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Labour migration to rural Norway

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Summary

This dissertation is a quantitative sociological study of labour migration to rural Norway and its effect on the rural labour market and society. The enlargement of the European Union, which included many post-communist countries in the east, marked the beginning of a new era of immigration in Norway. Not only was the increase in immigration unprecedented, but the new labour migrants, who are referred to as EU11 labour migrants, also displayed a unique settlement pattern. Immigration has traditionally been an urban phenomenon, but the EU11 migrants have settled in every municipality in Norway. Rural areas now host a more significant percentage of labour migrants than urban areas. The EU11 labour migrants' arrival has raised concerns about adverse effects on the labour market, such as increasing social inequality. However, from a rural perspective, immigration is also discussed as a potential solution to the rural depopulation problem.

The purpose of this dissertation is to examine the phenomenon of labour migration to rural Norway (after the EU enlargement in 2004) and how it has affected rural societies in terms of processes related to income inequality and geographic and social mobility. The dissertation consists of four articles, in which I examine 1) the spatial distribution of EU11 migrants in rural Norway and the characteristics of municipalities with many labour migrants, 2) the connection between labour migration and income inequality in rural and urban municipalities, 3) the connection between labour migration and natives' internal mobility patterns in rural areas, and 4) the social mobility patterns of natives, EU11 immigrants, and non-western immigrants in an immigrant niche – the Norwegian fish-processing industry.

Full population register data, at the municipality or individual level, are utilized in all four articles. The findings contribute to our knowledge about the rural labour migration phenomenon in several ways. First, I find that the spatial distribution of EU11 migrants is closely connected with labour market variables, such as the size of rural industries such as fish processing. Further, EU11 labour migrants settle in the more viable rural communities – not the rural areas that struggle the most with depopulation. Second, I find that increasing proportions of EU11 labour migrants and refugees are followed by rising income inequality in rural and urban municipalities. However, when studying the effect on income inequality within the native population, only EU11 labour migration has a (modest) effect, which is valid only in rural municipalities. Third, I find no systematic connection between EU11 labour migration and natives' geographic mobility patterns. Finally, I find a clear hierarchical pattern when studying the social mobility patterns of workers in the Norwegian fish-processing industry.

Norwegian-born workers had the highest probability of upward mobility, EU11 labour migrants were most likely to be immobile, and non-Western immigrants were most likely to be downwardly mobile.

Overall, I conclude that the arrival of EU11 labour migrants has resulted in a more unequal rural society, but the effect is relatively modest. Natives have not been majorly affected, which suggests that labour migrants and natives mainly work in different segments of the labour market. Regarding rural depopulation, I argue that the notion that immigrants can save rural areas is too optimistic and that the solution to the problem lies in the labour market and not in immigration in itself.

Content

Introduction

In 2004, 2007, and 2013 the European labour marked was opened to many of the post-communist countries in Europe (EU11)[1]. Norway is among the countries that have received the largest number of labour migrants relative to its population (Friberg & Eldring, 2013). In 2020, close to 200,000 immigrants from EU11 countries have settled in Norway, and they now make up almost 4,3 percent of the population. The majority come from Poland (over 100,000) and Lithuania (over 40,000), which now are the largest immigrant groups in Norway (Statistics Norway, n.d.-a).

The arrival of EU11 labour migrants can be said to mark the beginning of a new era in the history of immigration to Norway. Before 2004, (non-Nordic) labour migrants constituted a very small number of the immigrants to Norway. The labour migrants who arrived before the immigration stop in 1975 constitute only a fraction of EU11 migrants (Østby, 2017). Norway's inclusion in the EU's internal market in 1994 did not alter this, because relatively few persons from the old EU countries came to Norway. The inclusion of the EU11 countries in this market, however, caused a sudden rise in immigration, one unprecedented in Norwegian immigration history. Never before have so many immigrants arrived in so few years (Friberg, 2016). This development is displayed in Figure 1.

Traditionally, immigration to Norway has been mainly an urban phenomenon. This has changed in the last two decades. EU11 labour migrants have not just arrived in the large cities, such as Oslo. They have arrived and settled in every Norwegian municipality. Thus, their settlement patterns are different from that of previous labour migrants and refugees. Many of Norway's rural municipalities, defined in this dissertation as peripheral, sparsely populated, or characterised by primary industries, were previously completely unfamiliar with immigration, but they have now received a large number of migrants. The EU11 labour migrants have thus changed the spatial distribution of immigrants in Norway. Figure 2 illustrates this point.

In just a few years, the Norwegian countryside has evolved from a relatively homogenous place into a more heterogenous, multicultural place. The purpose of this dissertation is to increase our knowledge about this phenomenon and its effects on rural societies.

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[1] Poland, Lithuania, Latvia, Estonia, Czech Republic, Slovakia, Hungary, Slovenia (2004), Romania, Bulgaria (2007), and Croatia (2013).
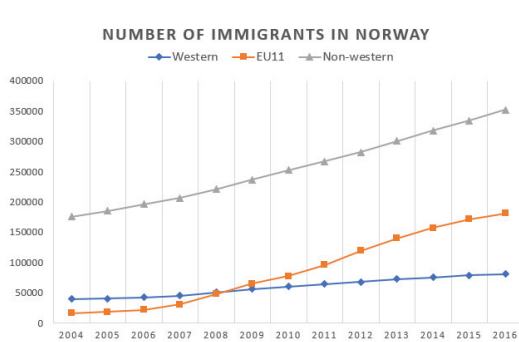
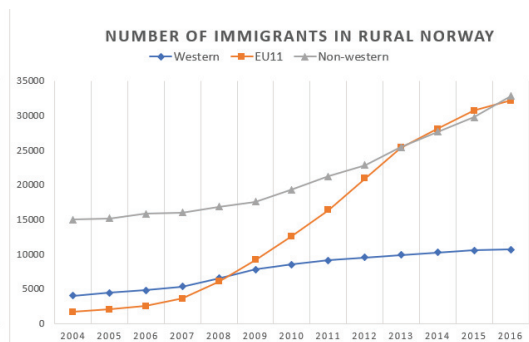Figure 1: Number of (non-Nordic) immigrants in Norway

Figure 2: Number of (non-Nordic) immigrants in rural Norway

The arrival of EU11 labour migrants is not only historic due to their large numbers and spatial distribution. Their arrival has changed the Norwegian labour market. The EU enlargement gave Norwegian employers and firms free access to a large pool of labourers from countries with significantly lower wages. This has given rise to concerns about low-wage competition, social dumping, segmentation, and increasing inequality in the Norwegian labour market. Such effects are often discussed as a threat to the 'Norwegian model' and have been an important part of the academic and political discourse in Norway (Bungum, Forseth, & Kvande, 2015; Friberg, 2016). The Norwegian model, or, more generally, the Nordic model, is known for its ability to combine efficiency and equality. It is characterized by a generous universal welfare state, mainly financed by taxes, which provides free education, healthcare, and social security in case of unemployment or disability. Work is highly organized and regulated, and employees have strong statutory labour rights. Strong labour unions and employer organizations work together in a "conflict partnership" (Dølvik, Fløtten, Hippe, & Jordfald, 2014) and take part in centralised wage-negotiations that have ensured a low level of income inequality (NOU, 2011:7).

Equality is one of the main foundations, as well as a result of the Norwegian model. In the political discourse, there is a high degree of agreement that small income differences are desired. It is not only important for left-wing parties but acknowledged by the current right-wing government, which claims that a low level of inequality unites people and is important in maintaining high levels of trust (Finansdepartementet, 2019).

Several contributions in the Norwegian literature have discussed and studied labour migration as a potential threat to equality. Sociologist Ottar Brox (2005) has argued against labour

migration for decades. His argument is simple: in the decades after WW2, the working class experienced increasing wages, and the wage-gap between the working class and middle class decreased. A precondition for this was full employment, which gave the working-class market power, specifically leverage to demand higher pay and better working conditions. However, when employers have access to what seems to be an inexhaustible supply of labour from poorer countries, full employment will never be seen again. The working class, which competes with the labour migrants, have lost their power; their income will stagnate or fall; and social inequality will increase. Eventually, we could develop an underclass of 'working poor' (Brox, 2005). Norwegian labour market researchers have pointed out that the Norwegian labour market may be particularly vulnerable to low-wage competition and social dumping because there is no statutory minimum wage (Dølvik, Eldring, & Ødegård, 2005; Friberg, 2016). After 2004, the General Application Act (the extension of collective agreements to entire industries) has been used in several industries where EU11 migrants cluster, which in itself is evidence of the effects of labour migration: the extension of collective agreements requires comprehensive documentation of social dumping (Eldring & Ørjasæter, 2018). There is thus little doubt that the exploitation of labour migrants has occurred or, more generally, that labour migrants are heavily concentrated in certain low-wage jobs (Friberg, 2016), with more atypical and insecure labour market attachments (Nergaard et al., 2011) and lower income levels (Jordfald & Dølvik, 2015; Statistics Norway, 2017). While a cross-sectional analysis of EU11 immigrants' labour market status suggests clear disadvantages, the question of opportunities for social mobility remains. Is their situation permanent, or will they, over time, display upward (or downward) mobility? Further, how does labour migration affect other workers in Norway? Are labour migrants competing with natives and thus lowering their wages and employment opportunities, or do they mainly take jobs natives do not want? The effect of immigration on natives' labour market outcomes is a disputed subject in the international literature, and the empirical evidence presented is divergent (See for example Blau & Kahn, 2012; Borjas, 2003; Borjas & Katz, 2005; Card, 2009; Dustmann, Frattini, & Preston, 2012; Okkerse, 2008). In Norway, the evidence is also somewhat mixed and very limited (Bratsberg & Raaum, 2012; Bratsberg, Raaum, Røed, & Schøne, 2014; Elstad & Heggebø, 2020; Hoen, Markussen, & Røed, 2018). In a review of the research on labour migration to Norway, Friberg (2016, p. 36) argues that we know too little about the direct effect of labour migration on the overall patterns of social inequality.

This dissertation is a contribution to this debate. Its main goal is to contribute to a better understanding of EU11 migrants' role in and effect on the Norwegian labour marked: is labour migration a source of increasing inequality? If so, is increasing inequality simply a result of the labour migrants' own position in the labour market, or has their presence affected other workers? Further, is the migrants' position in the lower segments of the labour market permanent, or do they have opportunities for upward mobility?

Moreover, I have focused on rural areas, and *this dissertation is also a contribution to the field of rural studies and the particular challenges faced by rural areas.* Although the Norwegian countryside has seen its first real influx of international migrants during the last two decades, a focus on rural areas has been lacking in research on labour migration. The exceptions are mainly qualitative studies focusing on the experiences of immigrants in rural locations (Andrzejewska & Rye, 2012; Aure, 2008; Rye, 2014; Stachowski, 2020). Quantitative research on labour migration to rural areas, however, is harder to find, not just in Norway but in the international literature as well. In my opinion, a focus on rural areas is necessary for two reasons. First, it is not obvious that the effect of labour migration is the same in large cities and small villages. Second, one of the greatest challenges faced by rural areas is depopulation. For several decades, Norway has experienced strong centralization (Johansen & Onsager, 2017; Langørgen, 2007). Just as there is a strong consensus on the importance of equality, there is broad political consensus on the importance of settlement in *all* of Norway (Kommunal- og regionaldepartementet, 2013). The arrival of immigrants is therefore demographically interesting, and a growing literature discusses the possibility that immigration can be a solution to the rural depopulation problem (Aure, Førde, & Magnussen, 2018; Collantes, Pinilla, Sáez-Pérez, & Silvestre, 2014; Hedberg & Haandrikman, 2014). In this dissertation, I contribute to this field of research by examining the settlement patterns of labour migrants in rural areas, as well as the effect of labour migration on the settlement patterns of natives in rural areas.

Overall, the purpose of this dissertation is to examine the phenomenon of labour migration to rural Norway (after the EU enlargement in 2004) and how it has affected rural societies in terms of processes related to income inequality and geographic and social mobility.

The dissertation consists of four articles. In the following, I will refer to the articles as "Article 1", "Article 2", etc.

Article 1	Rye, J. F. & Slettebak, M. H. (2020). The new geography of labour migration: EU11 migrants in rural Norway. *Journal of Rural Studies, 75*, 125-131
Article 2	Slettebak, M. H. (2020). Labour migration and increasing inequality in Norway. *Acta Sociologica, 64*(3) 314-330.
Article 3	Slettebak, M. H. (2021). Does international labour migration affect internal mobility in rural Norway? In Rye, J. F. & O`Reilly, K. *International Labour Migration to Europe's Rural Regions.* Oxon: Routledge.
Article 4	Slettebak, M. H. & Rye, J. F. (Unpublished). Social (im)mobility in low-skilled and low-wage immigrant niches. Submitted to *Nordic Journal of Working Life Studies.*

I have utilized quantitative register data in all four articles, at the municipality level (Articles 1–3) and individual level (Article 4). These are high-quality, full-population data, which allows me to study change over time. However, there are some limitations on what phenomena can be studied, as well as how they are measured.

The structure of this dissertation is as follows: I will first present and discuss my use of theory. Second, I discuss the advantages and limitations of the data I have applied, the operationalisation of some key variables, and the methods of analysis, particularly in relation to the concept of causality. Third, I present short summaries of each article. Finally, I discuss my overall findings and their implications and offer some conclusions.

Labour markets and labour migrants - Theoretical perspectives and previous research

Thematically, this dissertation is about immigration, labour markets, and rural areas. Theoretically, however, it is mainly about how the two phenomena of (rural) labour markets and immigration interact with one another. In this dissertation, theory is mainly used in a deductive way, to formulate concrete hypotheses and expectations about connections between phenomena. I apply a combination of sociological and economic theory. I have found that concepts and theories within neoclassic economic theory and segmented labour market theory have been the most relevant and fruitful. Both theoretical perspectives contribute to our understanding of *labour* migration – why labour migration occurs and what the consequences are, both for labour migrants and natives, in terms of the receiving country's labour market. Although these perspectives are in focus, other relevant sociological concepts and theories (not directly related to segmented labour market theory) will, of course, be mentioned and discussed.

In this chapter, I will describe these perspectives and discuss how the theories have been applied in the four articles in this dissertation. Previous research will also be presented. I will focus the theoretical discussion on three highly related questions that have been central to the four articles. In Table 1, I have presented these questions, along with a very simplified overview of the answers provided by neoclassic economic theory and segmented labour market theory.

Table 1 highlights the differences between the two perspectives, but I would like to point out that the theories are far from mutually exclusive. For instance, migration can be caused by high demand in the receiving country *and* income (and employment) differences between countries. Segmented labour market theory is a sociological reaction to (what its proponents see as) the shortcomings of economic theory, and it does not object to all of the assumptions of neoclassic economic theory. Rather, it focuses on many of the *social* processes that economists may have overlooked.

Table 1: A simple overview of theoretical differences

	Neoclassic economic theory	**Segmented labour market theory**
What are the main causes of migration?	Income differences between countries produce strong incentives to migrate for (rational) individuals	Migration is caused by high demand for labour in the secondary sector of the labour market
What are the consequences of immigration for native workers?	Immigration lowers wages and employment for substitute workers. Complementary workers receive higher wages.	Most native workers do not compete with the labour migrants; therefore, their wages and jobs are not threatened
How are the immigrants doing, and what opportunities do they have in the receiving labour market?	It depends on the immigrant's human capital	They often remain trapped in secondary sector jobs, regardless of their human capital level

What are the main causes of migration?

Neoclassic theory and segmented labour market theory give two very different answers to this question. These answers are important because they have implications for how the next two questions are answered.

Neoclassic theory focuses on the supply side when explaining migration. The causal explanation begins with the individual. One of the most important assumptions for neoclassical economists is that individuals are utility maximisers – rational agents who act based on the information they have to maximise their utility. Migration is thus understood as the outcome of the decisions of individuals who have weighed the costs of migration (for instance, monetary, social and cultural costs) against the rewards (expected income in the destination) and concluded that migration is the best option. In the simplest models, people decide to move if the income in the destination (minus the cost of migration) will be higher than their income in the country of origin (Bansak, Simpson, & Zavodny, 2015).

In segmented labour market theory, the focus is on the demand side. In his seminal book *Birds of Passage*, Piore (1979) argues that migration is demand driven. To understand labour migration is to understand the demand for migrant workers in the receiving country. This

demand is rooted in the dual nature of the labour market in industrial societies, which requires further elaboration:

According to dual labour market theory, the labour market is divided into a primary and secondary sector. This duality is rooted in the uncertainty we find in all economic activity, uncertainty created, for example, by seasonal variations, trends, booms, and depressions. *Someone must bear the cost of this uncertainty*. According to Piore (1979), *labour* (as opposed to capital) bears a disproportionate share of this cost. Labour is the variable factor in production. When demand declines, workers can be laid off and have to pay the cost of their own unemployment. Capital is the fixed factor in production, and even if demand declines, it cannot be laid off. The owner of capital can be made to bear the cost of its unemployment, for instance, continuing to pay for a new machine that is not being used. The owners therefore seek to meet the more stable demand with capital and the more variable, fluctuating demand with labour.

While this is nothing new, dual labour market theory argues that this dualism between capital and labour is also extended to a distinction *within* the labour market. Doeringer and Piore (1971) argue that 1) skill specificity, 2) on-the-job training, and 3) customary law are three important factors that create internal labour market (ILM) structures, which the primary sector is composed of. In many cases, the employer is forced to invest in labour in the same way that he or she invests in capital. If the labourers require specific skills and experience to perform, the employer must invest in their training, and the labour becomes expensive to let go, just like capital. Because of this, there is an incentive to organise production so that these workers have stable and secure employment. Further, where there is a stable labour force, rules and norms based on previous practice will begin to develop. Such work rules – or customary laws – can become rigid and may not respond to changes in the market. This can explain the long-term stability in the wage and allocative structures of internal labour markets (Doeringer & Piore, 1971). The *primary sector* is made up of a series of well-developed ILMs. Jobs in the primary sector are characterised by "… relatively high wages, good working conditions, chances of advancement, equity and due process in the administration of work rules, and, above all, employment stability" (Piore, 1972, p. 2). It is stability of employment that is the defining feature of the primary sector (because the laborers are like capital), while the other characteristics can be viewed as derivative of this factor.

Although the development of ILMs has shielded a great number of workers, the flux and uncertainty of economic activity remains, and its cost is borne by the workers in the *secondary sector*: "… a sector of the labour market that is not subject to restrictions on layoff and discharge to which the unstable portion of demand can be transferred" (Piore, 1979, p. 39). In addition to considerable instability in jobs and high turnover among the labour force, the jobs in the secondary sector are often low paying, with poor working conditions and – last but not least – little chance of advancement.

According to Piore (1979), primary sector jobs are reserved for natives, while migrants are found in the secondary sector. Natives shy away from secondary sector jobs – not just due to the characteristics described above but because the jobs have low social status. Piore argues that workers are not simply like commodities and cannot be analysed as such. Income is not everything. Workers are social beings, and the status and social meanings attached to a job therefore matter greatly. While this is true for natives, (temporary) migrants are able to distance themselves from the jobs they perform in the receiving country. Their social status is primarily located in their home-country, and the work they perform is viewed as an instrument to earn money to be spent there. Therefore, migrants are often viewed in the receiving country as the perfect labourers for the secondary sector.

In conclusion, migration occurs because of high demand for labour in the low-status jobs in the secondary sector. While neoclassic theory assumes that immigration will slow down if the main sending country increased its wages and employment, dual labour market theory argues that employers will simply look to new sending countries to obtain the labour they need (Piore, 1979, p. 9).

The cause of migration is not something that is directly empirically examined in this dissertation. However, the answers given by neoclassic theory and, particularly, dual labour market theory have inspired (along with previous empirical studies) the hypotheses and discussion in Article 1, which studies the spatial distribution of labour migrants in rural Norway. Further, dual labour market theory's claim that migration is demand driven inspired me to examine the direction of the relationship between income inequality and labour migration in Article 2. Research on the connection between immigration and income inequality is, to a large degree, dominated by economists who take the direction of the relationship for granted: they study how immigration affects income inequality (See for instance Blau & Kahn, 2012;

Borjas, 2003; Card, 2009; Okkerse, 2008). Dual labour market theory, however, questions this causal direction. Piore (1979) himself does not write about income inequality directly, but his claim that the labour market has become increasingly divided into primary (good) and secondary (bad) jobs implies increasing inequality. This leads to a line of thinking in which structural changes in the labour market are the real cause of increasing inequality – increasing immigration is simply a consequence of these changes and the demand for low-skilled labour. Thus, the literature on immigration and inequality can be divided in two: the supply-side perspective (neoclassic theory) and the demand-side perspective (inspired by dual labour market theory). Hyde, Pais, and Wallace (2015) formulated the demand-side argument in the following way: "…employers first create the degraded job structures, then discover that native workers are unwilling to accept such deplorable conditions of work, and then turn to foreign-born workers as a readily available alternative" (Hyde et al., 2015, p. 83). I do not find support for this argument, and this is discussed further in Article 2.

What are the consequences of immigration for native workers?
This is the central question in Articles 2 and 3, which attempt to measure the effect of labour migration on native's income inequality and mobility patterns directly. In both articles, the concepts and assumptions of neoclassic theory and segmented labour market theory are used to formulate hypotheses and discuss the results.

Within neoclassic theory, the effects of immigration in the receiving country can be deduced from the laws of supply and demand. In the basic (and simplest) model of immigration, it is assumed that immigration increases the supply of labour, which causes wages to fall.

However, this simple model assumes that immigrants and natives are perfect substitutes, which means that they are interchangeable and compete for the same jobs. In a more realistic model, immigration will have different effects on different groups of native workers, depending on whether they are substitutes or complements. While native workers who are substitutes for immigrants will experience falling wages, complementary workers will receive higher wages due to increased demand. Furthermore, assuming that the labour supply curve is upward sloping – which means that the supply of labour increases when wages increase – the change in wages will also affect employment, reducing employment for substitutes and increasing it for complements (Bansak et al., 2015).

Thus, according to neoclassical theory, immigration creates some winners and losers. The winners are the immigrants (who receive a higher wage than they would in the origin country),

the firms that hire immigrants (lower labour costs), and complementary workers (who receive higher wages and have better employment opportunities). The workers who are substitutable with immigrants (competing natives but also former immigrants) will, however, lose; their wages will be reduced, and some will exit the labour market (Bansak et al., 2015; Borjas, 2003).

These assumptions of neoclassic theory are used in both Articles 2 and 3 and, to some degree, also Article 4. Article 2 discusses the connection between immigration and income inequality (for the population in general and within the native-born population). Based on neoclassic theory, the expectation is that increasing immigration is followed by increasing inequality, not only because immigrants have lower incomes or more dispersed incomes, which affects overall income inequality (which is usually an undisputed empirical finding, see for instance Blau & Kahn, 2012; Card, 2009) but also because immigration creates winners and losers within the native population and therefore also increases native income inequality.

Although the basic neoclassic model has quite clear implications, the results of empirical research vary greatly. An enormous amount of research exists because the effect of immigration on natives' wages is one of the most studied topics in economics (Bansak et al., 2015). Literature reviews are therefore a useful resource. Blau and Kahn (2012, p. 52) conclude that "While some studies do find important effects, overall, it seems to us that most research does not find quantitatively important effects on the part of immigration on native wage levels or the wage distribution." These researchers do, however, also note that a recurring finding is that immigration has larger effects on the wages of prior immigrants than on those of natives. This suggests that immigrants are perfect substitutes for other immigrants but *imperfect* substitutes for natives. Card (2009, p. 19) draws a similar conclusion after reviewing evidence from cross-city comparisons in the US: "immigration has not had much effect on native wage inequality in the United States."

Thus, it seems as if the (simple) neoclassical model overestimates the impact of immigration on natives' wages. However, many potential adjustments, as well as methodological issues, are suggested, which could explain why the effects are not larger or present in all contexts. I will not go into all of this but, rather, focus on the issue of natives' geographic mobility because this is central in Article 3.

