Job Market Polarization and Employment Protection in Europe

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draft version

Abstract

Although much attention has been paid to the polarization of national labor markets, with employment and wage growth occurring in both low- and high-but not middle-skill occupations, there is little consistent evidence on cross-country differences in this process. I analyze job polarization in 12 European countries using an occupational skill-intensity measure, which is independent of country-specific labor supply conditions. Extensive north-south differences in the extent and skewness of polarization correspond to variation in economic growth, industrial structure, and to dissimilarities in employment protection.

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1 Introduction

Polarization of labor market, defined as employment and wages growth in low- and high-skill occupations at the cost of middle-skill occupations, was first documented by Goos and Manning (2007) in the UK.\footnote{Goos and Manning first used the term “polarization” to describe employment growth in low- and high-skill occupations at the cost of middle-skill occupations in the 2003 Working Paper version of this publication.} Further analyses of the British and American labor markets confirm this trend and suggest some explanations of its causes. Autor, Katz and Kearney (2006) propose that the labor market polarization observed since the 1990’s can be accounted for by the so called “routinization”, i.e., the substitution of routine job tasks by modern technologies.\footnote{The term “routinization” was introduced by Autor et al. (2003).} Fortin et al. (2009) suggest that offshoring certain job tasks to low-wage countries can also be partially responsible for polarization in the US. Finally, Acemoglu and Autor (2010) note that the allocation of workers to occupational tasks might be influenced by labor market imperfections and institutions, thus challenging the polarization pattern in some countries.

This has raised the question of whether labor market polarization is unique within the Anglo-Saxon countries, among which the US is known as the pioneer in technological progress and the largest outsourcer of manufacturing and remote consumer service jobs. In answer to this question, recent research suggests that polarization can be observed across the majority of developed economies. For example, studies by Spitz-Oener (2006) and Dustmann, Ludsteck and Schonberg (2009) show that polarization is present in another leading economy, Germany. Most importantly, Goos, Manning and Salomons (2009) provide evidence of this phenomenon across 16 European countries.\footnote{These countries are: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Ireland, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden and the UK.}

Nevertheless, the international analysis of labor market polarization is not complete. First, the European evidence is based on a crude measure of the skill requirements of occupations – the average wage. As argued in Pertold-Gebicka (2010),
this approach implicitly assumes that within occupations differently skilled workers are perfect substitutes, which is likely not to be the case. Second, cross-country differences in the shape of employment change distribution (which is used to picture polarization), while documented, have not been given much attention. These differences might be caused by cross-country heterogeneity in the supply of skills, variation in economic cycles or distinct labor market legislations. The interaction of the latter with the technological progress on occupation level has been recognized by Acemoglu and Autor (2010) as a fruitful area for further research. Finally, while in the US polarization has been measured in employment changes as well as in earnings changes, the existing international analysis is focusing only on employment changes, i.e., it documents the so-called job polarization as opposed to wage polarization. Studying wage polarization would give additional insight into the structure of the European labor market.

This paper addresses the first two issues. I use the European Union Labor Force Survey (EULFS) to report differences in the extent of job polarization across European countries, adopting the measure of skill requirements of occupations developed by Pertold-Gebicka (2010). This is a preferable measure to document polarization across countries, as it is independent of supply conditions in local labor markets. The discussion and examples provided in the current study confirm this statement. With the use of the skill requirements measure, I provide extensive evidence on cross-country differences in the extent of polarization. Specifically, one can observe that polarization is the strongest in Southern European countries and Ireland, while it is somehow weaker in Northern Europe. As a potential explanation of this observation, I suggest differences in economic growth and educational attainment of their populations. The remaining cross-country variation in the extent of polarization is shown to be partially driven by dissimilarities in labor market institutions. This latter finding

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Wage polarization is known as the pattern of earnings growth in the bottom and top percentiles of earnings distribution with a simultaneous decrease of earnings in the middle of the earnings distribution. Job polarization is know as growth of employment in high- and low-skilled occupations with simultaneous decrease (or stagnation) of employment in middle-skilled occupations. See Acemoglu et al. (2010) for a summary of the terminology used in the polarization literature.
suggests that strong employment protection might impede or slow down the market mechanisms observed in nonregulated countries, such as substitution of certain job tasks by computers (Acemoglu and Autor, 2010), which flatters the polarization patterns.

