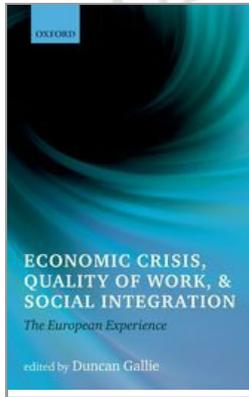


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Economic Crisis, Quality of Work, and Social Integration: The European Experience

Duncan Gallie

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Distribution in the Downturn

Tåhlin Michael

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[–] Abstract and Keywords

This chapter examines distributional changes in employment patterns during the economic crisis from 2007 to 2010. Employment reductions were strongly uneven along social and demographic lines. Youth, men and low-skilled workers saw their job prospects deteriorate significantly in most countries, while labour market conditions for older, female and high-skilled workers changed much less. The skill-biased employment change during the downturn slightly enhanced the continuous upgrading of the occupational structure but also contributed to its polarization, due to large job losses among skilled manual workers in manufacturing and construction. But earnings inequality did not increase or even fell somewhat. In general, then, changes in labour market inequality during the economic crisis were mixed and multi-faceted. Gender inequality decreased, class inequality increased in employment but not in earnings, while youth was hit harder than prime-age workers and older employees came through largely unscathed.

Keywords: Economic crisis, skills, occupational structure, occupational polarisation, wage inequality

Introduction

The previous chapter was concerned with cross-national differences in the magnitude of general employment decline during the economic crisis. We found that the boom and bust pattern of initial expansion and subsequent contraction ('The Great Regression') accounts for a very large share of the variation in labour market developments in the downturn. Institutional factors appear to have played a secondary but still significant role, with mechanisms related to both equality promotion and flexibility likely to have been involved. This chapter examines changes in the distribution of employment by gender, age, education, and occupation. How have employment reductions affected different groups of the population? To what extent can these distributive patterns be accounted for by the depth of the general employment decline? How much of the variation in distributive outcomes is associated with the institutional structure of inequality? Changes in the distribution of education and occupation among the employed will also indicate shifts in the structure of skill demand. How have rates of skill upgrading and skill polarization been affected by the great recession?

A fundamental feature of labour markets in all economically advanced societies is that rates of employment and unemployment differ greatly across worker and population categories. In general, the distributional pattern of employment closely resembles the structure of wage inequality. The young and the less educated have lower rates of employment and higher rates of unemployment, as well as lower wages, than more experienced and well-educated workers. Further, women tend to have inferior labour market conditions relative to men, with regard to both employment (but not unemployment) and wages. This pattern of inequality is evident in all OECD countries, at all points over the business cycle, and across long stretches of time.

(p.59) Aside from this very stable general structure, however, the *degree* of inequality in labour market conditions is highly variable. It is well known that labour market inequalities differ considerably in magnitude both across countries and between time periods. In addition, rates of inequality tend to differ over the business cycle, sometimes in rather complex ways.

In Europe, the economic crisis of recent years has hit some groups harder than others with regard to rates of unemployment: youth, men, immigrants, the low-skilled, and workers on short-term contracts (see e.g. European Commission 2010b). Generally, with the exception of gender (men rather than women tend to be over-represented in cyclically sensitive industries, like manufacturing and construction), traditionally vulnerable groups in the labour market thus tend to be hardest hit by economic downturns. A stylized fact is that there is a close correspondence between group-specific (by age, education, etc.) unemployment rates as observed in a cross-section and the cyclical volatility of unemployment for the same groups (see e.g. Elsbj et al. 2010). Typically, group-specific rates are multiplied by a constant factor in economic downturns, so that absolute differences between groups increase in size. This pattern recurs across

countries.

Retention of workers, while generally high in many European countries (although with adjustment in work hours in several cases), has been skill-biased, in line with the pattern of previous cyclical downturns. Short-term contracts tend to be used primarily in low-skill jobs, and even among more permanent contracts the incentive to keep high-skill workers is relatively strong, in order to avoid replacement costs as demand rebounds. Upgrading of the job structure, which is a strong long-term feature in most labour markets, hence tends to accelerate in recessions. Although job creation rates generally fall in recessions, especially in the early phase of the cyclical downturn, and job destruction rates rise, the negative development tends to be particularly strong for low-skill work.

The present chapter is organized as follows. We begin by sketching the employment profiles of the eighteen countries in the years prior to the onset of recession, before turning to the pattern of change in employment distribution during the economic downturn. After a descriptive overview of cross-national differences in the evolution of employment gaps by gender, age, and education, we evaluate two expectations of empirical regularities. First, we expect that crisis severity will magnify the changes in employment gaps. Second, we expect labour market institutions to modify the association between downturn magnitude and the distribution of employment decline. Aside from assessing the change in employment gaps between population categories, special attention will be given to shifts in the occupational structure reflecting skill upgrading and polarization. The final empirical section looks at changes in wage inequality. Here too, the cross-national pattern of **(p.60)** change will be related to the crisis magnitude and institutional structure, as well as to shifts in the occupational composition of the employed population. A summary and brief discussion of the main findings concludes the chapter.

Comparative Employment Rates by Population Group before the Recession

Before turning to distributional developments during the crisis, it is useful to give a background picture of the pre-recession employment profiles of the countries involved in our comparison. We begin by providing some general numbers that complement the description given in the previous chapter. Figure 3.1 shows the labour market performance of the eighteen countries prior to the recession. (As in Chapter 2, all numbers in the following are based on aggregate data from the European Union Labour Force Surveys, EULFS, unless otherwise indicated.) The rates of employment and unemployment are averages for the period 2000 to 2007. Denmark was the top performer in these years, with a high employment rate, second only to Sweden, and a low unemployment rate, second only to the Netherlands and Ireland. The UK and Portugal also had relatively favourable labour market conditions. At the other end, Poland had the worst conditions, followed by Slovakia. The labour

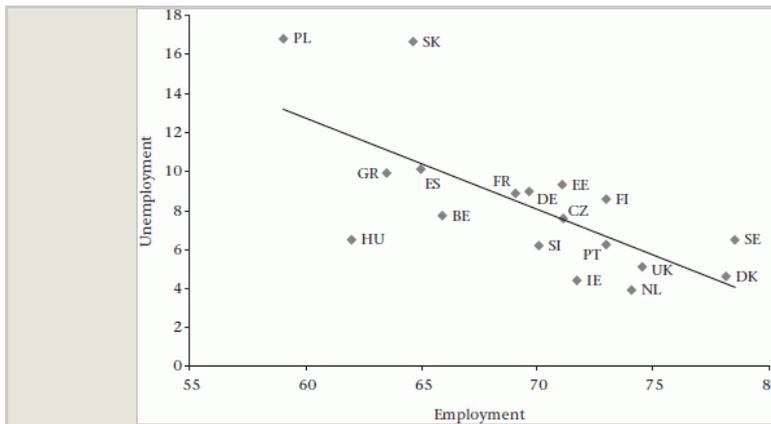


Figure 3.1. Employment (age 20–64) and unemployment (harmonized) rates, averages 2000–2007

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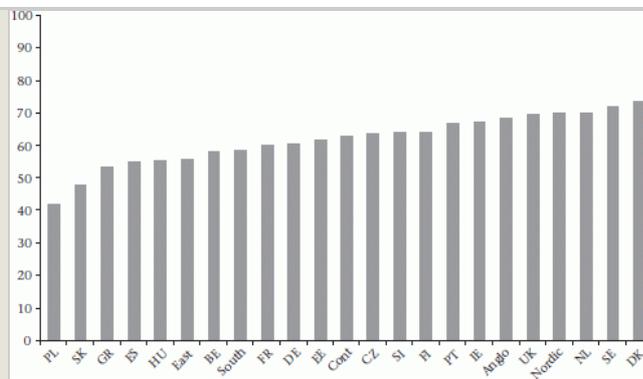


Figure 3.2. Employment index (employment rate minus unemployment rate) by country, average 2000–2007

markets of Greece, Spain, Hungary, and Belgium also showed relatively low participation levels and/or high jobless rates. In general, rates of employment and unemployment show a similar picture as indicated by the rather steep line of association between them, although there are a few outliers, mostly among the Eastern European countries.

Combining the employment and unemployment rates into one overall measure, by subtracting unemployment from employment (see Chapter 2), yields the country ranking shown in Figure 3.2. Aside from the eighteen individual countries, the chart indicates averages by country group. In order of appearance in the figure they are: ‘East’ for Eastern Europe (Poland, Slovakia, Hungary, Estonia, Czech Republic, Slovenia), ‘South’ for Southern Europe (Greece, Spain, Portugal), ‘Cont’ for Continental Europe (Belgium, Germany, the Netherlands), ‘Anglo’ for the Anglo countries (Ireland, the UK) and ‘Nordic’ for the Nordic countries (Finland, Sweden, Denmark).

The variation in total employment levels according to this index is rather strongly tied to GDP levels (the correlation is 0.66), which is not surprising since employment volumes and GDP are associated by construction. Still, as can be seen in Figure 3.2 there are several cases that deviate from a simple linear pattern. For example, Belgium, France, and Germany have lower employment levels than the size of their economic wealth would

predict, while Portugal has an unexpectedly high employment level.

With regard to institutional structure (as measured by the scales of equality and flexibility described and used in Chapter 2), overall employment **(p.62)** levels tend to be unrelated to equality promoting institutions (the correlation is -0.08), but appear to be strongly and positively tied to labour market flexibility (the correlation is 0.75). The strong association between employment and flexibility partly comes about through the connection of both factors with the level of economic wealth (GDP per capita). But even net of the wealth link, the degree of labour market flexibility is clearly connected to overall employment levels (the partial correlation is 0.52). Needless to say, causal interpretations of these associations are far beyond the scope of the present analysis.

