

Human Capital in the North

This chapter focuses on human capital measured as educational attainment in the BIN area. Human capital is productive wealth embodied in labor, skills and knowledge¹. Human capital theory² views education as an “investment” which yields returns in due course to the individual in terms of pay and to the state in terms of employment and economic growth. More importantly, investments in human capital are not only limited by economic returns, as the true goal of education is the activation and realization of the creative potential of a person. We use the attainment of tertiary education to measure the stock of human capital, i.e. the skills available in the population and the labor force.

Educational attainment refers to the highest level of education completed by a person, shown as a percentage of all persons in that age group. In this report, we study the educational attainment of tertiary education. Universities and other higher education institutions provide tertiary education. For comparability reasons of education systems across countries, educational attainment in tertiary education is analysed combining both short and long tertiary education. It includes short (less than three years) degrees and long (four years or more) degrees, including Bachelor’s, Master’s and Doctoral level programmes. Collectively short and long tertiary education represents both theoretically and practically oriented degrees. Incentives to earn a tertiary degree include higher salaries and better employment prospects.³ Knowledge production and transfer have direct impacts on the livelihood and prosperity of the BIN area. An analysis of tertiary education attainment provides estimates of the human capital and knowledge base in the BIN area. The analysis is conducted in the age group 20-59 and within its sub-age groups.

Tertiary education has pronounced impacts on the individual level by improving career opportunities and quality of life, while on the societal level tertiary education fosters innovation, increases economic activities and growth, and contributes to the wellbeing of citizens (Eurostat⁴). Tertiary education defines adolescents in transition reaching adulthood that traditionally involves leaving parents, forming a long-term relationship, becoming a parent and finding a long term job⁵.

Tertiary education, short and long, in age group 20-59 is compared from 2008 to 2014 in all countries across the BIN area and their respective counties. The indicator is defined as the percentage of the population aged 20-59 who have successfully completed tertiary studies (e.g. university, higher technical institution, etc.). Finland, Norway, and Sweden have comparably high expenditures on

education as a percentage of GDP⁶, however, analysis at the BIN level reveals cross-country and cross-county differences. On an individual level, investing in tertiary education pays off as higher net financial gains during one’s career. On the public level, countries benefit from having a higher percentage of individuals with tertiary education by collecting higher tax revenues once tertiary education graduates join the labor market. In this report, the proportion of employees with university degrees in different educational fields is analyzed in the BIN area.

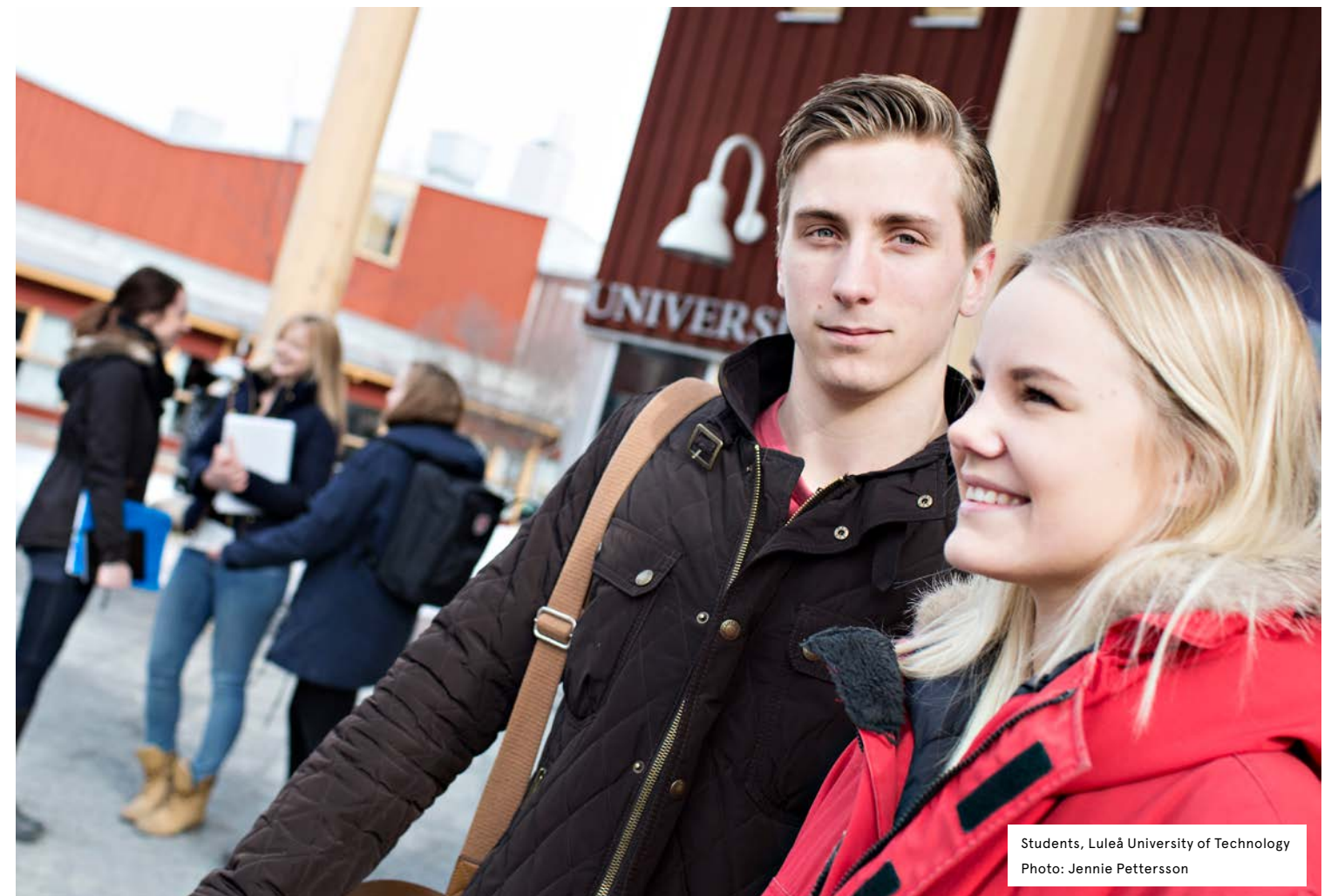
The results of this chapter suggest:

- A growth in human capital measured as tertiary education attainment of population is observed in the BIN counties reaching the respective country averages
- A high concentration of population with tertiary education attainment in age group 20-59 is observed in the counties of Troms and Northern Ostrobothnia
- Out of all the population that attained tertiary education degrees, 59 % are females, and 41 % are males in the BIN area, compared to 56 % females and 44 % males in total for Norway, Sweden and Finland
- In the Swedish and Finnish BIN counties, human capital in the age group 25-29 is decreasing, which may potentially reflect employability challenges of recent higher education graduates
- The highest gains in tertiary education attainment occurred in the age groups 40-49 and 50-59
- Out of the employed persons with tertiary degrees in the BIN area, 25 % have their degree in the field of health and welfare, compared to 20% in total for Norway, Sweden and Finland as of 2014

The results show that the highest concentration of human capital in the BIN area is observed in the county of Troms (Norway) and in the county of Northern Ostrobothnia (Finland) where 38% and 35% of all population aged 20-59 have attained tertiary education. Other BIN counties lagged behind their respective country averages in the percentage of population aged 20-59 that has attained tertiary education. This creates opportunities for higher education institutions in the area to offer tertiary education to the population living in the BIN area. Taking population development with diminishing young population in age group 0-19 into consideration, tertiary education offerings could be tailored to accommodate a life-long learning concept with flexible education opportunities. Holders of tertiary education degrees in the BIN area are predominantly females, e.g. 60 % of all tertiary education holders in Finnmark and Lapland. Sub-group analysis of tertiary education attainment in the BIN area during 2008-2014 shows that a high percentage of tertiary education holders in all age groups in the BIN area correspond or lie below the respective country averages. However, in Swedish and Finnish BIN counties, human capital in age group 25-29 is decreasing. That may

potentially reflect employment challenges for recent higher education graduates. The highest growth in tertiary education attainment is observed in age group 40-49 across all BIN counties.

