



Who Earns Minimum Wages in Europe? New Evidence Based on Household Surveys

François Rycx and Stephan Kampelmann

This paper aims to provide a comprehensive, evidence-based, and up-to-date assessment of minimum wages in a range of European countries. A first step towards a better understanding of where Europe stands today on this issue requires to grasp the diversity of European minimum wage systems, a key objective of the paper at hand. The second objective is to document international differences in the so-called "bite" of the minimum wage. This leads to questions such as "how do national minimum wages compare to the overall wage distribution?" and "how many people earn minimum wages in each country?" that are assessed for a set of nine countries from Western, Central and Eastern Europe: Belgium, Bulgaria, Germany, Hungary, Ireland, Poland, Romania, Spain, and the United Kingdom. This sample was designed to include countries for which recent evidence has been missing prior to this paper. What is more, the study also overcomes the narrow focus of extant overviews that have typically focussed only on full-time employment. Crucially, the study improves on existing work by looking beyond aggregate numbers; it provides a detailed panorama of the population of minimum wage earners in each country under investigation, notably by describing their composition in terms of a range of socio-demographic characteristics.

Keywords: Minimum wage systems, Socio-economic consequences, Europe.

JEL Classifications: J51, J58, J83

CEB Working Paper N° 13/002
2013

Who Earns Minimum Wages in Europe? New Evidence Based on Household Surveys¹

François Rycx

(Université Libre de Bruxelles, SBS-EM (CEB, DULBEA) and IZA)

Stephan Kampelmann

(Université Libre de Bruxelles, SBS-EM (CEB, DULBEA))

Abstract:

This paper aims to provide a comprehensive, evidence-based, and up-to-date assessment of minimum wages in a range of European countries. A first step towards a better understanding of where Europe stands today on this issue requires to grasp the diversity of European minimum wage systems, a key objective of the paper at hand. The second objective is to document international differences in the so-called "bite" of the minimum wage. This leads to questions such as "how do national minimum wages compare to the overall wage distribution?" and "how many people earn minimum wages in each country?" that are assessed for a set of nine countries from Western, Central and Eastern Europe: Belgium, Bulgaria, Germany, Hungary, Ireland, Poland, Romania, Spain, and the United Kingdom. This sample was designed to include countries for which recent evidence has been missing prior to this paper. What is more, the study also overcomes the narrow focus of extant overviews that have typically focussed only on full-time employment. Crucially, the study improves on existing work by looking beyond aggregate numbers; it provides a detailed panorama of the population of minimum wage earners in each country under investigation, notably by describing their composition in terms of a range of socio-demographic characteristics.

Keywords : Minimum wage systems, Socio-economic consequences, Europe.

JEL codes J51, J58, J83

¹ Funding for this research was provided by the European Trade Union Institute (ETUI).

1. Introduction

After a phase of “conscious neglect during the 1980s and 1990s” (ILO, 2010; p. 63), minimum wages² have re-appeared on political agendas around the world. Although their critics regularly warn against potentially negative effects, notably as regards low-wage employment, wage floors are widely regarded as useful instruments to protect low-wage workers and to combat rising levels of inequality and poverty. Today, minimum wages exist in one form or another in around 90 % of countries in the world (ILO, 2010), with Europe standing out as a traditional stronghold of this type of labour market policy.

Following episodes without mandatory wage floors, the United Kingdom and Ireland adopted statutory national minimum wages in 1999 and 2000, respectively, thereby joining the majority of their European neighbours: Bulgaria, the Czech Republic, Estonia, Spain, France, Latvia, Lithuania, Luxembourg, Hungary, Malta, the Netherlands, Poland, Portugal, Romania, Slovenia, and Slovakia. Two Candidate Countries for Membership in the European Union also have national statutory minimum wages (Croatia and Turkey). Belgium and Greece have a national minimum wage too, but it is set by collective bargaining agreements (in Belgium the collective agreement acquires legal force by royal decree and supplemented by sectoral minima). Two Member States of the European Union maintain a system of statutory national minimum wages that does not cover the majority of employees: Germany and Cyprus. In the former, minimum wages are set for specific sectors under the provisions of the Posted Workers Act (*Arbeitnehmer Entsendegesetz*). The Cyprian minimum wages are defined for a restricted number of occupational groups (salesmen, clerks, auxiliary health care staff and auxiliary staff in nursery schools, crèches and schools). A somewhat similar system exists in the Former Yugoslav Republic of Macedonia, a Candidate Country, where national minima are collectively negotiated for full time employees in the textile, leather, and shoes industry. Finally, there are several European countries without national statutory minimum wages: Austria, Denmark, Italy, Finland, Sweden, Iceland, Norway, and Switzerland. However, sector-level agreements often have *erga omnes* applicability in these countries and therefore function as a collectively negotiated minimum wage.

Advocates of minimum wages typically use one of the two following arguments to defend the introduction or increase of wage floors. They typically argue that minimum wages (a) affect the wage distribution so as to reduce overall wage inequality and/or (b) directly improve the living conditions of workers in the lower tail of the wage distribution. Unfortunately, scholars of minimum wages know little about some of the basic statistical facts that underpin both types of argumentation.

In order to provide a sound statistical basis for the first argument, one would arguably want to know more about how the observed diversity of minimum wage systems is linked to international variations in the shapes of wage distributions. On this point, we document how two types of systems generate contrasting wage distributions: countries operating “clean-cut systems” are associated with wage distributions that are truncated at the level of the minimum wages; in this type of system, the minimum wage affects a very specific segment of the distribution. By contrast, in “complex systems” many different minima co-exist so that the left tail of the distribution is more or

2 This paper defines “minimum wages” as including not only statutory wage floors, but also minima that are defined through collective bargaining at national and/or sectoral level. An overview about the different mechanisms through which minimum wages are set in Europe is provided below (see Table 2).

less bell-shaped; as a consequence, in these countries minimum wage policies affect individuals at different strata of the distribution, including relatively well-paid groups.

Also the second argument raises fundamental questions that have not yet been answered satisfactorily in the literature. These questions include: How many people earn minimum wages in Northern, Western, Central, or Eastern European countries? Most extant studies on this question are outdated and exclude several key countries from Central and Eastern Europe. Crucially, we also still know little about the people that are affected by minimum wage policies. For instance, to what extent do they differ from the rest of the labour force in terms of individual, job, and household characteristics?

This paper presents comprehensive statistical information allowing to map the impact of minimum wages in Europe. While statistics on the general level of national statutory minimum wages are published by international data providers on an annual basis, detailed information on specific groups of employees has to be computed from individual-level labour market surveys. The results of this paper are based on large, representative surveys with micro-data for a set of European countries: the European Union Survey on Income and Living Conditions (EU-SILC) and the German Socio-economic panel (GSOEP).

The overall objective of this paper is to provide statistical evidence on the impact of the minimum wage on European labour markets. This objective has been addressed in two complementary steps, one of conceptual (Section 2) and the other of empirical (Section 3) character.

Section 2 presents a review of the literature on minimum wages and summarizes the central issues addressed by the extensive research in this area. We also recapitulate the key concepts for the analysis of the “bite” of minimum wages as well as existing data. In order to grasp the international diversity of minimum wage policies, we introduce a typology of minimum wage systems that contrasts “clean-cut systems” (mostly found in the new Members States and Anglo-Saxon countries) and “complex systems” (such as Italy, Germany, Belgium, and the Nordic countries).