One of several potential labour market adjustments to immigration shocks is natives' geographic mobility. The basic neoclassic model presented above assumes that labour markets are closed. In reality, labour markets are, of course, not closed, and natives could respond to

immigration by relocating, referred to by some as "voting with their feet" (Bansak et al., 2015; Borjas, 2006). Thus, if an area experiences rising numbers of migrants to low-skilled jobs (which, in theory, should put downward pressure on wages), low-skilled natives can choose to move out of this area or avoid moving into it. In contrast, complementary workers (who, in theory, should experience rising wages and/or new employment opportunities in this area) will be attracted to the area. In Article 3, I use these assumptions from neoclassic theory to formulate hypotheses about the effect of labour migration on different groups of native workers in rural Norway.

In Articles 2 and 3, neoclassic theory is "challenged" by contributions from segmented labour market theory, which provides different answers regarding the effect of immigration on natives. Because (temporary) migrants take jobs in the secondary sector that natives do not want, migrants and natives are mainly not in competition with one another. There are, however, some exceptions according to Piore (1979): youth, housewives, and peasant workers. These groups share some characteristics with the migrants, namely that they view their work in the secondary sector as temporary and that they define themselves by some other activity (their studies, their family, or the farm they own). Their social status thus comes from something or someone else. In the decades after Piore (1979) wrote *Birds of Passage*, radical changes have taken place regarding this domestic "reserve labour force." Most women have joined the labour force permanently and are concerned with the status of their jobs as well as income. Further, the extension of formal education and higher education for the masses has reduced the number of youths available for work in the secondary sector (Massey et al., 1993). Lastly, the number of small family farms continues to decrease as large-scale industrial farming takes over (Rye, Slettebak, & Bjørkhaug, 2018). Thus, the traditional domestic labour force, which was willing to accept work in the secondary sector, has gradually disappeared.

If we follow this logic, very few native workers compete against labour migrants for work in the secondary sector. The effect of labour migration on natives' wages (studied in Article 2) and employment opportunities should therefore be small. Consequently, the internal migration patterns (studied in Article 3) of low-skilled natives should not be affected either.

Segmented labour market theory's views on immigrant/native competition are also relevant in Article 4, which examines the social mobility patterns of immigrants and natives in the Norwegian fish-processing industry – a growing immigrant niche (a concept we return to in the next section). From a demand-side perspective, immigrants have not displaced Norwegian-

born workers in the niche. Immigrants have entered certain jobs in large numbers because Norwegian-born workers leave and avoid these jobs. At the bottom of the labour market, the supply of labour is inherently instable. Because the work is stigmatizing and unpleasant, the established native workforce will leave for better jobs if economic expansion makes this possible (Waldinger & Lichter, 2003). Natives' increasingly negative attitudes towards work in certain low-skilled and low-waged jobs is also theorized in Norwegian research on the fish-processing industry and hotel-cleaning work (Friberg & Midtbøen, 2018, 2019). In order to explain niche formation, Friberg and Midtbøen (2019) present a model of cumulative causation: natives have gradually abandoned some of Norway's working-class industries due to an educational revolution and growth in income levels. Meanwhile, immigrants have entered and have gradually redefined these jobs as "immigrant jobs" with low status, which again reinforces natives' incentives to pursue higher education.

The assumptions in segmented labour market theory and previous research on immigrant niches inspired me to study the social mobility patterns of not only immigrants (as discussed in the next section) but also *natives* in the immigrant niche to determine whether their mobility patterns are, in fact, patterns of upward mobility.

How are the immigrants doing, and what opportunities do they have in the receiving labour market?

The first part of this question, regarding how immigrants are doing (performing) in the receiving labour market, is mainly an empirical question, but the explanation is theoretical. In most western countries, immigrants are not evenly distributed across industries and occupations in the host countries' labour markets: they are concentrated in certain industries and occupations, usually in low-skilled and low-wage jobs (Friberg, 2016; Kogan, 2007; Kolsrud, Røed, Schøne, & von Simson, 2016; Peixoto et al., 2012). The phenomenon have been referred to as immigrant niches (Chan, 2013; Model, 1993; Waldinger, 1994; Waldinger & Der-Martirosian, 2001), and it is defined by overrepresentation of at least 1,5 (Model, 1993; Waldinger & Bozorgmehr, 1996). In Article 4, such a niche (the Norwegian fish-processing industry) is examined, and the social mobility patterns of immigrants (and natives) are tracked.

Before discussing the theories applied in Article 4, I will briefly discuss the concept of social mobility. This concept is central in sociology and was defined almost a century ago by Sorokin (1927) as the shifting of individuals within social space. Mobility can, according to Sorokin, be both horizontal and vertical. However, social mobility is mainly associated with vertical

social mobility, and the study of social mobility therefore rests on the assumption that social positions can be arranged hierarchically (Hjellbrekke & Korsnes, 2012). The concept is thus closely linked with concepts such as class, inequality, and stratification. Social mobility can be measured both between generations (intergenerational) and over the life course (intragenerational). The former has been the main focus of social mobility research (Ringdal, 2010), but in this dissertation, only intragenerational mobility is measured.

The study of intragenerational mobility is particularly interesting in the field of immigration because immigrants, more often than natives, are found in jobs at the bottom of the social hierarchy. Two main theoretical questions are discussed in the following section: first, how can we explain immigrant concentration in the labour market, and second, is the disadvantaged situation of immigrants (in low-skilled and low-waged niches) permanent, or will they experience upward mobility over time?

Neoclassic theory and segmented labour market theory present two versions of the labour market, different explanations of inequality and ethnic/immigrant concentration in the labour market, and, therefore, also two different stories about immigrants' opportunities for social mobility.

In neoclassical theory, the labour market is a single competitive market in which everyone competes for jobs based on their preferences and skills. Individuals make choices about investment in human capital (such as education and skills) and how much they want to work (their labour supply). Inequalities in the labour market are the result of differences in these choices (Leontaridi, 1998). The concentration of immigrants in low-skilled and low-wage jobs is mainly explained by their level of human capital. When migrants first arrive, they may lack the right kind of human capital in the destination, as well as language skills. It is therefore expected that immigrants will experience downward mobility when they arrive in the receiving country. Over time, however, immigrants experience upward mobility as they accumulate country-specific capital, such as language skills or education (Bansak et al., 2015). Thus, the assimilation model predicts a U-shaped pattern of social mobility: downward mobility when they arrive, followed by upward mobility as they adapt and assimilate. The decisive factor is human capital: skills, experience, and education. With the same level of (country-specific) human capital, immigrants should have the same opportunities as natives. Many studies find support for the assimilation model, but the depth and shape of the U seem to vary for different groups of immigrants (Akresh, 2008; Chiswick, Lee, & Miller, 2005; Rooth & Ekberg, 2006).

Segmented labour market theory grew out of criticism of the classical and neo-classical economic approach to explain how the labour market works. They reject the assumption that workers freely choose jobs based on their preferences and skills and argue that the labour market consists of various non-competing segments, such as Piore`s (1979) primary and secondary segments. In these different segments, rewards (such as money) for human capital (such as skills, knowledge, and experience) differ due to institutional barriers. Thus, the labour market segmentation that exists does not correspond to skill differentials in the labour market (Leontaridi, 1998).

Contributions within segmented labour market theory (and social network theory) broaden our understanding of the social processes that create ethnic segmentation in the labour market because they focus on other aspects than human capital. The formation of niches has received much attention, and various aspects of the process of niche formation have been highlighted. Three main parts are involved in the process of immigrant niche formation: the immigrants, the employers, and (unless the niche is entirely new) the incumbent labour force. The incumbent (native) labour force was discussed above, and it is expected that they will leave the niche to pursue jobs with higher status and wages (Piore, 1979; Waldinger & Lichter, 2003). In the following, I will briefly discuss the supply of immigrants, as well as the employer's perspective.

The supply of immigrants to the niche is often explained through network theory. If a few initial migrants have found their place, others from their network tend to follow (Waldinger & Der-Martirosian, 2001). The costs and risks associated with migration are substantially lower for the migrants that follow behind because they can expect help with finding a job (in the niche), as well as accommodations and other needs in the destination. For every new act of migration to the destination, the door is opened for new potential migrants, making migration a self-sustaining process (King, 2012; Massey et al., 1993). From the point of view of the employer, there are several benefits of drawing on the network of their employees when hiring new workers. Recruitment through networks is efficient and cheap. Further, it reduces risks because the current migrant workers do not want to be responsible for recruiting a "bad worker" (Friberg & Midtbøen, 2019; Waldinger & Der-Martirosian, 2001).

However, employers' demand for migrant workers cannot be solely explained by the benefits of network recruitment – after all, all kinds of workers have networks. While Piore (1979) did not write in any detail about employers' preferences, more recent contributions within segmented labour market theory have theorized the part of the employer. Waldinger and Lichter (2003) argue that employers hire people not mainly based on their formal skills and human capital but based on generalised categorisations of entire groups. Stereotypes related to gender, age, class, and ethnicity are important because employers often have limited information about the people they hire. Thus, they argue that, in a racialised society (like the United States), entire ethnic groups are ranked according to their traits, and their ranking determines their suitability for different jobs. This creates hiring queues; the group ranked as most suitable for a type of job is hired first, while the rest follow in order (Waldinger & Lichter, 2003). Moreover, employers look for workers with the right attitude, that is, workers who are willing to accept subordination without complaint and say "yes" with no questions asked. Migrants with a dual frame of reference (comparing conditions in the receiving country with conditions back home) have the right mindset, and as long as this comparison is relevant, migrants are willing to accept hard, low-status work because conditions "back home" are less attractive. This dual frame of reference explains not only why immigrants would want to take on jobs that natives avoid but also why employers would *prefer* immigrants over natives. Immigrants – and particularly newcomers – are preferred because they are not like "us" (Waldinger & Lichter, 2003). Findings from several studies support the existence of these discriminatory practices based on ethnic stereotypes (Friberg & Midtbøen, 2018; Koivunen, Ylöstalo, & Otonkorpi-Lehtoranta, 2015; MacKenzie & Forde, 2009; Ruhs & Anderson, 2010; Scott & Rye, 2021; Tannock, 2015).

In conclusion, immigrant niches develop due to high demand for (the right kind of) labour as the native labour force exits (for better jobs). The supply of immigrants to the niche is aided by social networks, which also contributes to the clustering of ethnic groups/nationalities.

While segmented labour market theory is very clear on the prospects for natives, it is somewhat less clear on immigrants' chances of advancement. The jobs in the fish-processing industry do, to a large degree, fit Piore's (1979) description of the secondary sector. They are physically demanding and have low status and relatively low pay. Piore (1979) argues that immigrants are likely to stay in these jobs because they have very limited opportunities for upward mobility in this sector. Furthermore, unlike natives, they can be content with these low status jobs because they view their work purely as a means to an end. This is, however, likely to change

in the long run as the migrants settle down and become more integrated into the receiving country. Piore does, however, suggest that first-generation migrants rarely become fully assimilated and that the shift in attitudes toward the labour market is not complete until the second generation (Piore, 1979, p. 65). Thus, because I focus on recently arrived labour migrants, based on Piore's (1979) reasoning, the assumption is that these migrants are found in the secondary sector, with very limited upward mobility.

However, the focus on ethnic niches and networks has led researchers to be somewhat more optimistic about migrants' possibilities for upward mobility. Studies of ethnic enclaves and immigrant niches show that concentration can be beneficial for the dominant ethnic groups; as co-ethnics help each other climb the ladder (Wilson & Portes, 1980), overrepresented groups will have advantages when new and better positions within the niche become available (Model, 1993), and the search for advancement takes on a collective and not an individual form (Waldinger, 2005).

In Article 4, I study the social mobility patterns of workers in a growing immigrant niche, the Norwegian fish-processing industry. To my knowledge, there are many studies on immigrants' intragenerational mobility in general (Akresh, 2008; Barbiano di Belgiojoso, 2019; Hipólito, Raul, & Esteban, 2014; Rooth & Ekberg, 2006) but few quantitative studies that follow immigrant (and native) workers over time in a specific niche. Based on the theories I have presented, I hypothesised that immigrants would display less upward mobility than natives. Further, there are several reasons to believe that some immigrant groups, such as Polish and Lithuanian (EU11) labour migrants, have advantages in the search for upward mobility that other groups (such as the more heterogenous group of non-western immigrant workers) lack. These hypotheses are examined in Article 4.

Materials and methods

All the articles in this dissertation are empirical articles based on quantitative analyses. In this chapter, I will first present the data that have been applied in the four articles and discuss their quality. Second, I discuss the operationalisation of some key variables used in the articles. Third, I discuss the methods of analysis and their suitability for drawing causal inferences.

Register data and full-population data

This thesis is based on register data. Register data are an excellent research tool and have many advantages as compared to other quantitative data, such as survey data. The most important advantage of register data is the possibility of examining all the units in a population. All the articles in this dissertation are based on such full-population data. Thus, all issues related to sampling, particularly the concern that the sample is not representative of the population in question, are irrelevant. In relation to full-population data, there is a common misconception that I would like to address briefly. This misconception is that significance testing only makes sense when a researcher generalizes from a sample to a population. This is based on a faulty use of statistical sampling theory, a theory that should only be used when we want to make generalisations about the size of a single variable in a population based on a sample, for instance, how many people plan to vote for a particular political party? However, social scientists often want to study the connection between variables, for instance, are men more likely to vote for a particular political party? In the latter case, we must use theory for stochastic models. The aim of such models is not to generalise from a sample to a population but to make generalisations about the *connection* between variables. Thus, it does not matter if the data are from a sample or the entire population. However, in the latter case, we have more information and will obtain more precise and reliable results (Aaberge & Laake, 1984).

Statistics Norway is the primary source for the register data used in this thesis. The data are either downloaded for free from Statistics Norway`s website, ordered from Statistics Norway or made available to me by Microdata.no, a platform created by Statistics Norway and Norwegian Centre for Research Data (NSD).

Data from Statistics Norway are generally known for their high quality. In my experience, the data are easily available online, along with the information I need. Whenever I have had any questions about the data, answers have been provided by Statistics Norway. Furthermore, missing values have been only a minor issue. Most variables used in this thesis have values for practically all units and all years.

However, register data have their limitations, as mentioned in the introduction. If the data do not exist, they cannot be studied. For instance, no register data on language skills exist. Therefore, despite the obvious importance of language, it was not possible for me to control for Norwegian language skills in the analyses in article 4. In addition, some data may exist but be too expensive. In Article 2, two income inequality measures were available to me online. Other measures were available in theory but not necessarily in practice. I had to spend a substantial amount of money on the variable "P90/P10 without immigrants." As discussed in the article, other measures, such as P90/P50 and P50/P10, would also have been highly relevant to include, but this was not possible for financial reasons. Further, the data that exists may not be *perfectly* suited to the specific research question. For instance, the income inequality measures that were available to me defined income as employment income, capital income, and taxed and tax-free transfers. Theoretically, the article is about the labour market, and it can be argued that employment income alone would have been more appropriate. However, I strongly doubt that this would have affected the overall conclusions of the article.

Municipal level data
The first three articles are based on analyses at the municipality level. The unit of analysis is thus the municipality, of which 426 existed in 2017. The same municipality structure is used in all three papers. I have spent a significant amount of time on data facilitation because the municipality structure changed during the period that I am interested in. Seven municipality mergers took place from 2004 to 2017. This can be dealt with in various ways, but to avoid any loss of data, I decided to calculate values for the years before the merger. Some values, for instance, the number of migrants, are simply added together. Other variables require that the population size of municipalities is considered, and in these cases, I have used a weighted average. This technique is not perfect. For instance, income inequality, measured as p90/p10, cannot be precisely calculated for the years before the merger (without the underlying data the value is based on). Small deviations from the unknown real value will occur, but I do not consider this an issue in terms of the overall reliability of the data.

The use of municipal-level data does, however, involve some other challenges. The various sizes of the municipalities have been a source of challenges. For instance, in Article 2, I originally planned to use the Gini coefficient to measure income inequality. When studying the data, I noticed some extreme values. For instance, in a small municipality in northern Norway with around 1,300 inhabitants, the Gini coefficient rose from 0.223 in 2010 to 0.650 in 2011. In 2012, it decreased to 0.197. I immediately thought that this must be a mistake and contacted

Statistics Norway. They reported that no mistake had been made. The shockingly high Gini coefficient was the result of a few households with very high income in 2011 due to the sale of fish farms. The experience made me aware of the dangers of studying small municipalities. In larger municipalities and at the national level, this would never have been an issue. Luckily, another more stable inequality measure (P90/P10) was available to me that was unaffected by the incomes of the top 10 and bottom 10%. When using P90/P10 as my independent variable, I obtained robust results because the variation over time was not affected by the size of the municipality.

The various sizes of the municipalities were, however, the largest challenge in the analyses in Article 3. This issue is quite thoroughly explained in the article, but briefly summarized, the existence of too small and too large municipalities was the cause of errors in the results. In- and out-migration could not be measured as proportions in the smallest municipalities (particularly when dividing people into education groups), and studying the actual frequencies gave rise to errors caused by correlations in the largest municipalities. In fact, excluding only the largest municipality from the analysis (where there happened to be a correlation between number of labour migrants and number of out-migrations) changed the results drastically. In sum, I realised that one should be very careful with municipal-level panel data when the dependent variable is related to the population size of the municipality.

These challenges aside, municipal-level data can be useful to study. A large amount of information exists on this level because the municipality is central in the Norwegian governance structure. Municipalities are (usually[2]) large enough to make it possible to gather meaningful data and many enough to provide sufficient observations for analysis. Municipal mergers do, however, continue to reduce the number of municipalities, from 426 in 2017 to 356 today (2021).

I would also like to argue more substantially for choosing to analyse phenomena at the municipal level in three out of four articles. In Article 1, municipal-level data were obviously well suited. The objective was to study and explain the geographic distribution of EU11 migrants in rural Norway. Municipal-level data provide the most detailed examination of this distribution. In Article 2, I studied the effect of immigration on income inequality. Although it is certainly possible to use individual-level data and examine changes in income for various

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[2] One exception is housing prizes (see Article 3). Around half of rural municipalities had missing values for this variable.

groups, I wanted to study the large-scale patterns of inequality and measure income inequality directly, which means that it must be measured on a level above the individual. Finally, it was important to distinguish between rural and urban areas, which made the municipal level the most suitable. In Article 3, I examined the connection between labour migration and natives' mobility patterns in rural areas. Although the act of moving occurs at the individual level, this was not a suitable level of analysis for me. For instance, it would have been impossible to test the hypotheses about in-migration.

Microdata.no

During my work with the thesis, a new source of register data – at the individual level - became available. Microdata.no provided me instant access to register data for the entire Norwegian population. Over 250 variables were available for analysis, with information on population, education, income, the labour market, and welfare benefits.

Data from this service were used in Articles 3 and 4. In Article 3, I used the platform to construct and extract variables for in- and out-migration in Norwegian municipalities. In Article 4, the analyses are solely based on the individual-level data made available on Microdata.no, and all analyses were performed on that platform.

Microdata.no uses several measures to ensure anonymity. As a user of this platform, I am not able to see the actual data, only the output from analyses. Although this was somewhat uncomfortable at first, I soon gained confidence in the system. Furthermore, microdata adds noise (+/-5) to all tabulations, which means that one can never be exactly sure how many observations belong in each category. Therefore, in the tables in Article 4, the percentages do not always add up to 100. As long as the studied groups are not too small, I do not consider this an issue, because it does not affect any of the conclusions.

Operationalisation of key variables

The journal article format leaves little space for a discussion of variables. In the following, I will therefore discuss the operationalisation of the key variables: variables measuring immigration and rurality. A brief note on the operationalisation of social mobility is also included.

Who is an immigrant?

In this dissertation, an immigrant (or international migrant, as they are called in Article 3) is defined as a person born outside of Norway with two parents and four grandparents born outside of Norway. This is Statistics Norway's definition of an immigrant and is applied in the

first three articles. In Article 4, only a person's birth country is considered, which means that a person born outside of Norway is considered to be an immigrant regardless of their parents' birthplace. Because practically all those defined as immigrants in Article 4 also have foreign-born parents, there is no difference between the definitions used in the various articles in practice.

Immigrants are only registered as settled in a municipality in Norway if they have stayed or plan to stay for at least six months. Immigrants on shorter stays are therefore not included in the analyses in this thesis, except for Article 1. In this analysis of cross-section data from 2015, we were able to order data that was detailed enough to include short-term immigrants.

Categorisation of immigrants

In all four articles, immigrants are categorised in various groups. However, due to various theoretical and methodological considerations, this is done in different ways in the four articles. Therefore, I will present the basis for the categorisation and discuss the reasons for the differences.

The categorisation of immigrants is based on two variables: the reason for in-migration and country of origin. Although this dissertation concerns a specific type of immigrant, namely *labour* migrants from the *EU11 countries*, other groups of migrants are included in the analyses.

The categorisation of countries is based on Statistics Norway's division of the world in two; 'EU/European Economic area (EEA) countries, the US, Canada, Australia, and New Zealand' ("Western countries") and 'Africa, Asia, Latin-America, Oceania, excluding Australia and New Zealand and European countries outside EU/EEA' ("non-western countries"). This dissertation is about the immigrants from the new EU countries in Europe, which created the need to create a separate category for these immigrants. Throughout this dissertation, these countries are referred to as EU11. The Western countries have thus been divided in two to distinguish between the EU11 and the other western countries (EU15+4). The EU11 countries include all the post-communist countries that have joined the EU since 2004: Poland, Lithuania, the Czech Republic, Hungary, Latvia, Estonia, Slovakia, and Slovenia joined the EU in 2004; Bulgaria and Romania joined in 2007; and Croatia joined in 2013. The Mediterranean countries Cyprus and Malta also joined the EU in 2004 but are not included in the EU11 countries. This is because they are not post-communist countries but were considered western-aligned during the Cold War.

The other variable used to categorize immigrants is the reason for migration. All (non-Nordic) first-time immigrants arriving in Norway after 1989 are registered with one of the following main reasons for migration: work, family, refuge, education, or other. This variable was constructed by Statistics Norway and based on the immigration authorities' registers and other relevant variables (Dzamarija, 2013).

Immigrants from EU/EEA/European Free Trade Association (EFTA) do not need to apply for a residence permit but must register at their local police station within three months after arrival in Norway. During this registration, they must state their main reason for migration.

Work migrants (or labour migrants) include those immigrants with a work permit, as well as those registered as work migrants during EEA registration. *Family migrants* include those who have been granted residence based on their family connection to a settled person in Norway, as well as those registered as family migrants in the EEA registration. *Refugees* include those who have been granted residence based on the need for protection. This includes asylum seekers, quota refugees (UN refugees) and people granted residence on humanitarian grounds. Education migrants are students but also include some interns and *au pairs* (Dzamarija, 2013).

Table 1 displays the number of immigrants in Norway in 2016 by reason for migration and country group.

Table 2: Settled immigrants in 2016 by country group and reason for migration

	EU11	Western countries	Non-western countries	Total
Work	122 102 **(67,5%)**	35 120 **(43,7%)**	22 774 **(6,5%)**	179 996
Family	48 643 **(26,9%)**	23 391 **(29,1%)**	142 826 **(40,6%)**	214 860
Refuge	3 290 **(1,8%)**	604 **(0,8%)**	139 165 **(39,5%)**	143 059
Education	4 007 **(2,2%)**	5 609 **(7,0%)**	20 681 **(5,9%)**	30 297
Other	2 912 **(1,6%)**	15 606 **(19,4%)**	26 641 **(7,6%)**	45 159
Total	180 954 (100%)	80 330 (100%)	352 087 (100%)	613 371

Throughout all the articles in this dissertation, my main focus has been EU11 migrants. Furthermore, my interest lies with the *labour* migrants, that is, those EU11 migrants who have come to Norway to work. However, in many cases, it makes little sense to distinguish between labour migrants and family migrants

In Article 1, the objective was to explore the spatial distribution of EU11 labour migrants in Norwegian municipalities. During the review process, it was decided to include EU11 family migrants because they are mainly the family members of EU11 labour migrants. The correlation between the number of EU11 labour migrants and EU11 family migrants in 2015 was high, and the inclusion of EU11 family migrants did not significantly alter the results.

