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Institute for Fiscal Studies

Country Studies: Inequalities in Europe and North America
A parallel study to the IFS Deaton Review

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Inequality in Norway: 1970-2017

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1   Executive summary

We use data from five decades of Norwegian Register data to examine trends in the employment, hours worked, wages, earnings, after-tax and transfer income, and immigration in Norway.

There has been a substantial increase in female participation in the labour market, particularly among women aged 25–60. At the same time, male employment rates showed a slight decline within the same age group. Employment rates vary considerably based on education levels, with higher rates among those with high education, followed by middle education and low education. The gap between high and middle education employment rates has narrowed over time. However, the employment rates of low-educated individuals have declined.

Education trends reveal a decline in the importance of middle education and a substantial increase in higher education. Women have made remarkable progress in higher education, while middle education (comprised primarily of those in the vocational education track) remains relatively more important for men in Norway. The proportion of individuals with low education has decreased considerably over time.

There has been an increase in employment equality between genders over time. The employment gap between highly educated men and women has closed, and the gap among those with middle education has considerably declined. The employment gap between low-educated men and women has also reduced. Wage trends show growth for both men and women, but a gender wage gap exists. High-educated women earn less than high- and middle-educated men.

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Low-educated men earn more than middle-educated women. Wage disparities have increased over time, especially among highly educated individuals. Similar patterns exist using earnings rather than wages.

Earnings inequality in Norway has remained relatively stable over time, but there exist notable differences by gender. Wage inequality among men has increased, while women have experienced a decline in wage inequality. However, wages of women have increasingly lagged behind those of men over time, particularly among women with higher education. As before, roughly similar patterns exist using data on both earnings and wages.

The Norwegian welfare state plays a significant role in income redistribution, with benefits allocated to individuals across all income levels, but particularly among those at the bottom of the earnings distribution. Tax rates gradually increase with higher income, reflecting the redistributive role of the tax system. Despite the presence of a strong welfare state, a substantial proportion of households (around 15–20%) are classified as being in relative poverty. Family structures have changed, with a decline in marriage rates across all education groups and an increase in cohabitation and single households. Immigration has increased considerably in Norway over time: while immigrants accounted for only 3% of the population in 1970, this proportion increased to nearly 23% by 2017. While immigrant representation grew across all income levels, the growth was concentrated in the bottom half of the distribution, particularly the bottom 25%, suggesting the economic opportunities available to immigrants have become increasingly lower paid over time.

2 Institutional background

In this section, we summarise some key institutional factors and features of the Norwegian labour market and the Norwegian welfare system.

Social insurance and labour relations

Unemployment benefits are awarded to individuals who have had their work hours reduced by at least 50%. The replacement rate is 62% of the pre-dismissal income. The standard entitlement period was 186 weeks until 2004, at which point it was reduced to 104 weeks. Unemployment benefits are conditional on filing an employment form with the public employment office every 14 days.

Disability pensions are available to individuals who are unfit for work due to illness or injury. The cause of disability and whether the condition is permanent or temporary do not matter, but the disability must be verified by a doctor. Traditionally, access to disability pensions has been very liberal, and prior literature has identified the disability pension as a common channel through which individuals can permanently exit the labour force while still maintaining a modest source of income. The after-tax replacement rate for previously average earners is around 65%.

The Working Environment Act governs employment law, and, similarly to other Nordic countries, Norway has a somewhat high degree of employment protection and generous unemployment benefits, with no legal requirements for severance pay. There is no national minimum wage in Norway, but wages are typically collectively bargained across sectors.

Childcare and family policies

Maternal job protection, family support and child benefits play a key role in the Nordic welfare state. First, parents are entitled to 12 months of fully paid parental leave provided that they have worked for at least 6 of the 10 months before childbirth and earned a minimum amount. While parental leave benefits are subject to a benefit cap, this cap is generous ($75,000 in 2010, roughly 450,000NOK), and most employers supplement benefits to ensure 100% coverage. Second, all children have a fundamental right to childcare from August of the year they reach 1 year old. Childcare is heavily subsidised by the state, and the maximum monthly price is currently $350. Around 80% of 1-year-olds attend childcare. Third, parents receive non-means-tested financial child support from the state until the child turns 18 years old. This is intended to cover some of the expenses associated with raising the child, and amounts to approximately $130 per month. Finally, the government provides free universal healthcare and tuition-free education (including higher education) to all residents.

Education system

The Norwegian education system consists of 10 years of mandatory education starting at age 6. Following the successful completion of compulsory school, every child has a statutory right to 3–4 years of upper secondary education.

Upper secondary education consists of two different tracks: an academic track which provides

students with direct access to higher education, and a vocational track which results in a trade or journeyman's certificate. The two tracks are further subdivided into different programmes (five programmes within the academic track and 10 programmes within the vocational track). While there is a difference in the type of courses that students take across the different programmes within a given track, the structure of the programmes within a track is the same. We therefore abstract from this subdivision in the paper. The vocational track does not directly grant the student access to higher education. Approximately 50% of students choose to enrol in the vocational track, and 50% choose to enrol in the academic track. Admission to Norwegian high schools is very competitive from an international perspective. Individuals apply to high school with their grades from compulsory school (10th grade GPA), and selection into schools and programmes is determined exclusively by the relative GPA ranking of the applicants.

A range of universities and colleges offer higher education in Norway, and the majority are tuition-free public institutions. Admission is conditional on graduating from an academic high school track and satisfying a minimum grade requirement. If the number of applications exceeds the number of seats, students are assigned exclusively based on high school GPA. Education is free at all levels, including post-secondary school.

Income tax

Similarly to other Nordic countries, the tax system in Norway focuses on redistribution. Labour income is taxed progressively, and those with high labour incomes can face considerably higher tax rates. Consistent with this, the average tax rate on labour income is higher in Norway than the average among OECD countries.[1] Taxes are paid to the national government and local government (municipality and country). Many reforms have occurred relating to income taxes, with a major reform in 1992 implemented a dual income tax system with separate rates of taxation for capital and labour income. Some transfers from the state are also subject to taxation (see below section for further details).

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[1] See, for instance, OECD, 2023. *Taxing Wages 2023: Indexation of Labour Taxation and Benefits in OECD Countries.* Paris: OECD Publishing. `https://doi.org/10.1787/8c99fa4d-en`

3 Notes on measurement and definitions

Unit of analysis and sample:

- For most of the analysis we restrict to individuals aged 25–60.

- At the earliest, the sample begins in 1970 with the 1970 census. Detailed data on earnings are available from 1993.

- Figures represent the entire national population aged 25–60 unless indicated otherwise.

Definitions:

- **Employment rate:** the fraction of the population that is employed according to employment register.

    - Self-employed workers are defined as those having their primary source of earnings, as defined below, through business.

- **Earnings:** gross annual real individual earnings (includes self-employed).

    - Earnings represent the sum of any earnings across any job held by an individual in a year.

    - Most figures include employee taxes but not employer taxes, pension contributions or other contributions (e.g., health insurance). A few figures explicitly compare trends in gross earnings with and without employer taxes.

    - A few Appendix figures measure pre-tax income, which is the sum of annual earnings and taxable benefits such as unemployment insurance, parental leave benefits, or sickness benefits.

    - The period to which earnings data refer will vary across countries. In Norway, the data are obtained as follows:

        * Information on employee earnings is obtained from the tax and earnings register, which corresponds to the annual earnings on an employee's annual tax statement.

        * Earnings measure includes any sickness benefit or child parental allowance.

    - Nominal earnings are converted into real terms in calendar year 2018 using the CPI provided by Statistics Norway.

- **Hours of work:** hours worked are unavailable for all workers across the entire period, and as such, we impute a measure of hours worked as follows:

  - Every employee has employment status measured in bins of typical hours worked per week. The bins are defined as: 30+ hours/week, 20–29 hours/week, and less than 20 hours/week.

  - As detailed data on hours worked are not available across the entire period, we use the median hours per week of actual hours worked for each hours worked bin per week in 2006, and we assign the following hours worked per week for each worker for all years:

    * 30+ bin: 37.5 hours per week.

    * 20–29 bin: 24.17 hours per week.

    * Less than 20 bin: 7.5 hours per week.

  - These bins are calculated for all workers aged 25–60, and using other years where detailed data on hours worked per week produce similar numbers and trends.

  - Imputing hours worked assigns hours worked per week, and creates an annual measure of hours worked assuming 52 weeks of employment.

  - As exact hours worked per week are inevitably measured with some degree of error, the probability of working 30 hours or more per week is also measured in some figures.

- **Wages:** individual real gross hourly wages are imputed, taking annual earnings divided by imputed hours worked as defined above. We convert nominal wages into real terms in calendar year 2018 using the CPI.

  - In 2018, there are the following average exchange rates: \$1 = 8.142 NOK; 1 GBP = 10.856 NOK; 1 EUR = 9.606 NOK.

- **Disposable household income (household equivalised income after deducting taxes and adding benefits and tax credits:**

  - The main measure of household income used in this report is income before any deductions, and after direct taxes and transfers have been deducted from or added to household income.

- Income is measured as disposable income by Statistics Norway and includes: earnings from employment (including self-employment), capital income, taxable transfers, and tax-free transfers.

- Income is net of: tax-free transfers and taxable transfers, including unemployment benefits, disability benefits, and sickness benefits.

- Incomes are equivalised using the modified OECD equivalence scale, normalised to a single individual.

- Households are defined according to procedures established by Statistics Norway. In 2005, there is a break in the definition of a household, which provides an improved measure of cohabitation of households without children residing in buildings with many residents.

Splits:

- **Sex:** female, male

- **Education:** education is grouped into three categories based on International Standard Classification of Education (ISCED) categories: ISCED 0–2, ISCED 3–5, and ISCED 6–8. As Norway has a strong vocational education programme, ISCED 3–5 is comprised of many workers with a vocational education background.

- **Household type:** married with/without children; unmarried with/without children.

Figures not produced for Norway

- The following figures, which are produced for other countries included in the country-specific chapters for the Deaton Review, are not produced for Norway:

  - Gini coefficient of gross individual earnings and total employer cost, over time

  - Growth in gross earnings and employer cost by earning percentile, selected periods

  - Disposable income as a proportion of gross income plus employer payroll cost, by net household income quartile

  - Bite of the minimum wage, over time.

The first three figures are not produced due to a lack of data on employer payroll cost. The last figure is not produced as it is not applicable to Norway as there is no national minimum wage (wages are generally collectively bargained across sectors).

4 Individual employment and earnings

Here we examine trends in individual employment, earnings, education, and wages. Section 4.1 examines trends in employment, Section 4.2 examines trends in wages (where wages are measured using imputed hours worked as described above), Section 4.3 reports trends in hours worked (measured using full-time employment probability) over time, and finally Section 4.4 examines measures of inequality for individual earnings/wages.

4.1 Trends in employment

Figure 1 illustrates trends in employment rates among different age groups and genders over time. Firstly, there has been a substantial rise in female employment rates within the 25–59 age group, indicating a considerable increase in their participation in the workforce over time.[2] Additionally, there has been an upward trend in female employment rates among individuals aged 60–74, although to a lesser extent. Secondly, male employment rates were initially high within the 25–59 age range but experienced a slight decline as time progressed. Thirdly, Figure 1 highlights the presence of significant gaps in employment rates between the sexes among individuals aged 60–74, with men generally exhibiting higher rates of employment. However, these gaps have shown a decreasing trend over the period. Finally, there has been a considerable increase in employment rates among both men and women 16–24 from 2019 to 2021, potentially reflecting the importance of the COVID-19 pandemic.

Figure 2 provides a comprehensive overview of employment rates throughout the life cycle, differentiating between sexes, from 1986 to 2017. The figure demonstrates significant upward trends in female employment rates over time, particularly among women of prime working age. Similarly, male employment rates also exhibit an increase, concentrated among men in their mid-30s to early 60s. Irrespective of gender, the graph illustrates a consistent pattern of rising employment rates over the life cycle, reaching their peak during the prime ages in the labour market, and gradually declining as individuals approach retirement. By 2017, the levels of employment over the course of the life cycle are relatively comparable between men and women. However, women under 30 years old have slightly lower employment rates compared to their male counterparts.

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[2]Data here is extracted from the Labour Force Survey in order to have a longer time horizon for employment rates. Rather than ages 25–60, the survey groups workers into age ranges 25–59. For later years where annual data are available, numbers for workers aged 25–60 produce similar results to those using workers aged 25–59

Figure 1: Employment rates by age and sex, over time
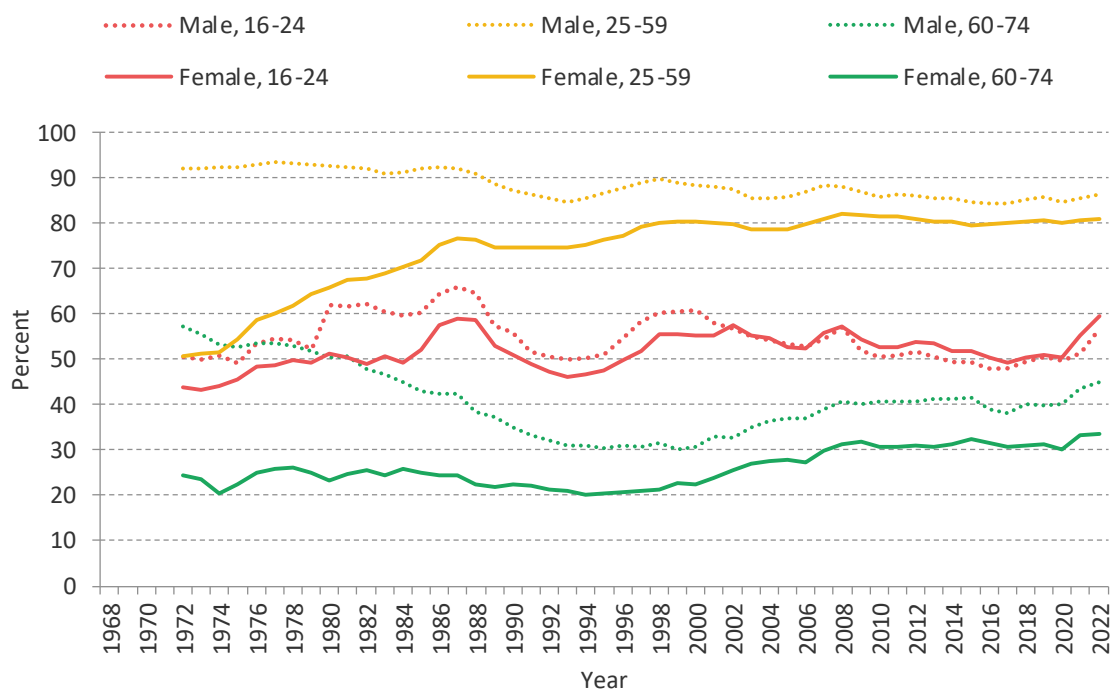
Note: Data extracted from Labour Force Survey conducted by Statistics Norway from 1972 onwards for workers in age groups 16–24, 25–59, and 60–74. "Percent" of y-axis refers to employment rate (%).

Figure 2: Employment rates over life cycle by sex, selected years
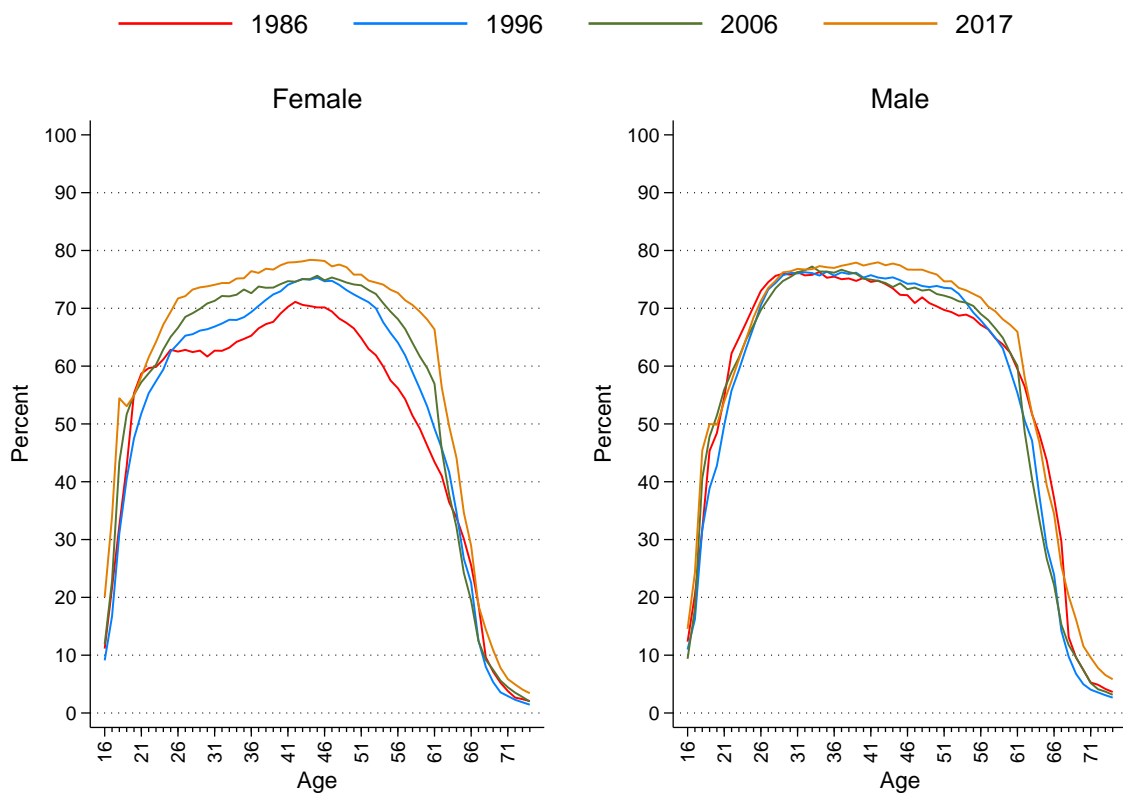
Note: Sample is individuals aged 25–60. "Percent" of y-axis refers to employment rate (%).

Figure 3 presents an analysis of education trends over time, categorising individuals into three groups: low educated (ISCED 0–2), middle educated (ISCED 3–5), and high educated (ISCED 6–8). In the context of the Norwegian education system, the low-educated group generally comprises individuals with compulsory schooling. The middle-educated group primarily consists of individuals with vocational high school degrees, including those who started vocational high school but did not complete it, as well as graduates from technical colleges and some university colleges, along with other post-secondary non-tertiary education programmes. The high educated category encompasses individuals with a university education. Historically, middle education has been a dominant educational pathway in Norway and has maintained its significance over time. However, there was a slight decline in its importance during the 2000s, reflecting a decrease in vocational high school enrolment. On the other hand, the high educated category has experienced increasing importance, with over 40% of the population classified as high educated by 2017 compared to just 15% in 1980. In contrast, the proportion of individuals with low education has progressively diminished from 1980 to 2017, indicating a decreasing share of the workforce with lower levels of education.

Figure 4 provides a breakdown of educational attainment by gender, displaying trends in education that align with those observed in Figure 3. However, the figure also highlights significant differences between the sexes. Notably, there has been a remarkable surge in high education among females throughout the period examined. While males have also shown an increase in high education, the magnitude of this increase is comparatively lower. Additionally, the figure indicates that males have experienced a relatively smaller decline in middle education, indicating that this pathway has remained relatively more important for them over time. Conversely, for females, middle education has become a progressively less significant pathway than for males. These findings underscore the shifting dynamics of educational attainment between genders, emphasising the pronounced advancements made by females in pursuing higher education.

