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Research Report

Youth unemployment in times of crises in the EU 27

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YOUTH UNEMPLOYMENT IN TIMES OF CRISES IN THE EU 27

FiBS-Forum No. 72
Berlin, July 2020



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Zein Karsin
Galiya Yelubayeva

**ENHANCING LIFELONG LEARNING
FOR ALL**

FiBS

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Content

Executive summary	6
1. Why Study Youth Unemployment in times of Crisis?	7
2. Youth Unemployment in the EU 27.....	11
2.1 Youth unemployment by education level.....	11
2.2 Youth unemployment by gender.....	14
2.3 Youth unemployment by gender and education.....	16
2.4 Summary	18
3. Implications of economic development on youth employment	19
3.1 Employment development for the age group (25-64)	19
3.2 Employment development for the age group (15-24)	23
4. An estimation: the impact of the Corona-crisis on youth unemployment.....	27
5. Summary and Policy Recommendations	30
Sources	33
Annex	34

List of figures

Figure 1: Youth (20-24) unemployment rate and total unemployment rate (20-64 years old) over time	7
Figure 2: Youth (20-24 years old) unemployment indicators and total unemployment rate over time.....	9
Figure 3: Youth (25-29 years old) unemployment indicators and total unemployment rate over time.....	9
Figure 4: Youth (20-29 years old) unemployment ratio by education levels over time	11
Figure 5: Youth (20-24 years old) unemployment ratio by education levels over time	12
Figure 6: Youth (25-29 years old) unemployment ratio by education levels over time	12
Figure 7: Population (20-64) unemployment rate by education levels in the EU (27)	13
Figure 8: Youth (20-24 years old) unemployment ratio by gender over time.....	15
Figure 9: Youth (25-29 years old) unemployment ratio by gender over time.....	15
Figure 10: Population (20-64) unemployment rate by gender in the EU(27).....	16
Figure 11: Youth (20-24 years old) unemployment by education and gender over time.....	17
Figure 12: Youth (25-29 years old) unemployment by education and gender over time.....	17
Figure 13: Qualification structure of employees (25-64) by NACE activity (%), 2008.....	22
Figure 14: Qualification structure of employees (25-64) by NACE activity (%), 2019	22
Figure 15: Qualification structure of employees (25-64) by NACE activity (%), 2008.....	25
Figure 16: Qualification structure of employees (15-24) by NACE activity (%), 2019	25
Figure 17: Estimation of impact of Corona-crisis on youth (20-24) and total unemployment in EU 27	27
Figure 18: Estimation of impact of Corona-crisis on 25 to 29 year olds and total unemployment in EU 27	28
Figure 19: Youth (20-29 years old) unemployment rate by education levels over time.....	34
Figure 20: Youth (20-24) unemployment rate by education levels over time	35
Figure 21: Youth (25-29 years old) unemployment rate by education levels over time.....	35
Figure 22: Youth (20-24) unemployment rate by gender over time	36
Figure 23: Youth (25-29) unemployment rate by gender over time.....	36
Figure 24: Youth (20-24 years old) unemployment rate by education and gender over time	37
Figure 25: Youth (25-29 years old) unemployment rate by education and gender over time	37

List of tables

Table 1: Sector size (share of total employment) in 2008 and 2019, GDP (in current Prices, million euros) growth rates and Sectoral Employment growth rates during and after the Great Recession in the male-dominated, female-dominated and gender-balanced sectors for the Age group (25-64).....	21
Table 2: Sector size (share of total employment) in 2008 and 2019, GDP (in current Prices, million euros) growth rates and Sectoral Employment growth rates during and after the Great Recession in the male-dominated, female-dominated and gender-balanced sectors for the Age group (15-24).....	24

Executive summary

The financial crisis led to rising unemployment levels for adult as well as for youth. The unemployment level rose across the EU 27 after 2008 and peaked only in 2013, i.e. decline started only from 2014 onwards. The middle and high qualified youth (20-29 years old) had the lowest percentage point increase in unemployment between 2007 and 2013, which rose from 7 percent to 11 percent, and managed to reach their pre-crisis levels by 2017. While the low qualified youth were disproportionately hit by the crisis, witnessing an increase in unemployment levels from 13 to 22 percent between 2007 and 2013. Moreover, they have also not managed to return to their pre-crisis unemployment level in 2019. However, it should be noted that while youth unemployment increased more in absolute terms relative increase as well as relative difference to overall employment did not change much. This indicates a level effect rather than a mere age effect.

Males were commonly more negatively hit by the crisis than females, with the gender differences being largest for the least qualified, and more so for the younger youth group aged 20-24. Differences between male and female unemployment are significantly lower for the higher educated groups and become lower with increasing age. We also find that the youth aged 25-29 had around 2 to 3 percentage point lower unemployment ratios compared to the younger age group. Strikingly, among the 20-24 year olds, the unemployment rates of the medium qualified was lower than for those with tertiary education. This suggests that the transition period of those with tertiary qualifications is a matter of concern for the younger age groups, where those with upper secondary education had more time to enter into employment.

A review of economic and employment development by sector reveals falling GDP growth rates for almost all male-dominated sectors between 2008 and 2010, while almost all female-dominated as well as most gender-balanced sectors still grew during the crisis – with few exceptions only (e.g. water supply, waste management and electricity among the male dominated sectors). In most cases, employment development followed the GDP growth path, i.e. if GDP shrinks employment also decreases and vice versa. The important gender implication of this is that – since most male-dominated branches experienced negative GDP growth, while most female-dominated as well as in most gender-balanced sectors grew even during the crisis – employment in male-dominated sectors decreased while employment in female-dominated and gender-balanced branches grew for the age group 25-65. If employment decreases, it affects mostly the younger population, which is highlighted by the employment development of youth aged 15 to 24 years of age, which shows even larger shrinking rates during the crisis in the male-dominated sectors and mainly negative rates in the female-dominated and gender-balanced sectors. Thus, youth was commonly more negatively affected, even if overall employment grew during the crisis.

Although growth rates improved for most sectors after the crisis, linked to employment growth among 25 to 64 year olds for most male as well as female-dominated sectors alike, employment development for youth was still less positive for almost all sectors, as shown in table 2. In various branches it remained even negative for youth, in spite of overall job growth, which is particularly the case for male-dominated sectors, such as, for example, agriculture, manufacturing. In construction, job loss continued for all age groups, but youth was far more strongly affected. The same discrepancy can be observed for female-dominated branches, apart from education.

These findings explain on the one hand why the unemployment of male youth increased more strongly than that of women, particularly among the low qualified: agriculture and construction, but to some extent also manufacturing are male-dominated and often linked to low qualifications.

I. Why Study Youth Unemployment in times of Crisis?

Preceded by a long period of economic expansion in Europe, the Global Financial Crisis of 2008, also referred to as the Great Recession, led to a sharp drop in economic output (GDP) within the European Union (EU), which reduced the demand for human resources and led to higher unemployment rates. At the peak of the crisis in 2009, the EU GDP dropped by 4.1 percent, the largest contraction in output since the 1960s. Nevertheless, the duration of this downturn and the degree of employment recovery substantially varied across European countries. While the unemployment rates in Scandinavian and continental Europe hardly changed between 2008 and 2014, they more than doubled in the Southern European countries of Greece, Spain, Italy and Portugal and in Ireland (Goshary et al. 2013).

More alarmingly, economic crises have a disproportionately higher negative influence on youth unemployment which tends to be super-cyclical, i.e. more sensitive to business cycle fluctuations than adult unemployment (Ryan 2001). This has especially characterized the youth unemployment in the EU after the 2008 financial crisis. Figure 1 shows the total and youth unemployment rates between 2005 and 2019 for the 27 EU countries.

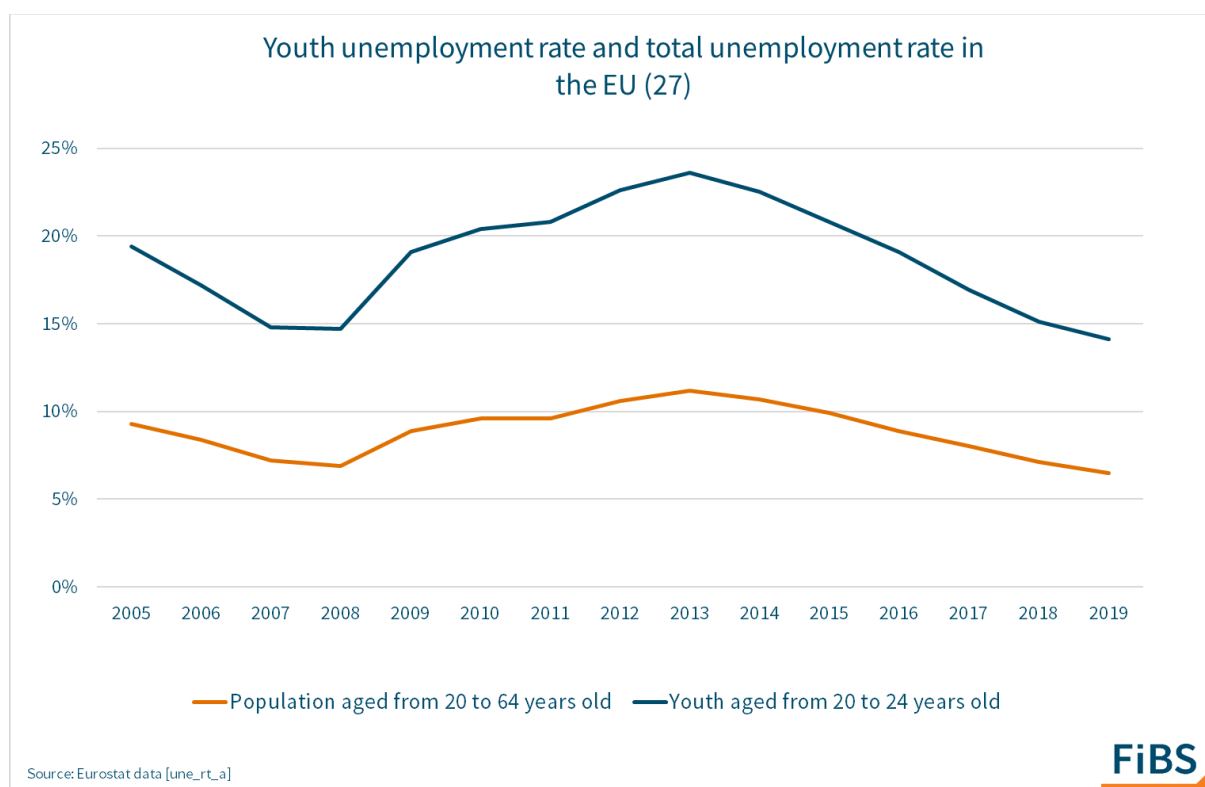


Figure 1: Youth (20-24) unemployment rate and total unemployment rate (20-64 years old) over time

While the total unemployment rate increased by 4 percentage points from 7 to 11 % between 2008 and 2013, the youth unemployment rate increased by 9 percentage points within the same time frame, from 15 to 24%. Thus, youth unemployment is more than double that high than overall unemployment. However, the relative increase (50%-60%) as well as the relative difference (youth unemployment is above as high as overall unemployment) remained mostly the same.

It is also noteworthy to mention that the increase occurred in two steps: the first increase happened between 2007 and 2009, where youth unemployment rose from 14.8% to 19.1%, followed by a further

increase to 23.6% till 2013. This highlights that the impact of the economic development in the aftermath of the crisis was equally strong as the immediate effect. Although a similar development can be observed for overall employment in principle, the level of the increase is much lower. In fact, youth unemployment rose between 2010 and 2013 more than double that of overall unemployment; however, in relative terms the differences are almost comparable. Thus, the larger rise is also due to the higher levels.

It is important to note that the youth unemployment rate can lead to an overestimation of the real unemployment situation of the youth, as the denominator does not consider the youth who are in education, which makes up a significant percentage in this age group. The low youth labour market participation rates in the denominator result in an overstatement of the unemployment effects as calculated by the unemployment rate. To demonstrate, a youth unemployment rate of 25% does not mean that 25 percent of the entire youth population is unemployed (Eurostat 2020). Rather, it indicates that a quarter of the youth who are participating in the labour force are unemployed, taking in mind that a large portion of youth are not participating since they are still in education. In addition, the unemployment rate overemphasizes the poorer employment prospects of the low qualified, which have a disproportionately high share, particularly in the younger age cohorts as the following figures will show. This problem does not occur that sharply when using the unemployment rate on older age groups since most of the population are already participating in the labour force.¹ Here, the denominator includes the entire population of youth aged 20-24, and not just those who are in the labour force. This is a much more realistic measure, since it also considers the youth in education. The larger value of the denominator in the unemployment ratio relative to the unemployment rate should also lead to lower youth unemployment.

The two youth unemployment indicators (rate and ratio) for the age group 20-24 are shown in Figure 2 and highlights the substantial differences. While the **unemployment rate** arrives at figures of up to 24 percent, the youth **unemployment ratio** is between 5 and 10 percentage points lower. More precisely: the **unemployment rate** increased from 15 percent in 2008 to almost 20 percent in 2009 and moved upwards to 24 percent. In contrast, the youth **unemployment ratio** rose from 9 percent (2008) via 12 to 14 percent in 2013. In comparison to overall unemployment, the latter is constantly only around 2 percentage points higher, while the youth unemployment rate is more than 10 percentage points higher during the peak of the unemployment phase between 2009 and 2013. This large difference reflects the high proportion of persons who are in education, which is accounted for in the unemployment ratio, but not in the unemployment rate. Although the unemployment ratio is still somewhat higher than the overall employment rate, the gap has narrowed significantly.

As expected, the difference between the two unemployment measures shrinks even more as the age groups get older. This is demonstrated in Figure 3, which shows the unemployment ratio and rate for the age group 25-29 over the study period. The unemployment ratio is around 2 percent, sometimes even 3 percentage points lower than the unemployment rate throughout the entire study period, reflecting the fact that most of the population in this age group are participating in the labour market. Moreover, it results also in a relatively small difference of less than 1 percentage point between the unemployment of youth aged 25-29 vs the overall unemployment rate; while the difference is somewhat higher for those aged 20-24 years.²

¹ Nevertheless, even the focus of the normal unemployment rate on those who are active in the labour market, do not properly pinpoint the different labour market participation rates by qualification. Higher labour market participation rates of the better qualified drive social returns to education even more (Dohmen/Henke 2011, Dohmen 2011).