The rest of the paper is organized as follows: Section 2 describes the skill-intensity measure used to order occupations according to their skill requirements. Section 3 describes the data used in this analysis and Section 4 presents some evidence on the incidence of labor market polarization in Europe and compares it to the results obtained using alternative measures of occupational skill requirements. The next section discusses cross-country differences in the extent of polarization and proposes an explanation of this observation. Finally, conclusions are presented in Section 6.

2 The measure of skill requirements of occupations

The term job polarization is used in the literature to indicate growth of employment in high- and low-skilled occupations with a simultaneous decrease (or stagnation) of employment in middle-skilled occupations (Goos and Manning, 2007). Thus, the key ingredient of any analysis of labor market polarization is a measure of the skill requirements of occupations.

Recent literature uses several alternative measures of the skill requirements of occupations. The most often encountered are the average educational achievement of workers (Autor et al., 2006, for the US; Goos and Manning, 2007, for the UK) and the average wage (Firpo, Fortin and Lemieux, 2009; Goos et al., 2009), although both approaches are based on implicit assumptions that are likely to be violated. For the employment structure of occupations to correctly reflect their skill requirements, we need to face zero within-occupation substitutability between workers of different skills. On the other hand, wages are good predictors of occupational skill requirements when differently skilled workers are perfect substitutes. With imper-
fect substitutability between skill types, occupation-specific employment structures are driven not only by skill requirements (i.e. the demand for skills) but also by the supply of differently skilled workers. In this case wages are the equilibrium outcome of the interaction between these two forces. Thus, neither wages nor employment can be used to identify occupational skill requirements.

To deal with this lack of identification, I use the measure of skill requirements of occupations (called the skill-intensity of occupations) developed in Pertold-Gebicka (2010). This alternative measure is based on estimating the relative productivity of more and less skilled workers employed within each occupation. Thus, it measures how crucial workers’ skills are for the tasks performed within a specific occupation. I propose that each occupation uses a relatively general labor aggregating technology of the constant elasticity of substitution (CES):

\[
Y_j = \left( \alpha_{Hj} L_{Hj}^{\gamma_j} + \alpha_{Lj} L_{Lj}^{\gamma_j} \right)^{\frac{1}{\gamma_j}}
\]

where \( Y_j \) is the output of occupation \( j \), \( L_{Hj} \) is the amount of high-skilled labor, \( L_{Lj} \) is the amount of low-skilled labor employed in occupation \( j \), and \( \gamma_j \) is a parameter describing substitutability between these two labor types (the elasticity of substitution is \( \sigma_j = \frac{1}{1-\gamma_j} \)). In this context, \( \frac{\alpha_{Hj}}{\alpha_{Lj}} \) describes the occupation-specific relative productivity of differently skilled workers.

Under perfect competition, occupation-specific employment \( (L_{Hj} \text{ and } L_{Lj}) \) and equilibrium wages \( (w_{Hj} \text{ and } w_{Lj}) \) have to satisfy

\[
\frac{\alpha_{Hj}}{\alpha_{Lj}} = \frac{w_{Hj}}{w_{Lj}} \left( \frac{L_{Hj}}{L_{Lj}} \right)^{1-\gamma_j} = \frac{w_{Hj}}{w_{Lj}} \left( \frac{L_{Hj}}{L_{Lj}} \right)^{-\frac{1}{\gamma_j}}.
\]

Thus, in the setup where more and less skilled workers are imperfect substitutes (i.e. where \( 0 < \sigma_j < \infty \)), it is necessary to combine the relative employment of differently skilled workers (the average educational attainment), relative wages, and the elasticity of substitution between more and less skilled workers to determine occupation-specific relative productivity. The measure of the skill-intensity of occupations proposed in Pertold-Gebicka (2010) incorporates all of these ingredients.

Occupation-specific average wages and employment can be easily retrieved from worker-level data, e.g., the European Community Household Panel (ECHP) or EU-
LFS; however, the substitution elasticities need to be carefully estimated. In my earlier paper, I propose a strategy for estimating this parameter employing data on individual workers and estimate occupation-specific elasticities of substitution between college and high school educated workers using the US Current Population Survey (CPS) data. As this is a very data-hungry process, it is not possible to replicate the estimations using the EULFS data, which does not provide information about individual workers’ earnings, or using the ECHP, which is too small to allow estimations on occupational level. However, assuming that the characteristics of occupations in the US and Europe is similar, I can match the estimates obtained for the US with European data. With today’s extent of globalization and spillover of technologies between the US and Europe, the above-made assumption is realistic. Nevertheless, in future work I plan to test it using the Danish register data to estimate the elasticities of substitution between college and high school educated workers in Denmark.