Figure 5 illustrates employment rates based on different levels of education over time. The figure clearly demonstrates that education levels impact employment outcomes. Individuals with high education consistently exhibit the highest employment rates, followed by those with middle education, and then those with low education. Interestingly, the employment gap between individuals with high education and those with middle education has narrowed over time. This trend reflects the strong employment rates among individuals with vocational education in
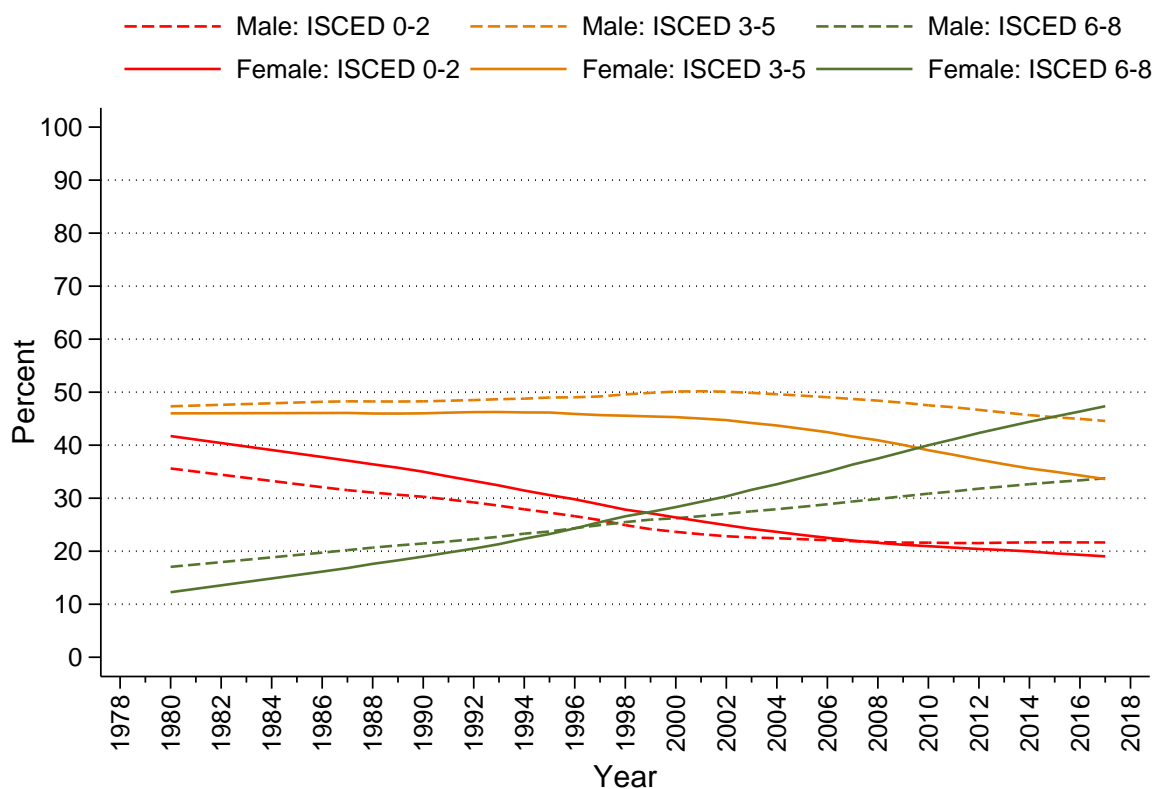
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from the Labour Force Survey.

Figure 3: Educational attainment over time
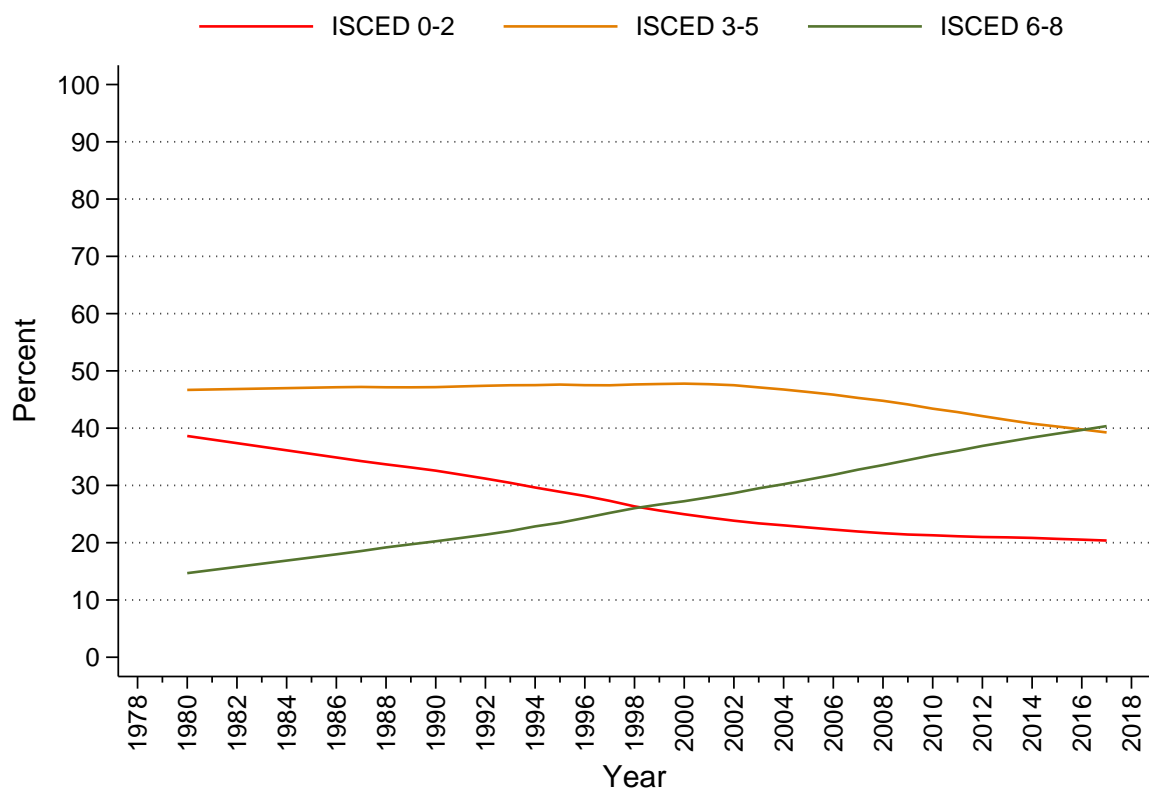
Note: Sample is individuals aged 25–60. "Percent" of y-axis refers to share of total population corresponding to each education group (%).

Figure 4: Educational attainment by sex, over time

Norway, contributing to their improved labour market prospects. On the other hand, employment rates among the low educated have experienced a decline. However, approximately 55% of individuals with low levels of education remained employed by 2017, although this is lower than the employment rates of 80–85% observed among the middle- and high-educated groups. The findings emphasise the importance of education in relation to employment outcomes and highlight both the positive impact of vocational and university education and the challenges faced by those with lower levels of education in the Norwegian labour market.

Figure 5: Employment rates by education, over time
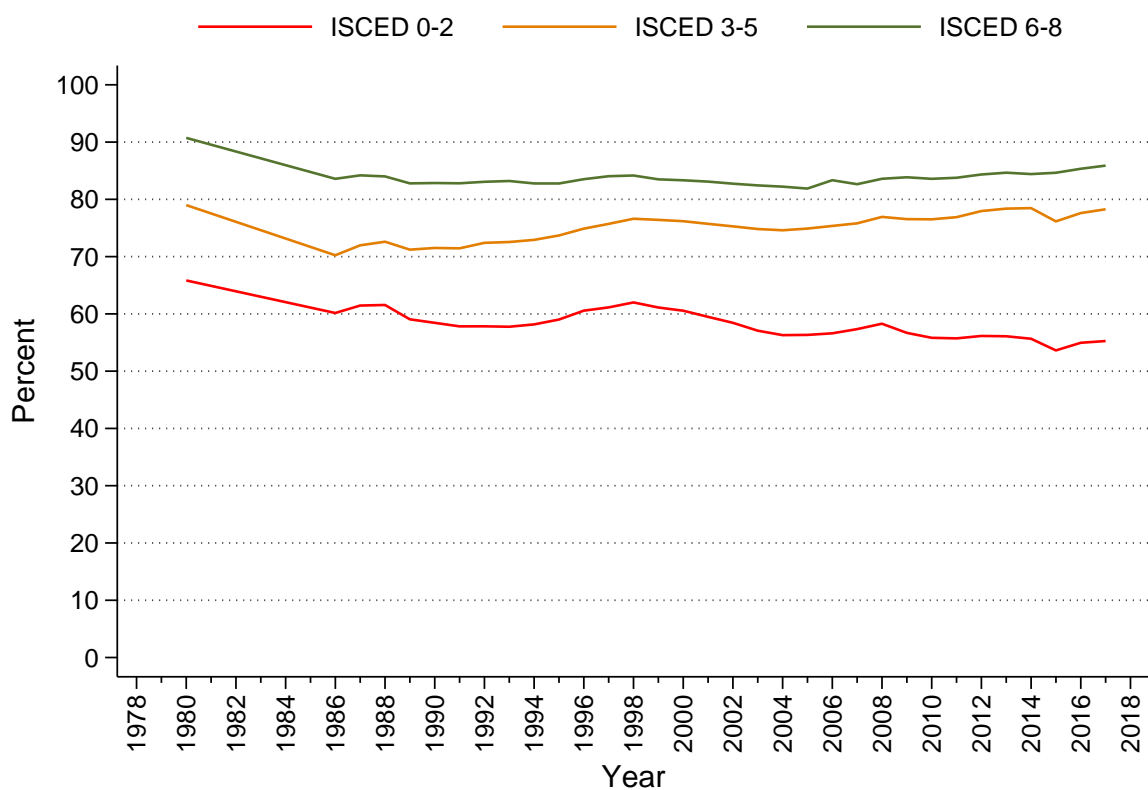
Note: Sample is individuals aged 25–60. "Percent" of y-axis refers to employment rate of each education group (%).

Figure 6 provides further insights by breaking down employment rates based on both education level and gender, exhibiting similar patterns to Figure 5. However, the figure highlights an increase in equality in employment rates by sex over time. Over time, the employment gaps by sex observed in 1980 decline, and in some cases, completely close. Initially, women with high education had much lower employment rates than men with high education. However, this gap completely closed by 2017, indicating a significant improvement in the relative employment

prospects for highly educated women. Similarly, men with middle education historically enjoyed higher employment rates than women with middle education, but this gap has also considerably declined over time. Furthermore, while females with low education continue to have the lowest employment rates, the gap between them and their male counterparts has significantly reduced in 2017 compared to the gap observed in 1980. These findings highlight the narrowing of employment gaps between genders across different education levels, indicating increased gender equality in employment over the period analysed.

Figure 6: Employment rates by sex and education, over time
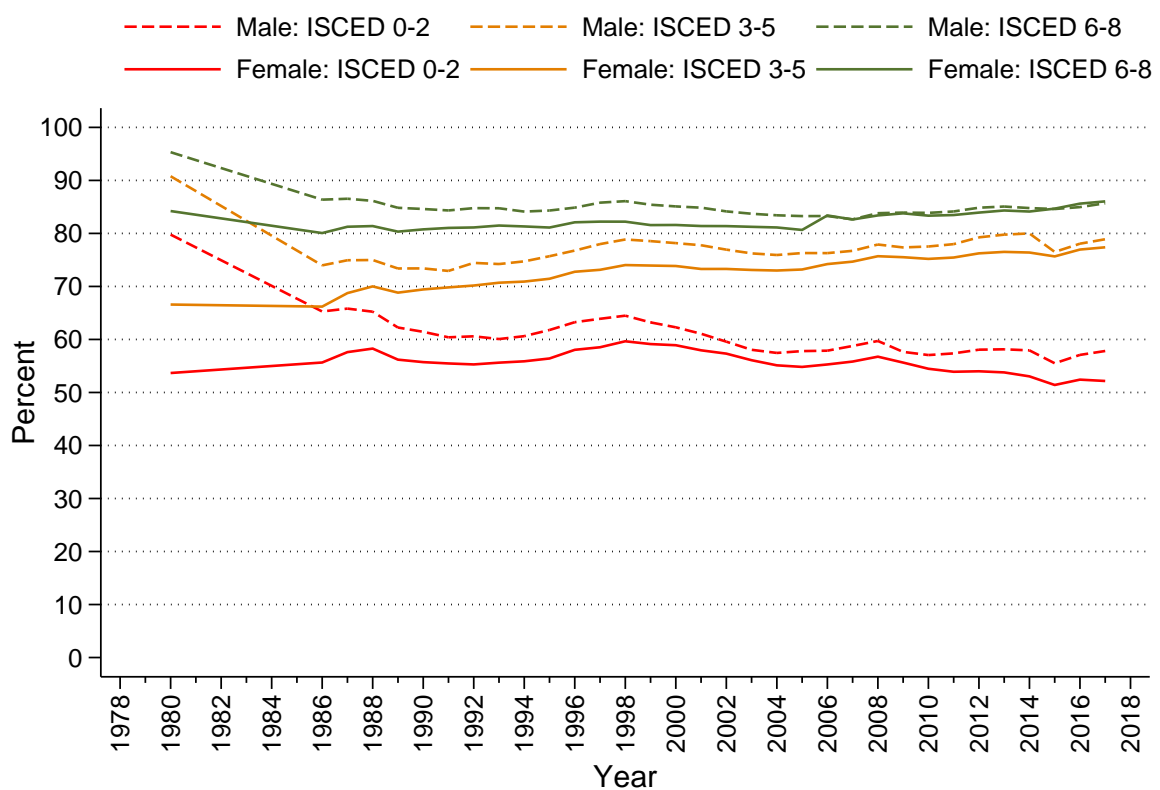
Note: Sample is individuals aged 25–60. "Percent" of y-axis refers to employment rate of each education group and sex (%).

Figure 7 examines unemployment rate by the duration of time spent in unemployment over time.[3] Short- and long-term unemployed workers are defined using data on months spent in unemployment in the current and previous year, leading to unemployment numbers which are slightly high in a given year but produce a better understanding of long-term unemployed workers. Unemployment, both in the short and long term, spikes in the early 1990s when many

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[3]Data on number of months spent in unemployment is only available until 2010.

Nordic countries experienced large financial crises and deep recessions. Unemployment rates were very low during the Great Recession, with the lowest rate of unemployment over the entire period in 2008.

Figure 7: Unemployment rate by duration of unemployment over time
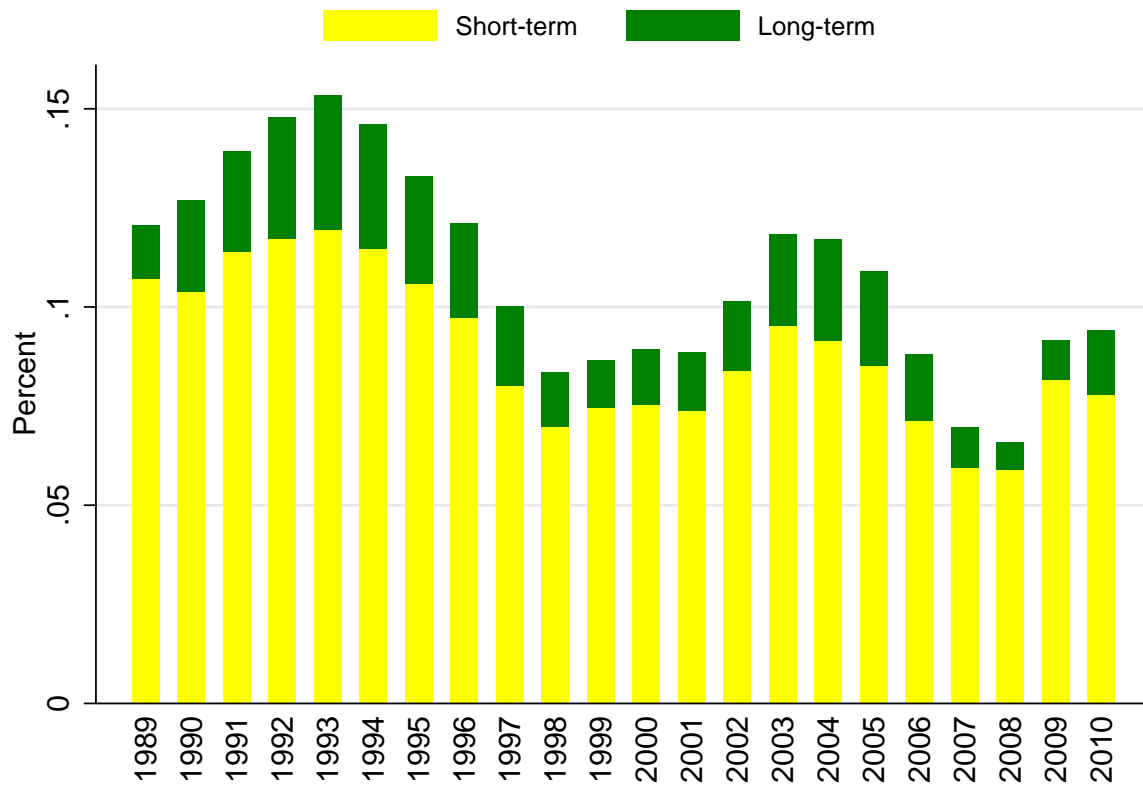
Note: Sample is individuals aged 25–60. Unemployment rate calculated as short-term (less than 1 year) and long-term (1 year or more) using data on the total number of months unemployed in the current and last year. Data on months spent in unemployment are only available until 2010. "Percent" of y-axis refers to unemployment rate.

4.2 Trends in hourly wages

Figure 8 depicts the progression of median hourly wages over time, differentiating by sex. At the beginning of the period in 1993, there is a gender gap in hourly wages. Men earn approximately 200 NOK per hour, whereas women earn slightly below 175 NOK per hour. Although both men and women experience considerable growth in median hourly wages over time, the wage gap has slightly widened over time. However, it is noteworthy that men and women generally follow similar wage trends, albeit with a noticeable level difference. Overall, the median wages for all workers increased from just below 200 NOK in 1993 to 300 NOK per hour by 2017. This overall growth masks a considerable slowdown around the time of the Great Recession, and later around 2014–15. While wage growth does slow around the time of the Great Recession, it quickly picks up again afterwards. However, wage growth stagnates around 2014–15, coinciding with a considerable fall in the price of oil which affected the Norwegian labour market more than other countries. For a longer time horizon of such evolution, refer to Section 4.4 which refers to trends in individual gross income (earnings plus taxable benefits).

Figure 9 presents the evolution of hourly wages, categorised by both gender and education. Such a split by education and sex highlights striking inequalities in hourly wages between women and men. This is particularly true among females with high education, where such females have a median hourly wage that falls just below that of males with middle education. In fact, the gender wage gap in Norwegian kroner is most pronounced among those with high levels of education. Despite their high levels of education, high-educated women still trail behind middle-educated men in terms of wages earned. A similar pattern emerges among middle-educated women, as low-educated men have a slightly higher median wage than their middle-educated female counterparts, despite the considerable disparity in educational attainment. Although wages show growth across all categories, the increase tends to be slightly steeper among individuals with higher levels of education. Overall, there are significant gender gaps in wages, even when comparing individuals with the same levels of education.

Figure 10 provides insights into the dynamics of median wages across the life cycle, looking into differences by gender and education levels, as well as changes between two different time periods. The data highlight considerable changes over time, revealing the disparities between men and women and across education levels. Notably, the absolute wage gap measured in Norwegian kroner between men and women has increased over time. This trend is particularly

Figure 8: Median real hourly wage among employees, overall and by sex, over time
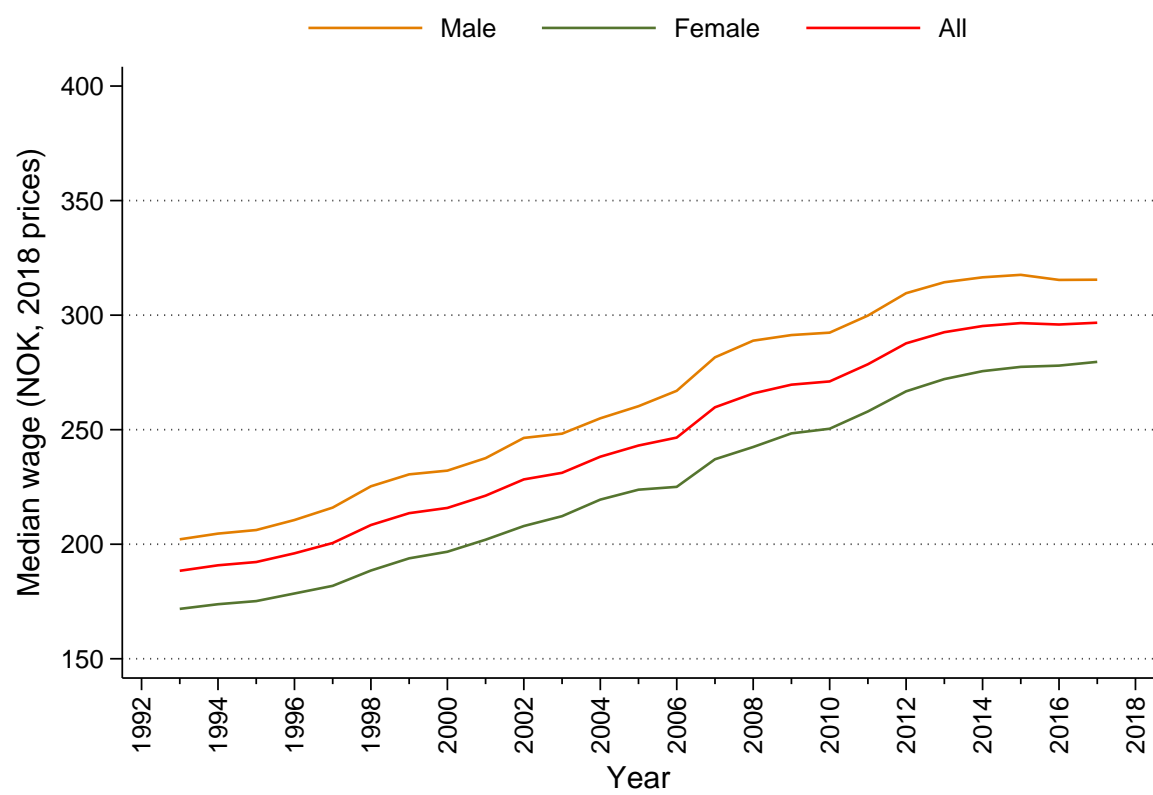
Note: Sample is employees aged 25–60. Wages are imputed as described in Section 3.

