

Master thesis POL3900

Does intra-EU migration aggravate economic inequality?

A multiple case study on the effects of intra-EU migration on real wage growth in wealthier and poorer member states.

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Affidavit

I hereby declare that the content of this work is my own composition and have not been submitted previously for any higher degree. All extracts have been distinguished using quoted references and all information sources have been acknowledged.

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Abstrakt

Tidligere forskning på virkningen av fri migrasjon innad i den Europeiske Union på lønnsnivå i ulike segment av arbeidsstyrken har for det meste fokusert på enkelte medlemsland og segment av arbeidsstyrken. Denne oppgaven utfordrer status quo i forskningsfronten ved å undersøke virkningen av fri migrasjon i både rike og fattige medlemsland. Videre søker oppgaven å kartlegge virkningen av fri migrasjon på reallønnsvekst i både lav og høyspesialiserte deler av arbeidsstyrken. Forskningens hovedformål er å avklare hvorvidt fri migrasjon mellom EUs medlemsland bidrar til å øke økonomisk ulikhet i både rike og fattige medlemsland. Medlemslandene Tyskland, Polen og Tsjekkia er, i tillegg til Norge som deltar i fri migrasjon innad i EU gjennom EØS avtalen, benyttet som case i oppgaven. Til å teste hypoteser knyttet til forskningsspørsmålet sammenlignes reallønnsvekst i medlemslandenes finans og bygge og anleggs sektorer før og etter EU utvidelsen i 2004 ved hjelp av deskriptiv statistikk.

På tross av at metoden er forbundet med noe usikkerhet, tyder funn fra oppgaven på at økt immigrasjon etter EU utvidelsen i 2004 bidro til nedgang i reallønnsvekst i den norske bygge og anleggssektoren. Denne oppdagelsen kan tyde på at fri migrasjon innad i EU over tid bidrar til å øke økonomisk ulikhet i rike medlemsland. Mot forventning ga forskningen få indikasjoner på at fri migrasjon bidrar til å øke økonomisk ulikhet i fattige EU land.

List of Figures

- Figure 1: Norway; Consumer price index 1997-2015. Adapted from [ssb.no,2017](https://www.ssb.no/priser-og-prisindekser/statistikker/kpi/tilleggsinformasjon/om-priskalkulatoren), Retrieved from <https://www.ssb.no/priser-og-prisindekser/statistikker/kpi/tilleggsinformasjon/om-priskalkulatoren>. Copyright [2017] by Statistisk Sentralbyrå. Adapted with permission..... 27
- Figure 2: Norway; migration trends 1997-2015. Adapted from [ssb.no,2016](https://www.ssb.no/statistikkbanken/selecttable/hovedtabellHjem.asp?KortNavnWeb=flytting&CMSSubjectArea=befolkning&checked=true), Retrieved from <https://www.ssb.no/statistikkbanken/selecttable/hovedtabellHjem.asp?KortNavnWeb=flytting&CMSSubjectArea=befolkning&checked=true>. Copyright [2017] by Statistisk Sentralbyrå. Adapted with permission..... 28
- Figure 3: Norway; trends in migration from Europe 1997-2015. Adapted from [ssb.no,2017](https://www.ssb.no,2017), Retrieved from <https://www.ssb.no/statistikkbanken/selecttable/hovedtabellHjem.asp?KortNavnWeb=flytting&CMSSubjectArea=befolkning&checked=true>. Copyright [2017] by Statistisk Sentralbyrå. Adapted with permission..... 29
- Figure 4: Norway: Unemployment rate 1997-2015. Adapted from [ssb.no,2016](https://www.ssb.no,2016), Retrieved from <https://www.ssb.no/statistikkbanken/selectvarval/Define.asp?subjectcode=&ProductId=&MainTable=AKUAarNY&nvl=&PLanguage=0&nyTmpVar=true&CMSSubjectArea=arbeid-og-lonn&KortNavnWeb=aku&StatVariant=&checked=true>. Copyright [2016] by Statistisk Sentralbyrå. Adapted with permission. 31
- Figure 5: Germany Consumer price index 1990-2015. Adapted from [destatis.de,2017](https://www.destatis.de,2017). Retrieved from https://www.destatis.de/EN/FactsFigures/NationalEconomyEnvironment/Prices/ConsumerPriceIndices/Tables_/ConsumerPricesCategories.html?cms_gtp=151228_list%253D1%2526151230_list%253D2%2526151226_slot%253D2&https=1. Copyright [2017] by Statistisches Bundesamt. Adapted with permission..... 35
- Figure 6: Germany; trends in migration 1995-2015. Adapted from [destatis.de,2017](https://www.destatis.de,2017), Retrieved from Copyright [2017] https://www.genesis.destatis.de/genesis/online/data;jsessionid=D5EC2D6EB28E1F219A38D4A390DD6FDF.tomcat_GO_1_2?operation=begriffsRecherche&suchanweisung_language=en&suchanweisung=migration&x=5&y=9. Copyright [2017] by Statistisches Bundesamt. Adapted with permission..... 36
- Figure 7 Germany; trends in migration from Europe 1995-2015. Adapted from [destatis.de,2017](https://www.destatis.de,2017), Retrieved from https://www.genesis.destatis.de/genesis/online/data;jsessionid=D5EC2D6EB28E1F219A38D4A390DD6FDF.tomcat_GO_1_2?operation=begriffsRecherche&suchanweisung_language=en&suchanweisung=migration&x=5&y=9. Copyright [2017] by Statistisches Bundesamt. Adapted with permission..... 37
- Figure 8 Germany; Unemployment rate 1990-2015. Adapted from [oecd.org,2017](https://data.oecd.org,2017), Retrieved from <https://data.oecd.org/unemp/unemployment-rate.htm>. Copyright [2017] by OECD. Adapted with permission. https://www.destatis.de/EN/FactsFigures/NationalEconomyEnvironment/Prices/ConsumerPriceIndices/Tables_/ConsumerPricesCategories.html?cms_gtp=151228_list%253D1%2526151230_list%253D2%2526151226_slot%253D2&https=1 38
- Figure 9 Poland; Consumer price index 1995-2015. Adapted from stat.gov.pl,2017, Retrieved from <http://stat.gov.pl/en/topics/prices-trade/price-indices/harmonized-indices-of-consumer-prices-hicp,3,2.html>. Copyright [2017] by Central Statistical Office of Poland Adapted with permission. 44

Figure 10 Poland; migration trends 1995-2015. Adapted from stat.gov.pl/en ,2015, Retrieved from http://stat.gov.pl/en/topics/population/population/structure-of-the-population-by-2015,7,1.html Copyright [2015] by Central Statistical Office of Poland. Adapted with permission.	45
Figure 11 Poland: Unemployment rate 1995-2015. Adapted from ons.gov.uk , 2017. Retrieved from https://www.ons.gov.uk/employmentandlabourmarket/peoplenotinwork/unemployment/timeseries/a4au/lms . Copyright [2017] by Eurostat. Adapted with permission.	46
Figure 12: The Czech Republic; Consumer price index 2000-2015. Adapted from czso.cz ,2015, Retrieved from https://vdb.czso.cz/vdbvo2/faces/en/index.jsf?page=vyhledavani&katalog=all&vyhltext=consumer%20price%20index . Copyright [2015] by Czech Statistics Official. Adapted with permission.	49
Figure 13: The Czech Republic; migration trends 1997-2015. Adapted from czso.cz ,2016, Retrieved from https://www.czso.cz/csu/czso/population_hd . Copyright [2016] by Czech Statistics Official. Adapted with permission.	50
Figure 14: The Czech Republic: Unemployment rate 2000-2015. Adapted from oecd.org ,2017, Retrieved from https://data.oecd.org/unemp/unemployment-rate.htm . Copyright [2017] by OECD. Adapted with permission.	51

List of Tables

Table 1 GDP per capita in Euro and as a percentage of the EU average 2003 Q1	19
Table 2: Percentage change real wage growth total growth, annual growth and inter-sector difference.....	24
Table 3:Unemployment, Norwegian Construction sector (%).....	32
Table 4:Percentage change real wage growth total growth, annual growth and inter-sector difference.....	33
Table 5: Percentage change real wage growth total growth, annual growth and inter-sector difference.....	40
Table 6: Percentage change real wage growth total growth, annual growth and inter-sector difference.....	47
Table 7: Unemployed persons previously employed in Construction (in thousands).....	52

Table of Content

1	Introduction	1
2	Theoretical foundation	3
2.1	Literature review.....	3
2.1.1	The effect of immigration on different skill groups.....	4
2.1.2	Effects of immigration in a European context	5
2.1.3	The effect of emigration on the wage distribution of sending countries.....	7
2.2	Critique and adaptation of the standard economic model	9
2.2.1	Expanding the standard model to fit the EU context	10
2.3	Hypotheses.....	12
3	Methodology and Descriptive statistics as method	15
3.1	The quantitative method	15
3.1.1	Brief introduction to the data and scientific approach	15
3.1.2	Considerations with regards to interpretation of results and alternative quantitative methods	16
3.2	Presentation of wage data	17
3.3	Operalization of the high and low-skill worker categories.....	18
3.4	Case selection	19
3.5	Treatment of the data	20
4	Data analysis	22
4.1	Introduction to the data.....	22
4.2	The effects of the economic crisis on real wage growth	22
4.3	Wealthier member states: Norway	23
4.3.1	Overview of real wage growth 1997-2015 and operationalisation of data	23
4.3.1.1	Annual real wage growth pre-and post-Enlargement	24
4.3.1.2	Total real wage growth pre- and post-Enlargement	25
4.3.2	Inflation 1997-2015	26
4.3.3	Overview of migration trends 1997-2015	27
4.3.3.1	European immigration as a proportion of total migration	28
4.3.4	General trends in Unemployment 1997-2015	30
4.3.4.1	Intra-sector unemployment rate Construction	32
4.4	Wealthier member states: Germany	33
4.4.1	Overview of real wage growth 1991-2015.....	33
4.4.1.1	Annual real wage growth pre- and post-Enlargement	33
4.4.1.2	Total real wage growth pre- and post-Enlargement	34
4.4.1.3	Overview of trend.....	34

4.4.2	Inflation 1990-2015	34
4.4.3	Overview of migration trends 1990-2015	35
4.4.3.1	Emigration and net migration 1990-2015.....	36
4.4.3.2	Migration trends 1990-2015 summary	37
4.4.4	General trends in Unemployment 1990-2017	38
4.4.4.1	Intra-sector unemployment rate.....	38
4.5	Poorer member states: Poland	40
4.5.1	Overview of real wage growth 1996-2015.....	40
4.5.1.1	Annual real wage growth pre- and post-Enlargement	40
4.5.1.2	Total real wage growth pre- and post-Enlargement	41
4.5.1.3	Notes to the pre-Enlargement real wage growth	41
4.5.1.4	Summation trends in real wage growth	43
4.5.2	Inflation 1995-2015.....	43
4.5.3	Overview of migration trends 1995-2015	44
4.5.4	General trends in Unemployment 1995-2015	45
4.6	Poorer member states: the Czech Republic	47
4.6.1	Overview of real wage growth 2000-2015.....	47
4.6.1.1	Annual real wage growth pre- and post-Enlargement	47
4.6.1.2	Total real wage growth pre-and post-Enlargement	48
4.6.1.3	Further analysis of the post-Enlargement period.....	48
4.6.2	Inflation 2000-2015.....	49
4.6.3	Overview of migration trends 2000-2015	50
4.6.4	General trends in unemployment 2000-2015	51
4.6.4.1	Intra-sector unemployment rate Construction	51
5	Analysis.....	53
5.1	Wealthier member states: Norway	53
5.1.1	Analysis of real wage growth in Construction and Finance sectors in relation to the hypotheses	53
5.1.2	The effects of unemployment on real wage growth in the Construction sector. 54	
5.1.2.1	Interactive effects of the economic crisis and post-Enlargement migration.....	55
5.1.3	The effects of unemployment on real wage growth in the Finance sector.....	57
5.1.4	Effect of post-Enlargement migration on real wage growth in the Finance sector	58
5.1.5	How the post-Enlargement real wage growth fit H3 and some concluding remarks on H1 and H2	58
5.2	Wealthier member states: Germany	60

5.2.1	Analysis of real wage growth in Construction and Finance sectors in relation to the hypotheses	60
5.2.2	Real wage growth in the Finance sector.....	61
5.2.3	Evaluation of the fit of H3.....	61
5.3	Assessment of the hypotheses pertaining to wealthier member states comparing and contrasting the Norwegian and German case	63
5.3.1	Assessment of the fit of H2	63
5.3.2	Assessment of the fit of H1	64
5.3.2.1	Assessment of H3 and concluding remarks.....	65
5.4	Analysis poorer member states: Poland.....	66
5.4.1	Fit of trends in real wage growth to the hypotheses.....	66
5.4.2	The effect of stabilization of inflation and recovery growth on real wage growth	67
5.4.3	Analysis of post-Enlargement real wage growth in the Construction sector	68
5.4.3.1	Context of analysis of real wage growth 2006-2009	68
5.4.3.2	Exploring the possible relationship between rise in emigration and the increase in Construction workers real wage growth between 2006 and 2009.....	68
5.4.4	Post-Enlargement real wage growth in light of trends in migration and unemployment 2010-2015.....	69
5.4.5	Exploring decline in real wage growth in the Construction sector in light of immigration	70
5.4.6	Fit of H5 to the Polish case	71
5.4.7	Fit of H6 to the Polish case and summary of evaluation of the fit of hypotheses H4 and H5	72
5.5	Analysis poorer member states: the Czech Republic	73
5.5.1	Introduction to the analysis of the Czech case	73
5.5.2	Analysis of real wage growth between 2005 and 2015 and evaluation of the fit of H5	73
5.5.3	Evaluation of the fit of H4 to the Czech Case.....	74
5.5.4	Discussion of the reverse relationship between migration and real wage growth	75
5.5.5	Consideration of the fit of H6 to the Czech case and summation	76
5.6	Assessment of the hypotheses pertaining to poorer member states comparing and contrasting the Czech and Polish case.....	77
5.6.1	The case for H4	77
5.6.2	Assessment of H5.....	79
5.6.3	Assessment of H6 and concluding remarks	79
6	Conclusion.....	81

7	Bibliography.....	83
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1 Introduction

The freedom of European Union citizen to reside and work in any member state of their choosing is a defining characteristic of the economic and political union. A part of the larger neoliberal agenda of the EU, the freedom of movement has not until recently attracted controversy as resistance against the freedom of movement within the EU was vocalized in the British “Leave” campaign in 2016 (Politico 2017). While the freedom of movement undoubtedly has many positive aspects, the resistance towards it was rooted in the belief that free migration between member states disadvantage British blue-collar workers (Politico 2017b). The concern about intra-EU migration yielding a negative effect on blue-collar workers’ wages is not unfounded. Research conducted by Borjas (2003) and Aydemir (2006) on immigration from Mexico to the United States confirmed immigration depressed low-skill workers’ wages, a development which over time exacerbated the gap between low-skill and high skill workers’ wages (Borjas 2003; Aydemir and Borjas 2006). The effects of Mexican immigration flows observed in the United States begs the question of whether intra-EU migration over time contributes to increase economic inequality in EU member states by aggravating the gap between high and low-skill workers’ wages. In contrast to the North-American case, characteristics specific to migration in the EU context suggest the negative effects on low-skill workers’ wages is not confined to the wealthier member states, but also apply to poorer member states.¹

The existing body of research on the effects of intra-EU migration on wages is meagre and often confined to one member state and particular segment of the labour force (see Carrasco, Jimena and Ortego 2004; Mishra 2005; Dustman, Frattini and Preston 2013). Challenging the status quo, this research is taking a comprehensive approach seeking to map the influence of intra-EU migration on high and low-skill workers’ wages in both wealthier and poorer member states. In conducting the research, the standard two-region neo liberal model describing migration effects on wages was adapted to accommodate EU conditions. Out of the new model, hypotheses were posed suggesting the intra-EU migration exacerbates economic inequality over time in both wealthier and poorer EU member states. These hypotheses were tested using descriptive statistics to observe changes in real wage growth in the member states Construction and Finance sectors before and after the 2004 Enlargement. The 2004 EU Enlargement was chosen as starting point for comparison of trends in real wage growth with a defined pre-Enlargement

¹ For a detailed outline of characteristics specific to the EU context see pages 16 and 17.

period as the inclusion of ten new relatively poorer member states impacted the extent and structure of intra-EU migration, making migration induced effect of real wage growth easy to ascertain². The overarching research question sought to be answered through testing of the hypotheses was whether and to which extent intra-EU migration contributes to exacerbating economic inequality in both wealthy and poorer member states. While the method of research is associated with a certain degree of uncertainty, some interesting results were found that are worth highlighting.

Perhaps the most convincing finding is that increased immigration to Norway in the post-Enlargement period contributed to depressing real wage growth in the Norwegian Construction sector. This finding arguably indicate free intra-EU migration contributes to depressing real wage growth in the low-skill segment of wealthier member states' labour force. Analysis of trends in real wage growth in the Czech case may indicate a similar reaction to increased immigration post-Enlargement in the poorer member states, although this validity of this finding is subject to more uncertainty. Contrary to expectation, the analysis yielded no evidence unambiguously indicating intra-EU migration post-Enlargement contributed to an increase in high-skill workers' real wage growth in either wealthier or poorer member states.

² Real wages were chosen as the unit of measurement for personal wealth over nominal wages for the reason that the objective of research effort is to uncover whether intra-EU migration exacerbates economic inequality. A nominal decrease in low skill workers' wages need not be observed in order to conclude intra-EU migration exacerbated economic inequality. Rather, it is only necessary that low-skill workers' increase in purchase power as measured by real wage growth declines in relation to real wage growth in the high-skill segment of the labour force.

2 Theoretical foundation

2.1 Literature review

Standard liberal economic theory predicts how immigration will affect wages in a closed system with free migration between two regions with unequal wage levels (Bauer and Zimmermann 1999: 13) According to this model, an influx of immigrants to the workforce in the primary receiving region, henceforth denoted as a supply shock, will shift the demand curve for workers increasing competition for employment (Bauer and Zimmermann 1999: 13; Borjas 2003: 4) The increased competition for employment will in turn result in a decrease in the wages of the labour force of the receiving region. A corresponding increase in wages for workers in the sending regions is predicted to ensue as demand for labour increase with the depletion of the workforce due to emigration (Bauer and Zimmermann 1999: 13). Migration between the regions is predicted to cease as these effects combine over time to approximate wages levels between the sending and receiving region (Bauer and Zimmermann 1999:13). According to the neoliberal assumption that individuals seek to maximize utility, the incentive for large scale migration is no longer present when emigration does not yield higher wages (Bauer and Zimmermann 1999: 13).

Whereas previous research into the effects of immigration on native workers' wages, yielded small and often ambiguous effects (see Altonji and Card 1991; Friedberg 2001), Borjas was able to demonstrate substantially larger and significant effects in several studies of the US labour market (Borjas 1996; Borjas 2003; Aydemir and Borjas 2006). Where previous studies had used a spatial correlation method, Borjas recognizing that the spatial correlation method would be subject to a cluster of endogeneity problems (Borjas 2003: 5; Aydemir and Borjas 2006: 8)³. Borjas' influential study from 2003 demonstrated that the demand curve is in fact downward sloping and builds on the theoretical assumptions guiding this thesis (Borjas 2003: 14-15, 36).

³ Borjas (2003) argues that the spatial correlation method does not adequately capture the effect of immigration on labour market conditions as migrant worker gravitate toward metropolitan areas with booming economies. Furthermore, native workers are likely to move in response to competitive pressures following an immigrant influx. Both these aspects of the method may confound the dependent variable (Borjas 2003: 5; Borjas and Aydemir 2006: 8).

As noted above, standard liberal economic theory predicts that an immigrant supply shock will shift the demand curve for workers, increasing competition for employment (Borjas 2003: 36). The 1997 study by Borjas on the American labour force estimates this effect to be quite significant, a 10 percent immigrant supply shock was estimated to decrease native wages of by 3-4 percent across skill groups (Borjas 2003: 14-15, 36). Later studies by Borjas and other authors have replicated this effect (Aydemir and Borjas 2006; Dustman et al. 2013). Alternatively, depending on several endogenous properties of the host country's labour market, an immigrant supply shock will result in higher unemployment (Angrist and Kugler 2003: 323; Borjas 2003: 36). Research conducted on this topic has also revealed the composition of the immigrants to host countries differentiate the effect of the supply shock on different skill groups wages (Aydemir and Borjas 2006: 40-44; Dustmann et al. 2013: 160) The results of this research will be presented to illustrate under which conditions low skill workers' wages are disproportionately affected by immigration.

2.1.1 The effect of immigration on different skill groups

Borjas' longitudinal 2003 study (1960-2000) disaggregates workers into different cohorts based on levels of education and work experience, making it possible to estimate the effects of immigration on low-skill and high-skill workers' wages. While the overall effect of a 10 percent immigrant supply shock is estimated to reduce the annual earnings by 6.4 percent and the fraction of time worked within a year by 3.7 percent, the impact differs substantially according to skill groups (Borjas 2003: 14-15, 36). Between 1980 and 2000 the US labour force experienced a 11.1 percent increase in working men due to immigration, the estimated effect of the supply shock was estimated to cause a 8.9 percent decrease in annual wages for high school drop outs, 4.9 percent decrease for college graduates and 2.6 percent for high school graduates (Borjas 2003: 34-35, 36). The wages of workers with some college were barely affected (Borjas 2003: 35).⁴

Borjas (2003), maintains that the impact of immigration on the wage structure is dependent on the skill composition of immigrant workers as well as the already existing wage structure of the host country (Borjas 2003: 7). Aydemir and Borjas' (2006) comparative case study on the effect

⁴ Borjas (2003) uses years of education as a proxy variable for sorting worker into high-skill and low skill groups (Borjas 2003: 8).

of immigration on the wage structure in Canada, Mexico and USA provides further evidence supporting this claim. Contrasting the cases of Canada and the USA may be illustrative to this point. In the Canadian case, the study running from 1960 to 2000, revealed that immigration supply shock experienced over this period narrowed the wage gap between Canadian high-skill and low-skill workers as the immigrants were disproportionately high-skill (Aydemir and Borjas 2006: 44). While the wages of high school drop outs increased by 7.8 percent, the wages of workers with at least a college education was estimated to have decreased by 6 to 8 percent, immigration was thus estimated to have increased the wage of high school drops outs relative to college graduates by approximately 13 percent (Aydemir and Borjas 2006: 40). Immigration to the USA had the opposite effect on the US' wage structure as the majority of immigrants to the USA over the same period were high school drop-outs (Aydemir and Borjas 2006: 42). Thus, an immigrant supply shock of 11.1 percent to the US' labour force affected the American wage structure differently than the Canadian wage structure (Aydemir and Borjas 2006: 41-42). The supply shock is estimated to have caused the wages of high school drops-outs to decrease by 7.1 percent, while lowering the wage of workers in the middle of the education distribution and workers with a college degree by 2.5 percent and 4 percent respectively (Aydemir and Borjas 2006: 41-42).