² However, the both indicators, youth unemployment ratio and overall unemployment rate, are not fully comparable, as the youth unemployment ratio comprises the total youth population in the denominator, while this is not the case for the

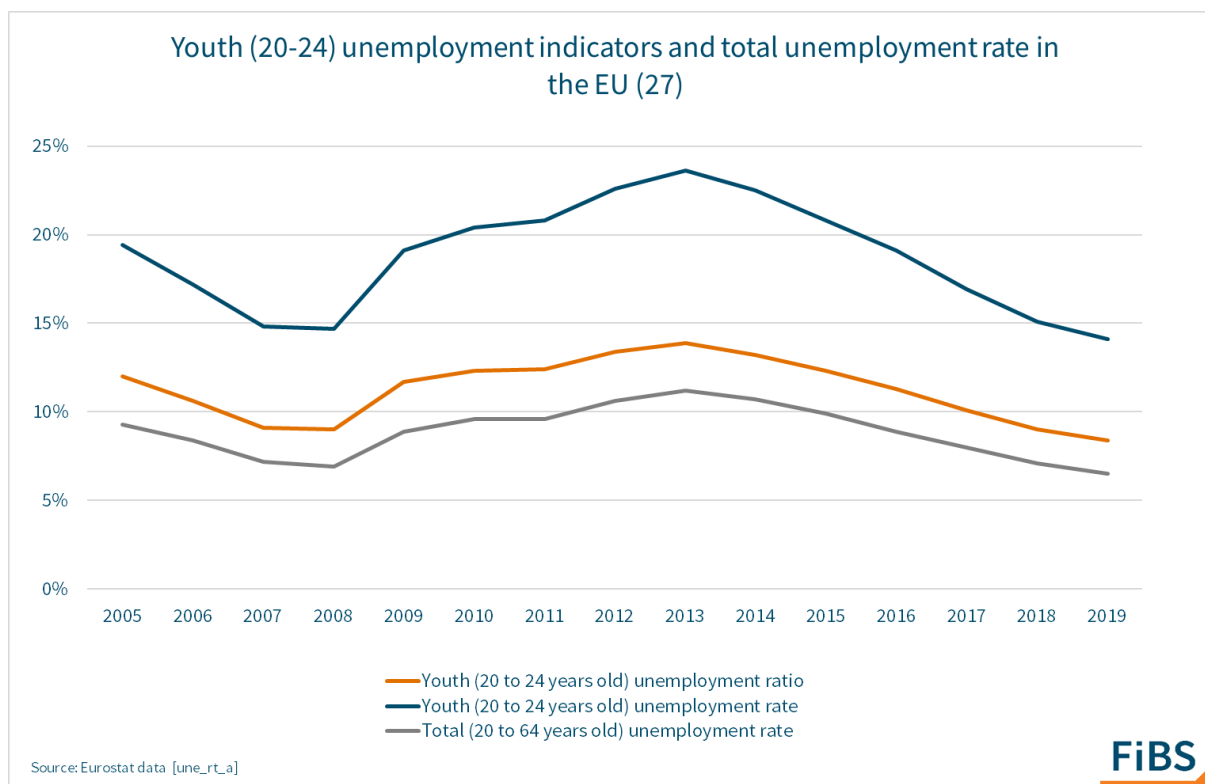


Figure 2: Youth (20-24 years old) unemployment indicators and total unemployment rate over time

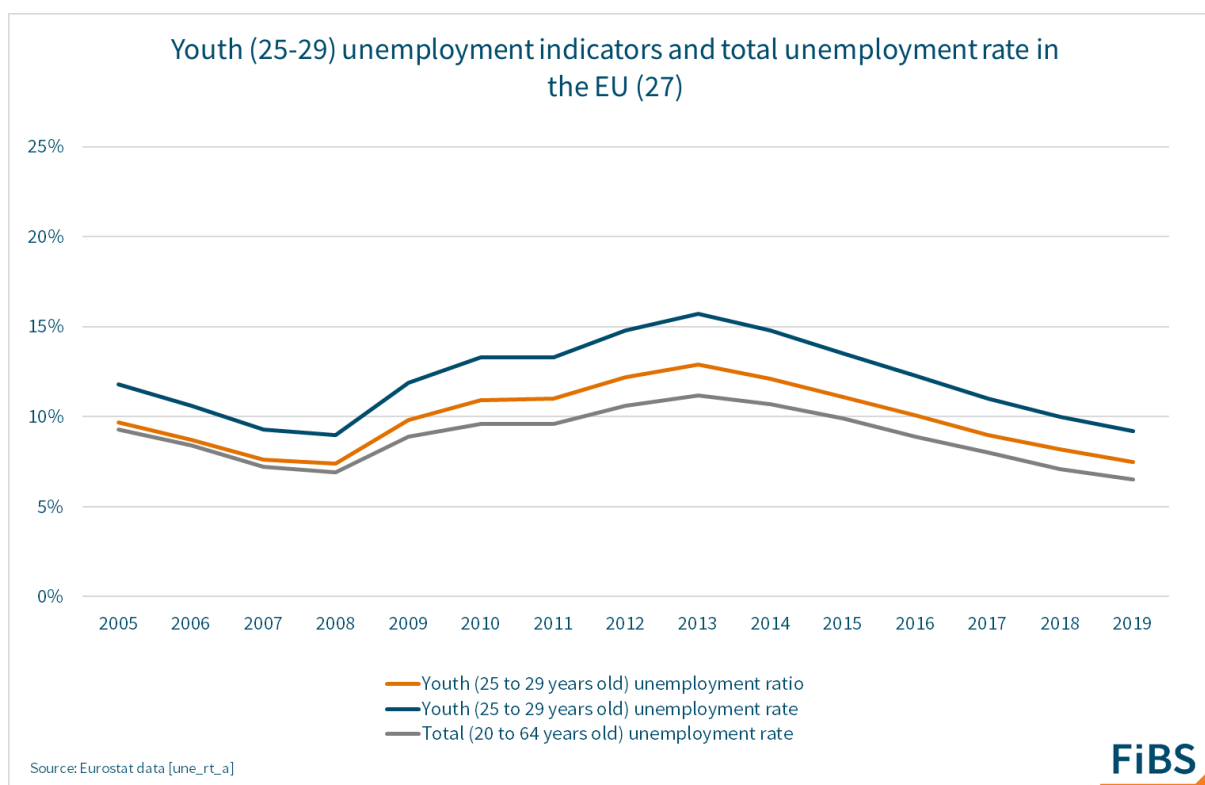


Figure 3: Youth (25-29 years old) unemployment indicators and total unemployment rate over time

overall unemployment rate. The overall unemployment rate would decrease if the inactive would be included in the denominator.

Since the youth unemployment ratio represents a more realistic picture of youth unemployment, especially for the age group (20-24), we will use it as unemployment measure for the rest of the analysis for the youth groups. In the Annex, we replicate the analysis using the unemployment rate, in order to allow for comparison with the labour market literature that relies on using the unemployment rate. As we are not heading for a comparison between overall unemployment and youth unemployment, we will mainly focus on youth unemployment to allow for comparability with general literature.

We focus our analysis on the youth groups aged 20-24 and 25-29 over the period 2005 to 2019. These two age groups will be mainly analyzed separately, since the former age group is still transitioning from school to the labour market, while the latter age group has either invested longer in education and/or transitioned earlier to the labour market. This implies that employment conditions are likely to vary between both age groups, which is what we will examine in our study. Based on human capital theory, labour market experience adds to an individual's level of human capital. Therefore, we hypothesize a higher employment vulnerability of the younger age group during the financial crisis.

Given the biased labour market impact of the financial crisis on the EU youth and expecting a similar cyclical effect in light of the Corona-crisis, this study examines the aftermath of the financial crisis on youth unemployment at the aggregate European level, the EU 27, focusing on unemployment dynamics by education, gender and youth age (see Section 2). To complement the analysis with employment developments, we examine sectoral employment developments between 2008 and 2019 for the age groups 25-64 and 15-24 (see Section 3). The main objective of the study is to extract lessons to help alleviate some of the negative consequences of the Corona-crisis on youth employment. Section 4 provides a first estimation of youth unemployment due to Corona crisis.

2. Youth Unemployment in the EU 27

2.1 Youth unemployment by education level

Human capital theory emphasizes that higher education investments increase employment probability as they lead to higher skills, productivity and income (Mincer 1974; Schultz 1961 and Becker 1962). Higher educated youth should hence face lower unemployment risk since they provide higher profitability for their employers.

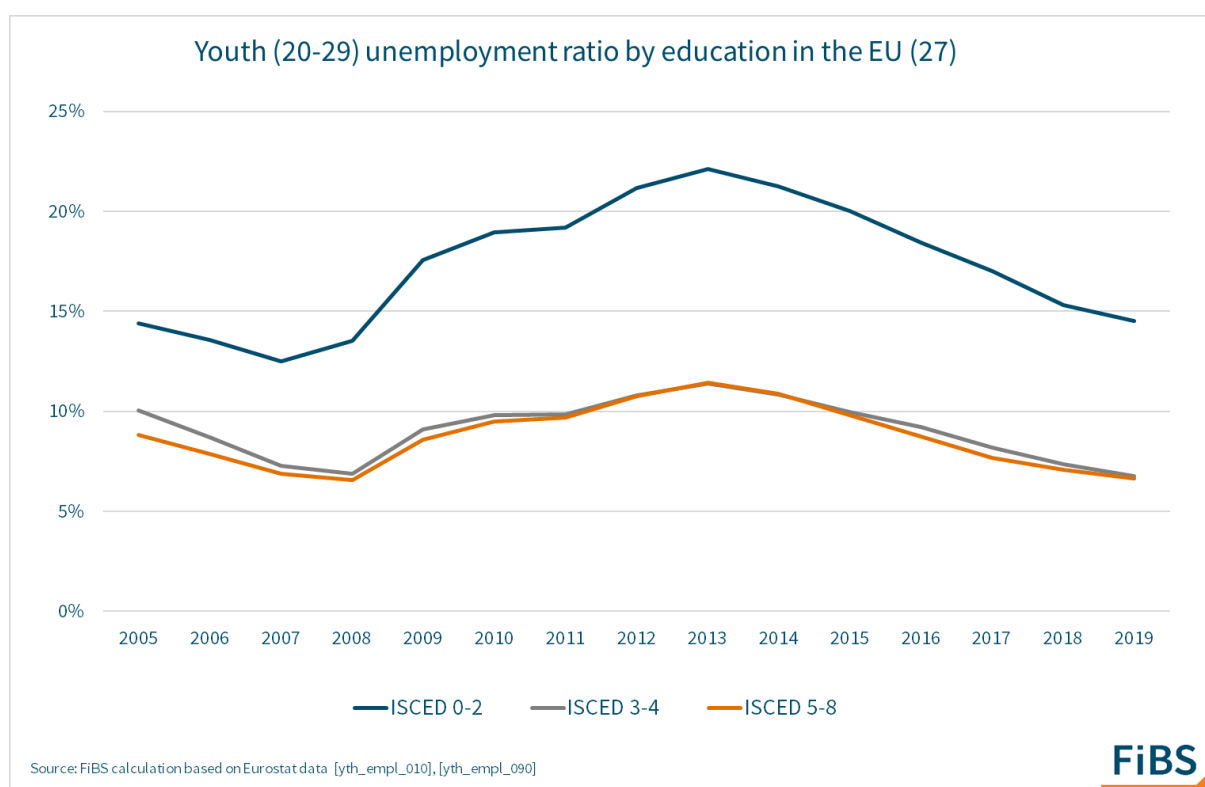


Figure 4: Youth (20-29 years old) unemployment ratio by education levels over time

Figure 4 shows the unemployment ratio of the total youth aged 20-29 by education level over the study period and indicates immediately the large difference between the unemployment level of the low and unqualified youth compared to those with upper secondary and tertiary education. While the ratios varied by “only” 4-percentage points before the crisis, they rose to more than 10 points during and after the crisis. Alike for the difference between overall unemployment and youth unemployment rate, the unemployment level for the low and unqualified is roughly double that high than for the medium and highly skilled youth. Again, alike above, in relative terms the ratios increased in a similar magnitude for all groups. However, during peak of the crisis in 2013, unemployment differences between the low and the higher educated groups reached 11-percentage points. After the peak, unemployment ratios for the medium and highly qualified managed to return in 2019 to their pre-crisis levels, while those of the low qualified remained 2 percentage points higher in 2019 than their pre-crisis level. Finally, the difference in unemployment between the low and the higher educated groups increased from 4 percent to 8 percent between 2005 and 2019.

This finding is an important issue: while the unemployment level of medium and highly qualified arrived eventually returned to its starting levels, this is still not yet the case for the low and unqualified. Moreover, the incline of the curve after the crisis is much steeper for the low and unqualified.

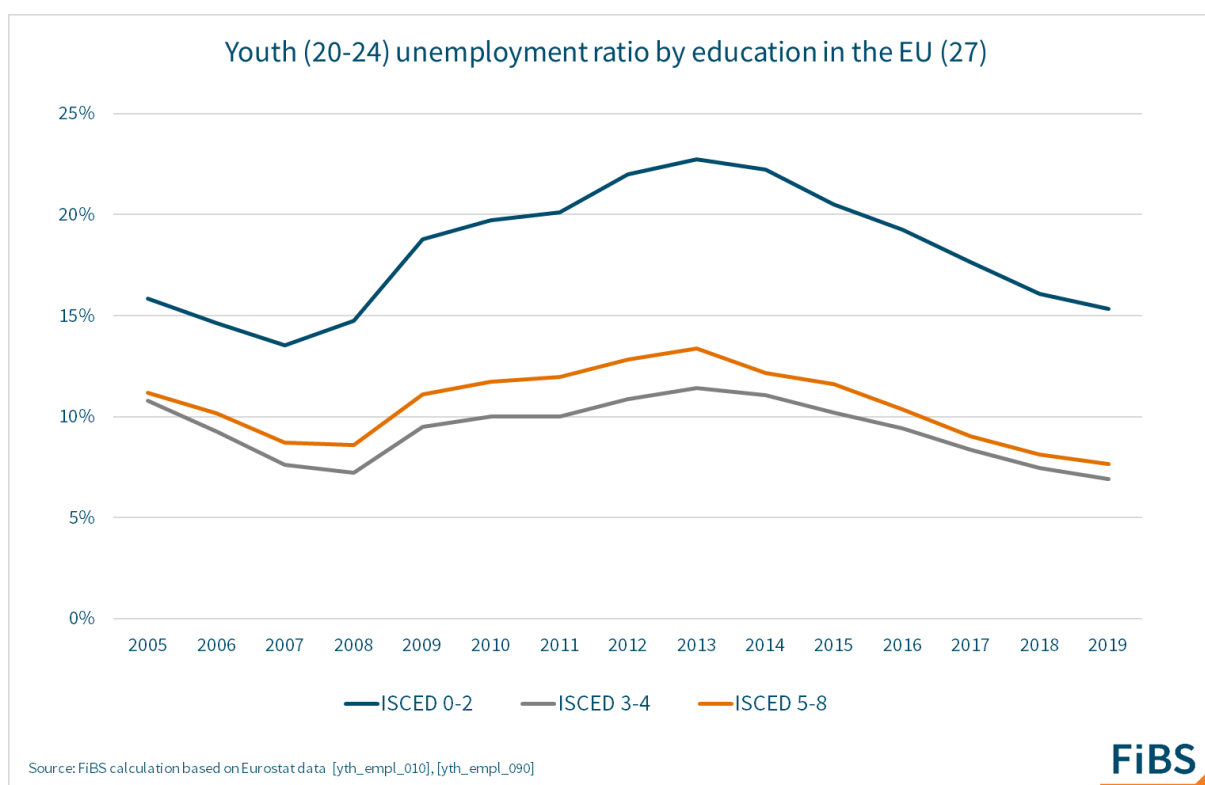


Figure 5: Youth (20-24 years old) unemployment ratio by education levels over time

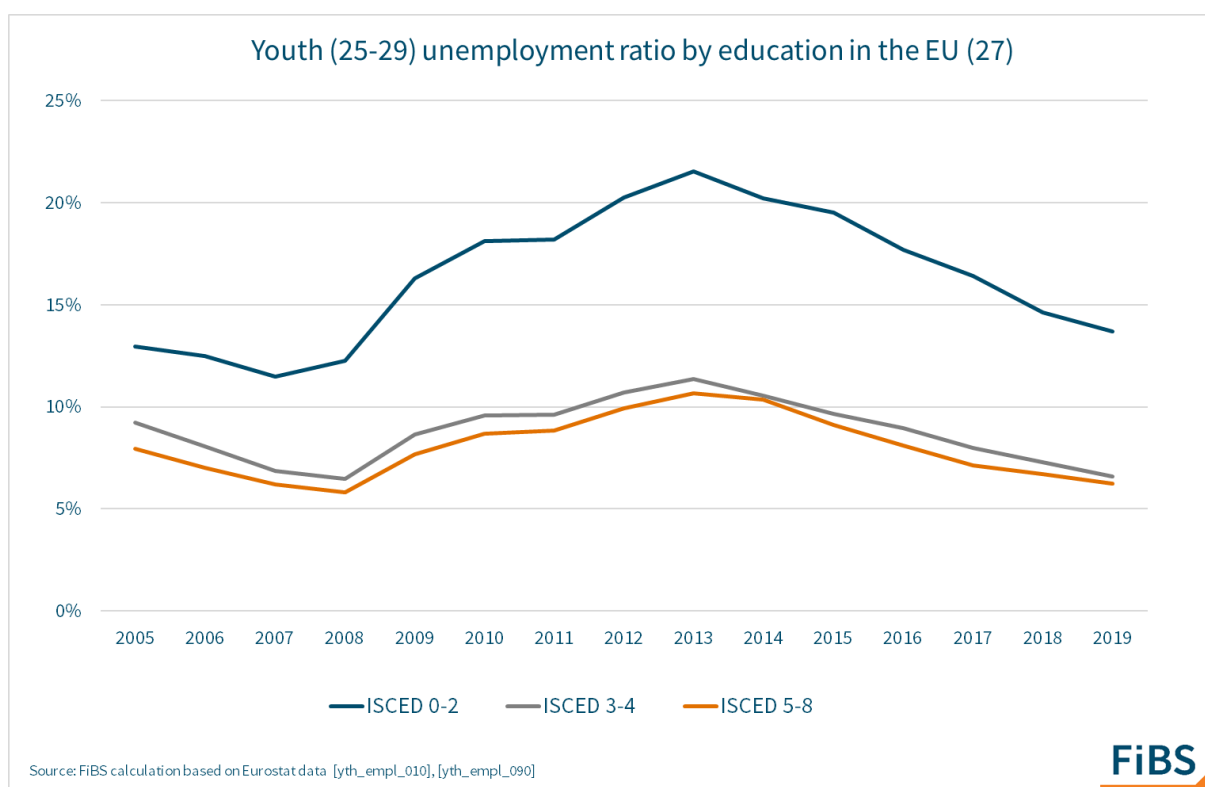


Figure 6: Youth (25-29 years old) unemployment ratio by education levels over time

In a next step, we examine unemployment developments by education level for the age groups 20-24 years and 25-29 years separately, since the younger age group is still transitioning from school or

university to the labour market, while the latter age group has either invested longer in education and/or transitioned earlier to the labour market. Therefore, the two youth age groups might be subject to different labour market conditions, which could be reflected in differences in unemployment levels by education level. Figure 5 shows unemployment by education level for the age group 20 to 24, while figure 6 shows the same figure for the age group 25 to 29.