Turning to the variation in employment across population categories, differences by gender are displayed in Figure 3.3. Male and female rates are positively interrelated, again with Poland at the low end and Denmark and Sweden at the high end. Positive outliers regarding female employment, in addition to the Nordics, are Estonia and Slovenia, while Greece and Spain are negative outliers. Given their male employment rates, female employment is also relatively low in Belgium, the Czech Republic, and Ireland.

Youth labour markets are strongly tied to general labour demand, to an extent not always appreciated in the literature. As seen in Figure 3.4, youth (age 20–29) unemployment is everywhere clearly higher than mid-age (30–54) unemployment, typically by a factor of around 2, so the line of association is steep (only men are included here in order to isolate the age pattern). Still, there is also a fair amount of deviation from the line. Greece and Poland have relatively high jobless rates among their young given general (prime-age) unemployment numbers, which is also true although to a lesser

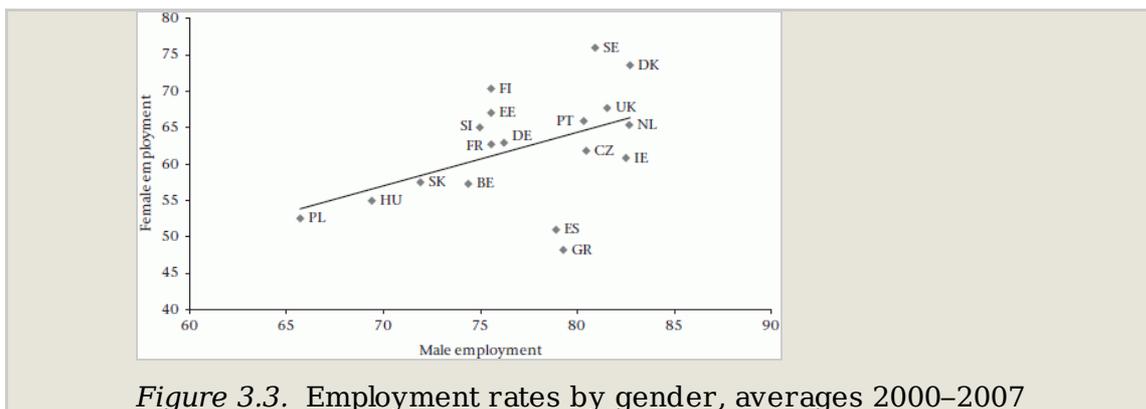


Figure 3.3. Employment rates by gender, averages 2000–2007

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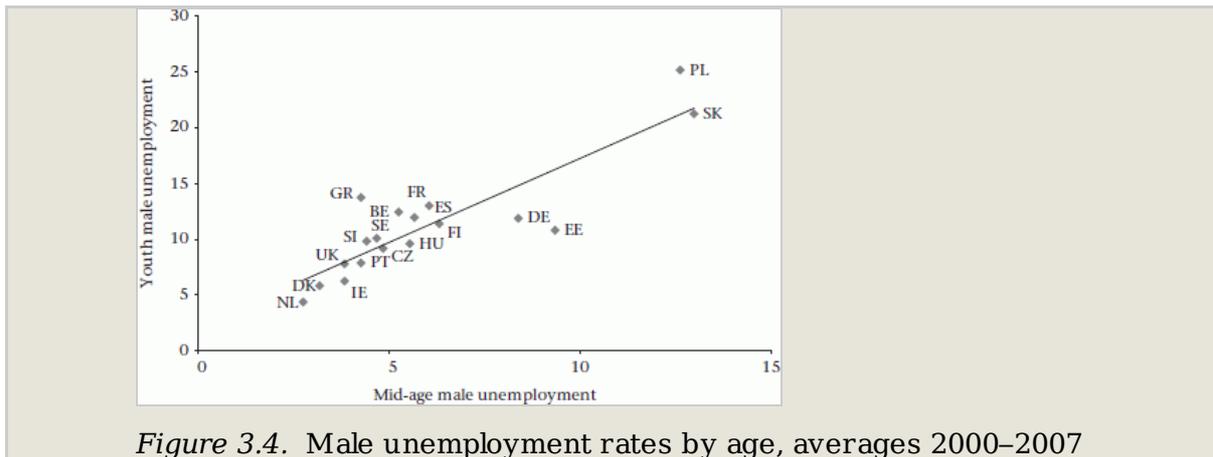


Figure 3.4. Male unemployment rates by age, averages 2000–2007

extent for Belgium, France, and Spain. Germany and Estonia have comparatively low relative rates of youth unemployment, and the same goes for the Netherlands, Ireland, and Denmark but less clearly. The case of Germany is notable, since it is often heralded as a success story in the policy debate on youth labour markets: while the German youth to mid-age unemployment ratio is indeed low, the rate of youth unemployment was in fact higher than in most other countries considered here in the period 2000–7. A similar pattern is evident for Estonia.

Employment at older ages (55–64) varies a good deal across the eighteen countries; see Figure 3.5. Again, there is a positive association between employment rates across demographic categories, underlining the fundamental role of general labour demand (growth) rather than categorical trade-offs based on a fixed number of jobs (zero-sum distribution). Hence, labour market participation among older men tends to be more frequent in countries with a high prime-age male employment rate. However, the pattern is not entirely clear-cut: among the countries with the highest prime-age rate, the association with elderly activity rates tends to be negative. Of all considered countries, Sweden has the highest employment rate among older men, around 70 per cent, followed by the UK, Ireland, and Denmark. Given its prime-age rate, Estonia also has a high elderly employment rate. The lowest labour market participation rate among older men, below 40 per cent, is found in three Eastern European countries—Poland, Hungary, and Slovenia—and two Western European nations—Belgium and France.

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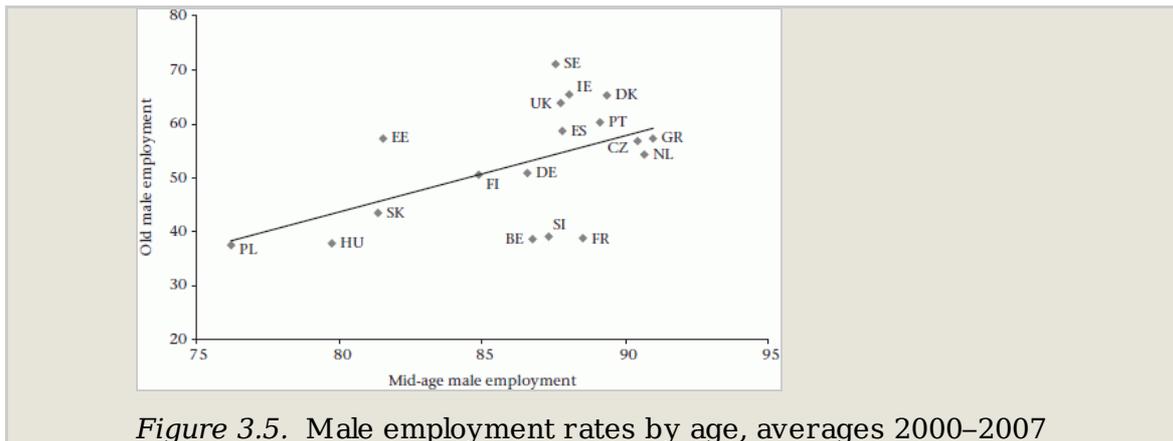


Figure 3.5. Male employment rates by age, averages 2000–2007

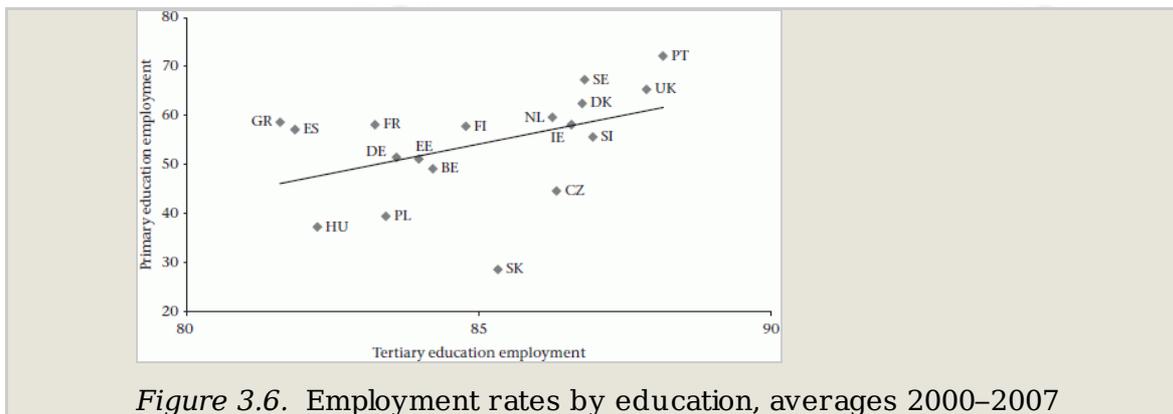


Figure 3.6. Employment rates by education, averages 2000–2007

The pattern of positively associated employment rates recurs with regard to education; see Figure 3.6. Employment rates among the highly educated are uniformly high, consistently above 80 per cent. The big variation across countries is among the low-educated (primary or lower secondary schooling); note that the horizontal and vertical scales in the figure differ greatly in range. Three Eastern European countries have very low activity rates in the low-educated group, below 40 per cent: Slovakia, Hungary, and Poland. **(p.65)** At the other end, Portugal has the highest rate, close to 70 per cent, and also has the highest rate among those with tertiary education. The position of Portugal is associated with its very low average education level: more than 70 per cent of the population has less than upper secondary schooling, by far the largest share of low-educated of all considered countries. Spain and Greece also have fairly low average education (close to 50 and 40 per cent with primary schooling, respectively), and consistent with this a fairly high employment rate of their low-educated.

