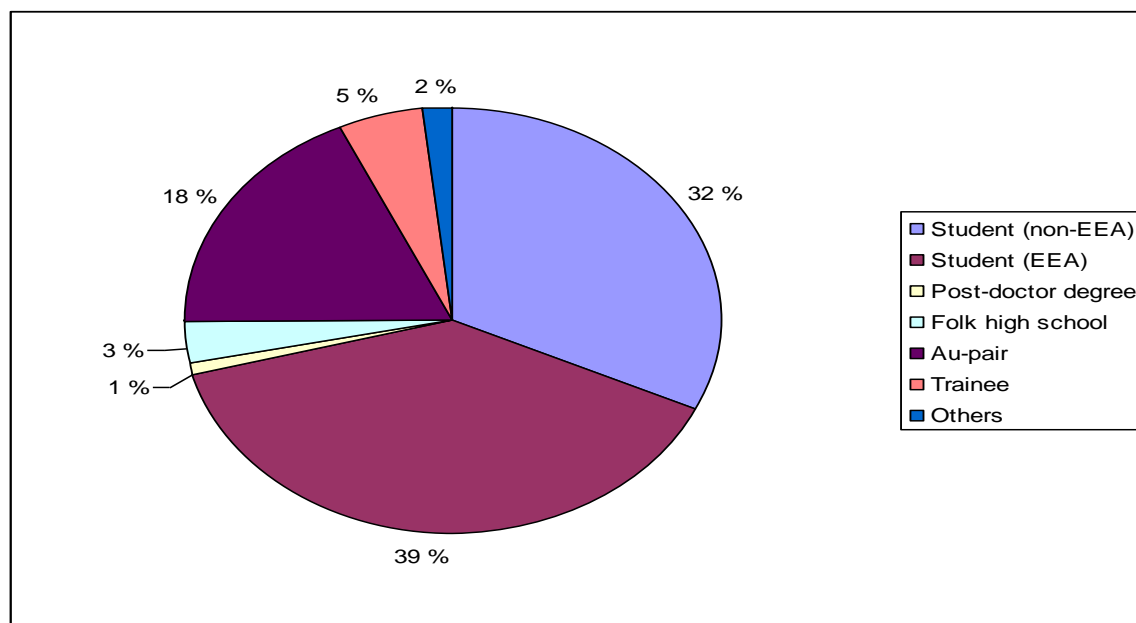[16] *Norwegian Directorate of immigration, facts and figures, 2006*

In 2006, around 467 persons were granted trainee and other study permits and other work-related study permits (not including renewals) in Norway, approximately the same number as in 2005. The most of those granted permits were men. People from Poland, Belarus and Ukraine received 52% of these permits. [17]

Table 2 *Number of migrants for educational and trainee purposes for the period 2003-2006[18]*

Migration category	2003	2004	2005	2006
Student (non-EEA)	2097	1828	1922	2157
Student (EEA)	1328	1713	2286	2634
Post-doctor degree	43	48	50	68
Folk high school	345	185	200	198
Au-pair	948	1019	1208	1243
Trainee	543	496	322	361
Others	164	131	120	106
Total	5468	5440	6108	6767

Figure 5 *Education permits by type of permit, percentage, 2006*

Source : *Table 2*

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[17] *Norwegian Directorate of immigration, facts and figures, 2006*

[18] *Norwegian Directorate of immigration, facts and figures, 2006*

The figure 5 shows, that students (39%) in Norway mostly came from EEA countries, than it follows by number of students (32%), who came from non-EEA area. The figure also describes, that during the period 2003 – 2006 the number of trainees has been reduced and quantity of au-pairs has been increased.

4. The unemployment

Unemployed is defined as persons with no income-earning work, but who are seeking work and can start working immediately. The percentage is calculated from the labour force. Labour force is the total of the employed and unemployed.

In Norway in 2006 unemployment was 3.4 per cent. Unemployment was stable at just below 2 per cent of the labour force from the start of the 1970s until the negative economic trend in 1983-84. In 1993, 6 per cent of the population were unemployed. Employment in education has doubled, and employment in health and social services has quadrupled since 1970, whereas employment for the same period fell by slightly less than two thirds in the primary industries and a third in manufacturing. Fewer women and more men currently work part-time than 10 years ago. Today, 44 per cent of working women and 13 per cent of men work part time. However, a large number of women in part-time jobs would like to work more. Since 1972, men's weekly working hours have fallen by around 5 hours. Women's working hours fell by one and a half hours during the same period.[19]

Figure 6 *Unemployment in Norway*

Unemployed (Labour Force Survey) as a percentage of the labour force

Source of the graph: Statistics Norway, Labour force survey, 2006

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[19] *Statistics Norway, Labour force survey, 2006*

In the table 3 it can be seen that in relative terms, the decrease in unemployment was similar in all groups. Registered unemployment among immigrants is still three times higher than in the majority population. This difference has been stable for a long time and is to some extent due to the relatively large number of immigrants who are newcomers on the labour market. Thus the proportion of employed in the labour force is somewhat lower in this group compared to the majority population. As long as there is immigration at a certain level this also applies in periods of low unemployment.

Within the four non-western groups the decline in the unemployment rate varied between 2 and 3 percentage points. Immigrants from Africa had the highest unemployment rate at 10.1 per cent. Immigrants from Asia had the second highest rate at 5.9 per cent, while the unemployment rate for immigrants from Eastern Europe (except EU countries) and South and Central America was 5.3 per cent and 4.7 per cent respectively. As in previous quarters, immigrants from western regions and the EU countries in Eastern Europe had an unemployment rate slightly below 2 per cent.

It is higher unemployment among women. The unemployment rate for male and female immigrants was 4.2 per cent and 4.4 per cent respectively. In the rest of the population, the unemployment rate was 1.3 per cent for both men and women. This is contrary to traditional gender differences in registered unemployment, where immigrant men usually have a higher unemployment rate than immigrant women. This new pattern is probably due to an increase in female job seekers due to the favourable labour market conditions.

Few Descendants registered unemployed. Only 290 descendants, defined as people born in Norway by foreign-born parents, were registered unemployed in November 2007. The majority were aged 16-29 years, and in this group the unemployment rate was 2.6 per cent. In the rest of the population, the unemployment rate for this age group 2.0 per cent.

Participants on labour market schemes slightly increased. Despite the falling unemployment rate, there was a slight increase in the number of immigrants on ordinary labour market schemes (job programmes) from 4 454 in November 2006 to 4798 in November 2007, i.e. a growth at 244 participants. In total, 11 763 people participated in such

labour market schemes. In the majority population, there was a decline of 1 200 participants. The immigrant participants had mainly non-western background.[20]

Table 3 *Registered unemployed, by immigrant background, region of birth and sex. In absolute figures and in per cent of the labour force. By the end of November 2006 and November 2007*

	November 2006			November 2007		
	In total	Males	Females	In total	Males	Females
	%	*%*	*%*	*%*	*%*	*%*
Registered unemployed, total	2.1	2.1	2.1	1.6	1.6	1.5
Non-immigrant population and descendants	1.8	1.8	1.8	1.3	1.3	1.3
First generation immigrants, total	6.0	5.8	6.3	4.4	4.2	4.6
The Nordic countries	2.2	2.4	2.0	1.7	1.9	1.6
Western Europe else	2.3	2.2	2.5	1.7	1.6	1.9
New EU countries in Eastern Europe	3.0	1.7	4.5	1.9	1.3	3.2
Eastern Europe else	7.0	6.8	7.3	5.3	5.0	5.6
North America and Oceania	2.5	2.5	2.5	1.9	2.0	1.7
Asia[1]	8.2	7.6	8.9	5.9	5.5	6.4
Africa	13.2	13.3	12.8	10.1	10.6	9.2
South and Central America	6.1	5.9	6.3	4.7	4.8	4.6
[1] Turkey is included.						

The source: Statistics Norway, Report of unemployment among immigrants, 4. quarter 2007

Chapter 3 Basic ideas

1.The theoretical prediction of the reasons of migration

The economic consequences of migration have significant effects for economic and social point of view. Immigration has become one of the most important topics of popular debate in many countries today. Recent years have also seen a series of changes in immigration policy which have been accompanied by a heightened interest in research findings that can help to guide policy in the future.

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[20]   *Statistics Norway, Report of unemployment among immigrants, 4. quarter 2007*

The migration process and reasons that force people to move to another place is very complicated. It can be seen a lot of reasons that force people to change the place of living. The table 4 represents the theoretical predications of migration on micro level and economic effects of migration on macro level.

Table 4 *Theoretical predictions of the causes of migration*

	Reasons
Micro level /the individual decision making/	1. Unemployment level 2. Poverty 3. Wage differentials 4. Personal decisions / family relations & friends/ 5. Support from authorities 6. Political situation in the home country
Macro level /economic effects/	1. Demographic changes 2. Security 3. Changes in politics 4. Changes in national culture 5. Impact on unemployment & employment 6. Changes in laws 7. Changes in education system

The immigration to Norway has impact on development of the country. The main economic effects in the analyses of migration are:

1. the impact of migration on wages;
2. the impact of migration on employment & unemployment;
3. strong effects on supplies of different skill groups;
4. the impact on labour productivity;
5. the impact on qualification level;
6. effects on changes in technology within industries;
7. the impact of labour force;
8. the impact to the fiscal policy.