Turning to the empirical part of the paper, Section 3 presents qualitative and quantitative data on minimum wages for a selection of nine countries from Western, Central and Eastern Europe: Belgium, Bulgaria, Germany, Hungary, Ireland, Poland, Romania, Spain, and the United Kingdom. Drawing on the typology of minimum wage systems, this section documents the link between the international diversity in the way minimum wages are set and the shapes of observed wage distributions (Section 3.1).

Section 3.2 investigates for each country how many and what kind of people earn minimum wages at the national and sector level. We present a series of empirical results that measure different aspects of the bite of minimum wages, including estimates of the Kaitz index; the size and composition of the employment spike around the minimum wage at the national and sector level; and the individual, job, and household characteristics of the population of minimum wage earners. In particular, we assess for each of the selected countries the relationship between minimum wages and age, sex, level of education, temporary work, working time, sector of activity, household size, household income, and poverty risk. We also carried out a scenario analysis that looks at the employment consequences of a hypothetical policy that would introduce a minimum wage fixed at 50 % of the national median wage in all nine countries covered by this study.

In order to assess the relative impact of individual and job characteristics on the likelihood of earning a minimum wage, the paper also provides results of a logistic regression for each of the countries in the sample (Section 3.3). The final section summarizes the conceptual and empirical findings and suggests directions for further research on minimum wages in Europe.

2. The study of minimum wages: state of the art

2.1. General issues addressed by the economic literature

Since the early 20th century, economists have been engaged in vivid academic controversies on minimum wages. Over time, this vast body of literature has grown beyond the possibility of synthesis. In what follows we will highlight some of the main issues addressed in the academic literature on wage floors.

By far the most controversially and frequently discussed issue are the employment effects of minimum wages. Although the conventional textbook labour market model clearly predicts disemployment effects following the introduction of a binding minimum wage (Stigler, 1946; Cahuc and Zylberberg, 2004), a theoretical case for positive employment effects has also been formulated (notably by Card and Krueger, 1995). In light of this theoretical ambiguity, economists have mobilised a variety of methods (time-series analysis, cross-section and panel data, controlled experiments relying on difference-in-differences estimators, identification of substitution and scale effects, distinction between effects on employment and hours, etc) in an on-going attempt to measure the underlying employment elasticities. This body of research failed to establish a lasting consensus, with some researchers concluding from extant evidence that employment elasticities are significantly negative (Brown et al. 1982; Neumark and Wascher, 2004, 2008), while others defend the opposite conclusion (Card and Krueger, 1995). A reconciliatory position in this debate is the view that any employment effects (be their positive or negative) are probably very small (Kennan, 1995; Dolado et al., 1996; ILO, 2010).

A second group of issues concerns the impact of minimum wages on the individual income distribution, the household income distribution, and poverty. These issues are of course related to the first one given that one needs to make assumptions about potential employment consequences in order to anticipate the effects of a minimum wage on inequality or poverty. Typically, economists have attempted to measure the net result of two effects: the (positive or negative) employment effect that results from changes in labour demand, and a (positive) wage effect that accrues to minimum wage earners that remain in employment.

The impact of minimum wages on inequality and poverty also raises a range of new questions: To what extent do increases in minimum wages lead to hikes in other wages? Do minimum-wage earners live in households situated at the bottom, middle, or top of the (individual or household) income distribution? And are they mainly young workers that will “grow out” of minimum wage jobs as they move up career ladders, or are other age groups for whom minimum wages could be a more permanent prospect also affected?

A range of studies suggest that a substantial share of the benefits of higher minimum wages accrue in households whose incomes already lie above poverty level, and that many minimum wage earners are teenagers who will see their earnings increasing as they acquire experience and seniority (see the overviews in OECD, 1998; Fairchild, 2004). However, other studies have found “considerable evidence of a poverty-reducing effect of minimum wages” for some sub-populations (Addison and Blackburn, 1999; p. 404) or a negative relationship between the minimum wage and overall inequality (Koeniger, Leonardi and Nunziata, 2007). A serious problem of this literature is that these questions have been almost exclusively analysed with data from the United States; especially cross-country comparisons of inequality and poverty effects of minimum wages are rare. This is unfortunate because national employment systems are likely to influence the link between

minimum wages and the overall earnings distribution. For instance, so-called “knock-on” or “ripple effects”, i.e. the phenomenon that a minimum wage hike will induce wage increases higher up in the wage distribution, are likely to depend on the incidence and strength of collective bargaining, unionisation, and other country-specific institutions such as the employment protection legislation (Dolado et al., 1996; Checci and Lucifora, 2002; Neumark, Schweitzer and Wascher, 2004).

A third set of questions asks to what extent minimum wages interact with other economic variables. This strand of research has attempted to establish links between wage floors and variables such as the general price level, unemployment, training decisions, or economic growth (e.g. Scarpetta, 1996; Fanti and Gori, 2011). In light of the considerable theoretical and empirical difficulties to reach robust conclusions on relatively direct consequences of minimum wages (such as their effect on low-wage employment), it is not surprising that no consistent evidence has yet emerged on more indirect effects.

2.2. Central concepts for the analysis of the “bite” of minimum wages

All issues mentioned above are clearly relevant to understand the impact of minimum wages for the working of European labour markets. The purpose of this paper is to produce a range of more fundamental statistics that are currently either outdated or unavailable. Although most of these statistics will be interesting heuristics for their own sake - e.g. by allowing to document and to compare the bite of minimum wages across Europe - it should be noted that answering more analytical questions also requires sound evidence on both the bite of existing minima and the socio-demographic composition of minimum wage earners. The employment effect of minimum wages is a case in point: given that different socio-demographic groups typically have different employment elasticities (Fitzenberger, 2009), a first step in estimating employment consequences is to paint an accurate picture of the population of minimum wage earners. Similarly, the impact of minimum wages on inequality and poverty can only be assessed correctly with detailed information on the characteristics of minimum wage earners.

This paper sheds light on the impact of minimum wages by applying state-of-the art concepts to micro-data from a set of European countries. The bite of national wage floors can notably be gauged by estimating different versions of the “Kaitz index” and the “employment spike”.

2.2.1. The Kaitz index

Named after its first formulation in Kaitz (1970), this index is a straightforward method to relate the absolute level of the minimum wage to other wages. Indeed, a direct comparison of absolute levels of minimum wages is not meaningful if countries differ with respect to the distribution of productivities: in a country with high average productivity, the bite of a relatively low wage floor might be weak; in a low-productivity country, however, the same minimum wage could have a much stronger impact.

In its most basic version, the Kaitz index is defined as the ratio of the minimum wage to the average wage of the working population. The Kaitz index is thus a measure of the “bite” of the minimum wage: small values indicate that the wage floor is a long way from the centre of the earnings distribution and its impact therefore potentially low; conversely, a high Kaitz index reveals that the minimum wage is close to the centre of the distribution and that it potentially affects a

larger number of employees. It should be noted, however, that the Kaitz index alone does not allow to draw any conclusion about whether a given level of the minimum wage is economically desirable or not: this question can only be addressed with additional information such as the structure of wage costs and the productivity of different types of workers. In addition, as Dolado et al. (1996) point out, the Kaitz index may misrepresent the impact of minimum wages in countries where other institutions such as benefit systems act as effective wage floors (ibid., p. 325).