2.1.2 Effects of immigration in a European context

Studies on the effects of immigration on native workers' wages in a European context also pay attention to the asymmetrical effects on wages of low-skill workers and high skill workers in the host country (Dustmann, Frattini and Preston 2013). As is discussed above, the composition of immigrants yields the most significant effect on the wage structure of the host country (Borjas 2003: 7) However, the European and the US context differs in that intra-EU migration is characterized by an influx of Eastern European migrant workers to Western EU member states. In contrast to the US case, where the vast share of immigrant workers are low-skill Mexican workers, evidence from Poland suggest the majority of Polish emigrants to the UK belong to the middle of the skill distribution (Dustmann et al. 2013: 155; Dustmann, Frattini and Rosso 2012: 28). However, studies show that the effect of the east to west European migration mimics the effect demonstrated in the US, as research on individual EU member states show that it is primarily the wages of low skill workers that decreases as an effect of immigration (Dustmann et al. 2012; Dustmann et al. 2013). The similarity between the US and

the European case regarding immigration effects on wage structure is puzzling considering the differences in skill composition of the immigrants. Dustmann et al. (2013) offers an explanation for the disproportionate effect on low-skill workers' wages in a longitudinal analysis of the impact of immigration on UK wages from 1998-2005.

In their longitudinal study on the impact of immigration on UK wages, Dustmann et al. (2013), challenge the assumption made by Borjas (2003) that immigrant workers are likely to be matched in the workforce to their observable skills (Dustmann et al. 2013: 146, 154). Obstacles such as licence requirements and language barriers cause immigrant workers to move down the skill hierarchy settling for employment in low-skill, lower paying jobs (Dustmann et al. 2013: 154).⁵ This tendency is evidenced by the settlement of Polish immigrants in the UK labour force after the recent EU Enlargement. Although Polish immigrants were on average better educated than the native workforce, recent Polish immigrant to the UK in the after the EU Enlargement tended to settle in low-skill occupations (Dustmann et al. 2013: 154). Of the recent Polish immigrants 48 percent settled in the two lowest occupational groups, compared to 27 percent of native workers and 26 percent of earlier immigrants (Dustmann et al. 2013: 154).⁶ To illustrate this effect, it is further instructive to compare the recent immigrants distribution along occupational categories with that of natives and immigrants with similar educational attainments. 64 percent of recent immigrants in the intermediate skill category were employed in the two lowest occupational categories compared to 19 percent of native workers (Dustmann et al. 2013: 155). Among highly skilled immigrants 11 percent worked in the two lowest occupational categories compared to 5 percent of highly skilled natives (Dustmann et al. 2013: 155).

An OLS regression of wages at ten percent intervals demonstrates how the distribution of immigrants along the wage curve depresses wages at the lower percentiles (Dustmann et al. 2013: 161). It is estimated that each 1 percent supply shock over the period studied lead to a 0.6 percent decrease at the 5th percentile and a 0.5 percent decrease at the 10th wage percentile, while producing a 0.6 increase in the wages at the median percentiles and a 0.4 percent increase at the 90th percentile (Dustmann et al. 2013: 160). The conclusion is that the downgrading of recent immigrants after the EU Enlargement contribute to a stretching of the wage curve, where

⁵ Drinkwater et al. (2009) corroborates that the majority of post 2004 EU8 migrants to the UK work in low-skill occupations. Over a third were employed in business, administration and management sector, a fifth in hospitality and catering, and just over 10 percent in agriculture (Drinkwater et al. 2009: 167).

⁶ Dustmann et al. (2013) define skill group according four different age groups and leaving school age as a proxy variable for educational attainment (Dustmann et al. 2013: 155)

immigration puts downward pressure on the lower part of the wage distribution but increases wages at the upper part of the distribution (Dustmann et al. 2013: 161). The tendency of medium and high skill recent immigrant workers to downgrade in the job market seems a good explanation for why the effect of immigration in the UK seem to resemble that observed by Borjas in the US case.

The literature does not provide an explicit outline of the mechanics causing high-skill workers' wages to increase as a direct result of immigration. However, a plausible explanation for this phenomenon could be that the profit margin for business owners and affiliates increase as a result of downward pressure put on low-skill workers' wages by increased immigration. In simpler terms, wages of business owners and affiliates whom are typically high-skill workers could increase as a consequence of decline in low-skill workers' wages. Lower labour cost resulting from an immigration induced downward pressure on low-skill workers' wages would increase the profit margin of business owners and affiliates. In turn, higher profit margins could plausibly allow for an increase in high-skill workers wages.

2.1.3 The effect of emigration on the wage distribution of sending countries

Interestingly, Aydemir and Borjas' (2006) comparative analysis found that emigration from Mexico to the USA over the same period did not contribute to higher earnings for the low-skill cohort of the Mexican labour force, which would be the result according to conventional economic theory (Aydemir and Borjas 2006: 42). Paradoxically, as the brunt of Mexican immigrants to the US were high school drop outs, these workers when taking work experience into account represented the middle-skill cohort of the Mexican labour force (Aydemir and Borjas 2006: 42). Thus, the substantial emigration amounting to 14.6 percent of the Mexican workforce between 1980 and 2000 is estimated to have increased the wages of workers in the middle of the education distribution by 5-8 percent, while reducing high school drop-outs wages by 1 percent (Borjas and Aydemir 2006: 43). An earlier study by Mishra (2005) on the effect of Mexican emigration on the wages of Mexican stayers found similar results. While the study concludes that emigration from Mexico from 1970-2000 raised Mexican workers' wages by 8 percent across skill groups and in contrast to Borjas study estimate the effect on high school drop-outs to amount to a 5 percent increase, the author points out that the corresponding wage increases in other skill groups were much larger (Mishra 2005: 193). For instance, Mishra estimates that a 15 percent increase in wages for high school graduates can be attributed to

emigration, concluding that emigration contributed to rising wage inequality in Mexico between 1990-2000 (Mishra 2005: 193). The explanation for the effect observed in both studies is that the exodus of workers at the middle of the education distribution makes the remaining low skill workers relatively more abundant (Aydemir and Borjas 2006: 43).

A possible explanation for this rather counterintuitive phenomenon is rooted in how the emigration of middle-skill workers improves the wages of middle-skill workers relative to low-skill workers. In primary sending countries, the wages in the middle of the skill distribution improves as emigration from this cohort create higher demand for middle-skill workers. Assuming chances of mobility into jobs normally occupied by middle-skill workers by workers classified as low-skill is small, the absence of middle-skill workers does not actually improve wages of low-skill workers. The result of large-scale emigration of middle-skill workers is therefore a widening of the gap between low and middle-skill workers' wages, meaning that low-skill worker's wages decline in relation to middle skill workers.

The effect of emigration on the Mexican wage structure and the mechanics causing it is arguably also found in Poland. The cases are similar in that both countries experienced large scale emigration to nearby wealthier countries (Drinkwater et al. 2009: 165; Borjas 2003). Further similarities pertain to some of characteristics of emigrants from the respective countries. Whereas Mexican emigrants belonged to the middle of the skill distribution in the Mexican labour force, Polish immigrants tend to be better educated than native workers in the UK, as they primarily belonged to the middle and high end of the education distribution of the Polish workforce (Dustmann et al. 2013: 154). Dustmann et als' (2012) analysis of the impact of Polish emigration on the Polish wage structure found some tentative evidence suggesting that emigration affected the Polish wage structure in a manner similar to what Aydemir and Borjas (2006) found was the case for Mexico. As was the case in Mexico, the authors found that Polish emigration after the EU Enlargement lead to an increase in wages for those in the middle and high end of the education distribution, but possibly decreased the wages for low-skill workers, although the last result was not found to be statistically different from zero (Dustmann et al. 2012: 28). It is natural to assume that the cause of this effect on wages of workers in the lower end of the education distribution can be attributed to the mechanics described by Aydemir and Borjas (2006) elaborated above.

2.2 Critique and adaptation of the standard economic model

The research presented above has demonstrated the validity of some of the liberal economic model's basic predictions pertaining to the effect of immigration on wages. The research of scholars such as Aydemir and Borjas (2006) on immigration in the North American context where the USA is the primary receiving country and Mexico the primary sending country, found that immigration of a specific skill groups leads to decreased wages in the corresponding skill group in the receiving country. Moreover, Aydemir and Borjas (2006) and Mishra (2005) found evidence that emigration from a skill group caused wages to raise in that particular skill group in the sending country (Aydemir and Borjas 2006: 40-43; Mishra 2005: 181). The findings documented in the body of literature presented provide sufficient alibi for looking for some of the same mechanisms pertaining to the effects of intra-EU migration in a broader context. The latter mechanic described can be interpreted as a tendency of the wages levels of sending and receiving countries wages levels to approximate each other. However, this argument is only convincing if one chooses to overlook the distributional impact of immigration and emigration on the wage structure of the respective countries documented in these studies. Moreover, the context of the intra-EU migration arguably diverges from the liberal model, which further suggests the approximation of wages in receiving and sending countries is compromised.

As outlined above, liberal economic theory use a closed model with two regions with unequal wage levels to demonstrate the effect of immigration on wages in a system where immigration is not subjected to exogenous restrictions (Bauer and Zimmermann 1999: 13) As immigration to the receiving country reaches a point of saturation, wages levels in the receiving country are expected to decrease (Bauer and Zimmermann 1999: 13; Borjas 2003: 4). Simultaneously, the stock of workers in the sending country is depleted causing demand for labour to increase which in turn causes wage levels to increase (Bauer and Zimmermann 1999: 13). Over time, immigration is predicted to cease as the wage levels in the sending and receiving country approximate each other (Bauer and Zimmermann 1999: 13). There are several reasons to expect that the approximation assumption is compromised when applied to the European context. Where the model stipulates how immigration affects wages in a system with two regions where wages are higher in the receiving country and lower in the sending, intra-EU migration is characterized by bilateral migration between 29 EU member states in addition to four EEA states where wage levels vary across a spectrum. The bilateral characteristic of intra-EU migration means every member state is simultaneously both a sending and receiving country of

immigrants. It is from this deviation in the model that the hypotheses about how intra-EU migration affect wage levels and wage distribution spring.

2.2.1 Expanding the standard model to fit the EU context

The EU currently consists of 28 member states all varying in wealth and wage levels, migration is free within the EU area meaning all member states are simultaneously sending and receiving countries. These defining characteristics of intra-EU migration defies the assumptions the standard model is founded upon and thus limits the ability of the model to accurately predict the impact of intra-EU migration and wage levels in member states. As all member states are both sending and receiving countries and wage levels throughout the EU area vary across a spectrum, the approximation outcome is arguably impeded. The mechanisms of the impediment can be illustrated by adding one country to the model. Consider the following example. Wage levels in Country A, B and C differ significantly across a spectrum, nevertheless, the countries have implemented a policy allowing free migration among them. Country A has high wage levels, middle wage levels can be found in country B while country C has the lowest wage levels. Due to issues such as degree of substitutability between workers or geographic proximity, country A receives a supply shock of immigrant to the low-skill cohort of the workforce over a period of ten years originating solely from country B. Over the same period country B experience an immigrant supply shock of the same size emanating exclusively from country C. Were A and B isolated as in the closed system as stipulated in the model, the result would have been a decrease in the wages of low-skill workers' wages in country A and a corresponding increase in the wages of this cohort in country B constituting an approximation of between these two countries. Country A would see a stretching of the distribution of wages along the wage structure where low skill workers will earn less compared to middle and high-skill workers. Country B would experience a narrowing of the distribution of wages where the wages of low-skill workers would improve in relation to the wages of middle and high-skill workers. However, in the example presented above, the impact of the migration will affect wage levels differently.

In the modified model comprising three countries, the wages of low-skill workers in all countries will decrease as a direct result of immigration. In country A, the wages of low-skill workers decrease as a result of lower demand for low-skill workers in response to the supply shock from country B. Low-skill workers also decrease in country B, given an equal emigration

and immigration to and from the group of low-skill workers, one might be tempted to assume that wages for this group stay constant. This is however not the case, as wage levels in country C are lower relative to the wages level in country B the 10 percent supply shock will impose a competitive pressure on this cohort wage levels, decreasing wages for low-skill workers in country B. The literature surveyed above gives reason to believe that the wage levels of low-skill workers in country C will also decrease. Aydemir and Borjas (2006) and Dustmann et al (2012;2013)found that middle-skill workers have the highest propensity to migrate, making low skill workers in country C relatively more abundant which in turn can be expected to depress the wages of low skill workers in country C (Aydemir and Borjas 2006: 13; Dustmann et al. 2012: 28; Dustmann et al. 2013: 154).⁷ The result is a stretching of the distribution of wages below the median in all three countries.

⁷ It is assumed that middle skill immigrants from Country C to Country B mainly work in low skill occupations as Dustmann et al. (2013) has demonstrated the propensity of immigrants to downgrade in the work force of the host country (Dustmann et al. 2013: 154).

2.3 Hypotheses

The adaptation of the liberal economic model and the literature reviewed lay the foundation for the explicit hypotheses about how free intra-EU migration in conjunction with the 2004 EU Enlargement affect the development of real wages in EU and EEA member states. In this section, the hypothesis pertaining to the effects of intra-EU migration on wealthier member will be presented, followed by the hypotheses about the effects on poorer member states. The overarching objective of the testing of the hypotheses is allow for the assessment of whether and to which extent intra-EU migration exacerbate economic inequality in both wealthier and poorer member states. As this research endeavours to uncover the effect of intra-EU migration on wealthier and poorer member states, hypotheses predicting the effect of post-Enlargement changes in intra-EU migration on member states on the middle of the wealth spectrum will not be presented.

The first of the predicted outcomes of intra-EU migration on wealthier member states is that free migration decreases the wages of the low-skill worker cohort relative to the wages of the high-skill cohort. The reduction in wages for low-skill workers is predicted to ensue as the supply shock from EU10 member states exerts a competitive pressure on native workers' wages. The competitive pressure is exacerbated as wage levels throughout the EU area are heterogeneous, meaning that migrant EU10 workers are likely to accept lower wages than the native workers. Further, the supply shock exerted on the low-skill cohort is predicted to slightly increase the wages of middle and high skill workers, due to the increased availability of inexpensive labour to capital owners. Resulting is a stretching of the wage distribution, increasing the wage gap between low-skill and high-skill workers. Using the development of real wages as a proxy measurement for wages, it is expected to find that growth in real wages for the low-skill workers either decrease or stagnate in the post-EU Enlargement period compared to the pre-Enlargement period.⁸ The wages of high-skill workers are expected to increase more in the period post-Enlargement compared to pre-Enlargement relative to the wages of low-skill workers. Further, it is expected that a decrease or stagnation in low-skill workers real wages in the post-Enlargement period combined with a steeper increase in the real

⁸ Real wages were chosen as the unit of measurement for personal wealth over nominal wages for the reason that the objective of research effort is to uncover whether intra-EU migration exacerbates economic inequality. A nominal decrease in low skill workers' wages need not be observed in order to conclude intra-EU migration exacerbated economic inequality. Rather, it is only necessary that low-skill workers' increase in purchase power as measured by real wage growth declines in relation to real wage growth in the high-skill segment of the labour force.

wages of high-skill workers' wages over the same period have exacerbated the wage gap between low high-skill workers in wealthier EU member states.

Finally, the hypothesis as how intra-EU migration affect real wages in low wage member states also closely adhere to the predictions stipulated in the amended model. The EU countries are primary sending countries, with negative net migration rates as wages levels are significantly lower than the EU average (Vargas-Silva 2012: 6; Eurostat 2016). The hypothesis therefore pertains to the effect on intra-EU migration on wage levels in these countries. The hypothesis states that significant out-migration from the middle-skill cohort demonstrated by Dustmann et al. (2013: 154) leads to a rise in the wages of middle-skill workers relative to low-skill workers' wages and thus the real wages of low-skill workers will decline in relation to middle-skill workers in the poorer cohort of member states. Diverging from the expectation from the three-country migration model introduced above, is the expectation of no significant immigration to the low-income EU member states. One cannot rule out the possibility, that a member state which is poor relative to the EU average is not a recipient of significant work migration from other, relatively poorer member states. Assuming once again that immigration to these countries would primarily consist of middle-skill workers settling in low-skill occupations, one cannot rule out that low-skill workers' wages are under further pressure from immigration in the low-income countries. The emigration of middle-skill workers in turn is hypothesized to produce a steeper increase in the growth of real wages in this cohort compared to the reference period. This assumption is supported by the findings of Mishra (2005) and Dustmann et al. (2012) which are elaborated in the previous chapter. As in the case of wealthier member states, the outcome of intra-EU migration post 2004 is predicted to contribute to a stretching of the wage distribution in EU10 countries.

Alas, the sum of hypotheses made amounts to an overarching hypothesis that free intra-EU migration has resulted in a decline or stagnation in the growth of low skill workers real wages parallel with contributing to faster growth in the wages of high-skill workers post the 2004 Enlargement in wealthier and poorer member states. The result of which is an exacerbation of economic inequality in wealthier and poorer member states. Following is an explicit outline of the hypotheses pertaining to the effects of intra-EU migration on high and low-skill workers' real wage growth in the post-Enlargement period.

Hypothesis 1 (H1): Annual real wage growth of low-skill workers in the wealthiest member states declined post-Enlargement (2004-2015) relative to the reference period.

Hypothesis 2 (H2): Annual real wage growth of high-skill workers in the wealthiest member states improved compared to the reference period.

Hypothesis 3 (H3): The gap in annual real wage growth between low-skill and high-skill workers was exacerbated in the post-Enlargement period relative to the pre-Enlargement period in the cohort of wealthiest member states.

Hypothesis 4 (H4): Annual real wage growth of low skill workers in the poorer member states declined post-Enlargement (2004-2015) relative to the reference period.

Hypothesis 5 (H5): Annual real wage growth of high skill workers in the poorer member states improved compared to the reference period.

Hypothesis 6 (H6): The gap in annual real wage growth between low skill and high skill workers was exacerbated in the post-Enlargement period relative to the pre-Enlargement period in the poorer member states.

3 Methodology and Descriptive statistics as method

3.1 The quantitative method

The mode of research employed in this thesis amounts to gathering and analysing descriptive statistics, this method falls into the quantitative methodological paradigm. The choice of the specific mode of quantitative research will be discussed later in this chapter. A quantitative method of research was chosen as macroeconomic changes are best captured by means of quantitative analysis. To uncover a causal relationship between increased intra-EU migration effect on real wages in different segments of the labour market would certainly require an analysis of wage data. Document studies would be the only viable alternative approach associated with the qualitative methodology paradigm that could conceivably produce reliable and valid results. However, applied as a method to explore the posed hypotheses, document studies are not well suited. The use of document studies would entail some methodological and practical shortcomings that would impede the extent to which the hypotheses could be meaningfully explored. First, the literature on the relationship between migration on wages in Europe is scarce. Research on migration induced effects on wages in light of the 2004 EU Enlargement is only available for a few select member states, of these the majority are wealthier western member states such as the UK and Poland (see Dustmann et. al 2013; Mishra 2005). The lack of research on a broader spectrum of member states alone discourages the use of document studies. Furthermore, the existing literature tend to explore the impact of migration changes on a single member state, and often within a single segment of the labour market.⁹ This arguably further detracts from the merits of the method as the existing research does not allow for comparison of how increased intra-EU migration affects different segments of the labour market.

3.1.1 *Brief introduction to the data and scientific approach*

Descriptive statistics was chosen as the preferred method to test the hypotheses presented in the previous chapter. The data and the mathematical calculations applied to it will be thoroughly described in the following sections below. For the purpose of clarity, I will limit myself to briefly summarizing the main data here. Data on gross monthly wages for each year in the Construction and Finance sectors was gathered for each member state included in the analysis.

⁹ Dustmann et. al (2013) is a notable exception.

These data were subjected to calculations revealing percentage change in real wage and evaluated in conjunction with annual migration data, unemployment statistics and annual inflation rate in an effort to discern migration effects on trends in real wage development. The advantages and disadvantages of the using descriptive statistics will be presented alongside a similar evaluation of panel data.

3.1.2 Considerations with regards to interpretation of results and alternative quantitative methods

The increase in intra-EU migration post the 2004 EU Enlargement is substantial. This makes it conceivable that migration effects on wage trends in the two sectors can be detected in the data material. However, the analysis of descriptive statistics alone does not allow for precisely measuring the influence other variables such as inflation and intra-sector unemployment that affects both the dependent and independent variable. Therefore, it is ill advised to firmly conclude or discard the possibility of a causal effect between the independent (migration) and dependent variable (real wages) solely on the basis of the data material at hand. Any such conclusion would increase the chance of committing the error of confirming an invalid hypothesis as well as discarding a valid hypothesis. Rather, one could argue that the significant increase in intra-EU migration post 2004 warrants that a migration effect on wages could be discernible in the data. Thus, the results of the data analysis could warrant careful indications of whether and to which extent migration affected real wage trends. The use of panel data was considered several times thorough the research process as the method would allow for control of the effect of intervening variables on the dependent variable. The idea was discarded as it is also associated with some methodological problems. The use of panel data might be ill advised as the data material consist of a relatively small number of observations, which compromises the integrity of results as the number of degrees of freedom might not be sufficient in relation to the number of variables and observations (Hancke 2013: 67). Moreover, panel data analysis performed on time series data is often subject to intercorrelation that also compromises the results (Skog 2013: 322). Furthermore, is unlikely that the relevant data for even a few variables thought to influence wage formation would be available for all four cases. Retrieving comparable wage data from the four member states already proved challenging. Lastly, even though the use of panel data would likely increase the confidence with which one can claim the existence of a causal relationship, the panel data method cannot guarantee such a relationship as the number of variables influencing wage formation is likely inexhaustive.

3.2 Presentation of wage data

The data on wages are retrieved from the respective member states official statistical bureaus. The sectors classified according to the same classification system (NACE-CZ) in all countries analysed (Central Statistical Office of Poland 2016; Czech Statistics Official 2016; Destatis 2016; Statistisk Sentralbyra 2016). This increases confidence that the material is comparable across countries, as one can be certain that the workers included in the sectors A in one member state are not significantly different from workers in sector A other member states

The original intent was to gather data on gross monthly wages for the period 1990-2015¹⁰ for several different sectors that would later be aggregated into a blue-collar and white-collar category to test the hypotheses. This proved challenging as there were discrepancies between the countries statistical bureaus as to which sector wage data was available, and then additionally for which periods the wage data was available for. The discrepancy in available data for the four cases had two main practical consequences for this research. First, the length of the period for which data is presented differs for each country. Whereas I was able to retrieve wage data for Germany for the entirety of the desired period (1990-2015), the wage data for the Czech Republic was only available dating back to 2000. Wage data from Norway and Poland was available from 1997-2015 and 1995-2015 respectively. Secondly, the necessity of gathering wage data for the same sectors across all countries greatly narrowed the range of sectors eligible for inclusion in the respective categories. To circumvent this problem, I chose to use the Construction sector to serve as a proxy for the low-skill category and the Finance and insurance sector as a proxy for the high-skill category.