2. The economic gains of migration

The economic consequences of migration for the country can be described from the theoretical point of view. The following discussion summarising the conclusions from the report "Does Immigration Grease the Wheels of the Labour Market?" by George J. Borjas, (1995).

The wage w is given by marginal productivity of labour at full employment w=F$_L$(K, N). In the short run, when the stock of capital does not vary and an increase in the labour force through the migration necessarily leads to a wage reduction due to the decrease in the marginal productivity of labour. This reasoning shows that the immigration of population whose productive characteristics are identical to those of the residents entails a reduction in all wages in the short run and an increase in the remuneration of the capital k=F$_k$ (K, N) in as much as a capital is less quickly adjustable than employment.

Benefits from immigration, rising the traditional one-sector model, can be shown by the following figure:

Despite the wage reduction, immigration entails an overall gain for the natives as a whole if they are owners of capital. This can be done by summarizing the variations in their wages and variations in the remuneration of capital due to immigration. It can be seen on the figure 7 that represents the impact of immigration when the labour force comprises N natives and M migrants, and the labour market is assumed to be competitive.

Figure 7   *The surplus of immigration in a model with fixed capital and homogeneous* <u>*labour*</u>
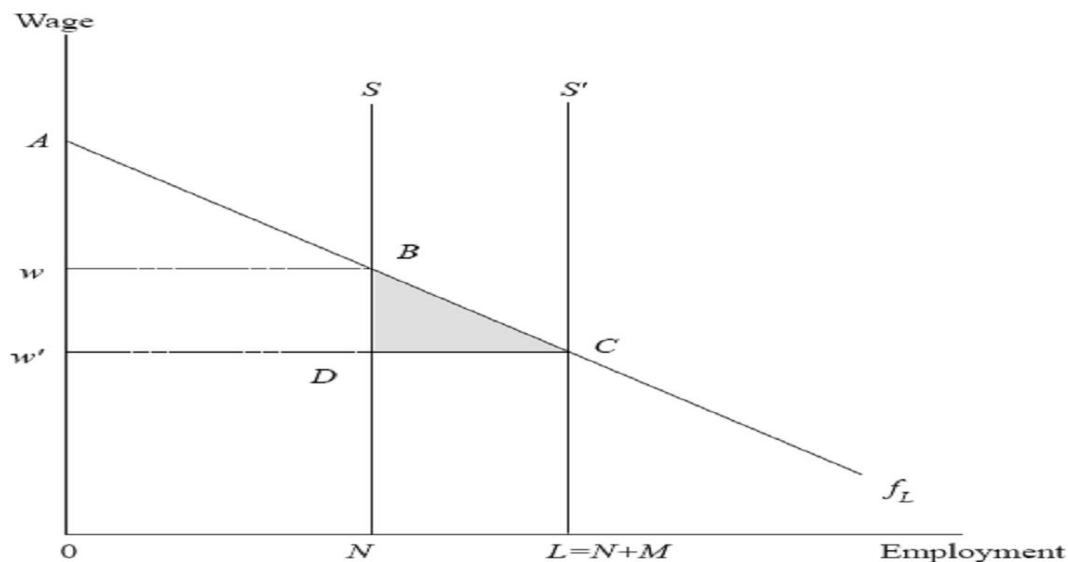
Source of the graph:*George J Borjas "Does Immigration Grease the Wheels of the Labour Market?(1995, p8)*

Let w be the wage in the absence of immigrants. So we have w=F$_L$ (K, N). The supply of capital is fixed, so, the area under the curve representing the marginal product of labour gives the economy's total output. National income, all of it accruing to natives, is then given

by the trapezoid *ABN*0. With the presence of immigrants, the national income is higher, since it corresponds to the surface of the trapezoid *ACL*0. The entry of *M* immigrants shifts the supply curve to $S^{\cdot}$ and lowers the market wage to $w^{\cdot}$. .Borjas concluded: "Immigration thus produced a surplus to the profit of natives equal to the surface of triangle *BCD*. Note that in this situation the immigration surplus arises because natives own all of the capital, and the additional labour raises the return to this fixed capital stock. The "immigration surplus" is a simple and frequently cited metric of natives' total gains from immigration. The surplus accrues to native factors of production that are complemented by immigrant workers – that is, to factors whose productivity is enhanced by the presence of immigrants".

3.The search-matching theory of unemployment

Economic situation in many countries is affected by business fluctuations. The business cycle is the periodic but irregular up-and-down movements in economic activity, measured by fluctuations in real GDP and other macroeconomic variables. During recessions we face a rise in productivity, when expected profits on investment exceed the rate of interest and induced by technological improvements which then lead also to expectations of profit. Cycles are leading to sustained rises in aggregate demand. The economic situation results in job creations, decreases the unemployment rate and leads to an increase of number of immigrants to the country. New immigrants flow into labour market and into a competition with native workers for better vacancies; they apply for different jobs and try to get highest possible wage. Due to relatively better job opportunities in Norway, there are higher immigration inflows then in country during the last years. They seem to be concentrated in regions with highest wage levels. From the figure 8 we can see that unemployment decreases when it is booms and decreases when it is recession. The business fluctuations effect the unemployment rate in the country. On the other side of this higher inflow of immigrants create a higher level of unemployment, more people come into competition for a better job position.

Figure 8 *Business fluctuation and unemployment in Norway*
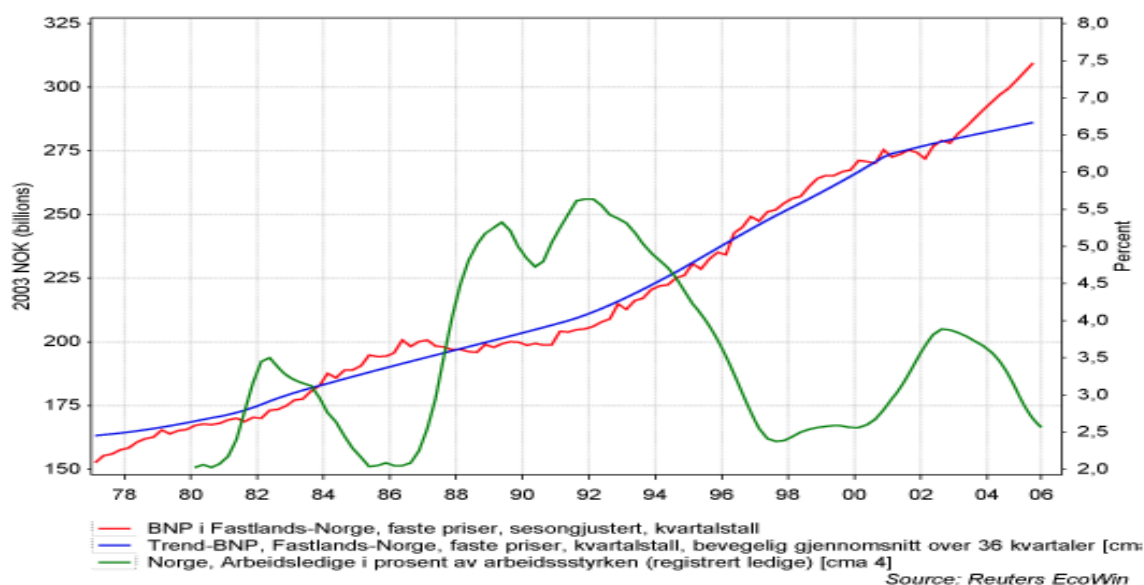
Source of the graph: *Reuters EcoWin*

Native workers and immigrants meet a vacant job at the same rate. Potential firms cannot directly search either a native worker or an immigrant worker. Whether it is a native worker or an immigrant will be revealed when a firm and a worker meet as it can be seen on figure 9.

Figure 9 *Job flows*
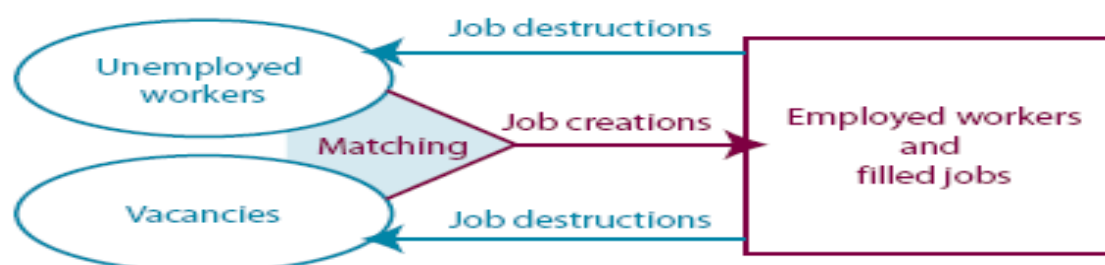
Source : *The Search-Matching Theory of Unemployment October 19, 2006 (http://economistsview.typepad.com)*

Immigrants not only change the size of the labour force, they change the relative supplies of factors such as unskilled labour, skilled labour, and capital in the economy. Norwegian natives tend to benefit from immigration precisely because immigrants are not exactly like natives in terms of their productive characteristics and factor endowments. Differences between natives and immigrants lead to production complementarities that benefit natives. Immigrants tend to complement (not substitute for) natives, raising natives' productivity and income. Skilled immigrants are likely to be especially beneficial to natives. In addition to contributions to innovation, they have a significant positive fiscal impact.