3 Data

Throughout this paper I use the 1993-2001 waves of the EU LFS microdata for scientific purposes. This is a collection of harmonized labor force surveys conducted at national levels in all EU member states and the associated countries. The availability of this dataset for all European economies, its comparability across countries and over time, and its representativeness on 2-digit occupation level makes it the best applicable for this study.

The chosen time span corresponds to the time period when polarization has been documented (Goos and Manning, 2007) and to the availability of the skill-intensity measure. Due to the limited time consistency of the occupational coding in the US CPS data, I could only estimate occupation-specific elasticities of substitution between more and less educated labor for the 1983-2001 period.

Given limitations in data availability for some countries, this study investigates 12 Western European economies: Denmark, Finland, Greece, Ireland, Iceland, Lux-
embourg, Netherlands, Norway, Portugal, Spain, Sweden and the United Kingdom. The Central and Eastern European countries are not analyzed, because the assumption about the similarity of occupations’ characteristics between these countries and the US is likely to fail. This study covers the whole working population of the above-mentioned 12 countries.

In the anonymized version of the EULFS occupations are coded using 2-digit ISCO codes, while the estimates of the substitution elasticities (and thus the estimates of occupation-specific skill-intensities) are available at the 3-digit level of the US Census occupational classification. To merge the EULFS data with the US occupational characteristics, 3-digit occupations from both datasets are matched according to an algorithm based on Elliott and Gerova (2005)\(^5\) and skill intensities are averaged at the 2-digit level. This procedure leaves me with 20 occupations listed in Table 1. Throughout the paper occupation-specific employment is measured as the usual weekly man-hours worked. For countries with shorter time spans,\(^6\) man-hours worked in each of the 20 2-digit occupations were extrapolated on the basis of average annual growth rates in occupation-specific employment.

4 Job polarization in Europe

Job polarization across European countries was first documented by Goos et al. (2009). This study reports changes in employment share for 21 ISCO occupations ranked according to their 1993 mean European wage. Employment structure is calculated by Goos et al. (2009) using the EULFS, and data for 1993 mean wages come from the ECHP dataset. I complement this study by providing evidence on job polarization using the skill-intensity measure introduced in Section 2.

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\(^5\)Elliott and Gerova (2005) propose a crosswalk between the 2000 Census occupational classification and 88-ISCO, while the skill-intensity measure is available for the 1990 Census occupational classification.

Figure 1 depicts job polarization in Europe with high- and low-skilled occupations experiencing a significant employment expansion and middle-skilled occupations experiencing a decrease or stagnation of employment between 1993 and 2001 using the pooled data on occupation-specific employment across 12 European countries. The two panels of this figure use different measures of the skill requirements of occupation: the left panel employs skill-intensity proposed by Pertold-Gebicka (2010) and the right panel employs average wage.\(^7\)

Polarization is present in both graphs, although there are significant differences between the two. First, the location of the minimum is skewed towards occupations higher in the skill requirement distribution when using the skill-intensity measure; and second, the variation in employment share changes across occupations from different skill requirement ranks is significantly lower when the average wage is used. These differences are driven by the characteristics of the two measures used to capture skill requirements of occupations. Specifically, with the growing supply of skilled labor, which is well-documented in Europe, some highly-skilled occupations might pay relatively low wages and thus can be classified as less dependent on skills than they actually are. This would be the case for the most “popular” occupations (i.e., the ones with a high supply of skilled workers) characterized by decreasing marginal productivity of highly skilled labor. Note that the CES occupation-specific production function introduced in section 2 captures this behavior.

To better understand the differences between the two measures of skill requirements of occupations, Table 1 documents the ranking of 2-digit ISCO occupations using skill-intensity and average wage. If occupations were characterized by perfect or zero substitutability between more and less skilled workers, these two measures of skill requirements would give the same ranking of occupations.

Note that there are substantial differences in ranking of occupations prepared

\(^7\)Occupations are ordered according to the 1993 average US wage to ensure consistency with ordering according to the skill-intensity. Nevertheless, there are only minor differences between ordering of occupations according to the US and European average wage.
Figure 1: Changes in employment share in Europe between 1993-2001 by occupational skill-intensity and wage rank

Note: Both graphs were obtained using the European Union Labour Force Survey. For countries with shorter time spans (Finland, Iceland, Norway, Spain and Sweden), man-hours worked were imputed on the basis of average annual growth rates. Skill-intensity rank corresponds to the position of each occupation in the skill-intensity distribution (5 = the most skilled); the wage rank corresponds to the position of each occupation in the US wage distribution (5 = the highest wage).

according to the two alternative skill requirement measures. These concern occupations such as corporate managers, which in 1993 paid higher wages than professional occupations because of the short supply of workers educated in management; or sales and service occupations, which paid relatively low wages due to the high supply of potential workers.