Figure 9: Median real hourly wage among employees, by sex and education, over time
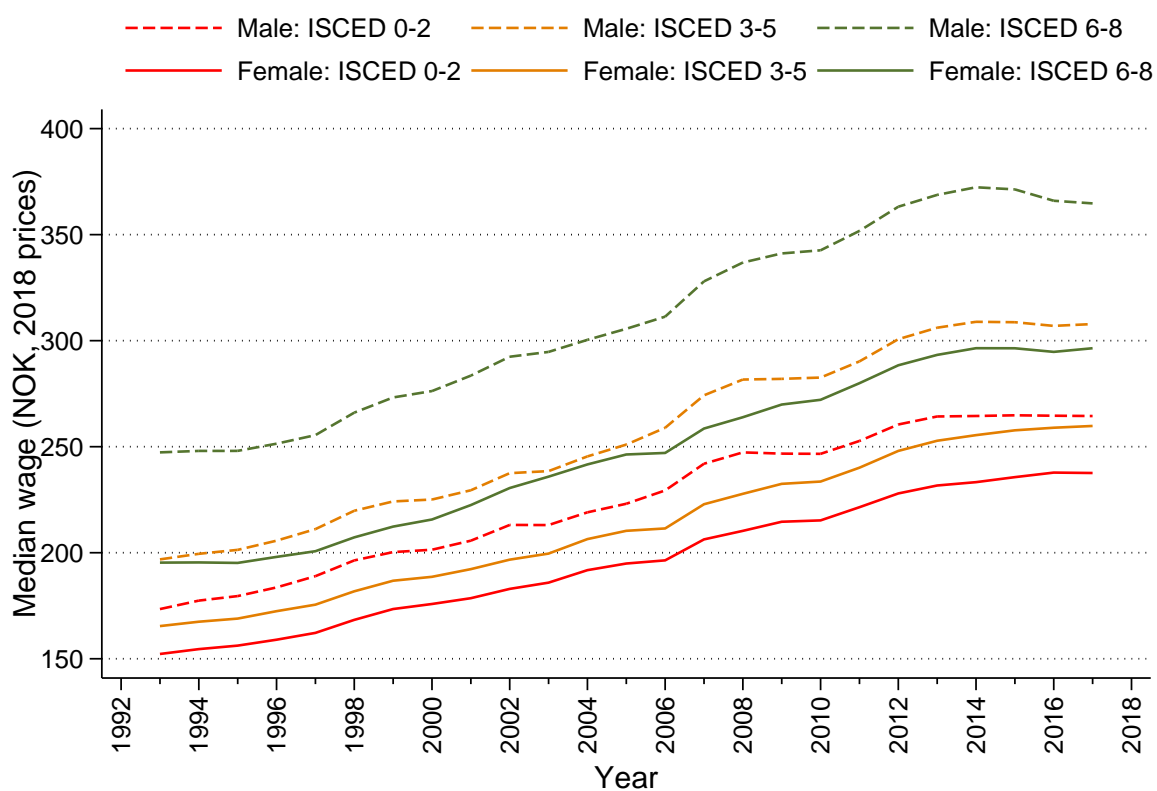
prominent among high-educated individuals, where men experience considerably higher wages later in their careers in 2015–17, despite starting at similar levels at age 25. These shifts in the wage gap later in the life cycle among higher-educated workers are substantial compared to the gaps observed in 1993–96. Furthermore, middle- and low-educated workers also witness increasing absolute wage gaps over time, although to a lesser extent. These findings underscore the varying effects of wage growth for men and women over time, as well as the significance of education levels in shaping wage disparities by gender.

Figure 11 presents insights into the inequality of hourly wages in Norway. The figure reveals that overall inequality in wages, as measured by the Gini coefficient, remains relatively stable over the period. However, considerable differences emerge when separating by sex. Among women, there has been a considerable decline in wage inequality over time, and the distribution of female wages has become more equal over time. In contrast, men have experienced a notable increase in wage inequality. This suggests that wage disparities among male workers have been widening over the period.

Figure 12 presents similar patterns in inequality over time, defining inequality by 90:10 and 50:10 ratios instead of the Gini as in Figure 11. While inequality measured by the 90:10 ratio has declined considerably for women, it has increased steadily among men. Given the relatively unchanged levels of inequality at the bottom of the distribution, measured by the 50:10 ratio, these changes in inequality among both men and women are driven by considerable changes in the top half of the distribution. Indeed, male inequality is rising considerably in the top half of the distribution over the period.

Figure 13 plots the growth in wages across different wage percentiles, over time and separately by sex. Wage growth among men tends to be higher at higher percentiles of the distribution. In contrast, female wage growth tends to be higher at the very bottom of the earnings distribution. The relationship between wage growth and wage percentiles among men is even stronger in the period 2006–17, where wage growth is considerably higher at the top of the earnings distribution. Such changes are in line with previous figures on wage inequality, which suggest that wage inequality is increasing among men primarily in the top half of the earnings distribution.

Figure 10: Median real hourly wage among employees over life cycle, by sex and education

1993 to 1996

2015 to 2017
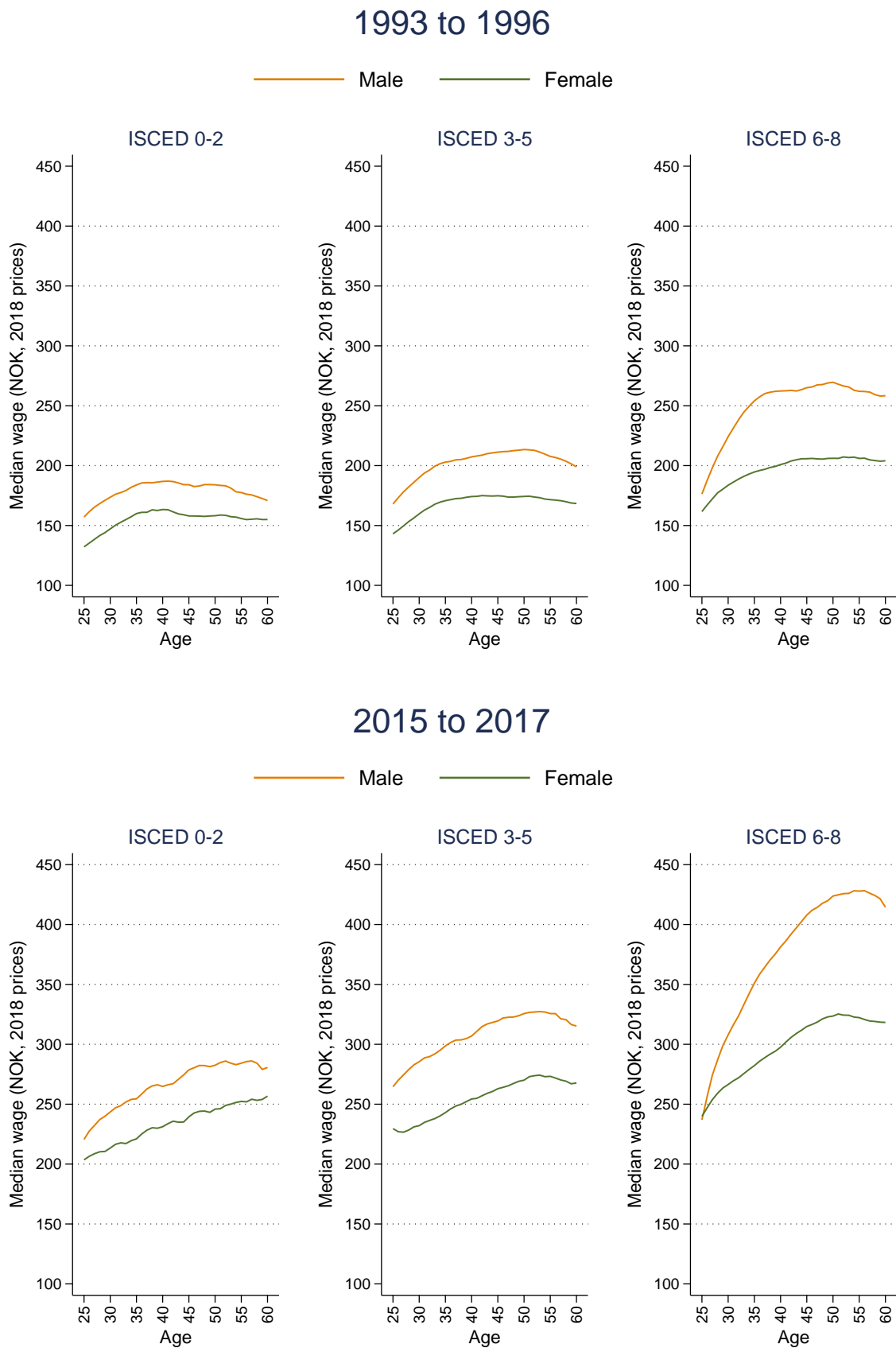
Note: Sample is employees aged 25–60. Wages are imputed as described in Section 3.

Figure 11: Gini coefficient of hourly wages among employees, overall and by sex, over time
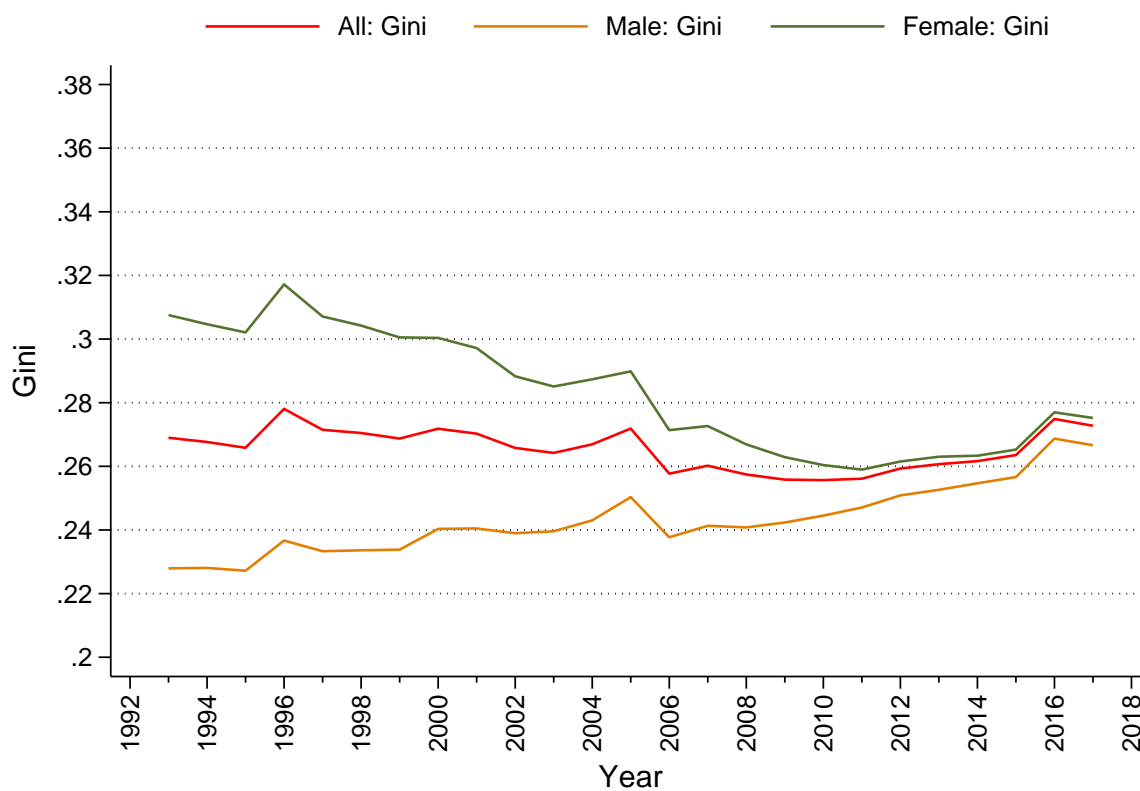
Note: Sample is employees aged 25–60. Wages are imputed as described in Section 3. The top and bottom 1% of the gender-specific wage distribution are excluded.
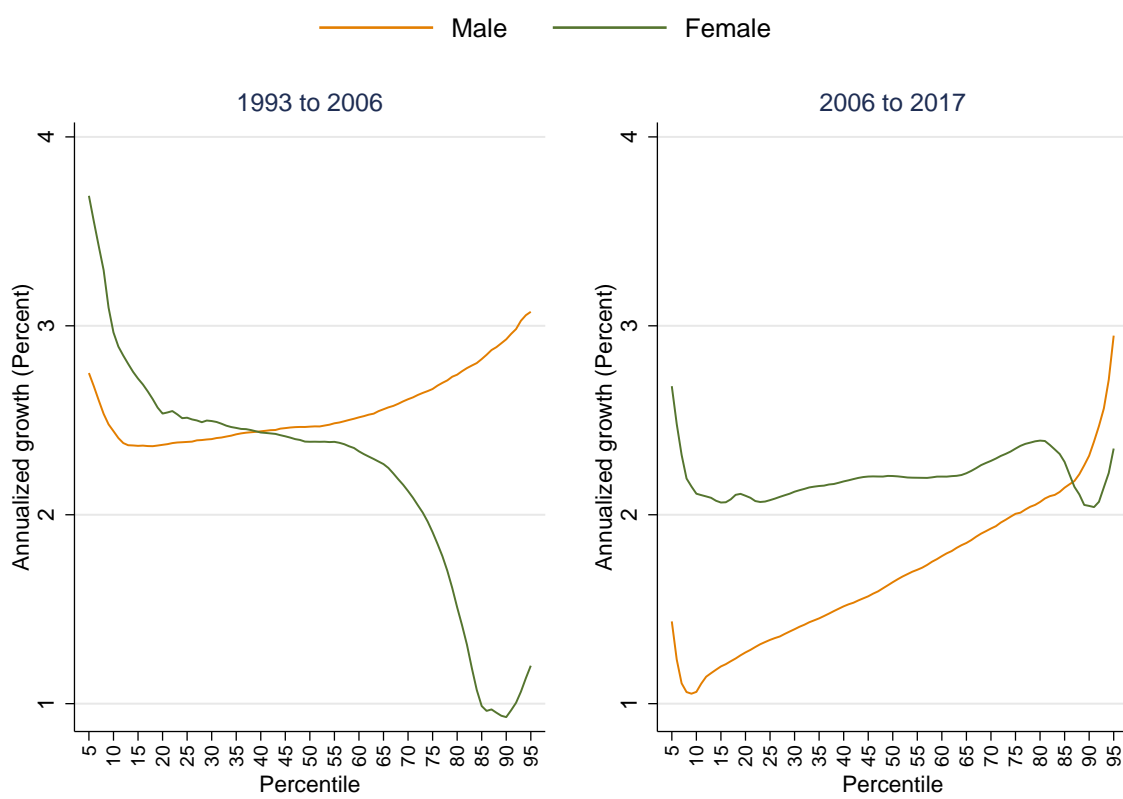
Figure 12: 90:10 and 50:10 ratios of hourly wages among employees, overall and by sex, over time
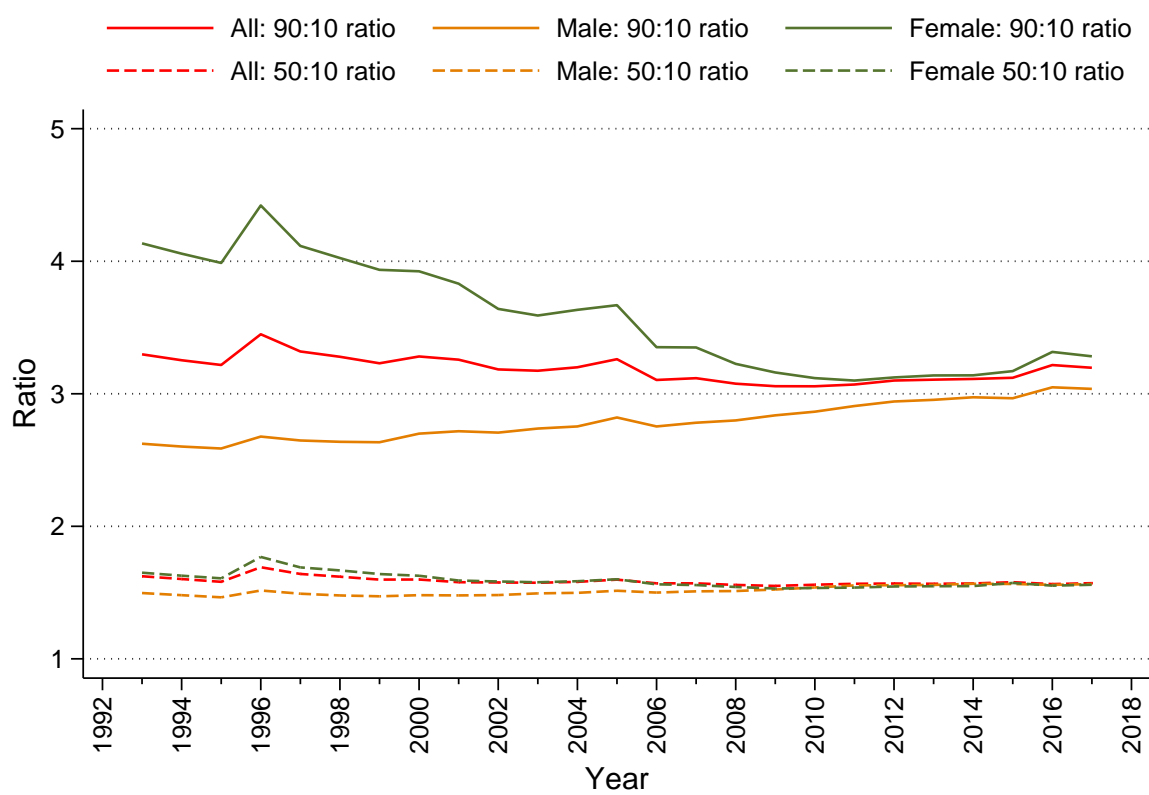
Note: Sample is employees aged 25–60. Wages are imputed as described in Section 3.

Figure 13: Growth in hourly wages among employees by wage percentile, by sex, selected periods

Note: Sample is employees aged 25–60. Wages are imputed as described in Section 3.

4.3 Trends in hours worked

Figure 14 illustrates the fraction of employees who are engaged in full-time employment, serving as a proxy for hours worked, among all workers. Similarly to other labour market outcomes, there is a substantial gender gap in full-time employment observed in 1970, but this gap has declined considerably over time. Starting from 1986, the proportion of females employed full-time exhibits a steady increase, while the proportion of men full-time employed experiences a slight decline. While overall 80% of all workers are employed full-time in 2017, this masks considerable differences between the sexes.

Figure 14: Mean weekly hours worked among employees, overall and by sex, over time
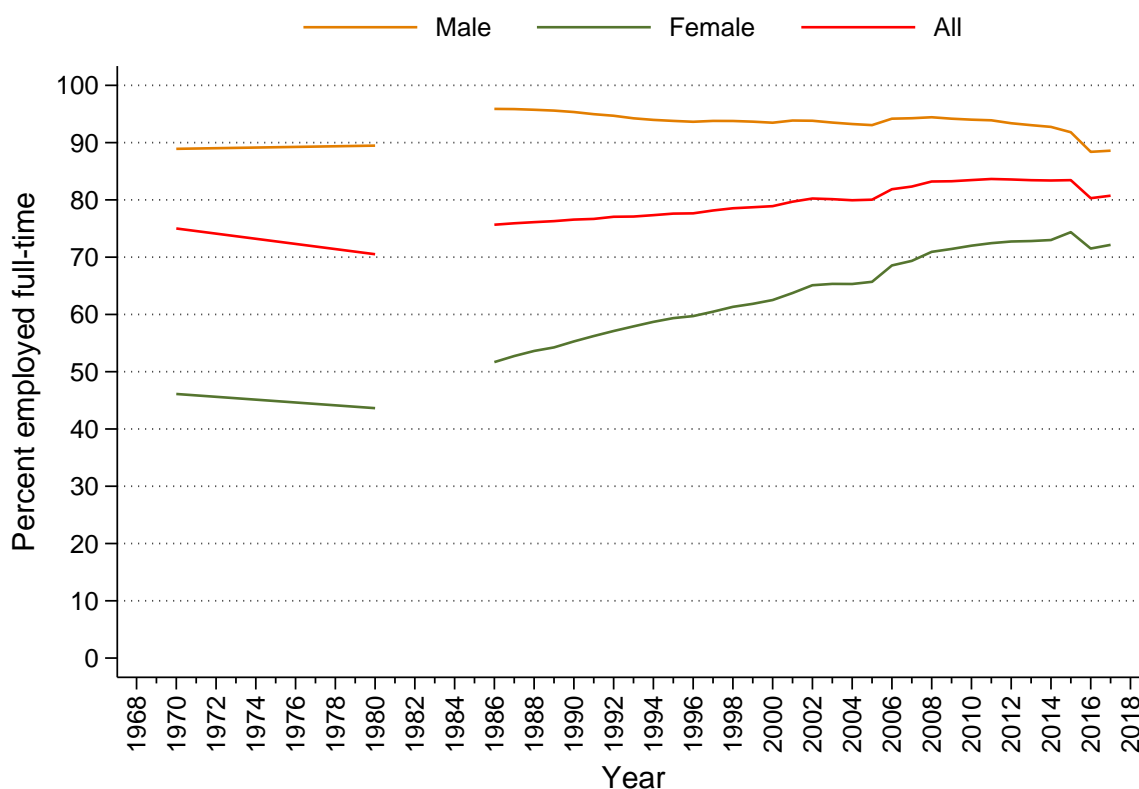
Note: Sample is employees aged 25–60. Figure plots trends in full-time employment probability rather than average imputed hours worked. Full-time work here is defined as working in a job at least 30 hours per week, measured in November. "Percent employed full-time" of y-axis refers to the percent of each group employed full-time.