Once we know how the market wage is determined, we can find the number of workers that firms are willing to hire, or equivalently, the number of vacancies they want to open. If it were costless to find a suitable worker and if it could be done instantaneously, firms would keep hiring workers as long as each new worker's productivity exceeded the market wage. But hiring a worker is neither costless nor instantaneous. The firm needs to post and advertise a vacancy, evaluate candidates, and so on. As a consequence of these labour market frictions, a firm will want to open a position only if the sum of profits it makes by hiring a worker compensates it for the various recruiting expenses it incurs to find the worker. This condition is referred to as the vacancy-supply condition. It says that the number of vacancies opened in a labour market is determined as a function of the market wage and recruiting costs.

The vacancy-supply condition is represented in figure 10. The curve slopes downward, meaning that the number of vacancies falls as the wage increases. This can be understood intuitively by considering that when the wage is low, each worker generates high profits, and firms are willing to open a large number of vacancies. Of course, as the number of vacancies increases, it becomes harder for firms to find workers. As a consequence, hiring and recruiting costs increase until the incentives to open new vacancies are exhausted.

Again, changes in the fundamentals of the labour market can affect the position of the vacancy-supply curve. The vacancy-supply curve moves upward (which means that firms want to hire more workers and therefore open a larger number of vacancies) as workers become more productive, as the cost of advertising vacancies falls, and as the process of finding suitable workers becomes more efficient.

Figure 10 *Search frictions & unemployment*
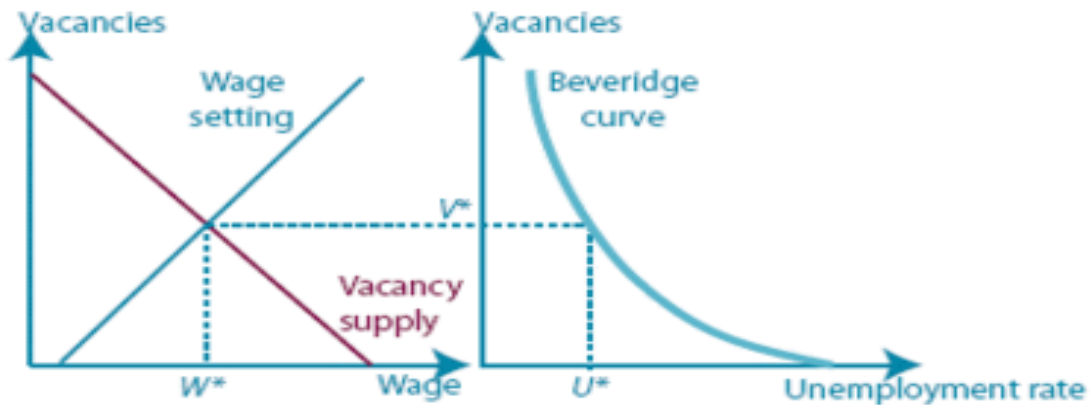
The following discussion summarises the model discussed by Cahuc, P. and A. Zylberberg, 2004.

It can be denoted the number of unemployed workers by u and the number of vacancies searching for a worker by v. The ratio $Q = \dfrac{v}{u}$ is then called labour market tightness. The random process by which vacancies and unemployed workers find each other is represented by a matching function: $m(u,v) > 0$ with $u > 0, v > 0$. The matching function denotes the number of matched vacancies and workers per unit of time. The application arrival rate for vacant jobs $q(Q)$ can then be written as:

$$q(Q) = \frac{m(u,v)}{v} = m(\frac{1}{Q};1)$$

An unemployed worker meets a vacant job at the rate:

$$p(Q) = \frac{m(u,v)}{u} = Q \cdot q(Q)$$

Labour market tightness and the rate of job destruction, along with the matching technology, condition the dynamics of jobs and workers. We designate the stock of unemployed by U, employed by L and the size of labour force by N. A labour force grows by quantity N'.

Assuming that all new entrants into labour force begin by looking for a job, the number of unemployed persons is increased by the total of these new entrants, to whom must be added the qL workers who have just lost their jobs. Unemployment thus increases by $N' + qL$. Conversely, at every instant there are $Qm(Q)U$ unemployed persons who find a job. The variation U' in the stock of unemployed persons is then:

$$U' = N' + qL - Qm(Q)U \qquad (1)$$

Let $n = \dfrac{N'}{N}$ be the rate of growth of the labour force and $u = \dfrac{U}{N}$ the rate of unemployment. As we have $N = L + U$ and also $U' = u'N + uN'$, the law of motion of the rate of unemployment is found by dividing the two sides of equation (1) by N. The result is:

$$u' = q + n - (q + n + Qm(Q))u \quad (2)$$

The stationary value of the unemployment rate corresponds to $u^{\cdot}=0$. So, we have

$$u = \frac{(q+n)}{(q+n+Qm(Q))} \quad (3)$$

The equation (3) describes a relationship between the unemployment rate u and the vacancy rate v. This expresses the equilibrium of workers flows between employment and unemployment, given the properties of matching function. This relationship (v, u) yields the Beveridge curve . The position of this curve reflects the efficiency of matching technology.

It has been used the Beveridge curve - the scatter plot of unemployment rates versus vacancy rates - to summarize the state of the labor market. The position on the curve can indicate where the economy is in the business cycle: Recessions, for example, are generally times of high unemployment and few job vacancies, corresponding to points on the lower right branch of the curve. In addition, the location of the Beveridge curve relative to the origin has been used to indicate the overall level of labor market activity, sometimes interpreted as the intensity of "reallocation" - the movement of workers from one job to the next, often from one sector to another, in the economy.

Figure 11. *Fluctuation of the unemployment rate*
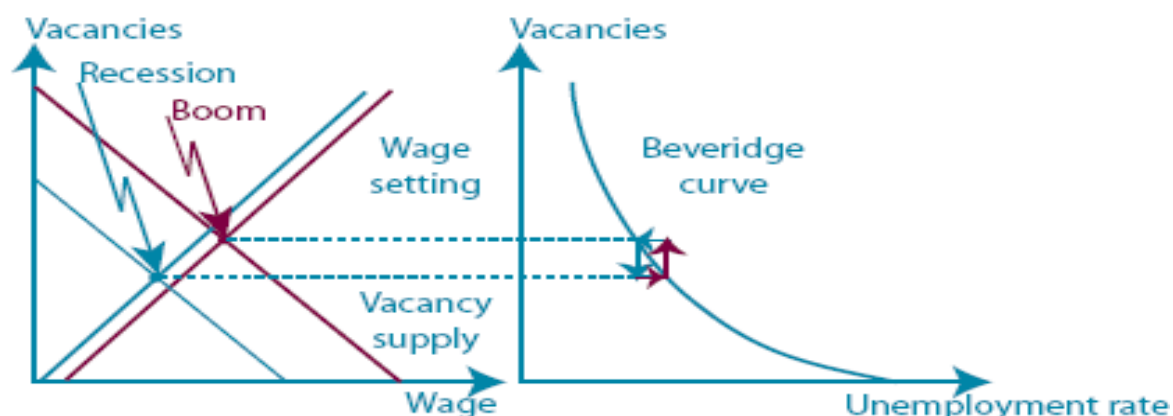
Unemployment rates are lower in booms and higher in recessions. Business cycle fluctuations are commonly thought to be initiated by productivity shocks, and changes in labour productivity over the business cycle will cause predictable consequences in the labour market that are captured by the theory. What happens when workers become more productive? Because they produce more output, they can ask for a higher wage. The wage setting curve moves to the right. Firms also make higher profits when workers are more productive (assuming that workers cannot appropriate the full increase in productivity), so the vacancy-supply curve moves upward. Over the business cycle, the vacancy rate will cycle above and below the Beveridge curve, we can see it on the figure 11. A positive productivity shock raises the vacancy-unemployment ratio so that the economy is located above the Beveridge curve. Then, the unemployment rate decreases over time and the economy returns to the Beveridge curve. Similarly, following a negative shock, the vacancy-unemployment ratio falls and the economy falls below the Beveridge curve. Then, the unemployment rate increases gradually to bring the economy back to a steady state.

The Beveridge curve can also shift up and down during the business cycle. Indeed, recessions are often described as intense periods of reallocations of workers and jobs. One explanation for this phenomenon is that the reallocation of jobs is less costly during recession because the opportunity cost of closing jobs and plants (the foregone output, worker retraining, the retooling of plants) is smaller than it is during booms.

4. The labour market equilibrium

The job-searching process for unemployed people, Norwegians and non-Norwegians, depends on many factors. People can search a new job, being employed in some region, but anyway to be accepted to job, person has to move to another region. The decision of changing a job for person who is unemployed or has just became unemployed from the previous working place, depends on many different factors. First of all it is the expected level of utility that the person is going to get from the future job. People compare the level of utility from the previous job and the expected utility level. It is affects the future wage level, living condition of new regions, the future responsibilities on a new job, the tax rate (for non-Norwegians). Utility level depends on unemployment in the regions, which affects the probability to new job. A potential problem of my empirical analyses may be that people choose to move in areas with low unemployment. The lower unemployment leads to the higher probability of getting job and as result the higher the expected level of utility.

It can be considered initially the interstate migration decision faced by workers.