In certain countries, such as Germany or Italy, the computation of Kaitz indices is relatively complex due to the existence of numerous minima negotiated at sector-level. But even for countries with a single national statutory minimum it is often advisable to calculate separate Kaitz indices for different wage or skill groups in order to reflect that the minimum wage bites deeper for lower paid employees (in this case the numerator of the index is the same for all employees, but the denominator decreases if one considers a group of employees with lower average earnings). Indeed, the aggregate Kaitz index may be similar across countries but mask compositional differences (OECD 1998). In this case, comparing the basic index between dissimilar countries might lead to serious misinterpretations. In order to improve its comparability, several adjustments to the basic Kaitz index have been proposed in the literature:

- The composition of the population affected by the Kaitz index might differ across countries; it is therefore advisable to compare indices for groups with similar characteristics (such as age, gender, occupation, educational attainment, contract type etc.).
- Most European countries apply lower sub-minima for young or inexperienced workers (e.g. teenagers), mainly in an attempt to curb potential disemployment effects for these groups. International comparability requires the use of different Kaitz indices for groups affected by sub-minima.
- Although most analysts compute the index with average earnings as denominator, using median earnings might yield more comparable results. The reason for this is that countries with higher wage dispersion also have lower minimum wages (OECD 1998). A Kaitz index based on median earnings is less affected by the shape of the overall wage distribution than an index based on average earnings.
- International comparisons of Kaitz indices are sensitive to the inclusion of bonuses, overtime, and other additional payments; countries in which the incidence of such payments is large will display a non-adjusted Kaitz index (i.e. excluding additional payments) that overestimates the effective bite of the minimum wage.
- Conversely, the basic Kaitz index can lead to flawed comparisons if gross earnings are used instead of net earnings: the more a country's tax system is progressive, the more the gross Kaitz index understates the bite of the minimum wage.
- Finally, it is important to take institutional differences into account when comparing Kaitz indices. For instance, national labour institutions differ in the extent to which hikes in the minimum wage are transmitted further up in the wage structure. As a consequence, Dolado et al. (1996) argue that it is safer to analyse changes over time than cross-country differences, especially in situations of considerable institutional diversity between countries.

2.2.2. The employment spike

The distance between the wage floor and the centre of the earnings distribution is a useful heuristic to measure the bite of minimum wages. This being said, the Kaitz index alone cannot give a complete picture of the impact of minimum wages. The case of Sweden illustrates this point:

although the Swedish Kaitz index is relatively high compared to other European countries (Neumark and Wascher (2004) estimate it at 0.52), nobody actually receives the minimum wage in Sweden. Despite its relatively high level, the Swedish minimum wage fails to bite due to other features of the earnings determination in Sweden, especially the strong incidence of collective bargaining. A complementary heuristic for the analysis of the bite of minimum wages is to measure the “spike” of employments that are situated at or near the minimum wage. The more employees are clustered around the minimum, the higher is its bite.

To be sure, conventional neoclassical models of the labour market do not predict any employment spikes. According to such models, the earnings distribution will be truncated and workers whose marginal productivity falls below the minimum wage will be laid off. Empirical research on wage distributions has documented, however, that this view is seriously flawed: in many countries the existence of a minimum wage has led to visible employment spikes at or near the minimum. Possible explanations for this phenomenon are that employers are able to afford at least part of the higher wage costs, either by tapping into existing rents (profits) or by passing these costs on to consumers. An alternative explanation is that the productivity of below-minimum employees can be raised through training or organisational changes so as to make their employment profitable at the minimum wage. Similar to the case of the Kaitz index, cross-country comparability requires examining the employment spike for similar groups of employees. For instance, an exclusive focus on the spike in the overall wage distribution might overlook differences in employment spikes for categories such as gender, age, occupation, education, sector, etc.

Depending on the research question, one might also be interested by the size and characteristics of the population that is remunerated below certain threshold values, for instance when assessing the impact of a hypothetical rise in the minimum wage (or the Kaitz index) to a higher level. Such a “shadow spike” can yield information on the bite of the hypothetical rise in the minimum wage by indicating how many and what types of employees would be affected in such a scenario. It should be noted, however, that the “shadow spike” can differ substantially from the employment spike that will be observed if the hypothetical minimum wage increase is actually implemented. The difference between the two spikes might stem from several factors: a higher minimum wage might attract new employees into the labour force, thereby changing its socio-demographic composition; conversely, some employees in the shadow spike might be laid off if the higher minimum wage renders their employment unprofitable.

2.3. Existing comparative studies and available databases

We identified several extensive databases containing statistical and/or qualitative information on basic features of European minimum wage systems. First, the OECD Minimum Wage Database³ contains time series for some of the main variables of interest, such as national levels of statutory minima (in local currencies and PPP-adjusted) and gross Kaitz indices (with both average and median earnings as denominator). The OECD provides information on minimum wages for different pay periods (hourly, weekly, monthly, annually) and allows to analyse their evolution over the long run: for some countries, the time-series data goes back to the 1960s (France, Greece, Luxembourg, Netherlands, Spain). For European countries, the OECD database contains information up to the year 2010. A limitation of this source is that it does not allow to distinguish

3 <http://stats.oecd.org/Index.aspx?DataSetCode=RHMW>

different groups of employees. All Kaitz indices are calculated with reference to full-time employees and no separate indices are provided for younger employees for which sub-minima may apply in different countries. While the OECD database allows to compare European experiences to non-EU countries with national statutory minimum wages (Australia, Canada, Japan, Korea, Mexico, New Zealand, Turkey, and the United States), it excludes countries in which minimum wages are established through sector-level collective agreements (such as Germany, Italy, and the Scandinavian countries).

The second source is the minimum wage data published by Eurostat⁴. This database is very similar to the OECD in that it also contains information on gross levels of national statutory minimum wages and gross Kaitz indices (albeit only for monthly rates and only with average earnings as denominator). Moreover, Eurostat also excludes Germany, Italy, Cyprus, Austria, Switzerland, Iceland, and the Scandinavian countries due to the lack of a national statutory minimum wage in these countries. By contrast, Eurostat provides data for several Eastern and Central European countries not covered by the OECD (Bulgaria, Estonia, Latvia, Lithuania, Malta, Romania, Slovenia, and Croatia). The longitudinal coverage of the Eurostat data is somewhat shorter (1999-2009) compared to the OECD series.

The third international source, the ILO Minimum Wage Database⁵, is quite different from the two preceding databases. While the ILO data is less useful to trace the chronological evolution of statutory wages floors and their relation to average or median earnings, it contains valuable qualitative information on many features of national minimum wages systems such as the national determination mechanism, the coverage of existing minimum wages, adjustment mechanisms, and control and enforcement procedures. In addition, the ILO provides detailed information on current levels of minimum wages, including existing sub-minima. The coverage of the database is much broader compared to both the OECD and Eurostat: the ILO database includes all 100 ILO member countries, i.e. also the countries in which minimum wages are set through collective agreements at the sub-national level (such as in Austria, Germany, or Italy). A drawback of the ILO data is that its last update dates back to September 2006.