Article 2 had a quite different objective, to determine the effect of (different types of) immigration on income inequality. I decided that there were good reasons to expect different effects on the part of labour and family migrants from the three country groups. Refugees and education migrants, however, are more homogenous groups and were not split into the three country groups. The "other" category was the only category not included in the analysis. The numbers vary very little from year to year (making the variable unfit for fixed-effects analysis) because this category mainly consists of immigrants that arrived before 1990. The analysis made it clear that distinctions between the reasons for migration were important. For instance, EU11 labour migration had a positive effect on income inequality, while EU11 family migration had a negative (but not significant) effect.

In Article 3, the objective was to study the effect of labour migration on the moving patterns of natives. Unlike in Article 1, EU11 family migrants were left out of the analysis. Although most of the EU11 family migrants are family members of EU11 labour migrants, some are family members of Norwegian-born people. To include family migrants could therefore have produced biased estimates.

In Article 4, the objective was to study the correlation between country of birth and social mobility patterns within the population of manual workers in the fish-processing industry. Three groups are analysed: Norwegian born workers, EU11 workers, and non-western workers. Reason for migration is not used to categorise immigrants. The decisive factor in this analysis was country of birth, and further subcategorisation would have produced too small groups and complicated the analysis unnecessarily.

Rural and urban municipalities

Although rural studies is a well-established field within the social sciences, there is no agreed upon definition of "rural" among academics (Bell, 2007; Cloke, 2006; Halfacree, 2006). For at least 100 years, researchers have debated the definition of rural (Halfacree, 1993). Bell (2007) argues that there are two dominant epistemologies of the rural: the *material* and the *ideal* moment of the rural. On the one hand, we have descriptive, material, and measurable definitions of the rural based on criteria such as population density, centrality, or labour market characteristics. On the other hand, some argue that the rural is not a "thing" that exists but something that is "imagined," socially constructed, or an analytical category (Halfacree, 1993, 2006; Mormont, 1990). I will not go into the lengthy ontological or epistemological debates about the rural here. I recognise the lack of clarity regarding the concept, but as with all concepts in quantitative research, it must be measured to be studied.

The definition of rural and urban municipalities is consistent throughout the articles in this dissertation. The definition is based on Almås and Elden (1997) and Farstad, Rye, and Almås (2009). Almås and Elden (1997) identified four factors that should be included in the rural dimension (See also Almås, 1985): 1) population density, 2) centrality, 3) the proportion of the population that is employed in the primary sector, and 4) the proportion of the population that is self-employed. I have, like Farstad, Rye, and Almås (2009) chosen to exclude the fourth factor because self-employment can no longer be said to be a typical rural phenomenon. I thus apply three criteria: centrality, settlement density, and proportion employed in the primary sector. I thus define a rural municipality as a municipality that has either a peripheral location, low settlement density, or relatively high proportion of the population employed in the primary sector.

1) Centrality: Statistics Norway has constructed a centrality scale from 1 to 6, where 6 indicates the least central municipalities (See Høydahl, 2017). Centrality is measured as the number of jobs and service functions that can be reached by car in 90 minutes. Municipalities on level 5 and 6, that is, the least and second least central municipalities, are defined as rural. Two hundred and twenty-one of the 426 municipalities were categorized as rural based on this criterion.

2) Settlement density: Statistics Norway defines a densely populated area as settlement with at least 200 persons in houses (normally) 50 meters apart (Statistics Norway, n.d.-b). I have defined a municipality as rural if over 50 % of the population did not reside in such areas but,

rather, resided in sparsely populated areas in 2016. One hundred and eighty-five municipalities were defined as rural based on this criterion.

3) Primary sector employment: finally, I have defined a municipality as rural if more than 7% of the working population was employed in the primary sector in 2016. The primary sector consists of jobs in agriculture, fisheries, and forestry. One hundred and seventy-nine municipalities were defined as rural based on this criterion.

While Almås and Elden (1997) constructed an index with four categories based on these criteria, it was necessary for me to create a dichotomous variable. Like Farstad et al. (2009), I chose to categorise a municipality as rural if at least one of these criteria was met, which resulted in 271 rural municipalities (in papers 2 and 3). Municipalities without any of these characteristics were defined as urban. Although all three factors are important objective traits associated with the rural, it is certainly possible to question whether each factor, in itself, is sufficient to classify a municipality as rural. Because this dissertation focuses on migration and the labour market, the centrality dimension is perhaps the most relevant because it captures the size of the local labour market. It is, however, a somewhat narrow definition of the rural. By including settlement density and primary sector employment, I also include some municipalities that lie in the middle of the centrality scale (11 on level 3 and 41 on level 4) but display other important rural characteristics. Settlement density is one of the most used criteria when defining rural areas (Bell, 2007). Further, primary-sector employment captures the occupational structure traditionally associated with the rural (Newby, 1983; Sorokin, Zimmerman, & Galpin, 1930-1932). However, due to the declining number of people employed in agriculture and the primary sector in general, it can be debated whether it still makes sense to speak of a place as rural based on Criterion 3.

Although one of the three rural characteristics is sufficient, there is high level of correlation between the variables, and most of the municipalities defined as rural have more than one of these characteristics. One hundred and fourteen have all three characteristics, 86 have two, and 71 have one (and then usually just the centrality characteristic).

The attentive reader will notice that in Article 1, 273 municipalities were defined as rural, while 271 were defined as rural in Articles 2 and 3. The difference is due to the data used. In Article 1, data from 2015 were used, while data from 2016 were used in Articles 2 and 3. Thus, the same definition categorised two municipalities as rural in 2015 and as urban in 2016. This illustrates two things. First, rurality (as I have measured it) is not a permanent feature of a

geographic area but something that changes (slowly) over time as human activity changes the material conditions in a geographic area, for instance, by building more houses and creating new jobs. Second, quantitative definitions of rurality will always produce a few "random" results, particularly when rurality is measured as an either/or phenomenon and not as a dimension. Municipalities with both rural and urban traits, which are best described as being somewhere in the middle in terms of the rural/urban dimension, can easily tip in both directions depending on the criteria that are used.

However, if we are to study rural areas or, more generally – differences across space – quantitatively, the limit must be set *somewhere*. By defining these 271/273 municipalities as rural, I do not argue that all the rural municipalities are significantly different from all the urban municipalities. I will, however, argue that this definition allows me to distinguish between two groups of municipalities that, *on average*, have very different characteristics – characteristics that are central to the subjects studied in this dissertation. Some of them are displayed in Table 3[3]. The "rural" municipalities do have significantly smaller populations and, therefore, smaller local labour markets. Significantly fewer have higher education, and they are therefore (according to some) more likely to face competition from immigrants. Finally, most of the municipalities I have defined as rural are losing their inhabitants, either through negative net-migration, a negative birth rate, or both. They thus face challenges that most "urban" municipalities do not, challenges that are discussed in relation to migration in this dissertation. In conclusion, while I recognise the issues related to a quantitative, dichotomised measure of the rural and urban, I still argue that the distinction is meaningful.

Table 3: Characteristics of rural and urban municipalities (2015).

	Mean population	Average proportion with higher education	Negative (native) net-migration (2011-2015)	Negative birth-rate (2011-2015)
Rural municipalities	3480	21,0%	81,0%	68,1%
Urban municipalities	27554	27,7%	41,8%	17,0%

Social mobility

(Vertical) social mobility can be defined as the movement of people in the social hierarchy. The concept can be measured in several ways. Depending on which field (or which hierarchy) we are interested in, education, occupation, or income/fortune can be indicators of your social position. In Article 4, we focus on labour market mobility and use a combination of information

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[3] See Article 1 for a further description of these variables.

on occupation and occupational income. We do not construct one variable to measure social mobility but consider three variables related to social mobility: occupational outcome, change in income, and long-term labour market attachment, measured as income stability. The operationalisation of these variables is described in detail in Article 4.

Methods of analysis and causality

The analyses in this dissertation rest on both cross-sectional data and longitudinal data. In Article 1, ordinary least squares (OLS) regression is applied to investigate correlations between variables at one point in time (2015). In Articles 2 and 3, fixed-effects linear regression models estimate the effect of labour migration (X) on income inequality (Y) and natives' in- and out-migration (Y), respectively, over time (2005–2016). In Article 4, data from several years are used (2009–2018), but "regular" OLS and logistic regression is applied to study social mobility-related outcomes in 2018 (Y) and how these vary with birth country (X).

The various types of analysis do not make me equally able to make causal inferences. The analyses in Articles 1 and 4 are not designed to draw causal inferences. In a strict sense, they are only descriptive analyses that study the correlation between variables. The research questions in Articles 2 and 3, however, explicitly concern the effect of one phenomenon on another phenomenon. I have therefore attempted, to the best of my ability, to use a research design that allows me to determine whether X causes Y.

However, before discussing the procedures involved in drawing causal inferences, I will briefly discuss the concept of causality. Philosophically, the concept is complicated, or "tangled," as Becker (1998) puts it. The philosopher David Hume is known for his classic problematisation of the concept and is frequently referred to on the issue. He points out the fact that causality is not something we can observe. We can observe that something follows something else – for instance, a billiard ball hitting another ball, which then starts to move, but we cannot observe power or the necessary connection between cause and effect (Bailey & O'Brien, 2006). However, three conditions needed for a causal relationship can be observed: 1) The cause (X) comes before the effect (Y), 2) there is a relationship in time and space between cause and effect, and 3) constant conjunction (a certain cause, in certain circumstances, is always followed by a certain effect) (Sohlberg & Sohlberg, 2013, p. 191).

The third condition implies the existence of laws – deterministic relationships. Such laws are lacking from the social sciences. The social world is far too complex for any simple laws. The third condition is therefore rewritten in probabilistic terms: X is not necessarily always

followed by Y, but X increases the probability of Y. This idea of causality is therefore quite different from the deterministic idea of causality that originated from the physical sciences, and they should not be confused. One objection to this probabilistic idea of causality is that it leaves us more vulnerable to interpret spurious and random correlations as causal relationships (Tufte, 2013). We therefore need to tread carefully when making causal claims, which brings me to my more technical discussion about the procedures to follow.

Kellstedt and Whitten (2013) have written guidelines on "best practices" in political science, which are just as relevant to sociology or other social sciences. They argue that we must cross four causal hurdles if we wish to know whether X causes Y. First, we must determine how and why X causes Y – what is the causal mechanism that connects X to Y? Second, we must exclude the possibility of reversed causation – that Y could cause X. Third, there must be covariation between X and Y, and fourth, this covariation between X and Y must not be spurious. In other words, all possible confounding variables must be controlled for.

The first hurdle is mainly theoretical. We must be able to determine how X causes Y. For instance, very simply put, increasing immigration causes a supply-shock that lowers wages for competing workers, increases wages for complementary workers, and thus increases income inequality.

The next three hurdles can, in theory, be crossed with the right kind of data (and a correctly specified model). Some methods and types of data are preferrable to others when drawing causal inferences. The gold standard is the use of experimental data in a randomised controlled trial (RCT). This is, of course, not possible in my case. The next best option is longitudinal data. The type of longitudinal data used in Article 2 and 3 is panel data. The same units (municipalities, in my case) are observed several times, and several variables are observed.

Longitudinal data are usually necessary to cross the second hurdle – eliminating the possibility that Y causes X. In Article 2, I found it particularly necessary to test the causal direction because theoretical perspectives and previous research questioned this direction. I use a method proposed by Allison (2005) in which structural equation modelling is used to estimate the effect of X (labour migration) on Y (income inequality), controlled for lagged values of Y, and the effect of Y on X, controlled for lagged values of X. The results clearly show that labour migration is followed by increased income inequality. The opposite is not found: increasing income inequality is not followed by increasing labour migration. I consider the result to be evidence enough to conclude that reversed causation is no major issue, and in order to keep the

following analysis as simple as possible, I continue with a standard fixed-effects model, with income inequality as the dependent variable.

The third hurdle, testing for covariation between X and Y, is fairly straightforward. The fourth hurdle is, however, the hardest to cross. How can we ever be certain that all potential confounding variables have been controlled for? The issue of confounding variables can be partially handled with panel data. In the analyses in Article 2 and 3, fixed-effects linear regression is applied. The fixed-effects transformation, or the within transformation, is done by averaging the variables across time and then subtracting the average from each observation. Thus, what we study is the variation from the mean within each unit (the municipality in this case). Another way to estimate fixed effects that produces identical parameter estimates of regressors (but was not used here due to a relatively large n) is to use dummy variables for the units. In other words, the fixed-effects model controls for all the differences between the municipalities.

By examining the within variation, everything about a municipality that does not change in the period we are studying is automatically controlled for, for instance, the municipality's geographic location. Fixed-effects models therefore bring us a step closer to crossing the fourth hurdle because all time-invariant variables are controlled for.

However, confounding variables can still exist because we must still control for variables that change over time. Immigrants do not settle in random places in rural (or urban) Norway. This was indeed examined in Article 1. Immigrants' settlement patterns are correlated with various labour market characteristics. The question then is as follows: can the reasons for increasing inequality be found in these characteristics? Although fixed effects control for all the stable characteristics, the economic climate could change rather quickly. For instance, in Article 1, we saw that municipalities with high unemployment host more labour migrants. Thus, it could be possible that labour migrants arrive where unemployment is increasing (paradoxically) and that unemployment is the real cause of increasing inequality. However, the fixed-effects regression in Article 2 shows that higher unemployment is followed by lower income inequality. Similarly, increased median income, if we see this as a sign of economic growth in the municipality, could be attracting more labour migrants. However, increased median income lowers inequality, and increasing labour migration reduces median income. Rather than change in median income being a confounding variable, I interpret it as an intermediate variable,

indicating that inequality is increasing due to changes in the lower half of the income distribution.

Another possible objection to the validity of the results in Article 2 is that the real reason for the correlation between income inequality and labour migration in rural areas could be related to depopulation. Perhaps immigration is not the real cause of inequality, but rather the demographic changes in the native population are. However, the findings in Articles 1 and 3 leads me to conclude otherwise: increasing labour migration to rural areas and rural depopulation appear to be two different processes, without any major effect on one another.

Of course, we can never be completely certain that all potential confounding variables have been controlled for. A very good instrumental variable could provide us with more certainty; however, these are difficult to find.

Causal relationships can never actually be observed, but I argue that the analyses in Articles 2 and 3 are sound contributions to the discussion of the causal effects of immigration.

Summary of the papers

This dissertation consists of four articles. In the following, I will provide a short summary of each article.

The new geography of labour migration: EU11 migrants in rural Norway

The article was co-authored with Johan Fredrik Rye and is published in *Journal of Rural Studies*. We study the varying numbers of EU11 migrants in rural municipalities in Norway to determine the characteristics of the rural municipalities that host many EU11 migrants. Because immigration has traditionally been an urban phenomenon, too little knowledge exists regarding the rural immigration phenomenon, particularly in the form of quantitative knowledge on the macro level. We review the literature and test three assumptions about the spatial distribution of labour migrants in rural areas: labour migrant concentration is related to 1) labour market characteristics (industry structure, unemployment, education levels, and the presence of other immigrant groups), 2) population decline, and 3) centrality. We use register data at the municipality level, which are analysed via linear regression.

Our findings confirm the hypothesis that labour migrants cluster in areas with strong traditional rural industries, such as the food industry and agriculture. Our analysis reveals the particular importance of the coastal food industry (i.e., the fish-processing industry). In addition, tourism-related industries (hotels and restaurant) also "attract" EU11 labour migrants. Furthermore, contrary to our initial assumption, municipalities with high unemployment levels host more EU11 migrants. This could indicate that EU11 migration leads to higher unemployment or, alternatively, that the unemployment level indicates a mismatch between local labour demand and supply. In line with our hypothesis, municipalities with many refugees host fewer EU11 migrants. The different settlement patterns of refugees and EU11 migrants are partly explained by the structure of the labour market. Furthermore, our hypothesis that municipalities struggling with depopulation received more EU11 migrants was rejected. If anything, it is the most viable rural municipalities that receive the most EU11 migrants, a finding that provides some nuance to the assumption that immigrants are "rescuing" rural areas. Finally, we find that EU11 migrants' tendency to settle in the least central rural municipalities is explained by employment opportunities in these areas. If labour market factors are held constant, EU11 migrants "prefer" the more central rural areas, as the general population does.

Labour migration and increasing inequality in Norway

In this article, published in *Acta Sociologica*, I explore the relationship between immigration and income inequality. While the numbers of EU11 migrants and other immigrants have

increased rapidly the last two decades, income inequality has also increased. The relationship between immigration and income inequality is contested. Both the direction of the relationship and the degree to which immigration affects inequality are disputed subjects. According to the demand-side perspective, inequality is mainly related to economic restructuring and is not caused by immigration itself. Immigrants simply respond to the demand for labour in the receiving country. Supply-side perspectives, however, argue that immigration causes increasing inequality, both because the income of immigrants is lower or more dispersed than natives' income and because immigration affects the income of natives. I further argue that other knowledge gaps remain; EU11 labour migrants have not been studied specifically, and little research exists on the effects in rural areas. Small rural labour markets with less educated populations could, in theory, be more affected than large and diverse urban labour markets.

By utilising Norwegian municipal-level register data from 2005 to 2016, this article analyses 1) the direction of the relationship between labour migration and income inequality, 2) the degree to which labour migration (as compared to other immigrant groups) affects income inequality in general and within the native population, and 3) whether the effect of immigration on inequality differs in rural and urban municipalities.

I use structural equation modelling to study the direction of this relationship. My findings support the hypothesis that labour migration is followed by increasing income inequality. No support is found for the opposite relationship, and I argue that, in the Norwegian case, the actual sudden *access* to a large supply of immigrant labour may have led to structural changes in the labour market. Norway has no previous recent history of polarisation in the labour market, as, for instance, the US has.

Further, I use fixed-effects linear regression to study the effect of various immigrant groups in rural and urban municipalities. The findings show that increasing proportions of EU11 labour migrants and refugees are followed by increasing income inequality in both rural and urban municipalities, likely because they increase income inequality in the lower part of the income distribution as a result of their own low incomes. However, when using native income inequality as the dependent variable, only EU11 labour migrants have a significant effect, and this is true only in rural municipalities. I argue that small and inflexible rural labour markets with many low-skilled native workers may be less adaptable to immigration shocks and that this may explain why native income inequality is affected here but not in urban areas.

Does international labour migration affect internal mobility in rural Norway?

This article, published in the anthology *"International Labour Migration to Europe's Rural Regions,"* examines the connection between EU11 labour migration and natives' internal mobility patterns in rural municipalities. A very large number of studies focus on how immigration affects natives' social mobility. The effect on natives' geographic mobility has received much less attention. Only a few studies exist in Europe, and rural areas are not in focus. The question of natives' internal mobility is particularly important in rural areas because many of these areas face challenges related to depopulation.

In neoclassic theory, it is assumed that immigration creates a supply shock and lowers the wages of competing workers, while increasing demand for complementary workers. The empirical evidence, however, shows conflicting results, and in general, the findings suggest that the effect on native's wages and employment is small. However, labour markets are not closed, and natives can move in and out in response to immigration. EU11 labour migrants in Norway cluster in low-skilled and low-wage jobs and, therefore, mainly compete with natives without higher education. I therefor hypothesise that increasing numbers of EU11 labour migrants lead to increased outflows and decreasing inflows of poorly educated natives and decreasing outflows and increasing inflows of highly educated natives.

I use municipal-level register data from 2005 to 2015 and analyse the data with fixed-effect linear regression models. The results show a weak and insignificant connection between labour migration and natives' internal mobility patterns, and I conclude that the internal migration of Norwegian-born people is largely unaffected by EU11 labour migration. This suggests that the EU11 migrants' role in the labour market is mainly expansive because there is no sign of displacement of less educated natives. This also means that migration can only benefit rural municipalities that are struggling with depopulation.

Social (im)mobility in low-skilled and low-wage immigrant niches

This article was co-authored with Johan Fredrik Rye and submitted to *Nordic Journal of Working Life Studies*. We analyse the social mobility patterns of native and immigrant workers in an 'immigrant niche'. Immigrants often cluster in certain low-skilled and low-wage jobs, which results in the formation of immigrant niches. Several researchers have contributed to the understanding of how such niches are formed, but few have studied the long-term mobility patterns of the different workers inside such niches. We use the Norwegian fish-processing industry (FPI) as a case. Since 2004, Eastern European (EU11) migrants have greatly increased

their numbers in the industry's manual jobs, while the number of Norwegian-born workers has been reduced. EU11 workers, together with a smaller number of non-Western workers, now make up the majority of the workforce.

Based on our review of the literature on immigrant niches, we expect Norwegian-born workers to be mostly upwardly mobile, while immigrant workers are expected to be more immobile or downwardly mobile. We further expect to find differences between EU11 and non-Western immigrants.

We utilise individual register data from 2009 to 2018 to study the social mobility patterns (in terms of occupation, income, and long-term labour market attachment) of workers born in Norway, EU11, and non-Western countries.

The results show a clear mobility hierarchy, with Norwegian-born workers at the top, EU11 workers in the middle, and non-western workers at the bottom. Norwegian-born were the most likely to be upwardly mobile within the FPI, the most likely to be employed in a new industry (and have higher incomes here, as compared to immigrants), and the least likely to be unemployed in 2018. They also had the most stable labour market attachment over time. Thus, we conclude that the majority of Norwegian-born workers show signs of upward mobility, which suggests that they have not been displaced by immigrants.

Immigrants were more likely to be immobile (remaining in manual jobs in the FPI, which strengthens the process of niche formation) or downwardly mobile. An immigrant's higher education level had very little effect on social mobility. There were, however, clear differences between EU11 and non-Western immigrant workers. EU11 workers more often climbed the occupational latter within the FPI. Non-western workers, however, had the least favourable labour market outcomes: a low chance of mobility within the FPI and a high probability of unemployment in 2018. They are also clearly overrepresented among workers with unstable long-term labour market attachment.

Discussion and conclusions

In the last two decades, rural areas in Norway have seen an unprecedented increase in immigration. In this dissertation, I have utilised excellent quantitative data to gain new knowledge about this phenomenon, and I have paid particular attention to processes related to inequality and geographic and social mobility.

In the introduction, I argued that this dissertation is a contribution to two debates/fields: labour migration and labour market inequality, as well as labour migration and rural depopulation. I begin my discussion with the latter.

Labour migration and rural depopulation

One of this dissertation's contributions is knowledge about the connections between international migration and natives' internal migration (geographic mobility), particularly as relates to the issue of population decline in rural areas.

EU11 migrants have arrived in every Norwegian municipality and therefore contributed to the population of rural areas, though very unevenly. Their settlement pattern is (not surprisingly) strongly correlated with the size of various rural industries, particularly the fish-processing industry. There is no doubt that EU11 labour migrants have mainly arrived in rural Norway to work and that they settle in locations where demand for their labour is highest. However, these locations are not also the locations that struggle the most with depopulation. Therefore, the assumption that immigrants are saving the rural municipalities threatened by depopulation is, perhaps, too optimistic. As shown in Article 1, most EU11 labour migrants settle in the more viable rural municipalities, partly because there are jobs for them there. I would therefore argue that the solution to the rural depopulation problem lies in the labour market, not in immigration in itself.

Further, one might expect that immigration, either though population increase in itself or through higher demand for certain complementary workers, could create new jobs, which attracts more (highly educated) natives to the area. However, as shown in Article 3, there is no significant connection between EU11 labour migration and natives' internal mobility patterns in rural areas, at least not in the short run.

Overall, increasing labour migration to rural areas and rural depopulation appear to be two separate processes, without one having any major effect on the other. However, this statement

must not be misunderstood: rural areas do, of course, benefit – in terms of increasing population – from immigration.