As major differences in the alternative ranking of occupations appear in the middle of the skill requirements distribution, higher aggregation of rank should lead to more similar patterns across the two measures. Indeed, Table 2 shows that once occupations are classified into three (as opposed to five) groups according to their skill requirements, the patterns revealed by both measures are similar.

Table 2 also shows that job polarization is present in all analyzed European economies, although its extent varies significantly across these economies. The next
Table 1: Comparison of occupational ranking using the 1993 skill-intensity and 1993 average wage measures

<table>
<thead>
<tr>
<th>Skill-intensity rank</th>
<th>Wage rank</th>
<th>Occupation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
<td>Life science and health professionals</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>Physical, mathematical and engineering science professionals</td>
</tr>
<tr>
<td>3</td>
<td>8</td>
<td>Life science and health associate professionals</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>Corporate managers</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
<td>Other professionals</td>
</tr>
<tr>
<td>6</td>
<td>5</td>
<td>Managers of small enterprises</td>
</tr>
<tr>
<td>7</td>
<td>6</td>
<td>Physical and engineering science associate professionals</td>
</tr>
<tr>
<td>8</td>
<td>18</td>
<td>Models, salespersons and demonstrators</td>
</tr>
<tr>
<td>9</td>
<td>13</td>
<td>Customer service clerks</td>
</tr>
<tr>
<td>10</td>
<td>7</td>
<td>Other associate professionals</td>
</tr>
<tr>
<td>11</td>
<td>12</td>
<td>Office clerks</td>
</tr>
<tr>
<td>12</td>
<td>17</td>
<td>Personal and protective services workers</td>
</tr>
<tr>
<td>13</td>
<td>14</td>
<td>Extraction, shot firers, stone cutters and carvers</td>
</tr>
<tr>
<td>14</td>
<td>11</td>
<td>Metal, machinery and related workers</td>
</tr>
<tr>
<td>15</td>
<td>10</td>
<td>Precision, handcraft, craft printing and related trades workers</td>
</tr>
<tr>
<td>16</td>
<td>16</td>
<td>Other craft and related trades workers</td>
</tr>
<tr>
<td>17</td>
<td>9</td>
<td>Stationary plant and related operators</td>
</tr>
<tr>
<td>18</td>
<td>15</td>
<td>Machine operators and assemblers</td>
</tr>
<tr>
<td>19</td>
<td>19</td>
<td>Laborers in mining, construction, manufacturing and transport</td>
</tr>
<tr>
<td>20</td>
<td>20</td>
<td>Sales and services elementary occupations</td>
</tr>
</tbody>
</table>

Note: The skill-intensity rank has been computed by the author; the wage rank is adapted from Goos et al. (2009).

section provides further evidence and suggests some explanations of this finding.

5 Explaining cross-country differences in the extent of polarization

Cross-country differences in the extent of job polarization are analyzed using five ranks of skill requirements, which is presented in Figure 2 illustrating employment changes in 12 European economies over the 1993-2001 period. Although all the analyzed countries experienced job polarization over the analyzed time interval, the differences across them are striking.

Note that in Benelux, Nordic and Anglo-Saxon countries (Denmark, Finland,
Table 2: Changes in employment share over 1993-2001 for low-skill, middle-skill, and high-skill occupations