The analysis of employed people holding tertiary education degrees in five major fields is conducted in order to detect tendencies in the employment market in relation to tertiary education, i.e. what skills and competencies were growing or declining in demand during 2008-2014. The analysis of employed people holding tertiary education degrees in five major fields revealed that the highest growth in employed people with tertiary education was in the field of natural and social sciences in the Norwegian and Swedish BIN counties. The percentage of employed people with tertiary education in the field of agriculture, fisheries and forestry grew in the Norwegian BIN counties. Moreover, there was a growth of people employed with tertiary education degrees in health and welfare (e.g. Norwegian BIN counties), while the percentage of employed people in the field of humanities and art has remained nearly the same. This analysis can be further extended in order to account for the industry of employment, gender and salary differences.



Students, Luleå University of Technology
Photo: Jennie Pettersson

¹ OECD definition

² Gillies, D.Peters, M. (Ed.) Human Capital Theory in Education. Encyclopedia of Educational Philosophy and Theory, Springer Singapore, 2017, 1-5

³ OECD (2016), Education at a Glance 2016: OECD Indicators, OECD Publishing, Paris.

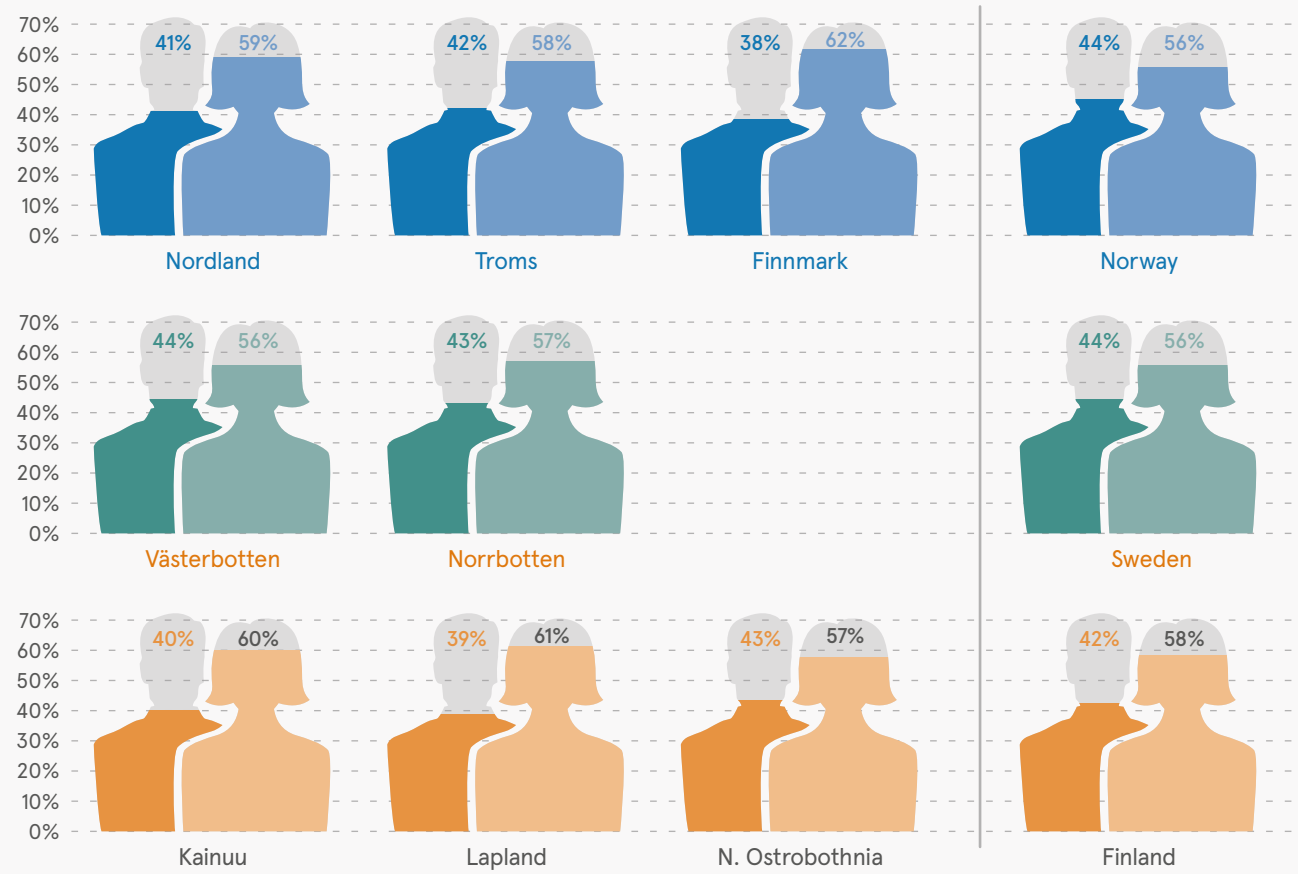
⁴ Eurostat definition

⁵ Arnett, J. J. (2007). Emerging adulthood: What is it, and what is it good for?. Child development perspectives, 1(2), 68-73.

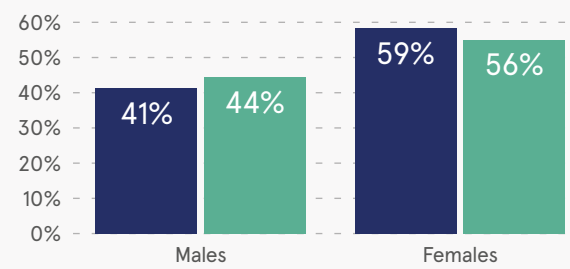
⁶ Expenditure on education, % of GDP /% of GDP on tertiary education in 2013, Finland (5.7%/1.8%), Norway (6.3%/1.6%), Sweden (5.4%/1.7%). Source: OECD

Gender differences in tertiary education attainment

2014

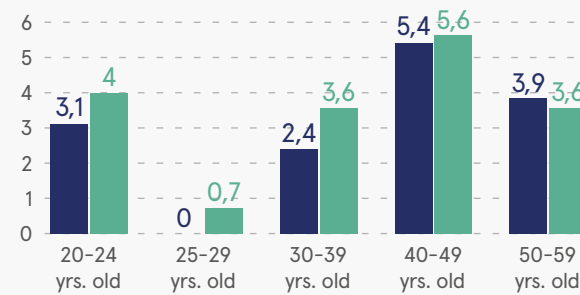


Gender differences in tertiary education attainment, 2014



■ BIN average ■ Average total, Norway, Sweden and Finland

Gains and losses in tertiary education attainment by age groups, average %, 2008–2004