Figure 15 depicts the share of full-time employment among employees, separately by both gender and education level. Male workers with high and middle education levels exhibit consistent and high levels of full-time employment throughout the period. In contrast, the figure

reveals a notable increase in full-time employment among highly educated women, with the share rising from around 50% in 1980 to over 80% by 2017. However, it is important to note that females with middle and low education levels also experience increases in full-time employment over time. On the other hand, a group that sees a decline in the share of full-time employment over the years is low-educated men. Their probability of full-time employment decreases from a peak of over 95% in 1986 to roughly 80% by 2017, with a particularly sharp decline observed from the mid-2000s and into the 2010s. Despite advances in full-time employment among women, full-time employment rates of women continue to lag behind those of men within each education level, with the largest gender gaps in middle and low education levels. Interestingly, full-time employment rates among high-educated women are lower than those of middle-educated men and roughly similar to those of low-educated men, reflecting a strong difference in working hours across the sexes.

Figure 15: Mean weekly hours worked among employees, by sex and education, over time
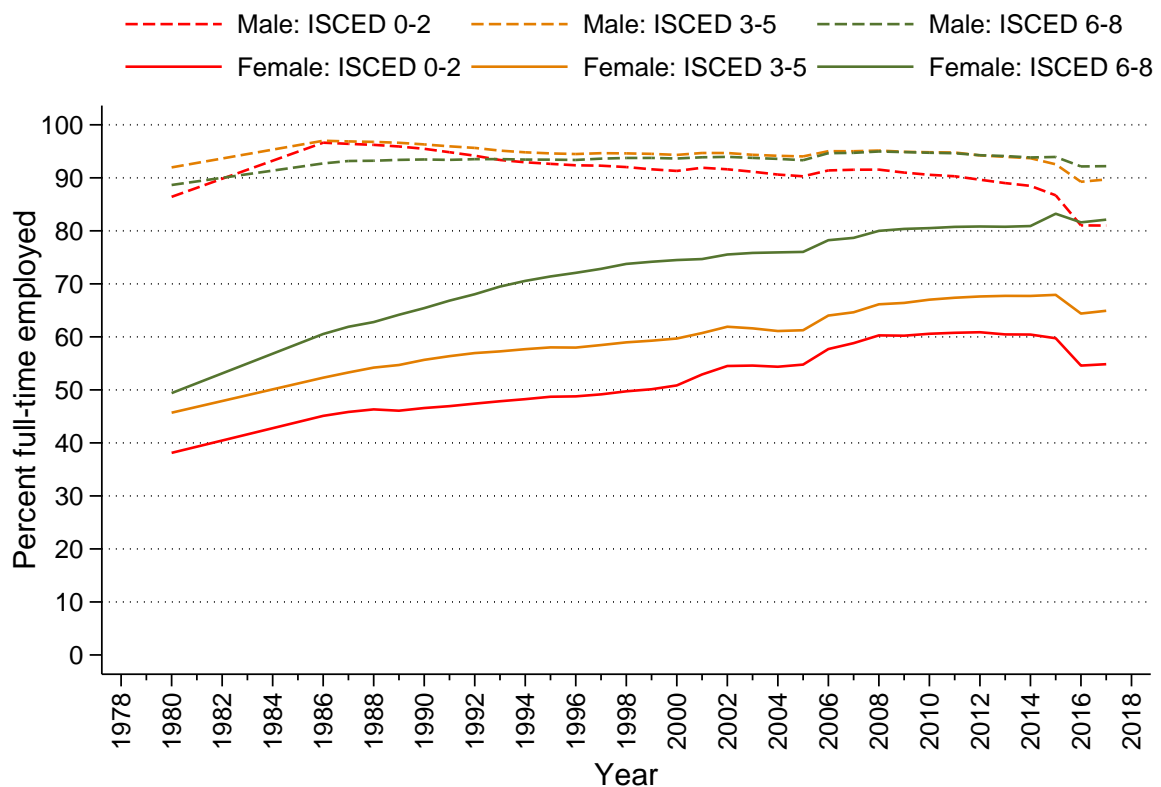
Note: Sample is employees aged 25–60. Figure plots trends in full-time employment probability rather than average imputed hours worked. "Percent employed full-time" of y-axis refers to the percent of each group employed full-time.

Figure 16 plots the growth in imputed hours worked across the hourly wage distribution, separately by sex. Growth in hours worked is considerably higher among women, who are becoming increasingly attached to the labour force over the period. Among men, there is a decline in hours worked over the period, particularly from 2004–06 to 2016–17. Despite this decline, men still have very high rates of full-time employment, as seen in Figure 15. Figure 16 excludes the change in the top 25% of the hourly wage distribution.

Figure 16: Growth in mean hours worked among employees by wage ventile, overall and by sex, selected years
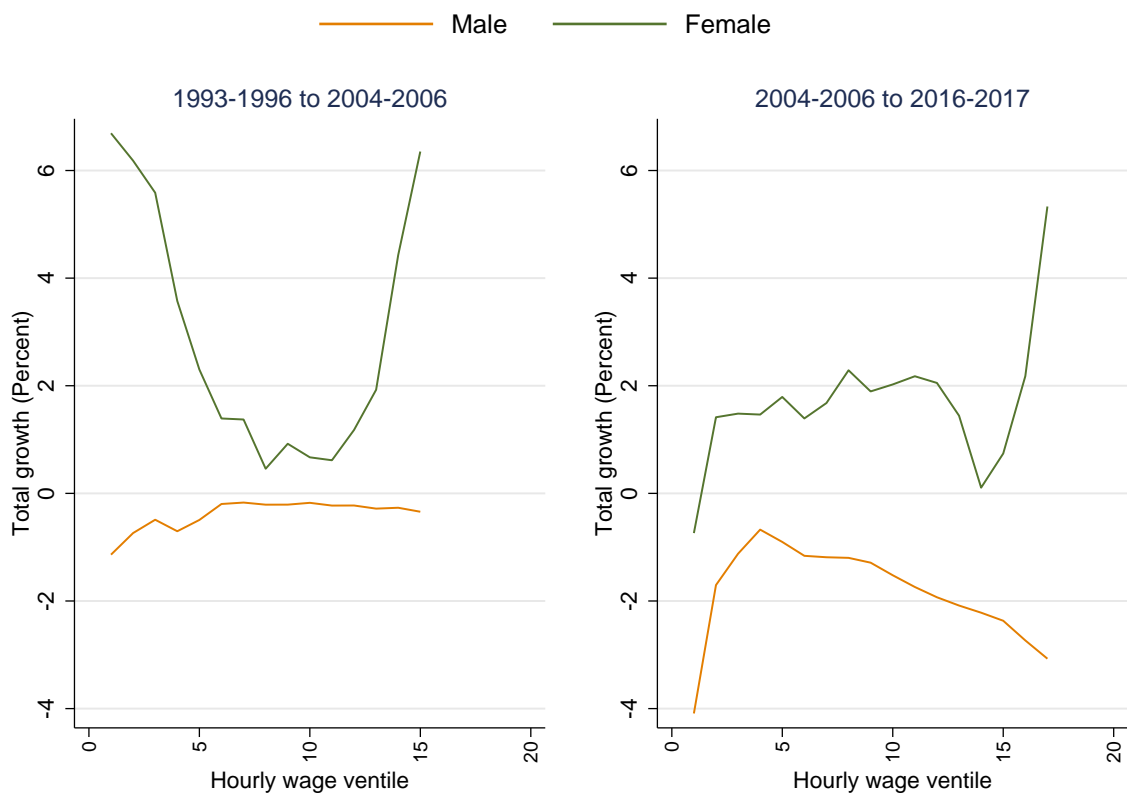
Note: Sample is employees aged 25–60. The figure plots the growth in the measure of imputed hours as described in Section 3. It does not report the change in the top 25% of hourly wage distribution.

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4.4 Inequality in individual earnings among those in work

Figure 17 presents trends in median gross earnings, differentiating between males and females. Similarly to Figure 8, the figure demonstrates substantial growth in earnings for both males and females over the period analysed. A substantial gender gap in earnings exists at the beginning of the period in 1993, and this gap remains relatively unchanged over time. By 2017, the gender gap in earnings is very similar to what it was over 20 years ago. Notably, earnings begin to slow down from 2012 onwards, and there is even a decline observed around 2013–14.

Figure 17: Median real gross individual earnings, overall and by sex, over time
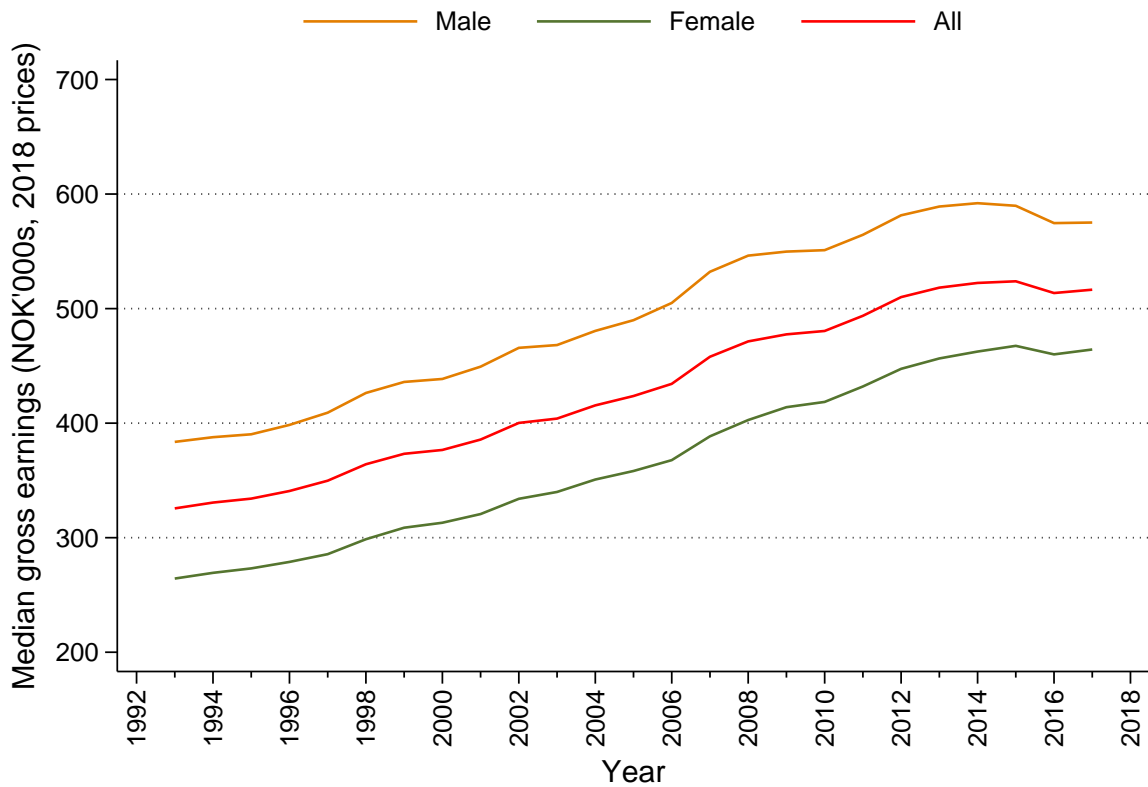
Note: Sample is employees aged 25–60.

Figure 18 illustrates the trends in median gross earnings, separately by both gender and education levels. Similarly to Figure 9, the figure reveals that high-educated women have lower median earnings than both high- and middle-educated men. Furthermore, low-educated men tend to earn more than middle-educated women in terms of median earnings. Over time, the growth in earnings is most prominent among the high-educated group, irrespective of gender.

Conversely, the lowest growth in earnings is observed among the low-educated cohort. These findings highlight the persistence of earnings disparities based on both gender and education, with higher-educated individuals experiencing greater earnings growth than their counterparts with lower levels of education.

Figure 18: Median real gross individual earnings, by sex and education, over time
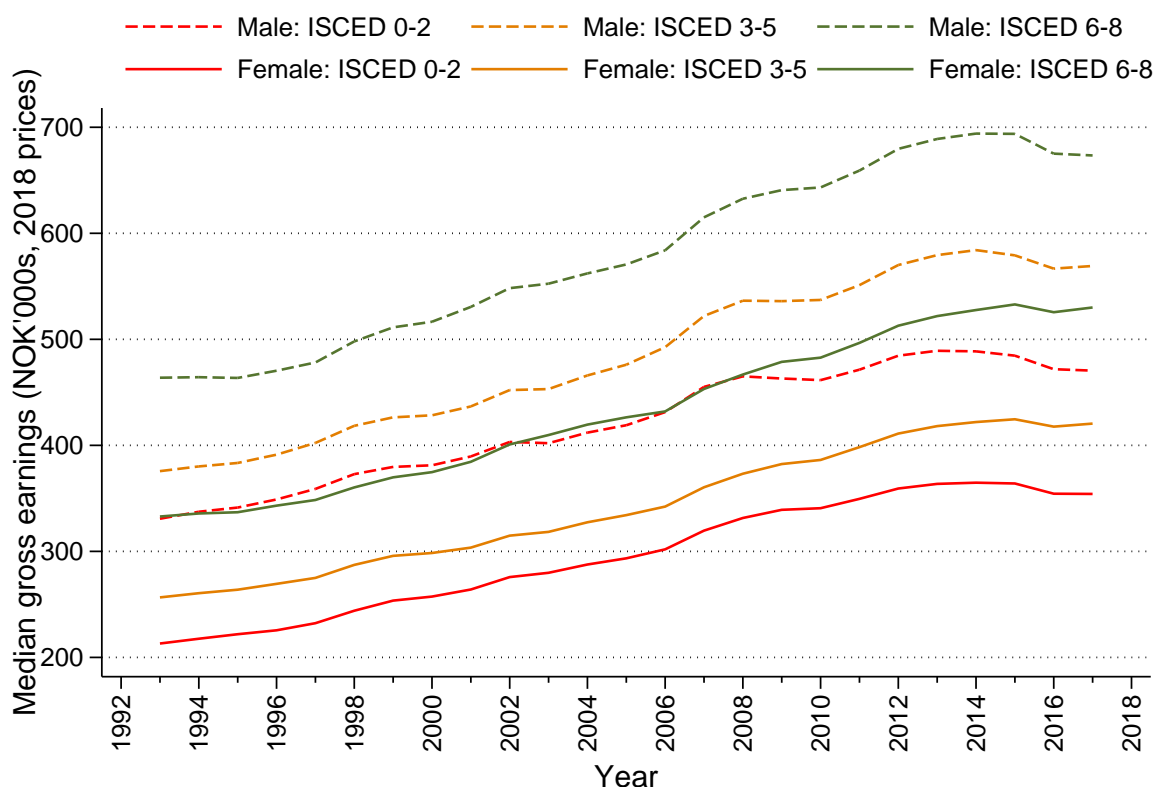
Note: Sample is employees aged 25–60.

Figure 19 provides insights into inequality in earnings in Norway over time. The figure reveals that overall income inequality, as measured by the Gini coefficient, remains relatively flat over the period. Moreover, the overall level of inequality in Norway is relatively low. However, looking into differences by sex, considerable differences emerge. Inequality in earnings for men has experienced a modest increase over the period, indicating a slight rise in inequality among male earners. In contrast, inequality in earnings for women has remained relatively unchanged. This finding suggests that the overall measure of inequality in Norway masks the rising inequality in earnings observed among men.

Figure 20 depicts the trends in two inequality ratios, 90:10 and 50:10, for all workers, male

Figure 19: Gini coefficient of gross individual earnings, overall and by sex, over time
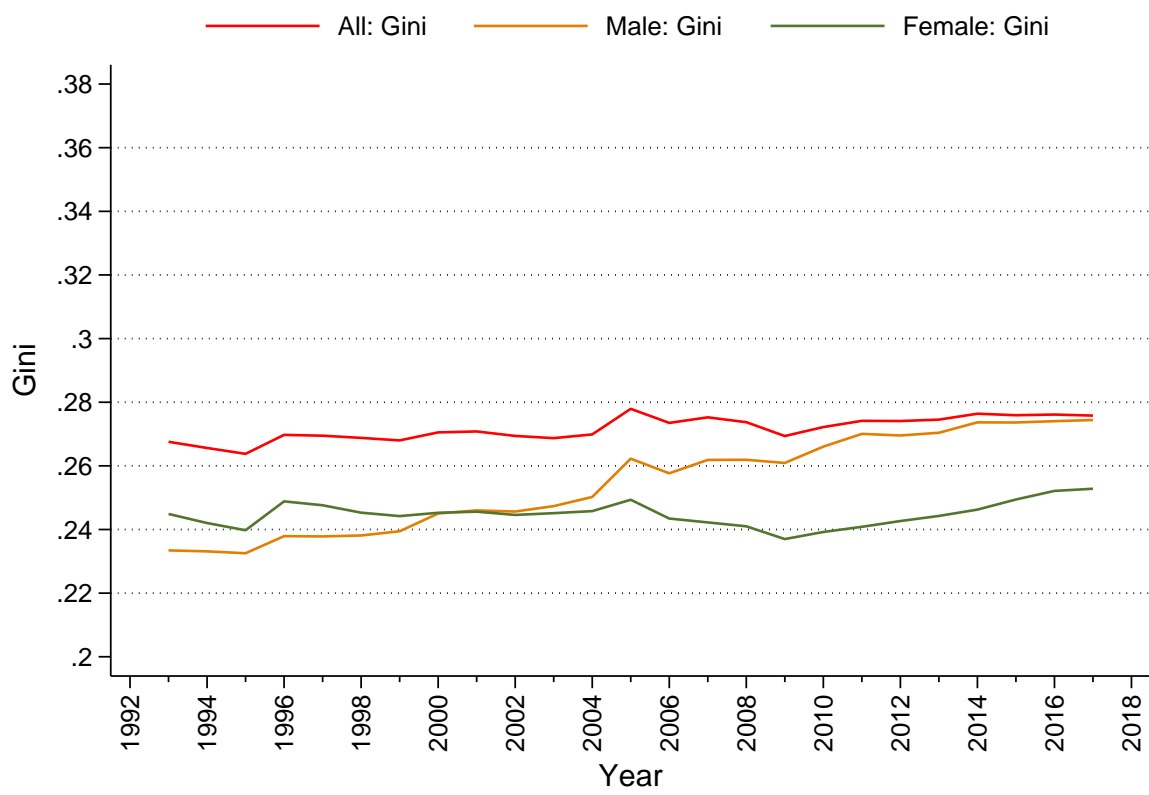
Note: Sample is employees aged 25–60.

workers, and female workers. Overall, Norway exhibits relatively low levels of earnings inequality compared to many other countries. Examining the 90:10 ratio reveals that females have higher levels of inequality at the beginning of the period than males. However, while female inequality remains stable or slightly declines over time, male inequality steadily increases. Consequently, by 2017, levels of inequality among men and women are relatively similar. Focusing on the 50:10 ratio reveals that inequality at the lower end of the earnings distribution remains higher among women than among men throughout the period. Consequently, inequality among men is growing more than among women in the top half of the distribution.

Figure 20: 90:10 and 50:10 ratios of gross individual earnings, overall and by sex, over time
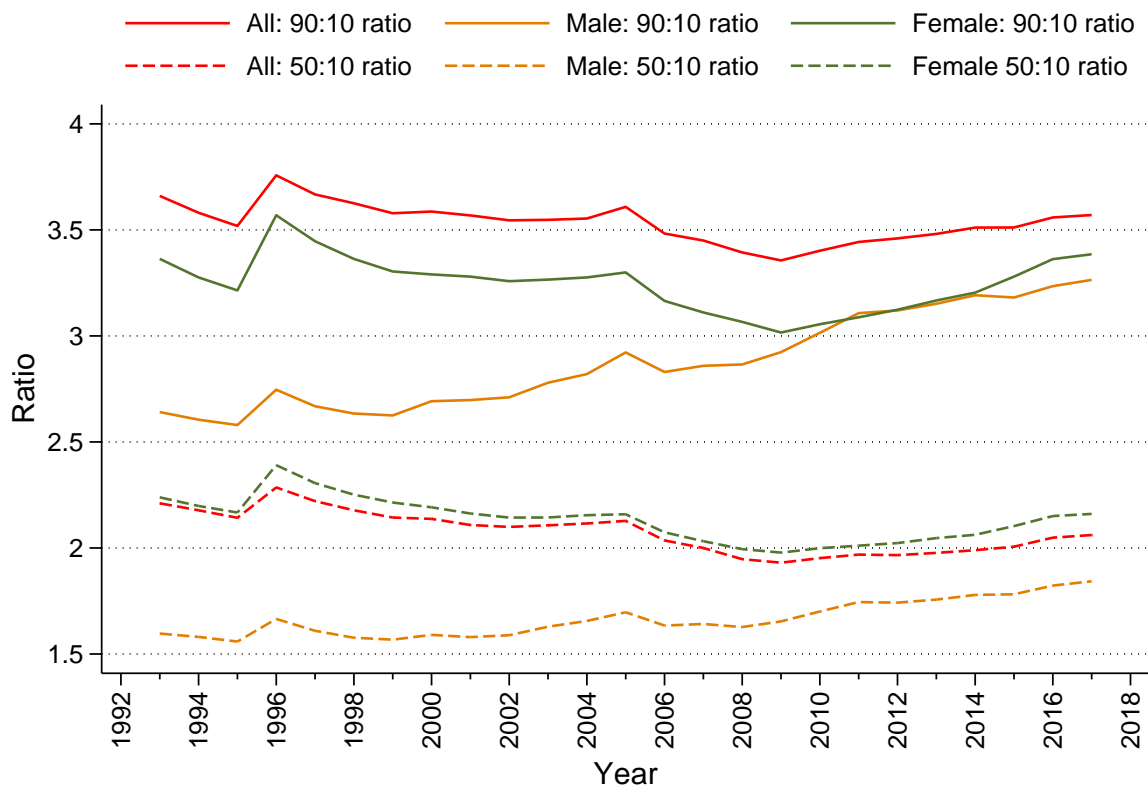
Note: Sample is employees aged 25–60.