Distribution in the Downturn: Employment Fall in Different Population Groups

We now turn to the main issue of the present chapter: how employment decline during the economic crisis has been distributed across different groups of the population. As explained in the previous chapter, the starting year of the contraction was 2007 in six of the examined countries (Estonia, Hungary, Ireland, Spain, Sweden, and the UK) and 2008 in the remaining twelve. In the following we compare the magnitude of employment reduction across countries and population groups by estimating the change in employment from the start of the recession to 2010. The measure of employment we use

is the summary indicator defined and motivated earlier (see Figure 3.2 and Chapter 2): the employed share of the population minus the unemployed share of the labour force.

With regard to comparing changes in employment for different groups (e.g. women and men) we take the difference in percentage points between the employment levels for 2007 (or 2008) and 2010 for each group and then compare the group-specific changes. Alternatively, we could have estimated the ratio between group-specific levels at each time-point and then compared these ratios over time. The choice between comparing group-specific percentage point changes and comparing time-specific ratios can make a substantial difference. For example, if women's employment level declined from 60 to 50 per cent and men's from 84 to 70 per cent, the percentage point comparison would find that male employment fell more than female (14 versus 10 points) while the ratio comparison would find no change since the male to female ratio remained stable at 1.4.

There is no way to unequivocally decide which of the two methods gives the more accurate picture; there are good arguments for both. (See also the point made above in connection to Figure 3.4 on how to compare youth unemployment rates across countries.) We mainly use the percentage point comparison here because this method comes closest to counting real individuals rather than more abstract quantities; 14 per cent of a group of a given **(p.66)** size reflects a larger number of individuals than 10 per cent does, regardless of the ratio involved. Nonetheless, the choice is also of a pragmatic kind. One method may simply provide a better fit to the available data than the other, and could be reasonably preferred on that ground. We will encounter such cases below, and will then temporarily switch to the more relative approach for purely statistical reasons.

Our empirical description of differential employment change across population groups begins with looking at the average development for all examined countries. As evident from Figure 3.7, there are large differences between population categories in how much employment has fallen. Men have seen larger losses than women, youth larger losses than prime-age workers, and there is a steep educational gradient in employment rate change. Older workers have fared much better than all other distinguished categories, with an overall change close to zero. With regard to education, the low-educated (individuals with primary or lower secondary schooling) have fared worst while workers with tertiary education have seen the smallest employment decline and individuals with secondary education falling in between, although on average somewhat closer to the low-educated than to the tertiary group.

Our next task is to examine how this population group variation in employment decline differs across countries. In doing so, we will be guided by two main expectations of empirical regularities. First, as discussed in the introductory section, economic downturns typically affect some worker categories more adversely than others, and the pattern we have showed above is largely in line with this tendency. Hence, we might expect that the more severe the downturn has been, i.e. the stronger the general decline of employment, the

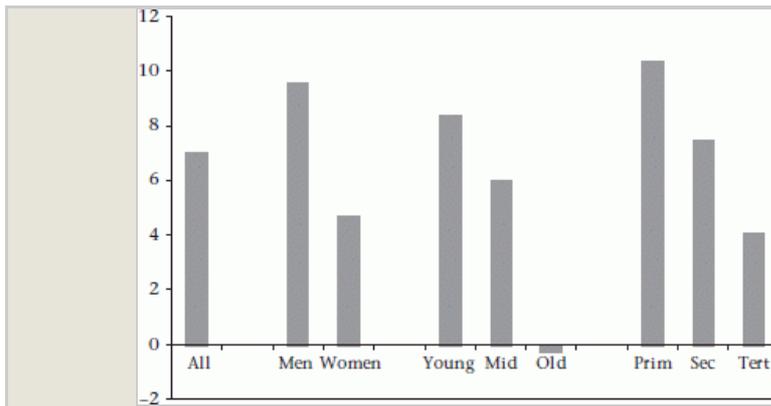


Figure 3.7. Employment fall 2007/8–2010 by gender, age, and education (percentage point differences between time-points); 18 countries, unweighted averages

(p.67) more marked will be the differences across population groups. Second, an important issue is to determine the extent to which institutional factors modify the relation between crisis magnitude and the distribution of employment decline across worker categories. As in Chapter 2, we focus on two fundamental institutional traits that tend to be empirically independent (uncorrelated): equality promotion and labour market flexibility.

Stratification of employment change by regime

As a descriptive first step in assessing cross-national variation in distributive outcomes we compare changes in group-specific employment decline between the institutional clusters of countries used earlier (see Chapters 1 and 2 and Figure 3.2). The three countries with exceptionally large reductions of employment—Estonia, Ireland, and Spain—have been removed from their respective ‘regimes’ in the following charts, and form a joint separate category in order to clarify the cross-national comparison. Figure 3.8 shows the country variation in employment decline by gender.

In general, the distributional pattern of change is similar in all country categories. But the details differ, in some cases notably. Men have experienced larger employment losses than women in all cases, although the male–female percentage point difference has been exceptional in size in the hardest hit group of countries. However, women as well as men have seen much

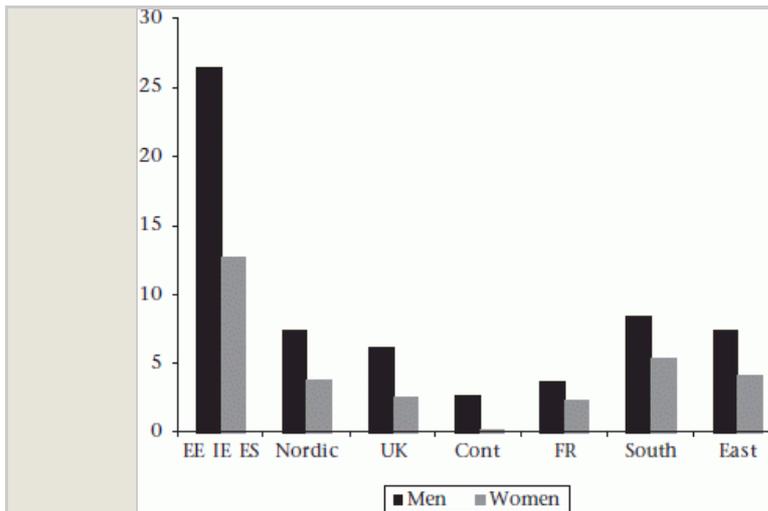


Figure 3.8. Employment fall 2007/8–2010 by gender and regime (percentage point differences between time-points)

(p.68)

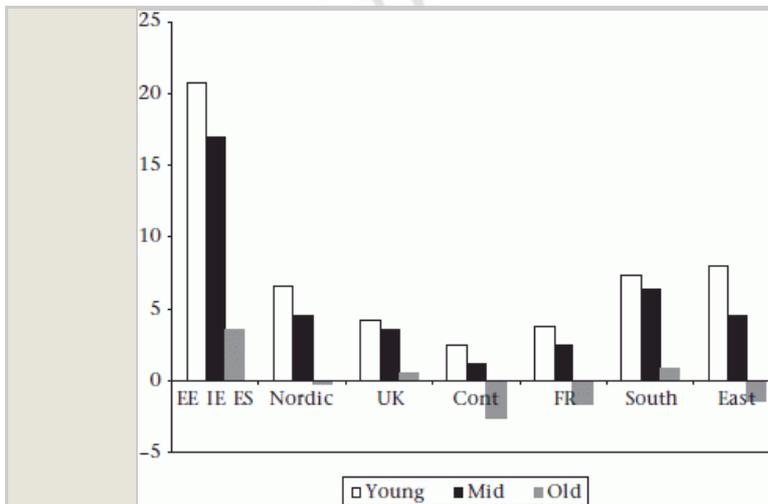


Figure 3.9. Employment fall 2007/8–2010 by age and regime (percentage point differences between time-points)

bigger losses there than anywhere else. In the Continental group (Belgium, Germany, and the Netherlands), by contrast, the average employment loss for women has been close to zero.

The country pattern of employment decline by age is displayed in Figure 3.9. Young people (age 20–29) have been hit hardest everywhere, but the difference relative to prime-age (30–54) workers is comparatively large in Eastern Europe and in the most severely struck country group, and smallest in the UK. Older workers (age 55–64) have lost significantly in employment only in the hard-hit country trio, and have actually made a notable gain—not only relatively—in Continental Europe and to some extent in France and in Eastern Europe as well.

As evident from Figure 3.10, educational inequality in employment loss during the crisis

has a similar general pattern in all country groups, but the UK stands out as particularly unequal in this regard with a bigger difference in employment decline between workers with primary and secondary education than anywhere else. At the other end, the Continental European countries display fairly small educational differences, in line with their low overall rate of labour market deterioration.