■ BIN average ■ Average total, Norway, Sweden and Finland

Tertiary education attainment in age group 20–59 year olds

2014

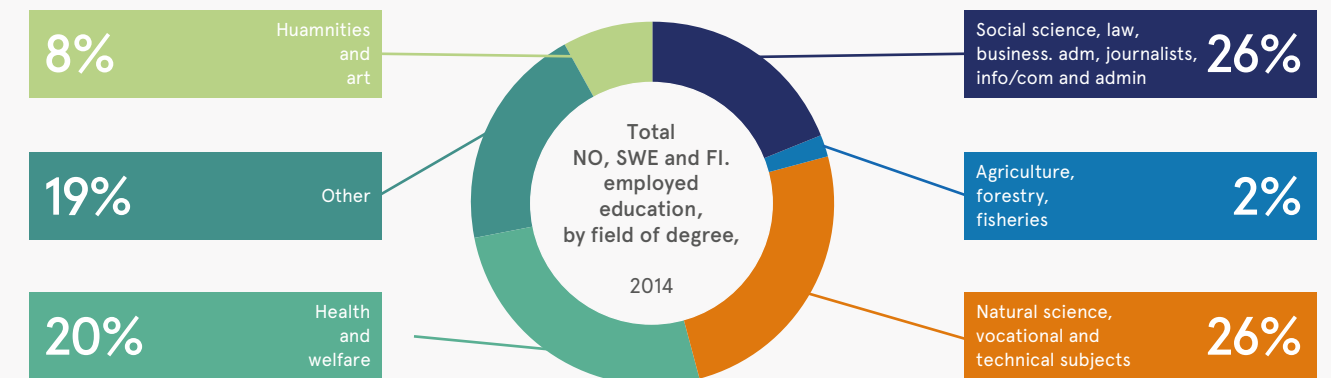
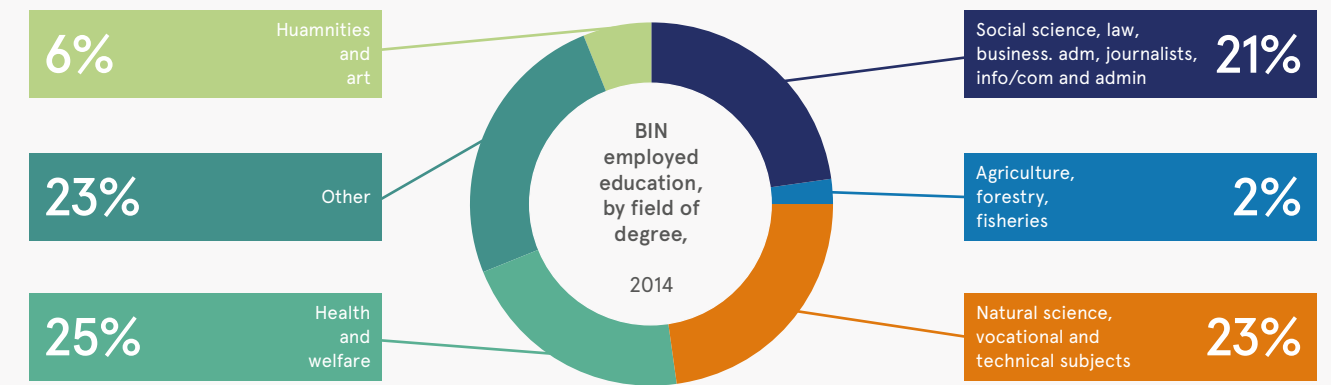
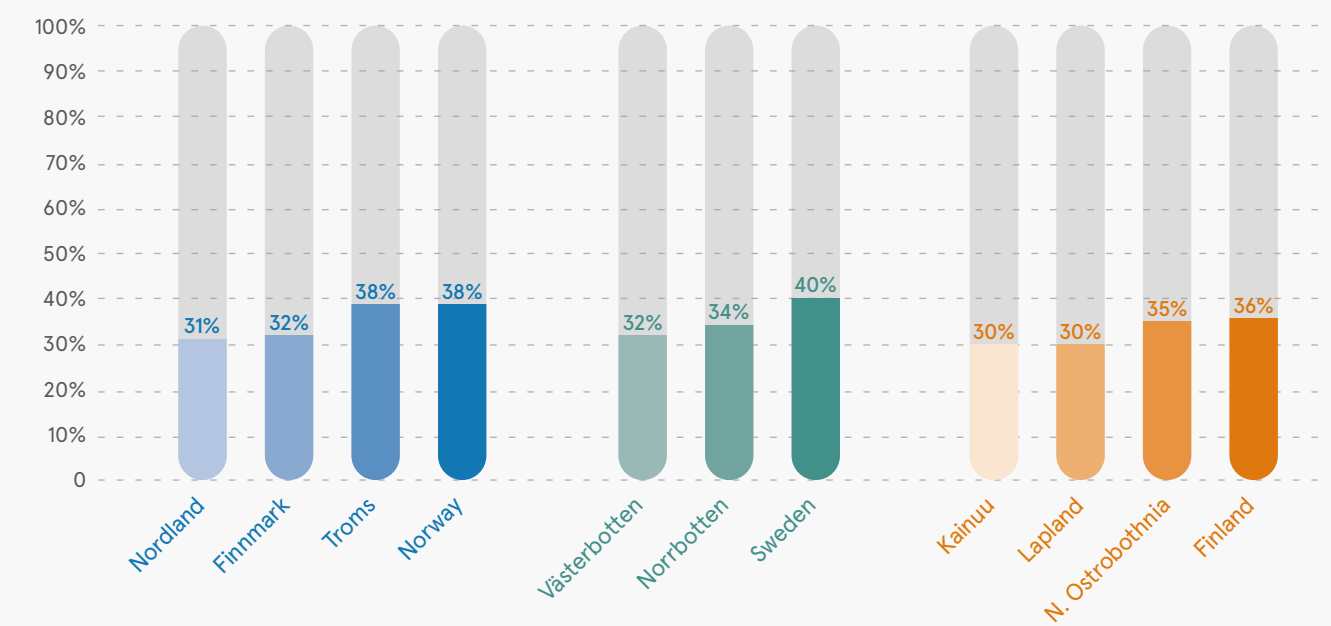


Figure 1 – Tertiary education combined in age group 20–59, total for Finland and its BIN counties

Figure 1 shows a pattern in tertiary education attainment in Finland, where the country's average in tertiary education attainment has increased by 3 % from 2008, reaching 36 % of the total population. Northern Ostrobothnia's statistics demonstrate that the level of tertiary education attainment is the same as the country's average, while the counties of Kainuu and Lapland lagged 6 % behind the country's average, both reaching the 30 % mark in 2014.

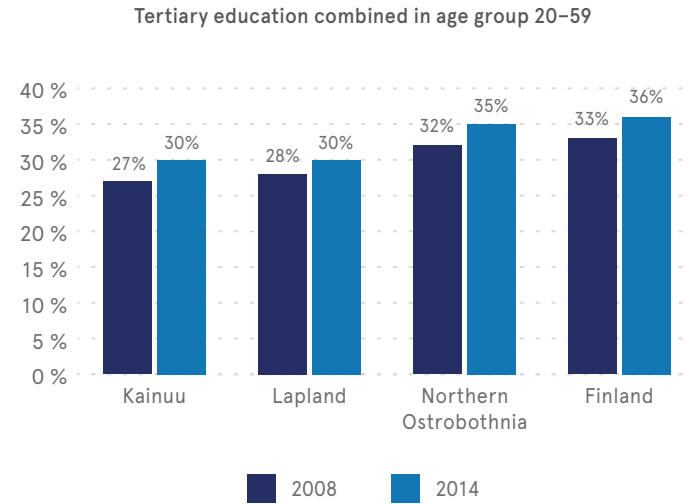


Figure 2 – Tertiary education combined in age group 20–59, total for Norway and its BIN counties

Figure 2 demonstrates development in tertiary education attainment in Norway and its BIN counties. Norway's average for tertiary education attainment in the total population had risen from 32 % in 2008 to 38 % in 2014. The county of Troms followed the national pattern, while in Nordland and Finnmark counties, the percentage of the population aged 20–59 who had successfully completed tertiary studies, was registered at 6–7 % below the country average in 2014.