Labour migration and labour market inequality

This dissertation's *main contribution* is to increase our knowledge of EU11 labour migrants' role in and effect on the rural labour market. Three main questions were asked in the introduction: 1) is labour migration a source of increasing inequality? 2) if so, is increasing inequality simply a result of the labour migrants' own position in the labour market, or has their presence affected other workers? 3) is the migrants' position in the lower segments of the labour market permanent, or do they have opportunities for upward mobility?

There are three main findings related to these questions. In the following, I will discuss these findings: how they contribute to the literature, their theoretical implications, and the knowledge gaps that remain and should be the subject of future research.

> - The arrival of EU11 labour migrants has been followed by increasing income inequality in rural areas, both in general and within the native population.

> - The arrival of EU11 labour migrants has had no effect on the geographic mobility of natives in rural areas.

> - There is a clear *social mobility hierarchy* in the Norwegian fish-processing industry (one of the rural industries that "attracts" the most EU11 migrants). Natives mainly display patterns of upward mobility, EU11 migrants are more likely to be immobile, and non-western workers are more likely to be downwardly mobile.

Income in rural (and urban) societies has become more unequally distributed in the last two decades. My findings show that the increasing number of immigrants is a part of the explanation. Only two groups of immigrants have a clear effect: refugees and EU11 labour migrants. However, these two immigrant groups' impacts on the income distribution are very different. I believe this finding represents an important contribution because it shows the importance of keeping these groups separate: there is an important difference between a labour migrant, who arrives in Norway to work, and a refugee, who arrives in Norway due to persecution in their home country. The increasing proportions of refugees have a *rather large impact* on income inequality in general but *no impact* on income inequality within the native population. Meanwhile, increasing proportions of EU11 labour migrants have a more *modest effect* on income inequality in general but *also affect native income inequality*, at least in rural

areas. The difference is, in many ways, not surprising. Refugees often spend their first years in the governmental introduction program and have low employment levels (Olsen, 2019), which limits the labour market impact on natives. EU11 labour migrants, however, have arrived to work and have very high levels of employment.

The results suggest that there is probably *some* competition between labour migrants and natives, which produces effects that are strong enough to affect an income inequality measure like p90/p10. However, until more detailed inequality measures are studied, we cannot know for certain which part of the income distribution is most affected in Norway. In theory, the entire observed effect of labour migration on income inequality in rural municipalities could be due to changes in the upper part of the income distribution – rich people benefiting from labour migration. I, however, believe this is unlikely, partly because many of the real profiteers are likely to be among the richest 10% (which would not affect p90/p10) but mainly because several previous studies show evidence of a negative effect on lower-class natives (Hoen et al., 2018) and natives in affected industries (Bratsberg & Raaum, 2012)

Still, as mentioned, the effect is modest in rural municipalities and not significant in urban municipalities. In the average rural municipality, the proportion of EU11 labour migrants has increased by two percentage points. Thus, if we take the highest estimated effect on native income inequality (0.010), we find that EU11 labour migration can, at most, explain an increase of 0.020. To put this in perspective, let us assume an increase from 2.421 (which was the rural average in 2016) to 2.441. This is certainly not an insignificant effect; in my view, however, it is relatively modest within the larger picture.

Some economists (Borjas, 2006) have argued that the effects of immigration could be modest or insignificant because natives can respond to immigration by moving – "voting with their feet". However, I find no evidence of such effects. Thus, my second main finding (2) strengthens the validity of the first: the effect of labour migration on native income inequality in rural municipalities is not biased due to natives' selective in- and out-migration. Moreover, the result is interesting in itself: if natives' mobility patterns are a reflection of the effect of labour migration, a way to understand how natives "vote" when confronted with immigration, native Norwegians in rural areas have not bothered to go to the voting-urns.

In conclusion, EU11 labour migration does affect native workers' income in rural areas, but the effect is not particularly large, and not large enough to affect natives' settlement choices. Overall, the findings suggest that there is limited competition between natives and labour

migrants. Neoclassic economists use the term "imperfect substitutes" (Card, 2009; Grogger, Borjas, & Hanson, 2008; Ottaviano & Peri, 2012) but often do not properly theorise as to why natives and immigrants in the same skill groups are not substitutes for one another. Insights from segmented labour market theory could, however, be helpful in order to explain why the impact on the native wage distribution is not larger. EU11 labour migrants have arrived in Norway due to the high demand for labour in jobs that most natives do not want: jobs in the fish-processing industry, as cleaners in hotels, strawberry pickers, or working on a zero-hour contracts in construction. In the Norwegian case, a growing economy and an educational revolution have lifted many working-class Norwegians out of these disadvantaged positions (Friberg & Midtbøen, 2019). Thus, EU11 labour migrants have not "stolen" jobs from natives but replaced natives who are leaving or entered new jobs that only exist because they are willing to fill them. This is the main role of labour migrants in rural (and urban) Norway.

This is, however, the macro-level picture, which can contribute to explaining why the effect on overall native income inequality is not larger. Beneath the surface, we are likely to find a more nuanced picture, for instance, large differences between industries. Although the evidence of the effect of immigration on natives' wages within particular industries is limited, studies suggest that income inequality has increased, particularly in the construction industry (Jordfald & Dølvik, 2015), and that Norwegians' wages and employment have been affected (Bratsberg & Raaum, 2012).

I argue that one of the contributions of Article 4, which takes a close look on the workers in the Norwegian fish-processing industry (FPI), is to illustrate how a large number of immigrants can arrive to work in rural coastal areas without *major* negative consequences for the incumbent native workforce. In addition to a gradually reduced interest on the part of natives in *entering* these jobs, many natives already working such jobs are able to *exit* and pursue jobs with higher pay and status, despite their low education level.

However, I would like to stress that native manual FPI workers' opportunities for upward mobility should not be exaggerated: some exit the labour market early (and receive disability benefits) or experience an unstable long-term attachment to the labour market, and such outcomes are far more likely for natives in the FPI than native workers in general (Heggebø & Elstad, 2019). Future research should determine if these natives' outcomes are related to the massive inflow of EU11 labour migrants to the industry or if this is normal and must be expected in this segment of the labour market, with unstable demand due to seasonal variations.

Either way, this precarious labour market attachment is miles away from the Norwegian ideal: permanent, full employment.

Overall, however, there is a very clear mobility hierarchy, and natives are the winners among the manual FPI workers. EU11 labour migrants occupy an intermediate position in this mobility hierarchy, which bring me to the third question: is their situation at the lower end of the labour market permanent, or do they have opportunities for upward mobility? My findings from the FPI suggest that some manage to climb the ladder but that the majority of EU11 labour migrants are best described as immobile. The findings are thus in line with previous Norwegian studies, which find few signs of economic assimilation (Bratsberg, Røed, & Raaum, 2014; Friberg, 2015). Still, EU11 migrants in the FPI are more upwardly mobile than other immigrants. In Article 4, I discuss this advantage as a potential effect of large numbers and networks, but several other factors could contribute. In future research, more comparative research is needed, for instance, comparing social mobility patterns in different industries, with varying compositions of workers.

However, rather than speaking of the EU11 migrants in the FPI as a group with an advantage, it might be more correct to see the non-Western workers as a group with a disadvantage. Non-Western workers are clearly at the bottom of the hierarchy. In the rural-fish processing industry but also more generally in the Norwegian labour market, there are good reasons to expect that the group most affected by the large increase in labour migration is prior immigrants (Bratsberg, Raaum, et al., 2014; Friberg & Midtbøen, 2018). Thus, although the effect on Norwegian-born workers may not be the largest threat to equality, a continued, unlimited supply of migrant workers can threaten the labour market opportunities and integration of other immigrants. In this way, an ethnically distinct underclass is more likely to evolve and persist over time. We need more research on how labour migration affects other immigrants.

In conclusion, the arrival of EU11 labour migrants has resulted in a more unequal rural society, but the effect seems to be more modest than what was expected (or feared) by, for instance, Brox (2005). The *Norwegian-born* population does not seem to have been majorly negatively affected. However, overall income inequality has increased, and I would argue that the Norwegian working class as a whole – now including many EU11 labour migrants and other immigrant workers – are more powerless than before, for instance, due to decreasing proportions in unions (Haakestad, 2021), issues related to integration, such as poor knowledge of the Norwegian system, and discrimination based on nationality or ethnicity (Midtbøen,

2015). Further, even though individual labour migrants are not trapped at the bottom of the labour market, labour migrants as a group are likely to stay there. As Brox (2005, p. 114) argues, it does not help the *class* that *individuals* are able to escape from it. In fact, some suggest it might hurt the class, by weakening collective efforts to improve their situation (Crompton, 2008).

In these concluding remarks, I would also like to discuss the relevance of segmented labour market theory, which has been my main source of theoretical inspiration. It is easy to criticise segmented labour market theory: it is practically impossible to test empirically, and although some have tried, it is unclear how many segments exist and what separates the segments (Leontaridi, 1998). Piore's (1979) dual labour market hypothesis and his two segments is obviously too simplified (as large-scale theories often are and need to be). Of course, the Norwegian labour market cannot be described in these black-and-white terms. This does not mean, however, that it is not helpful and fruitful for researchers to compare empirical findings to the proto-typical segments described by Piore (1979). I would argue, as opposed to Leontaridi (1998), that segmented labour market theory has brought us further than classic and neoclassic economic theory did, particularly when applied in migration studies. Piore's (1979) work is seminal for a reason: his description of the characteristics of migrants' jobs and insights on the importance of status are perhaps as relevant in the current Norwegian labour market as they were in the US and Western Europe in the 1970s. EU11 migrants do, to a large degree, fit Piore's (1979) description of migrants in the secondary labour market. They do mainly work in low-waged and low-skilled jobs, their labour market attachment is more insecure, and their contracts more often atypical. Although some of this could be explained by differing levels of human capital, I would argue that this explanation falls short, and that neoclassical theory fails to account for the extremely segmented character of the Norwegian labour market. The findings are simply not compatible with the assumption that rational individuals compete freely for jobs based on their skills and preferences. As a sociologist writing in a field that is often dominated by economists, I have found segmented labour market theory theory useful because it highlights the demand side as well as social and institutional aspects that are often missing from the work of economists.

Finally, some words on the current COVID-19 pandemic are necessary. This dissertation is about labour migration before the pandemic, but I believe that the questions that are discussed here are more relevant than ever. As migration researchers likely already knew, the pandemic has made it clear to everyone that certain sectors of the Norwegian labour market are extremely

dependent on migrant labour. Countless newspaper articles (See for instance Myhre, Røsrud, & Haagensen, 2021; Rosenborg, 2021; Røkeberg, 2021) discuss how Norwegian farmers are desperate for (migrant) labour and worried that they will have to throw away a large part of their crops. Paradoxically, at the same time, unemployment is high. The current situation with the pandemic has given researchers a good opportunity to study what happens when the supply of foreign workers suddenly disappears.

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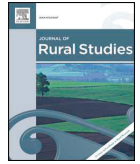
Article 1

Rye, J. F. & Slettebak, M. H. (2020). The new geography of labour migration: EU11 migrants in rural Norway. *Journal of Rural Studies, 75*, 125-131

ELSEVIER

The new geography of labour migration: EU11 migrants in rural Norway

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ARTICLE INFO

ABSTRACT

Historically, immigration to Western countries has been an urban phenomenon, but in recent decades, larger immigrant populations have also arrived in rural destinations. In this paper, we address the dynamics of inbound flows and geographical distribution of labour migrants within rural regions: While some rural localities have received large numbers of migrants, others have seen just a few. Specifically, we explore the case of Eastern and Central European labour migrants (EU11 countries) travelling to Norway's rural regions following the EU enlargements in 2004, 2007 and 2013. Which factors explain the spatial distribution of EU11 labour migrants in Norway's rural regions? We evaluate three assumptions in the extant literature – that labour migrant inflows are related to labour market characteristics, demographic profiles and localities' degree of peripherality. Norwegian register data at municipality levels are employed to estimate a regression model for how these characteristics impact sizes of EU11 labour migrant populations in rural municipalities. Finding show that EU11 migrants are found where the most labour-intensive rural industries dominate; industry-particularly fish processing industry, agriculture and the hospitality sector. Further, they reside in areas with higher unemployment and few refugees. Lastly, we find that the rural municipalities that struggles the most with depopulation has not received the relatively largest number of labour migrant, as EU11 migrants are more often found in the more demographically viable rural communities.

1. The new geography of European labour migration

Historically, international labour migration to Western societies has been an urban phenomenon. The majority of immigrants have settled in larger cities and industrial regions, where demand for labour is the highest (Castles et al., 2014). However, in recent decades rural regions have also received larger numbers immigrants, the majority of which find work opportunities in low skilled, rural industries (Bock et al., 2016; Dufty-Jones, 2014; Hedberg and do Carmo, 2012). The changing geography of labour migration was observed first in the United States in the 1990s (Massey, 2008; Zuniga and Hernandez-Leon, 2005), followed by parallel developments in the southern parts of Europe around the turn of the millennium (Hoggart and Mendoza, 1999; Gertel and Sippel, 2014; Corrado et al., 2017). In the northern parts of Europe, which is the focus of the present paper, the change is more recent and originates in the EU enlargement process starting in 2004 (Jentsch, 2007; McAreavey, 2012, 2018; Scott and Brindley, 2012). The enlargement gave citizens from eleven former Communist states in Central and Eastern Europe access to the far more affluent labour markets of the Western European countries and unprecedented numbers of workers migrated westwards across the European continent, with many arriving in Western Europe's rural regions.

Over the last decade, rural studies literatures have detailed many facets of enhanced labour migration to rural communities, including the structural changes that have facilitated the *outbound* flows of labour migrants, including geopolitical changes, immigration reforms, and industrial restructuration (Hugo and Morén-Alegret, 2008; Jentsch and Simard, 2009). Far less explored are the dynamics of the inbound flows and *intra*-rural geographical distribution of labour migrants. While some rural areas have received large numbers of migrants, others have seen just a few. The emerging literature provides many suggestions for factors that may impact levels of in-migration, mostly based on qualitative and in-depth case studies (Rye and Scott, 2018 [anonymised for review]; Milbourne, 2007). However, there are fewer extensive, quantitative studies of what community level factors are associated with many labour migrants.

Woods (2012, 2) identifies the 'intensification and reconfiguration of global mobility patterns from, to and across rural space' among the challenges for rural studies literature. The present paper responds to his calls for more detailed analysis of international migration to rural regions. Specifically, its analysis evaluates key assumptions emerging from the existent literature on the spatial distribution of labour

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migrants by drawing on materials from the Norwegian case and its population of labour migrants from the "new" EU countries (henceforth called EU11 labour migrants) in its rural regions (ENDNOTE 1).[1] The research question is: which factors explain the spatial distribution of EU11 labour migrants in rural regions?

Following a review of the emerging literature, we address three assumptions in the existing literature, namely that labour migrants concentrate in rural localities that are characterised by:

a) Strong demand for manual labour in the traditional rural primary industries (agriculture, food processing, and non-food industry, such as ship building) and the more recently developed rural hospitality sector, as well as building/construction. We also evaluate assumptions about the demand for migrants being affected by unemployment, education levels, and the presence of other immigrant groups.
b) Populational decline, as these localities have stronger incentives to actively recruit migrants and may also provide for attractive conditions for settlement, such as low-cost housing opportunities.
c) Relative proximity to urban centres, which allows labour migrants to mitigate potential disadvantages of the rural context.

The paper is organised in four sections. First, the literature on international labour migration to rural localities is surveyed in order to detail assumptions concerning the EU11 migrants' distribution across rural spaces. The next section presents the Norwegian study case and presents the paper's methods and materials. In the third section a multivariate regression model is estimated, and its results are analysed. The final section sets out main conclusions from the study.

2. Rural regions as migrant destinations - a review of the literature

In this section we survey the literature on international labour migration to rural destinations, focusing on EU11 migration to Western Europe's rural regions.

First, increasing migration to rural areas is closely linked with developments in rural labour markets. Europe's rural industries have increasingly turned to migrant labour to secure a supply of inexpensive, flexible labour (Rye and Scott, 2018). This is related to industrial restructuring driven by the vertical integration of food production and led by international supermarket chains. This has also put pressure on farmers to cut profit margins and reorganise production to meet demand for specialised, flexible delivery. These trends have resulted in further industrialisation of agricultural production, to which the recruitment of cheap, flexible, docile migrant labour has proven to be key. This is particularly evident in the agricultural industry, especially horticulture. In the United States and parts of Europe, particularly the Mediterranean region, manual harvesting work today is performed exclusively by migrants (Corrado et al., 2017; Gertel and Sippel, 2014). The literature demonstrates that the EU11 migrant labour force now increasingly serves a similar function in the northern parts of Europe as well, such as in England (Rogaly, 2008), Germany (Fialkowska and Piechowska, 2016), and Norway (Rye, 2007).

Further, in addition to agriculture and the production of food, several studies discuss the use of migrant labour in rural food processing industries. Kandel and Parrado (2005) link the arrival of immigrants to new rural destinations in the US to the industrial transformation in the meat processing industry. In the UK, Scott and Brindley (2012) argue that the spatial distribution of eastern European

migrants is largely linked to food production and food processing. In Norway, the fish processing industry constitutes a large part of the food industry. Several studies explore in-migration to the northern region, which is often but not exclusively related to the coastal fish-processing industry's demand for inexpensive labour (Aure, 2008; Friberg and Midtbøen, 2017; Tiller et al., 2015). Further, Ødegård's (2014) examination of the shipbuilding industry suggests that labour migrants are also found in large numbers in non-food industrial production, particularly along the coast.

In addition to traditional rural industries, our review of the literature suggests that the tourism industry has become an important employer of migrant labour. For instance, in their study of tourism labour markets in rural Sweden, Lundmark, Thulemark and Heldt Cassel (2012:4) argue that the tourism industry in peripheral areas has become a pull-factor for in-migration, mainly because of its employment possibilities but also because the tourism areas are attractive places to live. The tourism industry has seen a markable increase in Norway over the past years, most notably in the hotel and restaurant sector, which saw an increase of 9000 employees from 2011 to 2016 (SSB, 2018). Many of the jobs in this sector require few skills, and are subject to seasonal variations, which creates the need for flexible employees. In much the same way as the agriculture and food industries, these traits have become increasingly unattractive to the Norwegian-born population and, in recent years, migrants have somewhat replaced Norwegian-born workers, particularly in the hotel sector (Ødegård and Andersen, 2011).

Lastly, much is written about labour migration in the building and construction industry (Friberg, 2013; Friberg and Eldring, 2011), but mainly in urban areas and particularly in the capital. The construction industry is present all over Norway and requires a large number of manual workers. However, in their study of EU11 migrant labour in Norway's capitol, Oslo, Friberg and Eldring (2011) find that most Polish workers employed in the building and construction industry are hired through Norwegian or foreign staffing companies. Such untraditional staffing strategies have also become more common in some of the branches of the labour market mentioned above, particularly in the industry and hotels (Friberg, 2016; Ødegård, 2014).

Labour migration is commonly assumed to be demand driven. Piore (1979) argues that migration is caused by a structural demand for labour in modern industrial societies. Rural industries over the last decades have been drained of the traditional domestic reserve labour force as women have become integrated into the regular labour market and young people spend more time in education. However, while these are general developments, demand for EU11 labour migrants could differ within rural areas based on the local characteristics of the labour market, such as education levels, unemployment, and the presence of other immigrant groups.

Since EU11 labour migrants mainly work in the low-skilled sectors of the labour market, a larger presence of lower educated natives and a larger presence of other migrants (refugees) could reduce the demand for EU11 labour migrants. However, this would imply that low-skilled native workers and refugees are, to some degree, complements to EU11 migrants. This might not be the case as low-skilled and underemployed domestic workers have also become less interested in manual labour in rural primary industries, as wage and working conditions have deteriorated and taken on the characteristics of a secondary labour market (Piore, 1979). For instance, Kasimis (2009, 94) concludes that migrant farm workers in the Greek case 'have not replaced native wage labourers', but instead fill spots in the labour market whose very existence depends on migrant labour. Further, Friberg and Midtbøen (2017) analyse ethnic hierarchies in the hotel and fish-processing industries and find signs of ethnic hierarchies: Norwegians are undesirable in low-skilled positions but indispensable in key positions, and Eastern Europeans are preferred for manual labour, while refugees are last in the hiring queue. The latter's position in these industries appears to have been negatively affected by the large inflow of Polish and Lithuanians in recent years, making them regarded as less desirable. Also

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[1] ENDNOTE 1: Norway, the paper's study case, is part of the European common labour market as a result of the European Economic Agreement (EEA) between the EU and the European Free Trade Association (EFTA), which consists of four non-member states in Western Europe (Norway, Switzerland, Iceland, and Lichtenstein).

interesting in this regard is the internal mobility of refugees and labour migrants. Stambøl (2013, 2016) finds that refugees often move to places where refugees already have the largest proportions of workers. Labour migrants, in contrast, move more often to places with fewer labour and Nordic migrants.

Further, while we would intuitively expect that domestic unemployment would discourage a high presence of labour migrants, the literature suggests that even in times of domestic unemployment, employers prefer to recruit international labour (Hoggart and Mendoza, 1999; Kasimis, 2008, 512; Scott, 2013).

While the effect of labour market characteristics on the distribution of labour migrants might appear obvious, another strand of literature focuses on the settlement of migrants in areas struggling with depopulation. Many rural regions have seen decades-long trends of depopulation and aging populations. They welcome new residents, who represent a 'demographic refill' (Hedberg and Haandrikman, 2014, 129) and have the potential to reinvigorate declining rural communities (Bayona-i-Carrasco and Gil-Alonso, 2013; Aure et al., 2018). In theory, these municipalities may be in need of new laborers to fill vacancies; on the pull-side, these areas usually have lower housing costs. An interesting question in this regard is whether EU11 migrants settle in the municipalities that have the greatest need for a "demographic refill" and in this way compensate for their population-loss relative to the more viable rural municipalities. For instance, Båtevik and Grimsrud (2017) find that peripheral regions in western Norway receive relatively more high-skilled migrants, and thus compensates for peripheral disadvantages.

Finally, there is reason to believe that the distribution of labour migrants could be affected by geographical aspects. It is interesting that while the general moving patterns in the Norwegian-born population are characterised by centralization, the settlement pattern of EU11 labour migrants – at least after 2007 – has strengthened the peripheral regions (Stambøl, 2016). Whether or not this preference for the peripheral regions is just a consequence of high demand for labour in these regions – or EU11 migrants prefer these areas for other reasons – is unknown. However, the literature suggests that rural communities may be less accommodating to international migrants (McAreavey, 2018) due to their shorter experience of housing such populations (Jentsch and Simard, 2009).

In conclusion, the literature indicates, first, that rural localities differ in the international migrant populations they host, both in scale (total numbers) and content (migrants' geographic origins and motivations). More specifically, the literature suggests that the stronger the presence of agriculture, food, and hospitality (hotels and restaurants) industries, the larger the EU11 population will be in rural localities. Other labour-intensive industries have the same effects. Moreover, the unemployment and educational levels of the native population affects migrant populations. Second, there is also an assumption that rural localities experiencing population decline are more likely to try – and may succeed – in recruiting international migrants. Third and final, less peripheral municipalities house relatively more EU11 migrants.