Next, the Hans-Böckler-Stiftung maintains an extensive database on minimum wages⁶ via the Wirtschafts- und Sozialwissenschaftliches Institut (WSI). This database not only monitors the development of minimum wages in Germany tariff sectors, but also provides regular updates on levels of minimum wages for many European and non-European countries.

Finally, the European Industrial Relations Observatory⁷ publishes regular country reports with qualitative information on labour market institutions. These reports typically include sections on national minimum wage systems in which the mechanisms for fixing and revising wage floors are described by the Observatory's country experts.

In sum, existing databases contain statistical information on the bite of minimum wages at the aggregate, national level. At the same time, they have numerous limitations: they fail to provide statistical information for countries with sub-national minimum wages; they only contain Kaitz indices that do not adjust for existing sub-minima, the impact of the tax system, or cross-country differences in the composition of minimum-wage earners; and, importantly, they do not allow to assess neither the employment spike at or near the minimum wage nor the shadow spike that corresponds to hypothetical increases of the minimum wage. In other words, these databases are

4 http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Minimum_wage_statistics

5 <http://www.ilo.org/travaildatabase/servlet/minimumwages>

6 http://www.boeckler.de/wsi-tarifarchiv_4876.htm

7 <http://www.eurofound.europa.eu/eiro/structure.htm>

useful to obtain a general impression of cross-country differences regarding the bite of national statutory minimum wages, but they are less apt to further our understanding of the impact of other types of wage floors. Crucially, they do not allow to shed light on the characteristics of the affected populations.

As a consequence of these limitations, existing studies on minimum wages earners typically use micro-data from labour force surveys to elucidate questions such as the size and composition of the employment spike around the minimum wage (Dolado et al., 1996; Machin and Manning, 1997; European Commission, 1998; OECD, 1998; Neumark and Wascher, 2004; Funk and Lesch, 2006). These studies reveal significant within-country variation in the bite of minimum wages: Funk and Lesch (2006), for instance, report that whereas the 2004 minimum wage in Lithuania represented only 38 per cent of average wages in the economy as a whole, the minimum wage in the Hotels and Restaurants Sector was as high as 61 per cent of average wages in that sector. Similarly, in 2004 the Estonian Kaitz index was 34 per cent for the entire economy, but 67 per cent in the Retail Sector. The bite of the minimum wage also differs according to characteristics such as age and gender. According to the figures in OECD (1998), the mid-1997 minimum wage in Belgium represented 49.2 per cent of full-time median earnings for men, but as much as 55.2 per cent for women and 66.5 per cent for employees aged 20-24 years.

What is more, existing evidence suggests that the share of workers paid at or near minimum wage levels differs substantially among European countries: the work force of the Netherlands, Slovenia, Sweden, or Belgium includes less than five per cent of minimum wage earners, whereas this share lies above 10 per cent in countries like France, Latvia, Lithuania, and Greece (Dolado et al., 1996; Funk and Lesch, 2006). Such international comparisons are, however, extremely rare and outdated in light of recent developments in many European economies. Notably a systematic comparison of the impact of minimum wages in Western, Central, and Eastern Europe is currently not available. The objective of this paper is to fill this knowledge gap.

The results presented in Section 3 are based on different data sources. While most of the qualitative information on minimum wage system has been collected from the above mentioned sources (the ILO, WSI and EIRO data have been the most useful in this regard), most of the quantitative information has been drawn from a representative panel with harmonised micro-data, namely the latest (2008) update of the European Union Statistics on Income and Living Conditions (SILC). This extensive EU dataset allows to compute the bite of the minimum wage and to identify various characteristics of the individuals receiving the minimum wage. In particular, the SILC contains detailed information on sectors and occupations that allows to estimate the impact of minimum wages in countries that do not fix minimum wages at the national level (such as Italy), or in countries with sub-minima for younger employees (such as Belgium and the Czech Republic). Unfortunately, the German DE-SILC data does not allow to identify the region in which an individual works (to our knowledge, the corresponding NUTS 1 variable is not disseminated by the German statistical authorities due to data protection issues). Since the regional variation in the German wage distribution is particularly strong, we decided to compute all indicators with data from the German socio-economic panel. Incidentally, the SOEP happens to be very similar to the SILC in terms of sample design and data collection procedures - some commentators even argue that the SOEP is more comparable to other EU-SILC samples than the DE-SILC (Frick and Krell, 2009; see also the discussion in Kampelmann and Rycx, 2013).

2.4. Typology of minimum wage systems

One of the main challenges that have to be addressed in any comparative study on minimum wages is the institutional diversity between countries. The problem lies in the fact that no two countries are identical with respect to the labour market institutions that influence how minimum wages are determined, adjusted, implemented, monitored, etc.

A rather basic solution to this problem is to limit the analysis to countries with relatively similar systems. This approach has been adopted by most existing studies that focus exclusively on countries in which a national statutory minimum wage is determined by some centralised mechanism such as a government agency (like in the UK) or a tripartite commission that negotiates a national minimum wage through collective agreement (like in Poland). Countries whose system does not define a statutory minimum wage at the national level (like Italy, Germany, or the Scandinavian countries) are typically not considered in these studies.

We argue that this approach is not satisfactory if our task is to reflect how minimum wages affect the labour market in Europe *as a whole*, and not only in countries that happen to share a relatively similar minimum wage system. As a matter of fact, focusing only on national statutory minimum wages completely misses other minimum wages mechanisms, such as sectoral or regional determination of wage floors. For instance, it is clear that the lowest tariffs guaranteed by collective agreements typically function as effective minimum wages and should therefore enter the scope of this study. Or, as the introduction to the WSI minimum data base puts it, "*Tariflöhne sind Mindestlöhne*". The following quote taken from a typical Belgian collective agreement also illustrates that the lowest wages agreed in collective bargaining are effective minimum wages:

"Ce salaire horaire minimum correspond au niveau le plus bas applicable, à savoir à la fonction de manœuvre ordinaire."

(CCT relative au salaire horaire minimum conclue le 27 juin 2007 au sein de la Commission Paritaire de l'industrie chimique.)

In order to bring countries in which minimum wages are set at the infra-national level back into the picture, we propose a straightforward typology that has both intuitive appeal and fits well to the empirical results presented in Section 3. Our typology distinguishes between two types of minimum wage systems:

- Type I: the minimum wage that applies to most workers and employees is determined through the decision of a governmental agency or collective bargaining at the national level. Further differentiation of this minimum wage plays a minor role in countries that belong to this type. In its ideal-typical form, such a system leads to a clean cut in the wage distribution at the level of the national minimum wage, which is why we refer to this kind of set-up as a "clean-cut system"
- Type II: the minimum wage that applies to most workers and employees is determined at the infra-national level, for instance in sector or regional negotiations. The ideal-type of this system includes many different minima so that no clear truncation is visible at any particular point of the wage distribution. Due to the multiplicity of minimum wages, we refer to this type as "complex system".

In practice, most countries contain elements of both types of minimum systems. For example, a given country may fix minimum wages for some category of workers at the national level through a

statutory wage floor, while the minima for other categories of workers are renegotiated at the sector or regional level. It is nevertheless possible to classify most European countries into one of the two types, as is done in Table 1. As a general rule, it is clear that complex systems are dominated by collectively bargained wage floors whereas in clean-cut systems statutory minima prevail (see also Table 2 in Section 3).