Two main differences between the youth age groups can be noticed. First, unemployment ratios for the low qualified are around 3-percentage points higher for the 20-24 age group compared to the 25-29 age group over the study period, at 16 percent and 13 percent, respectively. Even for the higher educated groups, unemployment ratios of the older age groups were lower for most of the study period. Second, the unemployment ratio for the those with intermediate education became 2-percentage points lower than the unemployment of those the tertiary education level for the 20-24 age group after 2008, where the difference has dropped to one percentage point after 2016. While those with tertiary education in the age group 25-29 maintained a 1-percentage point lower unemployment ratio to those with intermediate education throughout the study period. Lower unemployment ratios for the older youth age group are likely due to the positive effect of longer labour market experience, especially for those with high qualifications. While the highest unemployment risk is experienced by those with the lowest human capital, especially within the age group 20-24.

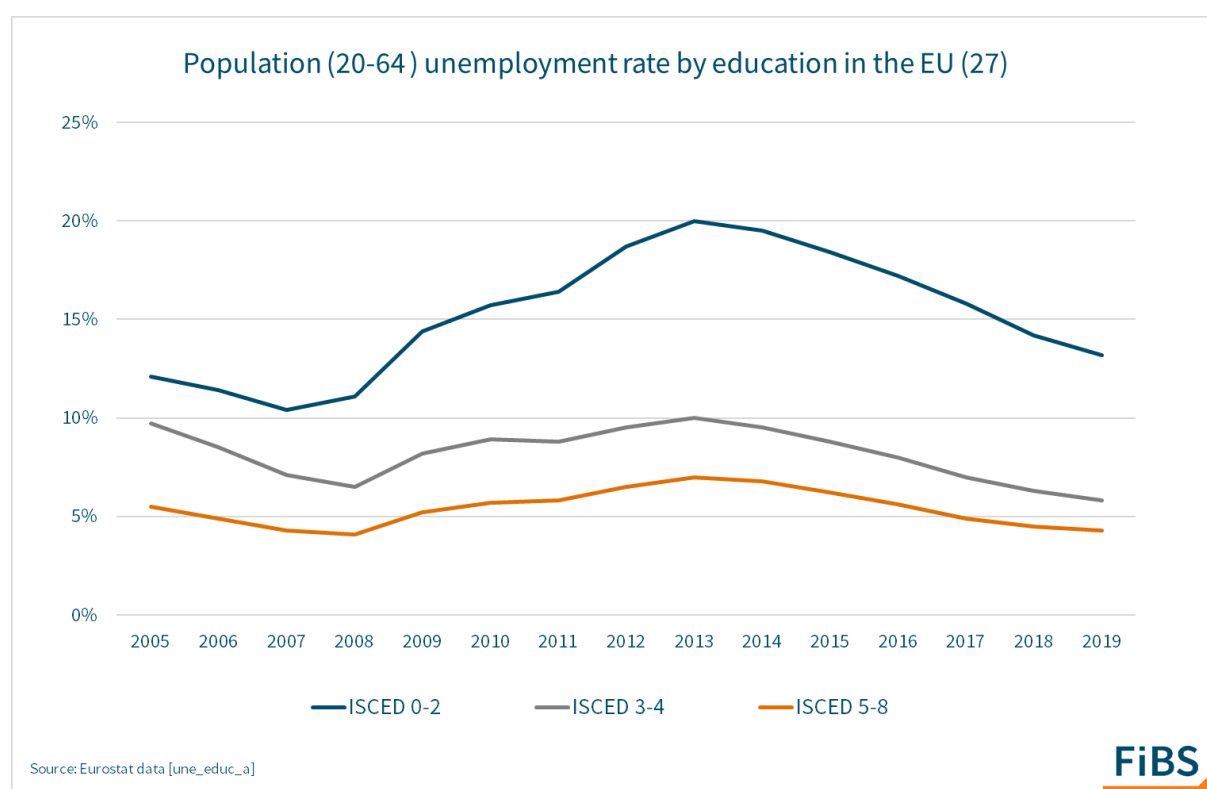


Figure 7: Population (20-64) unemployment rate by education levels in the EU (27)

Comparing the unemployment results for the two youth groups with the total unemployment rate³ for age groups 20 to 64 further highlights the importance of human capital and expenditure on employment. The highly educated had an average of 2-3 percentage point lower unemployment rates compared to the medium qualified over the study period. While the unemployment rates of those with the lowest

³ For the age group 20-64, we calculate the unemployment rate, since the difference between ratio and rate is only pronounced for the age group 20-24.

qualifications remained high and resembled the results found for the age group 25-29. Figure 7 reveals that the level of experience mainly benefits those with the highest education levels.

2.2 Youth unemployment by gender

To examine the gender dimension, figures 8 and 9 show unemployment ratios by gender for the two youth age groups, respectively. Figure 8 shows that males have had a 2 to 3 percentage point higher unemployment level than females throughout most of the study period. Similar to the overall unemployment evolution of youth (20-29 years old) in figure 4, unemployment ratios peaked in 2013 for both genders. Females managed to reach their pre-crisis (2007) unemployment ratio of 9 percent in 2017, while males reached it slightly later in 2019.

Figure 9 shows very similar unemployment trends for both genders also for the 25-29-year-olds, with a steady drop in unemployment, after its peak in 2013, and reaching pre-crisis levels in 2019 for both genders. Males in this age group also witnessed 2 percentage points higher unemployment relative to females until 2015, after which the difference declined. Mirroring what we observed in terms of lower unemployment ratios by education level for this age group compared to the younger one, we also observe slightly lower unemployment ratios by gender for the 25-29 age group, compared to the 20-24 age group.

Both figures 8 and 9 highlight that the youth unemployment of males was more negatively affected than females during and after the crisis. Interestingly, when we consider the unemployment rate by gender for all total population aged 20-64 in figure 10, we find that men had slightly lower unemployment than women throughout the study period. Between 2005 and 2008, males had a 2-percentage point lower unemployment rate compared to women, where this difference became less than 0.5 percent afterwards, since the crisis led to a higher increase of unemployment for males (3 percentage points) than females (1 percentage point). Although the gender trend of unemployment for the total population resembles the trend found for the youth groups, the differences in unemployment between males and females are much smaller for the total population.

Moreover, it should be mentioned that this pattern of a high unemployment level for males could also be observed for the unemployment rate by age and large (see Figure 8 and Figure 4).

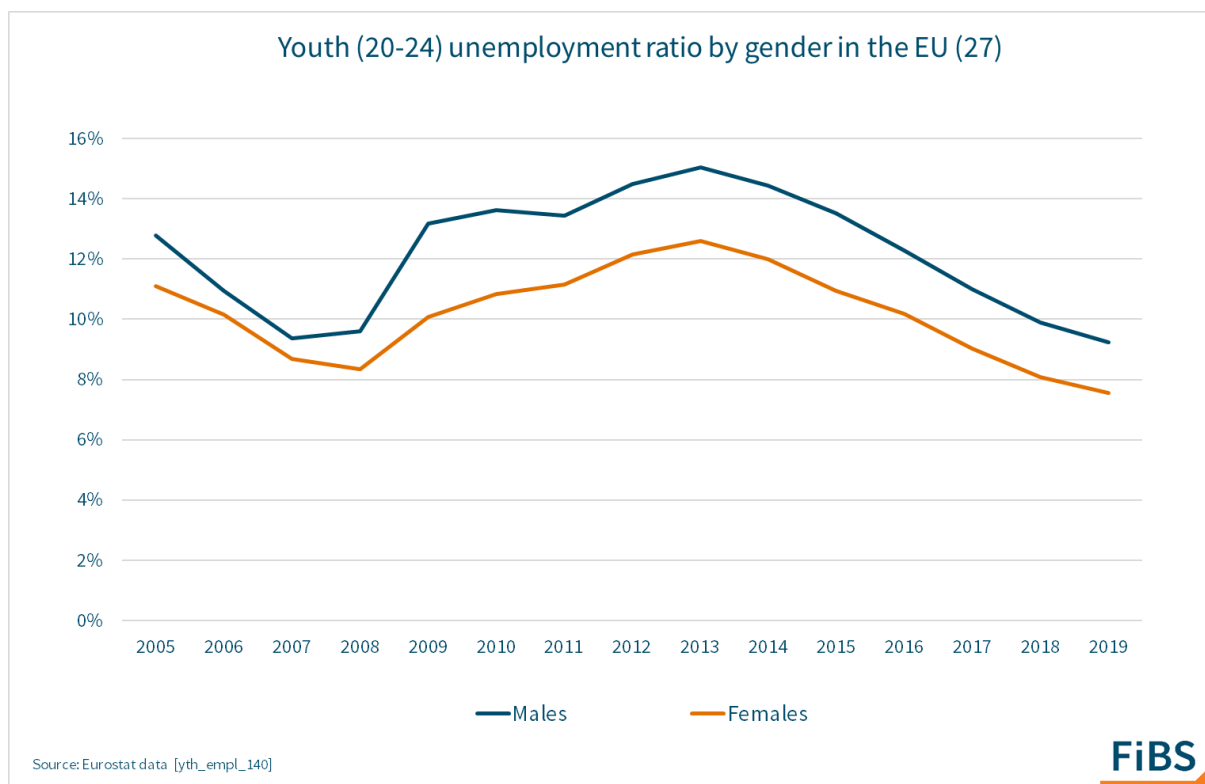


Figure 8: Youth (20-24 years old) unemployment ratio by gender over time

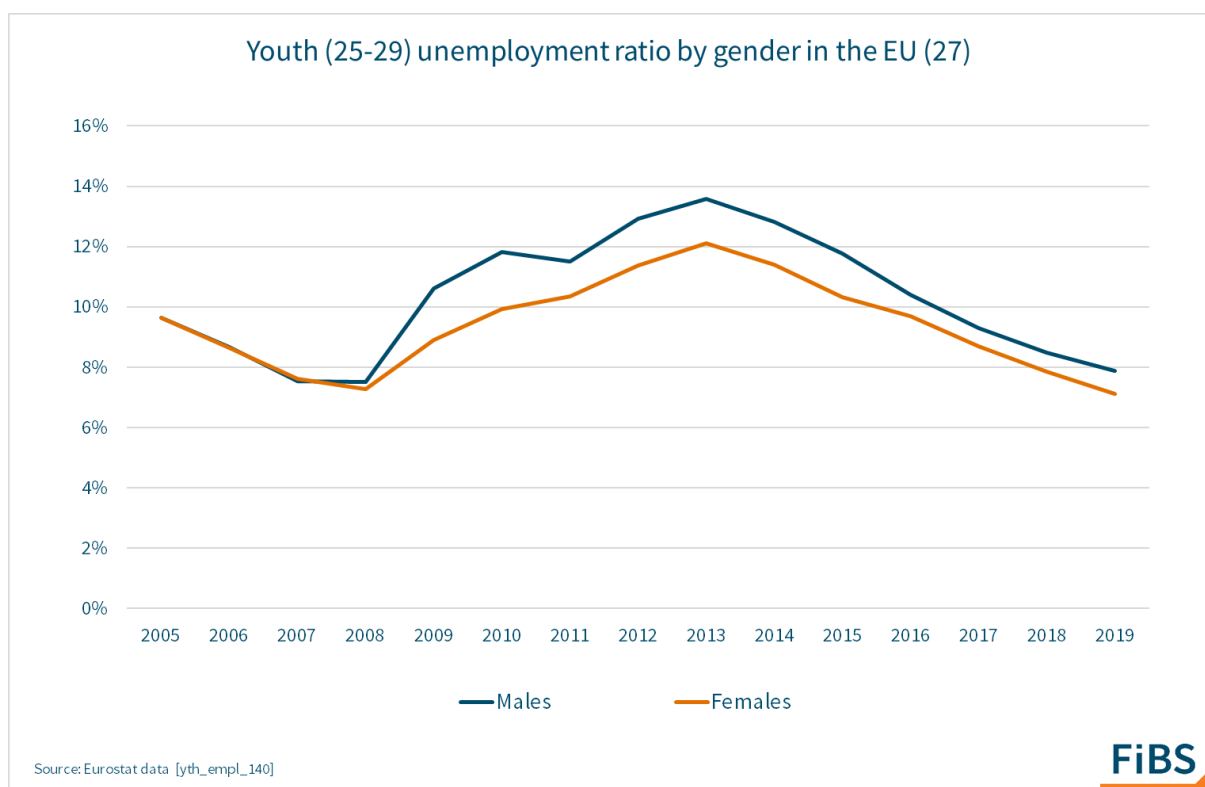


Figure 9: Youth (25-29 years old) unemployment ratio by gender over time

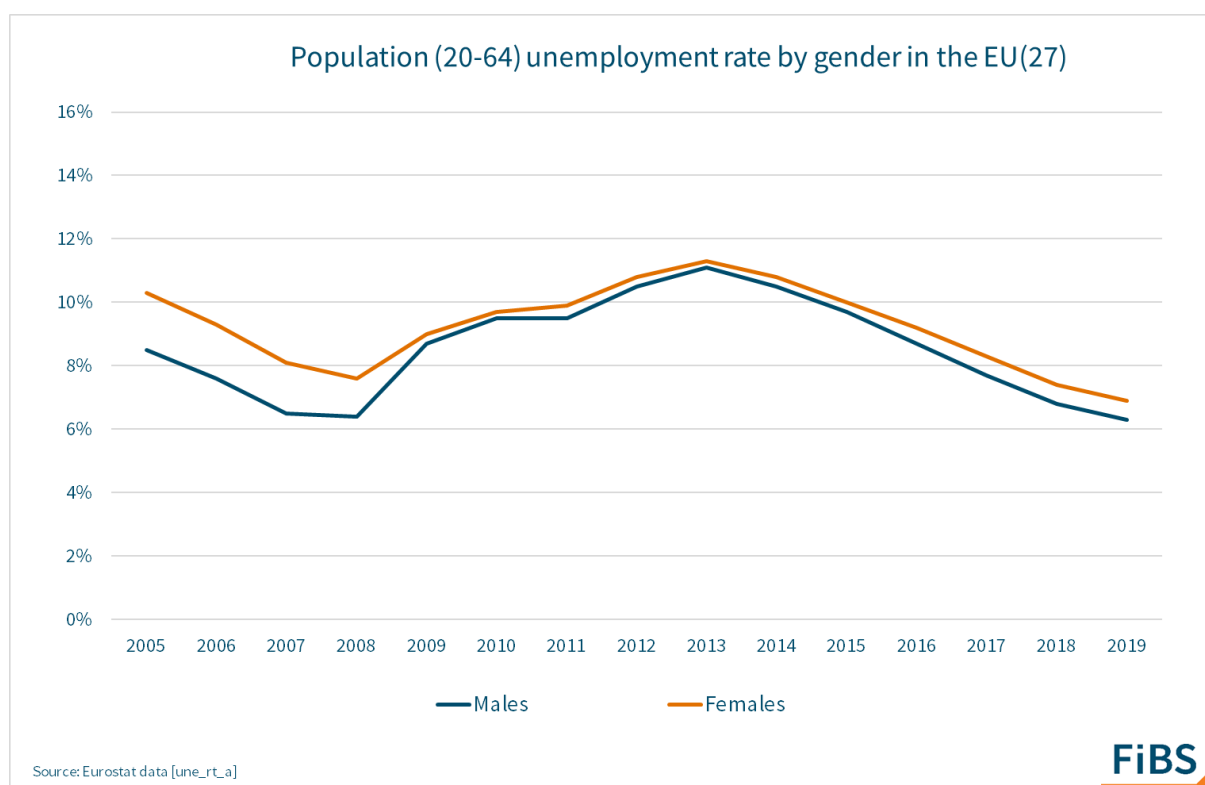


Figure 10: Population (20-64) unemployment rate by gender in the EU(27)

2.3 Youth unemployment by gender and education

To assess the interaction between gender and education on unemployment, figures 11 and 12 show unemployment ratios by education level and gender for both youth age groups, respectively. Figure 11 shows lower unemployment ratios for females compared to males for low and highly qualified in the age group 20-24, mirroring the lower female unemployment ratio shown in figure 8. Interestingly, unemployment rates for the highly qualified are higher than for medium qualified, though very similar for men, while the difference for women is substantial (4 percentage points to the advantage of medium qualified compared to highly qualified).