¹⁰ Gross monthly wages was used as the unit for all countries analysed (Central Statistical Office of Poland 2016; Czech Statistics Official 2016; Destatis 2016; Statistisk Sentralbyra 2016).

3.3 Operationalization of the high and low-skill worker categories

Using the Construction and Finance sector's wages as representatives of two large categories entailed a significant practical advantage and a methodological disadvantage. The use of these sectors allowed for cross-country comparison of wage trends over a considerable period of time. More specifically, wage data for Construction and Finance sectors were available for a continuous period time before the EU Enlargement of 2004, allowing assessment of the central hypotheses of this thesis. This was regrettably not the case for other sectors considered to be included in the categories. I consider the sectors "Construction" and "Finance and Insurance" to be representative of the properties associated with the categories they represent and therefore that the use of these sectors is appropriate. This argument will be elaborated below following a discussion on the disadvantages of reducing the categories to two sectors.

An aggregation of several sectors together in each category would undoubtedly be a better measure for of the categories that I endeavour to capture. The increase in quality would stem from the differences pertaining to each sector aggregated to make a better picture of wage trends in the categories altogether. An aggregation of several sectors into the two categories would therefore arguably strengthen the internal and external validity of results from the analysis of the wage data material. However, I would still argue that there are valid results to be extracted from researching wage trends in the chosen sectors. My argument here rests mainly upon the fit of the sectors with the categories they represent. The Construction sector comprises both skilled and unskilled workers, with low to medium levels of education. Furthermore, quite relaxed licence requirement has inspired intra-EU east to west work migration, which raises the chances that migration effects on wage levels are detectable in both the sending and receiving countries included in this research (Dustmann et.al. 2013: 154). The Finance and Insurance sector is arguably representative of the high-skill worker category, as entrance to the sector requires higher levels of education. The level of specialization required to obtain employment in the Finance and Insurance sector would likely act as a barrier to the entrance of migrant workers on a significant scale. In summation, I consider the difference in entry requirement to the two sectors to be indicative that they are both representative of the categories they represent, and therefore will respond differently to increased intra-EU migration post 2004.

3.4 Case selection

I selected four European countries of which two are representative of wealthier EU member states and two representatives of poorer member states. The countries were selected on the criteria of wealth relative to the European average as measured by GDP per capita as a percentage of the EU average (Eurostat 2017). In order to discern migration effects on wage trends I gathered data on in and out migration for each country¹¹ Specifically, the migration data aided in determining whether increases in in and out migration could plausibly have affected wage trends.

Norway and Germany qualify as wealthy EU member states with GDP per capita as a percentage of the EU average at 148 percent and 127 percent respectively in the first quarter of 2003 (Eurostat 2017). The Czech Republic and Poland arguably qualify as poorer EU member states with a GDP per capita as a percentage of the EU average at 38 and 23 percent respectively in the first quarter of 2003 (Eurostat 2017)¹². Data on GDP per capita for 2003 was used to determine the relative wealth of the member states. This is due to the need to compare the wealth of the member states prior to the Enlargement in 2004 which at a later point in time may have influenced the wealth of existing and newly included member states relative to the EU average.

Table 1 GDP per capita in Euro and as a percentage of the EU average 2003 Q1

Member state/area	GDP per capita 2003Q1 (Euro)	Percentage of EU average (%)
EU average (28)	5200	100
Norway	7700	148
Germany	6600	127
Poland	1200	38
The Czech Republic	2000	23

GDP per capita in Euro 2003Q1. Adapted from *Eurostat.ec.europa.eu*, 2017, Retrieved from http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=nama_10_pc&lang=en. Copyright [2017] by Eurostat.

Adapted with permission.

¹¹ Data on migration trends was retrieved from the databases of the countries respective official statistical bureaus and supplemented with data from OECD in cases where the official statistical bureaus did not have sufficient data (CsoP 2015; CSO2016; Destatis 2017; OECD 2017).

¹² Percentages are a result of the authors own calculations. Percentages were calculations using the following formula; GDP per capita member state/GDP EU average*100.

3.5 Treatment of the data

Real wages are the best suited unit of measurement as they allow for comparison of changes in personal wealth in different segments of the labour market. The hypotheses pose the question as to whether migration exacerbates wage differences between low-skill and high-skill workers over time. Another way to frame this question is of course whether increased migration pressures exacerbates economic inequality. Real wages are controlled for inflation meaning that percentage change in real wages as opposed to nominal wages measure change in purchase power. Changes in real wages is thus a measure of changes in personal wealth, real wages are thus a more appropriate measurement than change nominal wages which are distorted by inflation.

To determine the changes in real wages I calculated the individual data on gross monthly wages for each year into the 2015 value. The transformation was conducted in the following manner; each individual data point on wages for each sector for all four member states were multiplied with the percentage change in CPI from the previous year and all other years leading up to 2015. The data points on gross monthly wages for 2015 were exempted from such transformation.

Annual change in CPI:

2013: 2,1

2014: 2,1

E.g.: $\text{Gross monthly wage}_{2013} * 1.021 * 1.021 = \text{Gross monthly wage}_{2013} \text{ transformed into 2015 value}$

The real wage increase from the previous year was produced by subtracting the real wage of the previous year from a particular year and then multiplied with the wage of the previous year and the finally multiplied with 100 to determine the percentage increase in real wage.

$(\text{RealWage}_{2003} - \text{RealWage}_{2002}) * 100 = \text{RealWage percentage change}$

The hypotheses predict that increased intra-EU migration in the post-Enlargement period caused real wages in the Construction sector to stagnate or decline while causing real wage growth in the Finance sector would continue to increase relative to the reference period. In order

to test these predictions, the following work was done to the wage data of all four countries. First, the total real wage growth in both sectors for the entire period was measured by addition of the annual real wage percentage change. I subsequently measured the difference in real wage growth between the sectors for the period by simple subtraction. I calculated the growth rate per year for both sectors by dividing by the number of years included in this category. The difference in growth rate per year between the sectors was calculated by simple subtraction.

The data was thereafter divided into segments representing the periods before and after the EU Enlargement. The years up till and including 2004 were included in the pre-EU Enlargement category, the number of data points in this category vary in accordance with how far back in time the wage data for member state go. The years 2005-2015 make up the post-EU Enlargement category. The choice was made to start this category with the year 2005, a year after the accession as migration data demonstrate no significant change in migration trends in 2004, the year of the accession (CsoP 2016; CSO2015; Destatis 2017; SSB 2017). This could be attributed to factors such as a natural delay of effects and the delay on the part of EU member states to extend the right of free movement within the EU area (Dustmann et. al 2012: 6). Performing the mathematical operation described above, I calculated the aggregate increase in real wages for both sectors for both periods and subtracted the difference. This was done to ascertain whether and how increased migration post- EU Enlargement affected real wage growth in both sectors. Average annual growth rate was calculated for both sectors for both the pre-and post-Enlargement period by division by number of years included in the categories. This step is important as it allows for comparison of real wage growth between sectors and time periods despite the pre-and post-Enlargement categories often containing an unequal number of observations. The difference in growth rate per year between the two sectors for each period was calculated to facilitate further comparison.

In some cases, I divided the wage data into additional time periods that I deemed interesting to examine. The additional categorizations were usually made to measure the effect on real wage growth during periods of especially high in- or out migration. The reasoning behind the creation of each additional category will be explained in minute detail in the following chapter. The additional time periods were subjected to the same calculation detailed in the preceding paragraphs.

4 Data analysis

4.1 Introduction to the data

This section of the thesis presents detailed data on real wage growth in the sectors pre- and post-Enlargement along with data on migration flows for each country. Facilitating further analysis is the outline of data on intervening variables known to also influence wage growth; these are annual unemployment rate for each country and inflation. Where data on sector specific unemployment rates or proxy measurements were included where available to facilitate the accuracy of the analysis. Data on inflation was included as inflation is a good indicator of cyclical changes in the national economies. The effects of the 2008 recession undoubtedly affected real wage growth and is thus granted a brief discussion in the next paragraph as its effects pertains to all member states.

4.2 The effects of the economic crisis on real wage growth

The economic crisis of 2008, sometimes referred to as the great recession yielded a great impact on investment and demand in most European countries (Brauers, Kilidiene, Zavadskas and Kaklauskas 2013: 59). While the crisis lasted from 2008 till 2009 its effects were felt in the following years (Brauers et. al 2013:59). It is natural to assume the decrease in investment caused by the recession affected real wage growth. Decrease in investment is naturally linked to a decrease in demand for labour which in turn aggravates unemployment and depresses wages growth. Recent research suggests the investment in the European Construction sectors were especially hard hit by the recession. Therefore, the analysis factors in the economic crisis as an variable affecting real wage growth.

4.3 Wealthier member states: Norway

4.3.1 Overview of real wage growth 1997-2015 and operationalisation of data

The total real wage growth in the Norwegian Construction and Finance sectors amounted to 37.97 and 58.61 percent over the period 1998-2015 respectively. Real wage growth per year amounted to 2.05 for Construction and 3.26 percent for the Finance sector. For the entire period considered, the Finance sector experienced more substantial real wage growth and the growth of real wages in this sector was steeper than that of the Construction sector. The difference in per year real wage growth between the Construction and Finance sector amounted to 1.20 percent meaning the Finance sectors real wage growth per annum was on average 1.20 percent more than in the Construction sector.

For the purpose of detecting possible effects of the 2004 EU Enlargement on real wage growth in the sectors, the data was further divided into segments referred to as pre-Enlargement and post-Enlargement. The pre-Enlargement segment represents the period 1998-2004 while the post-Enlargement segment represent the period 2005-2015.¹³ The post-Enlargement period was further disaggregated in order to better discern the impact of major changes in migration trends. Immigration to Norway stemming from European countries increased significantly from 2006 (SSB 2017). The economic crisis of 2008 impacted economic growth in many sector and the Construction sector in particular (SSB 2015). To better discern the effect on real wage growth of these events, the post-Enlargement period was further divided into segments 2005-2008 and 2009-2015.

¹³ See chapter 3, p 3 for detailed consideration the pre-and post-Enlargement segments were selected.

Table 2: Percentage change real wage growth total growth, annual growth and inter-sector difference.

Time	Construction Tot. real wage growth (%)	Finance Tot. real wage Growth (%)	Difference (tot. real wage growth) (%)	Construction Annual growth (%)	Finance Annual growth (%)	Difference Annual growth (%)
1998- 2015	36.97	58.61	21.64	2.05	3.26	1.20
1998- 2004	14.93	22.14	7.21	2.13	3.16	1.03
2005- 2015	22.03	36.46	14.43	2.00	3.31	1.31
2005- 2008	14.67	27.31	12.65	3.67	6.83	3.16
2009- 2015	7.37	9.15	1.78	1.05	1.31	0.25

Norway; migration trends 1997-2015. Adapted from *ssb.no*, 2017, Retrieved from <https://www.ssb.no/statistikkbanken/selecttable/hovedtabelHjem.asp?KortNavnWeb=flytting&CMSSubjectArea=befolkning&checked=true>. Copyright [2017] by Statistisk Sentralbyrå. Adapted with permission.

4.3.1.1 Annual real wage growth pre-and post-Enlargement

Real wages grew on average 2.13 percent per annum in the Construction sector and 3.16 percent in the Finance sector in the pre-Enlargement period (1998-2004). The overall difference in annual real wage growth between the sectors over the period amounted to 1.03 percent. Real wages in the Construction sector increased on average 2.0 percent annually in the post-Enlargement period (2005-2015), a decrease of 0.13 percent from the pre-Enlargement period. Moreover, average annual real wage growth in the Finance sector amounted to 3.31 percent in the post Enlargement period, an increase of 0.15 percent relative to the per annum growth in the pre-Enlargement period. The difference in annual real wage growth between the sectors in the post-Enlargement period amounted to 1.31 percent resulting from the increase in the in annual real wage growth in the Finance sector coupled with the decrease annual real wage growth in the Construction sector. Thus, the inter-sector difference in annual real wage growth increased by 0.28 percent between the pre-and post-Enlargement period in favour of the Finance sector.

Disaggregation of the post-Enlargement period reveals real wage growth initially improved post Enlargement before declining substantially. Average annual real wage growth in the Construction sector measured 3.67 percent and 6.83 percent in the Finance sector between 2005

and 2008, the inter-sector difference amounting to 3.16 percent. Real wage growth declined significantly in the following post-Enlargement years, a reflection of which is average annual real wage growth measuring 1.05 percent in the Construction sector and 1.31 in the Finance sector between 2009-2015.

In summary, annual real wage growth decreased in the Construction sector both in relation to the real wage growth in the pre-Enlargement period and in relative to the real wage growth in the Finance sector. The opposite trend is observed in the annual real wage growth in the Finance sector where annual real wage growth increased relative to the annual pre-Enlargement real wage growth in both sectors.

4.3.1.2 Total real wage growth pre- and post-Enlargement

The decrease in annual real wage growth observed in the Construction sector in the post-Enlargement period coupled with the increase in annual real wage growth in the Finance sector in the same period is reflected in the difference in total real wage growth between the periods and sectors. The total real wage growth in the pre-Enlargement period amounted to 14.93 percent in the Construction sector and 22.14 percent in the Finance sector. The difference in total real wage growth between the sectors in the pre-Enlargement period was 7.21 percent. In comparison, the difference total real wage growth between the sectors amounted to 14.43 percent post-Enlargement as the total real wage growth in this period was 22.03 percent in the Construction sector and 36.46 percent in the Finance sector. When not taking into account that the pre-and post-Enlargement periods as operationalised contain an unequal number of observations, the difference in total real wage growth between the periods equals 7.22 percent. This means that the total real wage in the Finance sector increased 7.22 percent more than total real wage growth in the Construction sector in the post than the pre-Enlargement period. Total real wage growth between 2005 and 2008 was 14.67 percent in the Construction sector and 27.31 in the Finance sector. The inter-sector difference between the sectors measured 12.65 percent. The remainder of the post-Enlargement period saw a substantial decline in total real wage growth in both sectors, total real wage growth amounted to 7.37 percent in the Construction sector and 9.15 in the Finance sector between 2009 and 2015. The inter-sector difference in total real wage growth narrowed substantially in this period measuring 1.78 percent.

Real wage growth increases relative to both the pre-Enlargement period and the post-Enlargement period as a whole between 2005 and 2008. The increase is arguably significant for both sectors, however, the increase is more substantial in the Finance sector where annual real wage growth measured 6.83 between 2005 and 2008 relative to 3.16 in the pre-Enlargement period. The latter post-Enlargement period sees a significant decline in real wage growth in both sectors narrowing the gap in inter-sector real wage growth. The variation observed in real wage growth within the post-Enlargement period may be indicative of external influences such as the effects of the economic crisis and post-Enlargement changes in migration trends.

The post-Enlargement increase in total real wage gap between the sectors is a reflection of the trends in annual real wage growth discussed above, real wage growth declined in the Construction sector post-Enlargement while real wages growth in the Finance sector increased relative to the pre-Enlargement period. Thus, the increase in the inter-sector gap in real wage growth is a further illustration of how real wage growth in the Construction sector declined post the Enlargement while the real wage growth in the Finance sector intensified.

4.3.2 Inflation 1997-2015

The Norwegian inflation rate between 1997-2015 was relatively lower and less volatile than many other western-European member states (OECD 2017). The unemployment rate fluctuated within a relatively narrow band of 0.6 and 3.8 percent (SSB 2017). As is observable from graphic illustration, the inflation rate for 2008 is slightly elevated.

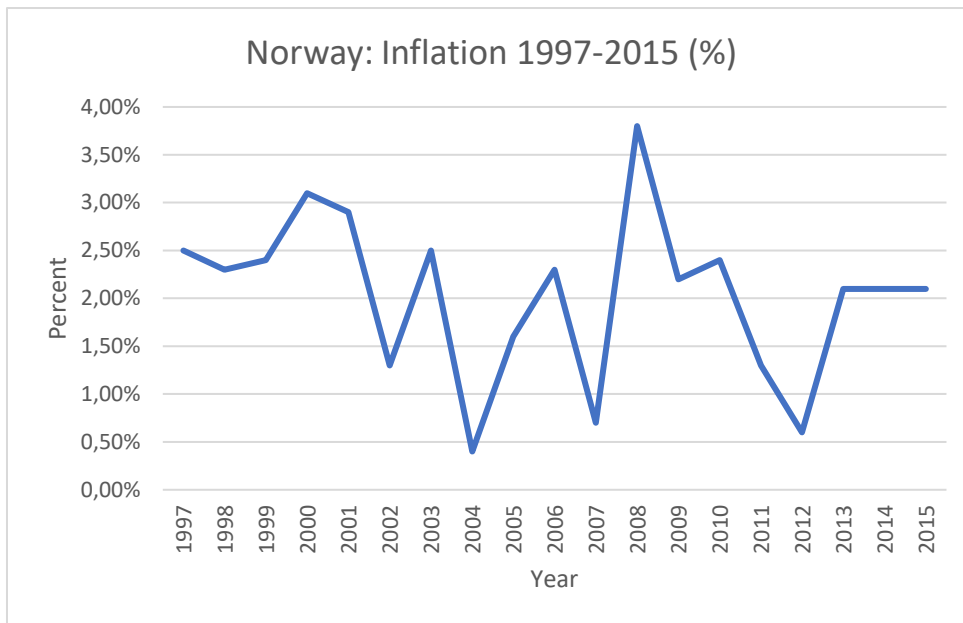


Figure 1: Norway; Consumer price index 1997-2015. Adapted from ssb.no,2017, Retrieved from <https://www.ssb.no/priser-og-prisindekser/statistikker/kpi/tilleggsinformasjon/om-priskalkulatoren>. Copyright [2017] by Statistisk Sentralbyrå. Adapted with permission.

4.3.3 Overview of migration trends 1997-2015

Immigration to Norway increases steeply between 2006 and 2015 (SSB 2016).¹⁴ It is clear from the graphic representations in figures 2 and 3 that immigration from European countries contributes the most to the overall increase. Annual total emigration from Norway increased slightly from the year 2010 and stayed elevated relative to the years 1998-2009 up until 2015 (SSB 2016). Annual emigration from Norway to European countries remained stable throughout the period 1997-2015 with relatively small annual variations (SSB 2016). Both total annual net migration and European migration increases significantly from 2006 reflecting the steep increase in total and European immigration to Norway. Total net migration and European net migration in 2015 diverge from the trend of previous years as total and European immigration is lower relative to preceding years, coupled with higher total and European emigration relative to previous years.

¹⁴ Migration figure denote total persons migrating to and from Norway, net migration denotes the difference annual difference in persons migrating to and from Norway (SSB 2017).

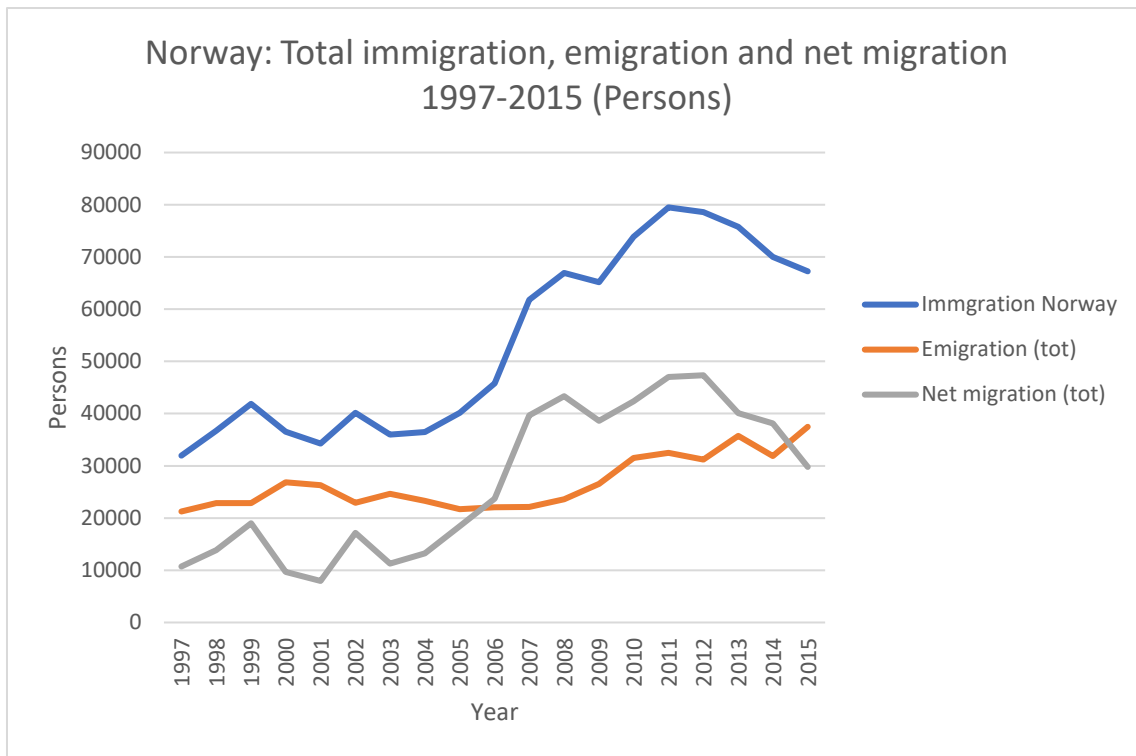


Figure 2: Norway; migration trends 1997-2015. Adapted from ssb.no,2016, Retrieved from <https://www.ssb.no/statistikkbanken/selecttable/hovedtabellHjem.asp?KortNavnWeb=flytting&CMSSubjectArea=befolkning&checked=true>. Copyright [2017] by Statistisk Sentralbyrå. Adapted with permission

4.3.3.1 European immigration as a proportion of total migration

Immigration from European countries increased to make up a percentagewise larger proportion of total immigration to Norway from 2006 onwards (SSB 2016). European immigrants made up 16018 of the total 35957 immigrations to Norway in 2003, a share of 44.5 percent of total immigration (SSB 2016)¹⁵. That share had vastly increased by 2010 when European immigrations numbering 49463 persons made up 66.9 percent of total immigration (73852) to Norway (SSB 2016).

¹⁵ The percentagewise proportion of European immigrants to total immigrants is based on the authors own calculations according to the formula $\text{European immigration} / \text{total immigrations} * 100$.