3. EU11 migrants in rural Norway

This paper studies the Norwegian case to evaluate the key assumptions on the spatial distribution of EU11 migrants detailed in the previous section. The analysis employs municipal level register data from Statistics Norway, which allows for a detailed examination of EU11 migrants across Norwegian rural spaces. Previous analysis of these materials has documented the considerable growth of in-migration to the rural regions, both from the EU11 and other parts of the world, and how this has resulted in a more even rural/urban spatial pattern of contemporary international migration to Norway (e.g., Østby et al., 2013). In 2000 only a very few rural municipalities hosted more than a few EU11 labour migrants – or any immigrants at all. In 2015, EU11 migrants resided in all but two municipalities in Norway and
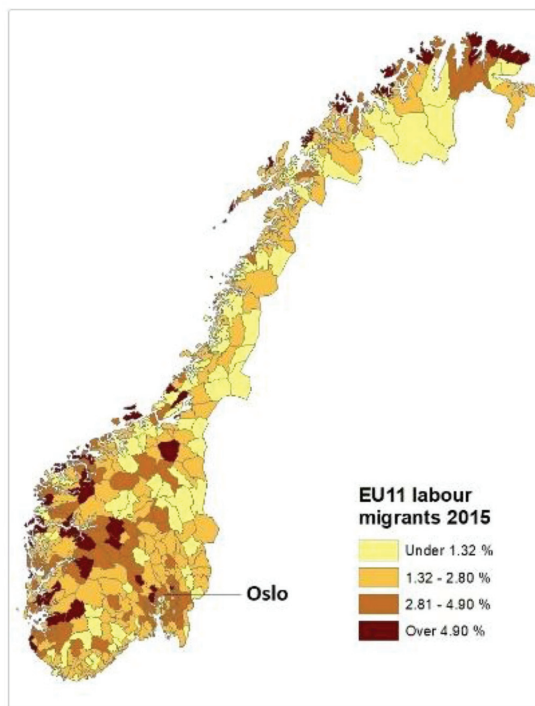

Fig. 1. Proportion EU11 labour migrants, 2015. (Source: Statistics Norway).

accounted for 3.1% of the total population in rural municipalities. Actually, the relative size of the EU11 migrant population is currently larger in rural than in urban regions.

Statistics Norway's register data furthermore evidences the relative dominance of the EU11 countries as the providers of labour for Norway's industries. EU11 labour migrants out-number labour migrants from the western countries by 6 to 1 in Norway's rural regions.

Published reports with initial analysis of the register data document strong variance in numbers of EU11 migrants in the country's rural regions and localities. For instance, Østby et al. (2013) found especially high populations in small coastal municipalities. They also noticed a stronger presence of EU11 migrants in western regions of the country. They did not further investigate the characteristics of municipalities with high and low migrant populations, but suggested – in line with the international literature in the field – that differences might arise from local variations in the labour market. Fig. 1 displays the variation in EU11 populations across Norway, which appears to follow no clear-cut spatial structure. For instance, many neighbouring municipalities house EU11 migrant populations of quite different sizes.

We find the Norwegian register data especially well-suited for further and more detailed evaluation of the spatial structure of EU11 migrants. The suitability of the material is due to at least three characteristics: first, the Norwegian local administrative structure is organised in small population units. On average, the 426 Norwegian municipalities (2017 numbers) have 12,100 inhabitants. Rural municipalities are generally much smaller. Those defined as rural in this paper have an average population of 4,023, which permits fine-grained empirical investigations on a local spatial scale. Second, rural municipalities—despite their small population size—play an important role in Norwegian governance structure, so long traditions of producing statistical knowledge at the municipal level exist. For instance, all changes in municipalities' populations (in-/out-migration) are tracked,

aggregated, and publicly reported annually. While no public register is ever complete, Norwegian society is characterised by a relatively small grey/black economic sector and smaller unregistered and undocumented immigrant populations. Third, Statistics Norway's procedures for data production are generally considered to be of high quality. For the variables employed in this paper, we observe no data quality issues or significant missing values.

The analysis addresses Norway's 'rural' municipalities. The literature abounds with definitional discussions on what constitutes a rural locality, and the operationalisation of the term depends on the research problem at hand. In this paper, we apply a taxonomic approach, building on Almås and Elden (1997) and Farstad et al. (2009), and define rural municipalities according to three criteria:

a) *Centrality*: the number of jobs and service functions that can be reached in 90 min when travelling by car by the average inhabitant of the municipality. A scale from 6 to 1 is constructed, where 6 is the least central (Statistics Norway's centrality scale, see Høydahl, 2017). Municipalities on level 6 and 5 are defined as rural in this paper.
b) *Settlement density*: the percentage of the population residing in sparsely populated areas (settlements with more than 200 people in houses less than 50 m apart). Municipalities are defined as rural according to this criterion if more than 50% of the population resides in sparsely populated areas.
c) *Labour markets*: the percentage of the working population in the primary sector (e.g., agriculture, fisheries, and forestry). Municipalities are defined as rural according to this criterion if more than 7% of the working population is in the primary sector.

A municipality is categorised as rural if *at least one* of these criteria are met. As a result, 273 of the 426 municipalities in Norway are classified as rural. 18.4% of the Norwegian population resides in these municipalities.

Among the various definitions of immigrants available, 'EU11 (labour) migrants' are, in this paper, defined as people who were born in one of the EU11 countries and have two parents and four grandparents not born in Norway. Migrants are defined as 'settled' in a municipality if they have lived in Norway for at least six months (Dzamarija, 2013). Moreover, in this paper we also include short-term migrants registered as working in Norway. This is important for the solidity of analysis, especially when studying rural regions where circular migrants engaged in seasonal work (e.g., in the agricultural and tourism industries) constitute significant segments of the population. In the analysis, the short-term worker population is estimated as an average of monthly numbers.

The dependent variable measures the number of EU11 labour and family migrants in 2015. EU11 refers to migrants from the (post-communist) countries that joined the EU after 2004. This includes migrants from Poland, Lithuania, Latvia, Estonia, Czech Republic, Slovakia, Hungary, Slovenia (2004 accession countries), Romania and Bulgaria (2007), and Croatia (2013). Citizens from these countries have full access to the Norwegian labour market and only need to register their presence to obtain a work permit. Note that since 1989 in the administrative annuals, immigrants' "main motivation" has been recorded via the EEA-registration scheme (Dzamarija, 2013). Categorisation is subjective and largely inconsequential for the migrants. 'Labour migrants' are those arriving for the explicit purpose of obtaining work, 'family migrants' are those stating a family connection to an already settled person in Norway; however, they are equally entitled to work in Norway and the larger part of them do. Numerically, these categories account for the larger part (98.6%) of EU11 migrants in rural Norway: 58.8% 'settled labour migrants', 21.9% 'settled family migrants', and 19.9% short-term migrants. The three remaining categories (education, refuge, and others) are extremely small, and are not included in the analysis.

In the next section we estimate a regression model that evaluates the

key assumption about community level characteristics related to EU11 migration. The dependent variable in the regression model measures the number of EU11 migrants in 2015. Based on the literature review, the independent variables taps into three aspects of municipalities' characteristics: 1) labour markets; 2) demographic profiles; and 3) centrality.

3.1. Labour market variables

The independent *variables agriculture, food industry, hotel and restaurant, non-food industry, building and construction,* and *labour services* measure the number of people, including short-term migrants, working in these particular industries. To clarify, industry (by which we mean manufacturing/industrial production) have been split into food and non-food industry.

In addition to the industry variables, we have included three other labour market factors that are related to the *demand* for labour migrants: *unemployment* levels (the average percentage of the labour force registered as unemployed from 2011 to 2015); *higher education* (the percentage of the population older than 16 years with university/college degrees); and the number of *refugees* (includes all migrants who have a residence permit in Norway and where refuge has been given as the reason for residence application). Refugees include asylum seekers who have been granted residence, those who have been granted residence on humanitarian grounds, and quota refugees (UN refugees) (Dzamarija, 2013).

3.2. Demographic variables

Two variables measure the overall demographic viability of municipalities. First, *Norwegian-born net-migration,* which is the ability to retain the local population and is measured by the balance of in-/out-migration in the Norwegian-born population from 2011 to 2015. Second, *birth surplus*, which measures births minus deaths from 2011 to 2015.

3.3. Centrality variable

Centrality measures a rural locality's relative distance to major centres. The centrality scale, which, as noted above, also contributes to the very definition of the sample, runs from 6 (most peripheral) to 1 (most central). The threshold for qualifying as a rural municipality is 5. However, some less peripheral municipalities (levels 3 and 4) are included in the sample due to their scores in settlement density and labour market structure criteria. Thus, in the regression analysis we evaluate whether more peripheral municipalities defined as rural house more EU11 migrants. Levels 3 and 4 are combined due to the few observations in level 3 (11 municipalities).

Finally, the model includes a variable in population size. This variable works as a pure, technical control variable to scale the other independent variables. This ensures that effects of other independent variables are not affected by municipality population size.

Operationalisations of variables are subject to criticism. However, we find that the chosen strategy of analysis by and large generates robust results and manages to identify the general patterns, which is the paper's objective.

Descriptive statistics for all variables are presented in Table 1.

4. Explaining the spatial distribution of EU11 labour migrants

Table 2 presents results from a multivariate regression model estimating the effects of the structural characteristics of rural municipalities on the size of the EU11 migrant population.

Table. 1

Descriptive statistics (rural municipalities, N = 273 for all variables).

	Min	Max	Mean	SD
EU11 migrants	0	1204	108.6	148.1
Agriculture	0	860	81.9	101.1
Food industry	0	909	56.4	109.7
Hotel & restaurant	0	428	46.6	59.5
Non-food industry	0	1705	126.7	197.0
Building and construction	4	1271	141.5	145.8
Labour services	0	446	12.9	42.0
Unemployment (%)	0.6	7	2.4	1.0
High education (%)	11.9	40.6	21.0	3.8
Refugees	0	599	51.8	71.0
Norwegian-born net migration	−298	349	−43.2	78.4
Birth surplus	−319	901	−9.8	100.6
Population	206	19,069	3511.6	2857.9

			N	%
Centrality				
3-4			52	19.0
5			120	44.0
6			101	37.0

4.1. Labour market results

The first hypothesis concerns the importance of the traditional rural industries and the more recently developed rural hospitality sector on the number of EU11 migrants in the municipality. Results in Table 2 strongly demonstrate how these rural industries are essential. Municipalities with larger agricultural, food, and hotel and restaurant industries host far more EU11 labour migrants than others rural municipalities. At one level, these are not very surprising results and merely confirm that rural labour markets with a strong reliance on labour-intensive industries are more likely to attract labour migrants. However, further analysis adds important nuances. First, the reported standardized coefficients estimate the relative strengths of effects. The food industry variable comes out to have the strongest effect (0.362) by far, followed by the agriculture variable (0.208), non-food industry (0.181), and lastly the hotel and restaurants variable (0.131).

Further, we ran a model that separates the effects of the inland food industry from the coastal food industry, which clearly shows that the coastal food industry has the strongest effect with a standardized coefficient four times higher than that estimated for the inland food

Table 2

Multivariate linear regression model. Dependent variable: Number of labour migrants from EU11. Rural municipalities. (Source: Statistics Norway).

	Coeff.	Std. Err	Std coeff.	P-value
Agriculture	**0.381**	0.062	0.208	0.000
Food industry	**0.611**	0.052	0.362	0.000
Hotel & restaurant	**0.410**	0.090	0.131	0.000
Non-food industry	**0.170**	0.032	0.181	0.000
Building and construction	0.051	0.076	0.040	0.502
Labour services	**1.138**	0.110	0.258	0.000
Unemployment	**9.588**	4.430	0.053	0.031
High education	1.901	1.276	0.039	0.137
Refugees	**−0.184**	0.084	−0.070	0.031
Birth surplus	**0.279**	0.058	0.152	0.000
Norwegian-born net migration	0.108	0.061	0.046	0.081
Centrality (ref.6)				
centrality 3–4	**31.210**	14.518	0.066	0.032
centrality 5	−15.621	10.014	−0.042	0.120
Population (control variable)	0.003	0.004	0.045	0.495
Constant	−43.976	31.595		0.165
N	273			
Adj. R^2	0.873			

industry. In other words: while all rural industries are key to understanding the distribution, it appears that, more than anything else, the municipalities with fish processing industries house the most EU11 migrants. This also explain Østby et al. (2013) observation about the many (but not all) coastal municipalities with higher numbers of migrants.

The effect of the building and construction industry is, however, small and not significant. This might be the result of external hiring practices within this sector, which, following the EU enlargement, have exploded, particularly within construction, but also in the industry and in hotels (Friberg, 2016). We have estimated separate models to evaluate the effects of large labour services in the locality. The effect is substantial but difficult to interpret: municipalities with many employees hired by staffing companies host significantly more EU11 migrants than others; which sectors of the labour market they actually operate within is unknown.

Labour market results further show that municipalities with higher unemployment levels host larger numbers of EU11 labour migrants. Although we hypothesised that municipalities with lower unemployment in the years before 2015 would have higher demand for labour and thus higher numbers of labour migrants, our results show the opposite. Further, our hypothesis that municipalities with higher education levels have received more EU11 migrants is difficult to conclusively assess. Results are partly dependent on the overall model specification, but in most cases the educational level has some (but not very strong) effects with p-values around the 0.05 cut off point. In the final model the coefficient is not significant at the 0.05-level.

Alternatively, our hypothesis concerning refugees was strengthened in this analysis. Municipalities with larger numbers of refugees host less EU11 migrants. While it is known that the spatial distribution of refugees and EU11 migrants is different (Østby et al., 2013), the analysis provides insight into why this is the case. We see a much stronger effect of refugees by running a model without the other labour market variables, which means that the structure of the labour market explains most (but not all) of the negative connection between refugee and EU11 migrant's settlement patterns. This supports Friberg and Midtbøen's (2017) findings that while EU11 labour migrants are attracting employees in the manual rural industries, refugees are the last in the hiring que. Their avoidance of rural areas dominated by traditional rural industries with high numbers of labour migrants might thus be explained by their lack of employment opportunities in these areas. Stambøl's (2016) observation that refugees often move to the municipalities with the highest proportions of refugees in the workforce may further explain the results, since such a process would strengthen the different spatial distribution of the two groups.

4.2. Demography results

The next set of hypotheses concerned population decline and our assumption was that municipalities that had experienced depopulation would have higher numbers of EU11 migrants. Norwegian-born net-migration and birth surplus measures two different but often related aspects of population decline. Contrary to our assumption, the results suggest that the number of labour migrants are higher in municipalities with a higher birth surplus in the last five-year period, suggesting they are more likely to locate in municipalities with young, fertile populations. Further, we see there is no significant correlation between the net migration of Norwegian-born the last five years and the numbers of EU11 labour migrants. These findings are robust, independent of inclusion of the other variables in the model. Together, these findings lead us to reject the hypothesis that municipalities struggling with depopulation receive relatively more labour migrants. If anything, our results suggest that it is municipalities with the least problems with depopulation that receive the most labour migrants.

4.3. Peripherality results

Our third hypothesis concerned proximity to urban centres. Our assumption was that – after control for other variables - labour migrants prefer to settle in the more central rural municipalities. Our findings support this hypothesis. While the proportion of EU11 migrants is higher in the most peripheral rural areas, this pattern changes after control for labour market and demographic characteristics. Thus, EU11 migrants' peripheral settlement pattern is a result of their job opportunities in the least central areas.

We further estimated models with EU11 'labour' migrants only (excluding those stating 'family reunion' as their main cause of migrating). These show very similar results and suggest these categories do have similar traits. It is also notable that the correlation between 'labour' and 'family' migrants' distributions is extremely high (0.989). Thus, it is not surprising that the models are similar. However, it is noteworthy that the significance of the centrality variable is lower without the inclusion of 'family' migrants. This may suggest that 'labour' migrants in the more central rural areas are more often joined by their family. Further, we estimated models without the short-term migrants. Again, results are similar, but we observe that the relative strength of the effect of variables *Agriculture* & *Hotel,* as well as the variable measuring the number of migrants employed by staffing companies, is slightly lower. This suggests some interesting effects in the sectors of the rural labour markets, which most frequently hire short-term workers; however, these are outside the reach of the present paper.

Finally, the value for the R-square (adjusted) test is 0.873, which is extraordinary in regression analysis in the social sciences. The result suggests that the included model accounts for almost all of the spatial variation of EU11 migrants. However, the value is inflated by the incorporation of the population control variable and should not be emphasised. In a model excluding all variables except population control, R-square is 0.556. Thus, a more correct estimate of the explanatory power of this model can be achieved by subtracting this number.

We conclude this section with notes on methodology to add further nuance to the paper's results. The regression model seeks to evaluate key assumptions on underlying mechanisms that generate the spatial pattern of international migrants; in this paper it is more specifically the flows of EU11 migrants to rural Norway. The presented results are clear in this regard, confirming some key assumptions in the literature (such as the overall importance of labour market structure) while rejecting others. Given the nature of the phenomenon at hand, however, results are necessarily open for alternative interpretations.

The first issue is the causal structure of relationships between the dependent and several of the independent variables. For instance, the model shows an association between high unemployment levels and number of EU11 labour migrants. In principle, this may be due to the fact that labour migrants have a higher unemployment rate (Thorsdalen, 2016), but it is also possible that migrants displace native labour and thus increase unemployment within the Norwegian-born workforce. This would be in line with Hoen et al.'s (2018) findings, which imply that lower class native employment is negatively affected by immigration from low-income countries. Conversely, migrants could – paradoxically – be attracted to areas with high unemployment, if this unemployment reflects a dysfunctional labour market with a mismatch between local residents' skills and ambitions and the available jobs, thus creating a high demand for migrants (Kasimis, 2009, p. 94). More advanced statistical analysis using panel data is required to dig deeper into these mechanisms. In parallel, the higher birth/death surplus in localities with many EU11 migrants may be affected by EU11 migrant age profiles: more in the fertile age range, fewer in the old. While more definite answers demand other statistical designs, such as panel data analysis, we find the presented interpretations of regression models reasonably substantiated. While there may be some reciprocal effects between variables (the presence of many migrant farm workers, who

represent lower wage costs, may facilitate further growth of the agricultural industry; young migrants may add to the birth/dead surplus), these effects are expected to be modest and not 'disturb' the overall interpretative framework.

A second issue is the ever-present question of data reliability. While we contend that the Statistics Norway materials are of good quality for the nature of the phenomenon, international migration (in part of a short amount of time and circular character) invites missing or even faulty data entries and affects definitional choices, such as evidenced by the case of seasonal labour in the agricultural industry. These are matters that emphasise the need for sensitive interpretation of results, but do not undermine the paper's conclusions.

5. Conclusions

The EU11 migrant population in Norway tripled between 2000 and 2015 and found their way into both urban and rural regions of the country. Today, international migrants are found everywhere in Norwegian society. However, the labour migrants from the post-communist EU countries are distributed very unevenly across Norwegian rural space, as they are in other nations. This paper evaluates assumptions of the social processes that produce these patterns.

First, the analysis confirms the principal importance of labour market characteristics. In part, the analysis provides a tautological finding: labour migrants are found where the most labour-intensive rural industries dominate – industry, agriculture, and hospitality sectors. However, the regression model adds nuances to the statement by demonstrating the varying powers of the industries. In the Norwegian case it appears that the food industry, particularly the fish processing industry along the coast, is especially important. Further, independent of the size of rural low-skilled industries, EU11 migrants' spatial distribution is also related to unemployment levels and the presence of refugees. Further research is needed to fully understand the mechanisms that create these patterns.

Second, while the analysis clearly shows that the structure of the labour market is important when explaining the spatial distribution of EU11 labour migrants, the demographic variables also have a clear effect, particularly the birth surplus. Several contributions to the literature (Hedberg and Haandrikman, 2014; Aure et al., 2018) discuss how labour migrants are "saving" rural municipalities by moving into areas struggling with depopulation. However, the results from this analysis suggest that the rural municipalities that struggle the most with depopulation have not received the (relatively) largest numbers of labour migrants. Instead, it is the rural municipalities with young and fertile populations that have received the most migrants. Although immigration certainly benefits rural population growth in general, this finding provides some nuance to this picture. Independent of labour market structure, the highest numbers of EU11 migrants are found in the more viable rural communities.

Third, the results suggest that the peripheral settlement structure of EU11 labour migrants can largely be explained by the employment opportunities in the most peripheral areas of Norway. Holding the labour market factors constant, EU11 migrants, like the general population, prefer the more central rural areas, which – as stated in the introduction - might allow migrants to mitigate potential disadvantages of the rural context. A more central location could for instance make travel to migrants' country of birth significantly easier and less expensive.

The Norwegian case demonstrates the highly diverse nature of the rural immigration phenomenon. Different rural communities host immigrant populations that are different in both scale and content. Some rural municipalities host large numbers of international migrants, while others still have relatively homogeneous demographic profiles. These differences are generated by a multiplicity of factors; however, labour market characteristics appear as the most important. This is a picture reflecting – and further corroborating – key findings in the emerging

international literature, which has predominantly applied qualitative and local level case studies with methodological designs to understand the mechanisms underlying the dynamics of labour migration across the European continent. As such, the current paper works to triangulate key findings in the literature in terms of methodological approaches; qualitative versus qualitative.

The analysis also extends the literature by focusing on the northern European (and more specifically, the Norwegian) social context of labour migration. At one level the correspondence between findings in the existent literature has largely emerged from studies of the US and Mediterranean localities, and those in the current study of the Norwegian case. However, there are also some interesting nuances and nation-specific idiosyncrasies, such as the importance of the fish processing industries that led to an accumulation of labour migrants along the Norwegian coast. There are also specific state policies likely to affect the scale and spatial distribution of migrants. For instance, the post 2004 influx of EU11 labour migrants was entirely dependent on Norway being part of the EU's labour market arrangements through the EEA agreement, while – for instance – its rural policies emphasising the upkeeping of a decentralized agricultural industry (Bjørkhaug and Blekesaune, 2008) are a precondition for migrants finding work in the peripheries. Further cross-national comparative research may add to the balance between more 'universal' and nation-specific factors affecting the scales and spatial distributions of international labour migrants, whether from EU11 countries or, as not discussed in the present paper, from other destinations. To what extent is international migration to rural regions nation specific? What are the effects of immigration regulations, labour market structures, and regional policies?

Acknowledgments

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Article 2

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Labour migration and increasing inequality in Norway

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Abstract

This paper explores the contested relationship between migration and income inequality, using labour migration to Norway as a case. The enlargements of the European Union starting in 2004 were followed by an unprecedented increase in labour migration to Norway. In particular, many rural regions, previously unfamiliar with immigration, have experienced a large influx of labour migrants. In the same period, income inequality has increased. This paper uses register data on the municipality level from 2005–2016 to discuss (a) the direction of the relationship between labour migration and income inequality; (b) the degree to which labour migration affects inequality (in general and within the native population) compared to other immigrant groups; and (c) whether the effects are different in rural and urban municipalities. Findings show that labour migration from the 'new' European Union countries is followed by higher income inequality in Norway. No support is found for the reversed causal relationship that increasing inequality causes higher numbers of labour migrants. The effect of labour migration on overall inequality is considerable, but not as strong as the effect of refugees. However, as opposed to refugees, labour migration also affects income inequality within the native population, but this effect is only significant in rural areas.

Introduction

The European Union (EU) enlargements to the east starting in 2004 were followed by an unprecedented increase in labour migration to Norway. According to register data from Statistics Norway, 180,000 labour migrants were settled in Norway in 2016, compared to 8500 in 2000. Labour migrants have also settled in every municipality in Norway. Thus, many rural regions in Norway, previously unfamiliar with migration, have seen a large influx of migrants (Høydahl, 2013). The EU enlargement to the east, and the

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migration that followed, represents a shift, not only in the history of immigration to Norway, but in the Norwegian labour market as well. Employers suddenly gained access to a large reservoir of labourers who came from countries with wages that were considerably lower than the Norwegian wages. Worries regarding low-wage competition and increasing social inequality that could possibly be a threat to the Norwegian work-life regime and welfare state soon surfaced (Friberg, 2016; Norges offentlige utredninger, 2011: 7). Still, too little research exists on how this labour migrant influx has affected social inequality.

Norway, along with the other Nordic countries, has enjoyed relatively low levels of income inequality for many decades. However, income inequality is increasing in the Nordic countries (Egholt Søgaard et al., 2018). In Norway, there has been a sharp increase in recent years. Since 2009, the difference in income between the 90th and 10th percentile (P90/P10) has increased every year, from 2.6 to over 2.8 in 2015, which is the largest number ever measured with P90/P10 in Norway (Telle et al., 2017). In Norway, there is a broad political consensus that small income differences are desired and increasing income inequality is considered problematic. Not only left-wing parties, but also the current right-wing government (Finansdepartementet, 2019) claim that low inequality unites people and is important to uphold high levels of trust. Equality and high levels of social trust characterize the Nordic countries (Rothstein and Stolle, 2003), and are a key to understanding the Nordic model (Bungum et al., 2015).