Unemployment ratios of the highly educated increased from 8 to 13 percent for males and from 9 to 14 for females between 2007 and 2013, after which they steadily fell, reaching 8 percent in 2018 for both genders. Differences in unemployment by gender were most pronounced for the lowest education group to the disadvantage of males, where the difference to female youth unemployment increased from a 1-percentage point in 2007 to 5-percentage points in 2009 and maintained this high level until the end of the study period.

Combining the latter result to figure 5 shows that it was particularly the low qualified males whose unemployment was disproportionately affected during and after the crisis. The unemployment of the low qualified males increased from 14 percent to 24 percent between 2007 and 2013, after which it fell to 17 percent in 2019, which is still above the lowest unemployment level in 2007. Interestingly, medium-level qualified females had the lowest unemployment level in this age group, being 2-percentage points less than that of the highly qualified. In contrast, the unemployment of medium-level qualified males was similar to that of high qualified males over the study period, and sometimes even lower. This suggests that the time for transition into employment plays a role, though even job preparedness or trade of training may be of importance.

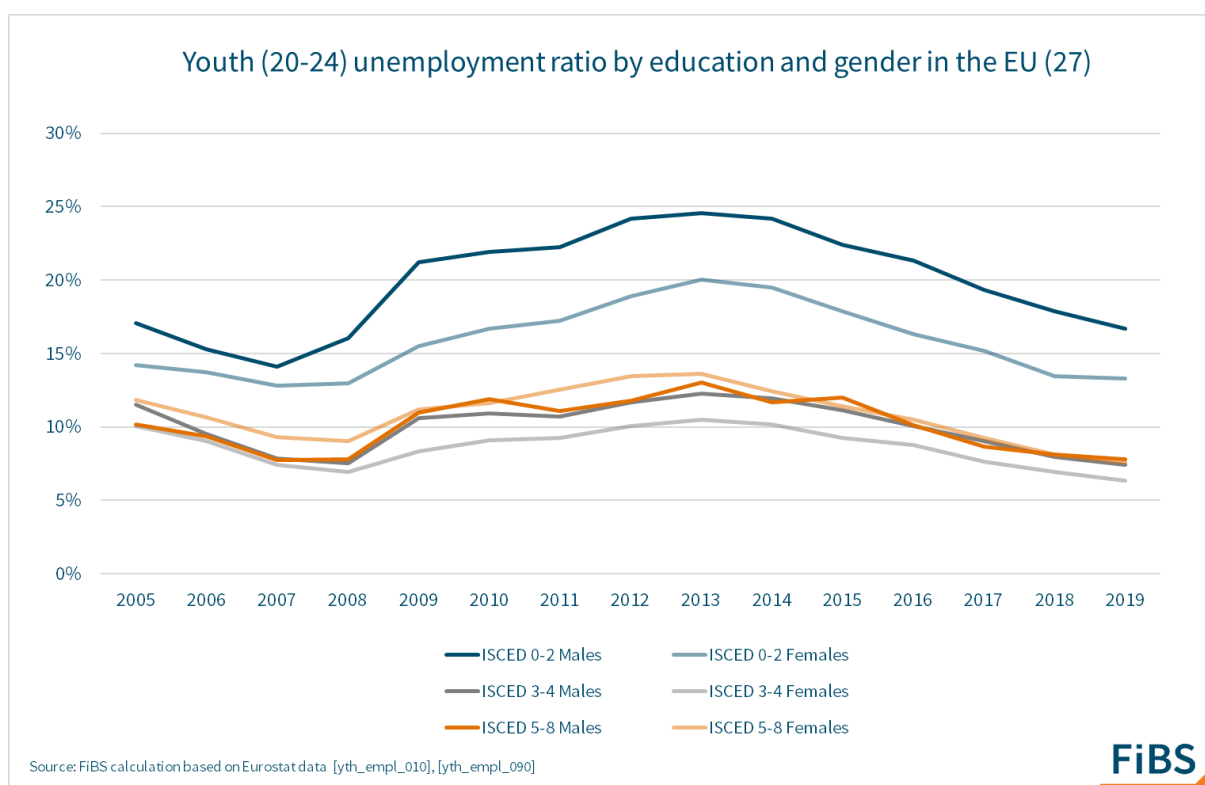


Figure 11: Youth (20-24 years old) unemployment by education and gender over time

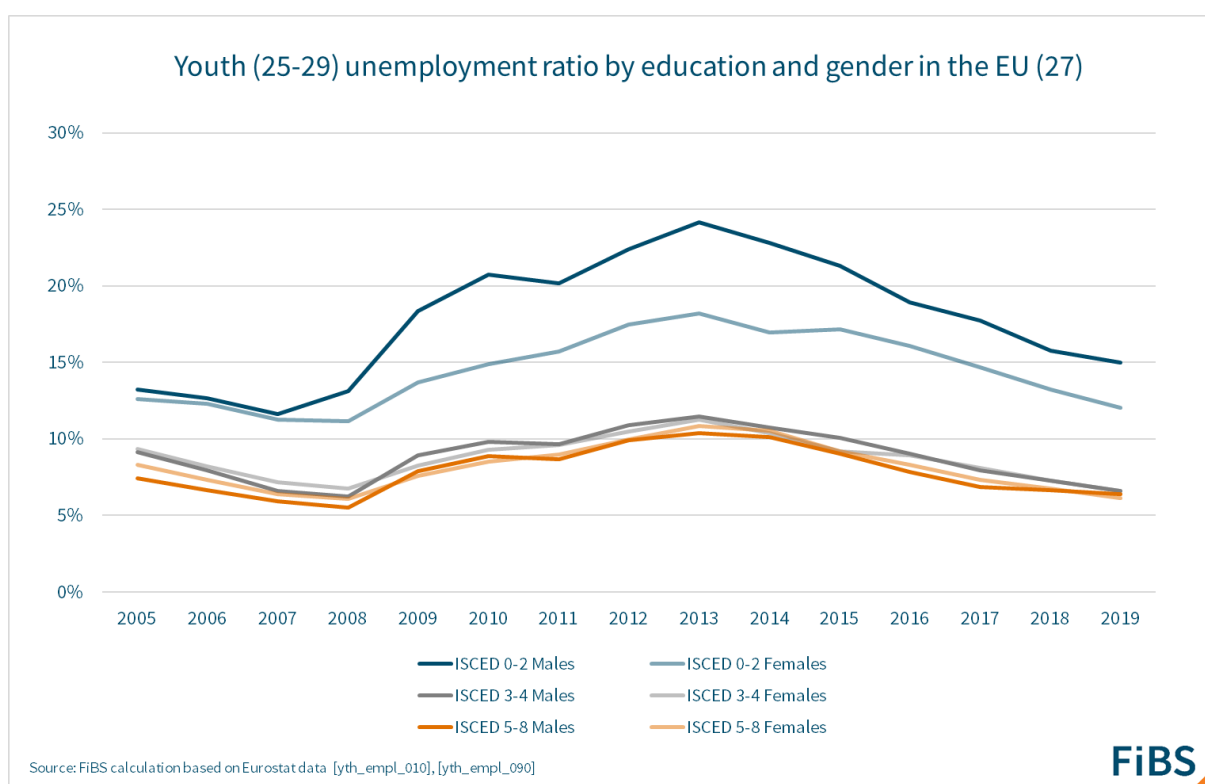


Figure 12: Youth (25-29 years old) unemployment by education and gender over time

Examining the interaction between education level and gender for the older youth group in figure 12 shows a similar trend than for the younger age group, especially for the lowest educated group. However, the low qualified males and females in this age group had an identical unemployment ratio of 12 percent

in 2007, which is 2 to 3 percentage points lower than the ratio for the younger age cohort with the same education qualification. Similar to the younger age group, unemployment gaps between low educated males and females increased after 2007, reaching a 6 percentage point difference in 2013 (with absolute values slightly lower than the peak values of the younger age group) and narrowing to 3 percentage points by 2019, with unemployment ratios of 15 percent and 12 percent for males and females, respectively. Older low qualified males had a 2-percentage point lower unemployment compared to the younger cohort. This is again probably because of the higher experience level for the older age group. For the middle and highly qualified 25-29-year-olds, we find an almost identical unemployment pattern over the study period. Nevertheless, the highest qualified males and females have slightly lower unemployment ratios than the middle-qualified, which was not found in the younger age cohort.

The change in unemployment rates between medium and highly qualified in the older age cohort (25 to 29 years of age) suggests that transition into employment plays a more important role than labour market preparedness of training or trade structure.

2.4 Summary

To summarize the main findings of section 2, the financial crisis led to rising unemployment ratios among youth in the EU 27 after 2008, which peaked in 2013 and started to fall after that. The middle and high qualified youth (20-29 years old) had the lowest percentage point increase in unemployment between 2007 and 2013, which rose from 7 percent to 11 percent, and managed to reach their pre-crisis levels by 2017. While the low qualified youth were disproportionately hit by the crisis, witnessing an increase in unemployment levels from 13 to 22 percent between 2007 and 2013. Moreover, they have also not managed to return to their pre-crisis unemployment level in 2019.

When we disaggregate these results by youth age, gender and education, we find that males were commonly more negatively hit by the crisis than females, with the gender differences being largest for the least qualified, and more so for the younger youth group aged 20-24. Differences between male and female unemployment are significantly lower for the higher educated groups and become lower with increasing age. We also find that the youth aged 25-29 had around 2 to 3 percentage point lower unemployment ratios compared to the younger age group. In contrast to the 20-24 year olds, the unemployment rates of those with tertiary education was lower compared to medium qualified.

This suggests that the transition period of those with tertiary qualifications is a matter of concern for the younger age groups, where those with upper secondary education had more time to enter into employment. This finding indicates that those with medium qualifications have a short-term advantage against the highly qualified, while in the longer run the value of human capital becomes more important. These results are further confirmed when examining unemployment rates by education for the total population aged 20-64, where the highest educated group had the lowest unemployment rates over the study period with a stable margin of least 2 percentage points.

3. Implications of economic development on youth employment

In this section we complement the human capital analysis of the previous section with sectoral analysis for the 27 EU countries between 2008 and 2019, considering that the gender segregation of sectors is a common feature of European labour markets. The gender impact of the crisis can be explained by the fact that females are concentrated in specific sectors and under-represented in others, while the opposite applies to males. In many European countries, females represent around 80 percent of the workers in health, education and social services, compared to only 10 percent or less in the construction sector. In contrast, men are overrepresented in construction and manufacturing (Pérvier, 2014).

To assess the dynamics between GDP and employment growth by sector, gender and age-group in the 27 EU countries during and after the great recession, table 1 shows the sector size as a share of total employment in 2008 and 2019, in addition to GDP growth rates and quarterly employment growth rates by economic sector during the crisis (between 2008 to 2010) and after the crisis (between 2011 to 2019) in the male-dominated, female-dominated and gender-balanced⁴ occupations, respectively, for the age group 25-65. Table 2 complements the analysis with employment changes for the youth age group 15-24. Since the data for the younger age group also include the age groups 15-19 who are predominantly still in education, the results of the analysis for youth should be read with some caution. The objective of the age group division in this section is to assess the differences in employment dynamics between the relatively young youth who are either in study or just transitioning into the labour market, and the older population who have already transitioned into the labour market and acquired labour market experience.

3.1 Employment development for the age group (25-64)

Table 1 shows falling GDP growth rates for almost all male-dominated sectors between 2008 and 2010, while almost all female-dominated as well as most gender-balanced sectors still grew during the crisis – with few exceptions only (e.g. water supply, waste management and electricity among the male dominated sectors). In most cases, employment development followed the GDP growth path, i.e. if GDP shrinks employment also decreases and vice versa. The important gender implication of this is that – since most male-dominated branches experienced negative GDP growth, while most female-dominated as well as in most gender-balanced sectors grew even during the crisis – employment in male-dominated sectors decreased while employment in female-dominated and gender-balanced branches grew for the age group 25-65. If employment decreases, it affects even more the younger population, which is highlighted by the employment development of youth aged 15 to 24 years of age, which shows even larger shrinking rates during the crisis in the male-dominated sectors and mainly negative rates in the female-dominated and gender-balanced sectors. Thus, youth was commonly negatively affected, even if overall employment grew during the crisis.

Although growth rates improved for most sectors after the crisis, linked to employment growth among 25 to 64 year olds for most male as well as female-dominated sectors alike, employment development for youth was still less positive for almost all sectors, as shown in table 2. In various branches it remained even negative for youth, in spite of overall job growth, which is particularly the case for male-dominated sectors, such as, for example, agriculture, manufacturing. In construction, job loss continued for all age

⁴ An occupation is defined as gender-dominated if the employment of the gender category makes up least 65 percent of total employment in the respective sector, while gender-balanced sectors are those where each gender group makes up between 45-55 percent of total sector employment.

groups, but youth was far more strongly affected. The same discrepancy can be observed for female-dominated branches, apart from education.

These findings explain on the one hand why the unemployment of male youth increased more strongly than that of women, particularly among the low qualified: agriculture and construction, but to some extent also manufacturing are male-dominated and often linked to low qualifications.

Looking more into the details, the most significant recession in relation to sector employment shares was in the sectors of construction (-10.4 percent), manufacturing (-6.2 percent) and agriculture (-2.8 percent). These sectors had an employment share of 18 percent, 8.2 percent and 5.4 percent, respectively, in 2008. The twin combination of low output and high employment shares led to an employment destruction of 8.8, 8.5 and 2.8 percent in the manufacturing, construction and agriculture sectors, respectively, during the recession. The only sectors that witnessed an economic expansion during this period are those of water supply/waste management (6.4 percent) and electricity (6.9 percent). As these sectors employment share is only 1.6 percent, they could not compensate for the large shrinking employment in the other sectors.

Conversely, average GDP growth rates in the female-dominated sectors expanded by 6 percent during the same time frame. All female-dominated sectors, apart from other service activities, witnessed job expansions in line with the positive GDP growth rates.

In the health and social work sector, where females make up 78 percent of the labour force, employment grew by a substantial 7.3 percent, even in this peak recession phase. This was followed by the education sector, which grew by 1.1 percent during the crisis. Coupled with the fact that both sectors employ around 16 percent of this age group explains why employment in the female-dominated sectors was less negatively damaged for the age group 25-64 compared to male employment in the male-dominated sectors.

The gender-balanced sectors of financial and insurance activities, public administration & defence and arts witnessed positive GDP growth rates of 9.1, 5.1 and 3.5 percent, respectively, which drove positive employment growth rates of around 2.5 percent between 2008 and 2010. While the rest of the sectors had falling GDP growth rates, especially wholesale & retail trade which contracted by 3.4 percent, leading to a 1.4 percent lower employment rates during the recession. Since the lion's share of employment in 2008 was in wholesale & retail, with an employment share of 13.6 percent, this meant that employment in the gender-balanced sectors also suffered during the recession. Interestingly, although the GDP growth rates in both the administrative activities and professional activities sector shrank by around 2.5 percent, employment in these sectors increased by 6 and 1.3 percent between 2008 and 2010, respectively.

A clear difference in employment destruction between blue-collar jobs and white-collar jobs during the crisis in all sectors can be noted. Specifically, blue-collar occupations were disproportionately affected during the recession, while most of the white-collar occupations had less negative or even positive employment growth rates. This can be explained by the fact that white-collar occupations require higher human capital, making them less affected by economic shocks compared to blue-collar occupations, confirming that higher human capital leads to lower unemployment rates and risk in times of crisis. Figure 13 shows the qualification structure of employees in 2008 for all the occupations in table 1. Between 30 percent and 67 percent of employees in white-collar occupations such as education, professional activities, information and communication, health and public administration have a high level of education, while the share of those having low education does not exceed 15 percent. Conversely, over 80 percent of employees in the blue-collar occupations of manufacturing, construction and agriculture attained low to medium levels of education.