Distributive Outcomes by Crisis Magnitude

As discussed earlier, we have two main expectations regarding the country variation in the distribution of employment decline across population **(p.69)**

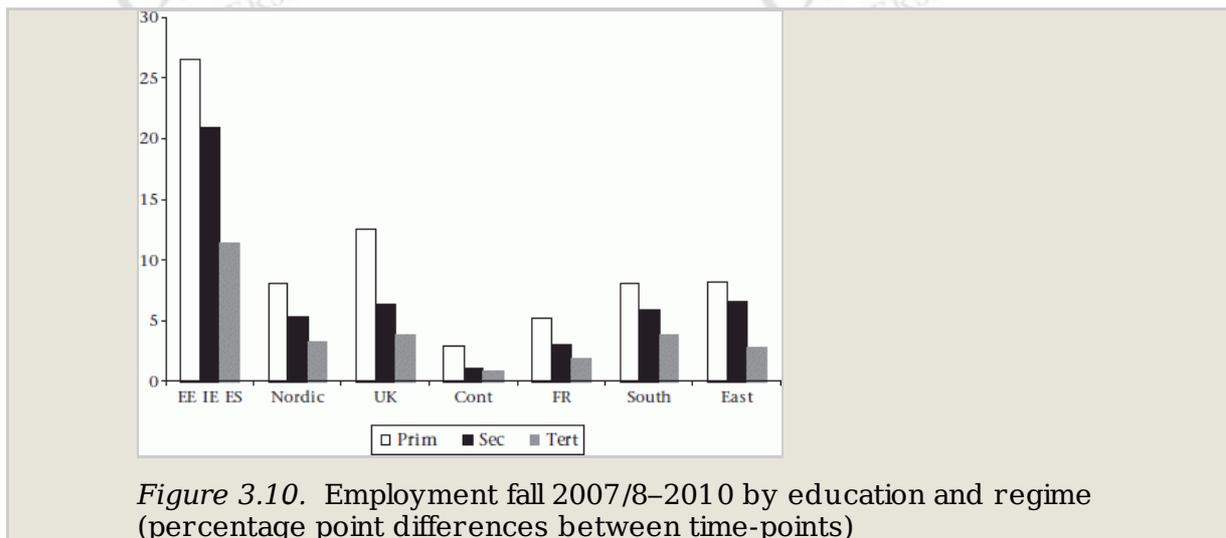


Figure 3.10. Employment fall 2007/8–2010 by education and regime (percentage point differences between time-points)

groups. In this section, we begin to empirically examine the first of these two expectations: that the magnitude of the downturn, indicated by the total size of employment reduction, tends to widen the differences in development across population groups. Figure 3.11 shows the association between total employment fall and the gender gap in employment change.

As can be seen, the association is very strong; the correlation is 0.88. Hence, the larger the total reduction of employment during the crisis, the bigger has been the closing of the gender gap in employment, due to disproportionately large losses for men relative to women. The association is mainly driven by the three hardest hit countries, but even among the less severely struck economies (fifteen countries) the correlation is substantial, at 0.48.

With regard to the evolution of employment gaps by age and education, there are similar country patterns concerning the link with downturn magnitude. To save space, these associations are not shown in figure form. Instead, the patterns are summarized in Table 3.1 by reporting correlations between total employment decline and the change in employment gaps.

In all cases, there are very strong associations in the expected direction. While all correlations are somewhat weaker when excluding Estonia, Ireland, and Spain, they remain substantial. A partial exception is the widening employment gap between workers

with primary and secondary education, with a comparatively moderate connection to downturn magnitude.

(p.70) Labour Market Institutions and Distributive Outcomes of the Crisis

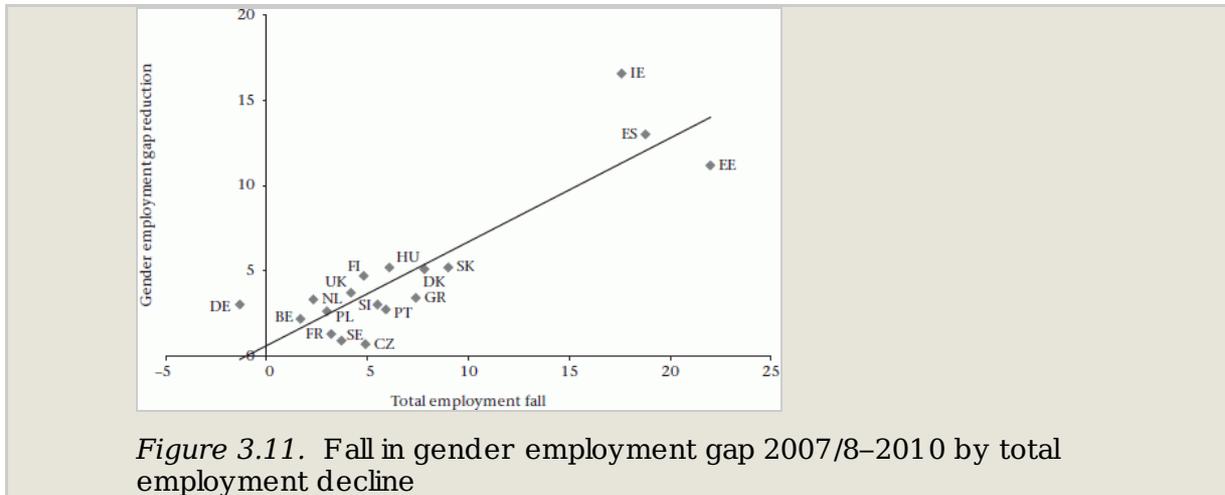


Figure 3.11. Fall in gender employment gap 2007/8–2010 by total employment decline

Table 3.1. Correlations between size of total employment decline 2007/8–2010 and changes in employment gaps by gender, age, and education

| Category | Direction | Corr with rec magn | Excl EE ES IE |
|-----------|--------------------------|--------------------|---------------|
| Gender | male emp loss vs. female | 0.88 | 0.48 |
| Youth | emp loss vs. mid-age | 0.78 | 0.75 |
| Old | emp gain vs. mid-age | 0.91 | 0.70 |
| Prim educ | emp loss vs. sec educ | 0.59 | 0.23 |
| Tert educ | emp gain vs. sec educ | 0.92 | 0.69 |

We have just seen that the employment decline during the economic crisis has been very uneven across population categories, and that these differences by gender, age, and education tend to be larger the deeper the downturn. But how general is this pattern of inequality? It is reasonable to suppose that labour market institutions have affected the ways through which employment reductions are transmitted across different groups. In this section, we examine how the distribution of employment decline is associated with the scales of equality promotion and labour market flexibility that were constructed in Chapter 2.

(p.71) In order to estimate these associations we first run a regression model with the change in each employment gap (by gender, age, or education) as outcome and three predictors: (a) crisis magnitude (total employment reduction), (b) institutional structure (equality promotion or labour market flexibility), and (c) the interaction between crisis magnitude and institutional structure. Based on this regression, we then compute the predicted change in inequality (population group employment gap) net of the main effect of employment decline. The correlation between this measure and the institutional scale

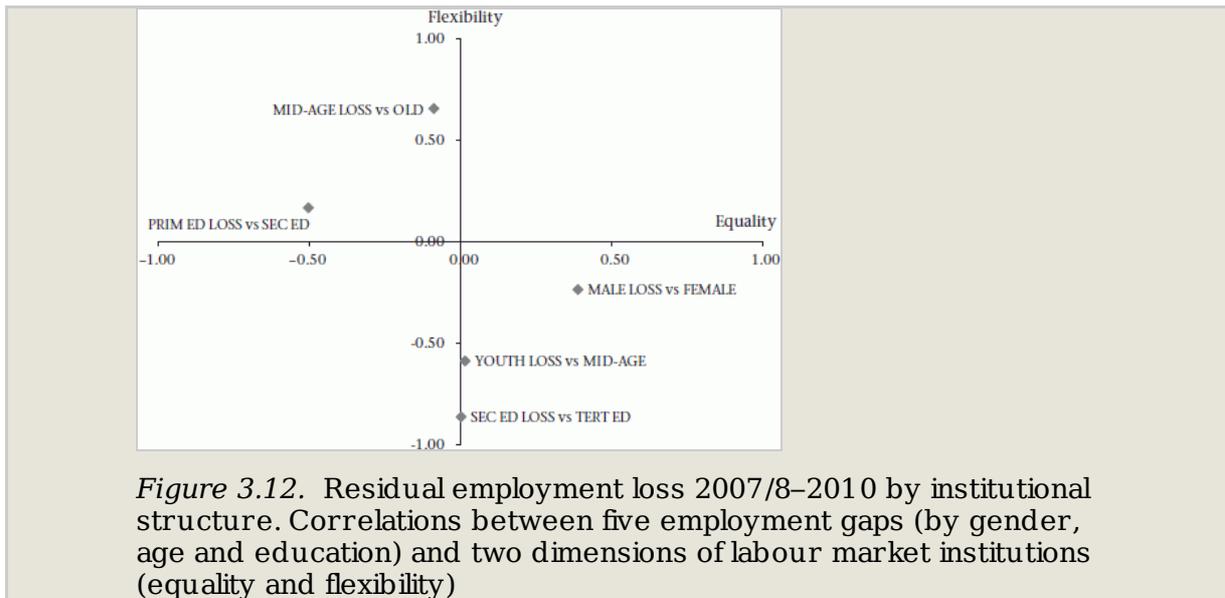
indicates the extent to which equality promoting institutions and labour market flexibility, respectively, have affected the change in inequality by gender, age, and education during the crisis, given the size of general employment decline.

Note that it would be insufficient to simply control for employment decline in these regressions. Doing so would implicitly be based on the assumption that the size of the employment fall would affect all population groups in the same manner regardless of institutional context. But that assumption would contradict the main rationale underlying the expectation we formulated above: the major purpose of labour market institutions is precisely to modify market determined distributions, so interaction effects are to be strongly expected.

Figure 3.12 gives a summary overview of the results of the empirical examination carried out as just described. The five data points in the chart indicate the associations (correlations) between the five employment gaps (one by gender, two by age, and two by education) and the two dimensions of labour market institutions (equality and flexibility).