<table>
<thead>
<tr>
<th></th>
<th>Skill-intensity</th>
<th></th>
<th>Wage</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low-skill</td>
<td>Middle-skill</td>
<td>High-skill</td>
<td>Low-wage</td>
</tr>
<tr>
<td>EU average</td>
<td>2.04</td>
<td>-3.55</td>
<td>4.78</td>
<td>1.58</td>
</tr>
<tr>
<td>Denmark</td>
<td>4.45</td>
<td>-0.60</td>
<td>0.18</td>
<td>-0.96</td>
</tr>
<tr>
<td>Spain</td>
<td>4.18</td>
<td>-6.10</td>
<td>4.73</td>
<td>0.96</td>
</tr>
<tr>
<td>Finland</td>
<td>3.07</td>
<td>-2.33</td>
<td>-1.48</td>
<td>6.66</td>
</tr>
<tr>
<td>France</td>
<td>-5.46</td>
<td>-12.55</td>
<td>19.07</td>
<td>-0.74</td>
</tr>
<tr>
<td>Greece</td>
<td>3.02</td>
<td>-14.38</td>
<td>12.62</td>
<td>1.75</td>
</tr>
<tr>
<td>Ireland</td>
<td>7.29</td>
<td>-8.08</td>
<td>-0.14</td>
<td>6.19</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>-1.90</td>
<td>-8.24</td>
<td>0.74</td>
<td>-1.66</td>
</tr>
<tr>
<td>Netherlands</td>
<td>-0.23</td>
<td>-4.62</td>
<td>3.02</td>
<td>2.27</td>
</tr>
<tr>
<td>Norway</td>
<td>6.51</td>
<td>-4.84</td>
<td>-1.85</td>
<td>4.96</td>
</tr>
<tr>
<td>Portugal</td>
<td>3.64</td>
<td>-3.31</td>
<td>-0.09</td>
<td>2.39</td>
</tr>
<tr>
<td>Sweden</td>
<td>3.57</td>
<td>-2.32</td>
<td>2.25</td>
<td>1.9</td>
</tr>
<tr>
<td>UK</td>
<td>2.91</td>
<td>-6.05</td>
<td>5.04</td>
<td>5.77</td>
</tr>
</tbody>
</table>

Note: Classification of occupations into low-, middle-, and high-skilled using the skill-intensity measure was done by the author; classification using the average wage is adopted from Goos et al. (2009).

Luxembourg, the Netherlands, Norway, Sweden, and the United Kingdom) the minimum is skewed towards occupations higher in the skill requirement distribution, while in Southern Europe (Greece, Portugal and Spain) plus Ireland and Iceland the minimum employment change happens at occupations close to the median in the skill requirements distribution. Additionally, the extent of polarization, measured as the difference between the lowest change in employment share for middle-skilled occupations and the highest change in employment share for low-skilled occupations, varies substantially across Europe. One observes the strongest polarization in the Southern European countries and Ireland, while the weakest polarization is observed in Nordic and Anglo-Saxon countries.

The polarization literature discusses two main sources of polarization. First, the decrease of employment in middle-skilled occupations is attributed to “routinization” (Autor et al., 2006), i.e., substitution of routine job tasks by modern technologies. Since machines carry out routine, precision tasks previously performed by administrative clerks or production workers, the demand for workers in occupations involving
Figure 2: Changes in employment share across European countries between 1993-2001 by occupational skill-intensity rank

<table>
<thead>
<tr>
<th>1. Luxembourg</th>
<th>1. Norway</th>
<th>1. Sweden</th>
<th>1. United Kingdom</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Denmark</td>
<td>2. Finland</td>
<td>2. Iceland</td>
<td>2. Netherlands</td>
</tr>
</tbody>
</table>

Note: Source: European Union Labour Force Survey. For countries with shorter time spans (Finland, Iceland, Norway, Spain and Sweden), man-hours worked were imputed on the basis of average annual growth rates. Skill-intensity rank corresponds to the position of each occupation in the skill-intensity distribution.

The second hypothesized reason for the contraction of employment in middle-skilled occupations lies in offshoring (Acemoglu and Autor, 2010). The development of communication and transport technologies makes it cheaper to outsource certain job tasks to low-wage countries, which decreases the demand for occupations involving these tasks in the developed economies. Additionally, Goos et al. (2009) show that routine tasks content\(^8\) has a negative influence on occupation-specific employment changes, while abstract tasks content has a positive influence on occupation-specific employment changes. Although Goos et al. (2009) do not find

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\(^8\)The routine tasks index is reported in the Occupational Information Network dataset (ONET).
any effects of offshorability\textsuperscript{9} on employment changes in the UK, Firpo et al. (2009) show that offshorability\textsuperscript{10} is a strong determinant of the development of occupational wages in the US.

The channels through which “routinization” and offshorability are expected to affect allocation of labor across occupations might be strongly influenced by the economic cycle. Fast growing countries are adopting new technologies at higher rates than other countries and thus “routinization” might have a greater impact on their labor markets. Additionally, the increase in the average educational achievement of a country’s workforce might strengthen the polarization effect. First, this means that there are more high skilled workers to implement new technologies, and, second, there are fewer people to work in middle-skilled occupations. Thus, we expect a positive correlation between both GDP growth and average educational attainment growth and the extent of polarization.