Economic Activity (by NACE)	During Recession (2008 to 2010)			After Recession (2011 to 2019)		
	Sector size (2008)	GDP Growth Rate	Employment Growth Rate	Sector Size (2019)	GDP Growth Rate	Employment Growth Rate
Total - all NACE activities		-0.9%	-0.9%		18.7%	8.1%
Male-dominated Sector						
Agriculture, forestry and fishing	5.4%	-2.8%	-1.4%	4.1%	13.1%	6.9%
Mining and quarrying	0.4%	-13.7%	0.2%	0.3%	-32.1%	-12.2%
Construction	8.2%	-10.4%	-8.5%	6.8%	13.9%	-1.3%
Water supply; sewerage, waste management and remediation activities	0.8%	6.4%	2.4%	0.9%	17.9%	19.9%
Electricity, gas, steam and air conditioning supply	0.8%	6.9%	10.3%	0.7%	3.2%	-3.8%
Manufacturing	18.2%	-6.1%	-8.8%	16.5%	23.1%	4.6%
Transportation and storage	5.4%	-1.5%	-2.5%	5.5%	20.0%	13.3%
Information and communication	2.7%	-1.9%	4.8%	3.2%	24.4%	21.4%
Female-dominated Sector						
Education	7.1%	4.8%	1.1%	7.5%	15.9%	10.8%
Human health and social work activities	9.4%	7.3%	7.3%	10.5%	21.4%	16.7%
Other service activities	2.4%	0.6%	-2.2%	2.4%	12.4%	10.8%
Households as Employers, Production for Own Use	1.3%	3.2%	8.7%	1.1%	-0.3%	-17%
Gender-balanced Sector						
Wholesale & retail trade; repair of vehicles	13.6%	-3.4%	-1.4%	13.3%	19.4%	6.9%
Public administration & defence; compulsory social security	7.5%	5.1%	2.7%	7.2%	12.1%	0.8%
Financial and insurance activities	2.9%	9.1%	2.0%	2.8%	5.1%	-0.7%
Real estate activities	0.7%	0.1%	-0.9%	0.8%	16.6%	8.7%
Professional, scientific and technical activities	4.7%	-2.4%	1.3%	5.6%	26.6%	23.8%
Administrative and support services	3.6%	-2.6%	6.3%	4.2%	36%	20.3%
Arts, entertainment and recreation	1.3%	3.5%	2.0%	1.5%	18.0%	20.7%
Accommodation & food service activities	3.8%	-0.7%	0.3%	4.2%	28.4%	17.6%

Source: FiBS calculations based on data from Eurostat

Table 1: Sector size (share of total employment) in 2008 and 2019, GDP (in current Prices, million euros) growth rates and Sectoral Employment growth rates during and after the Great Recession in the male-dominated, female-dominated and gender-balanced sectors for the Age group (25-64).

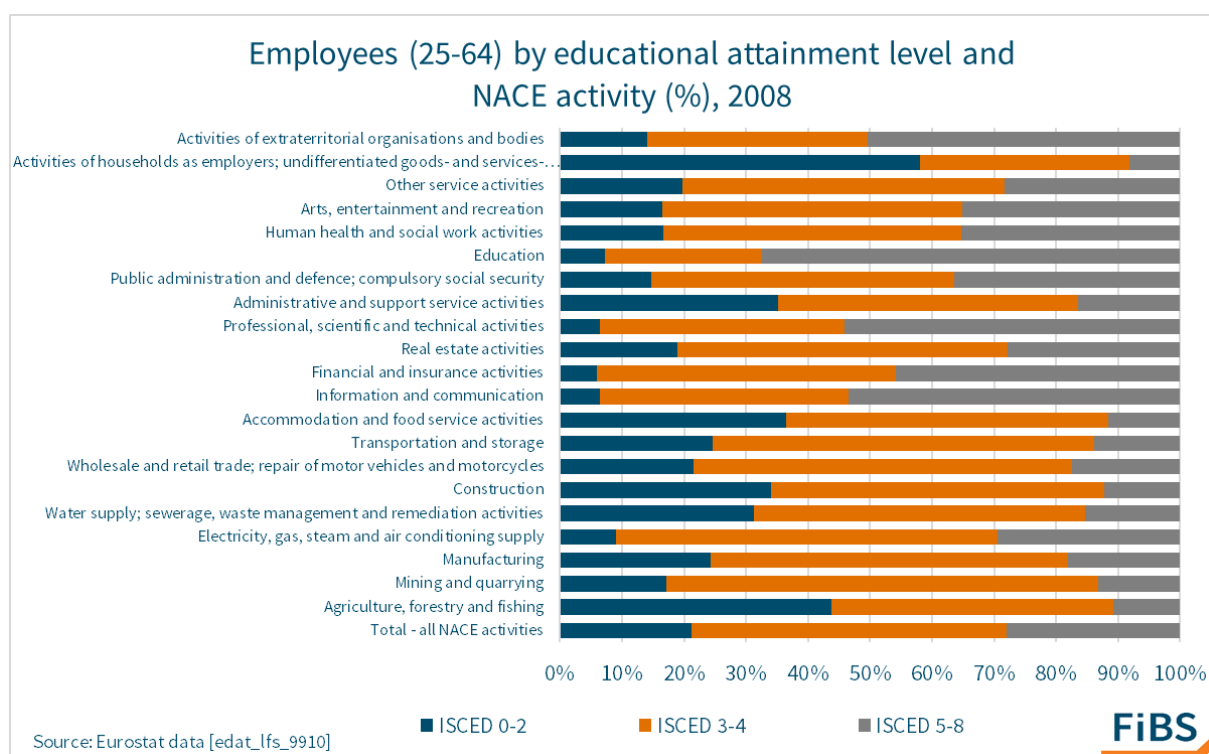


Figure 13: Qualification structure of employees (25-64) by NACE activity (%), 2008

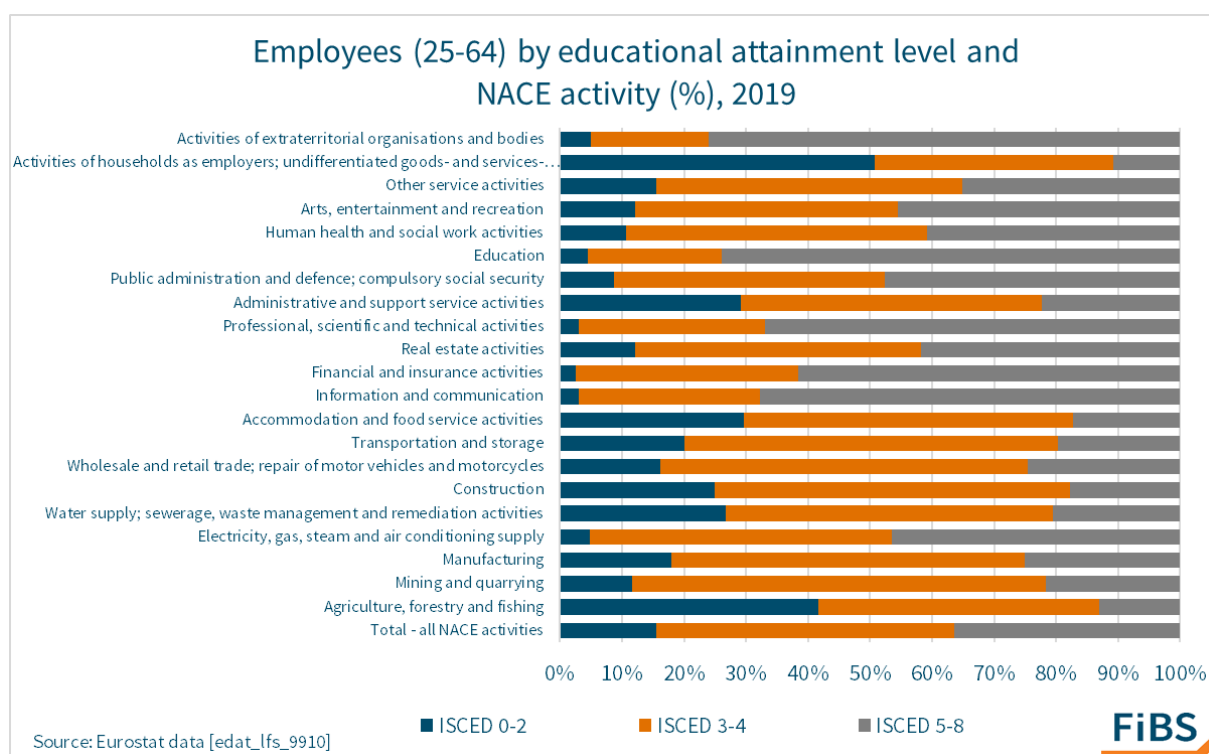


Figure 14: Qualification structure of employees (25-64) by NACE activity (%), 2019

The period between 2011 and 2019 witnessed significant employment growth in all female, gender-balanced and most male-dominated sectors (except for mining, construction and electricity). It is worthy to note that while the share of employment in the white-collar occupations remained stable or increased slightly after the recession, it shrank by 2 percent in the blue-collar occupations of agriculture, manufacturing and construction. In terms of sector qualification structure in 2019, there has been a

general upscale of education requirements for both the white and blue-collar occupations, as shown in Figure 14.

Overall, total employment shrank by 0.9 percent during the crisis period and expanded by 8.1 percent between 2011 and 2019 for the age group 25-64. As we are analyzing employment developments over time, demographic developments must also be considered since they could also drive employment dynamics. As the population growth rate for this age group remained almost stable over the study period, we can rule out that changes in employment were further affected by shifts in demography.

Eventually, figures 13 and 14 highlight that the qualification structure moved onwards to higher qualification levels, which means that employment opportunities become particularly worse for those with low qualification, but often also for those with medium-level qualifications.

3.2 Employment development for the age group (15-24)

Employment dynamics for the youth cohort aged 15-24 during and after the recession are presented in Table 2.

Total youth employment between 2008 and 2010 shrank by a significant 13.8 percent. Like the results found for the older age group in the male-dominated sector, the sectors of manufacturing, construction and agriculture had the highest employment shares and suffered the largest drop in GDP as well as employment rates during the recession. In spite of positive GDP growth rates in the female-dominated sectors during the recession, employment growth rates for the youth were negative in all sectors, except for the health sector, which grew by a modest 0.6 percent. Since this sector also employs the lion's share of (mainly) females in this age group, this may have helped to alleviate some of the recession effects for females. Moreover, employment growth rates were negative for all branches in the gender-balanced sector during the recession, despite positive GDP growth rates in some of these sectors.

Figure 14 shows the qualification structure of the youth by economic sector in 2008. Here we see a clear difference compared to the older age group. Namely, the share of persons in white-collar occupations with low and medium education levels are higher for the 15-24 age group compared to the older age group. Similarly, the share of those with low education levels is higher for the youth working in the blue-collar sector compared to the older age group. Such differences are understandable given that a large share of the younger age group is still in education, and the majority work in part-time low-skilled jobs to fund their life and education expenses. The lower education levels of youth on average in all the sectors could also explain why their jobs were more subject to destruction during the recession.

Although the GDP growth rates were positive for all but one male-dominated sector (mining & quarrying) and overall employment growth, job opportunities for the youth further shrank between 2011 and 2019 in almost all these branches, except for transportation/storage and information/communication, which grew by 16.7 and 11 percent, respectively. Job loss for the youth has even been an issue in construction and manufacturing, which are the largest branches and where at least manufacturing showed an overall employment growth.

In contrast, employment growth rates in the female-dominated sectors of education and health increased by 14.4 and 4.8 percent for the youth, which is even above the overall employment growth rate of 11% in education, while lower in health. The gender-balanced sectors witnessed job recovery in three of its seven branches, namely in professional activities, arts and accommodation & food service sectors, which grew by 12, 33 and 26 percent, respectively. It is noteworthy to mention that the wholesale & retail sector employed a significant 20 percent of the youth over the study period. However, employment in this sector shrank by 13.5 percent during the recession and only minimally recovered afterwards.

Economic Activity (by NACE)	During the Recession (2008 to 2010)			After the Recession (2011 to 2019)		
	Sector Size (2008)	GDP Growth Rate	Employment Growth Rate	Sector Size (2019)	GDP Growth Rate	Employment Growth Rate
Total - all NACE activities		-0.9%	-13.8%		18.7%	1.9%
Male-dominated Sectors						
Agriculture, forestry and fishing	4.3%	-2.8%	-6.2%	3.7%	13.1%	-17.6%
Mining and quarrying	0.2%	-13.7%	-17.2%	0.2%	-32.1%	-37.4%
Construction	10.2%	-10.4%	-21.6%	6.5%	13.9%	-20.4%
Water supply; sewerage, waste management & remediation activities	0.4%	6.4%	-26.0%	0.5%	17.9%	-3.5%
Electricity, gas, steam and air conditioning supply	0.4%	6.9%	2.4%	0.5%	3.2%	-2.7%
Manufacturing	18.2%	-6.1%	-24.4%	15.7%	23.1%	-0.8%
Transportation and storage	3.7%	-1.5%	-15.3%	4.2%	20.0%	16.7%
Information and communication	2.7%	-1.9%	-16.9%	2.7%	24.4%	11.7%
Female-dominated Sectors						
Education	3.1%	4.8%	-8.5%	4.2%	15.9%	14.4%
Human health and social work activities	7.3%	7.3%	0.6%	8.9%	21.4%	4.8%
Other service activities	3.1%	0.6%	-16.3%	2.6%	12.4%	-10.5%
Households as Employers, Production for Own Use	1.0%	3.2%	-9.2%	0.5%	-0.3%	-59.7%
Gender-balanced Sectors						
Wholesale & retail trade; repair of vehicles	20.4%	-3.4%	-13.5%	20.2%	19.4%	0.1%
Public administration & defence; compulsory social security	4.1%	5.1%	-8.4%	3.7%	12.1%	-6.1%
Financial and insurance activities	2.0%	9.1%	-13.4%	1.7%	5.1%	-17.3%
Real estate activities	0.5%	0.1%	-25.4%	0.5%	16.6%	-5.5%
Professional, scientific and technical activities	3.5%	-2.4%	-17.8%	4.0%	26.6%	12.0%
Administrative and support service activities	4.0%	-2.6%	-7.3%	4.0%	36%	-5.3%
Arts, entertainment and recreation	1.9%	3.5%	-2.0%	2.8%	18.0%	33.0%
Accommodation & food service activities	8.6%	-0.7%	-7.3%	11.0%	28.4%	26.3%

Source: FiBS calculations based on data from Eurostat.

Table 2: Sector size (share of total employment) in 2008 and 2019, GDP (in current Prices, million euros) growth rates and Sectoral Employment growth rates during and after the Great Recession in the male-dominated, female-dominated and gender-balanced sectors for the Age group (15-24).

Similar to the developments in the qualification structure for the older age group, we find an upscale of qualifications for the youth in all sectors in 2019, which becomes evident by comparing figure 15 and 16.