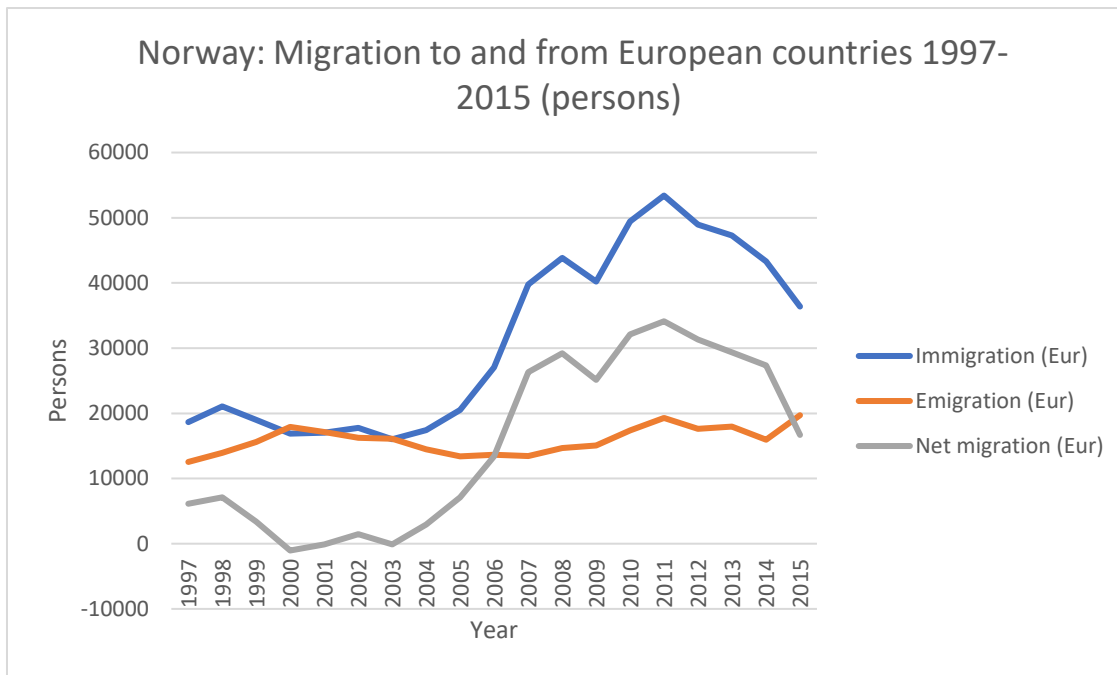


Figure 3: Norway; trends in migration from Europe 1997-2015. Adapted from *ssb.no*, 2017, Retrieved from <https://www.ssb.no/statistikkbanken/selecttable/hovedtabellHjem.asp?KortNavnWeb=flytting&CMSSubjectArea=befolkning&checked=true>. Copyright [2017] by Statistisk Sentralbyrå. Adapted with permission.

The persistently low European emigration rates coupled with the post 2006 spike in European immigration to Norway is not only reflected in high European net migration post 2006. It also indicates that many European immigrants stay in Norway for an extended period, adding to the Norwegian labour force over an extended period of time¹⁶. It is also an indication that each annual European immigration cohort add cumulatively to the size of the Norwegian labour force. Data describing immigrants' employment situation corroborate that immigrants from Eastern European member states tend to add cumulatively to the Norwegian workforce. The Norwegian Construction sector provides a good case for analysis as many Eastern European immigrants tend to find employment in this sector (SSB 2016b). For reference, the number of Eastern Europeans immigrants employed in the Construction sector increased from 9361 of a total of 185775 employed in the sector in 2008 to 26934 in 2015 of a total of 207492 employed

¹⁶ According to EU law intra-EU migrants can reside freely in foreign member states for up till three months. After this period expires, the migrant resident is required to present to the host member state a contract of employment proving economic self-sufficiency(reference). It is therefore assumed that the majority of European migrants to Norway and other EU member states post 2004 add to the workforce of the host member state in which they reside.

in the sector (SSB 2016b). This increase amounts to a percentagewise increase in the number of Eastern Europeans to the total employees in the sector from 3.24 percent in 2008 to 12.98 percent in 2015 (SSB 2016b)¹⁷. The total number of employees in the sector grew by 11.68 percent between 2008 and 2015, indicating the majority of the growth in employees in the sector in this period consisted of Eastern European immigrants. The relationship between the spike in European immigration to Norway and trends in real wages will be thoroughly discussed in the following chapter.

4.3.4 General trends in Unemployment 1997-2015

The Norwegian unemployment rate for all sectors fluctuated within a narrow band of 3.2 to 4.4 percent between 1997 and 2015 (SSB 2016c). The unemployment rate remained relatively low in the aftermath of the financial crisis of 2008, the 2009 Norwegian unemployment rate measured 3.2 percent compared to a European average of 8.8 percent (Arbeids og Inkluderingsdepartementet 2009: 3). Unemployment rates for specific sectors diverge from the all sector average, of particular interest to this research is the spike unemployment rates within the Construction sector from 2009. Unfortunately, statistics of intra-sector unemployment is not kept for the Finance sector¹⁸. The aggregate unemployment rate for all sectors is therefore used as a proxy to the sector specific unemployment rate.

¹⁷ The percentagewise increases are a result of the authors own calculations. They were calculated with the help of the following formula; $\text{New number} - \text{Original number} = \text{Increase}$ $\text{Increase} / \text{Original number} * 100$.

¹⁸ NAV not SSB keeps track of intra-sector unemployment, the classification of sectors is therefore different.

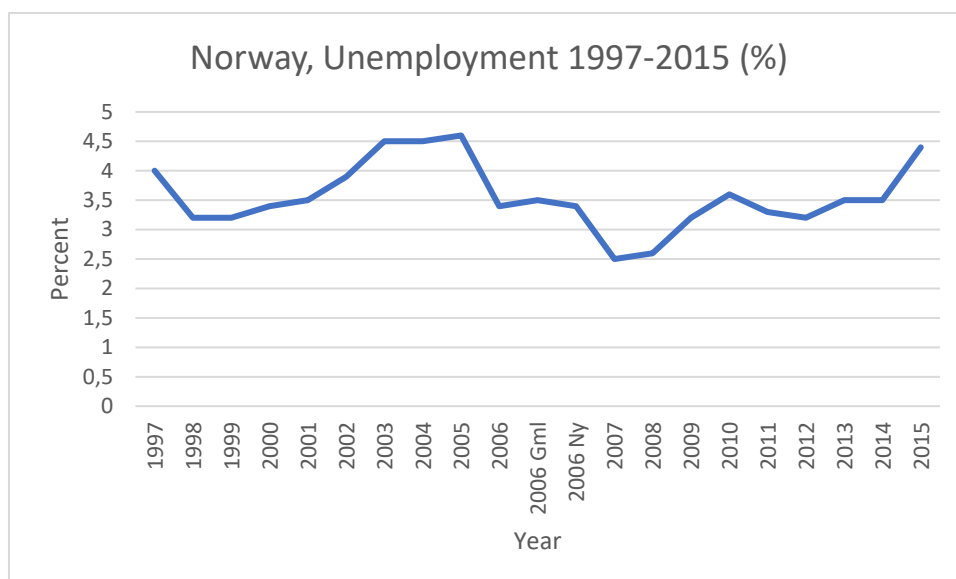


Figure 4: Norway: Unemployment rate 1997-2015. Adapted from *ssb.no*, 2016, Retrieved from <https://www.ssb.no/statistikbanken/selectvarval/Define.asp?subjectcode=&ProductId=&MainTable=AKUAarNY&nvl=&PLanguage=0&nyTmpVar=true&CMSSubjectArea=arbeid-og-lonn&KortNavnWeb=aku&StatVariant=&checked=true>. Copyright [2016] by Statistisk Sentralbyrå. Adapted with permission.

The Norwegian unemployment rate for all sectors fluctuated within a narrow band of 3.2 to 4.4 percent between 1997 and 2015 (SSB 2016c). The unemployment rate remained relatively low in the aftermath of the financial crisis of 2008, the 2009 Norwegian unemployment rate measured 3.2 percent compared to a European average of 8.8 percent (Arbeids og Inkluderingsdepartementet 2009: 3). Unemployment rates for specific sectors diverge from the all sector average, of particular interest to this research is the spike unemployment rates within the Construction sector from 2009. Unfortunately, statistics of intra-sector unemployment is not kept for the Finance sector¹⁹. The aggregate unemployment rate for all sectors is therefore used as a proxy to the sector specific unemployment rate.

¹⁹ NAV not SSB keeps track of intra-sector unemployment, the classification of sectors is therefore different.

4.3.4.1 Intra-sector unemployment rate Construction

The intra-sector unemployment rate in the Construction did not diverge from the national average between 2006 and 2008, ranging between 2.4 percent in 2008 and 3.5 percent in 2006 (Aetat 2006; Nav 2007; 2008). Unemployment within the sector rose to levels above average the national average unemployment rate in 2009 and stayed elevated up until 2015 with the exception of 2012 (Nav 2009; 2010; 2011; 2012; 2013; 2014; 2015). The intra-sector unemployment rate fluctuated between 3.7 percent in 2012, which is only slightly higher than the aggregate national unemployment rate of 3.2 percent that year (SSB 2016c), and 7.1 percent in 2010 far exceeding the aggregate national unemployment of 3.6 percent (SSB 2016c). Further disaggregation of the post-Enlargement period reveals that the spike in intra-sector unemployment in the Construction sector coincides with lower average annual real wage growth between 2009 and 2015. Average annual real wage growth between 2009 and 2015 was 1.05 percent in the Construction sector compared to 2.0 percent in the post-Enlargement period as a whole (2005-2015). Average annual real wage growth in the Financial sector between 2009 and 2015 is also found to be significantly lower than that of the post-Enlargement period as a whole and the pre-Enlargement period. Between 2009 and 2015 average annual real wage growth measured 1.31 percent compared to 3.31 percent for the entirety of the post-Enlargement period and 3.16 percent in the pre-Enlargement period.

Table 3: Unemployment, Norwegian Construction sector (%)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
<i>Unemployment</i>	3.5	2.5	2.4	4.8	7.1	5.9	3.7	5.3	5.8	6.0

Table 3 Unemployment, Norwegian Construction sector (%). Adapted from *Nav.no*, (2006-2015). Retrieved from <https://www.nav.no/no/NAV+og+samfunn/Statistikk/Arbeidssokere+og+stillinger++statistikk/Hovedtall+om+arbeidsmarkedet/Arkiv+Hovedtall+om+arbeidsmarkedet>. Copyright [2006-2015] by Nav. Adapted with permission.

4.4 Wealthier member states: Germany

4.4.1 Overview of real wage growth 1991-2015

From 1991-2015 the total real wage growth in the Construction and Finance sectors were 12.50 percent and 37.41 percent respectively. The difference in total real wage growth measured to 24.91 percent. The average annual real wage growth was 0.5 percent in the Construction sector and 1.5 percent in the Finance sector. The difference in average annual real wage growth amounted to 1 percent.

Table 4: Percentage change real wage growth total growth, annual growth and inter-sector difference

Time	Construction Tot. real wage growth (%)	Finance Tot. real wage Growth (%)	Difference (tot. real wage growth) (%)	Construction Annual growth (%)	Finance Annual growth (%)	Difference Annual growth (%)
1991- 2015	12.50	37.41	24.91	0.50	1.50	1.00
1991- 2004	5.00	24.79	19.79	0.36	1.77	1.41
2005- 2015	7.51	12.62	5.11	0.68	1.15	0.46
2005- 2009	-2.32	3.49	5.80	-0.46	0.70	1.16
2010- 2015	9.83	9.13	-0.69	1.64	1.52	-0.12

4.4.1.1 Annual real wage growth pre- and post-Enlargement

The annual real wage growth in the German Construction sector was 0.36 percent in the pre-Enlargement Period (1991-2004), increasing to 0.68 percent in the post-Enlargement period (2005-2015). The annual real wage growth in the Finance sector follows a revers trend. While the average annual real wage growth amounted to 1.77 percent in the pre-Enlargement period, the average annual wage growth in the sector decreased to 1.15 in the post-Enlargement period. As a result, the difference in annual real wage growth between the sectors narrowed from 1.41 percent in the pre-Enlargement period to 0.46 percent in the post-Enlargement period.

The sector development in annual real wages is the opposite of what is observed in Norway. Annual real wage growth in the German Construction sector rose as opposed to decreased in the post-Enlargement period. Furthermore, annual real wage growth in the German Finance

sector decreased relative to the pre-Enlargement period. In comparison, annual real wage growth in the Norwegian Finance sector increased relative to the pre-Enlargement period. Resulting in two very opposite outcomes, while the inter-sector gap in annual real wage growth widened post-Enlargement in Norway, it narrowed in Germany.

4.4.1.2 Total real wage growth pre- and post-Enlargement

The trends in annual real wage growth is reflected in pre- and post-Enlargement total real wage growth. Despite the categories having an unequal number of years favouring the pre-Enlargement category, total real wage growth in the Construction sector increased from 5 percent pre- to 7.51 percent post-Enlargement. Total real wage growth in the Finance sector decreased from 24.79 percent pre- to 12.62 percent post-Enlargement. The difference in total real wage growth between the sectors therefore decreased from 19.79 percent pre-Enlargement to 5.11 percent post-Enlargement.

4.4.1.3 Overview of trend

The Finance sectors' real wage growth exceeds that of Construction sector both in terms of total real wage growth and average annual real wage growth both pre- and post-Enlargement. However, the post-Enlargement annual real wage growth in the Construction sector increased by 0.32 percent, while annual real wage growth in the Finance sector decreased by 0.62 percent compared to the pre-Enlargement period, the result of which is a narrowing of the inter-sector gap in real wage growth occurring in the post-Enlargement period.

4.4.2 Inflation 1990-2015

The German inflation rate declined steadily from 5.1 percent in 1992 to 0.6 percent in 1999 (Destatis 2017). There was relatively less fluctuation to the inflation rate in the following years, as the German inflation rate fluctuated within a band of 0.3 and 2.6 percent between 2000 and 2015 (Destatis 2017). Throughout the period measured, the German inflation rate was considerably lower than that of many other western European member states (OECD 2017).

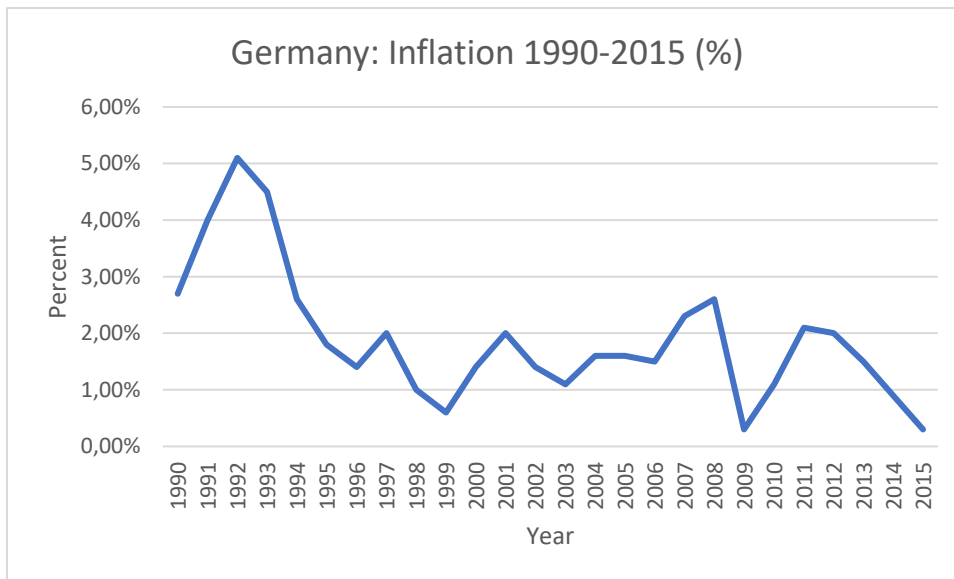


Figure 5: Germany Consumer price index 1990-2015. Adapted from *destatis.de*, 2017. Retrieved from https://www.destatis.de/EN/FactsFigures/NationalEconomyEnvironment/Prices/ConsumerPriceIndices/Tables/_/ConsumerPricesCategories.html?cms_gtp=151228_list%253D1%2526151230_list%253D2%2526151226_slot%253D2&https=1. Copyright [2017] by Statistisches Bundesamt. Adapted with permission.

4.4.3 Overview of migration trends 1990-2015

The number of persons immigrating to Germany between 1990 to 1995 was high compared to between 1996 and 2010 (Destatis 2017b). The relatively high number of immigrants to Germany in 1990-1995 can be attributed to the unification of Germany subsequent to the fall of the Soviet Union in 1990-1991. The fact that the clear majority of total immigrations to Germany emanated from European countries underscores this point. European immigrants made up 1220578 of a total of 1557755 immigrants in 1992, a peak year of immigration to Germany (Destatis 2017b). Following the peak immigration years of 1990-1995 both European and total immigration to Germany steadily declined until 2010 (Destatis 2017b). Meanwhile, European immigration continued to make up the majority of total immigration to Germany; in 2005 European immigrants made up 510390 of the total 707352 immigrants to Germany (Destatis 2017b). The years 2010 to 2015 saw a significant upswing in immigration to Germany, European immigrants continued to make up the majority of immigrants in these years (Destatis 2017b). It is worth noting that the European share of total immigration declined somewhat in 2015, ostensibly due to the influx of Syrian refugees that year.

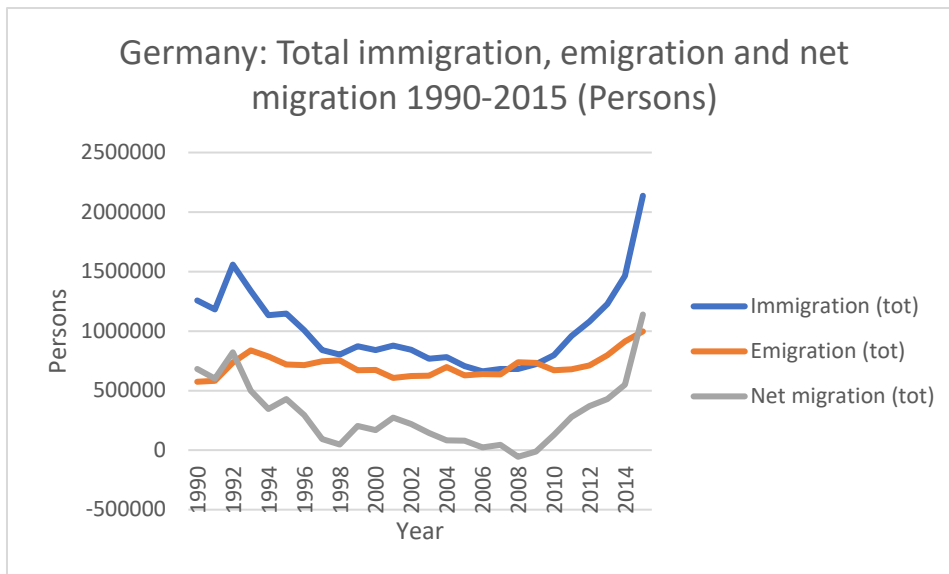


Figure 6: Germany; trends in migration 1995-2015. Adapted from *destatis.de*, 2017, Retrieved from Copyright [2017] https://www.genesis.destatis.de/genesis/online/data;jsessionid=D5EC2D6EB28E1F219A38D4A390DD6FDF.tomcat_GO_1_2?operation=begriffsRecherche&suchanweisung_language=en&suchanweisung=migration&x=5&y=9. Copyright [2017] by Statistisches Bundesamt. Adapted with permission.

4.4.3.1 Emigration and net migration 1990-2015

The number of emigrations from Germany in the years 1992 and 1993 was elevated relative to both previous and subsequent years, the majority of emigrations being to European countries (Destatis 2017b). As is the case with the relatively high number of immigration to Germany from 1990-1995, the relatively high number of emigrations can likely be attributed to the German reunification of 1990. The number of both total emigrations and emigrations to other European countries decline from 1994 onwards and remains low relative to the peak years of 1992 and 1993 up until 2010 (Destatis 2017b). However, annual emigrations in this period is high relative to the number of annual immigrations and subject to considerable annual variation (Destatis 2017b). Annual emigrations remain within the range of 755358 in 1998 and 606494 in 2001 (Destatis 2017b). Emigrations to European countries continue to make up the majority of total emigrations throughout 1994 to 2010 (Destatis 2017b). In 2005 emigration to European countries make up 437427 of 628399 total emigrations (Destatis 2017b). The persistently high emigration rates relative to immigration rates in this period resulted in markedly low net migration rates compared to 1990-1995 and 2005-2015 (Destatis 2017b). Both total and European net migration was negative in the years 2008 and 2009 (Destatis 2017b). There is a

marked increase in both total and European emigrations from 2010 onwards, the share of European to total emigrations narrows indicating an increase of European emigration to total emigration. The increase in European emigrations to total emigrations is a reflection of the increase in European immigrations in the same period.

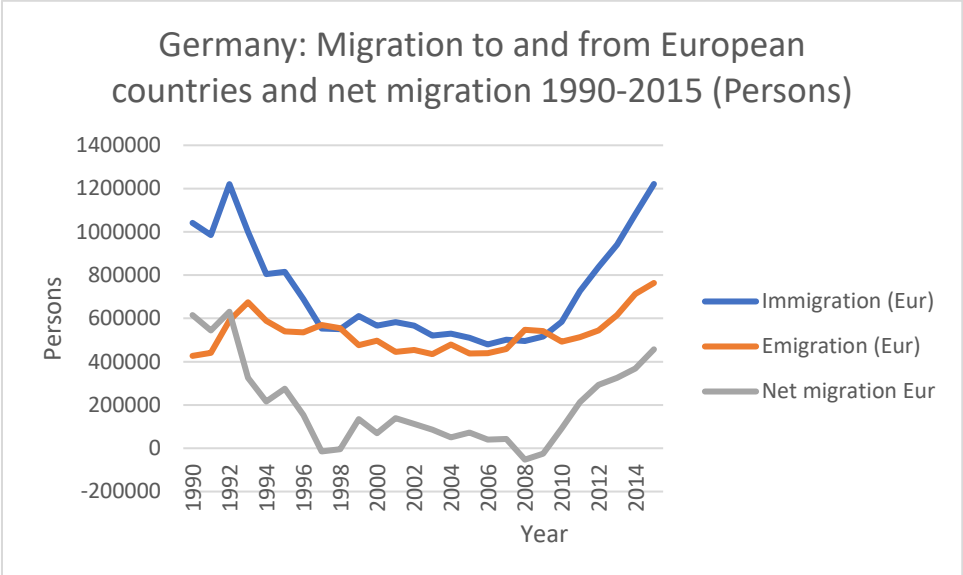


Figure 7 Germany; trends in migration from Europe 1995-2015. Adapted from *destatis.de*, 2017, Retrieved from https://www.genesis.destatis.de/genesis/online/data;jsessionid=D5EC2D6EB28E1F219A38D4A390DD6FDF.tomcat_GO_1_2?operation=begriffsRecherche&suchanweisung_language=en&suchanweisung=migration&x=5&y=9. Copyright [2017] by Statistisches Bundesamt. Adapted with permission.

4.4.3.2 Migration trends 1990-2015 summary

As opposed to Norway, Germany saw no significant increase in immigration from Europe subsequent to the 2004 Enlargement (Destatis 2017b). While European immigrations to Norway increased substantially from 2005 till 2015, Germany experienced no substantial increase in European immigration for six years subsequent to the Enlargement of 2004 (Destatis 2017b; SSB 2017b). European net migration was even negative in the 2008 and 2009 (Destatis 2017b). The increase in European immigration to Germany commenced in 2010, the late onset of which could be attributed to a delayed implementation of EUs free immigration policy towards the EU10 countries. Moreover, Germany differs from Norway in that the onset of increased European immigration observed in the years 2010-2015 is coupled with a greater

European emigration rate. This could indicate that European immigrants to Germany stay shorter than in Norway.