The sudden influx of labour migrants and the increasing inequality make Norway a particularly interesting case for this paper's objective, which is to study the connection between labour migration and income inequality. Income, in this case, includes employment income, capital income and taxed and tax-free transfers. Further, the availability of high-quality register data on the municipality level provides the opportunity to examine this connection in different geographical areas, particularly rural areas, which have been less explored as immigration to Western countries historically has been an urban phenomenon.

Although little previous research exists on the Norwegian case, there is a large body of literature discussing the connection between migration and income inequality. Most research in the field is carried out in the United States and might have limited transfer value to the Norwegian context. Further, there are large disagreements within this field, concerning both the direction of the causal relationship between migration and income inequality (Hyde et al., 2015) and the degree to which migration affects income inequality (Borjas, 1999; Card, 2009).

In addition to these important questions, other knowledge gaps remain. First, while there are a large number of studies on how immigrants in general (Hyde et al., 2015), low-skilled/high-skilled immigrants (Xu et al., 2016) or non-western migrants/refugees (Foged and Peri, 2016) affect wages or income inequality, the large *labour* migrant influx after the EU enlargement has received less attention. The fact that Norwegian register data distinguish between different reasons for migration – such as work, refuge, family and education – provides an opportunity to study particularly *labour migrants* and compare them with different immigrant groups. Second, little research exists on the effect of migration on inequality in different local labour markets, such as urban and rural ones (for an exception, see McLaughlin, 2002). While most studies assume that the variables affecting income inequality do so uniformly throughout different local economies, I ask whether the effect of immigration on inequality is different in (typically small) rural and (large, diverse) urban labour markets.

To address these knowledge gaps, this paper explores the connection between labour migration and income inequality in Norwegian rural and urban municipalities after the EU enlargement, using register data 2005 to 2016. First, advanced structural equation modelling is utilised to explore the direction of the relationship between labour migration and income inequality. Second, fixed effects regression is used to study the degree to which labour migration (compared to other types of migration) has led to increased income inequality (in general and within the native population) in rural and urban Norway.

The Norwegian case

Norway is an interesting case for at least two reasons. First, although migration is not a new phenomenon in Norway, the country was, at the turn of the millennium, relatively homogeneous, with an immigrant population of 5% (a third of them living in Oslo), according to data from Statistics Norway. In the following years, and especially after the EU enlargement in 2004, Norway experienced an unprecedented increase in immigration. By 2016, the immigrant population had increased to 13.4% and Poles were now the largest immigrant group. The spatial distribution of immigrants has also changed, as many immigrants, and especially labour migrants, have settled in the rural areas of Norway.

Second, Norway (which has a lot in common with the other Nordic states) has a set of structural characteristics that makes it somewhat different from other western countries. The small, open economies of the Nordic countries are characterised by a large welfare state, with universal benefits and free education and health care. The work-life regime is highly organised and is characterised by strong unions, collective agreements, strong statutory labour rights and a high degree of involvement of workers. Generally, the Nordic model is known for its ability to combine efficiency and equality (Bungum et al., 2015). However, Norway and the other Nordic countries have no national minimum wage, and wage is for most people determined through collective agreements. For this reason researchers pointed out early on that the Norwegian labour market is particularly vulnerable to low-wage competition (Friberg, 2016). To prevent social dumping and low-wage competition after the EU enlargement, many collective agreements were extended to entire industries (such as construction, agriculture, fishing and cleaning), securing a minimum wage for all workers in those industries. Bjørnstad (2015) studied the effects of extension of collective agreements and concludes that the agreements have slowed down the wage-reducing effect of labour migration, secured a minimum wage for most workers and thus (partly) worked according to their intentions. However, wage polarisation has continued to increase in the studied industries, and Bjørnstad (2015) claims that labour migration has contributed to changing the income distribution between capital and labour.

Immigration and inequality – Theoretical perspectives and previous research

According to Hyde et al. (2015), the literature discussing the relationship between inequality and immigration can roughly be divided into two camps. Supply-side perspectives argue that increasing immigration drives up income inequality (Borjas, 1999; Card, 2009), while demand-side perspectives argue that increased inequality is the result of economic restructuring, which in turn attracts higher numbers of immigrants (Piore, 1979; Sassen, 2001). The two perspectives do not necessarily stand in contrast to each other, as it is possible that structural changes in the labour market create more inequality and attract larger numbers of migrants, which in turn creates larger inequality. Hyde et al. (2015) find support for this and label it the reciprocal effect hypothesis. These theoretical contributions, and particularly demand-side perspectives, are developed in a US context, and their relevance for Norway will be discussed below.

Demand-side perspectives

This perspective argues that the US economy has gone through large changes in the last 40 years, resulting in a larger low-wage sector, the disappearing of middle-income jobs, expansion of managerial and professional jobs and overall polarisation of the wage structure (Hyde et al., 2015; Kalleberg, 2011). This creates demand for migrants to fill low-skilled, but also high-skilled, jobs.

In this perspective it is inequality (caused by economic restructuring) that causes higher numbers of migrants. Hyde et al. (2015) formulate the following chain of causation: ' . . . employers first create the degraded job structures, then discover that native workers are unwilling to accept such deplorable

conditions of work, and then turn to foreign-born workers as a readily available alternative' (Hyde et al., 2015: 83).

Dual labour market theory is relevant within this perspective. The theory has been central to the sociological understanding of the causes of migration and the migrants' role in the destination countries' labour market. According to Piore (1979), migration is caused by structural demand for labour in industrial societies. He argues that the labour market has become increasingly divided into a primary and secondary sector. In contrast to the secure and often high-paying jobs in the primary sector, the jobs in the secondary sector are unsecure, often low-paying and require little skill. Native workers are often unwilling to accept jobs in the secondary labour market, not just because of low income, as conventional economic theory would suggest, but because they signify or confer low status. For temporary migrants, however, their social status is located in their home community. The work they perform in the receiving country is only a way to earn money to be spent in the home country (Piore, 1979). Labour migrants thus have a dual frame of reference (Waldinger and Lichter, 2003), comparing the income in the receiving country with what they would have made in their home country, also known as 'the status paradox of migration' (Nieswand, 2011). Labour migrants can thus be satisfied with wages and working conditions that natives never would accept and are therefore regarded in receiving countries as perfect labourers for the secondary sector.

Dual labour market theory thus argues that the changing structure of the labour market creates inequality, while migrants simply respond to increasing demand. A more recent contribution within this perspective, studying the labour markets of New York, London and Tokyo, similarly argues that it is the economy, rather than the immigrants, which is producing low-wage jobs (Sassen, 2001). However, I argue that 'supply-side arguments' are also found within this literature. For instance, it is argued that a large presence of migrant workers will reinforce the undesirability of the jobs in the secondary sector for the native labour force, which in turn enables employers to drive down wage and working conditions even more (King, 2012).

Findings from Norwegian research on labour migration after the EU enlargement are certainly interesting in light of segmented labour market theory. Several studies find that labour migrants are concentrated in the lower segments of the labour market (such as construction, industry, hotel, transport, agriculture and cleaning) and have limited opportunities for upward mobility and a high degree of temporary and unsecure employment (Bjørnstad, 2015; Friberg, 2016; Friberg and Eldring, 2011; Rye, 2007). Studies within these industries show that employers consider certain ethnic groups more suited for manual labour than others (Friberg and Midtbøen, 2018). Eastern European labour migrants in Norway do to a large degree fit Piore's (1979) description of migrants in the secondary sector. However, the question of cause and effect is something different. In the Norwegian case, was the 'degraded job structure' created first and migrants recruited second? While Hyde et al. (2015) argue that the US for several decades has seen a hollowing of the middle-class and increasing polarisation, similar trends are perhaps not fit to describe the Nordic countries, which, according to several studies, have a lower risk of polarisation of employment structure (Gallie, 2007; Mustosmäki et al., 2017).

Supply-side perspectives

There are mainly two routes through which immigration can affect income inequality. First, the income of immigrants themselves can affect inequality, if immigrants have a different income dispersion or a different average income than natives. Card (2009) argues that because immigrants are often clustered at the high and low ends of the education distribution and tend to have higher residual inequality than natives, wage inequality over all workers in the economy is higher than it would be in the absence of immigration.

In Norway, Telle et al. (2017) finds that the immigrant population has a higher level of income inequality than the remaining population, and since the immigrant population is increasing, this can explain some of the increase in income inequality in the last years. Research on labour migrants' income

reveals large differences between labour migrants from eastern and western Europe (Epland and Kirkeberg, 2014). After seven years in Norway, Polish migrants' median income is around 80% of natives' income, while British migrants' median income is 17% higher.

The second, and more debated, route through which immigration can affect income inequality has to do with how immigration can affect the level or dispersion of natives' income (Blau and Kahn, 2012). Briefly summarised, the theoretical argument is that immigration increases the supply of labour too fast and affects competition among groups in the labour market, thereby supressing wages. Kalleberg (2011) argues that the impact of immigration on native workers is complex and partly depends on whether immigrants are substitutes for or complements to native workers. While substitution might lead to downward pressure on wages, complementation might create jobs for native workers.

Norwegian sociologist Ottar Brox (2005) argues that labour migration will ultimately lead to weakened market power for the working class and the emergence of a new lower class of 'working poor'. Briefly summarised, his argument is that one of the most important causes of social equality in Norway after World War 2 was a lack of labour reserves, or (almost) full employment. This gave the working-class power to demand higher wages and good working conditions. The European Economic Area (EEA) agreement and the free flow of labour between member countries ensures that full employment will never be the case, as a reserve army of labour migrants is always available. The lower classes that compete with the labour migrants have therefore lost their market power. Consequently, social inequality will increase.

Results from empirical investigation vary greatly. In the US, Card (2009) argues that immigration has not had much effect on native wage inequality. Others argue that an influx of low-skilled migrants lowers earning of low-educated natives while improving earnings for college graduates (Borjas, 1990; Borjas and Katz, 2005). Similarly, Dustmann et al. (2013) find that in the UK, immigration depresses wages in the bottom 20th percentile, but leads to a small increase in wages in the upper part of the distribution. However, in a review of research from several OECD countries, Blau and Kahn (2012) conclude that while some studies do find important effects, most studies do not find important effects of immigration on native wage distribution.

In Norway, the findings are also somewhat mixed. Bratsberg and Raaum (2012) studied the construction industry and found that professions with high labour migration experience significantly lower growth in wages. They also found that labour migration increases the probability of low-skilled natives leaving the workforce. Bratsberg et al. (2014), however, found that migration from low-income countries affects the income and employment of immigrants already in Norway, but has less effect on natives. More recently, Hoen et al. (2018) found that immigration from low-income countries has steepened the social gradient in natives' labour-market outcomes. While exposure to immigration from low-income countries lowers wages and employment for lower-class natives, it affects high-class natives by raising their expected earnings. Immigration from high-income countries has the opposite effect, and thus levels the social gradient (Hoen et al., 2018).

Spatial differences

There are several reasons to believe that the relationship between labour migration and income inequality might be different in rural and urban societies. Rural labour markets tend to be smaller and less diverse than urban labour markets. One or two industrial sectors, and perhaps only a few large employers, often dominate rural labour markets. Any large changes faced by these industries could have substantial implications for the local economy (McLaughlin, 2002).

Further, Kalleberg (2011) argues that immigrants are likely to have more negative effects on natives in local labour markets with large numbers of unskilled native workers. Rural municipalities tend to have a higher proportion of unskilled or low-skilled workers than urban municipalities. The descriptive statistics presented in Table 1 below show large differences in the proportion with higher education in rural and urban municipalities. Thus, there is potentially a larger proportion of the rural workers that are competing with immigrants in low-skilled industries.

Table 1. Descriptive statistics 2005–2016.

	Rural municipalities $N = 3252$				Urban municipalities $N = 1860$			
	Min	Max	Mean	SD	Min	Max	Mean	SD
P90/P10	2	3.8	2.44	0.17	2.1	3.6	2.51	0.21
P90/P10 without immigrants	2	3.7	2.36	0.14	2	3.2	2.40	0.16
Labour EU11	0	14.52	1.12	1.64	0	5.85	1.08	1.01
Labour EU15+4	0	3.05	0.40	0.39	0	1.94	0.36	0.25
Labour Asia, Africa etc.	0	2.27	0.09	0.17	0	1.26	0.13	0.15
Family EU11	0	3.91	0.46	0.51	0	2.93	0.53	0.42
Family EU15+4	0	3.84	0.36	0.41	0.02	1.44	0.30	0.19
Family Asia, Africa etc.	0	4.25	0.96	0.58	0.08	5.98	1.49	0.79
Refugees	0	9.60	0.94	1.06	0.05	5.44	1.83	0.92
Education migrants	0	7.39	0.12	0.34	0	3.09	0.24	0.29
Unemployment	0.27	10.31	2.43	1.28	0.48	6.07	2.49	0.81
Median income (NOK 100,000) – adjusted	3.03	6.57	4.42	0.54	3.45	6.57	4.81	0.57
Higher education	9.1	40.9	18.37	4.00	11.7	51.9	24.9	6.45

NOK: Norwegian kroner.

Methods and materials

The analysis is based on municipal-level register data from 2005–2016. All data are obtained or ordered from Statistics Norway.[1] Municipality-level data are well suited to explore the effect of migration on income inequality at the local level and with a spatial focus. The Norwegian municipalities are organised in small population units (average = 12.240, rural average = 3.467), which permits fine-grained empirical investigations on a local scale. Statistics Norway's procedures for data production are generally considered to be of high quality, and information about definitions, measurement, quality issues etc. is easily available online at ssb.no. For the variables employed in this paper, I observe no data quality issues or significant missing values that could affect the reliability of the data. However, in the period 2005–2016, a few municipalities (five) merged. To avoid loss of data, I have calculated values for the years before the merger. For some variables, such as the number of migrants, values have simply been added together. For other variables, a weighted average is calculated. Although these calculated numbers might have small deviations from the unknown real values, I argue that this solution is preferable over losing data. Thus, the data used in the analysis constitute a perfectly balanced panel from 2005 to 2016.

When defining what constitutes a rural and urban municipality, I apply a conventional approach, building on Almås and Elden (1997) and Farstad et al. (2009), and define rural municipalities according to three criteria. First, the *least central* municipalities (levels 5 and 6) are defined as rural. Centrality is measured by Statistics Norway as the number of jobs and service functions that can be reached by car in 90 minutes for the average inhabitant in the municipality (scale from 1–6 where 6 is the least central, see Høydahl, 2017). Second, municipalities are defined as 'rural' if more than 50% of the population resides in *sparsely populated* areas in 2016 (settlements with more than 200 people in houses less than 50 metres apart are *not* sparsely populated). Third, municipalities are defined as 'rural' if more than 7% of the working population is in the *primary* sector (agriculture, fisheries, forestry) in 2016. A municipality is categorised as rural if at least one of these criteria are met, and as a result 271 of 426 municipalities in Norway are classified as rural, with 18% of the Norwegian population residing in the rural municipalities. The other remaining municipalities are neither peripheral nor characterised by dispersed settlement structure or strong primary industries and are defined as urban. Figure 1 shows a map of rural and urban municipalities.
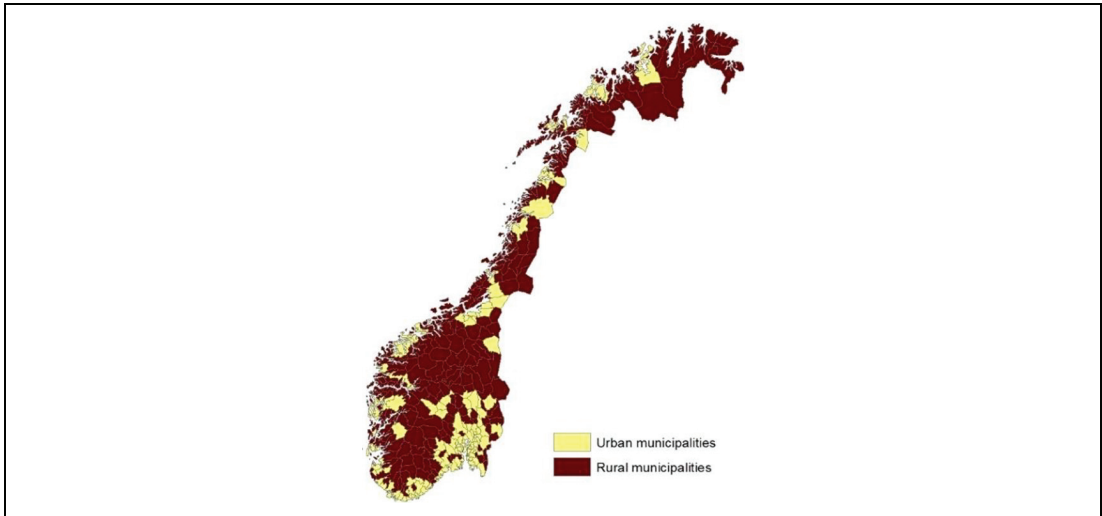
Figure 1. Rural and urban municipalities.

Measuring inequality

The dependent variable *P90/P10* is made by Statistics Norway and measures the difference in yearly income between the 90th and 10th percentiles in a municipality. Income includes employment income, capital income and taxed and tax-free transfers during the calendar year. Income is measured as the sum of the household's income after tax, divided by the number of consumption units in the household. Student households are excluded. The number of consumption units is calculated by using the EU-equivalence scale, where the first adult weighs 1, the next adult weighs 0.5 and every child weigh 0.3. Thus, a household of two adults and two children has 2.1 consumption units. In the dependent variable *P90/P10 without immigrants*, all households where the main provider was not born in Norway are excluded.

There are many ways to measure income inequality. The Gini coefficient is often labelled as the most popular (De Maio, 2007), and in addition to P90/P10, this is the measure used by Statistics Norway. I chose P90/P10 instead of the Gini coefficient, as it is more stable over time and less influenced by changes in the top of the income distribution. On the municipality level, and especially in municipalities with small populations, special events, such as the sale of a company, can have an extreme impact on the Gini coefficient. The P90/P10 measure is less sensitive to such events in the top 1%.

Measuring immigration

The immigration variables measure the proportion of different categories of immigrants in a municipality on 1 January each year. Given the timing of measurement, the variable measures immigration during the previous year. This variable therefore has a natural lag in relation to P90/P10.

In this paper, immigrants are defined as people born in a foreign country, and with two foreign-born parents. Immigrants are only registered as settled in a municipality if they are living in Norway for at least six months. Immigrants on shorter stays, for example seasonal workers only staying for the summer, are not included in the data. These immigrants' income is not included in Statistics Norway's calculations of P90/P10 either. Immigrants from the other Nordic countries are also not included in the analysis, as migrants from Nordic countries do not have to state a reason for immigration when entering Norway.

The categorisation of immigrants is based on information on (a) reason for in-migration; and (b) country of origin.

Reason for migration is a variable constructed by Statistics Norway and is based on the immigration authorities' registers as well as other relevant variables (Dzamarija, 2013). All immigrants arriving after 1989 are given one of the following values: refuge, family, work, education or other. The first four categories of migrants, which make up approximately 92.6% of the immigrant population, are included in the analysis.

Work migrants, or *labour migrants*, include those that have been granted a work permit, as well as people that register via the EEA registration. *Refugees* includes all migrants who have a residence permit in Norway and where refuge has been given as the reason for residence application. This includes both asylum seekers that have been granted residence, those who have been granted residence on humanitarian grounds and quota refugees (UN refugees). *Family migrants* includes those that have been granted residence based on their family connection to a settled person in Norway. EEA citizens do not have to file an application, but they are subject to registration for EEA citizens. *Education migrants* are mainly students, but also include interns and au pairs (Dzamarija, 2013).

The categorisation of countries is based on Statistics Norway's division of the world into two: 'EU/EEA countries, USA, Canada, Australia and New Zealand' and 'Africa, Asia, Latin-America, Oceania excluding Australia and New Zealand and European countries outside EU/EEA' (Statistics Norway, 2008). My interest in this paper is the effect of increasing labour migration after the EU enlargements to the east. The former category is therefore split in two: eastern/central Europe inside the EU[2] consisting of all the new EU members after 2004, except the Mediterranean countries Malta and Cyprus (called EU11), and western EU countries, as well as USA, Canada, Australia and New Zealand (EU15+4).

Like the labour migrants, family migrants are split into the three different country groups, as they are a very heterogeneous group. Many of the family migrants from Europe are relatives of labour migrants, while many family migrants from 'Asia, Africa etc.' are relatives of refugees. They could, however, also be migrating due to marriage to a Norwegian citizen. Refugees are kept as one group, since 97% of refugees in 2016 were from the 'non-western' countries (Asia, Africa etc.). The education migrants are also kept as one group, as I see no theoretical argument to differ between students from different countries in this context.

Unemployment, education level and median income

In addition to controlling for other immigrant categories, three other control variables are included in the analysis. Following the literature review, I control for unemployment, proportion with higher education and median income. These variables are time varying and could affect income inequality, while at the same time be correlated with migration.

Unemployment measures the proportion of the labour force (15–74 years) that is registered as unemployed. Monthly data are obtained from Statistics Norway for 2005 to 2014 and from the Norwegian Labour and Welfare administration (NAV) for 2015–2016. The variable is constructed by calculating the average for each year. *Higher education* measures the proportion of the population (aged 16 and older) with university or college education. *Median income* measures the median income for households after tax per 31 December each year. The numbers are adjusted for inflation using 2015 as the base. Finally, the numbers are divided by 100,000 to obtain larger units.

Descriptive statistics

Descriptive statistics for all variables are presented in Table 1.

Several differences can be observed between rural and urban municipalities. Income inequality is on average lower in the rural municipalities, and the proportion of EU11 labour migrants is higher. The proportion of refugees and family migrants from Asia, Africa etc. is, however, significantly higher in urban municipalities. Unemployment, median income and particularly the education level are higher in urban municipalities.
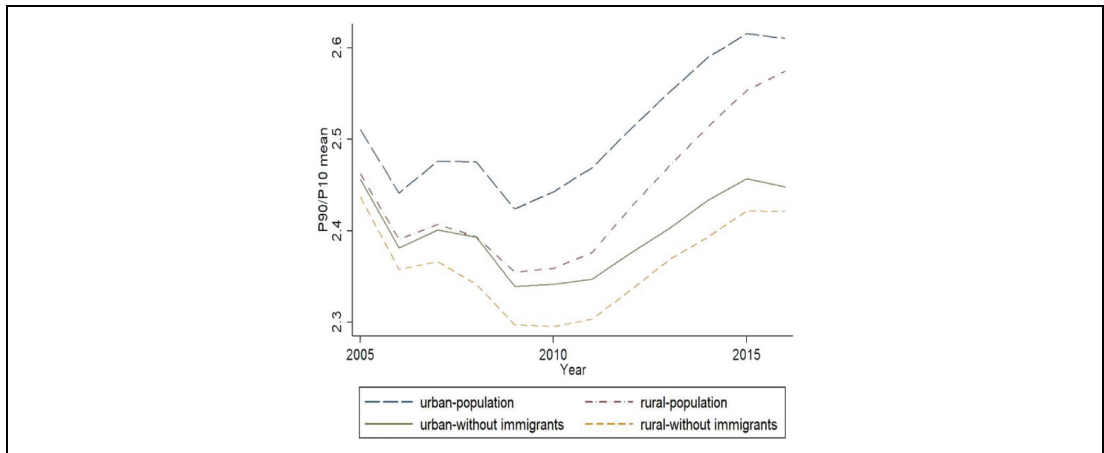
Figure 2. P90/P10 (mean), 2005–2016.
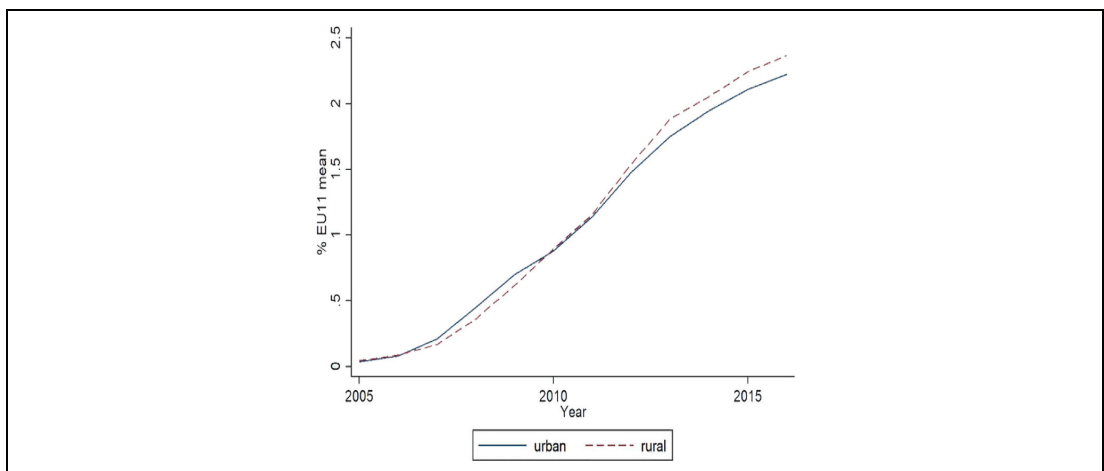
Figure 3. % labour migrants EU11 (mean), 2005–2016.