Figure 21 plots the growth in gross earnings by percentiles. Consistent with the previous figure, there is an increase in inequality in the bottom of the distribution for men, where earnings growth is consistently higher among men in the top of the earnings distribution relative to the bottom of the distribution. This is particularly true among men in the bottom half of the distribution, while female earnings growth is considerably higher in terms of percentage change.

Figure 21: Growth in gross earnings by earning percentile, overall and sex, selected periods
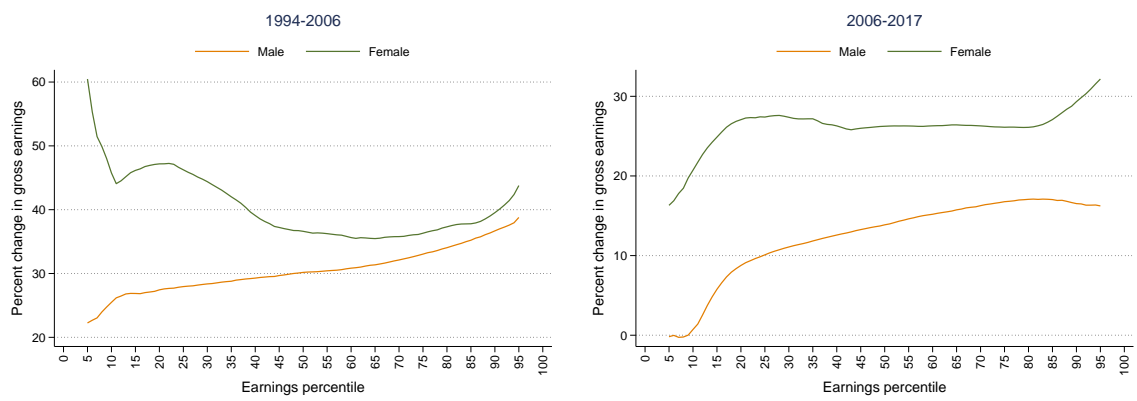
Note: Sample is employees aged 25–60.

4.5 Self-employment

Figure 22 illustrates the trends in self-employment over time, where self-employment is defined as having a primary source of labour earnings from business. The figure reveals a consistent decline in self-employment throughout the period analysed. In 1993 approximately 10% of individuals were engaged in self-employment, but by 2017 this proportion had reduced to around 5%. These findings indicate a decreasing trend in self-employment and suggest a slight shift towards employment in firms.

Figure 22: Share of employees and self-employed workers, over time

Note: Sample is employees aged 25–60. "Percent" of y-axis refers to the share of employees either self-employed or employees (%).

Figure 23 displays the trends in self-employment, disaggregated by gender and education. This figure reveals notable differences compared to the previous figure, highlighting the importance of both sex and education in self-employment dynamics. Firstly, males tend to have higher levels of self-employment than females. Additionally, the decline in self-employment observed over time is predominantly concentrated among low- and middle-educated men. Con-

versely, self-employment among both high-educated men and women remains relatively stable throughout the period analysed, albeit starting from a lower level.
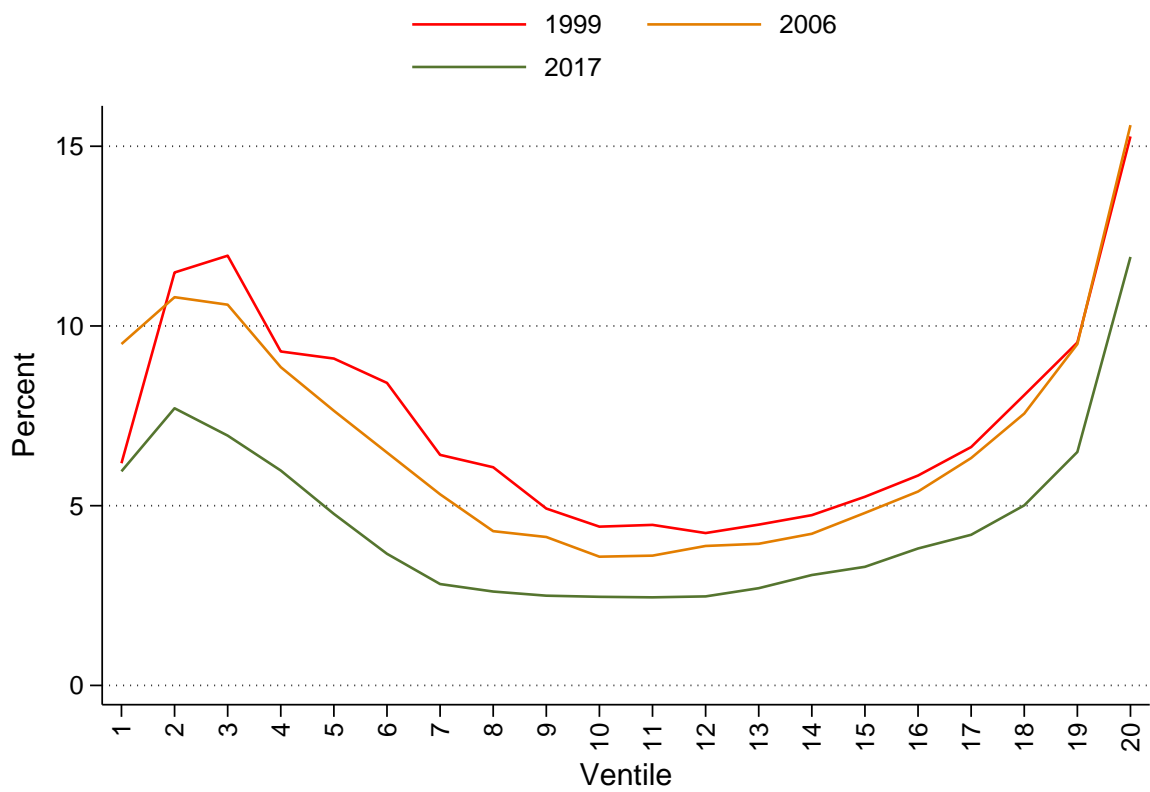
Figure 23: Share self-employed by sex and education, over time
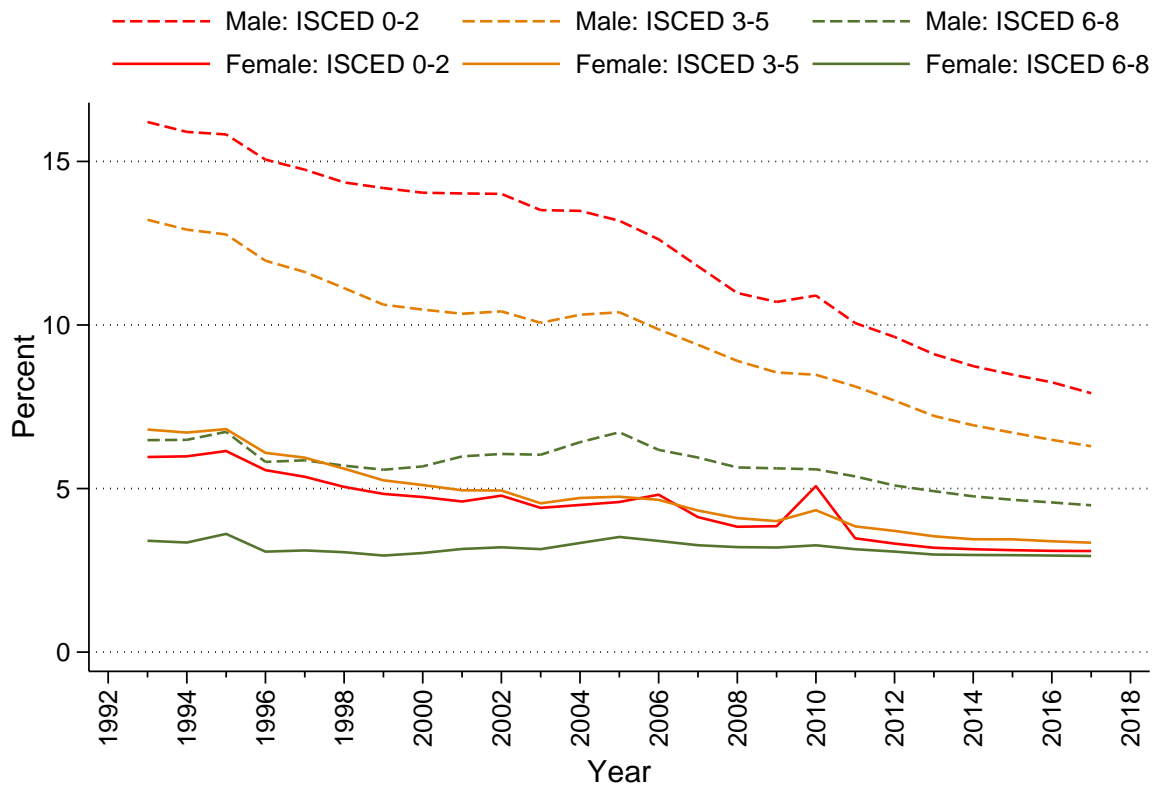
Note: Sample is employees aged 25–60. "Percent" of y-axis refers to the share of each group who are self-employed (%).

Figure 24 illustrates the variations in self-employment across different ventiles of the earnings distribution. The figure shows a U-shaped pattern, indicating that self-employment rates are highest at the top of the earnings distribution and lowest in the middle of the distribution. Self-employment levels decline consistently throughout the distribution, with a relatively equal decrease across all earnings ventiles. These findings demonstrate the association between self-employment and earnings, with higher rates of self-employment observed among individuals with higher earnings. The decline in self-employment rates across all income levels suggests a general trend of reduced self-employment regardless of earnings level.

Figure 24: Share self-employed by ventile of individual earnings, selected years

Note: Sample is employees aged 25–60. "Percent" of y-axis refers to the share of ventile who are self-employed (%).

5 Labour market institutions

5.1 Minimum wages and unions

Figure 25 highlights the strong presence of unions in Norway, with a prevalence that has remained significant over time, albeit with a slight decline. Despite this decline, union membership remains typical and widespread. In 1993, approximately 55% of employees were union members, and even by 2017, the proportion of union members among employees was still around 50%. The figure indicates that union membership continues to be common among Norwegian employees, and as unions collectively bargain over wages, reflects the enduring influence of unions in the labour market. The fraction of workers who are covered by collective bargaining is roughly 20–25 percentage points higher, but declines similarly to union membership.

Figure 25: Union density and fraction of workers covered by collective bargaining agreements, over time
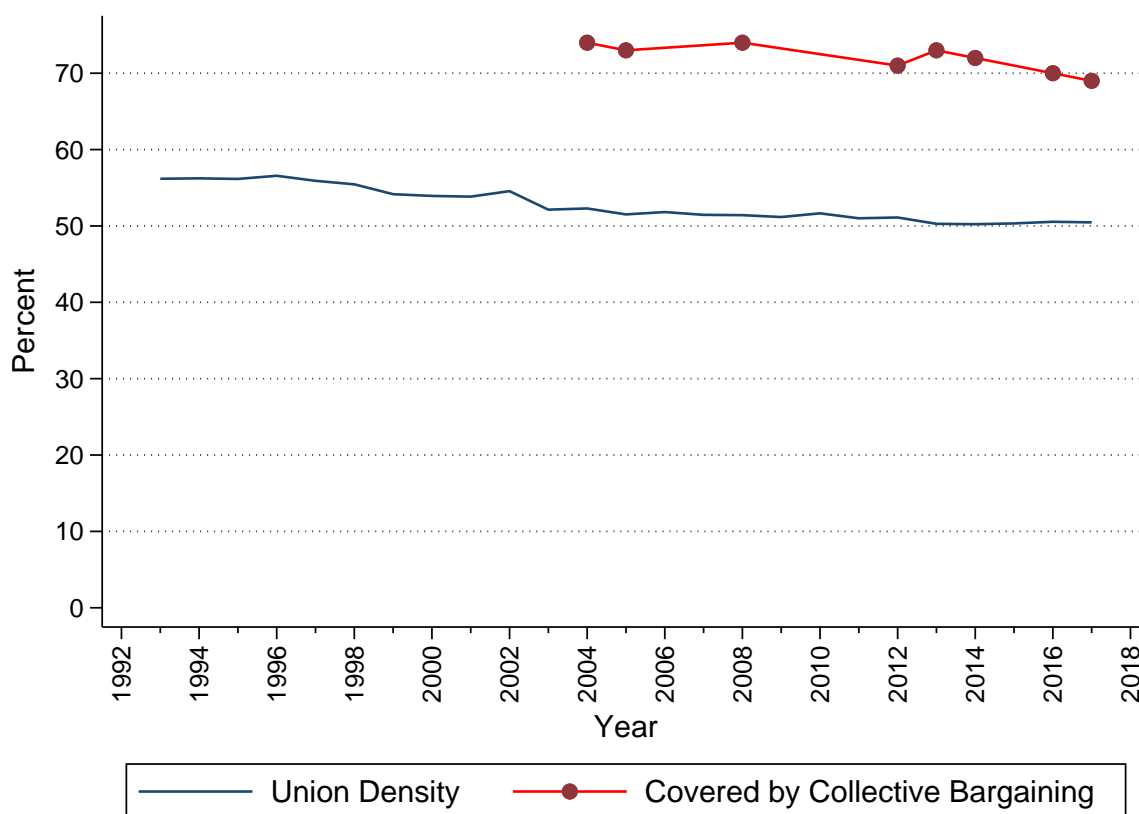
Note: Sample is employees aged 25–60. Figure plots trade union density over period, measured by individual-level union membership. Data on collective bargaining coverage are extracted from the OECD, Collective bargaining coverage, (`https://stats.oecd.org/index.aspx?DataSetCode=CBC`) which measures the percentage of employees with the right to bargain in various years. "Percent" of y-axis corresponds to the percentage of workers who are union members (solid line) and covered by collective bargaining (dotted line) (%).

5.2 Benefits from the state

Figure 26 demonstrates the significant influence of the Norwegian welfare state across the earnings distribution. The figure reveals that while individuals at the bottom of the distribution receive the highest proportion of their income through benefits, there is also a substantial fraction of benefits allocated to those at the top. In fact, the share of income received by the top 25% of the distribution has been increasing over time, surpassing 30% of total income by 2017. While there has been a decline in benefit receipt at the lower end of the household income distribution, it has remained stable, or even increased, at all other points in the distribution. The figure highlights the comprehensive and inclusive nature of the Norwegian welfare state, as it provides support not only to the most vulnerable individuals but also to a significant extent to those at higher income levels.

Our measure of benefits in Figure 26 includes taxable benefits such as disability, unemployment, and sickness absence, but interestingly, it is an increase in tax-free benefits among the top quartile that drives the increase in benefits as a proportion of gross income in the figure. Similarly, a decrease in receipt of tax-free benefits among the bottom quartile drives the decrease in benefits as a proportion of gross income. Among tax-free benefits, child benefits represent roughly 40–50% of the total average benefit among all workers, depending on the year examined. Such benefits are universal, and anyone responsible for a child under age 18 will be eligible for such benefits.

Figure 27 provides an overview of the tax rates in Norway across the household income distribution. Consistent with the previous figure on the prevalence of benefits, this figure demonstrates that taxation is prevalent across all income levels. Even individuals at the bottom of the distribution, who receive a significant portion of their income from benefits, pay approximately 10% in taxes throughout the period. As we move up the income distribution, tax rates gradually increase, with the top 25% of households facing the highest rates. Importantly, tax rates remain relatively stable across all points in the distribution over time. While there is a slight decline in tax rates among the third and fourth quartiles, the bottom and second quartiles remain roughly unchanged in their percentage of tax paid. This data showcases the progressive tax system in Norway, where individuals with higher incomes contribute a larger share of their earnings to taxation, supporting the comprehensive welfare state and social programmes in the country. While tax rates are high, they are not as high as taxes paid as a percentage of gross

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Figure 26: Benefits as a proportion of gross income, by net household income quartile
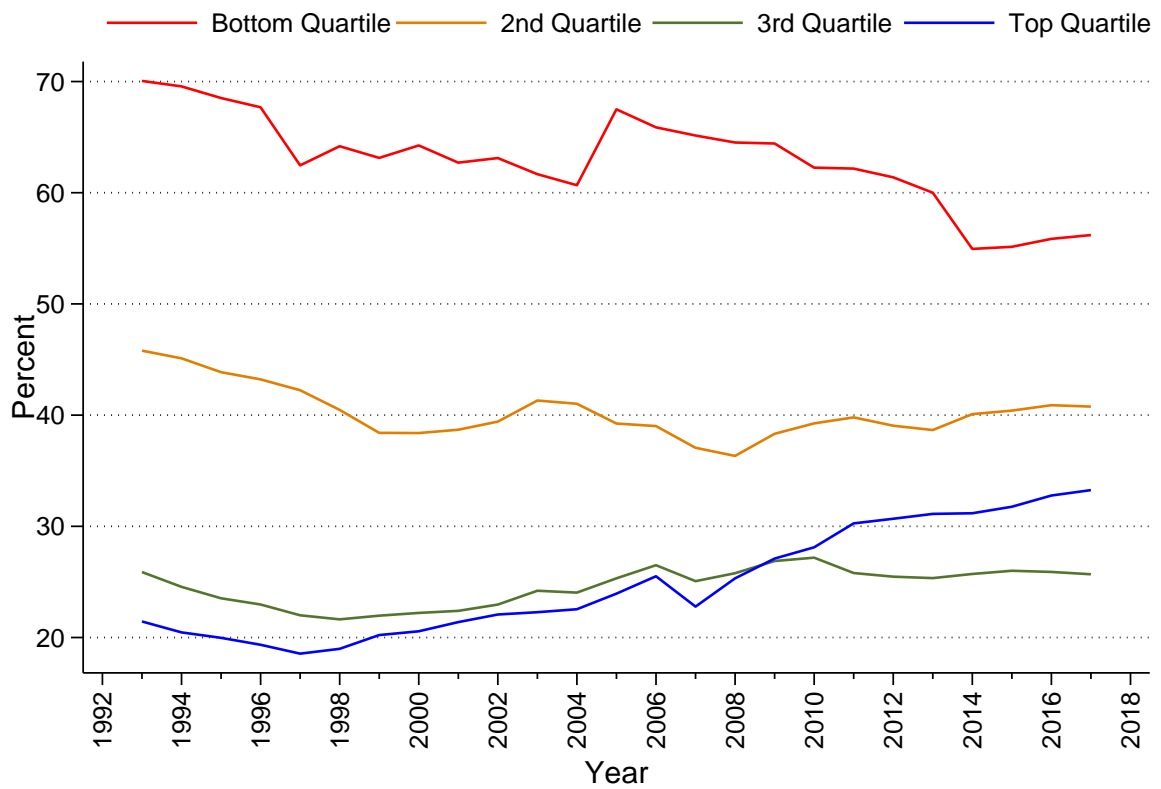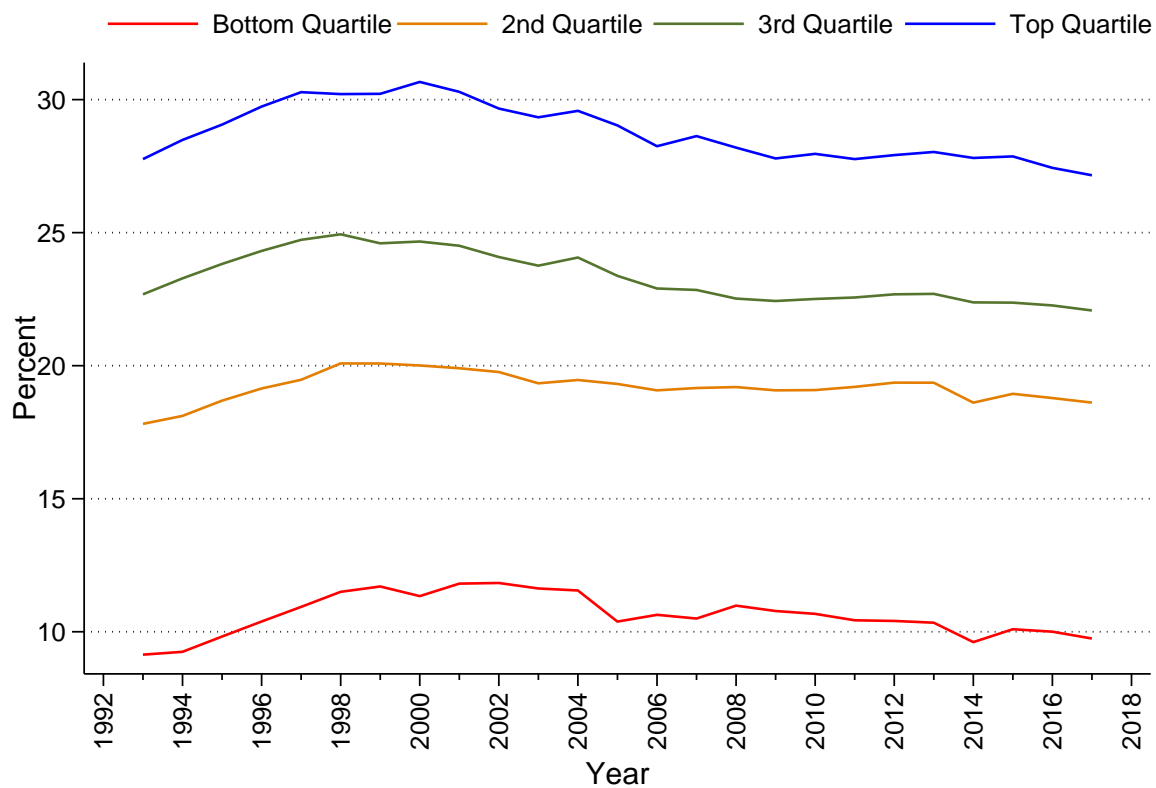

Note: Sample is individuals aged 25–60. There is a break in the definition of households in 2005 as described in Section 3. "Percent" of y-axis corresponds to the percentage of gross income made up by benefits for each quartile (%).

earnings, reflecting the contribution of benefits to gross income seen previously.