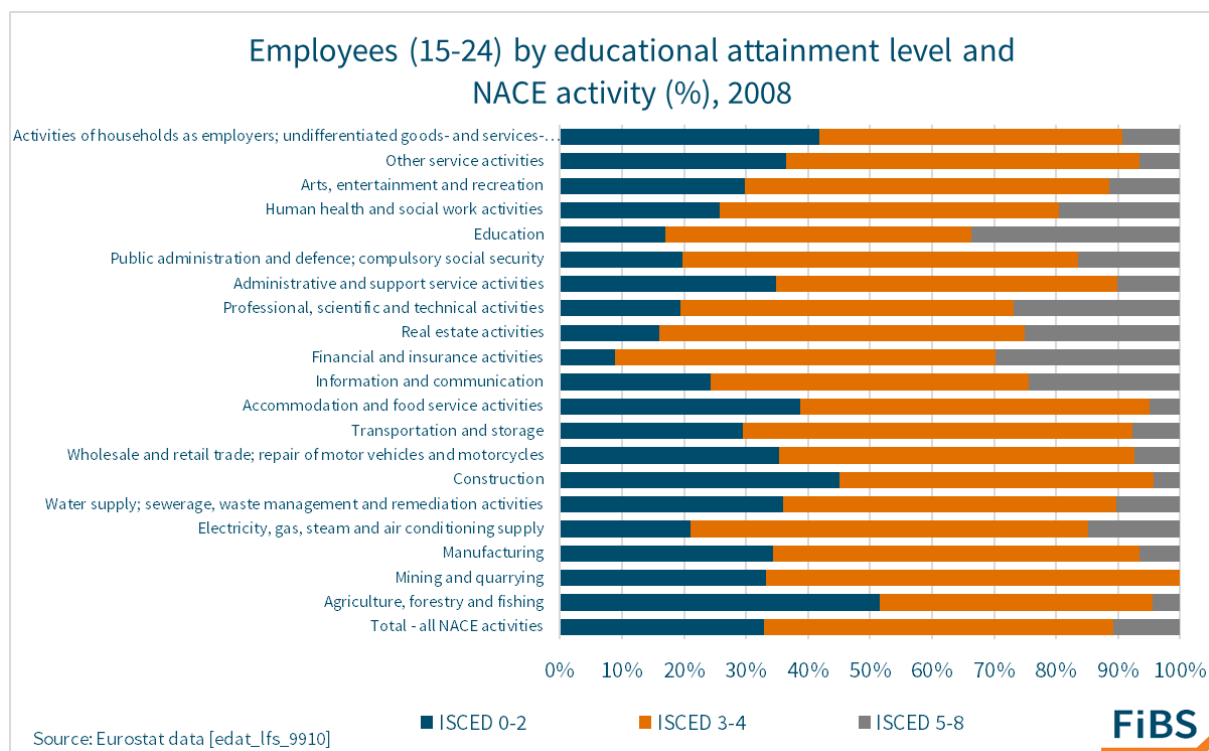


Figure 15: Qualification structure of employees (25-64) by NACE activity (%), 2008

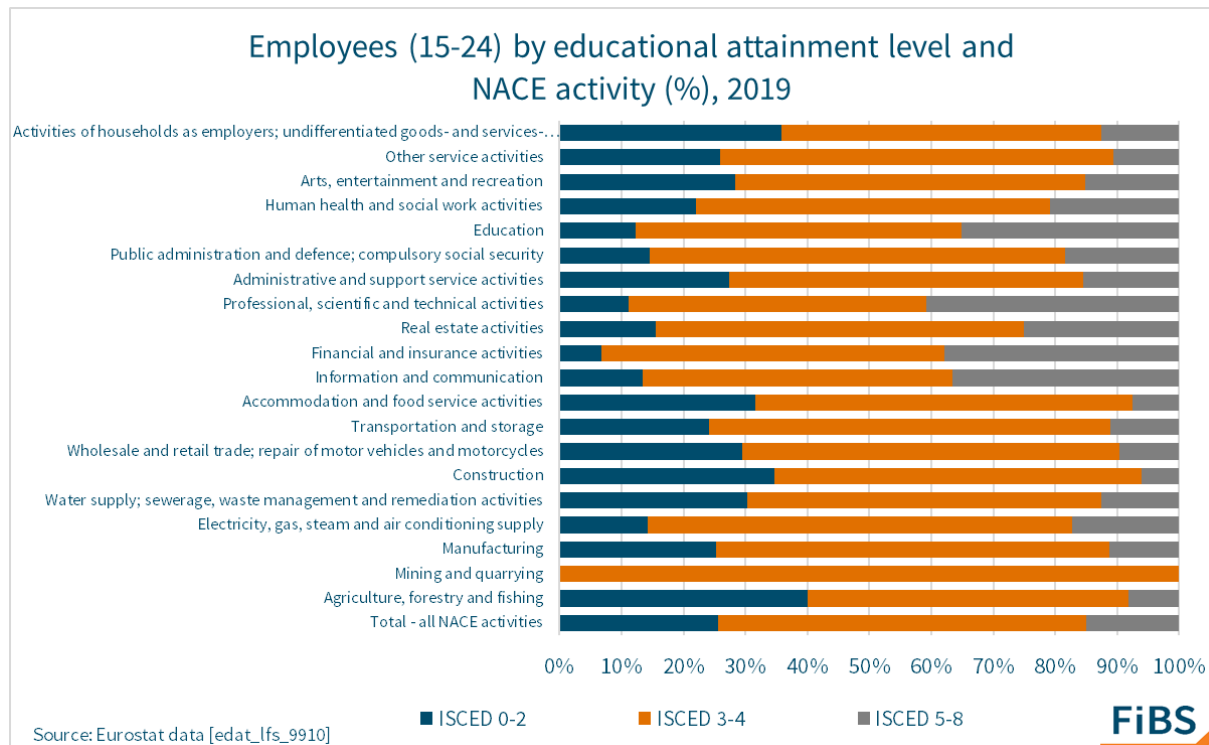


Figure 16: Qualification structure of employees (15-24) by NACE activity (%), 2019

Finally, two additional factors could have further reduced youth employment rates over the study period: negative demographic developments and a high participation rate in education. The population growth

rate for this age group shrank by around 12 percent between 2008 and 2019. Moreover, around 63 percent of all 15-24-year-olds were in education between 2013 and 2018.

4. An estimation: the impact of the Corona-crisis on youth unemployment

The key question of this paper is to estimate what may happen during and – particularly – in the aftermath of the Corona crisis, based on our analysis of the pathways during the financial crisis.

Although we are still at an early stage and the final implications of the Corona crisis on economic development are still unclear, it appears likely that its impact on economic as well as employment development will be much stronger than for the previous downturn. While EU GDP fell in 2009 by 4.8 percent, followed by an increase of more than 3 percent in the first two subsequent years, the expectation is that GDP will drop by 8.7 percent in 2020, followed by an expected increase of 6.1 percent in 2021 (EU summer forecast).

Yet, alike a decade ago, it seems probable that unemployment will not decrease in the years to come, even if GDP returns to its growth path soon. Instead, it may even increase further on because the economy will speed up its structural changes and increase its productivity levels, particularly driven by a substitution of employment by equipment and, particularly, digitalisation and automation (EU 2020).

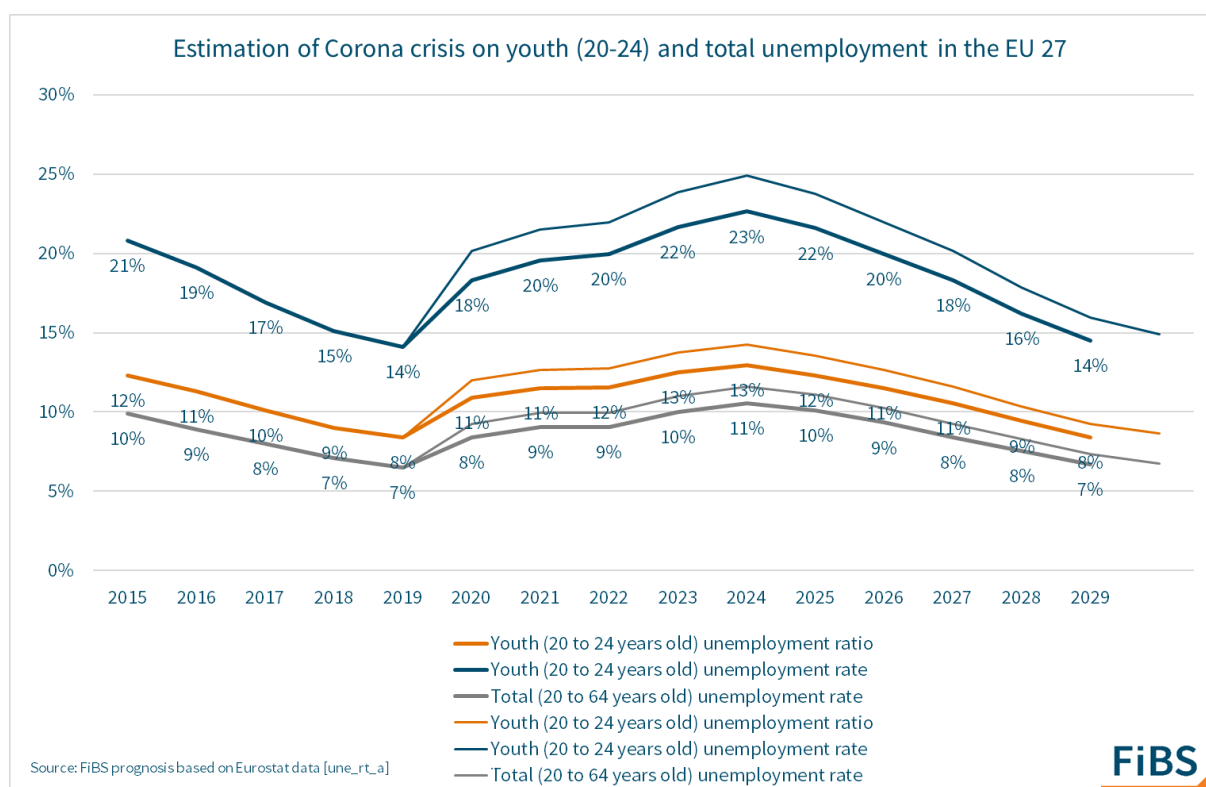


Figure 17: Estimation of impact of Corona-crisis on youth (20-24) and total unemployment in EU 27

The crucial question for the future estimate is: how strong is the initial effect on (youth) unemployment because of the GDP drop in 2020? Figure 17 shows two scenarios – (1) unemployment follows the same pattern than ten years ago, in spite of the far higher GDP drop, (2) unemployment increases initially 10 percent more than during the financial crisis, while following the same path in the years to come.

In the first scenario, the **overall unemployment** would rise by 2 percentage points from 6.5 percent in 2019 to 8.4 percent in 2020 and further on to 10.6 percent in 2024. The second scenario would lead to an initial increase to 9.2 percent (2020) and to 11.6 percent in 2024.

In contrast, the **youth unemployment rate** would jump from 14.1 percent to 18.3 in the lower or even 20.2 percent in the upper scenario in this year and further on to 22.6 or 25.0 percent in 2024, the youth unemployment ratio from 8.4 to 10.9 or 12.0 percent, respectively.

A similar pattern arises for those aged 25 to 29, though at lower levels. The initial effect on the unemployment rate is an increase from 9.2 percent (2019) to 12.2 or even 13.4 percent in 2020, followed by another increase to 13.1 or 14.4 percent in 2024. A reduction of youth unemployment would arise only in the middle of the 2020s. While the overall trend of the youth unemployment ratio follows this pattern, the levels are between 2 and 3 percentage points lower.

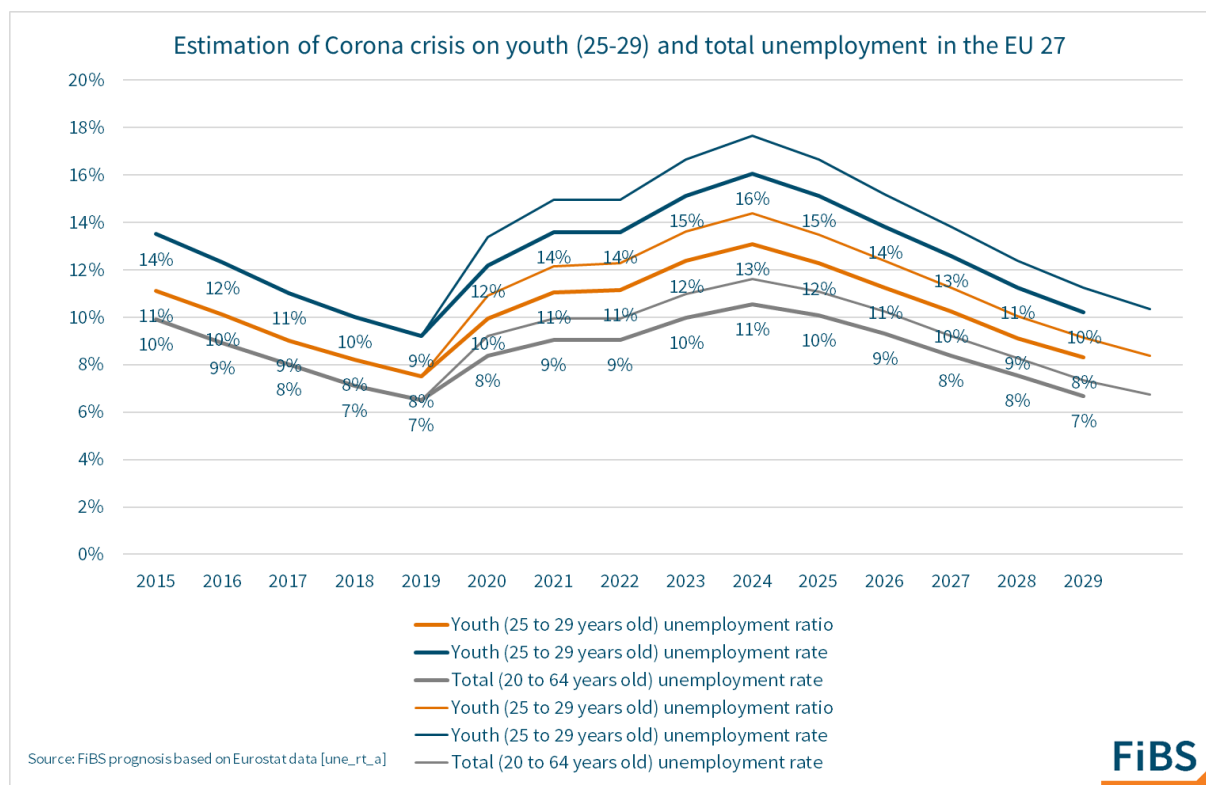


Figure 18: Estimation of impact of Corona-crisis on 25 to 29 year olds and total unemployment in EU 27

Alike for the previous crisis, the starting ratios will only be met at the end of the coming decade for all three indicators, at best. In the upper scenario, though, pre-Corona rates will still be surpassed. In fact, the Corona crisis means that all advancements in unemployment of the last five years are reversed.

Male youth unemployment is likely to increase even more than that of females

The analysis in section 2.2 indicates that males – and particularly: younger males – were even more affected from the previous economic crisis than the female counterparts – and the crisis worsened their position much stronger. It is very likely that this will happen again, as the following sections will highlight.

However, when looking at the youth unemployment rate, the pattern turns opposite, which suggests that different education pathways play a role here. This would imply that low qualified young females have a high risk of becoming unemployed (according to unemployment rate), which is overcompensated by the higher share of females in education and training (which is accounted for in the unemployment ratio).

Low or unqualified youth is the most vulnerable

In the previous crisis, and following the youth unemployment ratio, low qualified young men were most affected according to the youth unemployment ratio, followed by their female counterparts, while the

youth unemployment rate showed the opposite pattern: young females with low qualifications had somewhat higher rates than their male counterparts. A similar pattern is expected for the coming period.

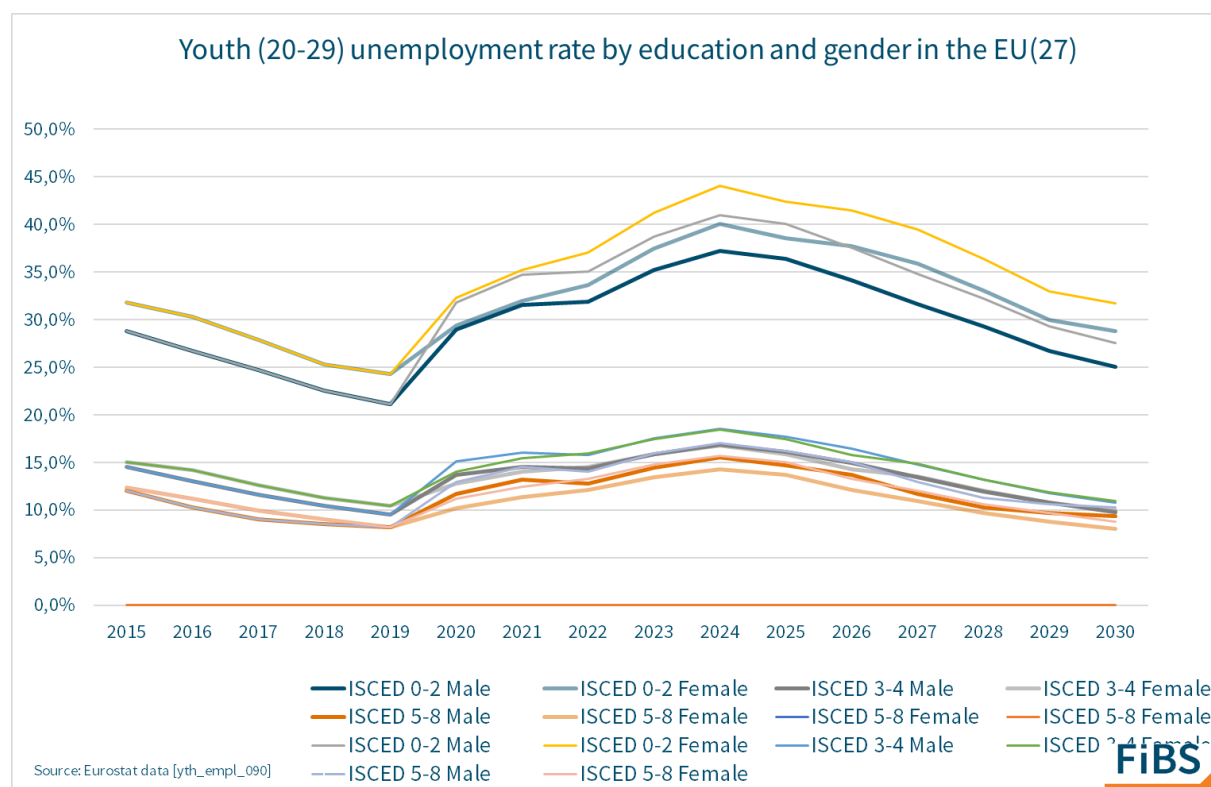


Figure 19: Youth unemployment rate by education and gender in the EU 27

The youth unemployment **rate** of those aged 20 to 29 with low education is expected to increase from pre-Corona 22 percent to 29 or even 32 percent in this year. While the rate of low qualified males would increase from 21% to 29%, the latter may be similar than for young females, which show a lower initial risk. If the development in the years to come is similar to that of the economic crisis 10 years ago, it will increase till the mid of this decade and arrive at more than 40% for males and almost 45 percent for females in 2024. Following our estimation, it will remain more than five percentage points above its pre-crisis level in 2030.