Figures 2 and 3 display the development in income inequality and proportion of EU11 labour migrants from 2005 to 2016 in rural and urban municipalities.

The graphs show clear trends in both variables. Figure 2 shows that the average P90/P10 value goes up and down from 2005 to 2009. Since 2009, however, there is a clear trend where inequality increases every year. The increase is somewhat larger in rural municipalities than in urban municipalities. Further, P90/P10 is lower when immigrants are excluded. The increase from 2009 is also significantly smaller. Figure 3 shows that the average proportion of EU11 labour migrants increases every year from 2005 to 2016 in both urban and rural municipalities.

Analysis

The analysis is structured in two parts. I first use a method published by Allison (2005) to test the direction of the relationship between labour migration and income inequality, thereby checking if there is support for the supply-side or demand-side arguments. The method uses a structural equation

Table 2. Estimates for reciprocal effects models measuring (1) labour migration on income inequality, and (2) income inequality on labour migration.

Direction of the relationship	Coef.	S.E.
(1) Labour migration (EU11) -> Income inequality (P90/P10)		
Labour migration (EU11)	0.007***	0.001
P90/P10 (Control for previous periods)	0.384***	0.016
(2) Income inequality (P90/P10) -> Labour migration (EU11)		
P90/P10	0.031	0.059
Labour migration (EU11) (Control for previous periods)	1.031***	0.007

*** $p < 0.001$.

modelling (SEM) estimator of a linear cross-lagged panel model with fixed effects. This method protects against both unmeasured confounding variables and reverse causation. Since my analysis strongly indicates that it is labour migration that causes higher inequality, and not the other way around, I proceed with a fixed effect linear regression. This I do in order to study the degree to which the proportion of labour migrants affects income inequality, how the effect compares to that of other groups of migrants and whether the effects differ in rural and urban municipalities. A significant Hausman test supports the decision to use fixed effects instead of random effects. Fixed effects models explore the relationship between the independent and dependent variable within the entity and remove the effect of all time-invariant variables (Park, 2011).

Labour migration and income inequality – The direction of the relationship

There is a widespread consensus that the best kind of data for making causal inference, apart from experimental data, are longitudinal data (Allison, 2005). Twelve strongly balanced panels (2005–2016) therefore provide the opportunity to use SEM to test if there is support for the demand-side hypothesis or supply-side hypothesis in Norway in this period. Table 2 shows the results of two models.

In model 1, following a lagged control for income inequality in the previous period, we can identify a statistically significant positive effect of labour migration on income inequality. There is however no statistically significant effect of income inequality on labour migration controlled for labour migration in the previous period. Estimations with P90/P10 without immigrants give almost identical coefficients and the same overall conclusion. This implies support for the supply-side hypothesis that labour migration is followed by higher income inequality. The models are estimated using a one-year lag. It is possible to argue that more time is needed before one can see the effect, perhaps especially in model 2. However, estimations of model 2 with two- and three-year lags did not yield significant results.

In order to make sure that the effect of labour migration on income inequality is not due to selection bias, I have performed an additional test, taking advantage of timing. While I do not have data from before the EU enlargement, Figure 3 shows that increases in labour migration were modest before 2007. Thus, I have tested whether the development in income inequality from 2004–2007 – before the large increase in migration began – is correlated with the development in labour migration in the years that followed (2008–2011). The correlation is positive, but weak and not significant (p = 0.295), which means that the development in income inequality followed a similar pattern – regardless of future migration – before the large increase in labour migration began.

Migration, income inequality and rural and urban labour markets

Table 3 displays the results from fixed effect linear regression. Due to the strong trends in both the dependent and independent variables all models are also controlled for year, making them time and

Table 3. Fixed effect linear regression. Rural and urban municipalities. Dependent variable P90/P10.

	Rural municipalities			Urban municipalities		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Labour EU11	0.012*	0.015***	0.010*	0.009	0.020**	0.014*
	(0.005)	(0.005)	(0.004)	(0.006)	(0.006)	(0.006)
Labour EU15+4		−0.006	−0.001		0.008	0.025
		(0.022)	(0.020)		(0.029)	(0.030)
Labour Asia, Africa, etc.		0.058	0.050		0.010	0.018
		(0.062)	(0.057)		(0.039)	(0.039)
Refugees		0.033***	0.028***		0.038***	0.036***
		(0.006)	(0.006)		(0.011)	(0.010)
Family EU11		−0.014	−0.001		−0.034	−0.018
		(0.014)	(0.013)		(0.018)	(0.017)
Family EU15+4		0.0001	0.004		0.013	−0.004
		(0.017)	(0.016)		(0.033)	(0.033)
Family Asia, Africa, etc.		0.017	0.025		0.027*	0.031**
		(0.018)	(0.018)		(0.012)	(0.011)
Education migrants		−0.040	−0.049		0.019	0.032
		(0.026)	(0.025)		(0.026)	(0.026)
Unemployment			−0.015***			−0.018***
			(0.004)			(0.004)
Median income (NOK 100,000) – adjusted			−0.150***			−0.086***
			(0.019)			(0.024)
Higher education, %			0.003			−0.001
			(0.004)			(0.005)
Constant	2.462***	2.431***	3.001***	2.511***	2.425***	2.876***
	(0.008)	(0.014)	(0.094)	(0.006)	(0.019)	(0.131)
Year fixed effects control	Yes	Yes	Yes	Yes	Yes	Yes
N	3252	3252	3252	1860	1860	1860
R^2 (within)	0.4167	0.4446	0.4699	0.6292	0.6496	0.6585

*Robust standard errors in parentheses.
***Sig <= 0.001, **Sig <= 0.01, *Sig <= 0.05.
NOK: Norwegian kroner.

entity fixed effects regression models. Further, due to the presence of heteroscedasticity and autocorrelation, robust standard errors, adjusting for clusters, are used.

Models 1 and 4 estimate the effects of changes in the percentage of EU11 labour migrants on P90/P10 in rural and urban municipalities. In rural municipalities, a one-percentage-point increase in labour migrants from EU11 is estimated to increase P90/P10 by 0.012. The effect is somewhat weaker and not statistically significant at the 0.05 level ($p = 0.125$) in the urban municipalities.

In models 2 and 5, controlling for other categories of immigrants, the effect of EU11 labour migrants is stronger and statistically significant in both rural and urban municipalities. It is thus clear that the proportion of EU11 labour migrants is correlated with several of the other immigrant groups and controlling for these groups is important in order to obtain correct estimates of EU11 labour. Other than EU11 labour migrants, refugees are the only immigrant group that has a significant effect on P90/P10 in both rural and urban municipalities. The effect is also somewhat stronger than the effect of EU11 labour migrants. A one-percentage-point increase in refugees increases P90/P10 by 0.033 in rural municipalities and 0.038 in urban municipalities. Further, family migrants from Asia, Africa etc. have a significant effect on P90/P10 in urban municipalities. The remaining categories of immigrants have no significant effect on P90/P10.

Table 4. Fixed effect linear regression. Rural and urban municipalities. Dependent variable P90/P10 without immigrants.

	Rural municipalities			Urban municipalities		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Labour EU11	0.007*	0.010*	0.007	−0.001	0.007	0.005
	(0.003)	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)
Labour EU15+4		−0.017	−0.010		0.006	0.011
		(0.020)	(0.019)		(0.036)	(0.038)
Labour Asia, Africa, etc.		−0.013	−0.015		−0.007	−0.008
		(0.034)	(0.033)		(0.035)	(0.036)
Refugees		−0.003	−0.007		−0.001	−0.001
		(0.005)	(0.006)		(0.010)	(0.010)
Family EU11		−0.014	−0.004		−0.028	−0.016
		(0.012)	(0.012)		(0.019)	(0.019)
Family EU15+4		−0.002	0.001		0.011	0.009
		(0.015)	(0.014)		(0.034)	(0.034)
Family Asia, Africa, etc.		0.001	0.006		0.017	0.021*
		(0.016)	(0.018)		(0.010)	(0.010)
Education migrants		−0.045*	−0.048*		−0.035	−0.030
		(0.020)	(0.020)		(0.020)	(0.019)
Unemployment			−0.013***			−0.013***
			(0.003)			(0.004)
Median income (NOK 100,000) – adjusted			−0.084***			−0.022
			(0.017)			(0.023)
Higher education, %			−0.001			−0.0003
			(0.005)			(0.004)
Constant	2.437***	2.446***	2.833***	2.457***	2.447***	2.580***
	(0.008)	(0.013)	(0.088)	(0.006)	(0.017)	(0.131)
Year fixed effects control	Yes	Yes	Yes	Yes	Yes	Yes
N	3252	3252	3252	1860	1860	1860
R^2 (within)	0.2749	0.2795	0.2956	0.4586	0.4632	0.4689

*Robust standard errors in parentheses.
***Sig < = 0.001, **Sig < = 0.01, *Sig < = 0.05.
NOK: Norwegian kroner.

In models 3 and 6, controls for unemployment, median income and education level are introduced. The coefficient for EU11 labour is reduced, but it is still significant in both rural and urban municipalities. Increasing unemployment and median income both significantly reduce inequality, while the percentage of the population with higher education does not have any effect on P90/P10 over time. These findings are robust, and they hold for several different model specifications. It is the control for median income that reduces the coefficient for EU11 labour. EU11 labour migrants are negatively correlated with median income.[3] My interpretation is thus that increasing proportions of EU11 labour migrants reduces the median income, and that this partly explains how labour migration increases P90/P10.

As a sensitivity analysis I have run the models from Table 3 with the Gini coefficient as the dependent variable (not shown). The results are very similar, particularly when excluding 2005 (which includes many extreme values), but the effect of labour migration is weaker and not significant in urban municipalities. This may suggest that labour migration has less effect on the highest and lowest incomes, at least in urban areas.

Overall, the models in Table 3 suggest that increasing proportions of EU11 labour migrants and refugees increases the overall income inequality in a municipality. However, Table 3 cannot reveal whether this effect is just the result of the immigrants' income alone or if immigration also affects native income inequality. In Table 4, I have run the exact same models, but with a dependent variable that excludes immigrant households.

In model 1 we see a reduced, but still significant, effect of EU11 labour, suggesting that labour migration from EU11 increases income inequality within the Norwegian-born population. In model 2 we see that refugees, which had a significant effect on P90/P10 in the population in general, have no significant effect on P90/P10 in the native population. The controls introduced in model 3 have the same effect as before – while unemployment and education level do not affect the other estimates, control for median income reduces the coefficient for EU11 labour, which suggests that reduced median income is a mechanism through which labour migration affects the income dispersion of the native population.

Discussion and conclusion

Norway has experienced increasing inequality in a period characterised by unprecedented increases in labour migration. In this paper, I have sought to explore the connection between these two phenomena.

As the literature discussing the relationship between migration and income inequality can be said to be divided between supply-side and demand-side perspectives (Hyde et al., 2015), the direction of the relationship was first explored. The findings support the supply-side argument that increasing immigration is followed by increased income inequality. I find no evidence for the opposite causal relationship – that increasing inequality is followed by higher immigration. In Hyde et al.'s (2015) view, demand-side arguments emphasise that employers first create the degraded job structure (and thus higher inequality), then discover that native workers are increasingly unwilling to accept the bad working conditions, and then turn to foreign-born workers. While this chain of events might be likely in the US – which has experienced major economic restructuring and polarisation of the wage structure for a long period and, importantly, has had access to migrant labour for a long time – this is not the case in Norway.

In the Norwegian case it seems more plausible that the EU enlargement made it possible for employers to expand the number of insecure, low-skilled and low-paying jobs. Several structural changes in the Norwegian labour market appear to be a consequence of the migrant influx *after* the enlargement. For instance, Bjørnstad (2015) argues that the sudden access to a reservoir of cheap labour has made the construction industry less capital intensive and more labour intensive. The use of external staffing agencies – providing low incomes and job insecurity for its employees – also exploded *after* the EU enlargement (Friberg, 2016). This is not to say that labour migration is not demand driven, but it seems evident that it was the actual access to the *supply* of migrant labour after 2004 that led to changes in the labour market – and increased income inequality.

In the second part of the analysis, fixed effects regression is used to study the degree to which labour migration, compared to other categories of immigrants, has led to increased income inequality, and whether this effect differs in rural and urban municipalities.

Previous research in this field has only to a small degree focused on how different groups of migrants might have different effects on inequality. Migrants are too often referred to as one group, when discussed in relation to inequality. The findings in this paper show that it is primarily EU11 labour migrants and refugees that contribute to increased inequality in Norway. The other categories of migrants have no significant effect on inequality. It is thus not migrants in general that can cause higher income inequality, but specific migrant groups. The fact that labour migrants and refugees on average have significantly lower incomes than the remaining population (Epland and Kirkeberg, 2014; Statistics Norway, 2017) suggests that these groups increase inequality in the lower part of the income distribution.

However, the analysis of income inequality within the Norwegian-born population provides important nuance to these findings. While both EU11 labour migrants and refugees increase income inequality in general, only EU11 labour migrants influence the native income inequality – in rural municipalities. The effect of EU11 labour migrants on overall income inequality is thus the result of two different mechanisms: the 'mechanical' effect of having more low-income workers in the municipality and the more debated effect on native workers' income. The strong effect of refugees on overall income inequality is however solely the result of their own income. One of the possible explanations for the difference between these two groups is their different labour market participation. While EU11 migrants have an employment rate at the level of the general population, immigrants from Asia and Africa have significantly lower participation in the workforce (Statistics Norway, 2019).

It is particularly interesting that the effect of EU11 labour migrants on native income inequality is significant in rural municipalities, but weaker and not statistically significant in urban areas. This could be due to the small and less diverse labour markets in rural areas. While natives in urban areas might have several different ways of adapting to changes in competition, such as changing job or occupation, their rural counterparts might have fewer opportunities. Another explanation concerns the different educational level in urban and rural areas. Following Kalleberg (2011), immigration has a larger effect in areas with larger proportions of low-skilled natives. As the general education level is much lower in rural areas, there are potentially more local people competing with the labour migrants.

At the same time, high-income groups are likely benefitting from the presence of immigrants, as cheaper and more flexible labour potentially increase profits and wages (Hoen et al., 2018; Iversen et al., 2017). In future research, more detailed inequality measures, such as P90/P50 and P50/P10, are needed to explore these mechanisms and determine where the effect is strongest.

Further, a potential weakness with this analysis (which possibly also has a rural/urban dimension) is that people move over time. If the moving patterns of natives are correlated with immigration, the effect of immigration on income inequality could be spread out across the country. For instance, if the influx of low-skilled labour migrants displaces low-educated natives, they might choose to move out of the municipality, which potentially reduces the effect of migration on income inequality. In such a case, the analysis underestimates the effect of labour migration on income inequality. Whether such mechanism exists in Norway is unknown and requires research.

This paper has shown that the unprecedented increase in labour migration after the EU enlargement has led to a higher level of overall income inequality and increased the level of income inequality in the Norwegian-born population. While public discourse in Norway often focuses on inequality and poverty in relation to refugees, this analysis shows that labour migration has an independent effect and – as opposed to refugees – affects natives' income and income inequality. Future research needs to pay attention to the mechanisms that create the relationship between labour migration and inequality. If the current trend of increasing inequality continues, it could have large implications for the Norwegian work-life regime and welfare state.

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Notes

1. With the exception of unemployment data from 2015 and 2016, which are obtained from the Norwegian Labour and Welfare administration (NAV).

2. Poland, Lithuania, Latvia, Estonia, Czech Republic, Slovakia, Hungary, Slovenia, Romania, Croatia, Bulgaria.
3. Fixed effects regression with median income as dependent variable and EU11 labour as independent variable shows a highly significant negative relationship, also when controlling for other variables.

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Chapter 11

Does international labour migration affect internal mobility in rural Norway?

Marie Holm Slettebak

International and internal migration in the Norwegian countryside

During the last two decades, Norway has evolved from a relatively homogenous country to a more multicultural one with international migrants in all parts of the country. According to register data from Statistics Norway, the proportion that are international migrants has increased from 5.3 per cent in 2000 to 14.4 per cent in 2019 (Statistics Norway n.d.). In addition to the arrival of refugees, it is particularly the enlargement of the European Union (EU) to the east, starting in 2004, that sparked an unprecedented increase in migration to Norway. These 'new' labour migrants, originating in eastern Europe, have, to a larger degree than other migrants, settled outside Norway's urban regions (Rye and Slettebak 2020). Therefore, many rural areas previously unfamiliar with international migration have experienced a large influx of labour migrants.

The large body of academic literature discussing the impact of international migration on native-born workers is mostly focused on wages, employment and other outcomes related to *social* mobility (See, e.g. Blau and Kahn 2012, Card 2009, Hoen, Markussen and Røed 2018). Less attention has been paid to the effect on *geographic* mobility. Particularly in Europe, this is an under-researched field. Further, the extant research has little focus on rural areas.

This chapter offers an examination of whether international labour migration to rural areas has had any effect on the internal mobility patterns of 'natives,' that is: people born in Norway (note that the term 'native,' which is commonly used in the literature to refer to someone that is born in a particular country, does not refer to ethnicity). Are international migrants only adding to the population, or are they replacing other in-migrants and pushing out similarly skilled workers, or creating new inflows of internal migrants? These questions are interesting and important for three reasons.

First, answering these questions provides important insight into the role of eastern European labour migrants in rural labour markets and their effect on Norwegian-born workers. Although there seems to be agreement in the public

discourse that international labour migration has been positive for the Norwegian economy in general, worries regarding low-wage competition, displacement effects, and increasing social inequality have been voiced, researched, and debated (Friberg 2016). Second, the questions are demographically interesting – particularly in rural areas. Many rural areas struggle with depopulation, and the literature abounds with research on how international migration can rescue rural regions that are struggling with diminishing and aging populations (see Aure, Førde and Magnussen 2018, Bayona-i-Carrasco and Gil-Alonso 2013). Hedberg and Haandrikman (2014) argue that international migrants are repopulating rural areas and can be seen as a rural 'demographic refill.' How international migration might also affect native-born inflows or outflows is an important part of this picture and of importance to rural communities' future demographic development. Third, these questions are methodologically interesting, as many studies use spatial variations in international migration to study the effects of migration on the labour market outcomes (wages, employment, etc.) of native-born workers. However, a potential weakness in previous studies is that labour markets are not closed, and people can selectively move in or out in response to the effects of migration from abroad. If so, the effects of international migration will be spread across the country and thus appear weaker (Borjas 2003). Although many researchers acknowledge this potential weakness, previous studies on the relationship between native-born internal mobility and international migration is limited. Most of the research has been conducted in the US, and only a few studies have focused on Europe.

The present analysis was conducted using Norwegian public register data from 2005 to 2015 at the municipality level. The Norwegian case is interesting due to the sudden increase in international labour migration. Further, the availability of high-quality register data at the municipality level provides an opportunity to examine the consequences of this increase in rural areas, which has been less explored, as international migration to western countries has, historically, been an urban phenomenon (see Rye and O'Reilly, Chapter 1).

Connecting international and internal migration: theoretical perspectives

According to King and Skeldon (2010), the field of migration studies has traditionally been split in two, as students of international and internal migration use different literatures, concepts, and methods. This chapter attempts to bridge this gap by discussing international and internal migration in interaction.

The effect of international migration on native internal mobility

According to Borjas (2003), the laws of supply and demand have clear implications for how international migration affects the labour market in the

short run. The entry of international migrants into a certain area will create a supply shock that lowers the wages of competing workers, that is, workers who have the same types of skills. Workers with complementary skills, however, will experience increased wages as their skills become more valuable. Thus, according to classic economic theory, international migration should affect the wages and employment opportunities for native-born workers. However, a large number of studies have provided mixed and conflicting results (Blau and Kahn 2012, Card 2009, Borjas 2003). Many of these studies exploit the spatial variations in international migrants across the country to study the effect of international migration. The concern with this approach is that local labour markets are not closed – natives may respond to the impact of migration on the labour market by moving their labour or capital to another labour market, or they may avoid moving into a particular area. In this case, the effect of international migration is spread throughout the country, so that many towns and cities are affected – not just the places that received the international migrants (Borjas 2003). One of the most-cited examples in the literature is Card's (1990) analysis of the labour market in Miami, Florida, after the Mariel boatlift (the mass emigration of Cubans to the US in 1980), which increased Miami's labour force by seven per cent without affecting the wages or unemployment rates of native workers. Card suggests that one of the reasons for this wage stability was that the net migration of natives and earlier international migrants slowed considerably after the boatlift. This is considered a possible explanation for the mixed and conflicting results in the literature.

Despite the above, another possible explanation for the conflicting results is that the actual competition between labour migrants and natives is much more limited than classic economic theory would suggest. Within dual (or segmented) labour market theory, it is argued that the labour market has become increasingly divided into a primary and secondary sector (Doeringer and Piore 1971, Piore 1979). The jobs in the primary sector are secure and often high paying, and mainly reserved for natives. The jobs in the secondary sector are not secure, often low-paying and require few skills. Native workers are often unwilling to accept jobs in the secondary labour market, not just because of the low income they yield, as conventional economic theory would suggest, but because they signify or confer low status (Piore 1979). This might limit the competition between natives and labour migrants and explain why the effect on wages has been found to be small or non-existent in many studies.

Previous research on the connection between international migration and native-born internal mobility is limited, particularly in Europe. Much of the discussion also revolves around cities and metropolitan areas, while rural areas have not been in focus. In the US, where most of the empirical work on this topic is done, research has produced conflicting results. In 1996, demographer William Frey claimed that immigration was creating social and demographic divisions across the national landscape, which he labelled

'demographic balkanization in America.' Part of the reason for this division, according to Frey, is that 'there is a unique, accentuated outmigration of low-income, less-skilled domestic migrants from high immigration areas' (Frey 1996, 741). Wright, Ellis and Reibel (1997), however, argue that the cause of net migration's loss of natives in the large cities is more likely a result of industrial restructuring than of competition with international migrants. They found that the net migration of the native-born workers to metropolitan areas is either positively related or unrelated to international migration.

Labour economists have also presented contrasting results as they have entered the debate. Contrary to the demographic balkanisation hypothesis (that immigration leads to native out-migration), Card and DiNardo (2000) found that – if anything – increases of international migrants in specific skill groups lead to small *increases* in the population of native-born workers in the same skill group. Card (2001) found that intercity mobility rates of natives and earlier international migrants are insensitive to new inflows of international migrants. In other words, the effect of immigration was minimal, and, as a result, cities that received many international migrants expanded their labour markets. By contrast, Borjas, Freeman, and Katz (1997) found evidence that native migration flows respond to local influxes of international migrants. In a more recent study, Borjas (2006) found that international migration is associated with lower in-migration rates and higher out-migration rates of natives. At the metropolitan area level, he found that, for every 10 international migrants who choose to enter an area, between three and six natives will choose to not to live in that area.