Let wjk be the wage paid in region j to a native worker with skills k (for example, a worker with a high school diploma). The worker currently lives in region / country b. The sign of the utility function determines the worker's internal migration decision:

$EU = \max_j \{wjk\} - wbk - C,$ where C gives the migration costs.

Although these include both variable and fixed costs, we assume that they are mostly fixed. Perhaps, the most important fixed cost is the disutility suffered by the migrant who leaves family and friends behind and begins life in a new and uncertain environment.

The worker migrates if $EU > 0$

Native workers do in fact move from region to region. Some natives will find that the wage differential between the highest-paying region and the current place of residence is sufficient to cover the fixed migration costs. But most of them will find the benefits from migration too low to move to other region, due to the "costs of habits" are very high and people do not tend to change their life stile. They will find that these migration costs act as a wedge, preventing them from taking full advantage of interstate differences in economic

opportunities. As a result, the native working population will not be sorted efficiently, and many native workers end up living in states where their marginal product is not maximized.

Since the wage differential between Norway and many other countries far exceeds the differences that exist between regions in the Norway, it is likely that many residents of other countries will find it optimal to move to the country.

The growth in the labor force is another important component of the model. As new workers enter the labor market, they join the ranks of the unemployed searching for work. . Labour force size can increase due to changes in the participation rate, population age and immigration. The focus of the report is how migration effects the labour market outcome. The increasing number of immigrants has increased the size of labour force in the country. Holding other things fixed, higher levels of labor force growth mean more unemployment, since more workers are searching for jobs at any particular time. The figure 11 represents unemployment rate (total unemployed as a percentage of the labor force, the horizontal axis) versus the job vacancy rate (the vacancies as a percentage of the labor force, the vertical axis). In the short run, vacancies may not adjust fully to an increase in labor force growth; in the long run, vacancies will likely increase roughly in line with unemployment. Thus, an increase in the rate of labor force growth would shift the Beveridge curve up and to the right. Long-term unemployment will push the curve outward from the origin. This is result of the hypothesis that all new entrants to the labour market start out as unemployed. For the same number of vacant jobs, each person in search of work sees his probability of being hired diminish if the number of entrants is increased, which is equivalent to a deterioration of the matching process. It is probably that people want to choose to move in areas with low unemployment, as it becomes easier to get a job. A one-time inflow of immigrants shifts the Beveridge curve (Figure 12) up and to leads to higher unemployment in the region. After one-time increase of people applying for a job it becomes a shift of the curve downwards and it is a new labour market equilibrium in the model. A permanent inflow of immigrants to the county from the other side leads to the shift of the Beveridge curve up and it keeps in this position. Labour market come to a new equilibrium.

Figure 12 .*The Beveridge curve*

The Beveridge Curve
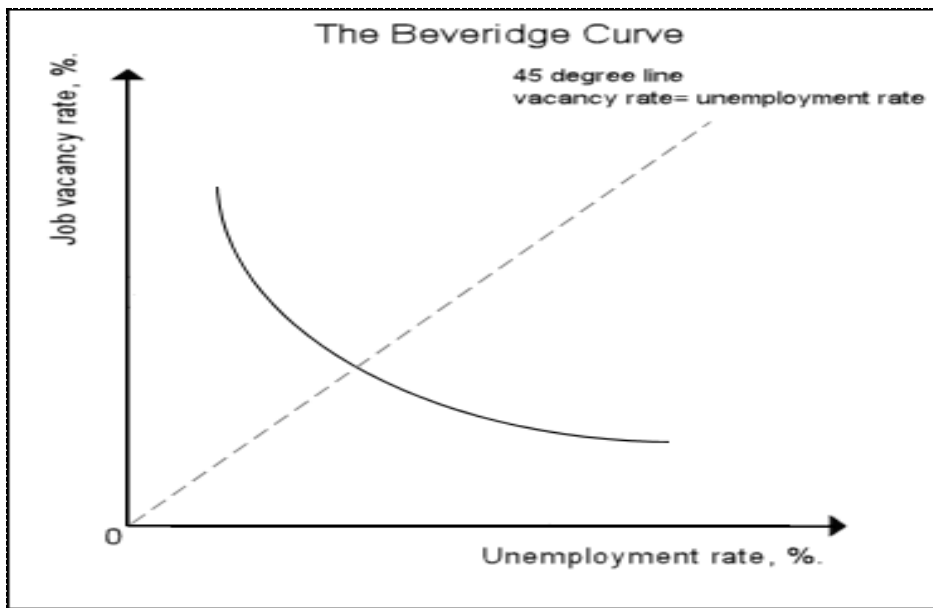
Source:http://en.wikipedia.org/wiki/Beveridge_curve

Chapter 4 Explanation of data

In this chapter it is presented the description of data and data modifications. It is also included comments of the characters of the variables under the analyses. The detailed explanation of the dependent and independent variables that were used in the analysis were added in this chapter.

For the research there were examined data for 437 municipalities in Norway. The immigrants' data was considered for period: people, who moved to Norway during the period from 1986 to 2007. It was used 8561 observation in the two groups of models.

- The types of data used for the analyses: number of immigrants in each municipality (immigrants, who arrived in period considered from non-western countries and western countries);
- Number of people in each municipality;
- The inflow of immigrants in each municipality
- The unemployment rate in each municipality;
- The share of immigrants from non-western countries;
- The share of immigrants from western countries;
- The proportion of immigrants to the total population in municipality.

This data was taken from the site: www.ssb.no, Statistics Norway (Statistikk banken)

1.Summary statistics

For our analysis we use unemployment rate, number of immigrants from non-western countries, number of immigrants from western countries, total number of immigrants, inflow of immigrants, total population in each municipality.

Based on these data sources, it has been constructed variables that were used in the empirical analysis in the two groups of models.

- The unemployment rate in the municipality was calculated as the percent of people that have been registered as unemployed to the total population in the municipality;

- The change in the unemployment rate was estimated as a difference in unemployment level in the period t and t-1 in the municipality, where t is one year in the period from 1986 to 2007;

- The change in unemployment rate was calculated as the difference in unemployment level in period t and t-1;

- The percent of immigrants from western countries was estimated as the number of immigrants who has come from western countries divided on the total population in the municipality;

- The percent of immigrants from non-western countries was estimated as the number of immigrants who have come from non-western countries divided on the total population;

- The inflow of immigrants was calculated as the difference between the percent of immigrants in period t and t-1 in the municipality.

Table 5 *Summary statistics for the variables included in analysis*

Variable	Mean	Standard deviation	Number of observations
Unemployment rate	1.649	0.856	8561
Change in unemployment rate	-0.00877	0.430	7483
Inflow of immigrants	0.219	1.349	8206
Percent of immigrants from non-western countries	1.405	1.3397	8561
Percent of immigrants from western countries	1.263	0.8477	8561
Total percent of immigrants	2.663	1.891	8561
Number of immigrants from western countries	210.17	1152.833	8688
Number of immigrants from non-western countries	317.25	2513.073	8688
Total number of immigrants	527.42	3580.434	8688
Total population	10616.98	29900.08	8688

The results from the Table 5 can be represented graphically. The main interest of all variables is unemployment rate in municipality. As it can be seen on the figure 13 the unemployment rate fluctuates a lot during the considering period from 1986 to 2007. There is an increase from 3% in 1985 to 5 % in 1993 and a slightly fall in numbers to 3.8% in 1999. After that there is a rise to 5% in 2005 and the line falls to 2.5% in 2007. It can be seen on the graph that the maximum value of unemployment rate 8.1% and min value equal 0.06%. To sum up, it can seen that the empirical results confirms the theoretical predictions about fluctuation in the unemployment rate due to the changes in time and economic situation in the country.

Figure 13 *Fluctuation in unemployment rate from 1986 to 2007*
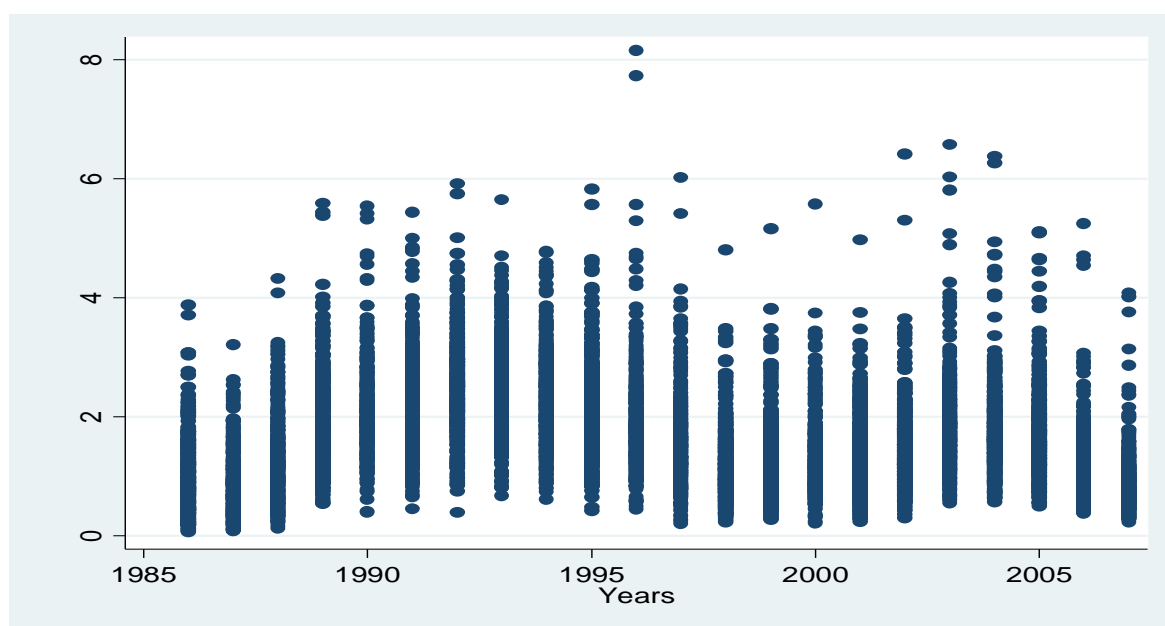
The summary statistics from the Table 5 can been considered graphically in the figure 14 where it can be seen the changes in the inflow of the immigrants. During considered period it is a lot of fluctuation on the graph. It can be seen that the higher number of immigrants came in four periods: 1988 -1989, 1993-1994, 2000-2001 and 2006- 2007 years. Comparing two figures it can be indicated that the higher inflows of immigrants were in the years where it is significantly low level of unemployment in Norway. The figures suggest that more immigrants have moved to Norway when it is relatively easier to get a job.