Figure 27: Tax payments as a proportion of gross income, by net household income quartile

Note: Sample is individuals aged 25–60. There is a break in the definition of households in 2005 as described in Section 3. "Percent" of y-axis corresponds to the percentage of gross income made up by tax payments for each quartile (%).

Figure 28 provides the ratio of disposable income to gross income. Disposable income has remained relatively constant as a share of gross income over time, with slight increases among the third and fourth quartiles. The bottom quartile receives a considerable share of total gross income as disposable income, roughly 85% across all years.

Figure 28: Disposable income as a proportion of gross income, by net household income quartile
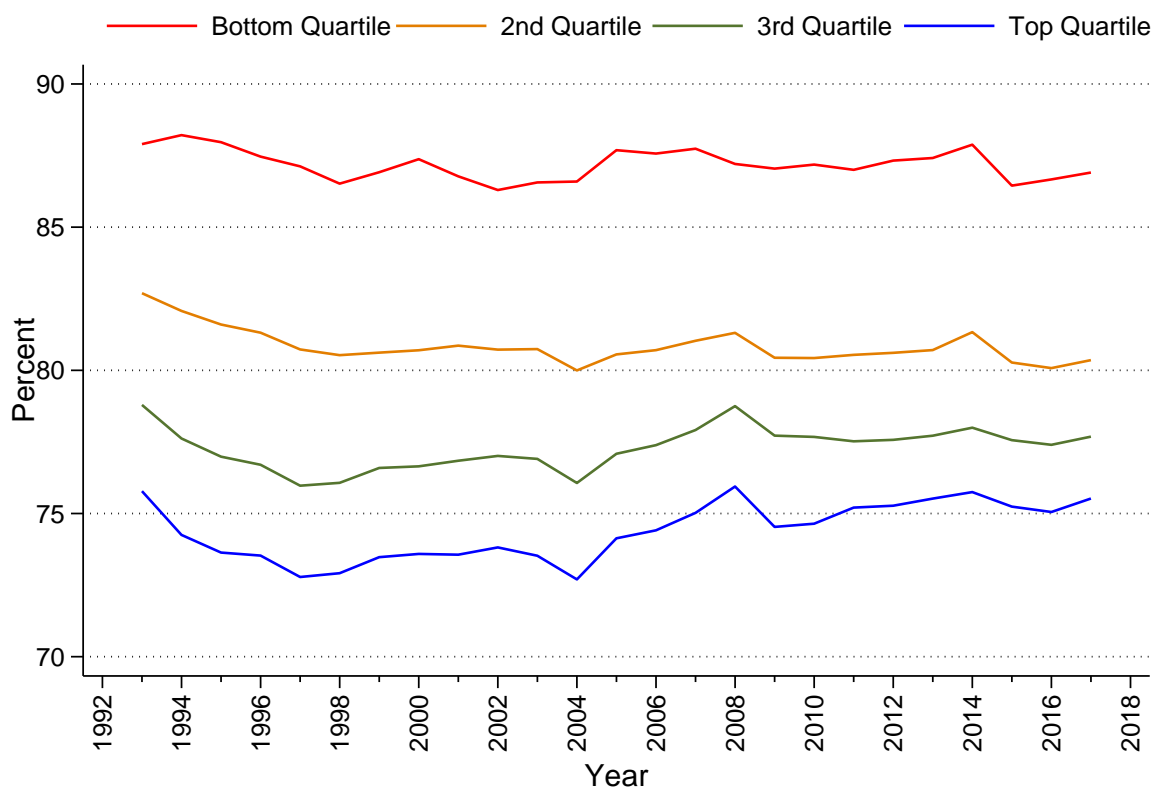
Note: Sample is individuals aged 25–60. There is a break in the definition of households in 2005 as described in Section 3. "Percent" of y-axis corresponds to the percentage of gross income made up by disposable income for each quartile (%).

# 6 Household incomes

6.1 Trends in household consumption

Figure 29 provides insights into the changing landscape of family structure in Norway over time. Marriage rates have significantly declined across all education groups, with a more pronounced decrease among the low educated. Marriage has become increasingly common among highly educated individuals over the period studied. While the figure does not directly capture cohabitation, information in the Appendix indicates a substantial growth in cohabitation among females across all age groups. Additionally, the fraction of single females has also witnessed a significant increase across all age groups. These findings suggest that while the figure focuses solely on marriage, the overall decline in family formation would persist when considering cohabitation. The data underscore the shifting dynamics of family structures in Norway, highlighting changes in marital patterns and the growing prevalence of alternative forms of partnership.

Figure 30 plots the relationship between marriage and having a working partner and income separately by sex. There is a very strong earnings gradient among married men, while the same is true among those with working partners, though to a lesser degree. A similar pattern exists for females as well.

Figure 31 plots trends in assortative mating, asking how spousal earnings varies across the earnings distribution. There exists a strong gradient where both females and males at lower ends of the earnings distribution have lower earning partners and those at higher ends of the distribution have higher earning partners. There have been some changes over time, where for females, the relationship between spousal and own earnings has become stronger at the bottom of the earnings distribution from 1993–2017. In contrast, the relationship between spousal and own earnings has become stronger at the top of the earnings distribution for men. It is worth noting that partners are only identified conditional on marriage, so differences in rates of marriage may influence some patterns.

Figures 32–33 plot the change in the composition of households over time. While Figure 32 plots for all households, Figure 33 separates by sex and education. There have been large increases in the share of individuals who are unmarried without children across all education groups and males and females. At the same time, there have been declines in those who married with children. Among men, there is a strong relationship between education and the increase

Figure 29: Share married, overall and by education, over time
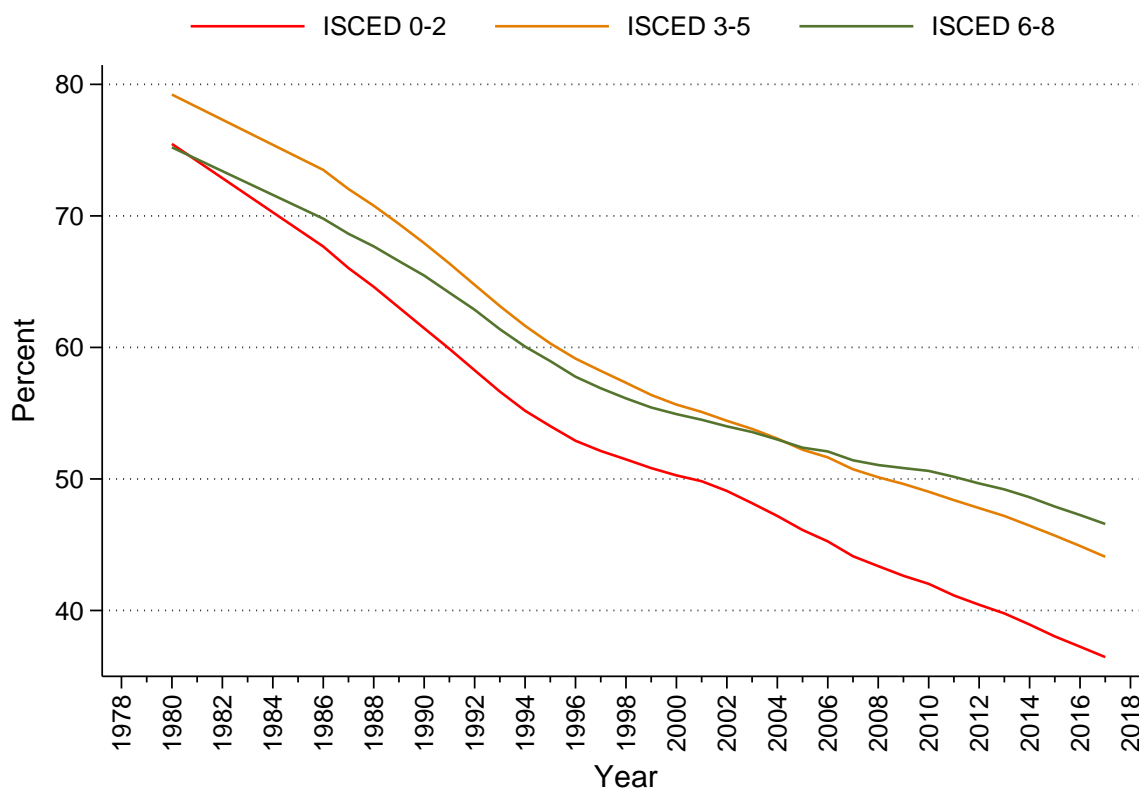
Note: Sample is individuals aged 25–60. Due to a break in the definition of households in 2005, the plot reports only the proportion of married individuals by education. See the Appendix for figures on the evolution of cohabitation and single (non-married, non-cohabiting) rates over time. "Percent" of y-axis corresponds to the percentage of each education group who are married (%).

Figure 30: Share married and share with working partner, by sex and individual gross earnings percentile, selected years

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Figure 31: Mean gross earnings percentile of partner/spouse by individual's gross earnings percentile, selected years
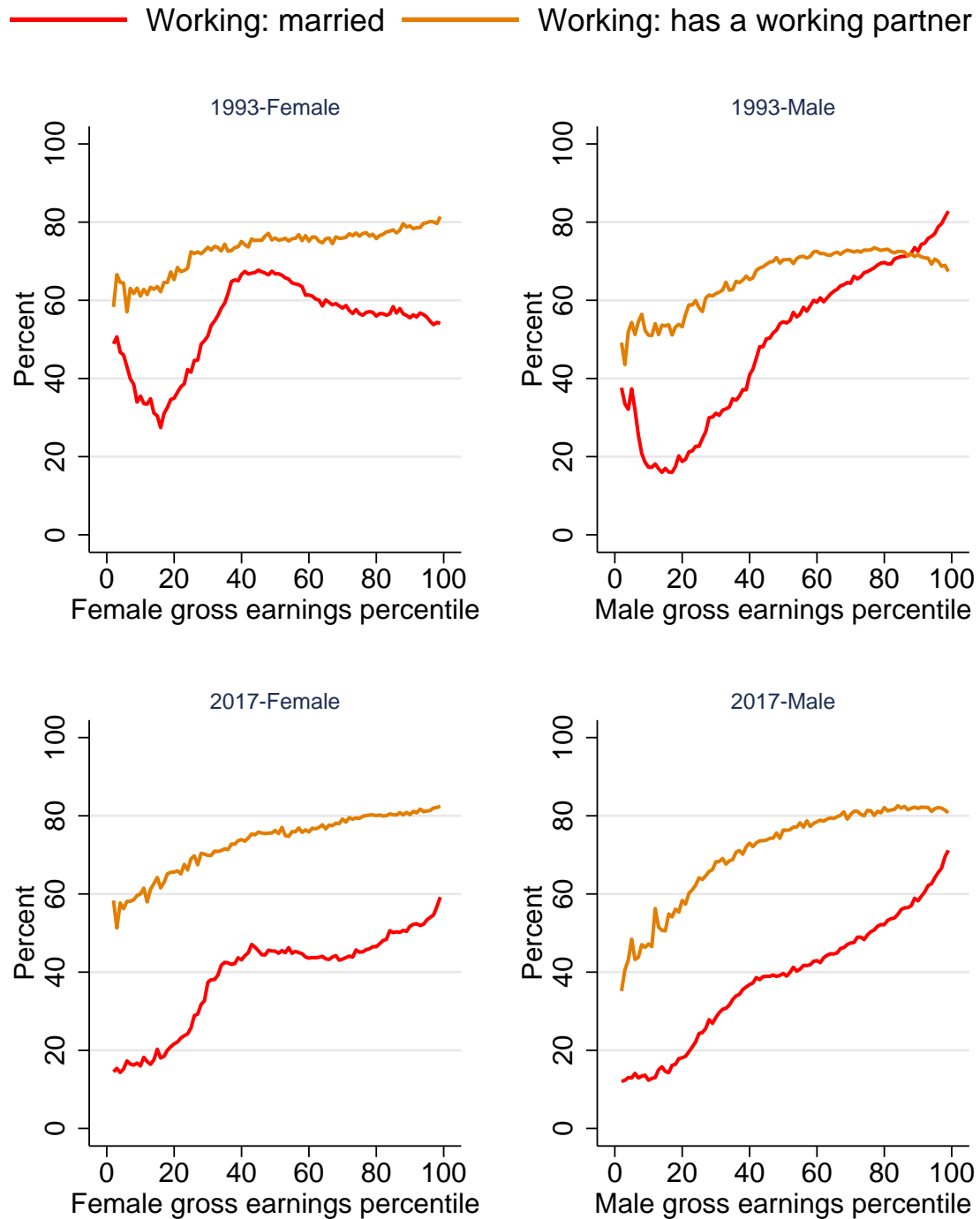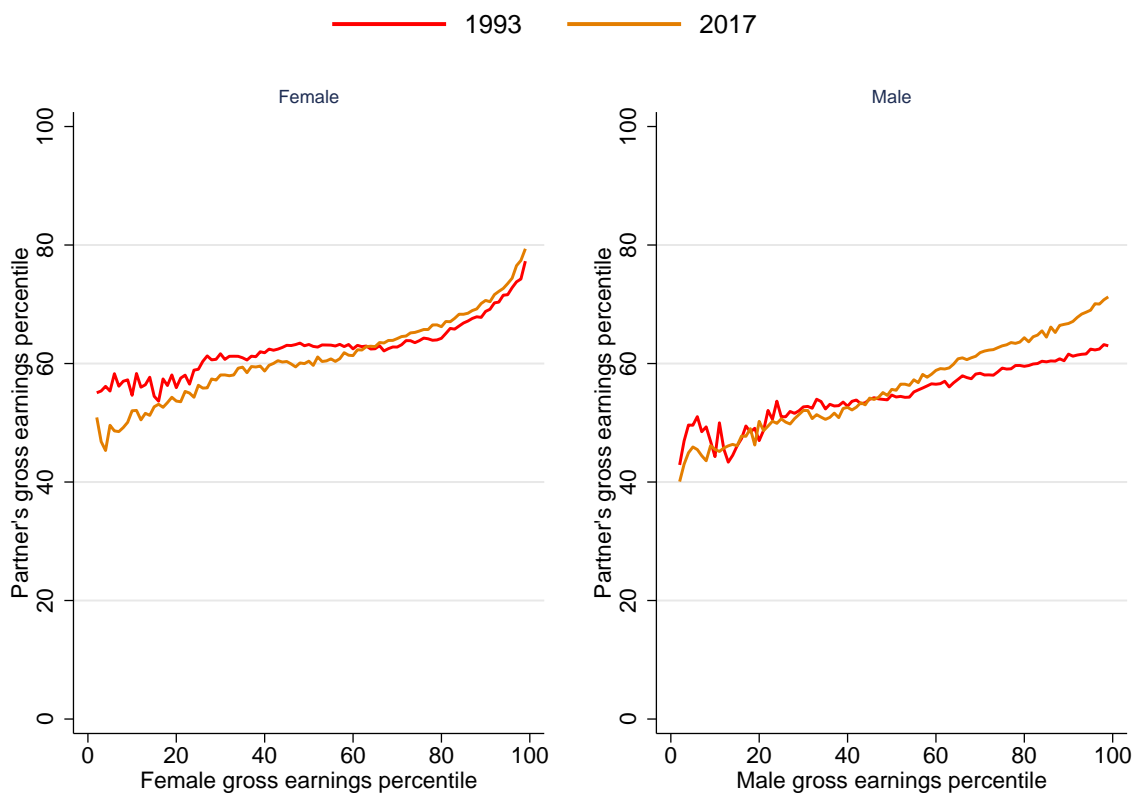
Note: Sample is individuals aged 25–60. Figure excludes the bottom and top 1% of the gender-specific earnings distribution. The proportion with a working partner is conditional on being married.

in the share of those unmarried with no children, where the growth is much stronger among low educated men relative to high educated men. In contrast, the growth rate of those unmarried without children is roughly similar across all education groups for females.

Figure 32: Share of individuals by position in the household, over time
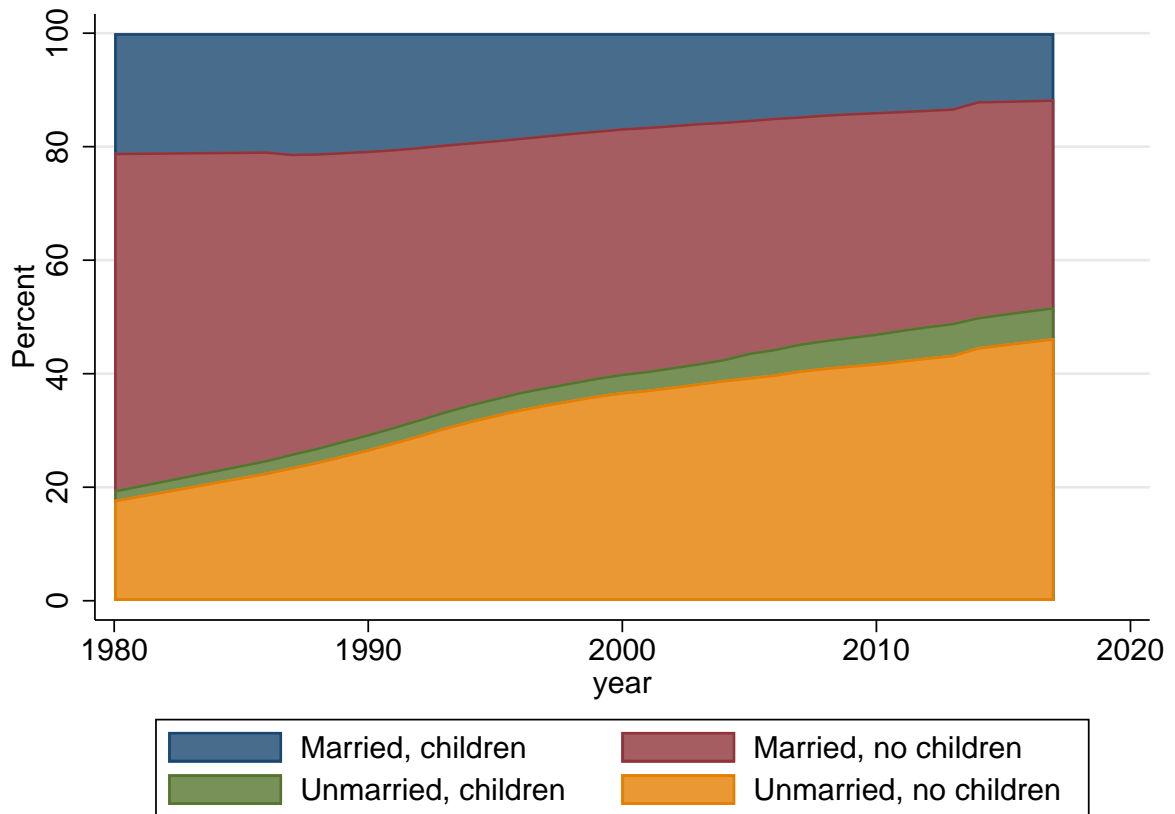
Note: Sample is individuals aged 25–60. "Percent" of y-axis corresponds to the share of the total population in each group (%).