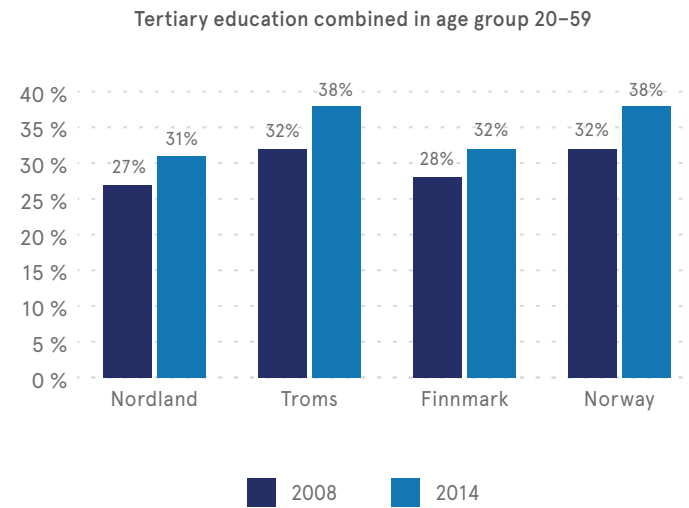


Figure 3 – Tertiary education combined in age group 20–59, total for Sweden and its BIN counties

Figure 3 demonstrates the development in tertiary education attainment among the population in Sweden and in its BIN counties. Norrbotten (32%) and Västerbotten (32%) both had a lower percentage of population with tertiary education attainment compared to Sweden's average of 40 % in 2014.

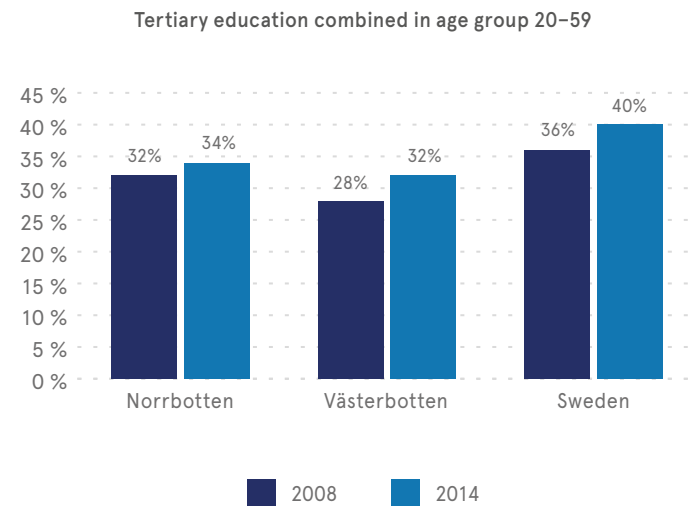


Figure 4 – Female to male ratio in tertiary education attainment as of 2014

Figure 4 demonstrates the breakdown of tertiary education attainment as a female-to-male ratio in 2014. A ratio higher than one means that there are more females than males with tertiary education attainment. High female-to-male ratio in all BIN counties demonstrates the prevalence of highly skilled females; the ratio is higher than the respective country average in all counties, except in Northern Ostrobothnia. In the counties of Finnmark and Lapland, nearly 60 % of all tertiary education holders are females. An analysis of population in the BIN area demonstrated that women tend to move to cities with higher employment opportunities.

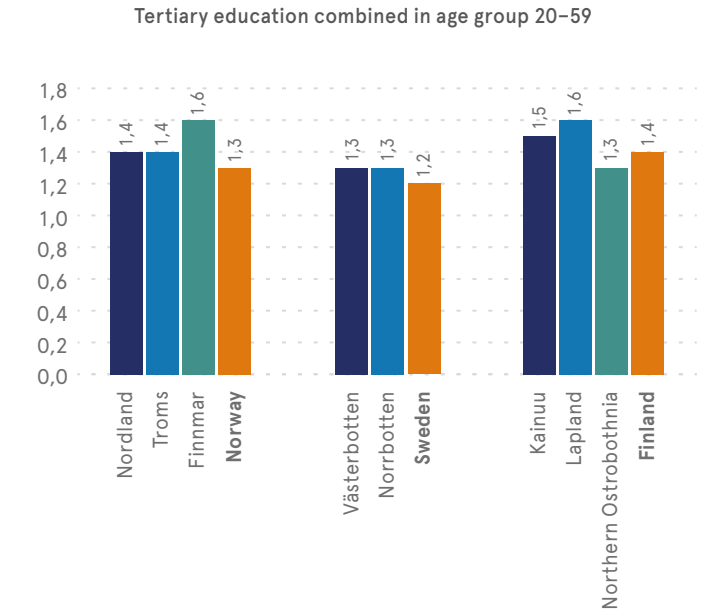


Figure 5 – Change in tertiary education attainment in age group 20–24 from 2008 to 2014, BIN counties

A further analysis involves the development of tertiary education attainment in age subgroups: 20–24, 25–29, 30–39, 40–49 and 50–59. Between 2008 and 2014, tertiary educational attainment among 20–24 year-olds increased in all countries of the BIN area (see Figure 5), ranging from 2 % to 5 % increase. This age group is dominated by short-cycle tertiary education attainment. According to Eurostat, 45 % of young people (aged 15–29) are still in education. In Troms county, 38 % of all 20–24 year-olds had attained tertiary education, which corresponded to the national average, while the Nordland and Finnmark counties had 31 % and 32 % of the population in the age group 20–24 with tertiary education degrees as of 2014. In Sweden, Västerbotten county had the highest percentage (42 %) of 20–24 year-olds with tertiary education degrees in 2014, while the average in Sweden equaled 40 %. In Finland, the Kainuu and Lapland counties had on average 6 % fewer 20–24-year-olds with tertiary education attainment compared to Finland's national average of 36 %.

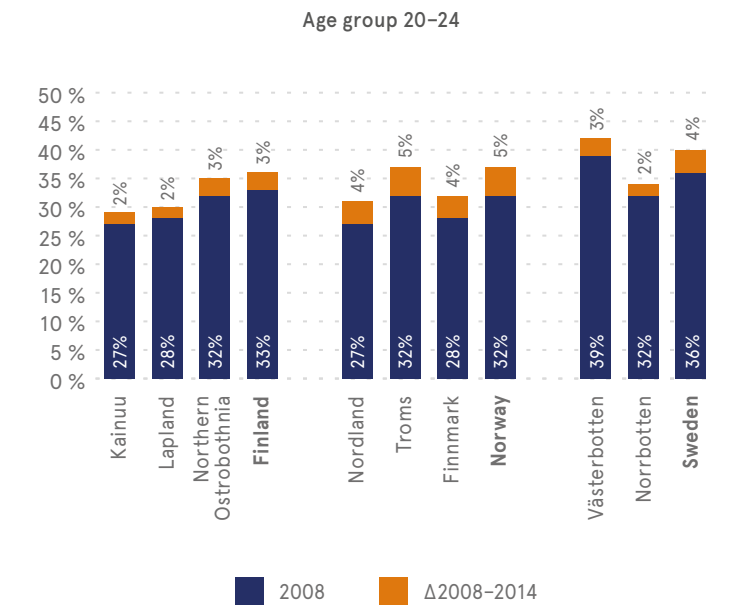


Figure 6 – Change in tertiary education attainment in age group 25–29 from 2008 to 2014, BIN counties

People aged 25–29 represent a category of people who mostly likely have completed their tertiary education, and for them, access the labor market is essential. Between 2008 and 2014, the tertiary educational attainment among 24–29 year-olds increased only in the Norwegian countries of the BIN area (see Figure 6), ranging from 2 % to 6 % increase. In Sweden, in Västerbotten and Norrbotten counties, the percentage of 25–29-year-olds with tertiary education has decreased by 3 %. In Västerbotten, the pool of highly skilled 25–29-year-olds in 2008 has reached saturation (50 % of that age group) and was higher than the national average of 43 %. Decreases in tertiary education attainment in age category 25–29 are observed in Lapland and Kainuu in Finland. This can be interpreted as an indirect proxy for employability opportunities of young people with tertiary education degrees. Therefore, the results potentially indicate weakened employment opportunities for young adults who attained tertiary education in the age group 25–29 in the Swedish and Finnish BIN counties, while Norway maintained growth in tertiary education attainment in that population group during 2008–2014.