According to these results, both kinds of institution have been important for the distribution of the employment impact of the crisis, but in distinctly different ways. Men's employment decline relative to women has been moderately larger in more equal countries (the correlation is 0.39) and marginally larger in less flexible countries (-0.24). One institutional interpretation of these associations is that high wage floors and downwardly rigid working hours have had a more negative employment impact on male employment in the crisis than on female. Alternatively, the industrial and occupational structures of national labour markets are associated with labour market institutions in a manner that has put men and women at a differential disadvantage in the economic downturn. Although the detailed mechanisms at work cannot be distinguished here, the gender employment gap has apparently evolved somewhat differently across countries, with a pattern that at least to some extent seems tied to institutional variation.

Changes during the downturn in employment gaps by age have been rather strongly correlated with flexibility but uncorrelated with equality. Employment chances of the young (age 20–29) relative to prime-age (30–54) **(p.72)**



workers have declined particularly much in countries with a comparatively inflexible labour market; the negative correlation is 0.59. Conversely, mid-age workers have fared less well relative to older (55–64) workers in more flexible countries; the positive correlation is 0.65. In contrast, the associations between the change in employment gaps by age and equality promoting institutions are very weak, close to zero.

With regard to education, the pattern is mixed: excess employment losses for low-educated workers are moderately associated with high inequality (0.51) but less with flexibility (0.17), while relatively large employment reductions for workers with secondary (relative to tertiary) education are highly correlated with flexibility (–0.86) but not at all associated with equality (0.00).

Skill Change and Occupational Polarization

For several decades, labour markets in OECD countries have been in a general and long-term phase of skill upgrading. This upgrading has two sides: supply (workers) and demand (jobs). The relative pace of skill rise on the supply and demand sides differs over time and across countries, and is also an issue of (p.73) discussion in the literature. Measurement of the relevant quantities is a crucial aspect of this debate. Labour economics has traditionally tended to measure only supply (education) and prices (wages), and then inferred demand (the skill requirements of jobs) from the relation between supply and price (see e.g. the analysis of long-run developments in the US labour market by Goldin and Katz 2007). In contrast, some recent economic research has attempted to measure skill demand explicitly by using data on job tasks (see e.g. Autor et al. 2003 for the US, Goos and Manning 2007 for Britain, and Spitz-Oener 2006 for Germany). This new economic research echoes a well-established, almost century-long tradition in occupational classification based on skill distinctions, assembled and used by statistical agencies in many countries and figuring prominently in large amounts of sociological research for many decades. The International Standard Classification of Occupations (ISCO), developed and updated by the International Labour Organization (ILO), is a prominent and widely used example.

A notable data innovation is the large-scale effort by Cedefop, the EU agency for vocational education and training, to put together internationally comparable time-series (including forecasts) of both skill supply and demand, with demand measured via ISCO; see Cedefop (2010). The trends revealed by these data, based on the European Labour Force Surveys, show strong upgrading of both education and job skill requirements in EU member countries, with the supply side typically ahead in pace. Available forecasts indicate that these trends, including their relative strength, will continue through 2020. While such predictions are obviously less than certain, the underlying forces tend to be highly robust since they reflect strong fundamentals, demographically, economically, and institutionally.

An important issue is the extent to which the long-term trends are affected by macro-economic conditions, with the great recession as a focal case. How have educational attainment and the skill structure of jobs changed due to the steep and widespread economic downturn, and how has the matching between workers and jobs evolved? In general, the EULFS data show that the low-skill share of all jobs declines significantly as the recession unfolds, thus raising the speed of occupational upgrading (Cedefop 2010). On the supply side, recessions usually lead to a rise in educational enrolment, as individuals turn to schooling as an apparently productive alternative to employment when jobs are scarce.

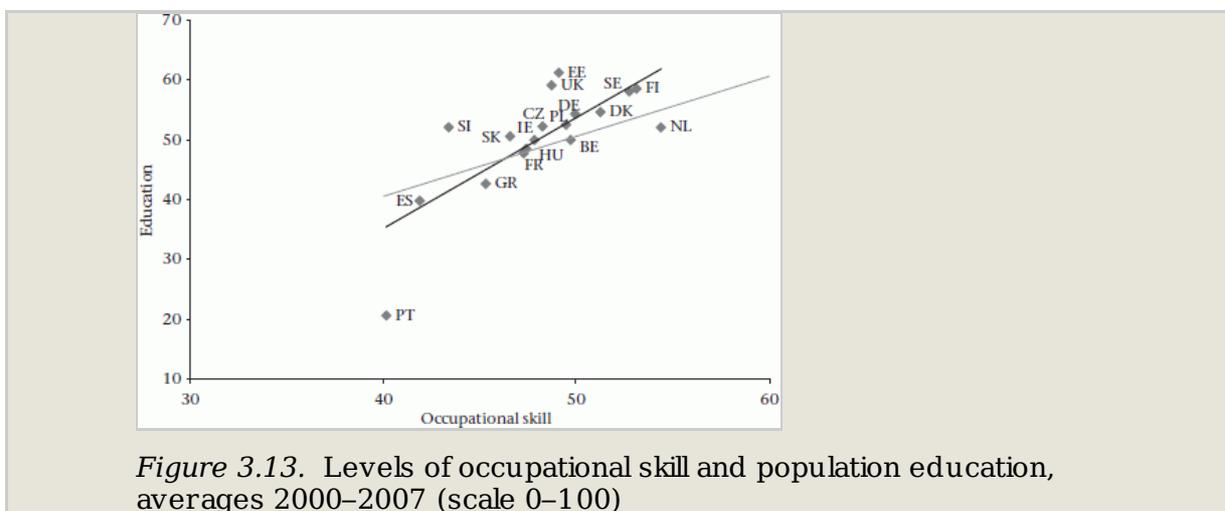
What are the potential implications for job-worker matching of these recession-induced shifts in skill demand and supply? In the short term, generally falling recruitment coupled with a relatively large loss in available low-skill jobs, may lead to bumping-down: the difficulty for well-educated workers to find a high-skill job increases due to the recession, leading them to take a low-skill jobs as a (hopefully) temporary substitute. This in turn **(p.74)** may add to the already increased difficulty for low-educated workers to find (or keep) a low-skill job, which pushes them into unemployment or out of the labour force. In the longer term, some time into the post-recession period of increased hiring rates, the pace of skill upgrading on the demand side will probably slow down as compared to the recession years, but skill supply will have been raised in the meantime, while jobs were hard to find. The net outcome of these two shifts is hard to predict. An additional issue is how unemployment and general economic conditions early in the career affect future labour market prospects. Previous research has found substantial long-term negative outcomes; a recent example is Kahn (2010) who documents significant losses in long-run earnings growth for US college graduates who entered the labour force in economic downturns. One reason may be difficulties in escaping the consequences of early skill mismatch.

We now turn to empirically examining the structure and change of skill supply and demand in the eighteen countries under comparison. On the demand side, a continuous measure of occupational skill requirements has been constructed on the basis of the distribution of the employed population across 1-digit ISCO categories. Each category has been assigned a skill demand score from 0 to 2 depending on the typical educational requirements of its included occupations, with 0 meaning that no schooling beyond the

primary or lower secondary level is normally required, 1 that upper secondary but not tertiary education is the normal requirement level, and 2 that the occupations typically require a tertiary education degree. Based on these criteria, professionals (ISCO 2) are assigned a score of 2, managers (ISCO 1) and semi-professionals (ISCO 3) a score of 1.5, craft workers (ISCO 7) a score of 1, clerical employees (ISCO 4), sales and service workers (ISCO 5), semi-skilled agricultural workers (ISCO 6), and factory workers (ISCO 8) a score of 0.5, and elementary workers (ISCO 9) are assigned a score of 0.

For education, a continuous measure has been constructed in the same manner as for occupational skill. Hence, education is scored 0 for primary schooling (including lower secondary) or less, 1 for completed upper secondary schooling, and 2 for a completed tertiary education degree.

On the basis of these measures, both transformed (simply multiplied by 50) to run from 0 to 100, Figure 3.13 shows average education levels of the population and average skill levels of the occupational structure in the eighteen countries. The numbers are averages for the years of the last decade prior to the start of the recession, 2000–7. A strong positive association is evident between the two skill dimensions, i.e. the skill levels of individuals and jobs, respectively. Still, the relation is far from perfect, and displays a fairly large amount of apparent excess supply of education: most countries are clearly above the flatter of the two lines in the figure which connects points of similar magnitude along the two dimensions. The steeper line is the regression **(p.75)**



line, and the fact that it is steeper confirms the systematic tendency of over-education: for each point increase in skill demand there is a consistently larger amount of increase in skill supply. In a sense, this is an underestimation of actual over-education rates, since (a) the employed relative to the full population are positively selected on education, and (b) there is mismatch at the individual level even when aggregate skill demand and supply are equal in size. On the other hand, all education is not useful in the labour market since not only levels but also fields of education are relevant, so some apparent over-education reflects horizontal rather than vertical mismatch.

There are exceptions to the pattern of educational over-supply. Portugal is an extreme case, with both a far less educated population than in all other countries under comparison and a large shortage of education relative to its occupational structure, despite its occupational skill level being the lowest of all. Greece, Spain, and the Netherlands are further cases of apparent education shortage relative to the skill level of their occupational structures. All other countries have a higher average education level of their populations than the average skill level of their occupational structures. Estonia, Slovenia, and the UK have the highest rates of structural (aggregate) over-education, while Belgium, France, and Hungary are close to balance.

In line with our parallel interest in distribution and growth (see the conceptual discussion in Chapter 2), the link between skill levels and economic wealth is important to examine. Both individual education and the skill level (**p.76**) of occupations are positively related to wealth (measured by GDP per capita). The wealth association is clearly stronger with occupation than with education, in part reflecting that much education is not used in production: many of the population are not employed, many of the employed have more education than their job requires, and there is a fair degree of horizontal mismatch. In addition, the correlation between educational quantity and quality is far from perfect, and the wealth connection is much stronger with quality than with quantity (Hanushek and Woessmann 2008).