Table 1. European countries according to a typology of minimum wage systems

	Type A countries ("clean-cut systems")	Type B countries ("complex systems")
Nordic		Finland, Denmark, Norway, Sweden, Iceland
Anglo-Saxon	United Kingdom, Ireland	
Western Continental	Luxembourg, Netherlands	Austria, Belgium, Germany
Southern	Cyprus, Spain, Portugal	Greece, Italy
Central and Eastern	Czech Republic, Bulgaria, Estonia, Hungary, Lithuania, Latvia, Poland, Romania, Slovenia	

Our typology reveals a geographical stratification of minimum wage systems. All of the Nordic countries operate minimum wage system that are "complex", i.e. many different minima co-exist side by side. In order to know which minimum wage applies to an individual worker, it is typically necessary to obtain information on her sector of activity, occupation, age, tenure, and residence. By contrast, the new Members States from Central and Eastern Europe have "clean cut" systems, i.e. the wage distribution is truncated by a minimum wage that applies to most workers. The Anglo-Saxon countries in our sample (United Kingdom and Ireland) also established systems that apply if not a single, but nevertheless a small number of minimum wages at the national level. Western Continental and Southern Europe cannot be classified into one of the two types: while Austria, Belgium, Germany, Greece, and Italy have complex minimum wage systems, Luxembourg, the Netherlands, Cyprus, Spain, and Portugal resemble more the clean-cut type.

3. Minimum wages in Europe: empirical results

In the framework of this paper it was not possible to study all of the countries listed in Table 1. This is particularly true for the set of countries with complex minimum wage systems because the computation of employment effects and the socio-demographic composition of minimum wage earners requires collecting information on the array of minimum wages that apply in each of these countries. We therefore chose to focus on a limited set of countries that nevertheless a) reflect the international diversity of minimum wage systems, i.e. contains both types of systems described in the previous section; b) strikes a geographic balance between the different European sub-regions (Nordic, Anglo-Saxon, Western-Continental, Southern, Central and Eastern Europe); and finally c) have a sufficiently large EU-SILC sample to allow for statistical inference. After consultations with experts from the European Trade Union Institute in October 2011, we opted to focus in the empirical section of this paper on the following countries: Belgium, Bulgaria, Germany, Hungary, Ireland, Poland, Romania, Spain, and the United Kingdom. Given the absence of important countries in this sample (France and the Scandinavian countries could not be treated at this point), we hope to be able to extend this selection to a wider set of countries in the near future (see also the suggestions for further research in Section 4). The presentation of the empirical results on these

countries is divided into two parts: Section 3.1 presents qualitative information on minimum wage systems and documents the diversity of European countries with respect to the way in which minimum wages are determined, extended, and differentiated in each of the countries in our sample. The quantitative results based on the EU-SILC and GSOEP data are presented in Section 3.2.

3.1. The qualitative dimension: the European diversity of minimum wage systems

The qualitative data on national minimum wage systems has been hand-picked from the major databases mentioned in Section 2, mainly the ILO minimum wage database, the country reports published by the European Industrial Relations Observatory, the database on collective bargaining agreements by the Belgian Ministry of Employment, and the WSI minimum wage database. For each of the nine countries in our sample, Table 2 presents a) the type of minimum wage system; b) the mechanism with which minimum wages are determined in each country; c) a description of existing extension mechanism; d) if applicable, a list of categories of workers that are exempted from the minimum wage; e) a description of the infra-national differentiation of minimum wages according to categories such as age, occupation, education, etc; f) for Type I countries, we report the level of minimum wage in 2007 in the national currency; and g) the typical length of the work week (or month) to which the minimum wage applies.

Table 2 illustrates the difference between the ideal-typical distinctions we defined in the previous Section and empirical minimum wage systems. In practice, only Hungary and Romania comes close to a "pure" clean-cut system in which only one national minimum wage is binding for all employees. All other countries have systems in which some employees are exempted from statutory minima; in addition, most countries differentiate the national minima according to age or occupational categories. This being said, we argue that despite these deviations from the ideal-type of "clean-cut systems", the systems in the United Kingdom, Ireland, Luxembourg, Netherlands, Cyprus, Spain, Portugal, Czech Republic, Bulgaria, Estonia, Hungary, Lithuania, Latvia, Poland, Romania, and Slovenia are nevertheless sufficiently close to be classified within this type.

Table 2. Characteristics of minimum wage systems in selected European countries

Country	Type of minimum wage system	Determination of minimum wages ¹	Extension mechanism	Exemptions	Differentiation	Level of minimum wage in 2007 ²	Weekly full time working hours ²
Belgium	complex	Collective agreement (interprofessional in <i>Conseils central de l'économie</i> ; sectoral in <i>Commission Paritaire</i>)	Collective agreements are extended to all workers by Royal Decree	Public sector employees and apprentices (Funk and Lesch, 2005)	Reduced rates for 16-20 year old (plus seniority rules for 21.5 and 22.5 year-olds) (CCT N° 43, 50)	1258,91 (until 1/4/07) and 1283,91 euros per month (after 1/4/07)	38 hours per week, 165 hours per month
Bulgaria	clean-cut	Government sets the national minimum wage rate by Decree	erga omnes	No exemptions (ILO minimum wage database)	During an apprentice's training period, which cannot exceed 6 months, an apprentice's remuneration may not be less than 90% of the national minimum wage rate. (ILO minimum wage database)	180 lew per month	40 hours per week, 173 hours per month
Germany	complex	Collective agreements negotiated at different levels: local, regional, branch, etc	erga omnes only if government applies § 5 Tarifvertragsgesetz or AEntG (WSI-Mindestlohn-datenbank)	Unless collective agreement is extended or AEntG applies, only trade workers in firms bound to collective agreements (<i>tarifgebundene Unternehmen</i>) are covered	Collective agreements often differentiate according to age.	-	Differ across firms, industries, regions: 35 - 42 hours per week
Hungary	clean-cut	Government with the agreement of National Council for the Reconciliation of the Interest, collective agreements can increase the minimum wage	erga omnes	No exemptions (Funk and Lesch, 2005)	No differentiation (Funk and Lesch, 2005)	65500 forint per month	40 hours per week, 173 hours per month
Ireland	clean-cut	National min. wage rate set in an order made by the Min. for Enterprise, Trade and Employment	erga omnes	No exemptions (Funk and Lesch, 2005)	Lower rates for employees under 18 and employees in education (European Industrial Relations Observatory)	8.30 euros per hour (until 1/7/07) 8.65 (after 1/7/07)	39 hours per week, 169 hours per month

Table 2. Characteristics of minimum wage systems in selected European countries (continued)