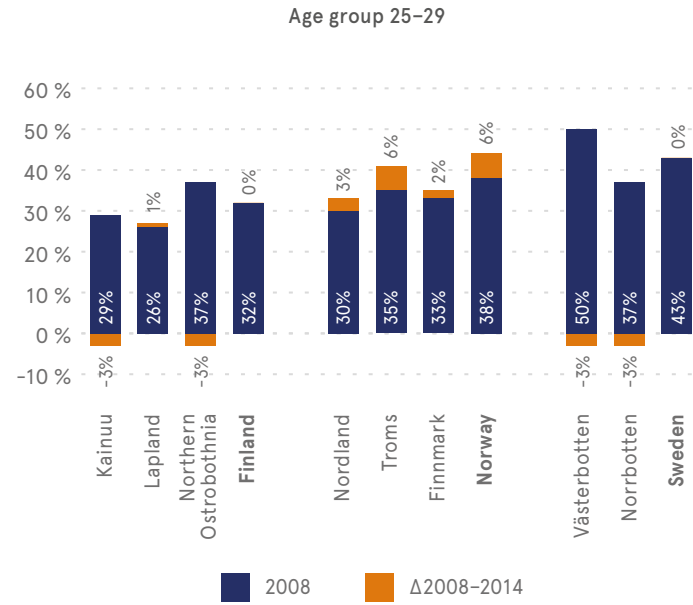


Figure 8 – Change in tertiary education attainment in age group 40–49 from 2008 to 2014, BIN counties

Figure 8 demonstrates tertiary education attainment in age group 40–49 from 2008 to 2014. This age group maintained the highest growth, ranging from 4 % to 8 % in all BIN area counties. This can be interpreted as an outcome of lifelong learning education, where 40–49-year-olds are most likely to receive a tertiary education degree either in their field of specialization or in a new field with favorable employability opportunities.

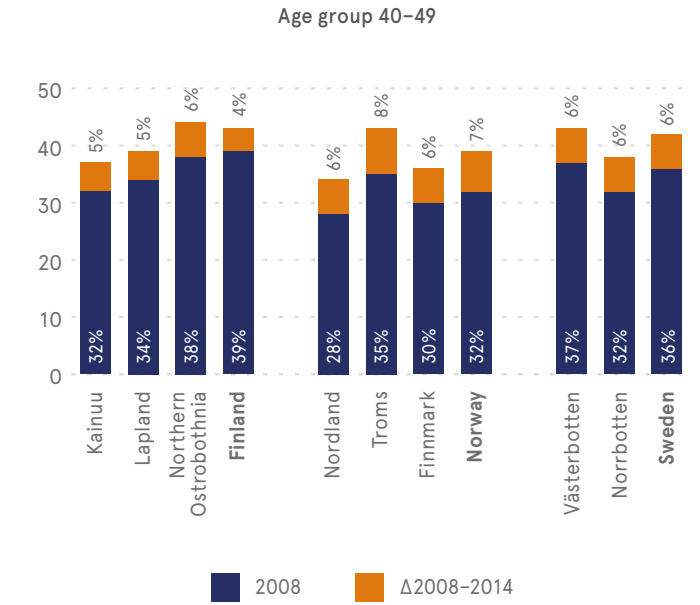


Figure 7 – Change in tertiary education attainment in age group 30–39 from 2008 to 2014, BIN counties

Figure 7 shows the trend of tertiary education attainment in age group 30–39. In Norway and Sweden, population in age group 30–39 demonstrated growth in tertiary education attainment, with Troms county (47 %) and Västerbotten country (51 %) leading to the number of highly skilled 30–39-year-olds. The decline in population who has attained tertiary education in the age group 30–39 was observed in Finland in Lapland and Northern Ostrobothnia counties. This potentially indicates weakening employment opportunities the Finnish BIN counties for people aged 30–39 during 2008–2014.

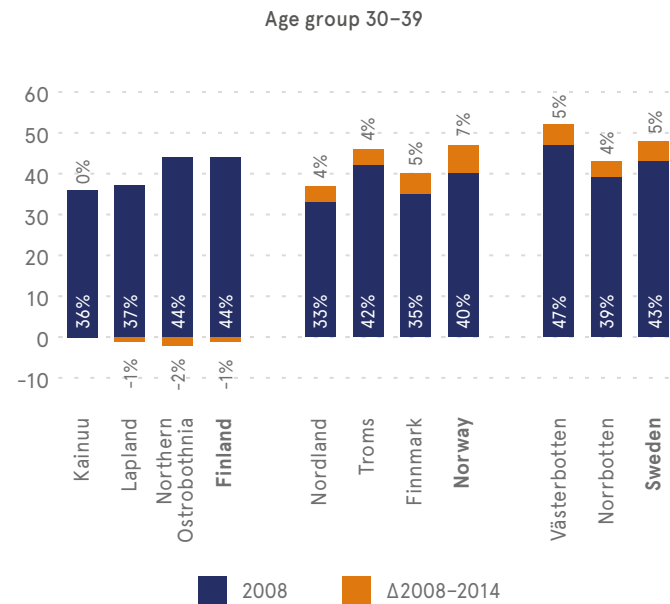


Figure 9 – Change in tertiary education attainment in age group 50–59 from 2008 to 2014, BIN counties

Figure 9 demonstrates tertiary education attainment in age group 50–59 from 2008 to 2014. Tertiary education attainment in this age group showed a positive trend ranging from 2 % to 6 %. Troms (33 %) and Västerbotten (36 %) counties had the largest proportion of 50–59 year-olds with tertiary education degrees in 2014. The rest of the BIN counties maintained a level of 50–59 year-olds with tertiary education degrees in 2014 that was below the national average. Collectively, results for 40–49 and 50–59 year-olds are in line with the OECD report⁷. The reasons for older adults to obtain a tertiary education is to secure higher earnings at an older age, and also to improve their prospects of being employed at an older age.

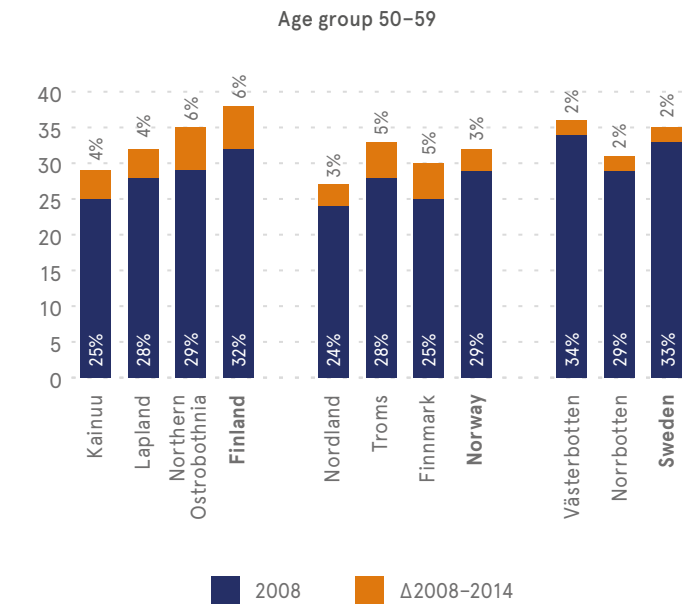
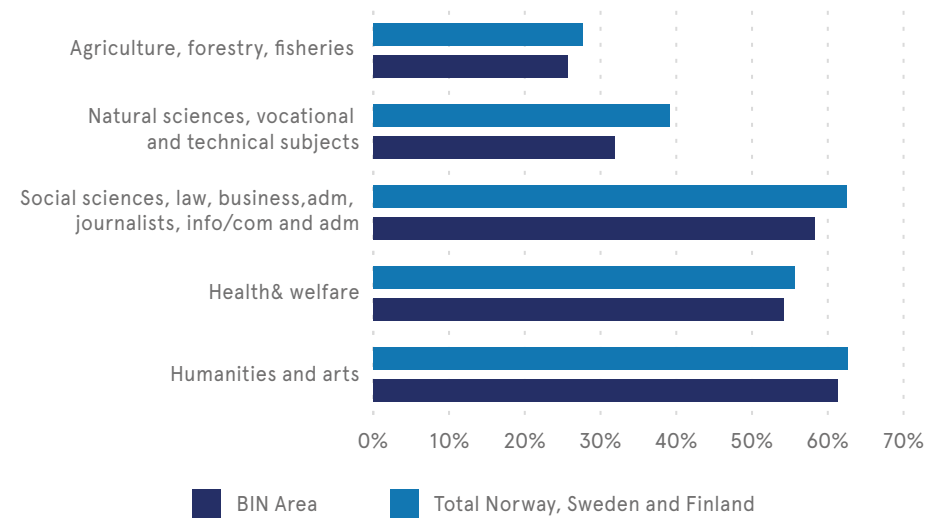