Figure 3.14 shows the association between average occupational skill level and wealth. There are three distinct groups of countries. The first consists of the nine richest countries, located in Europe's North West region, which also have the most highly skilled occupational structures. For the two other groups of countries, the rank orders of wealth and occupational skill, respectively, are inconsistent. The Southern European countries have the least skilled job structures but nonetheless have a clearly higher GDP level than the Eastern European nations. These two country categories thus appear to follow partly different developmental paths: The economic disadvantage of the South relative to the North West is mainly tied to its technological structure as reflected in its occupational distribution. In contrast, the Eastern economic disadvantage is both technologically (relative to the North West) and institutionally (relative to both the South and the North West) driven. The transition economies of Eastern Europe have so far had very limited time to catch up with more mature capitalist societies, and still suffer from relatively

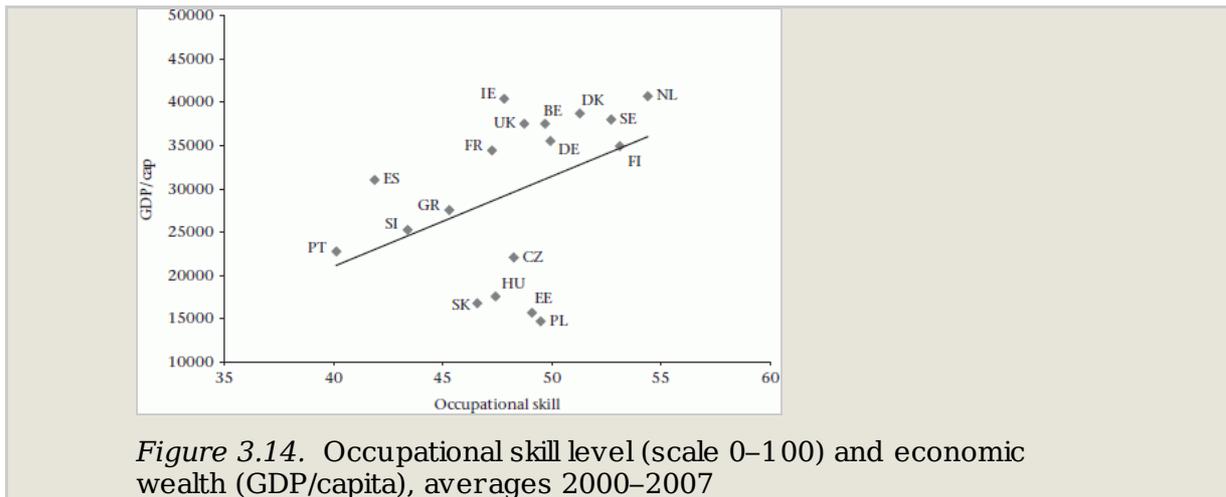


Figure 3.14. Occupational skill level (scale 0–100) and economic wealth (GDP/capita), averages 2000–2007

(p.77) low levels of productive efficiency and governance quality. One indication of the efficiency lag problem is the strong correlation (0.66) between GDP per capita given the skill level of the occupational structure and a standard measure of governance quality, the corruption index assembled by Transparency International. When excluding the transition countries this correlation is almost eliminated (0.17).

Changes in skill distributions, part 1: educational and occupational upgrading

After having sketched the skill supply and demand profiles of the eighteen compared countries in the years preceding the recession, we now move to examining how skill structures have changed during the economic downturn. As discussed earlier, economic downturns typically involve shifts in the skill distribution, both regarding education and occupation, since employment tends to be more reduced for low-skill than for high-skill categories.

Figures 3.15 and 3.16 are in line with this general pattern. The distributions of education as well as of occupational skill have shifted upward, and more strongly in countries with relatively large employment reductions. Average education has tended to increase more than average occupational skill. This implies that excess education has increased, raising the risk of skill mismatch, especially over-education.

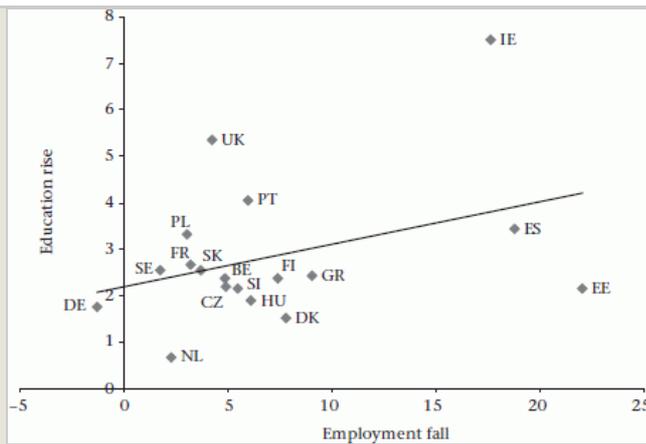


Figure 3.15. Rise in average education (scale 0–100) among employed population (age 25–64) from 2007/8 to 2010 by size of total employment decline

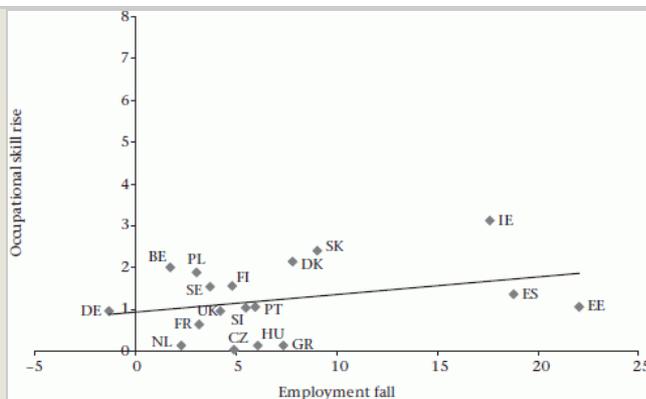


Figure 3.16. Rise in average occupational skill level (scale 0–100) from 2007/8 to 2010 by size of total employment decline

(p.78)

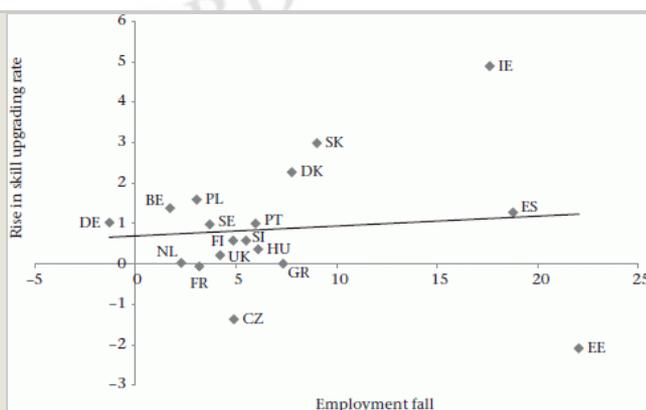


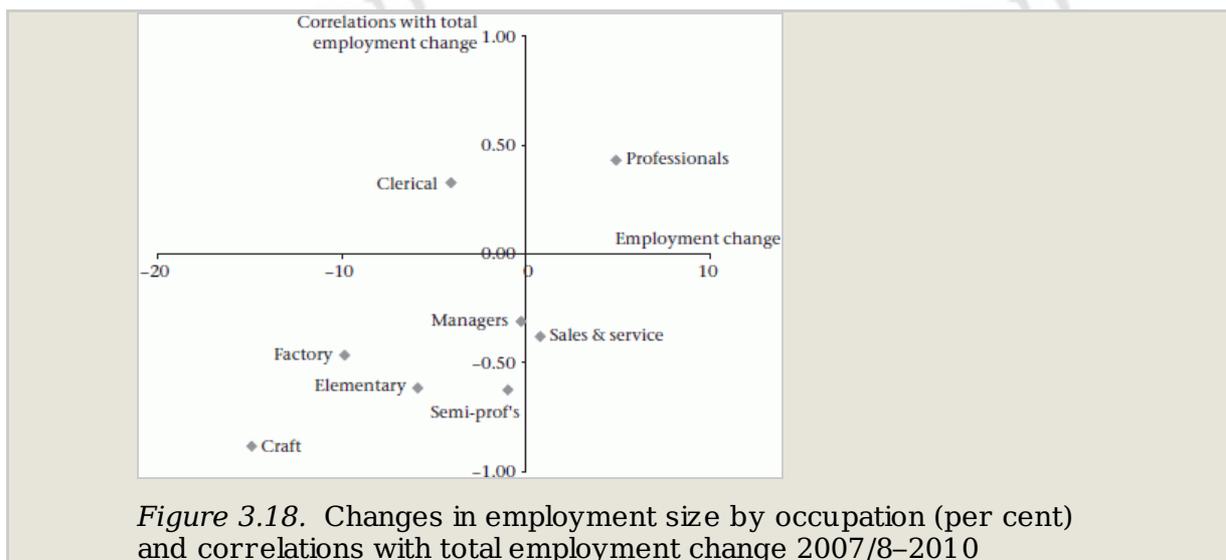
Figure 3.17. Change in occupational skill upgrading from 2004–2007 to 2007–2010 by total employment decline

However, the associations involved are not very strong. Crisis magnitude correlates 0.37 with educational rise and 0.31 with occupational skill upgrading, but these correlations

are not very systematic given the rather splintered country pattern. Apparently, other factors than employment decline determine changes in the skill structure, which should come as no surprise given the forceful long-term trends in skill supply and demand net of cyclical employment conditions.