Country	Type of minimum wage system	Determination of minimum wages ¹	Extension mechanism	Exemptions	Differentiation	Level of minimum wage in 2007 ²	Weekly full time working hours ²
Poland	clean-cut	Statutory minimum wage negotiated in Tripartite Commission	erga omnes	No exemptions.	Lower rates for employees who enter the labour market (80% first year, 90% second year)	936 zloty per month	40 hours per week, 173 hours per month
Romania	clean-cut	The government sets a national minimum wage rate following consultation with the social partners	erga omnes	No exemptions.	Different rates according to educational attainment (European Industrial Relations Observatory)	390 lei per month	39.2 hours per week, 170 hours per month
Spain	clean-cut	Government annually fixes the interoccupational minimum wage by Royal Decree following a period of consultation with the most representative trade unions and employers' associations	erga omnes	No exemptions.	Minimum wage for trainees cannot be less than 70, 80 and 90% of the inter-profession minimum wage for the first, second and third year (respectively) of validity of the contract. (ILO minimum wage database); Reduced rate of 66.7 % (Funk and Lesch, 2005)	570.60 euros per month	38 hours per week, 165 hours per month (
United Kingdom	clean-cut	The Secretary of State determines the national minimum wage	erga omnes	No exemptions.	Reduced rates for younger employees, certain occupations, and employees in training (European Industrial Relations Observatory)	5.35 pounds per hour (until 1/10/07), 5.52 pounds per hour (after 1/10/07)	38 hours per week, 165 hours per month

Notes

¹ ILO minimum wage database

² WSI-Mindestlohn datenbank

3.2. *The quantitative dimension: employment incidence, Kaitz indices and characteristics of minimum wage earners (and their households)*

Turning to the quantitative dimension of minimum wage systems, we first report the levels of minimum wages that apply in each of the nine countries in our sample. Although most comparative studies focus only on one minimum wage per country, we have documented in the previous Section that even countries that resemble a clean-cut system typically define a range of different minima according to categories such as age, education, tenure, etc (see Table 2). We have dealt with the differentiation of minimum wages in Type I countries by showing not only the lowest and highest minima in each country, but also by calculating an average of the different existing rates. Given that the EU-SILC data contains socio-demographic information on each individual in the sample, we were able to assign the corresponding categorical minimum wage to each individual. The average minimum wage in Table 3 below are therefore weighted averages that reflect the distribution of total employment according to the different minimum wage rates that coexist in each country. After converting the national currency amounts for 2007 (the latest available wave of the EU-SILC was collected in 2008 and contains information on earnings in 2007), Table 1 illustrates the considerable diversity of absolute levels of minimum wages in Europe. Among the Type I countries, the range of minima starts from 53 cents per hour in Bulgaria and extends to 8.37 euros in Ireland.

Our sample also contains two Type II countries, namely Belgium and Germany. In light of the institutional set-up of their respective minimum wage systems, the computation of the lowest, highest, and average minimum wage is considerably more difficult in these two countries. Indeed, this information first has to be hand-collected from collective bargaining agreements: in Belgium, these are the *Conventions Collectives de Travail* that are negotiated in more or less irregular intervals within the different *Commissions Paritaires*; in Germany, the data had to be collected from the *Tarifverträge* that are negotiated among the social partners at the regional and sectoral level⁸. We have notably collected information on minimum wages from collective agreements that were signed in 2007, thereby circumventing the issue of older agreements that might still be binding but subject to indexing (which is notably in Belgium a wide-spread phenomenon). For the case of Belgium, we collected information for around 150 *Commission* or *Sous-Commission Paritaires*. For Germany, recorded the 2007 minimum wages in more than 70 *Tarifbranchen*. In light of the marked wage inequality between the *Länder* of the former DDR and BRD, we included both the level of the lowest wage category in both East and West Germany, which means that we have collected information on around 150 different minima in Germany and in Belgium, respectively.⁹ As a consequence, the average minimum wages in Table 3 reflect the range of sectoral (and regional) minima and the distribution of total employment among these different minima.¹⁰

As for the results for our type II countries, Table 3 shows that the range between the lowest and the highest minimum wage is considerably greater in Germany than in Belgium: the German lowest minimum in 2007 amounts to only 3.91 euros and the highest to 12.21 euros. In Belgium, no

8 Although clearly relevant for empirical wages in most of the countries in our study, after consultations with experts from the European Trade Union Institute in October 2011, we decided to ignore any further renegotiation of minima that occurs at the firm level.

9 We would like to thank the WSI, and in particular Reinhard Bispinck, for the extremely helpful assistance in collecting the minimum wages from German Tariff contracts in 2007.

10 Unfortunately, it was not possible for the case of Germany to calculate the employment weight for each *Tarifbranche* because the SOEP data on sector of activity is based on the NACE and not on the system of *Tarifbranchen*. The weighted average is therefore based on the distribution of employment among NACE and the correspondence between NACE 2-digit sectors and *Tarifbranchen*. More detailed information on the weighting procedure can be obtained from the authors.

sectoral agreement is allowed to undercut the interprofessional minimum wage, which means that in 2007 no sectoral minimum could be fixed below 7.80 euros. The highest wage floor negotiated during 2007 was equal to 13.21 euros. The weighted averages of sectoral minima were 9.22 and 7.63 euros in Belgium and Germany, respectively.

As discussed in Section 2, absolute levels of minimum wages are not directly comparable across countries with different wage distributions. The computation of a Kaitz index is one way to take differences in the overall shape of the wage distribution into account by comparing the existing national minima to the correspond median wage. This being said, we have seen that only very few countries operate a minimum wage system in which a single rate applies to all employees; in practice, many different rates - and many different Kaitz indices - co-exist in each country. As a consequence, the Kaitz indices shown in Table 3 are averages of the multiple Kaitz indices in each country. Like for the case of the average minimum wage, the average Kaitz index has been weighted for the distribution of the total work force among the different minimum wage rates in each country. Among the Type I countries in our sample, Hungary has the highest average Kaitz index (57.0), followed by the UK (53.2) and Ireland (52.6 per cent). Spain has the lowest average Kaitz index in our sample (39.3).

The case of Belgium is special because the minimum wage system in this countries defines both a national (interprofessional) wage floors and sector minima through collective agreement. The Kaitz index that corresponds to the weighted average of the national rate was equal to 51.9 per cent in 2007. By definition the Kaitz index based on the sectoral minima is higher than the national Kaitz index and amounted to 59.6 per cent. In Germany, only sectoral minimum wages and Kaitz indices can be computed. The weighted average of the latter was 57.8 per cent in 2007.

Statistics like the average minimum wage and the average Kaitz index convey information about the absolute and relative value of minimum wages in monetary terms. But it is also extremely important to assess the size of the population to which these rates apply, i.e. to calculate the employment spike created by existing wage minima. For each of the countries in our sample, we have therefore marked all individual whose hourly wage is sufficiently close to the minimum wage that applies to the individual in question (taking into account her age, tenure, occupation, sector of activity, etc). Following the standard practice in the literature, we counted individuals as minimum wage earners if their hourly earnings did not exceed the corresponding rate by more than 5 per cent. This margin is required to account for the measurement error in the information on individual earnings (our sample relies on information collected via household interviews). It should also be noted that many individuals reported hourly earnings that lie below the minimum wage that applies to them. This might be due to several causes, including measurement errors and non-compliance with minimum wage laws.

Turning to the results for the national employment spike, it is not surprising that the countries with the highest average Kaitz index also display the greatest quantities of minimum wage earners: in Hungary, as much as 11.5 per cent of workers are paid at or below their minimum wage; in the United Kingdom this figure equals 9.5 and in Ireland 9.2 per cent. On the other end of the spectrum, Spain not only has the lowest Kaitz index but also the smallest employment spike in our sample (3.8 per cent).