Figure 10 – Proportion of employed people with tertiary education, by field of degree⁸, 2014.

Figure 10 shows the proportion of employees with tertiary education in five major fields. Statistics for employed people with tertiary education does not account for the industry in which these people are employed. University degree is indicative of a level of knowledge and intellectual ability. Supply of university graduates has been expanding, and the degree per se does not guarantee a job or a career. Graduates' attributes are more important in the recruitment process than the graduates' degree subject⁹. Therefore, a person with a degree in arts can be employed in the IT sector. Statistics of employees with tertiary (university) education by study field is only in-



dicative of the demand side of employment and its need for people with corresponding degrees. The results suggest that in the BIN area, the proportion of employees with university degrees lagged behind of the national average in Norway, Finland, and Sweden as of 2014. This can be interpreted as there not being enough jobs available for highly skilled workers or the supply highly skilled professional has not yet reached its saturation point. The differences are particularly pronounced in natural sciences, vocational and technical subjects; compare 31.9 % in the BIN area to 39.3 % in total for Norway, Finland, and Sweden. This indicates only that skills required, as we do not know whether these people work in the field in which they are educated. Statistics are on the field their degree is from.

Figure 11 – Breakdown by field of degree of all employed people with tertiary degrees (all tertiary degrees=100%), 2014

Figure 11 shows breakdown by field of degree of all employed people with a tertiary degree. Considering all employed people with a tertiary degree as 100%. The main differences between the BIN area and Norway, Sweden and Finland is employed people with tertiary degree in health and welfare. The BIN area accounts for 25% all employed people with a tertiary degree in health and welfare, while in Norway, Sweden and Finland in total this proportion is 20%. At the same time, lower proportion of employed people with a tertiary degree in social sciences 21% is observed in BIN in 2014, as compared to 26% in Norway, Sweden and Finland in total. This indicates higher demands in of employees with skills in health and welfare in the BIN area that corresponds to our finding of the ageing population in the BIN area that puts increased demands on health care and social services.

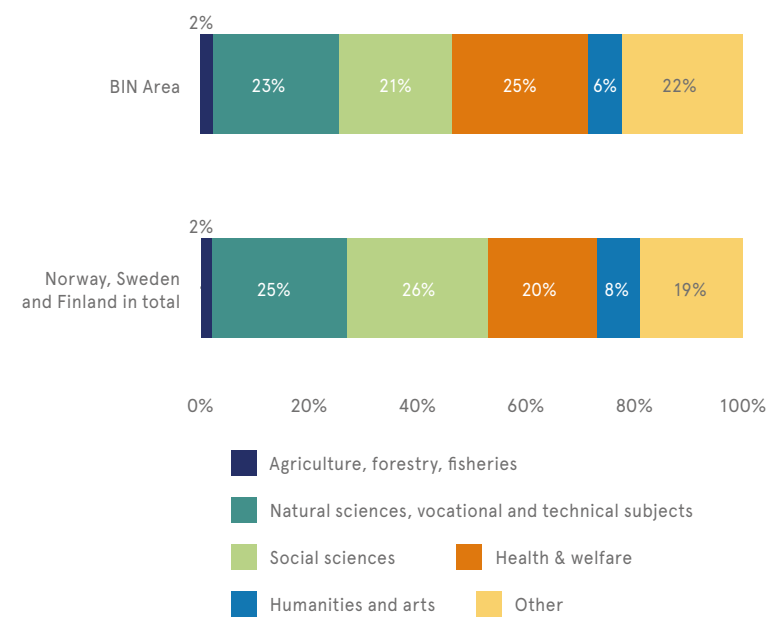


Figure 12 – Employed people with tertiary education degree in the fields of agriculture, forestry, and fisheries, 2008–2014, % change

Figure 12 illustrates the percentage change of employed people with a tertiary education degree in the agriculture, forestry and fisheries field from 2008 to 2014 in total for Norway, Sweden and Finland as well as the BIN area. Out of all persons employed with degrees in the field of agriculture, forestry, and fisheries, only 27.6 % had a university or equivalent degree in total for Norway, Sweden and Finland, and 25.7 % in the BIN area. This means that the demand side of employment does not require highly skilled workers in the agriculture, forestry, and fisheries field, while an increase of 2.1 % is observed in the BIN area.

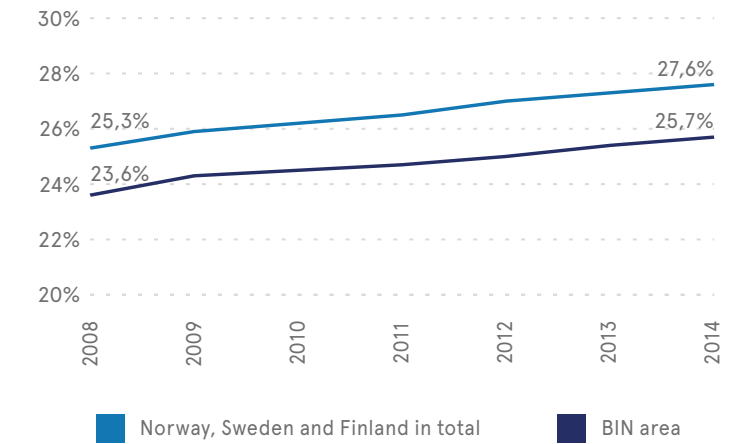
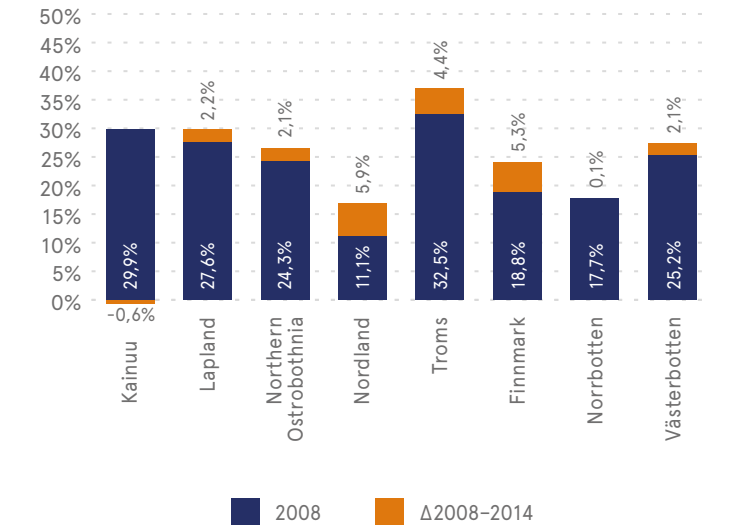


Figure 13 – Employed people with tertiary education degrees in the field of agriculture, forestry and fisheries at the BIN county level, 2008–2014, % change

Figure 13 shows the percentage change of employees with tertiary education degrees in the agriculture, forestry, and fisheries field at the BIN county level, from 2008 to 2014. The demand for highly skilled people with a degree in the field of agriculture, forestry and fisheries varied greatly amongst BIN counties, compare 37 % in Troms to 17 % in Nordland and 17.8% in Norrbotten. The change was high in the counties with an initial low percentage of highly skilled employed people, e.g. in Nordland, the increase during 2008–2014 was 5.9 % from 2008 level of 11.1 %.