4.4.4 General trends in Unemployment 1990-2017

The German unemployment rate increased steadily from 4.82 percent in 1990 to 9.82 percent in 1997 (OECD 2017). The unemployment rate proceeded to decline in the following years reaching 7.76 percent in 2000 (OECD 2017). The years between 2000 and 2005 are marked by annual increases, by 2005 the unemployment rate had reached 11.7 percent (OECD 2017). Between 2005 and 2015 the unemployment rate declined at a steady pace, the unemployment rate measured 6.97 percent in 2010 and 4.62 percent in 2015 (OECD 2017).

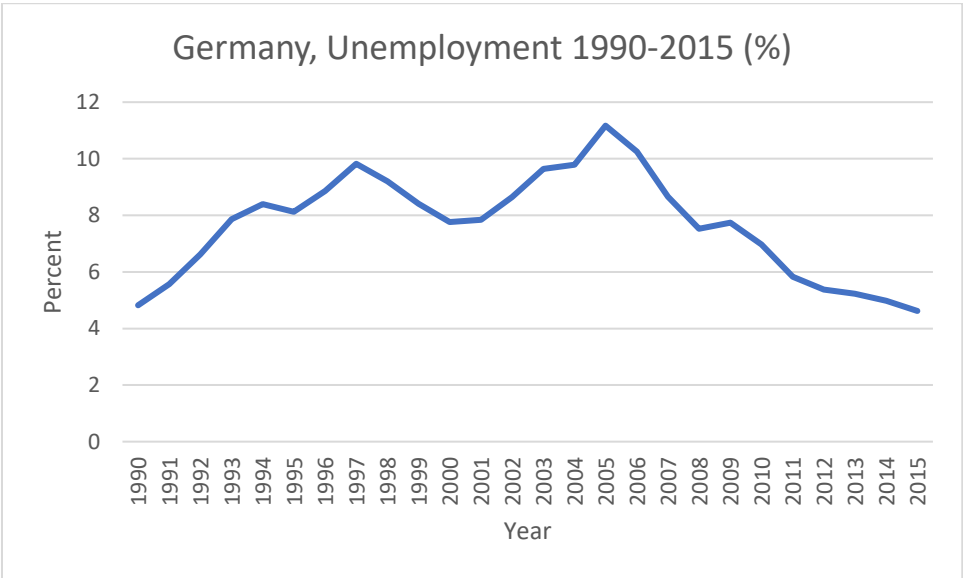


Figure 8 Germany; Unemployment rate 1990-2015. Adapted from *oecd.org*,2017, Retrieved from <https://data.oecd.org/unemp/unemployment-rate.htm>. Copyright [2017] by OECD. Adapted with permission.https://www.destatis.de/EN/FactsFigures/NationalEconomyEnvironment/Prices/ConsumerPriceIndices/Tables/_/ConsumerPricesCategories.html?cms_gtp=151228_list%253D1%2526151230_list%253D2%2526151226_slot%253D2&https=1

4.4.4.1 Intra-sector unemployment rate

While intra-sector unemployment rates are not available for Germany, the German official statistical office offers data describing the percentwise increase or decrease in employment within the Construction sector from 2004 till 2013, no such data are provided for the Finance sector (Destatis 2014). The data provided on percentagewise changes in employment within the Construction sector is not a perfect substitute for the inter-sector unemployment rate. However, the data is a good indicator of the demand in the sector as it describes growth in employed

persons in the sector. Therefore, while the data cannot be used as a proxy for the unemployment rate specific to the Construction sector, it may be used to estimate the demand for workers in the sector.

Employment of persons working in the German Construction sector to the previous year, sank annually between 2003 and 2006 (Destatis 2014). The decline in persons employed in the sector from the previous year was -2.7 percent in 2004, -3.7 percent in 2005 and 0.3 percent in 2006 (Destatis 2014). The number of persons employed in the Construction sector compared to the previous year increased percentwise from 2007 to 2013 with the exception of 2008, where the number of people employed from the previous year decreased by -0.6 percent (Destatis 2014). The percentagewise increase in persons employed in the Construction sector from the previous year was 1.5 percent in 2007, 0.4 percent in 2009, 0.7 percent in 2010, 2.2 in 2011, 1.5 percent in 2012 and 0.8 percent in 2013 (Destatis 2014).

4.5 Poorer member states: Poland

4.5.1 Overview of real wage growth 1996-2015

The total real wage growth in the Polish Construction sector for the pre- and post-Enlargement period combined (1996- 2015) amounted to 52.2 percent, whereas the total real wage growth in the Finance sector was 70.14 percent over this period. The difference in inter-sector total real wage growth was 17.93 percent. The average annual real wage growth over the period of measurement was 2.61 percent and 3.51 percent in the Construction and Finance sector respectively. The inter sector difference in average annual real wage growth amounted to 0.9 percent.

Table 5: Percentage change real wage growth total growth, annual growth and inter-sector difference.

Time	Construction Tot. real wage growth (%)	Finance Tot. real wage Growth (%)	Difference (tot. real wage growth) (%)	Construction Annual growth (%)	Finance Annual growth (%)	Difference Annual growth (%)
1996- 2015	52.20	70.14	17.93	2.61	3.51	0.90
1996- 2004	29.97	51.57	21.60	3.33	5.73	2.40
2005- 2015	22.24	18.57	-3.67	2.02	1.69	-0.33
2006- 2009	26.50	13.21	-13.29	6.63	3.30	-3.32
2010- 2015	0.44	5.36	4.92	0.07	0.89	0.82

4.5.1.1 Annual real wage growth pre- and post-Enlargement

The average annual real wage growth in the pre-Enlargement 1996-2004 was 3.33 percent in the Construction sector and 5.73 percent in the Finance sector respectively. The inter-sector difference in the average annual real wage growth amounts to 2.40 percent pre-Enlargement, meaning the average annual real wage growth in the Finance sector exceed that of the Construction sector. As was the case in Germany, the trend in annual real wage growth is reversed post-Enlargement (2005-2015), annual real wage growth decreased in both sectors, but more significantly so in the Finance sector. The post-Enlargement annual real wage growth

amounted to 2.02 percent in the Construction sector and 1.69 percent in the Finance sector. The inter-sector difference thus shifted in favour of the Construction sector where annual real wage growth grew 0.33 percent more than in the Finance sector.

4.5.1.2 Total real wage growth pre- and post-Enlargement

The revers in trends in average annual wage growth is reflected in the reduction in total real wage growth pre-to post-Enlargement. The Polish Construction sector experienced a total growth in real wages of 29.97 percent pre-Enlargement, while the total real wage growth post-Enlargement had been reduced to 22.24 percent post-Enlargement. Even more substantial was the reduction in total real wage growth in the Finance sector where total real wage growth shrunk from 51.57 percent pre-Enlargement to 18.57 post-Enlargement. The intra-sector difference in total real wage growth thus shifted from 21.60 percent in favour of the Finance sector pre-Enlargement to 3.67 percent in favour of the Construction sector post- Enlargement.

4.5.1.3 Notes to the pre-Enlargement real wage growth

The higher overall real wage growth in the pre-Enlargement period compared to the post Enlargement period is likely attributable to two influences. First, the relatively high growth in real wages may be a product of recovery growth after Poland gained its independence following the dissolution of the Soviet Union in 1989. National economies are known to grow at a faster pace in times of recovery from war or other significant trauma such as occupation or oppression by foreign powers (Kolodoko 2001: 280-282).²⁰ Secondly, the higher real wage growth in the pre-Enlargement period compared to the post-Enlargement period is likely an indirect, rather direct result of Polish preparation for accession into the EU. As is observable from the attached table, percentage real wage growth in 1999 constitutes an outlier in both sectors²¹. Real wage increased by 28.5 percent in the Construction sector and 22.38 percent in the Finance sector from 1998 to 1999. The 1999 inflation rate of 7.20 was rather low considering that the Polish inflation rate was consistently high in the mid to late 1990s ranging from 28 percent in 1995 to 11,8 in 1998 (OECD 2017b). The extreme increase in 1999 is therefore likely a product of a

²⁰ Economies grow in the after math of war as unrealised economic potential is again allowed to flourish. The fast pace of recover-growth is also often aided by government efforts to revive the economy by various means (Kolodoko 2001:280-282).

²¹

mismatch between expected inflation and actual inflation²². Expecting inflation to rise at the same pace as the previous years, wages were increased to match a higher inflation than what occurred. Preparing the Polish economy for EU entry required stabilization the zloty exchange rate and significantly decreasing inflation in preparation for participation of the ERM and eventually the EMU (Creel and Levasseur 2004: 84). The Polish government instituted a series of monetary policies aimed at decreasing the inflation rate and stabilising the zloty throughout the 1990s (Creel and Levasseur 2004: 93). A measure was introduced in late 1998 aimed at tackling inflation as an addition to the regulatory monetary policies previously implemented to tackle fluctuations in exchange rate (Creel and Levasseur 2004: 93). The implemented measure aimed at reducing the inflation rate in late 1998 could likely be the cause of the sharp decrease in inflation in 1999, the irregular percentagewise increase in real wage growth of 1999 may thus have been a bi-product of newly instituted inflation targeting policy.

The post-Enlargement period was further divided into two segments to allow analysis of real wage development during times in which significant changes to Polish migration pattern took place. Emigration from Poland increased significantly from 2006-2009, the number of annual emigrations in this period surpassed that of all previous and following years (Central Statistical office of Poland 2015). Between 2006 and 2009, the total real wage growth in the Construction sector amounted to 26.5 percent, whereas the total real wage growth in the Finance sector amounted to 13.21 percent. In these years, the Construction sector had an annual real wage growth of 6.63 percent, bypassing the annual growth in the Finance sector which amounted to 3.3 percent.

When divided into the segments described above 2005-2015 and 2006-2009, the post-Enlargement period have seen the Construction sector bypass the Finance sector in real wage growth between 2006 and 2009. However, analysis of real wage growth in the years 2010-2015 reveals that the total real wage growth in the Construction sector only bypassed the Finance sector in terms of real wage growth from 2005 up until 2010. From 2010 to 2015, total real wage growth in the Finance sector equalled 5.36 percent, whereas the equivalent growth in the Construction sector amounted to 0.44 percent. The isolation and separate analysis of real wage growth in the years 2010-2015 is relevant as steadily rising immigration rates from 2006 onwards resulted in a significant shift in net-migration compared to the pre-Enlargement period

²² See Friedman, M. "Nobel Lecture: Inflation and Unemployment," *Journal of Political Economy* 85 (June 1977), 451-472. For a thorough explanation of the relationship between inflation, demand and unemployment.

from 2010 onwards. Trends in Polish migration patterns will be further elaborated in other sections of the chapter.

4.5.1.4 Summation trends in real wage growth

In summation, there is a marked reversal in trends in real wage growth between the pre- and post-Enlargement period. Real wage growth pre-Enlargement is markedly stronger in the Finance sector as evidenced by inter-sector comparison of total- and average annual real wage growth. While real wage growth decreases significantly in both sectors post-Enlargement, the decrease is less substantial in the Construction sector resulting in a reversal of roles where both total-and average annual real wage growth is higher in the Construction sector than the Finance sector. Further analysis of real wage growth in the post-Enlargement period reveal that the majority of the growth in real wages took place between 2006 and 2009 alongside a spike in emigration from Poland. By 2010, steadily rising immigration from 2006 had caught up with the spike in emigration resulting in a marked increase in the net migration rate (CSoP 2015). The reversal in migration trends is reflected in trends in real wage growth as real wage growth from 2010 onwards real wage growth is once again stronger in the Finance sector than the Construction sector. The relatively stronger real wage growth in the pre-Enlargement period is likely attributable to post-recovery growth after the dissolution of the Soviet Union. Moreover, the extreme real wage growth of 1999 is likely a product of a mismatch between expected inflation and actual inflation.

4.5.2 Inflation 1995-2015

The Polish inflation rate was considerably elevated compared to that of the European average in the 1990s (CSoP 2017). The inflation rate decreased significantly from 28 percent in 1995 to 7.20 in 1999 (CSoP 2017). Policies aimed at reducing inflation was implemented in 1998 (Creel and Lavasseur 2014: 93). Inflation continued to decrease from 2000 and ranging between 0.7 and 4.2 percent, which is below the EU average (OECD 2017b).

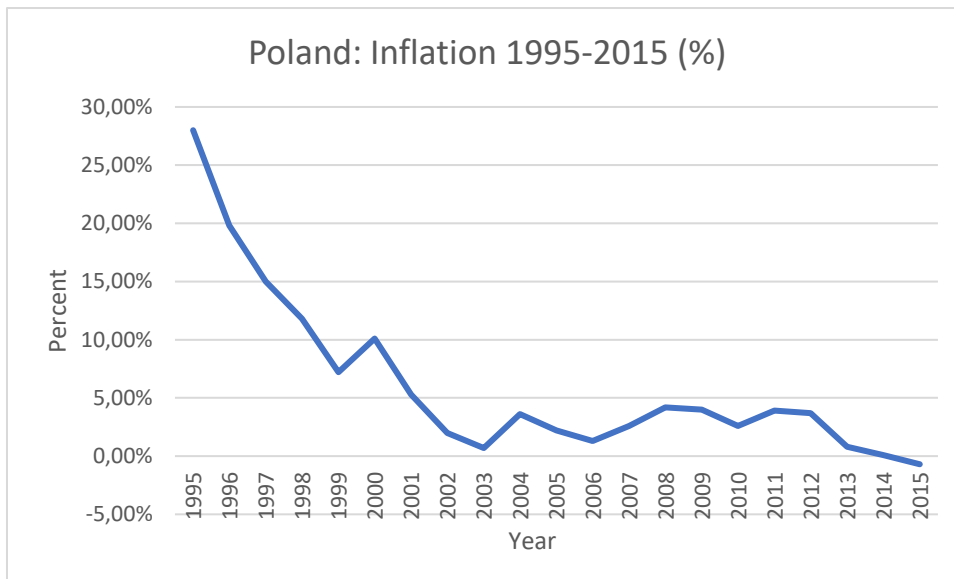


Figure 9 Poland; Consumer price index 1995-2015. Adapted from *stat.gov.pl*, 2017, Retrieved from <http://stat.gov.pl/en/topics/prices-trade/price-indices/harmonized-indices-of-consumer-prices-hicp,3,2.html>. Copyright [2017] by Central Statistical Office of Poland Adapted with permission.

4.5.3 Overview of migration trends 1995-2015

The number of immigrations to Poland was relatively stable and subject only to small annual variations in the pre-Enlargement years 1995-2003 (CSoP 2015). During the course of this period, the number of annual immigrants to Poland fluctuated between 6600 in 2002 and 8900 in 1998 (CSoP 2015). A gradual increase in the number of immigrants to Poland can be detected from 2004 onwards to 2009, the number of immigrants then decreases slightly until 2014, but nevertheless remain at an increased level from what is observed pre-Enlargement (CSoP 2015). The number of emigrations from Poland was subject to relatively minor annual variations pre-Enlargement where annual emigrations fluctuated within a band of 7300 in 2000 and 9500 in 2004 (CSoP 2015). A significant spike in emigrations from Poland can be observed in the years 2006-2008 post-Enlargement (CSoP 2015). The number of emigrations return to levels comparable with that of the pre-Enlargement (1995-2005) levels in 2009-2012, then again rising substantially in 2013 and 2014 (CSoP 2015). Polish net-migration is negative throughout the whole examined period 1995-2015. From 1995-2005 net migration is subject only to slight annual fluctuations. However, net migration decreased drastically from -12900 in 2005 to -36100 in 2006 reflecting the spike in emigrations from Poland the same year (CSoP 2015). The net migration rate then increased substantially and settles on a higher level than the pre-

Enlargement level. Net migration reached its peak year in 2009 when net migration reached - 1200 (CSoP 2015).

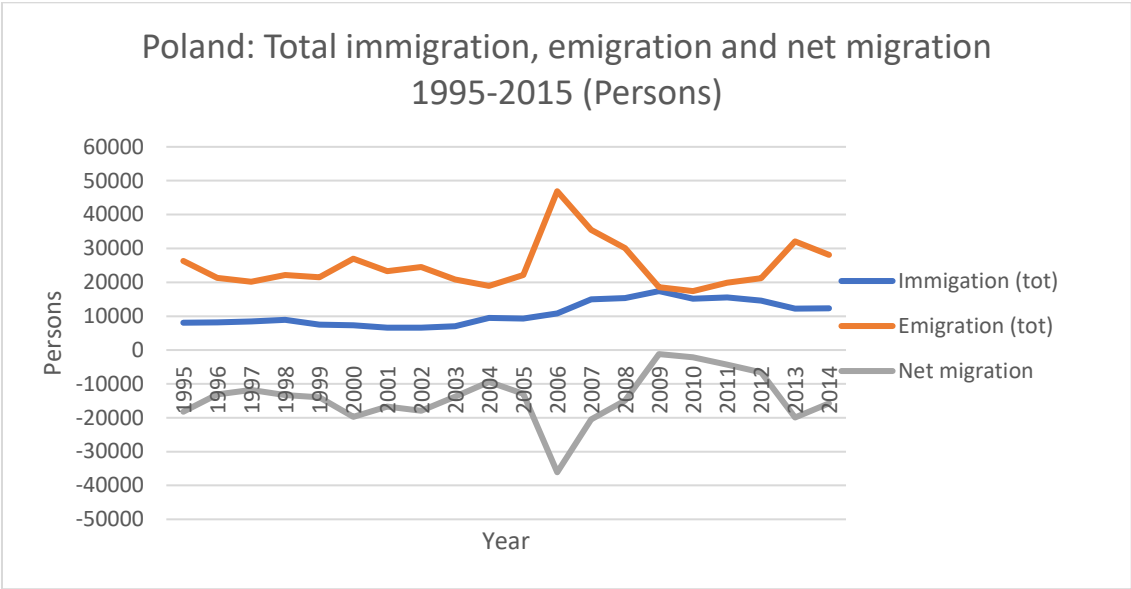


Figure 10 Poland; migration trends 1995-2015. Adapted from *stat.gov.pl/en,2015*, Retrieved from <http://stat.gov.pl/en/topics/population/population/structure-of-the-population-by-2015,7,1.html> Copyright [2015] by Central Statistical Office of Poland. Adapted with permission.

4.5.4 General trends in Unemployment 1995-2015

The Polish unemployment rate throughout the examined period is on average significantly higher than that of its Western European counterparts. The estimated Polish unemployment rate was 17.6 percent in 1993, steadily declining to 9.8 percent by April 1998 (Office for National Statistics 2017). What followed was a slow and steady increase to 20.0 percent in 2003, the highest unemployment rate observed in the period as a whole (ONS 2017). Following is annual decreases in the unemployment rate; by 2006 the unemployment rate was 14.8, by 2008 it was 9.5 percent (ONS 2017). Between 2007 and 2013 the unemployment rate remains low relative to previous years although it is slowly increasing from 9.5 percent in 2008 to 13.4 in 2012 and 2013 (ONS 2017) The estimate for 2014 and 2015 is 11.5 and 9.7 percent respectively. Although the unemployment rate continues to be volatile between 2006/2007- 2015, comparison with the previous period reveal the unemployment to be lower and relatively less volatile (ONS 2017).

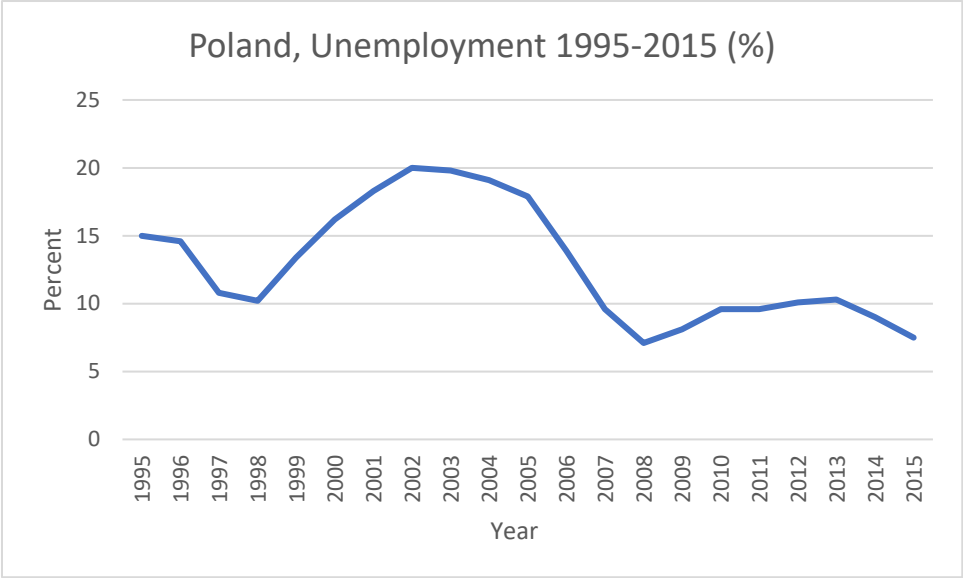


Figure 11 Poland: Unemployment rate 1995-2015. Adapted from *ons.gov.uk*, 2017. Retrieved from <https://www.ons.gov.uk/employmentandlabourmarket/peoplenotinwork/unemployment/timeseries/a4au/lms>.

Copyright [2017] by Eurostat. Adapted with permission.

4.6 Poorer member states: the Czech Republic

4.6.1 Overview of real wage growth 2000-2015

Total real wage growth in the Czech Construction sector amounted to 43.35 percent in the period 2001-2015, the corresponding real wage growth in the Finance sector amounted to 45.17 percent. The difference in wage growth between the sectors measured 1,82 percent in favour of the Finance sector. Average annual real wage growth over the period was 3.1 percent in the Construction sector and 3.23 percent in the Finance sector, the inter sector difference in average annual real wage growth was thus 0.13 percent in favour of the Finance sector.

Table 6: Percentage change real wage growth total growth, annual growth and inter-sector difference.

Time	Construction Tot. real wage growth (%)	Finance Tot. real wage Growth (%)	Difference (tot. real wage growth) (%)	Construction Annual growth (%)	Finance Annual growth (%)	Difference Annual growth (%)
2001- 2015	43.35	45.17	1.82	3.10	3.23	0.13
2001- 2004	17.39	37.86	20.47	4.35	9.46	5.12
2005- 2015	25.96	7.31	-18.65	2.36	0.66	-1.70
2005- 2009	28.07	9.27	-18.79	5.61	1.85	-3.76
2010- 2015	-2.11	-1.96	0.15	-0.35	-0.33	0.02

4.6.1.1 Annual real wage growth pre- and post-Enlargement

Pre-Enlargement average annual real wage growth in the Czech Republic (2001-2004) was 4.35 percent in the Construction sector and 9.46 percent in the Finance sector. The inter-sector difference amounted to 5.12 percent in favour of the Finance sector. As was the case in Poland, the trend in average annual wage growth reversed post-Enlargement (2005-2015) as average annual real wage growth in the Construction sector overtook that of the Finance sector by 1.70 percent. The annual real wage growth post-Enlargement was 2.36 percent in the Construction sector and 0.66 percent in the Finance sector respectively.