Figure 14 *Fluctuation in the inflows of immigrants in the period from 1986 to 2007*
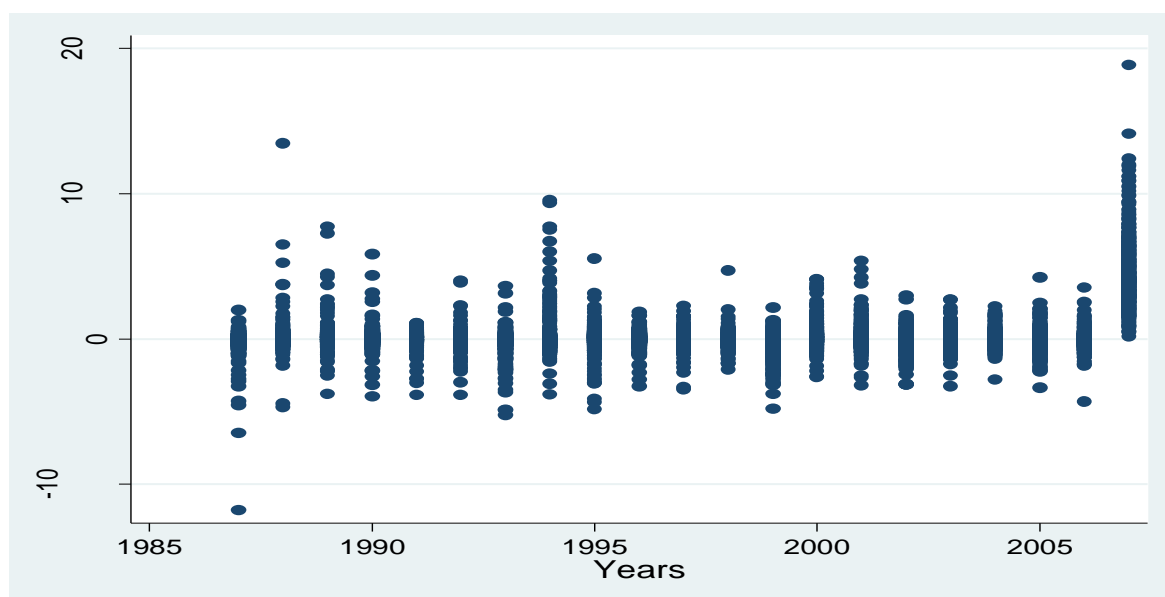
The variables considered in the empirical analysis and their correlation can be seen graphically in the figure 15 and 16 where it can be seen the proportion of immigrants and unemployment in four periods of time: 1986, 1996, 2000, 2007 years. During considered periods there are a lot of fluctuations on the graphs. It can be mentioned that it can be predicted a possible correlation between variables on the graphs. It is difficult to see any patterns in the graphs, but the correlation between unemployment and proportion of immigrants will be the topic of the analysis in the first group of models.

Figure 15 *Percent of immigrants population and unemployment in 1986 & 2006*
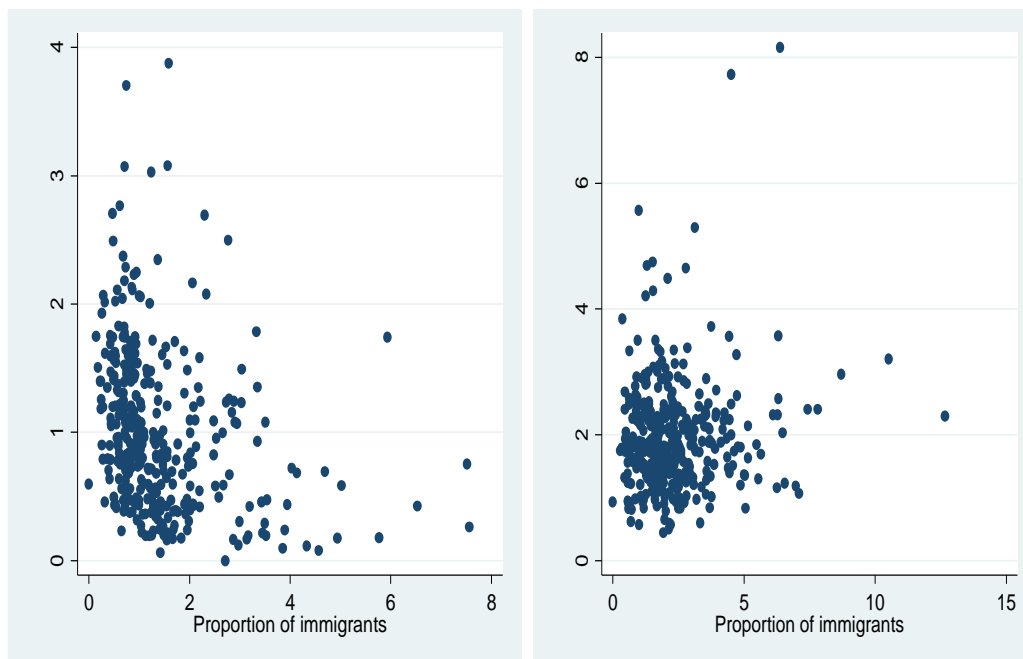
Figure 15 *Percent of immigrants population and unemployment in 2000 & 2007*
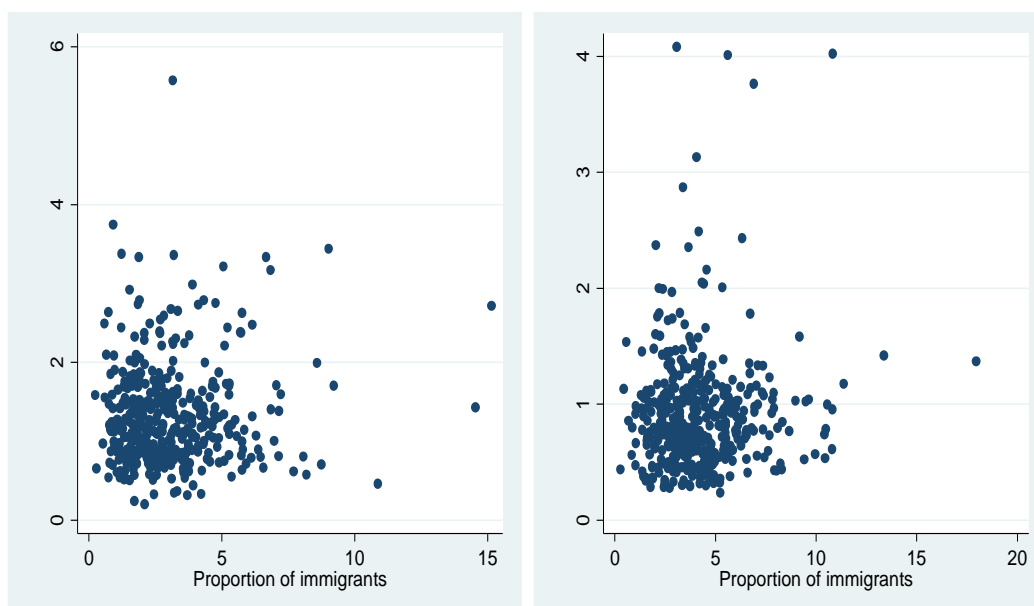
Chapter 5 Specifications of the models

The Stata program was used to analyse the results of models and estimated coefficients.

The specification of the models and estimation approach were used in the two groups of models .The first group of models reflects the relationship between the unemployment rate and the proportion of immigrants to the total population in the municipalities. It can be one of the important factors that results in changes of unemployment in Norway.

1. First group of models

The first model is:

$$Y = \alpha + \beta_1 X_1 + \varepsilon_i \quad \textit{(1)}$$

In the first model the dependent variable is:

Y - unemployment rate in the municipality;

In that model the independent variable is:

X_1 - the share of immigrants to the total population in municipality;

Where:

α - constant term , ε_i - error term.

The second model:

As long as there are changes in unemployment over time due to a lot of factors such as a possibility of getting job, the wage level, the business fluctuation, the economic situation, it has to be included to the regression the variable reflected the time changes.