An additional way to examine the association between crisis magnitude and occupational skill upgrading is to compare upgrading rates before and during the downturn. Figure 3.17 shows the difference in upgrading speed between two periods, the first running from 2004 to 2007 and the second from 2007 to 2010. If the economic decline increases skill upgrading, we should expect two things from the country pattern in the figure. First, most countries should lie above zero on the vertical axis, implying that average occupational upgrading has accelerated in the economic downturn. Second, the regression line (indicating the association between crisis magnitude and the change in the upgrading rate) should slope upward, reflecting that acceleration has been particularly sharp in countries where the employment downturn has been especially severe.

Both these expectations are met by the empirical outcome. However, the overall associations are not very strong. A majority of the countries have indeed seen a rise in their upgrading rates, but the increase in speed is not **(p. 79)**



dramatic: the average upgrading rate among all eighteen countries in the pre-recession period from 2004 to 2007 was 0.4 on the occupational 0–100 scale, increasing to 1.2 in the downturn (2007–10). The regression line does slope upward, but only barely; the correlation between general employment decline and the change in upgrading rate is only 0.10. The pattern of association is quite scattered, with some conspicuous outliers. Foremost among the latter is Estonia, where skill upgrading actually decelerated (from a rise of 3.2 in 2004–7 to a rise of 1.1 units in 2007–10). Excluding Estonia markedly raises the correlation between crisis magnitude and upgrading acceleration, to 0.55. The highest increase in upgrading speed occurred in the Irish labour market. In contrast to most other countries, and especially to Estonia, the pre-recession years (2004–7) in Ireland involved a fall in average occupational skill, by 1.8 units on the 0–100 scale, turning to a

strong upgrading with 3.1 units in the course of the crisis, to produce a change across the two periods of almost 5, which is the highest upgrading acceleration rate of all.

In summary, the labour market downturn does appear to increase the rate of occupational skill upgrading, reflecting a concentration of the fall in employment opportunities to low-skill work. But the association is only moderate in strength and displays a quite scattered pattern across countries. A reasonable interpretation of these findings is that shifts in the occupational structure are mainly driven by fundamental economic and social factors that tend to influence skill demand through mechanisms operating in the longer run. Cyclical (**p.80**) phenomena like the recent recession, while far from unimportant, are likely to be secondary drivers in this long-term development, not only because of the less than overwhelming empirical associations with downturn severity indicated above, but also due to their temporary character with upturns of demand eventually compensating for much of the impact of the foregoing decline.

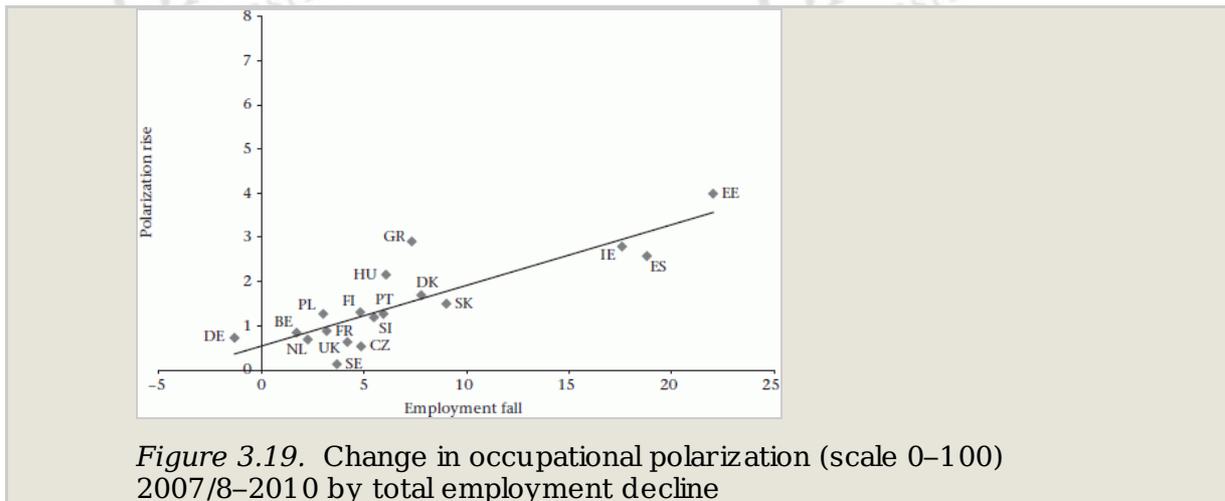
Changes in skill distributions, part 2: occupational polarization

Shifts in the skill structure do not only involve unidirectional change in levels (mostly upward), but also changes in distributional shape. A prominent line of labour market research in recent years has explored tendencies of polarization of the occupational structure, with both high-skill and low-skill jobs expanding in number relative to mid-level jobs (see Autor 2010 for an overview). In theory, technological change (especially IT expansion) is the main driver of polarization, the mechanism being an imperfect correlation between the skill content of job tasks and their potential for being replaced by computer technology. Many low-skill jobs do not lend themselves easily to technological replacement because they require human capacities that are difficult to imitate by using computers or other machines, like eye–hand coordination. In contrast, some job tasks that are relatively skilled, like book-keeping, have a structure and content more conducive to technological replacement, like IT-based accounting. This technological development is called task-biased rather than skill-biased labour demand change, and is assumed to have repercussions across all industries. In practice, the main mechanism behind polarization appears to be the decline in manufacturing employment, especially in skilled manual occupations.

There seems to be a good deal of variation across countries in the degree of polarization over time. The first empirical evidence (Autor et al. 2003) came from the United States and the UK (Goos and Manning 2007) and showed tendencies of a relative decline in the number of jobs at medium skill and wage levels. Despite some claims to the contrary (e.g. Goos et al. 2009), for most European countries evidence of job polarization during recent years seems rather weak, at least until the recession; see Cedefop (2011). Importantly, technological factors—crucial in the standard explanatory model—seem to have had only a minor impact on the evolution of the relative number of low-skill jobs.

How might occupational polarization have been affected by the economic crisis? There has been a particularly large fall in manufacturing and construction employment in most countries. If this decline has tended to primarily affect skilled manual work, then

polarization is likely to have increased since **(p.81)**



craft occupations are perhaps the major instance of mid-level jobs in the skill structure. Figure 3.18 shows changes during the downturn in the number of jobs at the 1-digit ISCO level together with the correlation between these changes and crisis magnitude (total employment decline).

Changes in occupational employment size are indicated on the horizontal axis. The clearly largest change is the steep decline (around 15 per cent on average) in the number of craft workers (ISCO 7), i.e. skilled manual workers mainly in manufacturing and construction. Relatively large falls in employment have also occurred for factory workers (ISCO 8) and elementary workers (ISCO 9), while the number of clerical employees (ISCO 4) has fallen somewhat. In stark contrast, employment of professionals (ISCO 2) has actually increased even in the economic downturn (around 5 per cent on average). Finally, the employment of managers (ISCO 1), semi-professionals (ISCO 3), and sales and service workers (ISCO 5) has not changed much in the course of the economic crisis.

Correlations between downturn magnitude (total employment decline) and changes in the size of different occupational categories are indicated on the vertical axis. The occupations showing the largest fall in size (craft, factory, and elementary workers) are also the ones that correlate strongest with economic downturn severity. At the other end, the change in employment size of professional occupations is positive and also correlates positively with crisis magnitude.

(p.82) Altogether, this pattern of shifts in occupational structure confirms the tendency shown in the previous section that the economic crisis has been associated with skill upgrading, with some nuance provided by the disaggregation of the continuous skill measure used above into the occupational categories displayed in Figure 3.18.

Tendencies of polarization are also clearly evident. In particular, the large decline in the number of craft workers relative to all others, both high-skill and low-skill occupations, implies that the contraction of employment has increased polarization of the job structure. Overall, there has apparently not been a unidirectional change in occupational skill level

during the downturn, but rather a combination of upgrading and polarization.

Figure 3.19 gives the country pattern of change in occupational polarization by crisis magnitude. All countries show an increase in polarization, although in some cases very slight. On average, the rise is 1.5 units on the 0–100 scale, with Estonia showing the largest increase (4.0) and Sweden the smallest (0.1). The association with total employment decline is strong; the regression line in the figure reflects a correlation of 0.85. Evidently, an important reason for this tight link is the large decline in employment of skilled manual workers during the downturn (see Figure 3.18).

Skill upgrading, occupational polarization, and institutional structure

We end this section by examining how changes in the occupational structure during the economic crisis have been associated with the structure of labour (p.83) market institutions. Figure 3.20 displays correlations between the change in size of different occupational categories and the institutional scales of equality promotion and labour market flexibility used earlier. In addition to the occupational groups, the continuous measure of occupational skill is indicated in the figure together with a continuous measure of polarization. The latter is constructed in a similar manner as the skill level scale, but in the polarization case mid-level occupations (craft) are scored lowest, high-skill occupations (professions) and low-skill occupations (elementary) are both scored highest, and the remaining occupations are scored in between. All correlations shown in the figure are estimated net of crisis magnitude, following the same procedure as in the section above on the distribution of employment decline by gender, age, and education.