4.6.1.2 Total real wage growth pre-and post-Enlargement

Total real wage growth in the pre-Enlargement period (2001-2004) was 17.39 percent in the Construction sector and 37.86 percent in the Finance sector, resulting in an inter-sector difference of 20.47 percent. The corresponding total real wage growth in the post-Enlargement period was 25.96 percent in the Construction sector and 7.31 percent in the Finance sector. As is reflected in the periods average annual real wage growth, the post-Enlargement inter-sector difference was reversed as the total real wage growth in the Construction sector was 18.65 percent more than in the Finance sector.

4.6.1.3 Further analysis of the post-Enlargement period

Subsequent comparison and analysis of real wage growth pre- and post-Enlargement is conducted with caution as the categories consist of an unequal number of observations. Moreover, the pre- Enlargement category contains only four observations. The small number of observations makes it difficult to determine whether the trend in real wage growth in this period is a continuation of previous years or merely a snapshot of the real wage growth as was between 2001-2004. One can therefore not know for certain that the real wage growth recorded for 2001-2004 is representative of the pre-Enlargement period as a whole.

As for the Polish case, the post-Enlargement period was further divided into two time periods reflecting significant changes in migration patterns. Net migration peaked in the years 2005-2008 (Czech Statistics Official 2016). To measure the effects of the increased immigration to emigration, it is therefore instructive to examine real wage growth in the period 2005-2009 in isolation, 2009 is added as the effects of higher immigration in the preceding years is likely to carry into 2009. Net migration from the years 2010-2015 were the lowest over the entire period examined (2001-2015). Thus, real wage growth in these years will also be subjected to special examination to explore possible effects of the shift in migration from the previous post-Enlargement period (2005-2009) on real wage growth.

Average annual real wage growth between 2005-2009 was 5.61 percent in the Construction sector and 1.85 percent in the Finance sector. The inter-sector difference amounting to 3.67 percent. Over this period, total real wage growth was 28.07 percent in the Construction sector and 9.27 percent in the Finance sector, the difference between the sectors being 18.79 percent. Real wage growth in the following post-Enlargement period (2010-2015) was negative in both sectors. The total real wage change in the Construction sector was -2.11 percent, and -1.96

percent in the Finance sector, the inter-sector difference measuring 0.15 percent. Average annual real wage growth was -0.35 percent in the Construction sector and -0.33 percent in the Finance sector.

4.6.2 Inflation 2000-2015

Inflation in the Czech Republic rose from 0.1 percent in 2003 to 6.3 percent in 2008 (CSO 2015). Inflation then decreased fluctuating between 0.3 and 3.3 percent between 2009 and 2015 (CSO 2015). The Czech inflation rate was below the EU average for the whole period considered (OECD 2017).

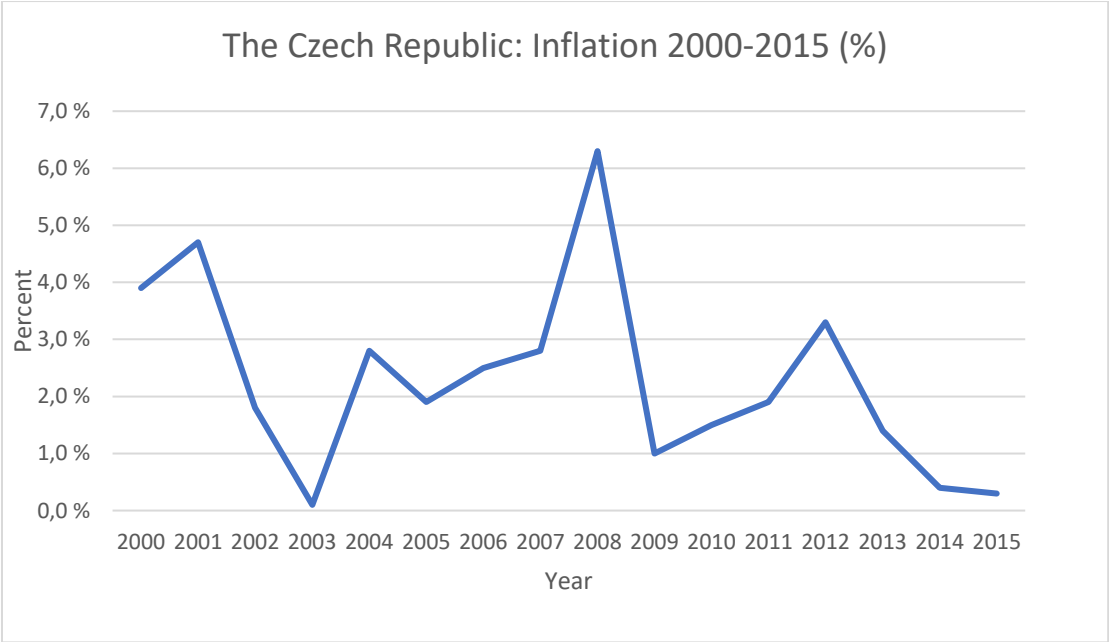


Figure 12: The Czech Republic; Consumer price index 2000-2015. Adapted from *czso.cz*, 2015, Retrieved from <https://vdb.czso.cz/vdbvo2/faces/en/index.jsf?page=vyhledavani&katalog=all&vyhltext=consumer%20price%20index>. Copyright [2015] by Czech Statistics Official. Adapted with permission.

4.6.3 Overview of migration trends 2000-2015

Immigration to the Czech Republic increased substantially between 2000 and 2007, which is the peak year of immigration of the examined period (CSO 2016). For reference, the number of total immigrations to The Czech Republic numbered 7802 in 2000 compared to 104445 in 2007 (CSO 2016). The number of annual immigrations sees a significant drop from 2008 before stabilizing between 2009-2015 fluctuating between 22590 in 2011 and 41625 in 2014 (CSO 2016). The number of annual emigrations experiences a steep rise from 1263 in 2000 to 32389 in 2002, annual emigrations then stabilize between 2002 and 2006 and is subject only to negligible annual variations (CSO 2016). The number of annual emigrations decreased from 2007, the number of annual emigrations is between in 2008 and 2011 is markedly lower compared to 2002-2006 period ranging between 6027 in 2008 and 14867 in 2010 (CSO 2016). Annual emigrations proceed to increase from 2012, reaching 30876 in 2013 before decreasing slightly in 2014 and 2015 (CSO 2016).

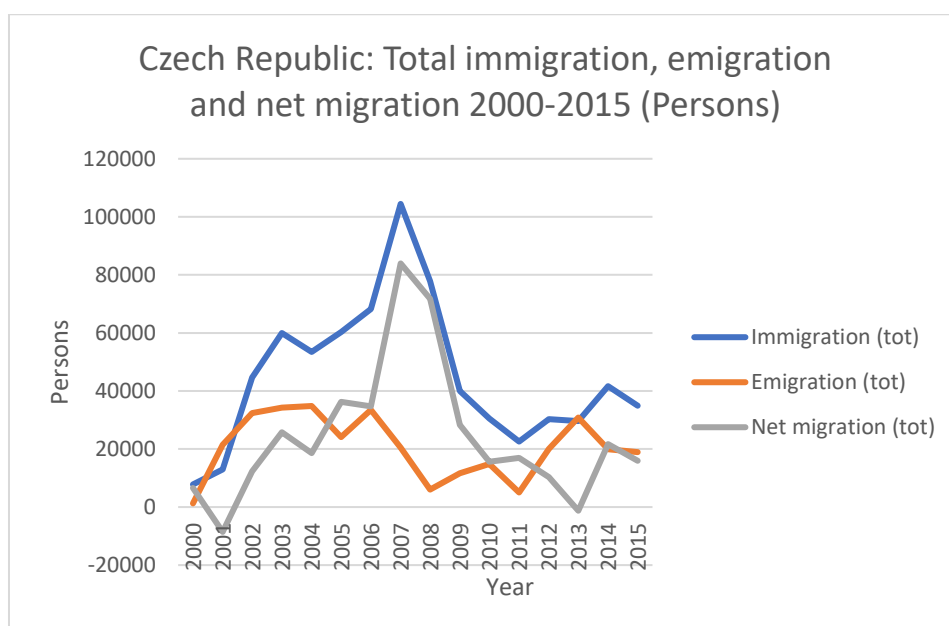


Figure 13: The Czech Republic; migration trends 1997-2015. Adapted from *czso.cz*, 2016, Retrieved from https://www.czso.cz/csu/czso/population_hd. Copyright [2016] by Czech Statistics Official. Adapted with permission.

Net migration increases steadily from a negative -8551 in 2001 to 34 720 in 2006, net migration then continues to increase substantially from 2006 to 2007 making 2007 the year of peak net

migration with a net migration figure of 83945 (CSO 2016). Net migration stay elevated approximating the 2007 level in 2008 before decreasing substantially to 28344 in 2009 (CSO 2016). Net migration was relatively stable between 2010 and 2015 with relatively small annual fluctuations (CSO 2016).

4.6.4 General trends in unemployment 2000-2015

Unemployment in the Czech Republic rose from 6.48 percent in 1998 to 8.77 percent in 1999 (OECD 2017b). Between 1999 and 2006 the unemployment rate remained elevated relative to the rest of the examined period fluctuating between 8.82 in 2000 and 7.15 per cent in 2006 (OECD 2017b). Thereafter, the employment rate briefly decreased to 5.32 percent in 2007 and 4.39% in 2008, before increasing again in 2009 (OECD 2017b). The unemployment rate then stabilized at around 7 percent between 2010 and 2006, fluctuation within a band of 7.28 percent in 2010 and 6.11 percent in 2014, before decreasing to 5.05 percent in 2015 (OECD 2017b). The higher unemployment rate from 2009 is usually attributed to the economic crisis.

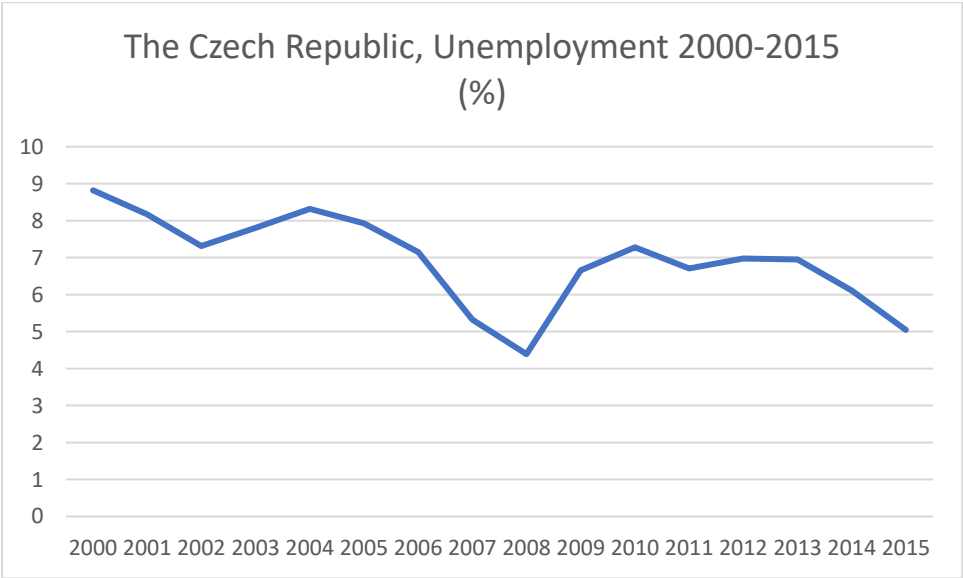


Figure 14: The Czech Republic: Unemployment rate 2000-2015. Adapted from *oecd.org*,2017, Retrieved from <https://data.oecd.org/unemp/unemployment-rate.htm>. Copyright [2017] by OECD. Adapted with permission.

4.6.4.1 Intra-sector unemployment rate Construction

Exact intra-sector unemployment rates for the Czech Republic is not attainable. However, a measure exists of the number of people employed within the last eight years according who are

currently unemployed according to sector (CSO 2011; 2012; 2013; 2014; 2015b). Unfortunately, this data is not available for the Finance sector and is only recorded for the Construction sector since 2011. Nevertheless, the intra-sector data on employment in the Construction sector would arguably serve as a decent proxy giving some impression of the unemployment rate within the Construction sector. Its inclusion in this study is made so as to better be able to assess the impact of the intra-sector unemployment rate on real wage growth, as well as the relationship between intra-sector unemployment, post-Enlargement migration and real wage growth.

Table 7: Unemployed persons previously employed in Construction (in thousands)

2011	2.11
2012	31.2
2013	24.2
2014	23.9
2015	16.2

The Czech Republic; Last CZ-NACE activity and occupation of unemployed persons: by Educational attainment, 4th quarter 2015. Adapted from czso.cz,2015, Retrieved from <https://www.czso.cz/csu/czso/employment-and-unemployment-in-the-czech-republic-as-measured-by-the-labour-force-sample-survey-3rd-quarter-of-2011-miurt7bwml>. Copyright [2015] by Czech Statistics Official. Adapted with permission.

The total number of unemployed persons previously employed within the Construction sector increased quite substantially from 22 100 in 2011 to 31 200 in 2012 (CSO 2011; 2012). The number of unemployed persons previously employed in the Construction sector decreased in the two following years measuring 24 200 in 2013 and 23 900 in 2014 (CSO 2013; 2014). By 2015, the number had sunken to 16 200 (CSO 2015b). Treating the data as a proxy for the unemployment rate within the Construction sector one can infer that the unemployment rate rose quite significantly between 2011 and 2012, before decreasing the next three years. If these data are a good indicator of the actual intra-sector unemployment rate, the unemployment rate within the Construction sector had been nearly halved by 2015.

5 Analysis

5.1 Wealthier member states: Norway

Analysis of patterns in real wage growth pre- and post-Enlargement in the Norwegian Construction and Finance sector reveal a conformity to the predictions espoused in the hypotheses. Remaining is to determine whether, and to which extent changes in real wage growth pre- to post-Enlargement was influenced by intra-EU migration. The fit of the changes in real wages to the hypotheses will be outlined in the next sections. Following is an assessment of how real wage development in the sectors were affected by other factors such as fluctuation in the unemployment rate, the economic crisis, inflation and the relationship between them. Finally, trends in real wage development pre- and post-Enlargement is assessed in the light of increased intra-EU migration. An argument will be made suggesting the increase in immigration to Norway from 2006-2015 exacerbated the decline in real wages in the Construction industry which was initially triggered by lower demand in the wake of the 2008 recession.

5.1.1 Analysis of real wage growth in Construction and Finance sectors in relation to the hypotheses

The development of real wage growth in the Norwegian sectors conform to the prediction of the hypotheses. H1 states low skill workers real wages post-Enlargement will decline relative to the reference period. The decline in low-skill workers' wages is thought to be caused by downward pressure on wages caused by increased immigration post- Enlargement. Average annual real wage growth in the Construction sector was lower post-Enlargement (2005-2015) than the reference period, conforming to the expectations of H1. As outlined in the previous chapter, average annual real wage growth in the Construction sector, representative of low-skill workers' wages, declined slightly from 2.13 percent pre-Enlargement to 2.0 percent post-Enlargement. H2 states that high skill workers real wages will remain the same or increase as a result of decrease in labour cost induced by migration pressures. Annual real wage growth in the Finance sector, representing high skill workers, increased slightly from 3.16 percent pre-Enlargement to 3.31 percent post-Enlargement. This development is congruent with the predictions of H2- The decrease in annual real wage growth in the Construction sector and the increase in annual real wage growth in the Finance sector combine to exacerbate the inter-sector gap in annual real wage growth post-Enlargement relative to the pre-Enlargement period. Inter-

sector difference in annual real wage growth increased by 0.28 percent from 1.03 percent in favour of the Finance sector pre-Enlargement to 1.31 percent in favour of the Finance sector post-Enlargement. The observed development towards a larger inter-sector difference in annual real wage growth is congruent with the prediction of H3 predicting the post-Enlargement difference in real wage growth between low skill and high skill workers to be exacerbated relative to the pre-Enlargement period.

The margins by which annual real wage growth changed pre-to post-Enlargement are quite small and the data points are few, it is therefore difficult to determine whether decline and rise in annual real wage growth is statistically significantly different from that of the pre-Enlargement period. Thus, the interpretation of the data is done with caution. However, the possibility of correctly interpreting data is arguably strengthened by comparing changes in annual real wage growth with sector specific unemployment rates as well as detailed data on immigration to Norway and employment of immigrant in the Norwegian labour force.

5.1.2 The effects of unemployment on real wage growth in the Construction sector

The decrease in annual real wage growth in the Construction sector between 2009-2015 is likely a reflection of the elevated intra-sector unemployment rate in this period (SSB 2017b). The unemployment rate specific to the Construction sector was well over the national average between 2009 and 2015 fluctuating between 4.8 and 7.1 percent (Nav 2009; 2011; 2012; 2013; 2014; 2015). As is iterated in the theory chapter, lower real wage growth is a reflection of lower demand for workers which leads to higher unemployment which in turn causes a decrease in wages.

The steep increase in the Construction sector unemployment rate both relative to the preceding years and to the aggregate unemployment rate makes it likely that the post-Enlargement decline in real wage growth is a reflection of lower demand for labour in the sector. This assumption is strengthened as further disaggregation of the post-Enlargement period reveal average annual real wage growth in the Construction sector was significantly lower between 2009 and 2015 compared to both the pre-Enlargement period and the post-Enlargement period as a whole. Average annual real wage growth in the Construction sector measured 1.05 percent between 2009-2015 compared to 2.0 percent in the post-Enlargement period as a whole. On the basis of these indices one can with some confidence conclude that the decline in annual real wage growth in the post-Enlargement period was largely caused by a decline in demand for labour.

5.1.2.1 Interactive effects of the economic crisis and post-Enlargement migration

The onset of the financial crisis in 2008 has been pinpointed as one of the causes of higher unemployment in the sector as investments in Construction sector decreased (Godøy 2014: 296). The economic crisis of 2008 affected demand in many sectors Europe wide discouraging investment and must therefore be acknowledged as the primary source of reduction in demand in the Norwegian Construction sector. The decline in real-wage growth in the sector post-Enlargement and between 2009 and 2015 in particular can therefore be chiefly attributed to the onset of the economic crisis. However, analysis of immigration data suggests the increase in work related immigration post-Enlargement worked in tandem with the effects of the economic crisis, contributing to the reduction in real wage growth in the Construction sector.

The number of immigrants from Eastern European member states working in Norway almost doubled from 2010 to 2015, measuring 58645 in 2010, to 13330 in 2015 (SSB 2017b). The number of Eastern European immigrants working in the Norwegian Construction sectors increased simultaneously from 9361 of a total of 185775 employed in the sector in 2008 to 26934 of a total of 207 492 employed in the sector in 2015 (SSB 2017b). For reference, the share of Eastern European immigrants employed in the Construction sector to the all employees in the sector increased from 3.24 percent in 2008 to 12.98 percent in 2015²³. The number of employees in the sector grew by 11.68 percent between 2008 and 2015, indicating Eastern European immigrants made up the majority of the growth in employees in the sector in this period. One could argue that the increase in the share of immigrant workers to native workers in the Construction sector is likely to have negatively influenced real wage growth. Even in the absence of the subduing effects on investment caused by the financial crisis, an increase in the mass of eligible workers alone could cause unemployment and a flattening of real wage growth. According to liberal economic theory, competition for employment increase as workers become relatively more abundant resulting in either higher unemployment, lower wages or a combination of the two (Bauer and Zimmermann 1999: 13).

Borjas (2003) demonstrated that the influx of immigrant from the relatively poorer Mexico to the United states depressed low-skill workers' wages not only because the size of the immigration in itself caused competition for employment to intensify, but also because the Mexican immigrants had lower earning expectations (Borjas 2003: 14-15). The difference in

²³ Percentages are a result of the authors own calculations using the following formula $\text{New number} - \text{Original number} = \text{Increase}$ $\text{Increase} / \text{Original number} * 100 = \text{percentage increase}$

earning expectation between native and Eastern European workers further strengthen the assumption that the increase of immigrants from Eastern European member states contributed to lowering the annual real wage growth between 2009-2015. The argument underpinning this assertion is rather intricate and requires insight into the Norwegian system of wage settlement. In short, Norway has a tradition of strong protective institutions overseeing the protection of workers' rights, most workers' wages are regulated by tariff agreements that are a result of bargaining between the workers and employer unions and the Norwegian state (NOU 2016: 15, 2016: 16-17). By law, employers cannot require employees to take pay cuts, thus wages resulting from the tariff agreements must always represent a nominal increase from the previous year. However, as evidenced in the data material presented in the preceding chapter; real wage may decrease from the previous year. When demand for labour is lower and added that a proportion of the workforce consists of work migrants with lower wage expectations than the native workers, it is conceivable that the employers' unions enjoys an advantage over the workers' union in tariff negotiations resulting in lower real wage growth compared to previous years. Thus, one could argue that both the increase in Eastern European work migrants employed in the Norwegian Construction sector, and the heterogeneity in wage expectations resulting from the influx have likely contributed to the lower real wage growth observed in the sector between 2009 and 2015. Judging from the change in size and composition of workers in the Norwegian Construction sector taking place between 2008-2015, one could argue the dip in demand for workers within the sector was caused by the onset of the financial crisis but exacerbated by increased intra-EU migration.

Adding weight to this assumption is the fact that the proportion of Eastern European immigrants to total employees employed in the Construction sector increased at a time unemployment in the sector was rising. Unemployment in the Construction sector was elevated relative to the national average between 2009 and 2015 (SSB 2017). As outline earlier, the share of Eastern European immigrants employed in the sector rose from 3.24 percent in 2008 to 12.98 percent in 2015, occurring in conjunction with the decrease in demand for labour as evidenced by the elevated unemployment rate to the sector. This indicate Eastern European immigrants were preferred over native workers as a time when investment in the sector was low due to the Economic crisis. It is natural that the share of Eastern European workers to total number of employees in the sector increased as the economic downturn in the sector prompted employers to prefer cheaper labour. Thus, the increase in the share of Eastern European workers to total share of workers occurring in a period of heightened unemployment within the sector is

arguably a strong indication that the increase in immigration contributed to lowering Construction workers' real wage growth.

5.1.3 The effects of unemployment on real wage growth in the Finance sector

The inter-sector unemployment rate in the Finance sector is not known as there are no available data on the inter-sector unemployment rate pertaining to this sector. One could use the all-sector aggregate unemployment rate as a proxy for the unemployment rate specific to this sector, to consider any possible effects of unemployment. The all-sector aggregate unemployment rate arguably did not increase in the years after the onset of the economic crisis in 2008. The aggregate unemployment rate fluctuated within a narrow band of 2.5 percent in 2007 and 3.5 percent in 2014, only to rise to 4.4 percent in 2015 (SSB 2016). For comparison, the unemployment rate fluctuated between 4.6 percent in 2005 and 3.2 percent in 1998 (SSB 2016). Assuming the sector specific unemployment rate to the Finance sector approximates the aggregate unemployment rate, real wage growth in this sector should according to liberal economic theory be positively affected as the unemployment rate between 2008 and 2015 was lower relative to the years 1997 to 2007 (SSB 2016). A decrease in the unemployment rate is a reflection of higher demand for workers which would cause wages to rise according to liberal economic theory.