The employment spike in Germany is measured at 19.0 and therefore appears to be particularly high. This figure, however, should be interpreted with care. Most importantly, one has to keep in mind that the minimum rates on the basis of which this figure has been calculated are not necessarily binding for all individuals - this is only the case in sectors in which the German government decides to apply *erga omnes* legislation. In all other sectors, only workers in firms that

are bound to collective agreements (*tarifgebundene Unternehmen*) are covered by existing rates. As a consequence, the employment spike of 19.0 per cent should be interpreted as the share of the work force that earns hourly wages at or below the applicable minimum rates if the government extended the collective bargaining agreements in all sectors. Since not all workers are covered by collective agreements, the actual figures are arguably lower than the 19 percent shown in the table. In 2010, the sector-level tariff coverage in West Germany was 56 and in East Germany 38 per cent; a first rough estimate of the actual employment spike would therefore be closer to 10 than to 20 per cent in light of observed coverage rates. This being said, according to the WSI CB archive and personal communication from an expert of the European Trade Union Institute, in Germany the effective impact of collectively agreed minima is likely to extend to firms that are not directly bound by collective agreements. Notably in West Germany, as many as half of the non-bound employers appear to implement wage policies that are directly influenced by collectively bargained wage floors.¹¹ Given that numerous German firms therefore apply collectively negotiated minimum wages even though that they are bound to do so, the effective employment spike is arguably substantially higher.

For the case of Belgium, it is interesting to note that the employment spike based on the national minimum wage is considerably lower than the more realistic figure calculated on the basis of sectoral minima. Indeed, in 2007 the share of workers that earn minimum wages increases from 6.9 to 11.4 per cent.

Finally, one might also be interested by the size of the population that is remunerated below certain threshold values, for instance when assessing the impact of a hypothetical rise in the minimum wage (or the Kaitz index) to a given level. Such a “shadow spike” can yield information on the bite of the hypothetical rise in the minimum wage by indicating how many and what types of employees would be affected in such a scenario. It should be noted, however, that the “shadow spike” can differ substantially from the employment spike that will be observed if the hypothetical minimum wage increase is actually implemented. The difference between the two spikes might stem from several factors: a higher minimum wage might attract new employees into the labour force, thereby changing its socio-demographic composition; conversely, some employees in the shadow spike might be laid off if the higher minimum wage renders their employment unprofitable.

At the request of the European Trade Union Institute, we have calculated the shadow employment spike that corresponds to a policy that would fix a single national minimum wage at 50 per cent of the medium wage in each of the countries in our sample. Given that the average Kaitz index in some of the countries lies currently above this level, such a policy is associated with smaller shadow employment spikes in these countries: this is the case for Hungary, Ireland, the UK, Belgium, and Germany (see Table 3). By contrast, the shadow employment spike is higher than the actual employment spike in Bulgaria, Poland, Romania, and Spain.

11 The effect of collectively negotiated wage floors on firms that are *not* bound by collective agreements is conceptually similar to the so-called “knock-on” or “ripple” effects of minimum wages that have been observed in different countries. In both cases, minimum wages impact on wages paid to individuals that are not directly covered by existing wage floors.

Table 3. Level of minimum wages, share of minimum wage earners, and Kaitz indices per country (2007)

Obs.	Level of minimum wages (current euros)			Employment-weighted Kaitz index according to different minimum wages (per cent) ²		Share of minimum wage earners according to different minimum wages (per cent)			
	Lowest Minimum	Highest Minimum	Employment-weighted average of minima ²	National minimum wage	Sector minimum wage	National minimum wage	Sector minimum wage	Minimum wage equal to 50 per cent of median wage	
TYPE I COUNTRIES									
Bulgaria	3904	0.48	0.53	0.53	41.0	-	5.8	-	12.2
Hungary	6513	1.51	1.51	1.51	57.0	-	11.5	-	4.7
Ireland	3361	5.93	8.48	8.37	52.6	-	9.2	-	8.8
Poland	10452	1.14	1.43	1.42	47.5	-	8.9	-	10.4
Romania	5055	0.69	0.69	0.69	44.4	-	4.9	-	8.3
Spain	11327	2.42	3.46	3.41	39.9	-	3.8	-	7.9
United Kingdom	7029	4.85	7.86	7.78	53.2	-	9.5	-	7.7
TYPE II COUNTRIES									
Belgium	5100	7.80	13.21	9.22	51.9	59.6	6.9	11.4	6.6
Germany	8833	3.91	12.21	7.63	-	57.8	-	19.0 ³	14.3

Notes

¹ Germany SOEP, EU-SILC for all other countries

² Weighting variables depend on differentiation of minimum wages; employment weighted by sector (and region for Germany)

³ Figure is not corrected for incomplete collective bargaining coverage at the sector level (see explanation in the text).

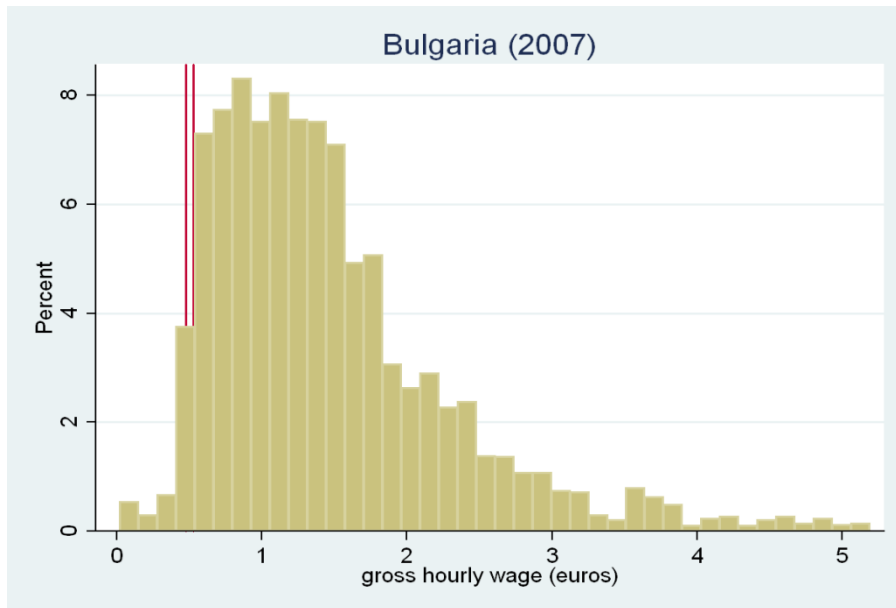
3.2.1. Graphical analysis

A complementary way to shed light on the international variations among minimum wage systems is to depict the existing wage floors with the help of distributional graphs. This exercise is particularly salient as it allows to visualize the distinction between Type I and Type II countries that we introduced in Section 2.4.

Figures 1 through 4 plot existing minimum wages as vertical red lines onto the national wage distribution in 2007. The difference between Type I countries (Bulgaria and Hungary) and Type II countries (Belgium and Germany) comes out very clearly on these graphs: the two former countries display a clean cut that truncates the wage distribution at the level of the (national) minimum wages; the employment spike around the minimum wage is clearly visible in both countries. This holds also for the other Type I countries whose wage distributions can be found in Annex A.

By contrast, the shape of the lower tail of the wage distributions of Belgium and Germany are much more gradual and reflect the existence of an array of different sectoral minima. This being said, it should be noted that even in Type II countries each existing wage floor also creates a truncated wage distribution. However in order to reveal this phenomenon graphically, it is necessary to disaggregate the overall population and plot the minimum wage onto the sub-population to which it applies (we will come back to this issue in the sector by sector analysis below).