According to the results, labour market institutions have been important for the pattern of change in the occupational structure during the downturn. In countries with strong equality-promoting institutions, the employment of professionals and semi-professionals, as well as of craft workers and factory workers, has been maintained at relatively high levels compared to less equal countries. In contrast, the number of clerical employees and sales and service workers has declined relatively little in unequal countries. With regard to labour market flexibility, employment levels of elementary workers have

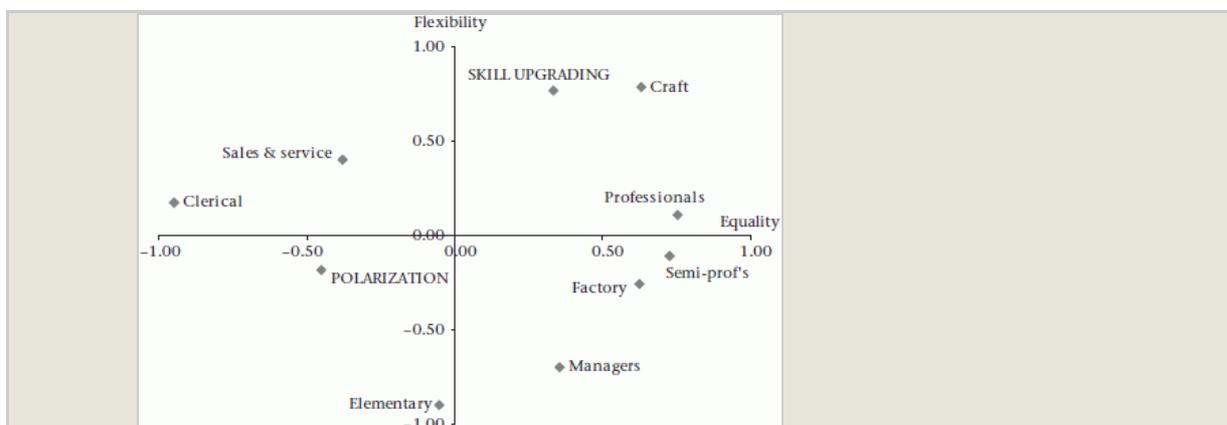


Figure 3.20. Changes in occupational structure (skill rise, polarization, and occupational category size) 2007/8–2010 by labour market institutions (equality and flexibility)

(p.84) fallen more sharply than elsewhere in flexible countries, while sales and service workers to some extent show the opposite tendency.

Overall, skill upgrading has apparently been stronger in equal and flexible countries, with the Nordics being a prime example (see Chapter 2 for the full country pattern with regard to institutional structure in this respect). Occupational polarization, on the other hand, has been particularly sharp in unequal countries, and to some extent also in countries with less labour market flexibility.

Changes in Wage Inequality

A central issue closely tied to skill supply and demand is economic inequality. We close the present chapter by briefly assessing how the structure of wages has changed in different countries during the downturn. As shown above, the labour market has changed its composition of jobs and workers during the economic crisis, with tendencies of both upgrading and polarization. While these tendencies have been rather moderate and uneven, they are likely to have affected the wage structure. Compositional shifts need to be taken into account in examining the cyclical evolution of wages (see e.g. Solon et al. 1994).

In general, predictions of how recessions affect economic inequality are not straightforward. While it is clear that job loss and unemployment disproportionately hit traditionally vulnerable groups, there are several counteracting mechanisms involved. For instance, an important driver of wage growth among high-skill workers is job-to-job mobility, often across firms. The opportunities for this kind of mobility are strongly reduced in economic downturns, thus weakening high-skill wage growth.

Previous research has not arrived at a clear set of findings regarding the overall relation between business cycles and economic inequality. For example, a study of the Nordic countries during the deep recession of the early 1990s (Aaberge et al. 2000) shows that, as a net outcome of complex mechanisms, 'income distributions were remarkably stable' (Aaberge et al. 2000: 95). For the US, Barlevy and Tsiddon (2006) find that the impact of recessions on earnings inequality resembles the general trend of the time period: in times of increasing inequality, recessions tend to raise the rate of increase, and vice versa. A recent overview of the literature (Fiorio and Saget 2010) concludes that overall income inequality commonly falls somewhat following financial crises, while the impact on earnings inequality is more uncertain.

Descriptive international trends of wage inequality are regularly published (see e.g. ILO 2010; OECD 2010), and the latest available information is used below to assess the downturn's consequences for the distribution of earnings. At the time of writing (November 2012), there are relevant data for thirteen **(p.85)**

Table 3.2. Change in earnings inequality during the recession and correlations of inequality change with recession magnitude, shifts in occupational structure, and labour market institutions (n = 13, except last column where n = 11)

| Decile ratio | Average change | Correlations with: | | | | | |
|--------------|----------------|--------------------|---------|--------------|----------|----------|-------------|
| | | recession | rec net | skill change | polar ch | equality | flexibility |
| d9/d1 | -0.11 | -0.19 | 0.02 | -0.04 | -0.15 | 0.18 | 0.78 |
| d9/d5 | -0.03 | -0.42 | -0.68 | -0.11 | 0.34 | -0.51 | 0.48 |
| d5/d1 | -0.03 | 0.16 | 0.67 | -0.01 | -0.46 | 0.91 | 0.64 |
| d avg | -0.06 | -0.21 | -0.01 | -0.06 | -0.12 | 0.10 | 0.82 |

Source (decile ratios): OECD Earnings Structure database.

of the eighteen countries in our comparison, i.e. data extending through 2010 (or in one case, the Czech Republic, through 2009). For five countries—Belgium, Estonia, the Netherlands, Slovakia, and Slovenia—there are as yet no published comparative data on changes in wage inequality beyond 2008.

Table 3.2 shows how economic inequality, in the form of ratios between earnings levels at deciles 1, 5, and 9 among full-time employees, has changed during the crisis as well as correlations between inequality change and a number of factors of interest including downturn magnitude, shifts in occupational distributions, and the structure of labour market institutions.¹

Changes in the rate of inequality are shown in the first column of the table. All changes are negative, implying that wage inequality has decreased during the employment downturn. The size of the fall in inequality is just above 3 per cent in the case of the ratio between deciles 9 and 1 (where the average ratio is around 3) and a little less than 2 per cent in the d9/d5 and d5/d1 cases (where the average ratios are around 1.9 and 1.7, respectively). This indicates that the economic downturn on average across the thirteen countries with available information has had a slight dampening impact on wage inequality. Consistent with such an interpretation, the correlations between inequality change and downturn magnitude (see column 2 of the table) are mostly negative, with the exception of the ratio between median and low earnings (d5/d1).

As discussed above, some of the change in economic inequality is likely due to shifts in the job structure. As a way of indicating the importance of **(p.86)** the composition mechanism, the third column of Table 3.2 (labelled ‘rec net’) shows the correlations between inequality change and total employment decline given occupational skill upgrading and polarization. The strong correlations in this case emerge when median earnings are involved in the ratio: net of compositional shifts in the occupational structure, the economic downturn appears to have increased relative earnings more at the middle level than at the high and low levels. This difference is mirrored by the associations between occupational structure change and inequality change, given crisis magnitude (see columns 4 and 5 of the table). While the correlations with skill level change are generally weak, the correlations with polarization that involve median earnings are fairly

strong. In line with the decline in demand at the middle of the skill structure, primarily reflected by falling employment of skilled manual workers and being especially large in countries with a strong increase in occupational polarization, wages at the median level appear to have fallen relative to both tails of the distribution.

Finally, the last two columns of Table 3.2 display the associations between the change in wage inequality and the structure of labour market institutions. (As in the earlier analyses in this chapter, the institutional associations are estimated net of downturn magnitude.) In the case of equality-promoting institutions, it seems that wages at the median level have held up better relative to both high and low earnings in relatively equal countries. This pattern is consistent with the comparatively small loss in employment of craft workers in more equal countries; see Figure 3.20. In contrast, the correlations between labour market flexibility and the change in wage inequality rates are generally positive and fairly strong, implying that economic inequality has increased more (or decreased less) in relatively flexible than in more inflexible countries.

We end this section on a cautionary note: since the wage data used above are only available for thirteen of the eighteen countries involved in the larger comparison, the conclusions based on them must be seen as preliminary. This is especially the case with regard to the correlation analyses; with such a small number of cases, and with the rather limited variation across the available countries, any interpretation of the findings must be quite careful. While clearly suggestive, the results just reported concerning economic inequality will obviously need further empirical investigation as the amount of useful information expands.

Summary and Conclusions

In this chapter, we have examined distribution in the downturn: (a) how employment decline during the economic crisis has affected different population groups as defined by gender, age, education, and occupation, (b) how **(p.87)** wage inequality has changed, and (c) how these patterns are associated with downturn magnitude and the structure of labour market institutions.

Aside from the sharp contrast in crisis magnitude between the three extreme national cases (Estonia, Ireland, Spain) and the remaining fifteen countries, labour market outcomes have been strongly uneven along social and demographic lines. Youth, men, and low-skilled workers have seen their job prospects deteriorate significantly in most countries, while labour market conditions for older, female, and high-skilled workers have changed much less. The skill-biased employment change during the downturn has slightly enhanced the continuous upgrading of the occupational structure but has also contributed to its polarization, with comparatively large job losses occurring among skilled manual workers in manufacturing and construction.

Regarding changes in the distribution of earnings, the available information suggests that inequality has fallen somewhat, or at least not increased. To the extent that any impact of the economic downturn is discernible, the distribution of earnings has become slightly more compressed. Based on the limited data available, median earnings might have been

more affected than either high or low earnings have. While the increase in occupational polarization would seem to have reduced relative wages at the middle of the skill distribution, the magnitude of the downturn net of compositional shifts appears to have counteracted this decline of median earnings.

In general, then, the impact of the economic crisis on labour market inequality has been mixed and multi-faceted rather than unidirectional and simple. Gender inequality has decreased, class inequality has increased in employment but not in earnings, while the change in age inequality has been mixed, with youth losing more than prime-age workers and older employees coming through largely unscathed.

Notes:

(1) Deciles indicate points in a percentage distribution (of wages, for example), with decile 9 indicating a high point where the (wage) level is higher than 90 per cent of all individuals and lower than 10 per cent of all individuals. Correspondingly, decile 5 is at the median of the distribution, with 50 per cent of all individuals earning more and 50 per cent earning less; finally, decile 1 indicates a low point where the (wage) level is below 90 per cent of all individuals and above 10 per cent of all individuals.



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