There is however reason to doubt that the unemployment rate in the Finance sector closely aligns with the aggregate unemployment rate. Annual real wage growth in the Finance sector was significantly lower between 2009 and 2015 measuring 1.31 percent compared to 3.31 percent for the post-Enlargement period overall, and 3.16 percent for the pre-Enlargement period. The decline in real wage growth in this period coincide with that of a significant decline in annual real wage growth in the Construction sector. As is outlined above, the decline in real wage growth in the Construction sector coincide with a significant elevation of the sector specific unemployment rate signifying a drop in demand for labour in the wake of the onset of the 2008 recession. As an equally significant drop in the annual real wage growth is observed in both sectors over the same period, it can be assumed that the Finance sectors' unemployment rate was higher than that of the aggregate unemployment rate, indicating a decline in demand for labour in the wake of the 2008 recession.

5.1.4 Effect of post-Enlargement migration on real wage growth in the Finance sector

The annual real wage growth in the Finance sector between 2005 and 2008 was significantly higher than that of the second post-Enlargement period (2009-2015) measuring 6.83 percent. Moreover, annual real wage growth in the post-Enlargement period overall was higher than that of the pre-Enlargement period. However, the elevated average annual real wage growth rate found between 2005-2015 cannot be ascribed to an increase in immigration as immigration from European countries and total immigration alike only increase significantly from 2006 (SSB 2017b). As demonstrated in the previous chapter, the number of annual immigrations to Norway was at its highest between 2008 and 2015, coinciding with the period in which real wage growth in the Finance sector was at its lowest (2009-2015). Seeing as the period in which significant increase in immigration from Europe coincides with low annual real wage growth in the Finance sector, the possibility that immigration yielded a positive effect on the wages of workers in the Finance industry as stated in H2 can be ruled out. It is therefore more likely that the increase in real wage growth observed in the sector post-Enlargement can be ascribed to fluctuations in demand independent of immigration.

5.1.5 How the post-Enlargement real wage growth fit H3 and some concluding remarks on H1 and H2

From the analysis of real wage development, it is clear that the exacerbation of the gap in inter-sector real wage growth post-Enlargement is not exclusively attributable to increased immigration to Norway in the post-Enlargement period. First, the possibility that real wage growth found in the Finance sector post-Enlargement was caused by increased immigration was ruled out. Thus, the exacerbation of the gap in inter-sector real wage growth was not caused by a mechanism in which workers in the Finance sector were able to increase profits as a result of lower labour costs as predicted by H2. Secondly, it was established that post-Enlargement decline in annual real wage growth in the Construction sector was largely caused by a decrease in demand for labour spearheaded by the economic crisis. However, a review post-Enlargement migration trends revealed a sharp increase in settlement of immigrants from Eastern European member states in the Norwegian labour force generally and in the Construction sector specifically. The evidence of a sharp increase in employment of Eastern European immigrants in the Construction sector post-Enlargement allows for a cautious asserion that the decline in real wage growth was exacerbated by the increase in immigrants employed in the sector. Therefore, H3 can only be said to hold for the Norwegian case to the effect that increased

immigration post-Enlargement likely exacerbated the downward pressure on Construction workers wages, a development mimicking the predictions of H1. Thus, in summation, the Norwegian case yield quite convincing support for H1, no support for H2, and partial support to H3 as one of the mechanisms causing an exacerbation of the inter-sector wage gap was likely present.

5.2 Wealthier member states: Germany

The Germany case defies the expectations of the hypotheses as post-Enlargement real wage growth increases in the Construction sector and decreases in the Finance sector relative to the pre-Enlargement period. An argument will be presented demonstrating that the increase in immigration from to Germany did not yield a negative influence on real wage growth in the Construction sector. Rather, the decrease in the unemployment rate from 2006 had a positive effect on real wage growth in the German Construction sector post-Enlargement.

5.2.1 *Analysis of real wage growth in Construction and Finance sectors in relation to the hypotheses*

Post-Enlargement annual real wage growth in the German Construction sector improved relative to the pre-Enlargement period. This development runs direct counter to the prediction of H1 stating low-skill worker's wages will decline post-Enlargement as an increase in immigration put downward pressure on wages. Germany did not experience significant increase in immigration from Europe until 2010, although the number of annual immigrations to Germany doubled from 515925 in 2009 to 1221291 in 2015 (Destatis 2017b). Analysis of real wage growth in the Construction sector between 2010-2015 further discourages the notion that increased immigration post-Enlargement contributed to depressing real wage growth in the Construction sector. Average annual real wage growth in the Construction sector measured 1.64 percent between 2010 and 2015, surpassing average annual real wage growth of both the post-Enlargement period as a whole (0.68 percent) and the pre-Enlargement (0.36 percent) period by wide margin. Rather, it is reasonable to view the development in real wage growth from pre- to post-Enlargement as primarily the result of a decrease in the unemployment rate. As demonstrated in the previous chapter, the all-sector unemployment rate rose steadily but substantially from 1990-2005 before decreasing steadily from 2006 to 2015 (OECD 2017). For reference, the unemployment rate measured 11.17 percent in 2005 compared to 4.62 percent in 2015 (OECD 2017). Furthermore, data on the growth of persons employed in the Construction sector corroborate this assertion as they reveal negative growth in the number of persons employed in the sector between 2003 and 2006, and an increase in the number of people employed in the sector between 2007 and 2013 (Destatis 2014). The argument is thus that real wage growth in the Construction sector increased post-Enlargement due to higher demand reflected in the decline in unemployment. Additionally, isolated analysis of real wage growth between 2010 and 2015 when immigration from Europe and real wages rose substantially,

further solidifies the notion that increased immigration post Enlargement did not contribute to negatively to real wage growth in the sector. All evidence considered, one must conclude that in the German case does not provide evidence for the mechanisms described in H1. First, real wage growth in the post-Enlargement period improved in relation to the pre-Enlargement period. Secondly, real wage growth in the Construction sector was increased in conjunction with the increase in immigration from Europe observed from 2010-2015. The increase in real wage growth in the post-Enlargement period seem to have been caused by an increase in demand for labour as reflected in an overall lower unemployment rate.

5.2.2 Real wage growth in the Finance sector

Counter to the prediction of H2, real wage growth in the Finance sector post-Enlargement decreased relative to the pre-Enlargement period. Average annual real wage growth post-Enlargement measured 1.15 percent compared to 1.77 percent pre-Enlargement. The causes for the decrease in real wage growth remains an enigma. The decrease in unemployment from 2006 suggest real wages in the sector should increase, as was the case in the Construction sector. Unfortunately, data on the specific unemployment rate within the Finance sector is not available to nuance the picture. Moreover, real wage growth in the sector between 2010 and 2015 amounted to 1.52 percent, eliminating suspicion that the post-Enlargement decrease in real wage growth was brought on by the economic crisis. Nevertheless, the post-Enlargement decrease in real wage growth in the Finance sector is incongruent with H2 predicting high-skill workers' real wage growth stay equal to or increase as a result of downward pressure on low skill workers' wages due to increased immigration.

5.2.3 Evaluation of the fit of H3

Contrary to the expectations of H3, post-Enlargement inter-sector difference in real wage growth had decreased relative to the pre- Enlargement period. The inter-sector difference in annual real wage growth measured 0.46 percent post-Enlargement in favour of the Finance sector compared to 1.41 percent pre-Enlargement. It is identified that the decrease is brought on as post-Enlargement real wage growth in the Construction sector improved as a result of increase in demand for labour, while the cause of the post-Enlargement decrease in real wage growth in the Finance sector remains an enigma. H3 maintain post-Enlargement changes in migration trends will lead to an increase in the inter-sector difference in real wage growth as

low- skill workers' wages decrease as a result of changes in migration trends while the wages of high-skill workers either stay the same or improve. As the post-Enlargement period oversaw a decrease in inter-sector difference real wage growth, one must conclude that the mechanism described in H3 is not present in the German case.

5.3 Assessment of the hypotheses pertaining to wealthier member states comparing and contrasting the Norwegian and German case

Analysis of the German and Norwegian case allows for the careful extrapolation of how well the hypotheses predict how intra-EU migration affects high and low-skill workers real wage growth. By extension, analysis of the cases allows for evaluation of whether and to which degree free intra-EU migration exacerbates economic inequality. Given the number of cases is limited to two and the limitations of the method discussed in the methods chapter, it is inadvisable to interpret the findings as definitive proof of the validity of the hypotheses. Also in the cases where no plausible causal relationship between the variables is found, definitive rejection of the hypothesis is not advised as it is possible that a causal relationship exist but eluded detection due to the lack of refinement in the scientific method applied or the choice of cases. Rather, findings yielded by the analysis is best considered as indications of the integrity of the internal validity of the hypotheses and how they apply to the relationship between intra-EU migration and real wage growth in wealthier member states generally. Again, a caveat of warning; any attempt to generalize the findings to describe the relationship between intra-EU migration and wages in wealthier member states will be done with great caution as the limited number of cases and imprecision of the method does not warrant complete confidence in the findings.

5.3.1 Assessment of the fit of H2

No evidence was found underpinning hypothesis number two predicting high-skill workers' real wage growth to increase post-Enlargement as increased immigration from relatively poorer member states exerts a downward pressure on low-skill workers' wages. Finance workers real wage growth post-Enlargement was found to improve relative to the pre-Enlargement in the Norwegian case. However, further analysis revealed the substantial increase in European immigration to Norway only partially coincided with the strong increase in Finance workers real wage growth. Rather, fluctuation in the real wage growth of Finance workers must be seen as a result of fluctuations in demand for labour as real wage growth in this sector does seem to correlate with fluctuations in unemployment. Neither does the German case provide evidence for the existence of the mechanisms described in H2. Although the analysis failed in pinpointing the driving influence behind the decline real wage growth in the German Finance sector, real wage growth nevertheless declined relative to the pre-Enlargement period counter to the prediction of the hypothesis. No evidence supporting H2 has been uncovered in analysing these

cases indicating intra-EU migration does not exacerbate economic inequality by means of raising the wages of high-skill workers. On the basis of results uncovered in this thesis, the H2 should be discarded as the internal validity of the hypothesis is indicated to be faulty. However, given the small number of cases and shortcomings of the method, one cannot exclude the possibility that the proposed relationship between intra-EU migration and high-skill workers' wages would be uncovered by application of a different method, different cases or a combination of the two.

5.3.2 Assessment of the fit of H1

While analysis of the German and Norwegian case diverges in terms of the hypothesis number one, the presence of a positive result in the Norwegian case is arguably well-underpinned strongly indicating the presence of the mechanism proposed in the hypothesis. The German case defied the expectations of H1 as real wage growth in the German Construction sector increased in conjunction with increased immigration post-Enlargement. However, the lack of a positive result in the German case should not be interpreted as detrimental the evidence found in the Norwegian case. While, the analysis endeavours to control for the effect of many external factors on real wage growth, it is inevitable that the effects of intra-EU migration is contingent on endogenic properties specific to each member state that is not within the scope of the thesis to control for. Thus, the negative result in the German case, should not detract from the results found in the Norwegian case. It was concluded in the Norwegian case that the influx of immigrants post-Enlargement likely contributed to aggravate the decline in real wage growth. As iterated above, the most compelling argument demonstrating the complicit effect of the immigrant influx on decline in real wages is that the proportion of Eastern European workers to native workers employed in the sector increased dramatically at a time when demand for labour in the sector was falling. This suggest employers in the sector did turn to cheaper labour when demand was declining, which ultimately exacerbated the effect of the economic crisis on the decline in Construction workers real wage growth. Thus, analysis of the Norwegian case does warrant cautious belief that the mechanism suggested has been detected, inspiring confidence in the internal validity of the hypothesis. Therefore, the analysis warrants confidence in the prediction of H1, namely that increased immigration post-Enlargement contributed to depressing low-skill workers' real wage growth.

5.3.2.1 Assessment of H3 and concluding remarks

Hypotheses number three predicts increased immigration to wealthier member states post-Enlargement will lead to an exacerbation of the gap in low and high-skill workers real wage growth. The exacerbation of the gap is thought to be brought about by a combination of the mechanisms described in H1 and H2, namely a decrease in low-skill workers' wages in conjunction with an increase in high-skill workers' wages brought about by intra-EU migration. While the inter-sector gap in real wage growth increased post-Enlargement in the Norwegian case, the inter-sector gap in real wage growth narrowed in Germany. Considering the mechanism proposed in H2 was not found in any of the cases, H3 as it pertains to these cases in particular must be considered partially negative. It cannot be proven that increase immigration to Norway and Germany post-Enlargement had a positive effect on high-skill workers' real wage growth. Although, as is argued above, the Norwegian case did inspire confidence in the validity of H1. Therefore, using the Norwegian post-Enlargement real wage growth outcomes as a template, H3 can be considered a partial fit as increased immigration post-Enlargement likely contributed to depressing Construction workers' real wage growth. The increase of the inter-sector gap in real wage growth observed in the Norwegian case can therefore be viewed as an indicative that increased immigration post-Enlargement may have contributed to aggravating economic inequality in the wealthier member states.

5.4 Analysis poorer member states: Poland

Recovery growth, inflation and unemployment needs to be taken into consideration before proceeding to determine the impact of post-Enlargement migration to and from Poland. In order to maintain clarity, this chapter will revisit annual real wage growth in the sectors and comment on to which extent real wage growth pre-and post-Enlargement conforms to the hypotheses. Following is an analysis of real wage growth in the disaggregated post-Enlargement period. The main findings emerging from the analysis indicate real wage growth in the Construction sector between 2006-2009 increased as a result of heightened emigration. Furthermore, findings indicated decrease in real wage growth in the Finance sector post-Enlargement cannot be attributed to changes in migrations, but are rather a result of the ceases of recovery growth and the effects of the economic crisis.

5.4.1 Fit of trends in real wage growth to the hypotheses

Trends in real wage growth in the Polish sectors pre- and post-Enlargement does not conform neatly to the hypotheses. The exception to this statement can be observed in annual real wage growth in the Construction sector. As predicted in H4, average annual real wage growth in the Construction sector had decreased post-Enlargement relative to the pre-Enlargement period. Annual real wage growth in the Construction sector measured 2.02 percent post-Enlargement to the 3.33 percent pre-Enlargement. Contrary to the expectations of H5, post-Enlargement average annual real wage growth in the Finance sector declined relative to the pre-Enlargement average, measuring 5.73 percent pre-Enlargement to 1.69 percent post-Enlargement. H6 states that the difference in high-skill workers and low-skill workers real wage growth will exacerbate post-Enlargement due to a decline in annual real wage growth of low-skill workers' real wage growth occurring simultaneously with an increase in high-skill workers' real wage growth. As real wage growth post-Enlargement declined in both sectors, but more significantly so in the Finance sector, the inter-sector difference in annual real wage growth was measuring 2.40 percent in favour of the Finance sector pre-Enlargement reversed to 0.33 percent in favour of the Construction sector post-Enlargement. The observed post-Enlargement development in inter-sector difference in real wage growth is of course completely contrary to what is expected.

5.4.2 The effect of stabilization of inflation and recovery growth on real wage growth

The decline in real wage growth in the Construction sector post-Enlargement is likely not solely attributable to changes in migration patterns. Considering annual real wage growth in both sectors declined significantly post-Enlargement, it is plausible that the decline is caused by factors that would impact wage growth in the two sectors similarly. A possible dual explanation for the decline in growth affecting both sectors is linked to changes made to the monetary and fiscal policy in 1998 to dampen inflation. It is natural that real wage growth in both sectors would decrease as a result of fiscal and monetary policy halting inflation. Inflation in the 1990s was high and volatile, measuring between 28.0 percent in 1995 and 7.2 percent in 1999 (CSoP 2017). The relatively higher annual real wage growth in the pre-Enlargement period could therefore be the result of an attempt to keep pace with the rapid increase in prices of goods and services. Monetary and fiscal policies implemented in late 1998 aimed at stabilizing the exchange rate and dampen inflation yielded results as the inflation rate decreased from 1999, fluctuating between 5.3 percent in 2001 and -0.7 percent in 2015 (OECD 2017b). The lower more stable inflation rate is likely to have had a soothing effect on real wage growth; it is likely that wage settlement after 1999 could be more modest as the gap between wages and the annual increase in price of goods and services had narrowed. Moreover, the rapid recovery growth that characterized the 1990s would have positively affected real wage growth pre-Enlargement. One could speculate that the pace of the recovery growth had slowed down somewhat by the early 2000s, contributing along with the stabilization of inflation to dampen real wage growth in the post-Enlargement period relative to the pre-Enlargement period. Furthermore, the average annual real wage growth between 2010 and 2015 was particularly low in both sectors, measuring 0.07 percent in the Construction sector and 0.89 percent in the Finance sector. The decline in real wage growth of this period compared to both the pre-Enlargement period and the post-Enlargement period as a whole indicate, along with a marked decrease in the inflation, that the economic crisis contributed to the Post-Enlargement decrease in real wage growth in both sectors. When taking into account the factors presented above it is clear that the post-Enlargement decline in real wage growth in the Construction sector is likely to be chiefly a result of the factors mentioned above and should therefore not be interpreted as a confirmation of H4 in relation to the Polish case.

5.4.3 Analysis of post-Enlargement real wage growth in the Construction sector

5.4.3.1 Context of analysis of real wage growth 2006-2009

It is concluded that the post-Enlargement decrease in real wage growth in the Construction sector cannot solely be chalked up to post-Enlargement changes in migrations trends; rather, the analysis pointed to influences such as the slowdown in recovery growth and policies aimed at stabilizing the inflation rate. Thus, the post-Enlargement decrease in real wage growth in the Construction sector should not be considered as indicative of a confirmation of H4. However, analysis of the post-Enlargement period disaggregated to reflect marked changes in migration trends does yield some indication that changes in migration trends might have influenced real wage growth in the Construction sector which should be subjected to further exploration.

The period 2006-2009 is characterized by a massive increase in emigration from Poland in conjunction with the beginning of a lasting substantial decrease in the unemployment rate (CSoP 2015; ONS 2017). 2006 and 2007 were peak years of emigration where the number of Poles emigrating from Poland reached 46900 in 2006 and then 35500 the following year, the number of emigrations from Poland in 2006 had more than doubled from 2004 and 2003 where the number of Poles emigrating from Poland measured 18900 and 20800 respectively (CSoP 2015). The year 2006 marked the onset of a lasting decrease in unemployment levels as continuing throughout 2015. For reference, unemployment levels fluctuated between 6.6 and 12.0 percent between 2007 and 2015, compared to between 12.9 and 20.5 percent between 1999 and 2005 (ONS 2017). The unemployment rate rose somewhat between 2010 and 2013 fluctuated between 9.3 and 10.7 percent (ONS 2017). It is in the period 2006 to 2009 when unemployment is low compared to preceding years and emigration similarly particularly high compared to preceding years that the annual real wage growth in the Construction sector measures a staggering 6.32 percent per year, compared to 3.3 percent in the Finance sector.

5.4.3.2 Exploring the possible relationship between rise in emigration and the increase in Construction workers real wage growth between 2006 and 2009

First, it is likely that elevation of annual real wage growth between 2006 and 2009 compared to Pre-Enlargement period can be ascribed to the markedly lower unemployment rate as it signifies a greater demand for workers. Secondly, it is possible that the large upswing in emigration from Poland in 2006 and 2007 contributed to lower unemployment and greater demand for workers. The assumption that unemployment contributed to greater demand for

labour in the Construction sector thereby stimulating real wage growth in the sector is strengthened as annual real wage growth in the Finance sector (2006-2009) was markedly lower than that of the Construction sector. Considering that the majority of Polish emigrants can be classified as middle-skill workers (Dustmann et. al 2013: 154), one can hypothesize that the increase in emigration only caused increase in demand for workers in the Construction sector as workers in the Finance sector are primarily high-skill workers. As iterated in earlier portions of the thesis, liberal economic theory predict wages to rise in response to emigration, *ceteris paribus* (Bauer and Zimmermann 1999: 13). Thus, the correlation between the spike in emigration, decline in unemployment rate and elevated real wage growth might indicate that post-Enlargement changes in migration trends influenced real wage growth in accordance with the expectations of liberal economic theory. Nevertheless, isolated analysis of real wage growth in the Construction sector between 2006 and 2009 does not provide support for H4.

5.4.4 Post-Enlargement real wage growth in light of trends in migration and unemployment 2010-2015

Compared to the changes taking place in migration trends and unemployment rate from 2000-2005 to 2006-2009, the characteristics of unemployment and migration trends between 2010 and 2015 are quite modest compared to the changes taking place in migration trends and unemployment rate from 2000-2005 to 2006-2009. Although still substantially lower than the unemployment rates observed between 2000 and 2005, the unemployment rate was somewhat elevated between 2010 to 2015 compared to what it was between 2006 and 2009 (ONS 2017). As mentioned, the number of emigrations sank quite dramatically following 2008 in conjunction with a steady increase in the number of people immigrating to Poland from 2007 till 2015 (CSoP 2015). The combination of these two factors resulted in an increase in net migration occurring between 2009 and 2012 that was markedly elevated compared to the preceding years. For comparison net migration in its peak year 2009 measured -1200 compared to -36100 in 2006 and -20500 in 2007 (CSoP 2015). Importantly, 2005 marked the beginning of a period of steady but over time substantial increase in immigration to Poland, the number of immigrations to Poland measured 17400 at its peak in 2009 compared to a meagre 9300 in 2005 (CSoP 2015).

5.4.5 Exploring decline in real wage growth in the Construction sector in light of immigration

The logic identifying migration as a possible influence in the decline in Construction workers real wage growth between 2010 and 2015 is rooted in the same logic described above. In this period, the elevated net migration signifies the accumulation of immigrant workers in the Polish labour force. As is observed in the Norwegian case, one can assume a portion of the work migrant immigrating to Poland settle in the Polish labour force meaning the stock of immigrant workers grow over time (SSB 2017b). Thus, a causal link explaining the influence of increased immigration on Polish Construction workers wages is based on the same liberal economic argument presented above. The higher net migration between 2010-2015 would yield a negative effect on demand for workers reflected in the somewhat higher unemployment rates between 2010 and 2015 compared to the preceding post-Enlargement period (ONS 2017). The decline in demand for workers would in turn result in lower real wage growth as competition for employment intensified putting a downward pressure on Construction workers' wages. While this argument is logically sound to the effect that it is coherent with liberal economic theory, concluding firmly that increased immigration to Poland between 2010 and 2015 contributed to the observed decline in real wages in the Construction sector in isolation would be erroneous. While the changes in migration between 2010 and 2015 are significant changes to previous years, it is not certain that the size of annual migrations in these years are large enough to yield a significant impact on the size and composition of the Polish labour force. For comparison, identifying post-Enlargement immigration as an impacted on real wage growth in the Norwegian Construction sector is arguably plausible as the annual number of immigrations to Norway is larger relative to the size of the Norwegian population (see figure 3 and 4). Thus, while the argument remains logically sound, one cannot conclude post-Enlargement changes in Polish migration trends influenced the decline in Polish Construction workers' real wage growth as the size of changes in migration while significant by themselves, may not be large enough to yield meaningful influence on the size and composition of the Polish labour force.