In addition to the above-discussed forces, the extent to which “routinization” and offshoring are expected to affect the shape of job polarization might be influenced by labor market institutions. In countries with high employment protection, it is more difficult to adjust employment to the prevailing technological conditions (Samaniego, 2006; Kugler and Pica, 2008) and thus the possibility of substituting workers with machines might be limited there. On the other hand, in countries with flexible labor markets employment adjusts to the changing structure of occupational skill-requirements. Additionally, as high employment protection is supposed to slow down the process of adjusting the labor market to current economic and technological conditions, we might observe that polarization affects different occupations in countries with different degrees of employment protection. This leads me to the formulation of two hypotheses: (i) the extent of polarization should be negatively correlated with the strength of employment protection (once the economic cycle is

\textsuperscript{9}Goos et al. (2009) measure offshorability as the number of occurrences in the European Restructuring Monitor.

\textsuperscript{10}Firpo et al. measure offshorability as an index based on ONET information about the necessity of face-to-face contact on site work, and decision-making for each occupation.
controlled for); and (ii) in countries with strong employment protection the largest employment drop should be observed in occupations close to the median of the global skill requirements distribution.

Using the measure of occupational skill-intensity which is exogenous to the European labor market and the same for all analyzed economies, I can perform consistent cross-country comparison of the polarization patterns to verify the above-stated hypotheses. This is illustrated in Figures 3 and 4. Using the employment protection index developed by Allard (2005) and reported in Nickell (2006), Figure 3 plots the correlation between the extent of polarization (after controlling for country-specific average educational achievement and GDP growth) and employment protection. As expected, countries with strong employment protection – the Southern European and Scandinavian countries – experience stronger polarization than other countries. Specifically, the conditional correlation between the Allard’s employment protection index and the extent of polarization is -0.37.
Figure 3: Correlation between the extent of job polarization (1993-2001) and employment protection

Note: This graph is constructed controlling for country-specific average educational achievement and GDP growths as well as the share of employment in manufacturing sector as of 1993. The extent of polarization is measured as the difference between the lowest change in employment share (occurring either at 3rd or 4th fifth of the occupational skill-intensity distribution) and the highest change in employment share (occurring either at 2nd or 3rd fifth of the occupational skill-intensity distribution). The employment protection index is an index decreasing on the {0, 5} range developed by Allard (2005) on the basis of the OECD methodology. This index is unavailable for Greece, Iceland and Luxembourg.

Figure 4 illustrates the relationship between the occurrence of the minimum in the distribution of employment share changes and the employment protection index. It is clearly visible that countries with the strongest employment protection (Sweden, Spain and Portugal) experience the largest drop in employment at occupations around the median skill-intensity, while the remaining countries (except Ireland) experience the strongest decrease of employment at occupations higher in the skill-
intensity distribution. Note that occupations around the median skill-intensity are characterized by the strongest automation (Firpo et al., 2009), which makes them the most prone to “routinization”.

Figure 4: The occurrence of minimum change in employment share change and employment protection

Note: The occurrence of minimum is equal to the skill-intensity rank at which the strongest drop in employment share over the 1993-2001 period is observed. The employment protection index is an index decreasing on the {0, 5} range developed by Allard (2005) on the basis of the OECD methodology. This index is unavailable for Greece.

6 Conclusion

Polarization of the labor market is a new phenomenon and there is still a lot of research needed to better understand its causes and draw conclusions for the future development of the labor market, as Acemoglu and Autor (2010) sum up in their
recent chapter of the Handbook of Labor Economy. This study applies a new measure of the skill requirements of occupations, which is independent of local labor market conditions, to analyze job polarization across Europe and reveals extensive cross-country differences in polarization patterns. Specifically, it is observed that polarization is the strongest in Southern European countries and Ireland, while it is somehow weaker in Northern Europe. Exploring exogeneity of the skill requirements measure, I show that these differences in the extent and skewness of polarization are not only correlated with country-specific GDP and educational achievement growth, but also with the strength of employment protection.

The latter finding is especially interesting, as it indirectly confirms the existing theories explaining polarization—the “routinization” and offshoring hypotheses. According to these theories, polarization is driven by workers employed in middle-skill occupations being substituted by modern technologies or by cheaper workforce in distant locations. Employment protection limits the possibility to adjust firms’ workforce in response to technological change and thus dampens the polarization effect. The natural next step in the development of the polarization literature in the context presented in this paper would be to explicitly model the interaction between labor market institutions and occupational allocation of workers.

References