In the second model the variable X_2 was added to explain the effect of change in unemployment rate when it is changes in time.

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_2^2 + \varepsilon_i \quad \textit{(2)}$$

In the second model the dependent variable is:

Y - unemployment rate in the municipality;

In that model the independent variables are:

X_1 - the share of immigrants to the total population in municipality;

X_2 -   the effect of time changes /one year/;

X_2^2 - the squared effect of time change;

Where:

α -constant term , ε_i - error term.

The third model:

The places where accumulated people who migrates, depend on a lot of factors that can be relatively better job opportunities, family accumulations, higher wages, better living condition, such as schools, kinder gardens, better transport connection and etc. So, it can be reasonable to include to the regression fixed effect of municipality that can be predicted to have a higher influence for people who has migrated. For example, it seems to be easier to find a work in a big city due to higher number of job opportunities than in a small town.

In the third model it has been included the fixed effect of municipality to the effect of changes in the shares of immigrants to total population to the unemployment rate in the municipality.

$$\mathbf{Y} = \alpha + \beta_1 \mathbf{X_1} + \beta_2 \mathbf{X_2} + \beta_3 \mathbf{X}_2^2 + \mathbf{X_3} + \varepsilon_i \quad (3)$$

In the third model the dependent variable is:

$\mathbf{Y}$ - unemployment rate in the municipality;

In that model the independent variables are:

$\mathbf{X_1}$ - the share of immigrants to the total population in municipality;

$\mathbf{X_2}$ - the effect of years changes;

$\mathbf{X}_2^2$ - the squared effect of time change;

$\mathbf{X_3}$ - the fixed effect of municipality.

Where:

α -constant term, ε_i - error term.

2. Second group of models

The second group of models reflects the relationship between the changes in unemployment rate on the inflow of immigrants.

The first model is:

$$\mathbf{dY} = \alpha + \beta_1 \mathbf{dX_1} + \beta_2 \mathbf{X_2} + \beta_3 \mathbf{X}_2^2 + \varepsilon_i \quad (1)$$

In the first model in the second group of models the dependent variable is:

$\mathbf{dY}$ - the changes in unemployment rate in the municipality;

In that model the independent variables are:

dX₁ - the inflow of immigrants in municipality;

X₂ - the effect of time changes;

X$_2^2$ - the squared effect of time change;

Where:

α - constant term , ε_i - error term.

The second model:

In the second model it was added the variable **X₄** – the fixed effect of municipality as independent variable to the model.

$$dY = \alpha + \beta_1 dX_1 + \beta_2 X_2 + \beta_3 X_2^2 + X_4 + \varepsilon_i \qquad (2)$$

In the second model the dependent variable is:

dY - change in the unemployment rate in the municipality;

In that model the independent variables are:

dX₁ - the inflow of immigrants in the municipality;

X₂ - the effect of time changes;

X$_2^2$ - the squared effect of time change;

X₄ - the fixed effect of municipality.

. Where:

α - constant term , ε_i - error term.

The third model:

In the third model it was added the unemployment rate at the period t-1 in the municipality.

$$dY = \alpha + \beta_1 dX_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_3 X_2^2 + X_4 + \beta_5 Y_{-1} + \varepsilon_i \qquad (3)$$

In the third model the dependent variable is:

dY - change in the unemployment rate in the municipality;

In that model the independent variables are:

dX₁ - the inflow of immigrants in the municipality;

X₂ - the effect of time changes;

X$_2^2$ - the squared effect of time change;

X₄ - the fixed effect of municipality

Y₋₁ - the unemployment rate in the previous period in the municipality

Where:

α – constant term, ε_i – error term.

All these models were estimated by OLS regressions.

Chapter 6 Estimation results

The explanation of the results of estimations of these models is discussed in this chapter.

1. First group of models

The results of the first model, where the independent variable is the share of immigrants to the total population, cannot explain much of the variation in the unemployment rate in this regression. These variables explain only 0.24% of the variation in the model. It is a quite low result. Even that it was used the higher enough number of observation (8561) and the coefficient which reflects the share of immigrants is statistically significant. T-value in this model is -4.64. From the other point of view the coefficient of the share of immigrants is negative. So, unemployment rate is negatively associated with immigrant concentration. The interpretation of β_1 is: the increase of the immigrant population by the 1% of the total population results in 0.02 percentage point decrease in unemployment rate. Simultaneous causality may lead to a possible correlation between independent variable and error term. It leads to a negative bias in estimated effects and this depends on whether immigrants settle predominantly in regions with high or low unemployment. In this case it is a possible effect that immigrants have accumulated in the areas with low level of unemployment. The estimation results of this model cannot be taken into consideration because of the many other factors that influences on the rate of unemployment.

The results from the second model changed when a time trend was added. The coefficient β_1 has become positive and it is again statistically significant T-value equal 3.15. It results that 1% increase of the immigrant population leads to an increase in unemployment by 0.016 percentage points. Considering the time effect coefficient β_2 which is equal 0.129 and highly statistically significant. It means that 1 year more in the period from 1986 reflects 0.129% increase in unemployment rate. The squared time effect (β_3) is negative. It implies a declining marginal value for each year in the considering period. The

R-adjusted improved from the 0.24% in the first model to the 10% in the second model. It means that in the second model it can be seen the higher explanatory power.

The results from the third regression where it was used the time variable and fixed effect of municipality added to the first model have improved a lot. All coefficients are statistically significant. The year effect coefficient β_2 has decreased slightly from the results in the second regression during considering period from 1986 to 2007 from 0.128 to 0.125. It means that 1 years left results in increase in unemployment by 0.126 . The coefficient for the share of immigrants β_1 has increased and has kept positive. The estimated result means that the increase of the immigrant population by 1% of the total population reflects in the increase in the unemployment rate by 0.1. The estimated results can explain 21% of the variation in the model. The adjusted R-squared has changed from the fist regression to the last from 0.24% to approximately 21%. It leads to the improved fits of the model when the fixed effect of municipality and year effect were added to the first regression. The problem of a possible bias in the first regression has been solved by including to the regression time effect and the fixed effect of municipality. To sum up, it can be said that a lot of other factors influence on the unemployment rate in addition to the variables that we used in our regression. But it can be also concluded that there is a correlation between proportion of immigrants and unemployment in the first group of models.

Table 6 *Estimation results from regressions for percent of immigrants of the total population, arrived in Norway during the period from 1986 to 2007.   Dependent variable is the unemployment rate (percent of the total population) .*

	Model 1			Model 2			Model 3		
	Coeff.	*St. err.*	*t*	*Coeff.*	*St. err.*	*t*	*Coeff.*	*St. err.*	*t*
Const	1.709	0.0159	107.04	1.3198	0.0259	50.93	1.182	0.022	53.62
Percent of immigrants	-0.0227	0.00489	-4.64	0.0162	0.00514	3.15	0.103	0.00885	11.65
Time effect	-	-	-	0.129	0.00536	24.01	0.126	0.00387	32.54
Squared time effect	-	-	-	-0.00705	0.000244	-28.87	-0.00745	0.00017	-42.07
Fixed effect of municipality	No			No			Yes		
Adjusted R-squared	0.0024			0.1063			0.2088		
N obs	8561								

2. Second group of models

The estimated results from the first model of the second group of models is statistically significant. The coefficient β_1 is positive and shows that an increase in the inflow of immigrants of 1% of the total population leads to an increase in the unemployment rate by 0.04 percentage points. T- value equal 4.19. The coefficient β_2 (time effect) is negative and results that adding one year in time decreases the unemployment in short-run by 0.043. The coefficient β_3 is positive and equal 0.001. It implies an increasing marginal value for each year in the considering period.

The adjusted R-squared is 8.9%. It means that these variables used in the fist model can explain just approximately 9% of changes in unemployment rate.

In the second model when the fixed effect of municipalities were included to the regression all coefficients have not changed significantly. It is a slightly decrease comparing to the results in the first model. This observation means that there is no strong correlation between the fixed effect of municipality and inflow of immigrants.

The R-adjusted has not improved and has kept approximately the same as in the second model.

In the third model where the unemployment rate in the period $t-1$ for the considered period was added in the regression the R-adjusted has improved from 8.97 in the second model to 22% in the third model. The coefficient β_4 is the negative and equal - 0.27. It means that a 1% higher unemployment rate results in the decrease in unemployment in the next year by 0.27. From the second regression the coefficient β_2 (time effect) has decreased from -0.042 to -0.0039, taking number in absolute value. The coefficient β_1 has decreased from 0.039 to approximately 0.01 in this regression. It has become statistically insignificant. T-value is 1.09. This estimated result means that it cannot be found a statistically significant short run effect of unemployment on the change of inflow of immigrants.

The R-adjusted has changed from 8.7% to 22.1% in the third model when effect of unemployment in long run was added. In this model all independent variables can explain 22% of variation in the model.

To sum up, when the fixed effect of municipality were included the results has not improved. The third model has the higher explanatory power than the first and the second model.