Rather, the decline in Construction workers real wage growth between 2010 and 2015 should be regarded as a result of the economic crisis. Evidence of the effect of the financial crisis on real wage growth is strengthened as real wage growth between 2010 and 2015 was also markedly lower in both sectors compared both to the pre-Enlargement period and the post-Enlargement period as a whole. Thus, the onset of the financial crisis likely yielded the most effect on depressing real wage growth in the Construction sector between 2010 and 2015. Further indication of the effect of the economic crisis can be traced in the in the overall lower

annual inflation rates observed between 2010 and 2015 (see figure 8). The decline in annual inflation between 2010 and 2015 is indicative of a slowdown in economic growth, substantiating the claim that decline in real wage growth observed in both sectors were caused by the recession.

In conclusion therefore, changes in post-Enlargement migration trends and corresponding decline in Construction workers real wage growth is congruent with H4. However, the size of the changes in migration between 2010 and 2015 are not large enough to warrant concluding increased immigration contributed to the decline in Construction workers' real wage growth. rather, the decline in Construction workers' real wage growth between 2010 and 2015 seems to have been caused by the economic crisis and H4 can therefore not be confirmed for the Polish case.

5.4.6 Fit of H5 to the Polish case

The post-Enlargement decrease in annual real wage growth in the Finance sector directly contradicts H5. The hypothesis states that high-skill workers' post-Enlargement real wage growth is likely to increase as a result of the decrease in low skill workers' wages. Annual real wage growth in the Finance sector measured 1.69 percent in the post-Enlargement period compared to 5.73 percent pre-Enlargement. As demonstrated, annual real wage growth in both disaggregated post-Enlargement periods were also below that of the pre-Enlargement period. Argued above is that the decline in real wage growth in both sectors can be attributed to the stabilization of the inflation rate in the late 1990s, the alleged slowdown in recovery growth from the early 2000s and the effect of the economic crisis on investment and demand. It is assumed to be the case for both sectors that the post-Enlargement decrease in real wages between 2006 and 2009 can be chiefly attributed to the stabilization of inflation and possibly slowdown in recovery growth, while the decrease in real wage growth between 2010 and 2015 can be attributed to the effects of the economic crisis. Therefore, the development in Finance workers real wage growth post-Enlargement does not provide support for H2.

5.4.7 Fit of H6 to the Polish case and summary of evaluation of the fit of hypotheses H4 and H5

In summary, analysis of the Polish case has revealed that the post-Enlargement decrease in real wage growth in the Construction sector as chiefly a result of stabilization of inflation, a halt in the recovery growth characterizing the 1990s and lastly the effects of the economic crisis. While the correlation between high emigration, low unemployment and increase in real wage growth along with correlations found between high immigration, higher unemployment and a decrease in real wages reflect the mechanisms described in H4, migrations streams to and from Poland were not large enough relative to the size of the labour force to warrant conclusion that H4 neatly describes the Polish case. Moreover, the post-Enlargement decrease in real wage growth in the Finance sector directly contradicts H5 and is as the corresponding decrease in the Construction sector likely a product of stabilization of inflation, halt in recovery growth and the effects of the recession.

The reversal of inter-sector difference in annual real wage growth between the pre- and post-Enlargement period directly contradicts the predictions of H6. H6 states that the post-Enlargement inter-sector difference in real wage growth would be exacerbated in favour of the Finance sector due to the dual mechanisms described in H4 and H5. As neither H4 or H5 fit to the Polish case, it must be concluded that H6 does not provide a good description of real wage growth in the Polish case. Although, it could be argued that the economic crisis and the stabilization of inflation are extraordinary events acting as intervening variables to muddle results, concealing the real connection between migration and real wage growth. While H6 must be discarded for the Polish case, one can only speculate whether the absence of these intervening variables would have yielded a different result.

5.5 Analysis poorer member states: the Czech Republic

5.5.1 Introduction to the analysis of the Czech case

Real wage development in the Czech Republic closely mirror that of Poland as annual real wage growth decreased in both sectors post-Enlargement. Annual real wage growth in the Construction sector decreased from 4.35 percent pre-Enlargement to 2.36 percent post Enlargement. Mirroring the real wage growth in Poland, the inter-sector difference in annual real wage growth reversed post Enlargement as the decrease in real wage growth in the Finance sector was more severe than in the Construction sector. Average annual real wage growth in the Finance sector decreased from 9.46 percent pre-Enlargement to 0.66 post Enlargement. Once again parallel to the Polish case, an argument will be presented demonstrating the decrease in real wage growth in the Czech Construction sector is not a direct result of changes post-Enlargement migration trends. Moreover, it will be argued that H5 and H6 does not fit the Czech case as real wage growth in the Finance sector decreased significantly relative to the pre-Enlargement period causing a reversal of the inter-sector difference in real wage growth.

5.5.2 Analysis of real wage growth between 2005 and 2015 and evaluation of the fit of H5

Average annual real wage growth decreased significantly in both sectors between 2010 and 2015. Annual real wage growth measured -0.35 percent in the Construction sector and -0.33 percent in the Finance sector compared to 5.61 and 1.85 percent respectively in the preceding post-Enlargement period. The increase in inflation and unemployment rate beginning in 2009 indicate the decrease in real wage growth should be considered an effect of the economic crisis as both indicators signify a drop in demand (CSO 2015; OECD 2017b). The unemployment rate between 2010 and 2014 was heightened compared to 2007 and 2008 period measuring between 7.28 and 6.11 percent compared to 5.32 percent in 2007 and 4.39 percent in 2008 (CSO 2015).

Not congruent with the decrease in real wage growth is the marked decrease in net migration characterizing the period. Brought about by a decline in the number of immigrations along with an increase in emigration, net migration plummeted from 83945 in 2007 to 15648 in 2010 dropping even further in the following years (CSO 2016). The decline in net migration should according to liberal economic theory correspond with an increase in real wage growth as fewer eligible workers translates into an increase demand for labour which in turn stimulate wage growth. Analysing the two post-Enlargement periods in conjunction, the notion that migration

affects real wage growth seem false at first glance, further strengthening confidence that real wage growth declined in both sectors as a result of the economic crisis. Considering the evidence listed, H5 stating that high skill workers real wage growth post-Enlargement should be equal to or greater than the pre-Enlargement growth must be judged to be not applicable to the Czech case.

5.5.3 Evaluation of the fit of H4 to the Czech Case

Once again referring to the Polish case, the decrease in annual real wage growth in the Construction sector cannot be mainly ascribed to post-Enlargement changes in migrations trends. The higher inflation rate in the 1990s suggest the real wage growth in this period might have been artificially high due to recovery growth. Furthermore, disaggregation of the post-Enlargement period reveal annual real wage growth in the Construction sector was only lower than the pre-Enlargement average between 2010 and 2015. The discovery that annual real wage growth was only lower than the pre-Enlargement average in this period encourages the suspicion the economic crisis of 2008 was the main cause of the post-Enlargement decrease in real wage growth in the sector. After all, the effects of the economic crisis would have been most prominent in these years. Further encouraging the inclination that changes in migration trends post-Enlargement did not contribute to the decrease in real wage growth is, in contrast to the Polish case, the disconnect between migration trends and real wage growth. Disaggregation of the post-Enlargement period according to the major trends in migration to and from the Czech Republic reveal immigration was at an unsurpassed high between 2005 and 2009 (CSO 2016). The post-Enlargement period 2005 to 2009 was isolated to uncover the effects of an all-time high number of immigrations to the Czech Republic, revealing real wage growth in the Construction sector in this period to surpass that of the pre-Enlargement period and that of the post-Enlargement period as a whole. For reference, annual real wage growth in the Construction sector measure 5.61 percent compared to 4.35 percent pre-Enlargement and 2.36 percent post-Enlargement. The concordance of an increase in immigration to the Czech Republic with an increase in real wage growth is incompatible with liberal economic theory's prediction. The lower unemployment rate in this period nevertheless concur with the theory, as lower unemployment signify demand for labour is high. Thus, at first glance at the results there is little support to be found for H4 claiming low-skill workers' real wages decline as a result of increased immigration post-Enlargement to be found in the Czech case. On the contrary, an increase in immigration correspond with an increase in Construction workers wages, although

it is unlikely that the increase in immigration caused the increase in real wage growth. However, a closer look at the relationship between the migration flows and cyclical changes in the economy challenges this view.

5.5.4 Discussion of the reverse relationship between migration and real wage growth

While the seemingly reverse relationship between migration and real wage growth in the Czech case might seem puzzling and potentially detrimental to the integrity of the hypotheses as a whole, there is a plausible explanation for the phenomenon. As in the case of Poland, the economic crisis had been identified as the main causal link between the decrease in real wage growth both in the post-Enlargement period as a whole and between 2010 and 2015 specifically. However, the relationship between migration and real wage growth in the Czech case, albeit counter to the expectations espoused in liberal economic theory does have a plausible explanation. As first demonstrated in the Norwegian case, annual immigration tend to add cumulatively to the workforce (SSB 2017b).

Immigration to the Czech Republic increased between 2005 and 2009, at a time when real wage growth and the annual inflation rates suggest the economy is in high gear making the Czech Republic an attractive destination for work migrants. Similarly, slower real wage growth and inflation recorded between 2010 and 2015 indicate slow economic growth. In the Czech case it is established that the downturn in real wage growth was brought on by the economic crisis, however, a slowdown in economic growth can emerge as a direct effect of too fast growth in the economy over time (Friedman 1977: 454). A downturn in economic activity is often results from an overheating of the economy where inflation rise too fast for real wage growth to keep up with the rise of prices of goods and services (Friedman 1977: 454). In the Czech case, one might hypothesise that the increase in immigration between 2005 and 2009, which is a response to the booming economic growth producing attractive employment opportunities, contributed to saturating the labour force, thus lowering demand for labour and worsening the impact of the economic crisis on real wage growth. The spike emigration observed in 2012 and 2013 in particular can therefore also be interpreted as a reaction to the slowdown of economic growth and the associated adverse effects on employment opportunities. The reversed relationship between real wage growth and migration is therefore likely a result of a time lag effect where the adverse effect of immigration on real wage growth comes into force a few years later. The slowdown in real wage growth thus coincides with a period in which in emigration is low as a

result of the slowdown in economic growth partially brought on by high immigration in previous years. Two key insights can be inferred from this line of reasoning; first, while the economic crisis along with the fast-paced growth of the Czech economy was the main influence causing the downturn in economic growth and real wage growth between 2010 and 2015, changes in migrations patterns aided in this process. In contrast to what was argued in the Polish case, post-Enlargement changes in migration trends are arguably significantly large in proportion to the size of the Czech population (10.6 million) that they could plausibly have affected the size and composition of the Czech labour force, affecting decline in real wage growth. Secondly, the reverse relationship between migration and real wage growth from what is predicted by liberal economic theory does not discredit the integrity of the hypotheses.

While evidence underpinning the fit of H1 as it applies to the Norwegian case was rather strong, the fit of H4 to the Czech case is less certain. Apart from the disconnect between the predicted relation between migration and real wage growth discussed, there are no data available longitudinal data on the employment of immigrants in the Czech labour force. Therefore, the evidence examined here must be interpreted as an indication that H4 fit to the Czech case, but less certainly so than in the Norwegian case.

5.5.5 Consideration of the fit of H6 to the Czech case and summation

Although the increase in immigration to the Czech Republic might have contributed to the economic decline and drop in real wage growth, the lack of congruence between migration trends and predicted effect discourages firm conclusion that the Czech case conforms to H4. Moreover, the reversal of inter-sector real wage growth where real wage growth in the Construction sector overtook that of the Finance sector post-Enlargement disqualifies the validity of H6 for the Czech case. Rather than an exacerbation in difference between real wage growth in favour of the Finance sector, the post-Enlargement period oversaw the opposite outcome as real wage growth in the Construction sector overtook that of the Finance sector. Thus, in sum, analysis of the Czech case uncovered no evidence to support any of the hypotheses pertaining to the impact of intra-EU migration on real wage growth in poorer member states.

5.6 Assessment of the hypotheses pertaining to poorer member states comparing and contrasting the Czech and Polish case

Assessing the outcome of the analysis of the poorer member states in conjunction allows better judgement as to how well the hypotheses predict the relationship between post-Enlargement intra-EU migration and high and low-skill workers real wage growth in poorer member states. The most important finding here is that analysis of the Czech case arguably yield a slight indication that the mechanism described in H4 might apply to poorer member states. A qualification is added here, advising evidence suggesting increased immigration to the Czech Republic post-Enlargement contributed to lowering real wage growth in the Construction sector is not as strong as in the Norwegian case. It is further argued that H5 and H6 must be discarded as they pertain to the selected cases.

5.6.1 The case for H4

The poorer member states have in common that the mechanisms described in H4 cannot be confirmed present, although there are slight indications that the mechanism might have been in effect. It is confirmed in the Polish case that the decrease in Construction workers' real wage growth post-Enlargement can largely be attributed to external factors such as the drop in demand in the wake of the economic crisis, the slowdown in recovery growth and the stabilization of the inflation rate. Closer inspection of trends in real wage growth in the Construction sector reveal a correlation between periods of growth and high immigration and decline with increase in immigration. Seeing as the period of decrease in real wage growth coincide with the years following the eruption of the economic crisis, it is tempting to draw parallel to the Norwegian case and claim that the increase in immigration to Poland exacerbated the negative effects of the economic crisis on Construction workers' wages. However, the size of the immigration flow to Poland relative to population is not nearly as large as in the Norwegian case, making it harder to ascribe the increase in immigration as one of the causes of lower real wage growth in the Polish Construction workers' wages. Drawing parallels to the Polish case, the post-Enlargement decrease in real wage growth in the Czech Construction sector was also confirmed to be caused by the slowdown in demand in the wake of the 2008 recession. Disaggregation of the post-Enlargement period reveals an at first counter-intuitive relationship between migration trends and real wage growth, where real wage in the Construction sector increase when net migration is high and decrease when net migration is low. Rooted in liberal economic theory, this-counter intuitive outcome was explained as the

results of cyclical changes in the economy. Immigration correlated positively with the increase in real wages as economic growth attracted a lot of work migrants. While not visible in the results of the analysis, one can speculate whether the influx of immigrants in the first post-Enlargement period contributed to the subsequent decline in Construction workers' real wage growth. Supporting this argument is the observed increase in emigration in the second post-Enlargement period, which may indicate a portion of potential work migrants left the Czech Republic when growth in the economy subsided causing demand for labour to decline. The observed increase in emigration from the Czech Republic in the second post-Enlargement period may therefore indicate the influx of immigrants during the initial post-Enlargement growth period exacerbated the negative effects of the economic crisis on Construction workers' real wage growth. The disaggregation of the Post-Enlargement period reveals real wage growth in the Czech Construction sector only decreased between 2010 and 2015 uncovering the economic crisis to be main reason for the decline. Although, in contrast to the Polish case, the increase in immigration experienced in the first post-Enlargement period is relative to the size of the Czech population substantial and therefore more likely to be of macroeconomic consequence (see Figure 12). Data on the employment of immigrants in the Czech Construction sector is unfortunately not available, thus an absolute confirmation of the effect of increased immigration on real wage growth in the Czech Construction sector cannot be as strongly confirmed as in the Norwegian case. However, the relationship between real wage growth in the Czech Construction sector and trends in migration behave consistently with predictions of liberal economic theory and by extension H4, that one can interpret the results as a careful indication of the presence of the mechanism described in H4.

Considering that the Polish results did not align with the predictions of H4, the argument presented in in the discussion of the wealthier member states is worth revisiting. Due to endogenic properties of the cases chosen for analysis, limitations of the method and the selection of only two cases, it is not warranted to discard a possibility positive result due to it not being present in both cases. Although, a caveat of caution is warranted here; the analysis of the Czech case does not warrant as strong confidence in the validity of H4 as was expressed for the corresponding hypothesis (H1) upon analysis of the Norwegian case. The likelihood that the mechanisms proposed in H1 is observed in Norway is arguably made stronger by data demonstrating a substantial increase in Eastern European immigrants employed in the Construction sector over the course of the post-Enlargement period. Thus, while the analysis of the Czech case might indicate the presence of the mechanisms described in H4, its results are

not strong enough to suggest H4 should be considered valid. Rather, it is warranted to surmise the Czech case indicate the existence of the mechanisms proposed in H4 in poorer member states.

5.6.2 Assessment of H5

No support is found in the analysis of either member state indicating support of H5. Real wage growth in both member states' Finance sectors decreased post-Enlargement. The decrease in real wage growth relative to the pre-Enlargement period has been identified and attributed to decrease in demand cause by the economic crisis, the slowdown in recovery growth marking the pre-Enlargement period in both member states and additionally the stabilization of inflation in the Polish case. While these factors could arguably colluded to inhibit any positive effect on Finance workers' real wage growth, the absence of any such effect nevertheless demand the hypothesis be discarded for the time being. Here, an iteration of the argument applied to the wealthier member states is in order. Once again, the uncertainty surrounding unidentified endogenic properties of the member states analysed, the small number of cases and limitations of the method might not be sufficient to uncover the mechanism proposed in in H5. Thus, while the analysis of these cases warrants H5 must be discarded, the possibility that change in migration trend post-Enlargement did positively influence real wage growth in high-skill workers in poorer member states cannot be fully discounted.

5.6.3 Assessment of H6 and concluding remarks

The inter-sector gap in real wage growth reversed from being in comfortable in favour of the Finance sector to being in favour of the Construction sector in both the Polish and Czech case. The reversal in the inter-sector gap in real wage growth runs directly counter to the prediction of hypotheses number six, predicting the inter-sector difference in real wage growth exacerbate post-Enlargement as a result of changes in migration trends. As in the wealthier countries, the increase of the inter-sector gap was predicted to be the result of the mechanisms described in H4 and H5. Analysis of the wealthier member states granted H3, corresponding to H6 partially validated as the Norwegian case demonstrated the validity of H1 predicting low-skill workers' real wage growth decrease post-Enlargement resulting from increased immigration exerting downward pressure on low-skill workers' wages. As discussed earlier, the evidence validating H1 in the Norwegian case was more substantial than in the Czech case where it was concluded

that the presence of the mechanisms proposed in H4 was only indicated. Thus, the exacerbation of the post-Enlargement inter-sector difference in real wage growth could in the Norwegian case be partly attributed to the increased immigration as predicted in H1. The greater uncertainty surrounding the validity of H4 in relation to the poorer member states does not warrant concluding H6 might be partially valid despite the inter-sector difference in real wage growth behaving the opposite of what was to be expected. The conclusion therefore has to be that the analysis of the poorer member states reveals no results indicating intra-EU migration post-Enlargement exacerbated the difference in real wage growth between high and low skill workers. In sum, analysis of the poorer member states might indicate intra-EU migration post-Enlargement contribute to the decline in low-skill workers' real wage growth over time as was implied in analysis of the Czech case, however the evidence is not sufficient to conclude intra-EU migration exacerbated the economic inequality

6 Conclusion

The overarching research question sought to be answered through testing of the hypotheses was whether and to which extent intra-EU migration contributes to exacerbating economic inequality in both wealthy and poorer member states. While the method of research is associated with a certain degree of uncertainty, some interesting results were found that are worth highlighting.

Great uncertainty is tied to the results found in the poorer member states as intervening variables such as recovery growth, inflation stabilization and the economic crises make effects of changes in migration on real wage growth difficult to isolate. Tentatively, no evidence was found supporting the assumption that the real wage growth high-skill workers' wages rise as a result of intra-EU migration in poorer member states. Real wage growth in the Finance sector in both of the poorer member states decreased post-Enlargement contrary to the expectation espoused in hypothesis number five. Hypotheses number four predicting a decline in low-skill workers' real wage growth post-Enlargement in the poorer member states could not be confirmed in the Polish case. While trends in migration correlated with trends in Construction workers' real wage growth, the migration streams were not sufficiently large that one could confidently conclude increased migration post-Enlargement contributed to depressing real wage growth in the sector. In the Czech case, migrations and trends in real wages in the Construction sector seemed at odds with the hypothesis, however examination might indicate increased immigration post-Enlargement along with the economic crisis contributed to the post-Enlargement decline in real wage in the sector. Lack of data on the employment of immigrants makes the results found in the Czech Republic less certain than those found in Norway. Nevertheless, analysis of the Czech case indicate that intra-EU migration might contribute to depressing low-skill workers wage growth in poorer member states. The hypothesis predicting intra-EU migration would exacerbate economic inequality in poorer member states had to be discarded as the gap in inter-sector real wage growth narrowed in both member states post-Enlargement. The analysis revealed the effect of the economic crisis to be the driving force behind this development, potentially obstructing the predicted outcome as it caused real wage growth in the Finance to decrease substantially post-Enlargement.

The perhaps most convincing confirmation of any causal relationship between intra-EU migration and real wage growth was found in the Norwegian case. Real wage growth in the Norwegian Construction sector decreased post-Enlargement. The impact of increased

immigration post-Enlargement is made likely as data reveal the proportion of Eastern European immigrants employed in the Construction sector to total employees in the sector grew significantly at a time of a downturn in demand for labour. Thus, the analysis yielded support for hypothesis number one predicting low-skill workers' real wage growth decline in wealthier member states as a result of increased immigration post-Enlargement. As in the poorer member states, the hypothesis number two predicting high skill workers' real wage growth in wealthier member states would increase post-Enlargement had to be discarded as the data material revealed no such causal link. While this hypothesis had to be discarded as it pertains to both the wealthier and poorer member states, it can be suspected that the limitations of the applied method of research and the limited number of cases failed to uncover the causal mechanism predicted in this hypothesis.

Considering the diverging conclusions on the validity of hypothesis number one and two, hypotheses number three summarizing the research question was deemed partially valid. The analysis of the Norwegian case yielded a convincing confirmation of the notion that intra-EU migration does depress low-skill workers' real wage growth. The decline of real wage growth in low-skill workers in wealthier member states is sufficient to cause exacerbation of economic inequality in wealthier member states even if results indicate intra-EU migration does not contribute to accelerate real wage growth in high-skill workers.

On a final note, I would like to recommend the relationship between intra-EU migration and wages be pursued further. Referencing that many of the hypotheses have been tentatively discarded citing the limitation of the method and the number of cases as possible sources of error, I think a rigorous panel data analysis could be applied to test the validity of the hypotheses. I specifically recommend researchers interested in pursuing this topic strive to study the effects of intra-EU migration comprehensively including several cases and segments of the labour force to the analysis. As mentioned, research on this topic has up until now focused on the effects in individual member states and segments of the labour force, contributing only to a piecemeal understanding of the effects of migration on wages in the EU context. A shift towards a more comprehensive approach in the research front, studying the effect of intra-EU migration on wages several member states over time would dramatically improve our understanding of the relationship between intra-EU migration and wages, that has now become a politically contentious issue.

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