In contrast, the unemployment levels for the medium and highly skilled are expected to be close to their pre-crisis levels. Mid-level skilled are expected to increase from 10 percent in 2019 to 13 to 14 percent in this year, followed by an increase to a level of 17 to 18 percent in the mid of the decade in the lower and even almost 20 percent in the upper scenario. At the end of the EU 27 decade they are expected to arrive at 10 to 11 percent.

Highly skilled people have to face an increase from 8 percent in 2019 to 10 to 13 percent in this year, whereas the upper value is expected for women. The highest level of 14 to 17 percent is expected in the mid of this decade, followed by a steady decrease to present levels in 2030.

It should be noted, though, that the youth unemployment ratio are expected to lower, which applies particularly to those with medium and higher qualifications.

Our estimates highlight the difficult employment prospects of those with low qualifications, which demand particular attention. Their pre-crisis starting level is much higher than before the economic and financial crisis ten years ago, which is likely to be linked to even far higher youth unemployment figures this time. Although even medium and highly skilled youth are affected by the recent crisis, their future

prospects are probably far better – comparatively – than those of the low and unqualified. In addition, it should be noted that the 20 to 24 year olds show even worse figures.

5. Summary and Policy Recommendations

This paper examines the effects of the financial crisis on youth unemployment in the EU 27 by analyzing its dynamics by qualification, gender and age during the period 2005 to 2019. For this purpose, we assessed youth unemployment evolution for the total youth (aged 20-29 years old) and for the age groups 20-24 and 25-29 separately, since human capital theory hypothesizes lower unemployment of the latter group due to higher labour market experience which adds to human capital.

The results show that the financial crisis led to rising overall as well as youth unemployment rates in the EU 27 after 2008, which peaked in 2013 and steadily fell after that. More precisely, the youth unemployment rate rose from 15 percent in 2008 to 19 percent in 2013 and further to 24 percent in 2019. Despite its decrease in the following years, it only passed the pre-crisis levels in 2019 (14 percent). The same pattern can be observed for the unemployment rate of the entire population aged 20 to 64, though the values are much lower with 7 percent (2008), 9 percent (2009), 11 percent (2013) and 6.5 percent (2019). Thus, the gap rose from 8 to more than 10 points and, eventually, more than 12 percentage points.

In contrast, the gap is at around 2 percentage points, when looking at the youth unemployment ratio, for those aged 20 to 24 and even less for the age group 25 to 29. A major reason for the discrepancy is the high reliance on low qualified youth with a particularly high unemployment rate in the youth unemployment rate, as the following sections will show. Thus, from our point of view, this suggests building upon the youth unemployment ratio rather than the rate, even though the latter is officially used. To overcome the weaknesses of using the unemployment rate, which does not consider the youth who are inactive or in education, the unemployment ratio is used to perform the analysis. The unemployment ratio considers the entire population of youth in the denominator, which leads to a more realistic measure for youth as it accounts for the large proportion of those in education.

Similar to overall unemployment, the magnitude of the negative effect and the speed of recovery was directly related to the level of education. The unemployment ratios for the medium and highly qualified youth (aged 20-29) increased by about 4 percentage points (from 7 to 11 percent) between 2007 and 2013 and managed to return to their unemployment pre-crisis levels by 2017. In contrast, the low qualified youth had a 9-percentage point increase in unemployment between 2007 and 2013 (from 13 to 22 percent) and the level has not yet returned to pre-crisis levels.

The financial crisis also had a clear gender dimension, leading to disproportionately higher negative effects on male unemployment compared to female, when looking at the ratio, whereas the opposite pattern is visible for the rate. While this gender unemployment gap shrinks with higher levels of education and with age, it is particularly pronounced for those with low qualifications. Low qualified young men show a 2 percentage points higher unemployment ratio than females, which is similar for both sub-age cohorts (20-24, 25-29). Moreover, among the younger sub-cohort (20-24-year-olds), females fare a bit better than men. When looking at the youth unemployment rate, females show a rate that is a bit higher than that of males.

The visible gender gap in the unemployment ratio to the disadvantage of young men is particularly due to the strong increase in unemployment levels of low qualified men compared to low qualified women, while this effect cannot be observed for the other qualification levels, with the exception of medium qualified women aged 20 to 24. In contrast, in those other groups, female unemployment is slightly higher than male unemployment.

We also find that the 25-29-year-olds had 2 to 3 percentage point lower unemployment ratios than the younger age group and were more able to profit from tertiary education. The lower unemployment ratio of the older youth group reflects the positive influence of labour market experience on employment postulated by the human capital theory, especially in connection with a high education level.

To complement the analysis on gender and education effects with employment developments, we examine sectoral employment evolutions and GDP growth rates in male or female-dominated as well as gender-balanced branches of the 27 EU countries for the age groups 25-64 and 15-24 during the crisis (between 2008 and 2010) and afterwards (between 2011 and 2019). The analysis highlighted that female-dominated and gender-balanced sectors in the age group 25-64 had mostly positive employment growth rates even during the crisis, while employment growth in most of the male-dominated sectors was negative during that time. This provides evidence that the financial crisis disproportionately reduced employment in blue-collar occupations compared to white-collar occupations, which confirms the link between higher human capital and lower unemployment rates. After the crisis, high GDP growth rates in the EU fuelled employment recovery in all sectors for this age group.

For the youth aged 15-24 years, employment growth rates shrank in all sectors between 2008 and 2010, while only some female-dominated as well as few gender-balanced sectors witnessed an employment expansion. After the recession, employment development in female-dominated and gender-balanced branches was better than in male-dominated sector, which applies even to some sectors with positive GDP or overall employment rates, as, for example, manufacturing (which is the largest single sector of the EU economy). The negative youth employment growth rates in many sectors could be attributed to several reasons. First and foremost, the employed youth have on average lower education levels in all economic sectors compared to the older age group, making their employment more vulnerable to economic shocks. Second, the youth witnessed shrinking population growth rates of around 12 percent in total between 2008 and 2019. Third, around 63 percent of this age group was in education between 2013 and 2019. Our results show an upscale in the qualification structure of employees in all sectors in 2019 compared to 2008 for both age groups.

A major takeaway from the analysis of the impact of the economic and financial crisis in 2008/09 on youth unemployment in this study is that the high employment in the aftermath of the financial crisis was for the low qualified, especially those aged 20-24 years old, and – dependent on the definition males or females. The unemployment ratio for the low qualified males increased from 14 percent to 24 percent between 2007 and 2013, after which it fell to 17 percent in 2019, which is still above the lowest unemployment level in 2007. In contrast, the young females had the highest rate with about 36 percent in 2014, compared to 34 percent for the young males. While the unemployment levels decreased slowly to pre-crisis levels and were even below at the end of the period under consideration for the medium and highly qualified, this is not yet the case for the low qualified – men and women alike. In addition, it is noteworthy to mention that unemployment remained for almost ten years above the pre-crisis levels of 2007 and 2008.

When building upon the patterns of rising youth unemployment during and after the economic crisis a decade ago and estimating the possible impact on youth unemployment because of the Corona-crisis, the major issues are:

- Low and unqualified youth will become again the most vulnerable group, which is particularly the case for young men, as they show the highest rates of low qualified youth. In contrast, although the unemployment rates of young women are a bit higher, the youth unemployment ratio of young females is below that of young males, suggesting higher participation rates in education and training. Moreover, it appears likely that the youth unemployment level of the low and unqualified will also not

return to its pre-crisis levels, as could be observed for the previous crisis in 2008 as well, but remains higher. As the Corona-crisis GDP drop is even stronger (-8.5 percent (expected) vs. -4.5 percent), it seems very likely the rise in the unemployment levels will be even higher than a decade ago. The estimates in this study arrive well above 40 percent (unemployment rate) for this group across Europe and it seems possible that the rates in 2030 will be about 5 percentage points higher than last year. The dynamic trend of the economy, driven by the growth of the service sectors and by a strong demand for higher qualifications, may become even stronger.

- Economic and employment development in the various branches highlight significant trends towards the service sector and higher qualifications as well as towards gender-balanced and female-dominated branches.
- As manufacturing and construction as well as some low qualified service sectors (e.g. hotel & restaurants, accommodation etc.) are likely to be more affected than higher level service sectors, young men, but also young women, demand particular attention. While the male-dominated manufacturing branch was the largest single sector in the past, it would have been replaced by hotel & tourism in the near future, if the Corona crisis would not have happened.

The combination of these three key findings demand two major policies:

Major efforts should be undertaken to lift up the qualification level of the low and unqualified at least to ISCED-level 3. At the same time initiatives should be started to motivate young men more towards the service sector, rather than agriculture, construction or manufacturing as well as other shrinking sectors. We are aware that the latter proposal may be odds with present policies in some countries, though. In addition, the concerns medium qualifications more than the highly qualified.

To put it differently: training will lead to employment only if two conditions are met: (1) additional employment opportunities arise, and, (2) the young person is better qualified to get this job than others (i.e. particularly, an older person with more employment experience). As shown above, the service sector is far more likely to grow than the primary or secondary sector, with few exceptions. As this trend is very likely to continue, youth should be trained particularly for service sector jobs, which often require a medium to high qualification. This may also call for a shift in the training offer as they often focus on the secondary sector (e.g. construction, manufacturing, etc.), while less on the service sector.

This recommendation fits very well to present EU policies: provide (practically-oriented) learning opportunities for young people with low qualifications rather than school-based learning as this target group has not been successful in the school system. A major focus should be laid to improve on the one hand their skills in reading, writing, maths and digital literacy and on the other hand, they should be able to engage in practical and employment-oriented training to qualify for the future labour market. As they have dropped out of the general education system, this means also that they have not been addressed properly by this system and need to have learning methodologies and technologies, which address their experiences and needs more directly. People who learnt that the general education system has not helped them to gain a qualification, or even dropped out will hardly be motivated to learn again in a school-like setting and may assume that they will be successful in the future. Alternative option may be to address them through serious games, i.e. learning-oriented game-based opportunities.

Whether the Youth Guarantee, which is costly and possibly of limited effectiveness may be questionable, though.

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Annex

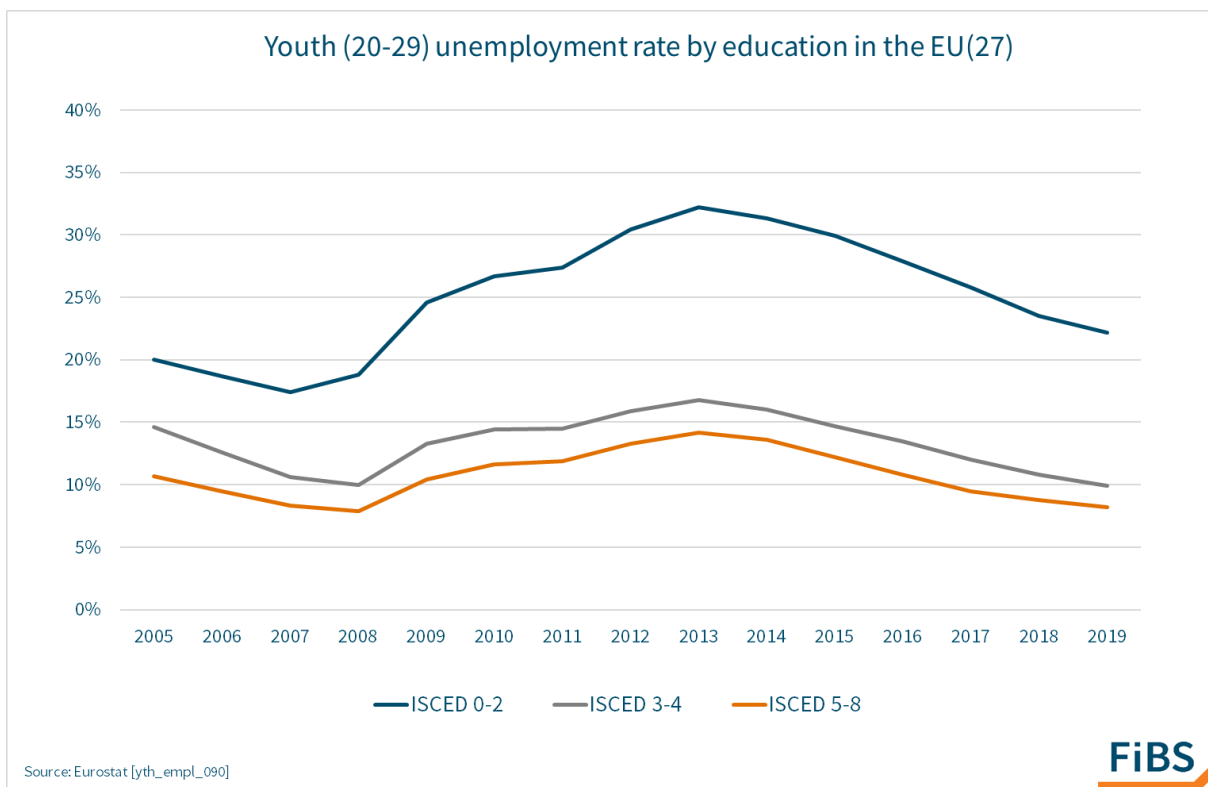


Figure 20: Youth (20-29 years old) unemployment rate by education levels over time