In the few studies from Europe, the findings are less conflicting and suggest a clear connection between international migration and internal mobility. In the UK, Hatton and Tani (2005) finds consistently negative correlations between immigration to a region from abroad and in-migration from other regions. They conclude that these results suggest that internal migration is one of the mechanisms through which regional labour markets adjust to immigration shocks. In Italy, Brücker, Fachin, and Venturini (2011) have studied the effect of international migration on international mobility from poor to wealthy regions and found that the presence of international migrants significantly discourages internal mobility. Mocetti and Porello (2010) also investigated the relationship between native internal mobility and international migrants in Italy, but studied the differential impact by skill level. They found that international migration has a positive effect on inflows of highly educated natives, while displacing low-educated natives.

Summing up, though previous research is limited, the majority has found a connection between international migration and native-born workers' internal mobility. Although a few US studies find that immigration leads to increases in the native population, most of the studies find that higher rates of immigration are followed by fewer natives choosing to live in a particular area, either by moving out or avoiding moving in.

Relevant factors beyond the labour market

While this study's main argument is that the possible connection between international labour migration and native-born internal mobility is due to mechanisms in the labour market, there are also other factors beyond the labour market that are relevant to consider. First, the housing market can influence decisions about moving. An increasing number of labour migrants in a municipality often puts pressure on the housing market, leading to higher prices (Gonzalez and Ortega 2013, Saiz 2007). This might also affect native-born migration. Mocetti and Porello (2010) found a significant negative effect of higher housing prices on native net migration, which suggests that higher housing costs reduce labour mobility and deflate income prospects in a region.

Second, a large and diverse body of literature exists on the issue of residential segregation and international migrants' concentration in urban neighbourhoods. Several studies have found that the native-born population increasingly flees or/and avoids neighbourhoods with high proportions of international migrants (Brama 2006, Crowder, Hall, and Tolnay 2011, Wessel and Nordvik 2019). Although this strand of the literature cannot be ruled irrelevant for this study, it can be argued that the processes at the neighbourhood level in the cities are distinct from migration at the municipality level in rural areas, the topic with which this study is concerned. While attitudes toward international migrants or high-immigration areas might affect neighbourhood choices within cities, these are less likely to lead to migration patterns across greater distances.

The Norwegian case

While previous research has treated international migrants as one group, the focus in this chapter is on a specific group of international migrants, namely labour migrants from the newest EU countries. In 2005, approximately 2,600 labour migrants from post-communist EU countries (in this chapter referred to as 'EU11 labour migrants') were residing in Norway, compared with more than 115,000 in 2015. While previous labour migrants and refugees often settled in urban areas, the labour migrants from EU11 displayed a settlement pattern more representative of the general population. In 2015, 2.24 per cent of the population in the average rural municipality were EU11 labour migrants, compared with 2.10 per cent in urban municipalities. These people were, however, very unevenly distributed across rural Norway – some municipalities have received many, while others have received very few (Rye and Slettebak 2020).

The majority – more than 75 per cent – of EU11 labour migrants in Norway are registered as being employed in manual and low-skilled work. They are overrepresented in agriculture, fish processing, the shipyard industry, hotels, cleaning, construction work, and transportation. Only six per cent work in

technical, administrative, or academic occupations, compared with 50 per cent of Norwegian-born workers (Friberg 2016). This means that Norwegian-born workers with higher levels of education face little competition from this group of migrants, while the low-skilled potentially do.

To this author's knowledge, no previous research has been conducted in Norway to study the connection between international migrants and Norwegian-born workers' internal mobility. However, some studies exist on the effects of international migration on native workers' wages and employment. Bratsberg and Raaum (2012) studied the construction industry and found that professions with high international labour migration experience significantly lower growth in wages. They also found that international labour migration increases the probability of low-skilled natives leaving the workforce. Bratsberg *et al*. (2014), looking at the entire Norwegian labour market, found that migration from low-income countries affects the income and employment of international migrants already in Norway, but has less of an effect on Norwegian-born workers. More recently, Hoen, Markussen and Røed (2018) found that migration from low-income countries has steepened the social gradient in natives' labour market outcomes. While exposure to migrants from low-income countries lowers wages and employment for lower-class natives, it affects natives in the higher classes by raising their expected earnings. Similarly, Slettebak (in-press) found that labour migration increases income inequality within the native population in rural areas.

Although the findings are somewhat mixed, previous research suggests that international labour migration has affected the wages and employment of Norwegian-born workers. The question to be answered in this chapter is whether these effects affect settlement decisions. An important question in this regard is whether employment/job opportunities are important factors for explaining out- and in-migration in rural Norway. Sørlie (2009) argues that employment is actually a more important motivation for moving into or staying in the peripheral regions of Norway than in the country in general. Part of the reason for this phenomenon is that there are fewer available jobs in the periphery, which puts more focus on the necessity of employment. Similarly, Grimsrud (2011) found that work and family are the most important reasons for in-migration to rural areas, and that the 'counter-urbanisation story'– depicting urban to rural migration as motivated by anti-urban preferences – is not a good fit for rural Norway.

Assuming that low-skilled labour migrants have a negative effect on the employment and wages of less-ducated workers and a positive effect on the employment of highly educated ones, and assuming that this is relevant for their settlement decisions, the following hypotheses can be tested:

H1:   Increasing international labour migration is followed by *higher out-migration* of *less-educated* Norwegian-born people.

H2: Increasing international labour migration is followed by *lower in-migration* of *less-educated* Norwegian-born people.

H3: Increasing international labour migration is followed by *higher in-migration* of *highly educated* Norwegian-born people.

H4: Increasing international labour migration is followed by *lower out-migration* of *highly educated* Norwegian-born people.

It is important to note that there is an essential difference among the hypotheses concerning out- and in-migration. For instance, H1 assumes that the weakened position of lower educated people in the labour market will increase their chance of leaving the particular municipality. H2, however, simply assumes that lower educated people, to a larger degree, will avoid the particular municipality. It is possible to argue that leaving a place is a much stronger statement than avoiding one place in favour of another.

Another relevant point in this regard is that Norway and the other Nordic countries are characterised by a large welfare state with universal benefits, including free education and health care. Being a part of what Esping-Andersen (1990) calls the 'social democratic welfare states regimes,' the dependence on the market is weaker in Norway than in other less de-commodifying welfare states, such as in the US, UK, or southern Europe. Such features of the Norwegian case could imply weaker incentives to relocate for economic reasons.

Lastly, Norway's geographic and demographic features have implications for the frequency of migration. In many western European countries, people move frequently and in all directions among populous regions with short distances between them. Large distances and relatively small populations, however, characterise the Nordic countries. This has implications for mobility patterns. In Norway, relocation often implies moving to another part of the country and across a great distance. Therefore, it is natural, according to Sørlie (2010), that, compared with the populations of many other western European countries, Norwegians move less often.

Researching movements in rural municipalities

The analysis is based on municipal level register data from 2005 to 2015. All data were obtained or ordered from Statistics Norway or Microdata.no, a service that gives researchers access to microdata from Statistics Norway.

Defining the 'rural'

This analysis focuses on rural municipalities. When defining what constitutes a rural or urban municipality, a conventional approach, building on Almås and Elden (1997) and Farstad, Rye, and Almås (2009), has been applied to define rural municipalities according to three criteria:

1) *Centrality*: this refers to the number of jobs and service functions that can be reached by car in 90 minutes for the average inhabitant in the municipality. A scale from one to six is constructed, where 'six' is the least central (Statistics Norway's centrality scale, see Høydahl 2017). Municipalities at levels five and six (238 municipalities) are defined as 'rural.' These are the municipalities described as least and second-least central by Statistics Norway.

2) *Settlement density*: this refers to the percentage of the population residing in 'sparsely populated areas' (settlements with more than 200 people in houses less than 50 meters apart are *not* sparsely populated). Municipalities are defined as 'rural' according to this criterion if more than 50 per cent of the population resided in a sparsely populated area in 2016.

3) *Labour markets*: this is the percentage of the working population employed in the primary sector (agriculture, fisheries, forestry). Municipalities are defined as 'rural' according to this criterion if more than seven per cent of the working population was employed in the primary sector in 2016.

A municipality is categorised as rural if at least one of these criteria are met; this yielded 271 'rural' municipalities in Norway, out of 426. Roughly 18 per cent of the Norwegian population resides in a rural municipality. The other remaining municipalities are neither peripheral nor characterised by a dispersed settlement structure or strong primary industries; they are defined as 'urban.'

Measuring internal mobility among Norwegian-born people

The dependent variables measure the municipal out- and in-migration of high and low educated Norwegian-born people. The dependent variables were constructed using Microdata.no. Due to confidentiality concerns, the output from this platform is noise inflicted. However, no counts (numbers) are noise inflicted by more than +/-5 and the noise is random and should not affect the conclusion of this analysis.

Out-migration is defined as being registered as settled in the municipality in year *t*, but registered in a different municipality in year t+1 (1 January). In-migration is defined as being registered as settled in the municipality in year *t*, but registered in a different municipality in year t-1. Only internal mobility is included. Compared with internal mobility, the frequency of international in- and out-migration is very low among Norwegians, thus the exclusion of this type of mobility is not expected to affect the results.

A distinction is made between less and highly educated people to look for patterns in mobility based on educational level. In- and out-migrants over the age of 25 are categorised as 'highly educated' if they have education to the

college or university level, and as 'less educated' if they do not have such an education. The age limit of 25 was set to avoid including too many children and young adults who have not yet finished their education.

This resulted in six dependent variables: out-migration (all), out-migration of the highly educated, out-migration of the less educated, in-migration (all), in-migration of the highly educated and in-migration of the less educated. The variables are measured as proportions, that is, what per cent moved out or in during a specific year (number/total number in group*100).

Independent variables

In this chapter, 'international migrants' are defined as people born in a foreign country with two foreign-born parents. International migrants are only registered as settled in a municipality if they have lived in Norway for at least six months. This means that migrants on shorter stays, for example seasonal workers staying only for the summer, are not included in the data. This is due to theoretical considerations and lack of data for this group over time.

The main independent variable measures the proportion of EU11 labour migrants in a municipality each year. EU11 refers to migrants from the (post-communist) countries that joined the EU after 2004. This includes migrants from Poland, Lithuania, Latvia, Estonia, Czech Republic, Slovakia, Hungary, Slovenia, Romania, Croatia, and Bulgaria. The term '*labour* migrant' refers to their main reason for migration and has been used in Norwegian registries since 1989. This includes those who have been granted a work permit or, in the case of EU/EEA (European Economic Area) citizens, who are registered via the EEA registration (Dzamarija 2013). All EU/EEA citizens who intend to stay in Norway for more than three months need to register.

In addition, the study controls for *refugees,* a term that includes all migrants who have a residence permit in Norway and where refugee status has been given as the reason for their residence application. This includes asylum seekers who have been granted residence, those who have been granted residence on humanitarian grounds and quota refugees (UN refugees) (Dzamarija 2013).

Unemployment measures the proportion of the labour force (workers 15–74 years) who are registered as unemployed. Monthly data were obtained from Statistics Norway for 2005 through 2014. The variable was constructed by calculating the average for each year.

Median income measures the median income for households after tax each year. The numbers have been adjusted for inflation using 2015 as the base. The numbers are divided by 100,000 to obtain larger units. Descriptive statistics for all variables are presented in Table 11.1.

Testing the connection between international labour migration and natives' internal mobility patterns

The analysis uses fixed effects linear regression models, which explore the relationship between the independent and dependent variables within a given entity, municipalities in this case. Fixed effects models remove the effect of all time-invariant variables, which means that only variables that have changed between 2005 and 2015 can affect the results. All models are also controlled for year, making them time and entity fixed effects regression models.

Table 11.1 displays the results of a fixed effects linear regression with two dependent variables, the out- and in-migration of Norwegian-born people in rural municipalities. Starting with out-migration, we see that the effect is close to zero and not statistically significant. Controlling for changes in the proportion of refugees, unemployment, and median income (adjusted for inflation) does not alter this result, but clearly shows that increasing unemployment and median income are followed by higher levels of out-migration. Moving on to the in-migration models, we see that, when the proportion of EU11 labour migrants increases, the in-migration rate increases, but again the results are not significant.

Overall, Table 11.2 depicts a very weak and insignificant relationship between the arrival of EU11 labour migrants and the general moving patterns of Norwegian-born people in rural regions.

In Table 11.3, however, the dependent variables distinguish between the out- and in-migration of people with lower and higher education, and a pattern emerges between EU11 labour migrants and the moving patterns of higher educated Norwegian-born people. When the proportion of EU11 labour migrants increases with one per cent, the out-migration of higher educated people decreases, and the rate of in-migration increases. The effect on the less educated is close to zero and not significant.

Table 11.1 Descriptive statistics (variables used in Tables 11.2 and 11.3)

	Min	Max	Mean	SD
Out-migration	1.10	9.20	3.39	1.01
In-migration	0	9.2	2.90	1.02
Out-migration, low educated	0	8.79	2.04	0.83
Out-migration, high educated	0	26.67	5.40	3.01
In-migration, low educated	0	8.15	2.08	0.89
In-migration, high educated	0	69.51	4.26	3.15
EU11 labour migrants	0	14.52	1.01	1.55
Refugees	0	9.60	0.88	1.01
Unemployment	0.27	10.31	2.43	1.30
Median income (100,000 NOK) – adjusted	3.03	6.57	4.39	0.55

Source: Statistics Norway and Microdata.no

Table 11.2 Fixed effects linear regression, out-migration and in-migration of Norwegian-born

	Out-migration		In-migration	
EU11 labour migrants, t-1	-0.009	-0.008	0.012	0.005
	(0.016)	(0.017)	(0.017)	(0.017)
Refugees t-1		-0.028		-0.043
		(0.033)		(0.033)
Unemployment t-1		**0.087*****		-0.022
		(0.023)		(0.024)
Median income t-1		**0.350****		-0.220
(adjusted)		(0.119)		(0.121)
Constant	3.524***	1.902***	2.776***	3.726***
	(0.041)	(0.477)	(0.041)	(0.486)
R2within	0.025	0.034	0.023	0.025
N	2,710	2,710	2,710	2,710
Year control	Yes	Yes	Yes	Yes

Standard errors in parenthesis

***Sig<=0.001, **Sig<=0.01, *Sig<=0.05

Source: Statistics Norway and Microdata.no

Two issues can be raised concerning these models. First, changes in the proportion of labour migrants can be affected – particularly in smaller municipalities – by the dependent variables. For instance, the *number* of labour migrants may remain unchanged, but the *proportion* may increase due to the out-migration of Norwegian-born people. Second, it could be problematic to study proportions in the smallest municipalities, as they have only a few hundred inhabitants. In the descriptive statistics in Table 11.1, it is clear that relative measures, particularly of the in- and out-migration of highly educated people, are problematic when the original numbers are too small.

Neither of these weaknesses is present in models with frequencies instead of proportions. Further, both weaknesses are mainly related to the smallest municipalities. Additional analyses have been conducted to test the robustness of the models presented; first by running the analysis from Table 11.3, but without the smallest municipalities included, and, second, by running the analyses using frequencies instead of proportions.

Only the coefficient for EU11 migrants is presented in Table 11.4, but all control variables used in Table 11.3 were also used in these analyses. The first row shows the results from the models, which are identical to the models in Table 11.3, though the smallest municipalities (those with fewer than 900 inhabitants) are excluded. The effect of EU11 labour migration on out- and in-migration of Norwegian-born people is strongly reduced and no longer significant, which suggests that a few very small municipalities affected the regression and might have overestimated the effect.

Table 11.3 Fixed effects linear regression, out- and in-migration of low- and high-educated Norwegian-born

	Out-migration, low educated		Out-migration, high educated		In-migration, low educated		In-migration, high educated	
EU11 labour migrants, t-1	-0.020	-0.018	-0.148*	-0.159*	0.013	0.015	0.155*	0.154*
	(0.016)	(0.017)	(0.062)	(0.065)	(0.016)	(0.017)	(0.072)	(0.075)
Refugees t-1		-0.021		-0.117		-0.030		-0.062
		(0.033)		(0.124)		(0.032)		(0.143)
Unemployment t-1		0.063**		0.142		0.021		-0.323**
		(0.023)		(0.088)		(0.023)		(0.101)
Median income t-1		0.306*		0.285		0.191		-0.997
		(0.119)		(0.454)		(0.118)		(0.523)
Constant	2.109***	0.736	6.808***	5.309**	2.021***	1.237**	4.291***	9.269***
	(0.041)	(0.478)	(0.154)	(1.818)	(0.040)	(0.472)	(0.178)	(2.091)
R2within	0.015	0.021	0.068	0.070	0.017	0.019	0.007	0.012
N	2,710	2,710	2,710	2,710	2,710	2,710	2,710	2,710
Year control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Standard errors in parenthesis

***Sig<=0.001, **Sig<=0.01, *Sig<=0.05

Source: Statistics Norway and Microdata.no

Table 11.4 Sensitivity analysis. Fixed effects linear regression with different model specifications

	Out-migration, low educated	*Out-migration, high educated*	*In-migration, low educated*	*In-migration, high educated*
EU11 labour migrants, t-1 N=2,550 (excluding small municipalities) **Proportions**	-0.023 (0.016)	-0.054 (0.055)	0.006 (0.016)	0.060 (0.060)
EU11 labour migrants, t-1 N=2710 **Frequencies**	**0.012**** (0.004)	**0.009**** (0.003)	**0.012**** (0.004)	0.005 (0.004)
EU11 labour migrants, t-1 N=2,550 (excluding large municipalities) **Frequencies**	-0.010 (0.006)	-0.004 (0.004)	0.008 (0.006)	**0.010*** (0.005)

(Standard errors in parenthesis)

***Sig<=0.001, **Sig<=0.01, *Sig<=0.05.

Source: Statistics Norway and Microdata.no

The second row depicts the results from models that are identical to those in Table 11.3, except that all variables are measuring frequencies, instead of proportions. The results are drastically different; for instance, the results display a significant positive relationship between EU11 migrants and out-migration. The reason is that Norway's rural municipalities are of very different sizes, which means that the larger rural municipalities will have an extremely strong effect in a model with frequencies. Because a few of the larger municipalities (with roughly 18,000 inhabitants) experienced an increase in out-migration that was relatively small, but very high in absolute numbers, the results changed.

In the third row, the 16 largest rural municipalities (which have more than 8,000 inhabitants) have been removed from the analysis. The results from these regressions are similar to the results in Table 11.3, thus strengthening the conclusion that the connection between international labour migration and Norwegian-born internal migration is weak and insignificant. When the number of EU11 labour migrants increases with one per cent, out-migration decreases and in-migration increases, but the coefficients are close to zero and not significant, except for the in-migration of more highly educated people.

Models with control for housing prices (based on the price per square meter) were tested as well, but about half of the rural municipalities have missing values for this variable, so it is therefore not included in the presented analyses. The results were not altered after controlling for housing prices, which had no significant effect on internal migration in rural municipalities.

My overall interpretation of the results is that there is no significant system-atic connection between international labour migration and Norwegian-born

internal mobility patterns. There is a tendency for higher international labour migration to attract more highly educated natives, but this correlation is weak and not robust enough to argue that there is any clear connection between these two phenomena.

International labour migration as demographic refill and expansion of the rural labour market: discussion and conclusion

Norway's rural areas have experienced an unprecedented increase in labour-related migration in the years since the enlargement of the EU. The present analyses show that, overall, the internal migration of Norwegian-born people in rural areas is unaffected by international labour migration. This has several important implications.

First, the results suggest that, overall, the migrant's role in the rural labour market is mainly an expansion – new jobs are created and filled by migrants. There are no signs of a displacement of less-educated Norwegian-born people. Municipalities that, over time, have received many labour migrants have seen no significant change in the in- and out-migration of their less-educated workers. The hypotheses claiming there should be visible changes rest on two main assumptions. First, that the less-educated workers would, to some degree, compete with the migrants and that their wages and employment opportunities are negatively affected by the migrants' presence. Second, it was assumed that these effects are relevant and important enough to affect workers' settlement decisions. We can speculate that both assumptions, to some degree, are invalid. Although an analysis of settlement decisions cannot say anything directly about labour market outcomes for natives, the results suggest that the effect of international labour migration on natives' wages and employment cannot be particularly strong in rural areas. If it was, we would likely see some change, if not in out-migration (which could be counteracted by a de-commodifying welfare state or strong place attachment), at least in in-migration of the less educated. If increasing international labour migration has no effect on the in-migration of Norwegian-born people without a higher education, it likely means that their employment opportunities are not negatively affected in any major way. Rather than labour migrants and less-educated Norwegian-born workers being in competition, it seems more likely that they are often operating in different segments of the labour market (Piore 1979). Further, even if international labour migration has a significant effect on natives` wages and employment opportunities, which some Norwegian studies have indicated (Bratsberg and Raaum 2012, Hoen, Markussen, and Roed 2018, Slettebak in press) these effects might not be sufficient to affect the settlement decisions of Norwegian-born workers. Strong place attachment to the rural area, or a strongly de-commodifying welfare state, could counteract

the economic incentives and perhaps explain why the (rural) Norwegian case is different from the British, Italian, or American cases.

Despite the above, an alternative explanation, one that involves the economic climate of the times, should also be discussed. It is possible to argue that, although we cannot observe any systematic effects of international labour migration on internal migration, we do not know what would have happened in a counterfactual scenario where rural industries experienced booms (such as the fish-farming industry in Norway, which has also occurred during the period under study), but without the option of recruiting labour migrants. One possibility is perhaps the higher in-migration of natives to the booming industry. In this scenario, international labour migrants have cancelled out the in-migration of natives. In other words, the results suggest that labour migrants' roles in the rural labour market are mainly an expansion, but they might have replaced (some) natives who would otherwise have migrated to the municipalities with booming industries. However, it is unlikely that employers within, for instance, the fish-processing industry, would have managed to recruit enough native workers, at least not without improving wages and working conditions. Without cheap and flexible labour, higher capital investments (such as investments in machines) might have been a more likely development.

Further, it is interesting that this expansion, both in the labour market and in the population in general, has not resulted in a higher demand for more highly educated native workers. In many cases, international migration has led to a significantly higher number of inhabitants, which in theory would require increasing numbers of doctors, nurses, teachers, and other professions that require strong Norwegian language skills and higher education. Although there is a tendency toward a lower net-loss of highly educated workers in municipalities with larger labour migrant populations, this correlation is weak and not systematic. A possible explanation could be that, in many peripheral municipalities, labour migrants (or other migrants) themselves help to fill these high-competence jobs. Although the majority of EU11 labour migrants work in manual and low-skilled jobs (Friberg 2016), not all of them do. In a study of the regions of western Norway, Båtevik and Grimsrud (2017) found that the peripheral regions receive relatively more high-competence workers, such as those in the academic professions, through international labour migration than the central regions do, thus reducing the traditional 'peripheral disadvantages.' They also, however, note that there are big differences among the peripheral regions. Some receive many highly skilled migrants, while others receive very few, which might help explain the weak and unsystematic results emerging from this analysis.

Second, the results clearly show that international labour migration benefits rural municipalities that are otherwise struggling with depopulation. While many studies reviewed in this chapter found that international migration is

associated with increasing rates of out-migration among natives, no such effects are found in the case of rural Norway. Labour migrants from EU11 are mainly adding to the population, giving a much-needed 'demographic refill' to many rural areas (Hedberg and Haandrikman 2014).

Third, the results of these analyses show that it is unlikely that the results from spatial correlation exercises on the effect of international migration on native wages and employment are biased, due to the selective out-migration of natives in rural Norway. Further research is required to determine whether these results are more generally representative for rural areas in western Europe.

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