Figure 33: Share of individuals by position in the household, by sex and education, over time
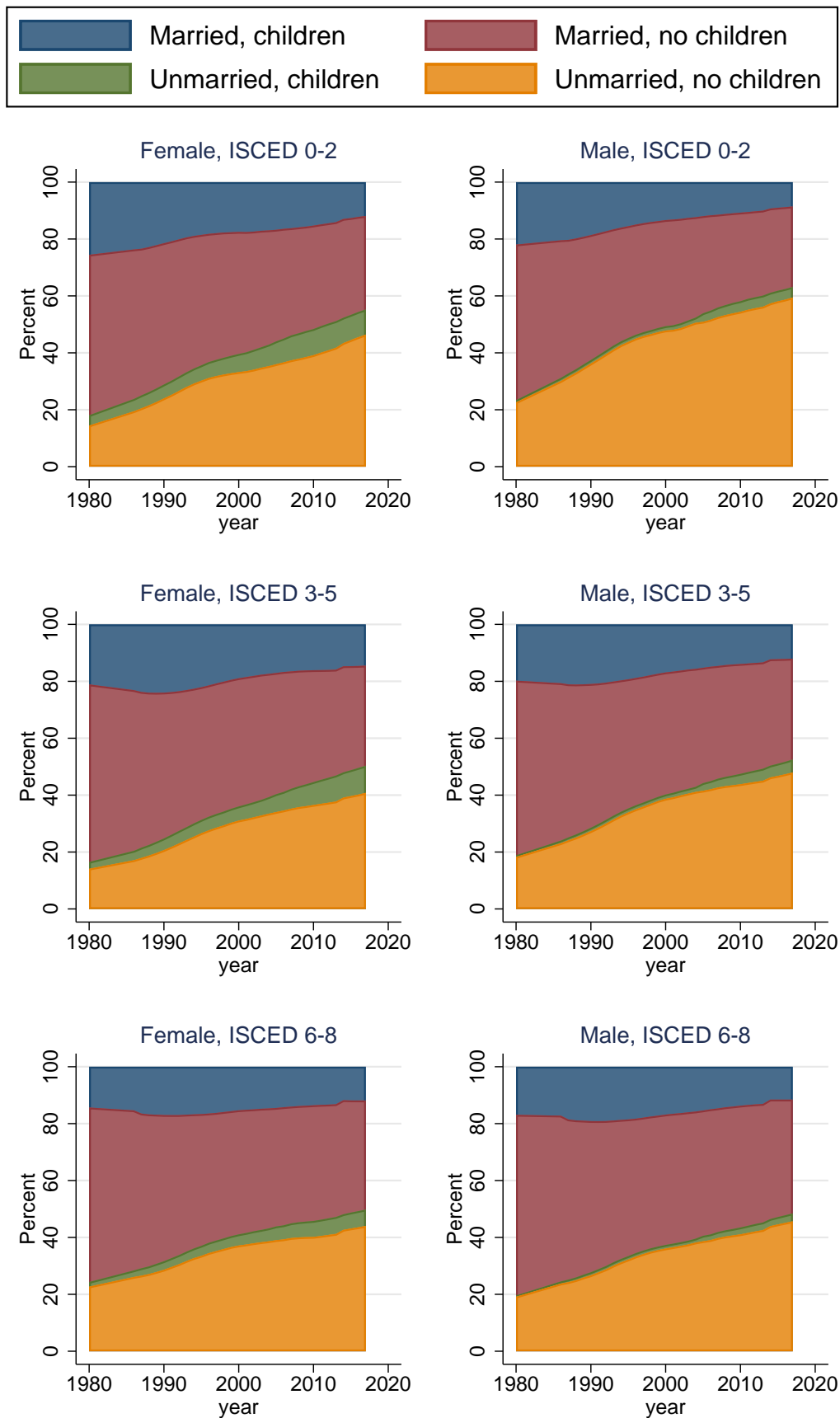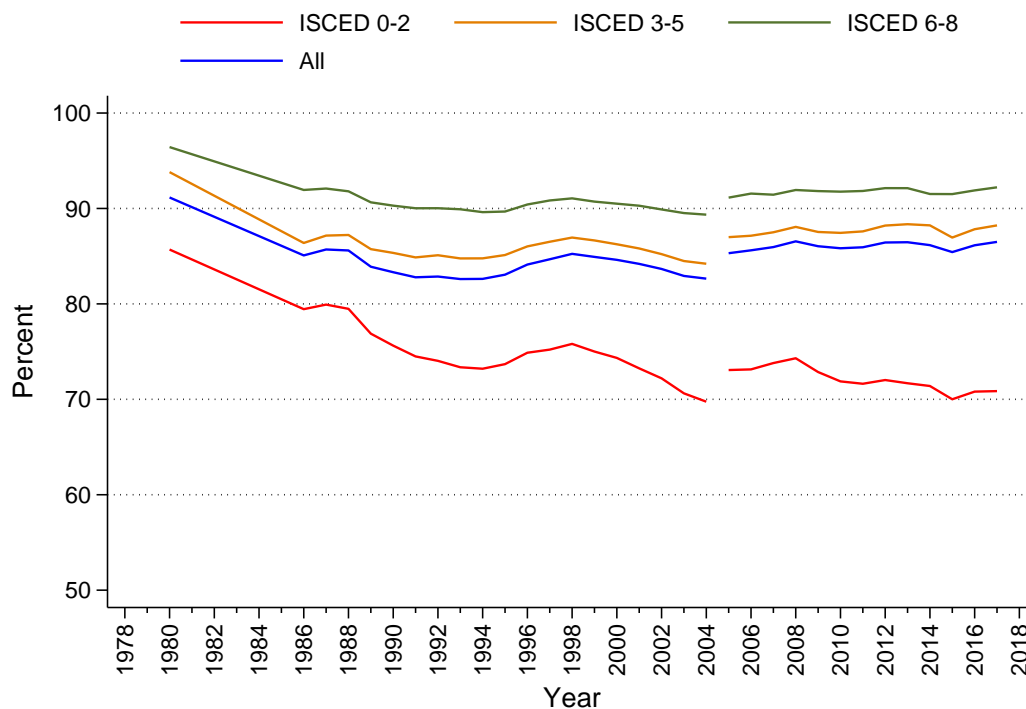

Note: Sample is individuals aged 25–60. "Percent" of y-axis corresponds to the share of the total population in each group (%).

6.2 Earnings and incomes among working households

Figure 34 sheds light on the disparities in living in a household with at least one working adult based on education levels. The figure highlights substantial differences across the different levels of education. Individuals with the lowest levels of education are becoming less and less likely to reside in a household with a working adult as time progresses. In contrast, the trends among high- and middle-educated individuals follows a similar pattern over time, albeit with a consistent disparity in levels. However, the magnitude of this gap is not substantial when compared to the significant decline observed in low-educated households. This discrepancy reflects the greater availability of employment opportunities for high- and middle-educated individuals in Norway. The figure highlights the challenges faced by those with lower levels of education in residing in working households.

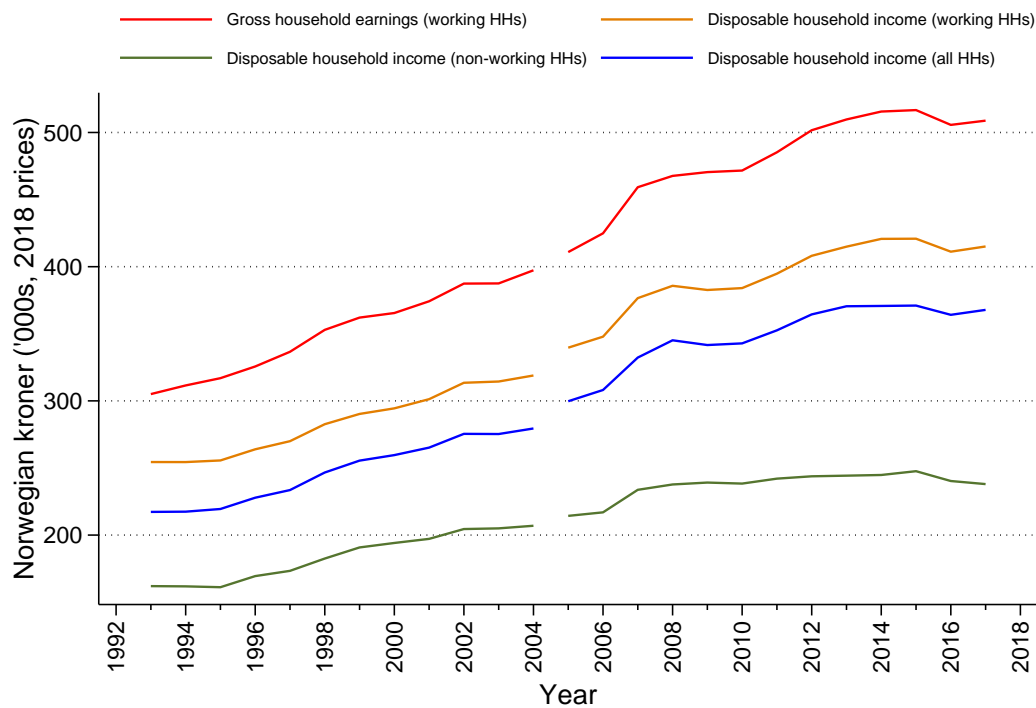Figure 34: Share of individuals in a working household, over time

Note: Sample is individuals aged 25–60. A working household is defined as a household in which at least one adult is in work. There is a break in the definition of households in 2005 as described in Section 3. "Percent" of y-axis corresponds to the share within each group who are in a working household (%).

Figure 35 provides insights into the disparities in disposable income between working and non-working households, highlighting substantial differences in income levels between the two groups. Working households exhibit significantly higher levels of disposable income than non-

working households. Furthermore, the figure illustrates that working households also experience much stronger income growth over time in comparison to non-working households, whose income has remained relatively stagnant in recent years. The earnings of working households steadily increase throughout the period, contributing to their overall higher levels of disposable income. These findings emphasise the importance of employment in driving income growth and the challenges faced by non-working households in achieving comparable income trajectories.

Figure 35: Median real gross household earnings and disposable household income, by household working status, over time
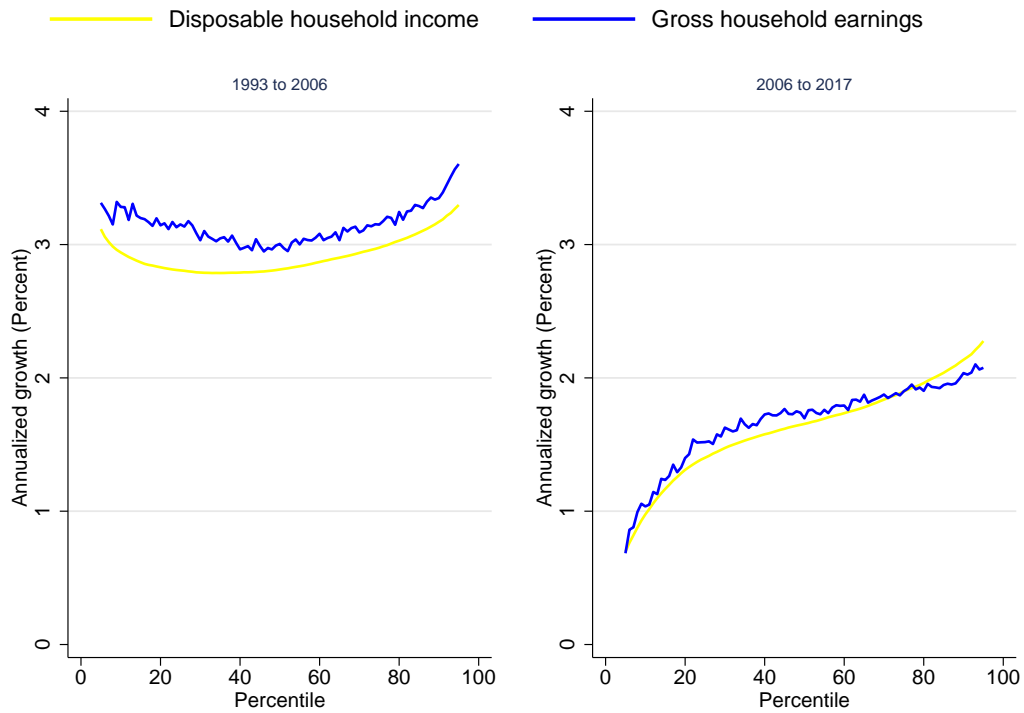

Note: Sample is individuals aged 25–60. A working household is defined as a household in which at least one adult is in work. There is a break in the definition of households in 2005 as described in Section 3.

Figure 36 plots the annualised growth in household earnings and disposable income among working households from 1993–2006, and from 2006–2017. Annual growth has declined over time, from 1993–2006 there was around 3% growth in both measures, while from 2006–2017, there is around 1–2%. This is true across the distribution, but the decline in annual growth of earnings and income is even worse among those at the bottom of the distribution. While there was a U-shape in annualised growth previously, with stronger growth at both the bottom and the top, from 2006–2017 there exists a strong gradient in growth across the distribution, where those at the lower end of the distribution have considerably lower growth rates than those at

the top of the distribution. Even among working households, growth in earnings and income has slowed down at the bottom of the distribution relative to the top of the distribution over time.

Figure 36: Annualised growth in real equivalised gross household earnings and household disposable income for working households, by percentile, selected years
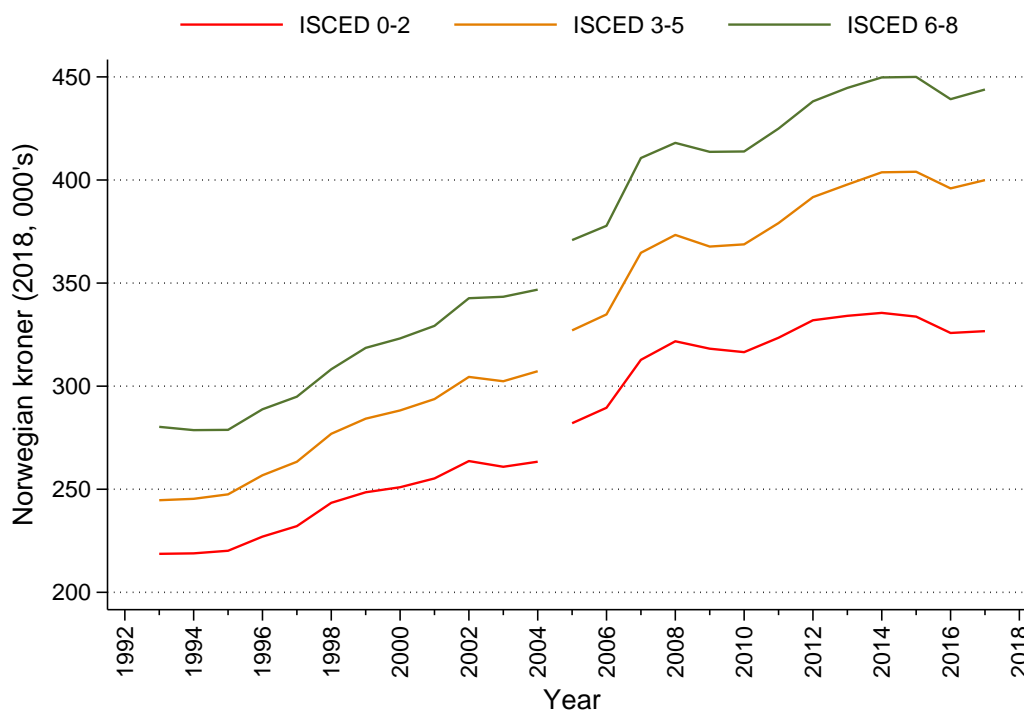

Note: Sample is individuals aged 25–60. A working household is defined as a household in which at least one adult is in work. There is a break in the definition of households in 2005 as described in Section 3.

6.3 Inequality in incomes among all households

Figure 37 provides insights into the relationship between education and median disposable income. The figure illustrates that individuals with higher levels of education experience much stronger income growth over time. As observed in previous figures, the disposable income of individuals with low levels of education reaches a plateau, showing limited growth in recent years. In contrast, individuals with middle-level education follow a similar income trend to those with high education, although there may be an initial difference in income levels. The income growth of those with middle-level education is comparatively strong in Norway, particularly when compared to the slowdown among those with low levels of education. These findings confirm the significant role of education in determining not only individual labour market success but also household income.

Figure 37: Median real disposable household income for all households, overall and by education, over time
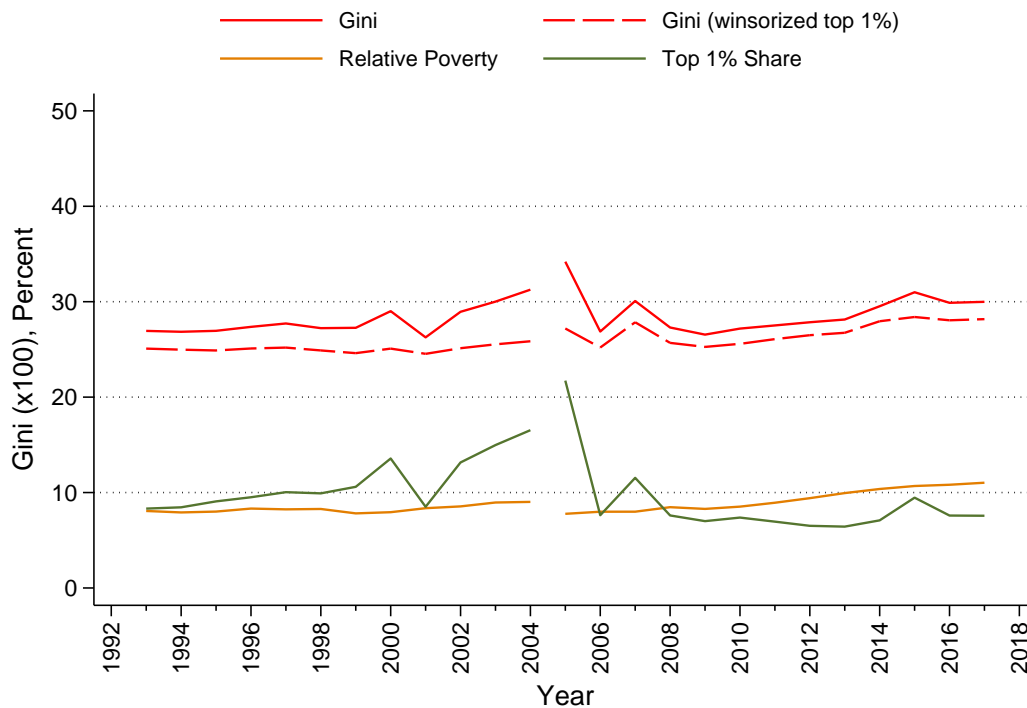

Note: Sample is individuals aged 25–60. There is a break in the definition of households in 2005 as described in Section 3.

Figure 38 reveals that inequality at the household level remains relatively stable over time, as measured by various indicators such as the Gini coefficient (presented both with and without winsorising the top 1%), relative poverty (defined as income below 60% of the median net

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income), and the top 1% ratio. One exception is the Gini coefficient, which shows a slight rise from 1993 to 2017. The rise in the Gini coefficient is observed in both measures with and without winsorising the top 1%, and eliminating the influence of the top 1% serves to decrease the Gini by a roughly equal share over time. The level of the top 1% share is high compared to the other measures, indicating high levels of disposable income concentrated at the top of the income distribution. Despite the presence of a robust welfare state, around 8–10% of individuals aged 25–60 are classified as being in relative poverty, a number which is very slightly increasing over time. Similar to individual inequality, household inequality shows a consistent pattern over time.

Figure 38: Gini, relative poverty and top 1% share of net household income for all households, over time
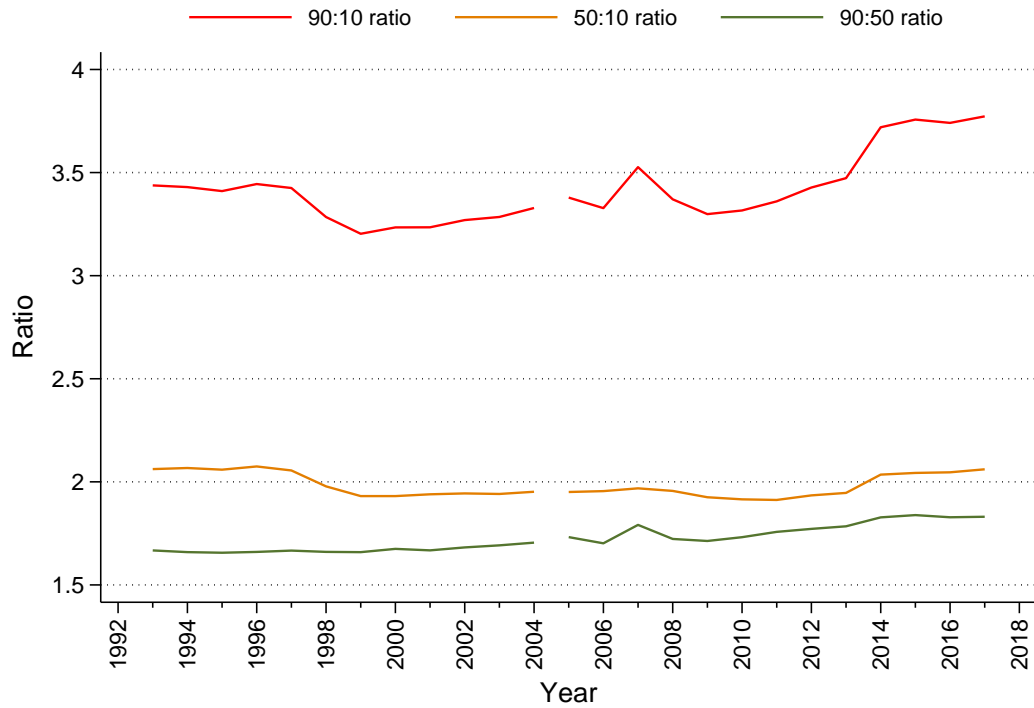

Note: Sample is individuals aged 25–60. There is a break in the definition of households in 2005 as described in Section 3. The Gini inequality index is multiplied by 100. The relative poverty rate is defined as the proportion of people living in households with less than 60% of contemporaneous disposable median income. "Percent" of y-axis corresponds to the percentage of the population in either relative poverty or the top 1% (%).