Table 7 *Estimation results from regression for inflow of percent of immigrants of the total population, arrived in Norway during the period from 1986 to 2007. Dependent variable is the changes in unemployment rate (percent of the total population).*

	Model 1			Model 2			Model 3		
	Coeff.	*St. err.*	*t*	*Coeff.*	*St. err.*	*t*	*Coeff.*	*St. err.*	*t*
Const	0.3055	0.0163	18.74	0.3028	0.0169	17.96	0.63653	0.0183	34.80
Inflow of percent of immigrants	0.0399	0.0095	4.19	0.03897	0.009844	3.96	0.00994	0.00913	1.09
Time effect	-0.0426	0.0033	-12.78	-0.04206	0.00344	-12.23	-0.00391	0.00336	-1.16
Squared time effect	0.00099	0.000145	6.80	0.000971	0.00015	6.47	-0.00086	0.000148	-5.76
Unempl. in period t-1	-	-	-	-	-	-	-0.275	0.00789	-34.80
Fixed effect of municipality	No			Yes			Yes		
Adjusted R-squared	0.0892			0.0874			0.2212		
N obs	7483								

Summary results of the fist group of regressions

Analysing the first group of regressions it can be said that the share if immigrants can not be the leading factor in explaining the unemployment rate in Norway. The increase in immigrant population by 1% of the total population leads to an increase in unemployment rate by 0.1 percentage points. With these results the regression can explain just 21% of variation in the unemployment rate. So, other factors influence the unemployment rate as well.

Summary results of the second group of regressions

Analysing the second group of regressions it can be said that inflow seems to have insignificant explanatory power on unemployment rate in short run. In the third model it can be explain 22% of variation of the model when time effect, effect of municipality and unemployment rate in period t-1 have been added to the model.

Short – and long – run coefficients of unemployment

From the third regression in the second group of the regressions models $dY = \alpha + \beta_1 dX_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_3 X^2_2 + X_4 + \beta_5 Y_{-1} + \varepsilon$, it can be seen that short-run coefficient of unemployment $\beta_1 = \frac{\partial dY}{\partial dX_1}$. The estimated coefficient $\beta_1 = 0.01$ means that it is a increase in unemployment in short run. As long as t-value $=1.09$ the coefficient is statistically insignificant.

From the third regression in the second group of models $dY = \alpha + \beta_1 dX_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_3 X^2_2 + X_4 + \beta_5 Y_{-1} + \varepsilon_i$ we assume that dY=0 and then $-\beta_5 Y_{-1} = \alpha + \beta_1 dX_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_3 X^2_2 + X_4 + \beta_5 Y_{-1} + \varepsilon_i$, then the long-run effect is $Y_{-1} = - (\alpha / \beta_5) - (\beta_1 / \beta_5) dX_1$, so the long-run coefficient is $\beta_6 = (-\beta_1 / \beta_5)$. The short- and long-run coefficients represented in the table 8.

Table 8. *Unemployment coefficients*

Short-run unemployment coefficient	Long-run unemployment coefficient
0.01	0.036

It can be seen from the table 8 that both coefficients: short-run and log-run unemployment coefficients are positive.

Chapter 7. Conclusions

The main focus of the estimation results and regression analysis is the consequences of migration to the unemployment rate in Norway. The two groups of regression models were considered. The time interval was taken from 1986 to 2007 when the higher number of people have migrated due to a lot a changes in the economic situation in the world. What is the impact of immigration on unemployment?

Analysing the results from the first group of regressions it can be seen that in the first model it is simultaneous causality between independent coefficient and error term. It leads to a negative bias in estimated effects. The coefficient β_1 has a negative sign. This depends on whether immigrants accumulate in regions with high or low unemployment. In this case it is

the effect that immigrants have accumulated in the areas and time periods with low level of unemployment. The reason for this can be that immigrants moved to big cities where it is higher possibility to find a job and higher number of companies representing working places. Accumulation of people in such places results to higher level of unemployment in the future. More people coming leads to higher number of applicants who are looking for a job. The negative bias in the first model has been solved by including in the model fixed effect of municipalities. The results from the third model are statistically significant. The estimated result means that increase of the immigrant population by 1% of the total population increases the unemployment rate by 0.1 percentage points.

Analysing the results from the second group of models it can be seen that in the first model all results are statistically significant. An increase in the inflow of immigrants coming to the municipality leads to increase in unemployment. The second regression showed that there is no strong correlation between the fixed effect of municipality and inflow of immigrants. The third model, when unemployment rate was added, the short-run effect of unemployment on the increase of inflow of immigrants was founded to be statistically insignificant.

- The main finding of estimation results is that there is a statistically significant but rather small impact of immigration on unemployment;

- Correlation between the inflow of immigrants and the change in unemployment rate in short-run is not statistically significant;

- The long–run effect of a permanent inflow is larger than the short-run effect;

- Correlation between unemployment and the time changes is statistically significant;

In spite of all results that were estimated in the report the fact that our dependent variable includes non-immigrant and immigrant unemployment is a serious shortcoming. It means that it cannot be distinguish the possibilities that immigrants themselves fail to find a work as opposed to the possibility that immigration leads to unemployment among those already resident.

The conclusion from the report of Dustmann Christian, Francesca Fabbri, Ian Preston, Jonathan Wadsworth "The local labour market effects of immigration in the UK" comes in line with the empirical results in this thesis. The findings from that report have a slightly

higher effect on the unemployment level in UK than in Norway, according to estimated results. The main concussion, as well as in this thesis, is statistically significant impact of immigration on unemployment.

Chapter 8. Summary

The focus of the thesis is to investigate the consequences of migration on the unemployment level in Norway. The report attempts to provide a comprehensive analysis of the mechanisms by which immigration may have an effect on labour market level of unemployment. This investigation therefore considers an important issue for Norway. The report involves careful analysis of relevant theoretical economic models.

Based on these considerations, an empirical analysis is attempted, using data sources which are appropriate for this purpose. The report carefully examines the empirical problems that may arise and analysed the results of estimations. The analysis concentrates on effect of higher number of immigrants, accumulated in the country to unemployment rate. The data were taken from Statistics, Norway.

Chapter 1 gives the introduction of the main problem of migration to the country. It provided an attempt to give the basic definitions of the migration. The description of the history of migration was added to this chapter. The focus of this chapter is also to discuss consequences of migration in the world more generally.

Chapter 2 describes the history and the general characteristics of migration in Norway. The general description of the inflows of migrants and regulation are included in this chapter. The chapter gives the overview of the population groups from country background and gender description of immigrants. It included a description of the rules and permission for migrants who have moved to the country. The description of unemployment for natives and immigrants were added to this chapter.

Chapter 3 describes the theoretical background of the problem. The theoretical predications of migration on micro- and macro level are considered in this chapter, as well as the economic gains of migration for the country. It was an attempt to describe the unemployment due to business fluctuation and different economic conditions in the country. The search-marching model was used to describe the problem. It included the Beveridge curve and its fluctuation due to inflow of immigrants to the country. It was described job-

searching process and labour market equilibrium. The chapter includes a discussion of the difference of the utility level for immigrant and native people, in order to say something about the motives for migration.

Chapter 4 reports the description of the data and data modifications, used for analyses. It also included comments of the characters of the variables under the analyses. Summary statistics were presented in this chapter. The detailed explanation of the dependent and independent variables that used in the analysis added in this chapter. It was an attempt to consider the possible correlation of the variables graphically. All data was taken from Statistics, Norway. (www.ssb.no)

Chapter 5 consists of model specification description and gives an estimation approach to the problem. It reported the general characteristics of the variables used for our analysis. The detailed description of the two groups of models included in this chapter. The specification of the dependent and independent variables used in the regression added to this chapter.

Chapter 6 includes the estimation results from the two groups of models used in analysis. It estimated the coefficients of the independent variables used in the regressions. The explanation of the main results, the fits of the two groups of models added to this chapter, as well as an interpretation of the estimated coefficients from the regressions. The chapter gives the estimated results of the short-run and long-run coefficients of unemployment.

Chapter 7 reports the conclusions of the analysis of the two groups of models. The summarised results and the interpretation of the findings are included in this chapter.

The conclusions from the report are:

- All empirical estimates were based on the correlation between unemployment and immigrant concentration;

- Correlation between unemployment and the time changes is statistically significant;

- The main finding of the report is the impact of immigration on unemployment. It is statistically significant and small in size;

- The short-run coefficient is statistically insignificant and very small number;

- The long-run coefficient of a permanent inflow is three times higher than estimated short-run coefficient;

- The immigrant concentration in the country has a very mild effect on the unemployment level;

The estimated results in this report have a number of shortcomings problems that may weaken its look:

1. The dependent variable is unemployment in whole population. Even if an association has been indicated between immigrant inflows and growth in unemployment. It is impossible in the basis of these results alone say that whether that is because the immigrants themselves are failing to find a work or because the employment in the existing population is declining as consequence.

2. No controls have been included in the regression to capture non-immigrant outflow or changes in non-immigrants characteristics. If the economic effects of immigration were lead to outflows of more employable workers in the existing population then this could show up an effect of this sort even if no jobs were being lost in the existing population.