⁸ Social sciences include: Social sciences, journalism and information, business, administration and law

⁹ Harvey, L. (2000). New realities: The relationship between higher education and employment. Tertiary Education & Management, 6(1), 3–17.

Figure 14 – Employed people with tertiary education degrees in the field of natural sciences, vocational and technical subject, 2008-2014, % change

Figure 14 demonstrates that the demand for highly skilled workers with tertiary education degrees in the field of natural sciences, vocational and technical subject was much lower in the BIN area (31.9 %) compared to the total for Norway, Finland and Sweden (39.2 %) in 2014. Moreover, the change during 2008-2014 was below 2% in the BIN compared to 3% in the total for Norway, Finland and Sweden.

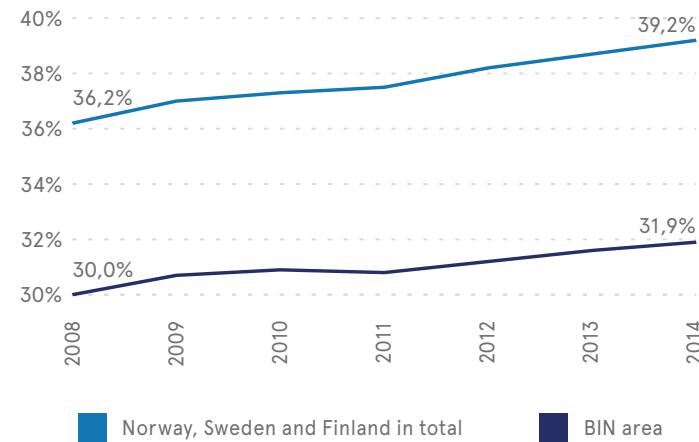


Figure 16 – Employed people with tertiary education degrees in the field of social sciences, 2008-2014, % change

Figure 16 demonstrates an increase of 5.9 % in the group of employed people holding a tertiary education degree in the field of social sciences in total for Norway, Sweden and Finland during 2008-2014. In the BIN area, the same indicator grew by 5.8 % but still remained at 58.3 %, compared to a 62.5 % total for Norway, Sweden and Finland in 2014.

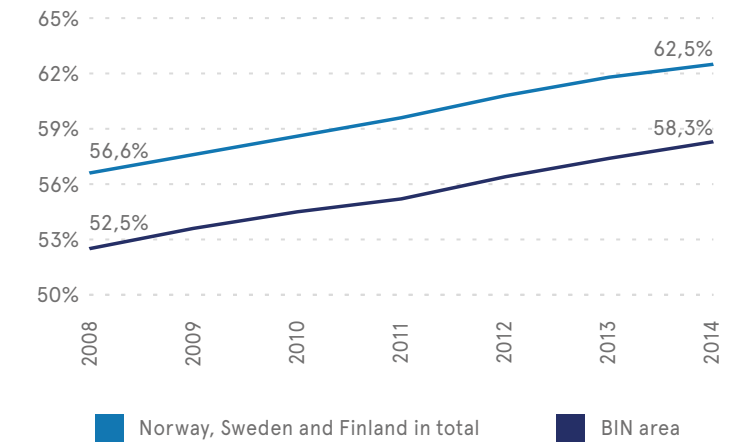


Figure 15 – Employed people with tertiary education degrees in the field of natural sciences, vocational and technical subject at the BIN county level, 2008-2014, % change

Figure 15 shows the trend of percentage change of employed people with tertiary education degrees in the field of natural sciences, vocational and technical subject at the BIN county level from 2008 to 2014. Norwegian and Swedish counties appear to be the net gainers of highly skilled employees in that category. The county of Northern Ostrobothnia had a slight decrease of 0.9 % in employed people with tertiary education degree in the field of natural sciences, vocational and technical subject, yet it remained the leader in the BIN area, with 40 % of employed people having a degree in the field of natural sciences, vocational and technical subject on a tertiary level.

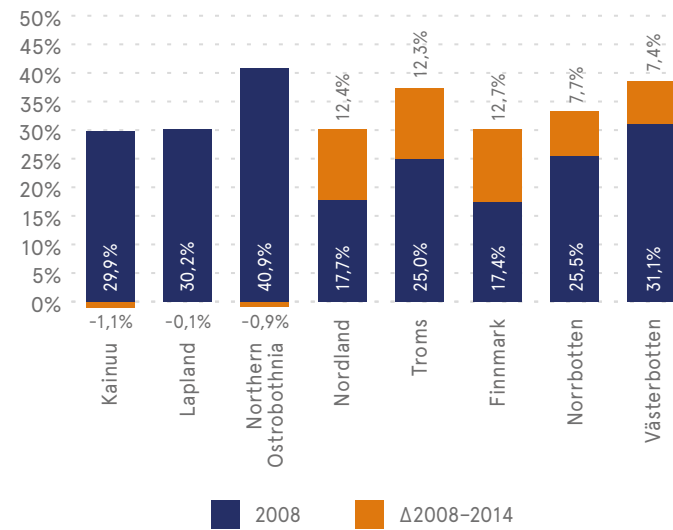


Figure 17 – Employed people with tertiary education degree in the field of social sciences at the BIN county level, 2008-2014, % change

Figure 17 demonstrates trends in employed people holding tertiary education degree in the field of social sciences at the BIN county level. The Norwegian counties of Nordland, Troms and Finnmark had an average growth of 12 % in employees holding tertiary education degrees in the field of social sciences, meaning an increase in the demand side of the employment market for people with skills in social sciences. The Swedish counties Norrbotten and Västerbotten saw an average growth of 7.5 % in the same category. The Finnish counties had a slight decrease in employed people holding tertiary education degree in the field of social sciences, which is explained by a high average percentage (69 %) of people holding tertiary education degree in the field of social sciences in 2008.

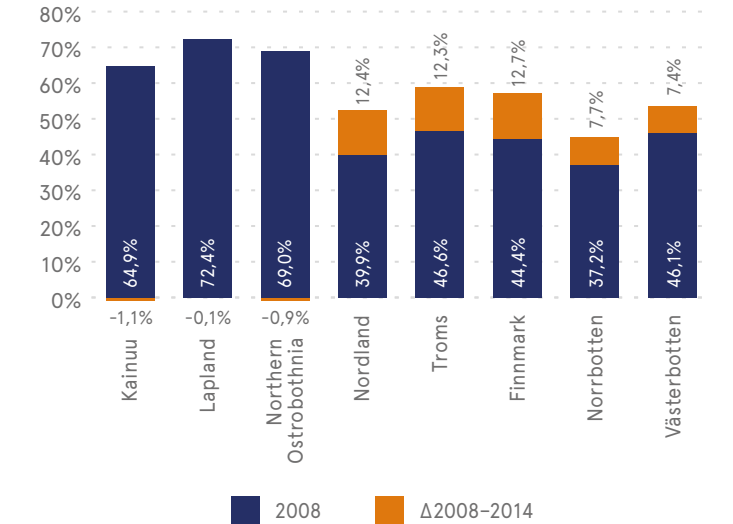


Figure 18 – Employed people with tertiary education degree in the field of health and welfare, 2008-2014, % change

Figure 18 demonstrates the percentage change of employed people with tertiary education degrees in the field of health and welfare from 2008 to 2014. A 3.1% increase is observed in the total for Norway, Sweden, and Finland in 2014, compared to 2.2 % in the BIN area.