Figure 39 presents alternative measures of inequality using disposable household income. The data reveal that the 90:10 ratio shows a slight increase over the period. On the other hand, the 50:10 ratio remains relatively constant. These findings suggest a growth in inequality at the top half of the disposable household income distribution over time, although the extent of this

growth is modest. While the 90:10 ratio indicates a widening income gap, the stability of the 50:10 ratio suggests that inequality in the bottom half of the distribution is relatively constant over time.

Figure 39: Percentile ratios of disposable household incomes for all households, over time

Note: Sample is individuals aged 25–60. There is a break in the definition of households in 2005 as described in Section 3.

7 Immigrant outcomes

Figure 40 displays the remarkable growth in the proportion of the population born outside of Norway from 1970 to 2017. At the beginning of the period in 1970, immigrants accounted for just 3% of the population. However, over time, there has been a substantial increase in this share. While the immigrant share is growing prior to the early 2000s, the rate at which immigration is increasing becomes even stronger after 2004, coinciding with the EU expansion to include the 'A10; countries (Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, and Slovenia). This expansion facilitated a more accessible immigration process into Norway from these countries, and by 2017 immigrants comprised nearly 23% of the total population aged 25–60. This strong growth after 2004 represents a doubling of the immigrant share over the 13-year period.

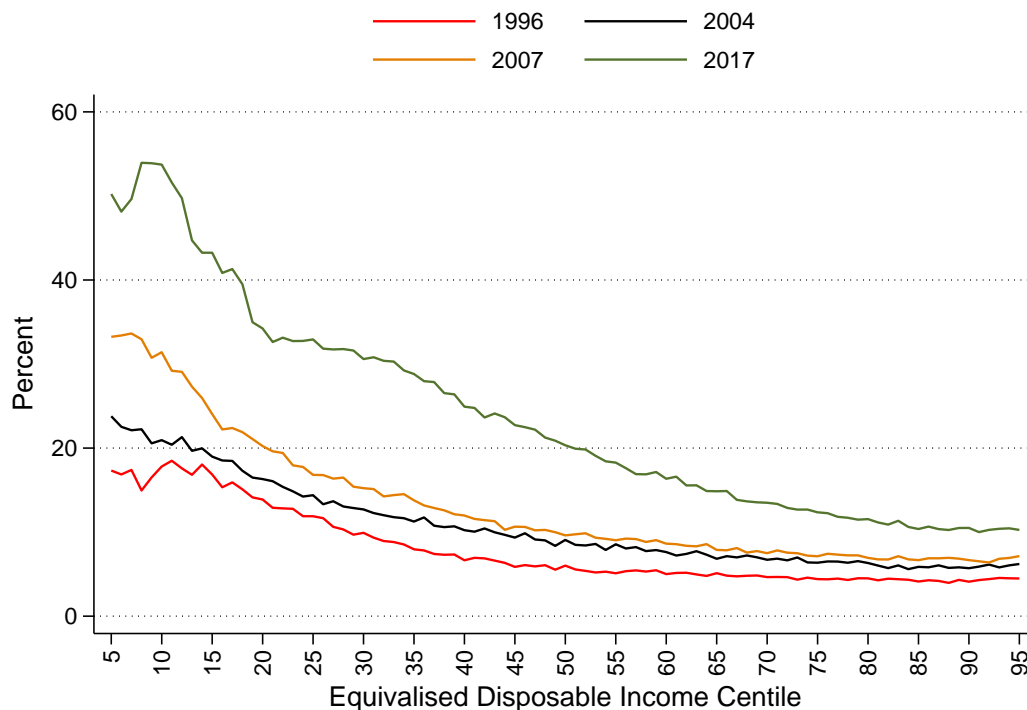Figure 40: Share of immigrants in population, over time
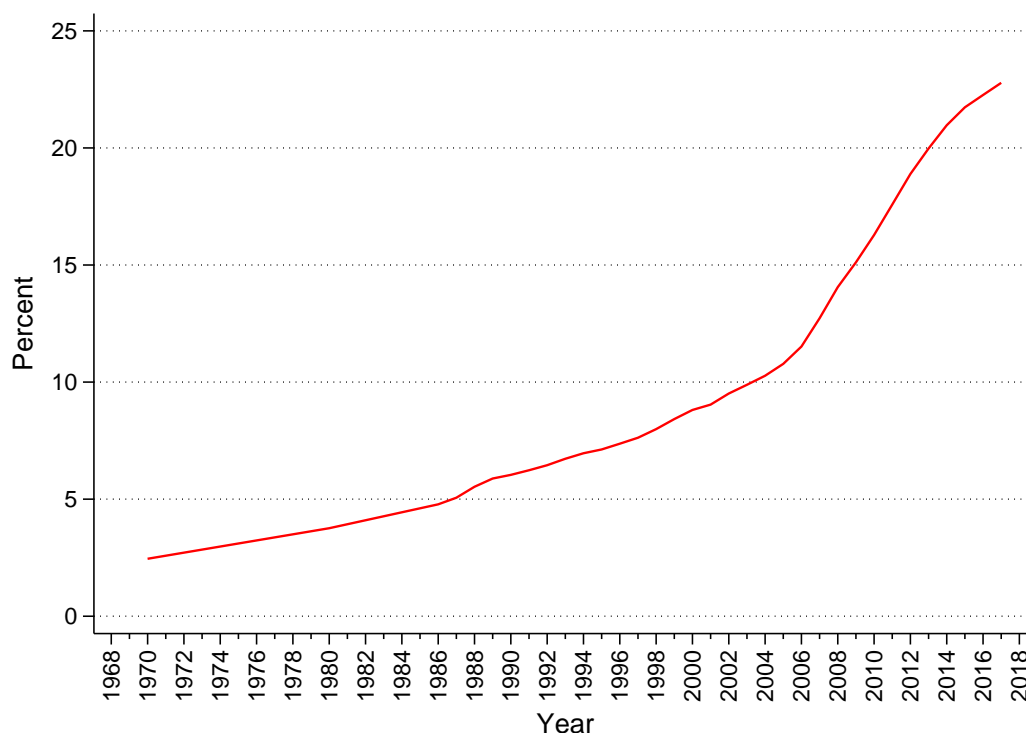
Note: Sample is individuals aged 25–60. Immigrants are defined as those born outside of Norway. "Percent" of y-axis corresponds to the percentage of the population who are immigrants (%).

Figure 41 depicts the significant changes in the presence of immigrants across the equivalised disposable income distribution in Norway, coinciding with the increase in immigration discussed in Figure 40. The figure reveals a disproportionate representation of immigrants in the bottom

25% of the income distribution in 1996, a pattern that has considerably intensified over time. While there is substantial growth in the immigrant share across all points in the distribution, this growth is primarily concentrated in the bottom half of the distribution, particularly the bottom 25%. In 2017, around 30–50% of individuals in the bottom 25% of the distribution are non-Norwegian born, compared to 20% at the median and approximately 10–15% at the top of the distribution. Consequently, the substantial increase in immigration witnessed in Figure 40 has significantly influenced the composition of the bottom of the income distribution in Norway, suggesting that immigration may be linked with patterns of inequality in the 2000s in Norway.

Figure 41: Share of immigrants in population, by disposable income distribution over time
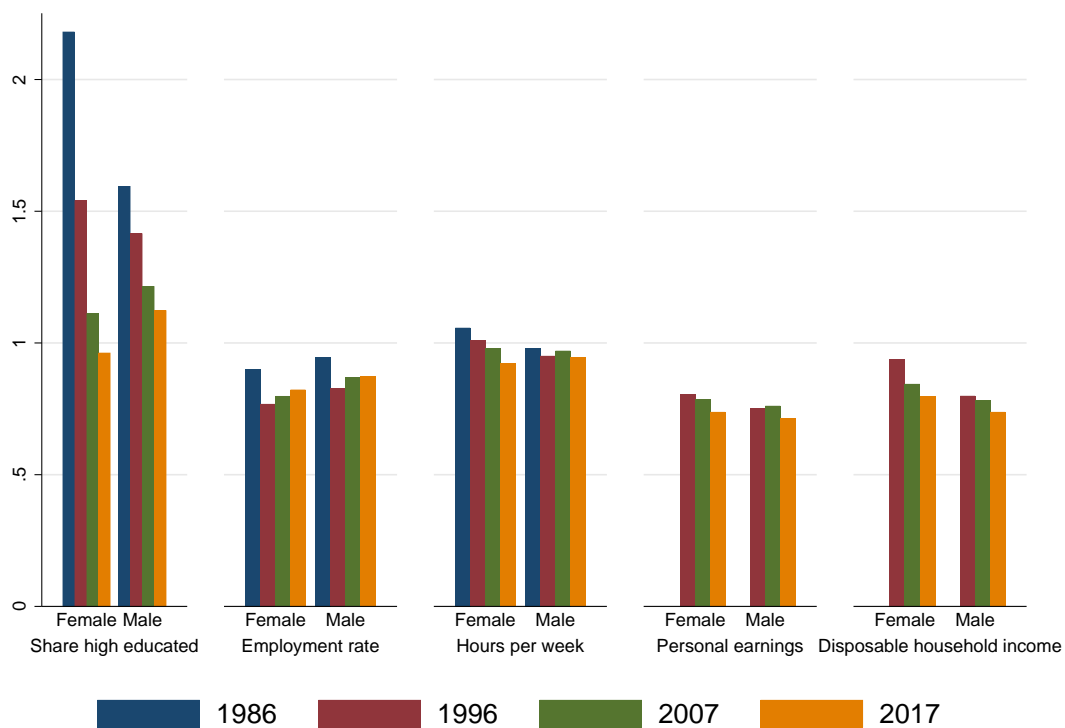

Note: Sample is individuals aged 25–60. Immigrants are defined as those born outside of Norway. "Percent" of y-axis corresponds to the percentage of the population who are immigrants within each point of the distribution (%).

Figure 42 plots the relationship between the immigrant and native-born population, separately by sex and over time. These are normalised with respect to native workers, such that a value of 1 corresponds to equality between immigrants and natives, while anything less than 1 highlights areas where immigrants lag behind the labour market outcomes of natives. As immigration has increased considerably into the period from 1986 to 2017, there are considerable changes in the relative outcomes of natives and immigrants. Immigrants into Norway

are considerably more likely to be highly educated than natives, but this has also declined considerably as immigration into Norway has increased. However, by 2017, male immigrant workers in Norway were on average more highly educated than native workers. Despite these differences in education, employment rates of immigrants, hours worked per week, and earnings of immigrants lag behind those of natives, for both men and women. The gap with native workers in earnings is considerable, and becoming even larger over time, which is also reflected in disposable household income. Despite being, on average, more highly educated than native workers, the labour market outcomes of male and female immigrants lag behind those of native workers.
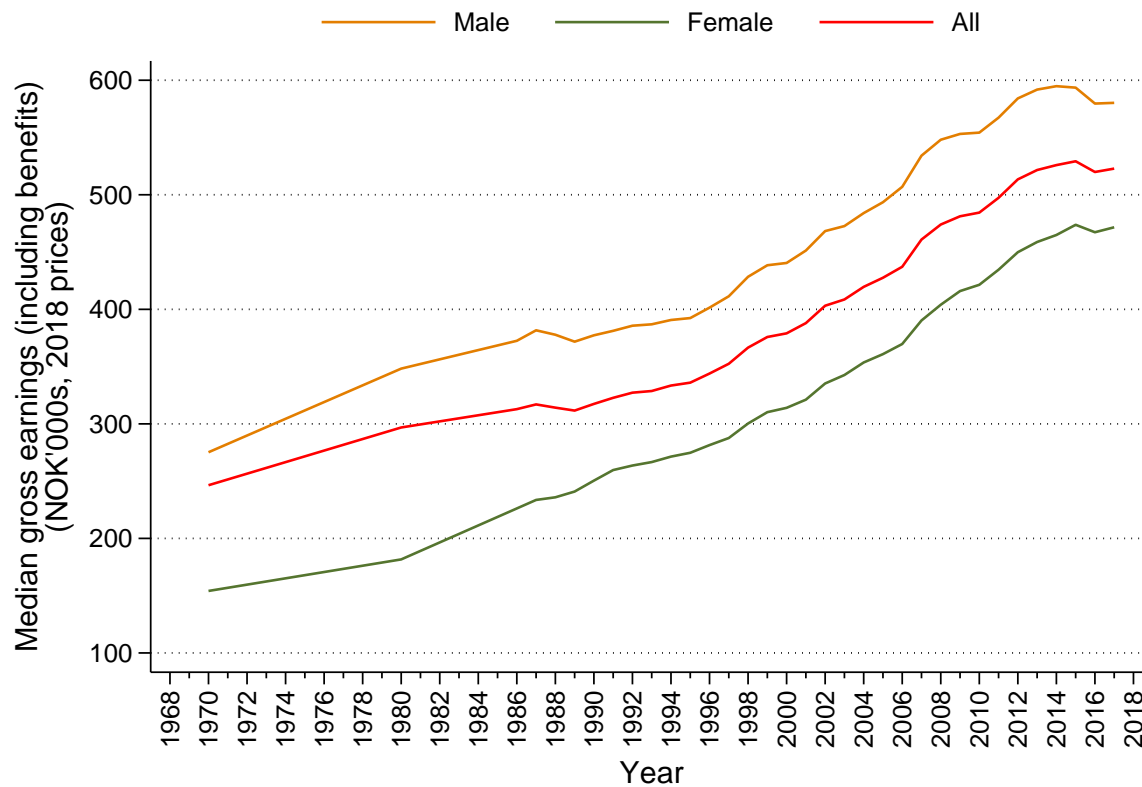
Figure 42: Outcomes of immigrants relative to native-born population, by sex and over time

Note: Sample is individuals aged 25–60. Immigrants are defined as those born outside of Norway. Y-axis corresponds to the ratio of immigrant outcomes to native outcomes ($\frac{immigrant}{native}$).
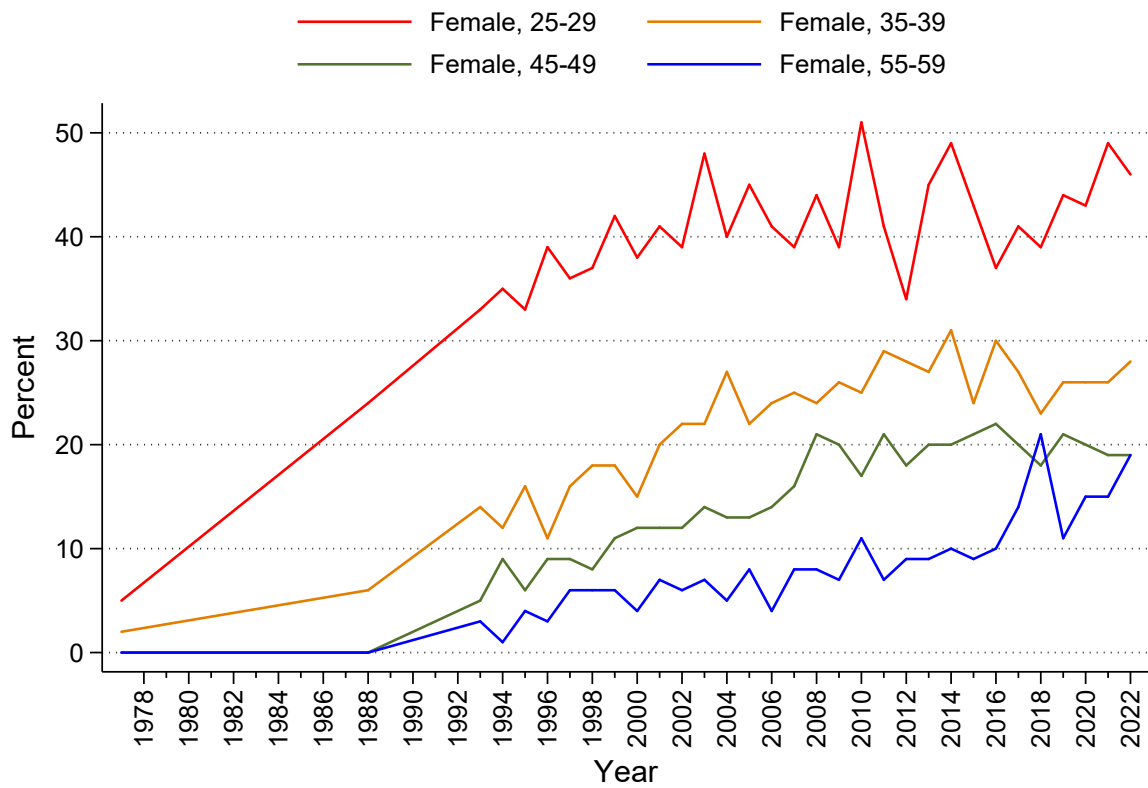
8 Appendix

Figure 43: Median real gross individual income, overall and by sex, over time
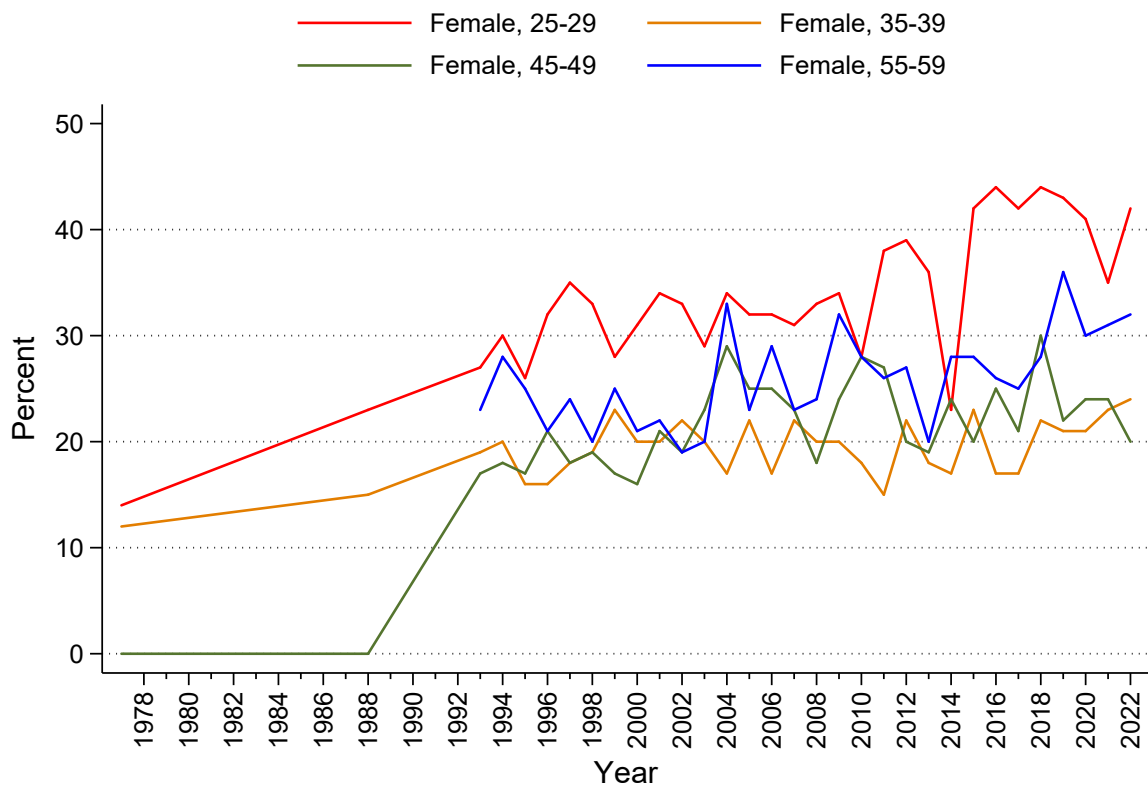

Note: Sample is individuals aged 25–60. Gross income, measured as earnings plus benefits such as unemployment insurance, sickness benefits, and parental leave.

Figure 44: Share single/cohabiting, by age, over time

(a) Cohabitation rates

(b) Single rates

Note: Data available from Tidligere kilder har vært Fruktbarhetsundersøkelsen (1977), Familie- og yrkesundersøkelsen (1988), and Omnibusundersøkelser (1993–2004). From 2005 onward, representative survey of 8,000 residents.