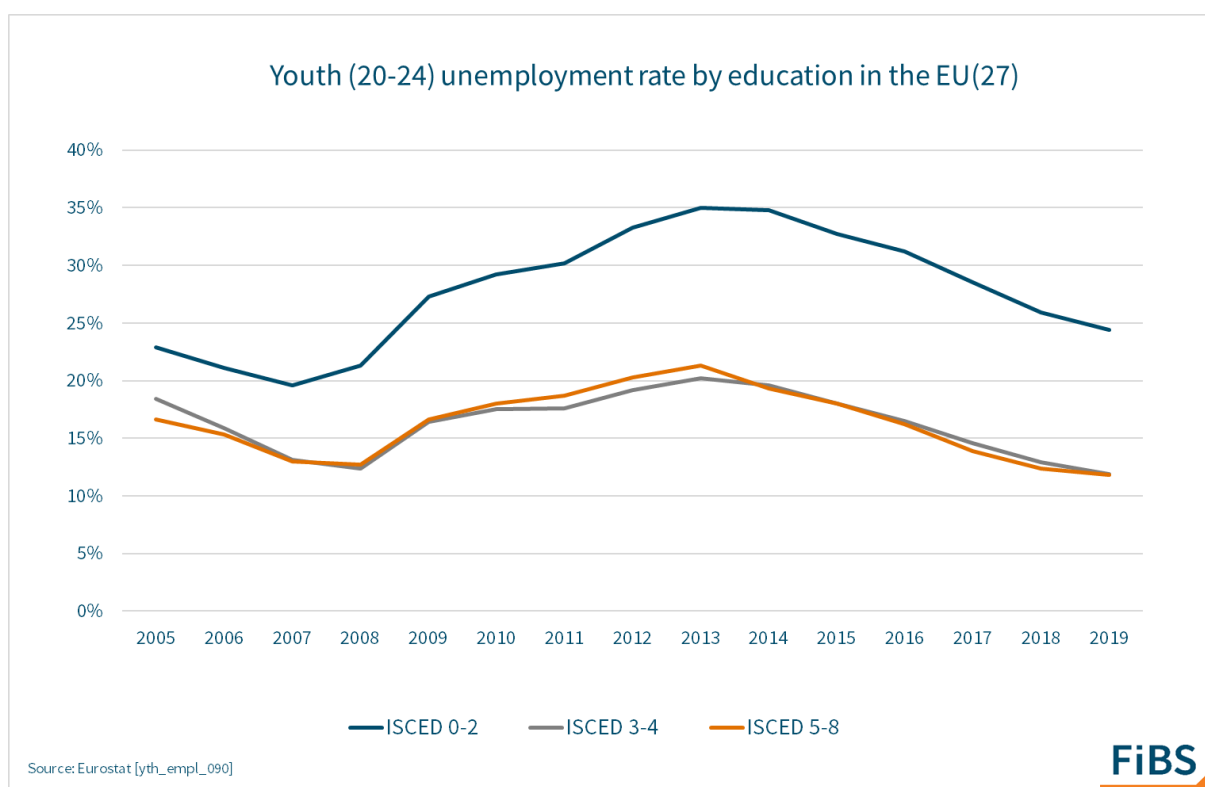


Figure 21: Youth (20-24) unemployment rate by education levels over time

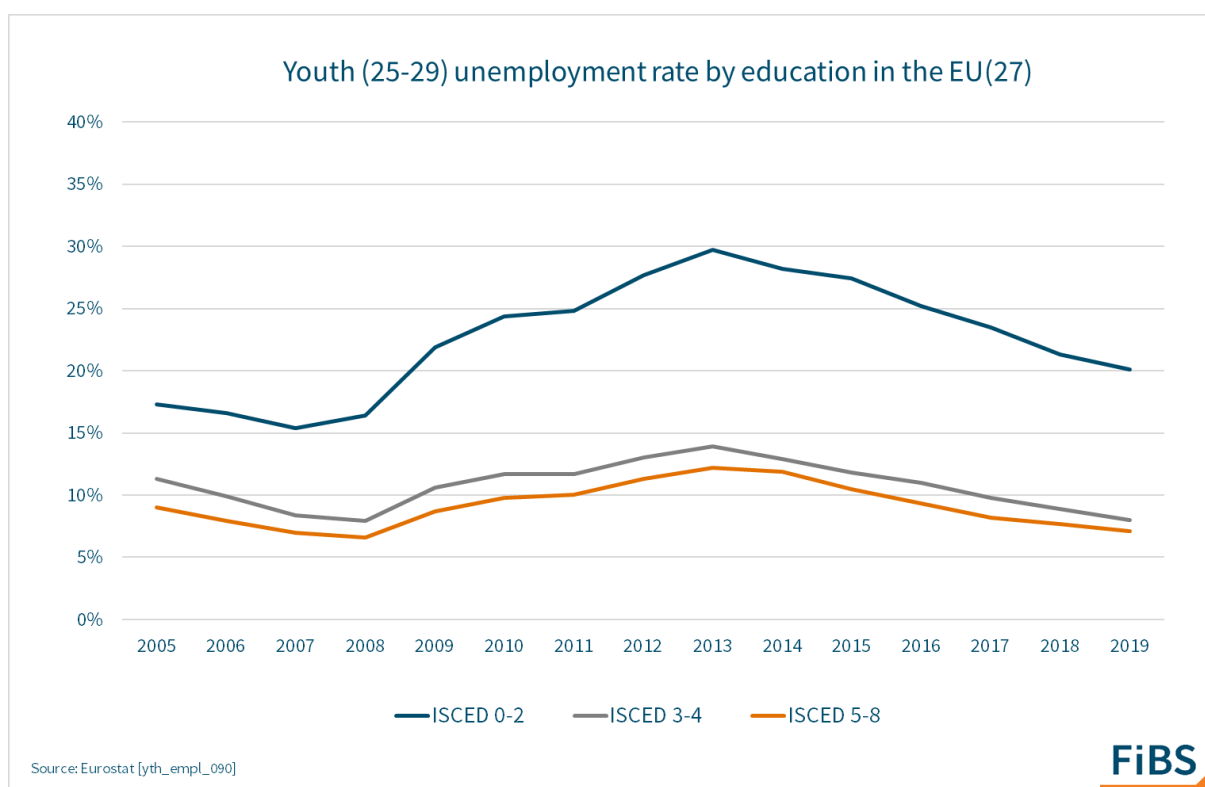


Figure 22: Youth (25-29 years old) unemployment rate by education levels over time

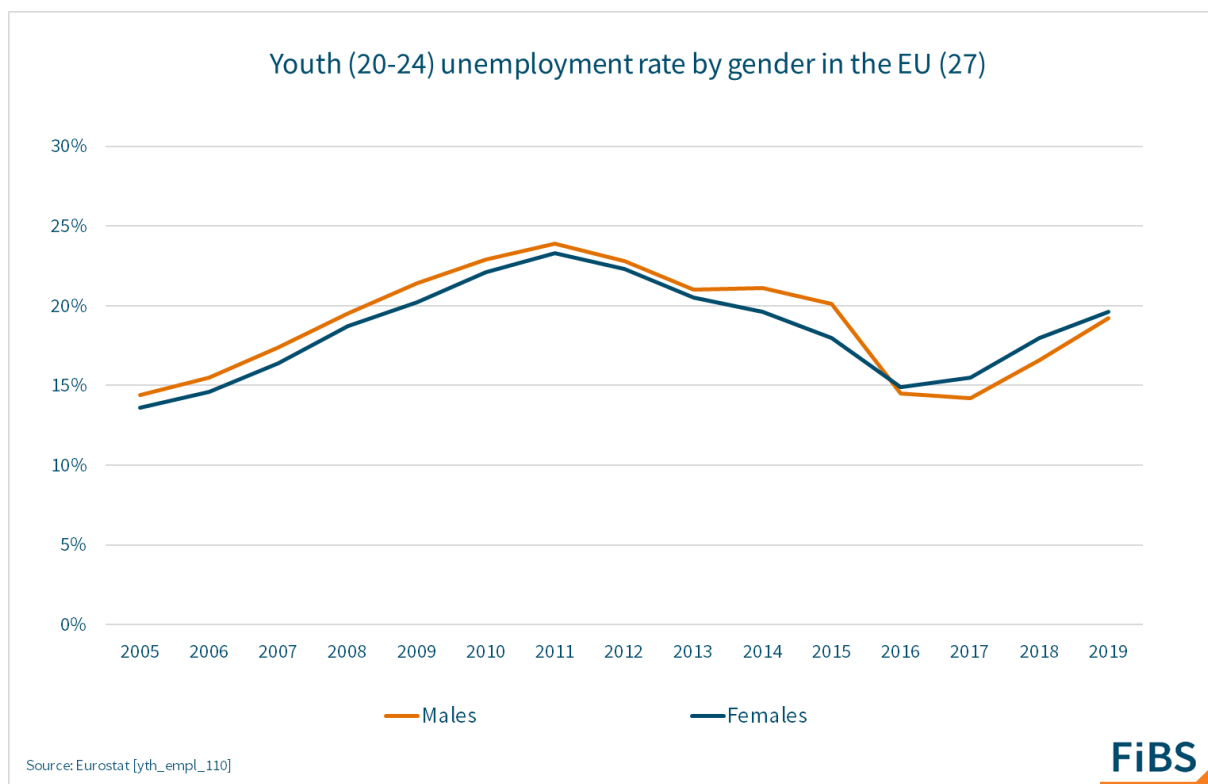


Figure 23: Youth (20-24) unemployment rate by gender over time

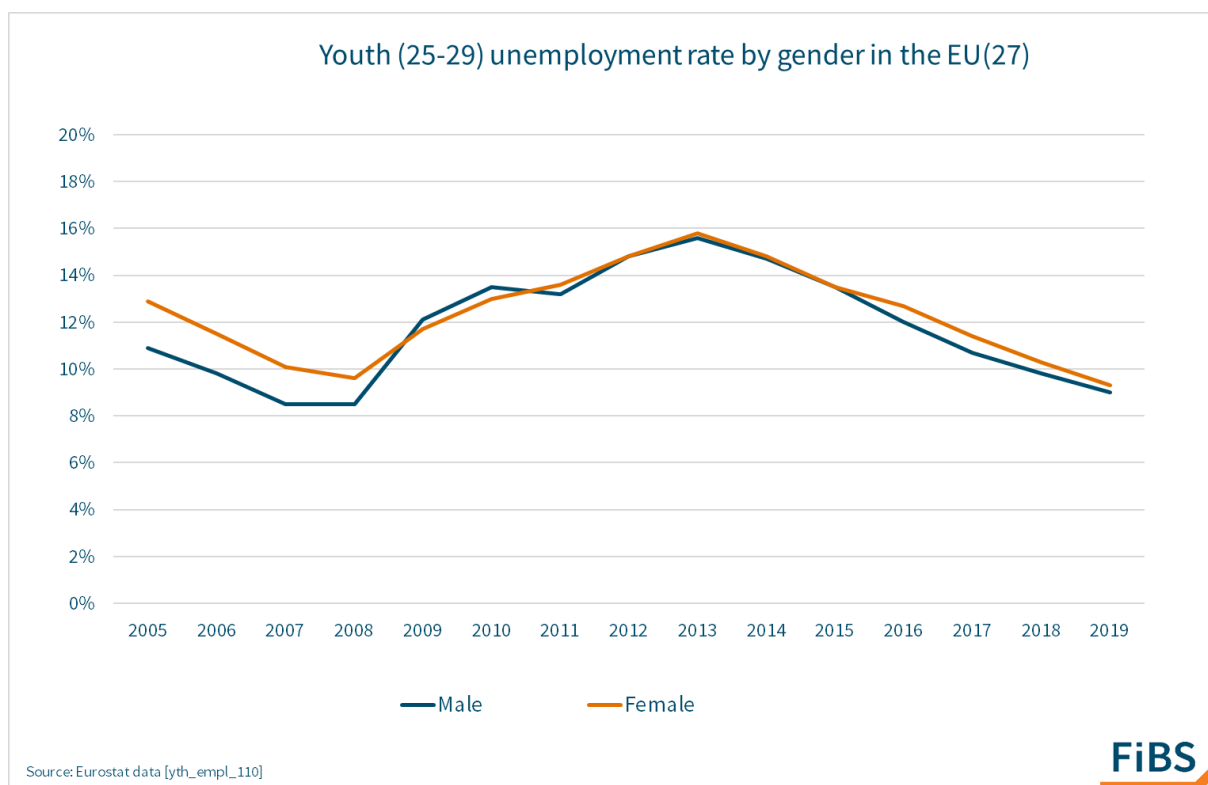


Figure 24: Youth (25-29) unemployment rate by gender over time

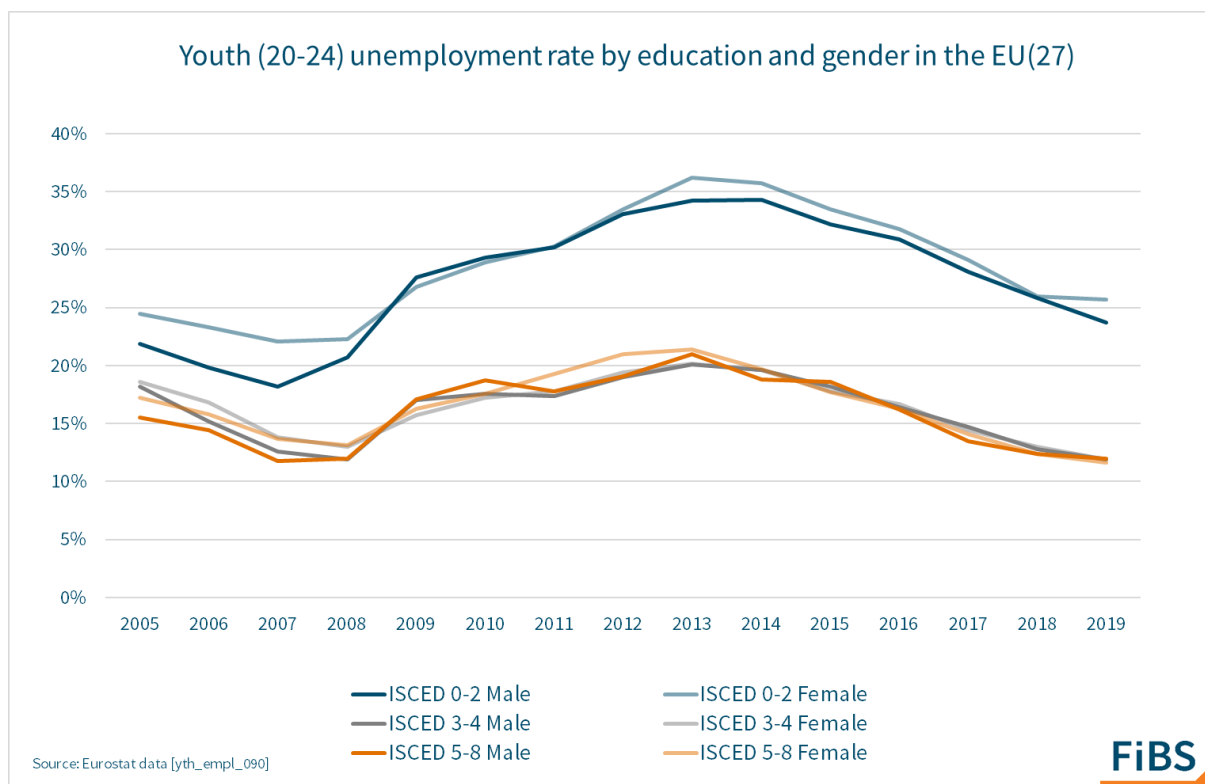


Figure 25: Youth (20-24 years old) unemployment rate by education and gender over time

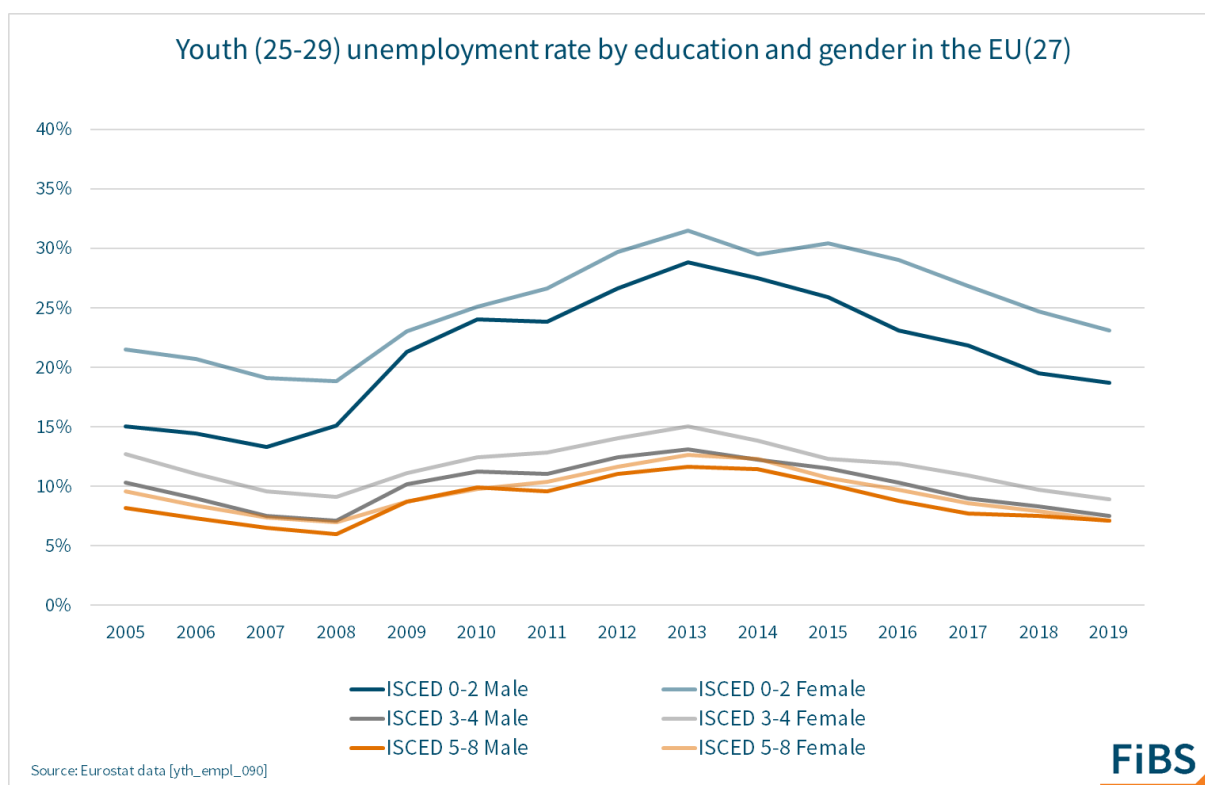


Figure 26: Youth (25-29 years old) unemployment rate by education and gender over time

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