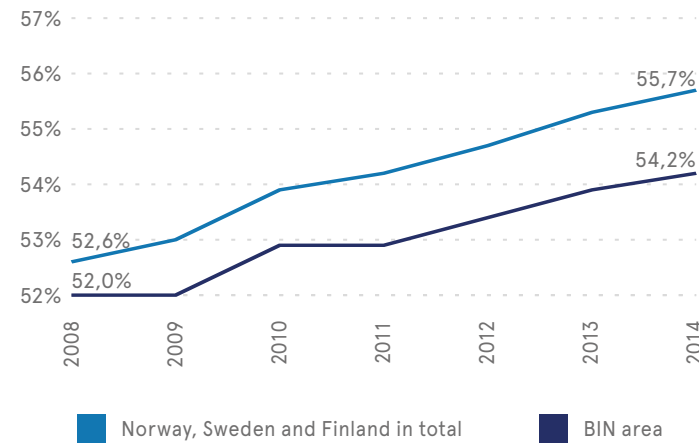


Figure 20 – Employed people with tertiary education degrees in the field of humanities and arts, 2008-2014, % change

Figure 20 demonstrates that the percentage of employed people with tertiary education degrees in the field of humanities and arts plateaued during 2008-2014, which can be explained by a high starting point; 61.7% for the BIN area and 62.5 % in total for Norway, Sweden and Finland in 2008.

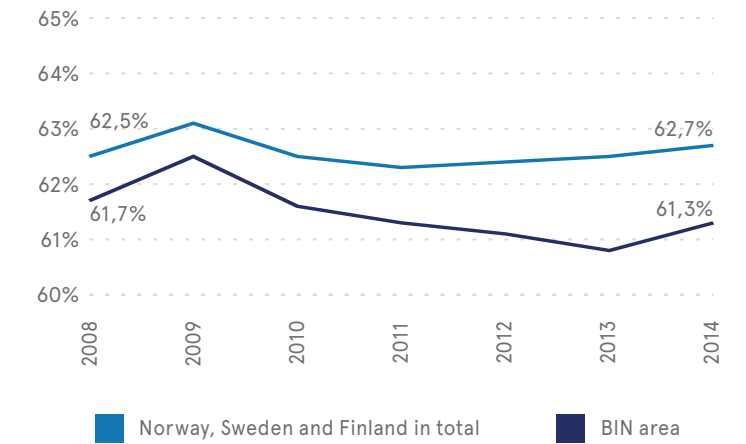


Figure 19 – Employed people with tertiary education degree in the field of health and welfare at the BIN county level, 2008-2014, % change

Figure 19 demonstrates that in the Norwegian counties Nordland, Troms and Finnmark, employed people with a tertiary education degree in the field of health and welfare increased the most. For example, Nordland had 62.1 % of the employed people with tertiary education degree in the health and welfare field in 2014, which is much higher than the total of 55.7 % across Norway, Sweden, and Finland. Norrbotten and Västerbotten saw an average growth of 3.5 %, while the Finnish BIN counties had a slight decrease. This indicates that the population growing older creates job demands for the holders of tertiary education degrees in the health and welfare field.

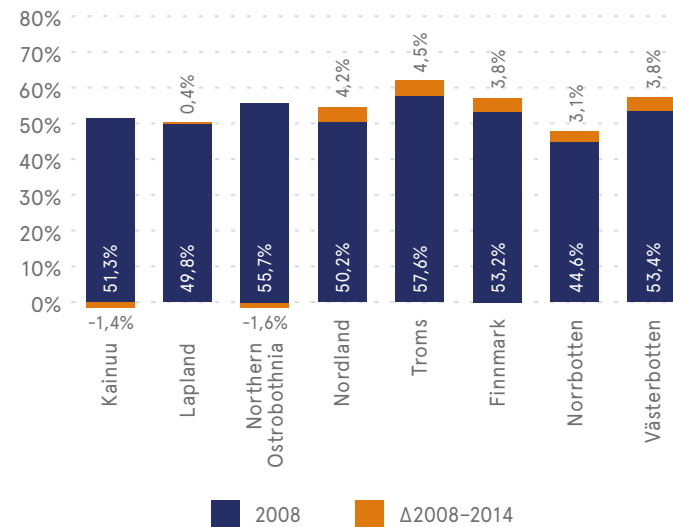
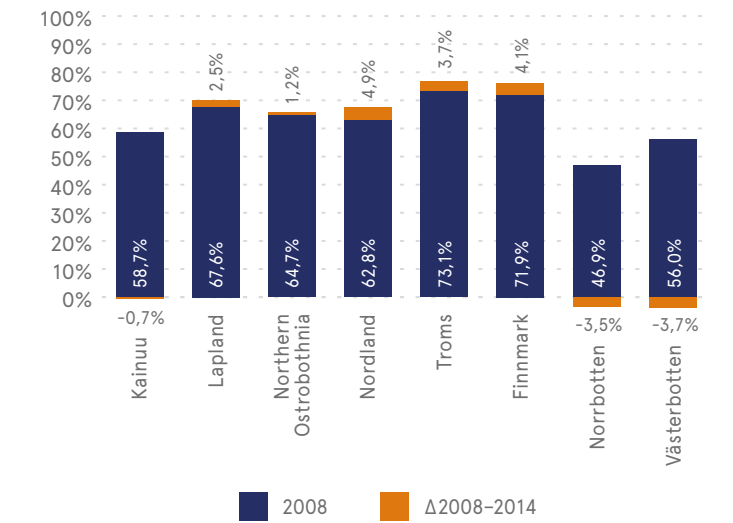


Figure 21 – Percentage change of employed people with tertiary education degree in the field of humanities and arts at the BIN county level from 2008 to 2014

Figure 21 demonstrates a continuous growth of employed people with tertiary education degrees in the field of humanities and arts in the Norwegian BIN counties as well as in Lapland and Northern Ostrobothnia. The Swedish BIN counties saw an average decrease of 3.6 % of employed people with tertiary education degrees in the field of humanities and arts.



Implications

“Human Capital in the North” chapter provides an analysis of trends in human capital measured as tertiary education attainment in the BIN area and for Norway, Sweden and Finland as a whole. The Human Capital Index¹⁰ measures how well countries are at leveraging their human capital and establishing workforces that are prepared for the demands of competitive economies. The Countries of the BIN area have ranked at the very top of the world, Finland (1), Norway (2) and Sweden (5). The value of this chapter is the investigation of educational attainment in-depth on a county level and within age groups. Prior results on high levels of tertiary educational attainment¹¹ suggest that highly educated people generally have better health, are more socially engaged, have higher employment rates and have higher relative earnings. We suggest the following implications for policy makers and business in general.

For policy makers:

- The findings from population development and educational attainment in the BIN area should be used for planning an education system of the future. The BIN area may experience shortage of new local entrants to its educational system caused by the decline in the population group aged 0-19
- Shrinking population in rural parts of the BIN area creates challenges to maintaining the accessibility of education services

- Assessment of distance learning in the future for the BIN area education systems
- Facilitate cooperation in the tertiary education sector (universities in the BIN area) in order to work together and strategically address demographic challenges of the BIN area

For business:

- County profiles help to gauge which human capital and what skills (employed people by the field of degree) are available in each of the BIN counties. This information is useful for recruitment and capital investment purposes
- Business opportunities for companies offering life-long learning solutions and education for the mature and elderly population
- Business opportunities for companies offering digital learning platforms
- Export opportunities of educational expertise and solutions based on Finnish, Swedish and Norwegian education systems

¹⁰ Source: World Economic Forum, *2016 rank out of 130 economies

¹¹ OECD (2016), Education at a Glance 2016: OECD Indicators, OECD Publishing, Paris.