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Appendix

Table A.1. *Municipality codes in Norway*

0101 Halden	0912 Vegårshei	1566 Surnadal
0104 Moss	0914 Tvedestrand	1567 Rindal
0105 Sarpsborg	0919 Froland	1569 Aure (t.o.m. 2005)
0106 Fredrikstad	0926 Lillesand	1571 Halsa
0111 Hvaler	0928 Birkenes	1572 Tustna (t.o.m. 2005)
0118 Aremark	0929 Åmli	1573 Smøla
0119 Marker	0935 Iveland	1576 Aure
0121 Rømskog	0937 Evje og Hornnes	1601 Trondheim kommune
0122 Trøgstad	0938 Bygland	1612 Hemne
0123 Spydeberg	0940 Valle	1613 Snillfjord
0124 Askim	0941 Bykle	1617 Hitra
0125 Eidsberg	1001 Kristiansand	1620 Frøya
0127 Skiptvet	1002 Mandal	1621 Ørland
0128 Rakkestad	1003 Farsund	1622 Agdenes
0135 Råde	1004 Flekkefjord	1624 Rissa
0136 Rygge	1014 Vennesla	1627 Bjugn
0137 Våler (Østf.)	1017 Songdalen	1630 Åfjord
0138 Hobøl	1018 Søgne	1632 Roan
0211 Vestby	1021 Marnardal	1633 Osen
0213 Ski	1026 Åseral	1634 Oppdal
0214 Ås	1027 Audnedal	1635 Rennebu
0215 Frogn	1029 Lindesnes	1636 Meldal
0216 Nesodden	1032 Lyngdal	1638 Orkdal
0217 Oppegård	1034 Hægebostad	1640 Røros
0219 Bærum	1037 Kvinesdal	1644 Holtålen
0220 Asker	1046 Sirdal	1648 Midtre Gauldal
0221 Aurskog-Høland	1101 Eigersund	1653 Melhus
0226 Sørum	1102 Sandnes	1657 Skaun
0227 Fet	1103 Stavanger	1662 Klæbu
0228 Rælingen	1106 Haugesund	1663 Malvik
0229 Enebakk	1111 Sokndal	1664 Selbu
0230 Lørenskog	1112 Lund	1665 Tydal
0231 Skedsmo	1114 Bjerkreim	1702 Steinkjer
0233 Nittedal	1119 Hå	1703 Namsos
0234 Gjerdrum	1120 Klepp	1711 Meråker
0235 Ullensaker	1121 Time	1714 Stjørdal
0236 Nes (Ak.)	1122 Gjesdal	1717 Frosta
0237 Eidsvoll	1124 Sola	1718 Leksvik
0238 Nannestad	1127 Randaberg	1719 Levanger
0239 Hurdal	1129 Forsand	1721 Verdal
0301 Oslo kommune	1130 Strand	1723 Mosvik
0402 Kongsvinger	1133 Hjelmeland	1724 Verran

0403 Hamar	1134 Suldal	1725 Namdalseid
0412 Ringsaker	1135 Sauda	1729 Inderøy
0415 Løten	1141 Finnøy	1736 Snåsa
0417 Stange	1142 Rennesøy	1738 Lierne
0418 Nord-Odal	1144 Kvitsøy	1739 Røyrvik
0419 Sør-Odal	1145 Bokn	1740 Namsskogan
0420 Eidskog	1146 Tysvær	1742 Grong
0423 Grue	1149 Karmøy	1743 Høylandet
0425 Åsnes	1151 Utsira	1744 Overhalla
0426 Våler (Hedm.)	1154 Vindafjord (t.o.m. 2005)	1748 Fosnes
0427 Elverum	1159 Ølen (t.o.m. 2005)	1749 Flatanger
0428 Trysil	1160 Vindafjord	1750 Vikna
0429 Åmot	1201 Bergen	1751 Nærøy
0430 Stor-Elvdal	1211 Etne	1755 Leka
0432 Rendalen	1216 Sveio	1804 Bodø
0434 Engerdal	1219 Bømlo	1805 Narvik
0436 Tolga	1221 Stord	1811 Bindal
0437 Tynset	1222 Fitjar	1812 Sømna
0438 Alvdal	1223 Tysnes	1813 Brønnøy
0439 Folldal	1224 Kvinnherad	1815 Vega
0441 Os (Hedm.)	1227 Jondal	1816 Vevelstad
0501 Lillehammer	1228 Odda	1818 Herøy (Nordl.)
0502 Gjøvik	1231 Ullensvang	1820 Alstahaug
0511 Dovre	1232 Eidfjord	1822 Leirfjord
0512 Lesja	1233 Ulvik	1824 Vefsn
0513 Skjåk	1234 Granvin	1825 Grane
0514 Lom	1235 Voss	1826 Hattfjelldal
0515 Vågå	1238 Kvam	1827 Dønna
0516 Nord-Fron	1241 Fusa	1828 Nesna
0517 Sel	1242 Samnanger	1832 Hemnes
0519 Sør-Fron	1243 Os (Hord.)	1833 Rana
0520 Ringebu	1244 Austevoll	1834 Lurøy
0521 Øyer	1245 Sund	1835 Træna
0522 Gausdal	1246 Fjell	1836 Rødøy
0528 Østre Toten	1247 Askøy	1837 Meløy
0529 Vestre Toten	1251 Vaksdal	1838 Gildeskål
0532 Jevnaker	1252 Modalen	1839 Beiarn
0533 Lunner	1253 Osterøy	1840 Saltdal
0534 Gran	1256 Meland	1841 Fauske
0536 Søndre Land	1259 Øygarden	1842 Skjerstad (t.o.m. 2004)
0538 Nordre Land	1260 Radøy	1845 Sørfold
0540 Sør-Aurdal	1263 Lindås	1848 Steigen
0541 Etnedal	1264 Austrheim	1849 Hamarøy
0542 Nord-Aurdal	1265 Fedje	1850 Tysfjord
0543 Vestre Slidre	1266 Masfjorden	1851 Lødingen
0544 Øystre Slidre	1401 Flora	1852 Tjeldsund
0545 Vang	1411 Gulen	1853 Evenes

0602 Drammen	1412 Solund	1854 Ballangen
0604 Kongsberg	1413 Hyllestad	1856 Røst
0605 Ringerike	1416 Høyanger	1857 Værøy
0612 Hole	1417 Vik	1859 Flakstad
0615 Flå	1418 Balestrand	1860 Vestvågøy
0616 Nes (Busk.)	1419 Leikanger	1865 Vågan
0617 Gol	1420 Sogndal	1866 Hadsel
0618 Hemsedal	1421 Aurland	1867 Bø (Nordl.)
0619 Ål	1422 Lærdal	1868 Øksnes
0620 Hol	1424 Årdal	1870 Sortland
0621 Sigdal	1426 Luster	1871 Andøy
0622 Krødsherad	1428 Askvoll	1874 Moskenes
0623 Modum	1429 Fjaler	1901 Harstad
0624 Øvre Eiker	1430 Gaular	1902 Tromsø
0625 Nedre Eiker	1431 Jølster	1911 Kvæfjord
0626 Lier	1432 Førde	1913 Skånland
0627 Røyken	1433 Naustdal	1915 Bjarkøy
0628 Hurum	1438 Bremanger	1917 Ibestad
0631 Flesberg	1439 Vågsøy	1919 Gratangen
0632 Rollag	1441 Selje	1920 Lavangen
0633 Nore og Uvdal	1443 Eid	1922 Bardu
0701 Horten	1444 Hornindal	1923 Salangen
0702 Holmestrand	1445 Gloppen	1924 Målselv
0704 Tønsberg	1449 Stryn	1925 Sørreisa
0706 Sandefjord	1502 Molde	1926 Dyrøy
0709 Larvik	1503 Kristiansund(t.o.m. 2007)	1927 Tranøy
0711 Svelvik	1504 Ålesund	1928 Torsken
0713 Sande (Vestf.)	1505 Kristiansund	1929 Berg
0714 Hof	1511 Vanylven	1931 Lenvik
0716 Re(fra 2002,Våle til 2001)	1514 Sande (M. og R.)	1933 Balsfjord
0719 Andebu	1515 Herøy (M. og R.)	1936 Karlsøy
0720 Stokke	1516 Ulstein	1938 Lyngen
0722 Nøtterøy	1517 Hareid	1939 Storfjord
0723 Tjøme	1519 Volda	1940 Gáivuotna Kåfjord
0728 Lardal	1520 Ørsta	1941 Skjervøy
0805 Porsgrunn	1523 Ørskog	1942 Nordreisa
0806 Skien	1524 Norddal	1943 Kvænangen
0807 Notodden	1525 Stranda	2002 Vardø
0811 Siljan	1526 Stordal	2003 Vadsø
0814 Bamble	1528 Sykkylven	2004 Hammerfest
0815 Kragerø	1529 Skodje	2011 Guovdageaidnu Kautokeino
0817 Drangedal	1531 Sula	2012 Alta
0819 Nome	1532 Giske	2014 Loppa
0821 Bø (Telem.)	1534 Haram	2015 Hasvik
0822 Sauherad	1535 Vestnes	2017 Kvalsund

0826 Tinn	1539 Rauma	2018 Måsøy
0827 Hjartdal	1543 Nesset	2019 Nordkapp
0828 Seljord	1545 Midsund	2020 Porsanger Porsángu Porsank
0829 Kviteseid	1546 Sandøy	2021 Kárásjohka Karasjok
0830 Nissedal	1547 Aukra	2022 Lebesby
0831 Fyresdal	1548 Fræna	2023 Gamvik
0833 Tokke	1551 Eide	2024 Berlevåg
0834 Vinje	1554 Averøy	2025 Deatnu Tana