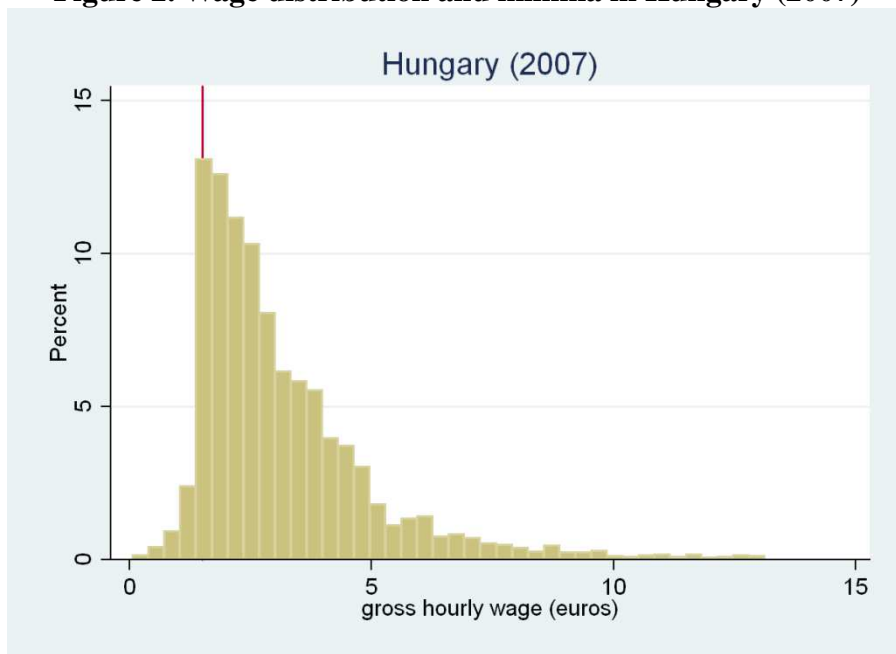
Figure 1. Wage distribution and minima in Bulgaria (2007)



Notes

Data source: BU-SILC; current 2007 euros; vertical red lines represent levels of national minima (differentiated by educational activity and job tenure)

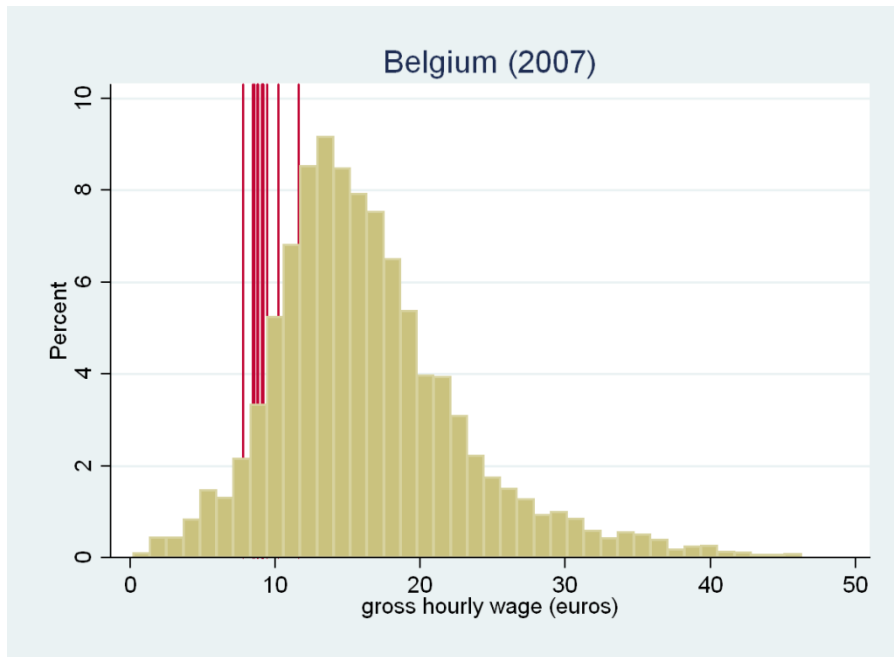
Figure 2. Wage distribution and minima in Hungary (2007)



Notes

Data source: HU-SILC; current 2007 euros; vertical red lines represent level of national minimum

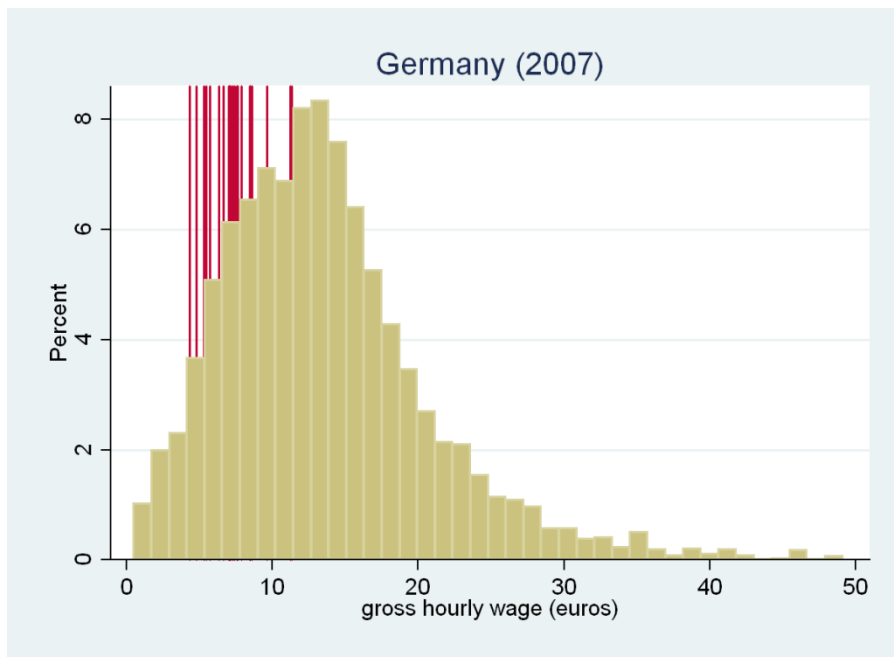
Figure 3. Wage distribution and minima in Belgium (2007)



Notes

Data source: BE-SILC; current 2007 euros; vertical red lines represent levels of minima (differentiated by sector)

Figure 4. Wage distribution and minima in Germany (2007)



Notes

Data source: SOEP; current 2007 euros; vertical red lines represent levels of minima (differentiated by sector and region)

3.2.2. Individual and job characteristics of minimum wage earners

So far we presented information on the size of the employment spike around wage minima in general. We now turn to the composition of the population of minimum wage earners. This will be done by comparing them to the rest of the labour force with respect to a range of socio-demographic and job characteristics.

Table 4 contains information on individual characteristics, namely on age, sex, and educational attainment. Although there is some diversity among the different countries, in all of them the population of minimum wage earners is similar in that it is characterised by:

- a lower average age;
- on average more female employment;
- lower levels of educational attainment than workers with higher wages.

Table 4 also shows the standard deviation associated with the average age and proportion of female workers that allow to compute whether the observed differences between the two sub-populations are statistically significant in the different countries of our sample.

As for the job characteristics, Table 5 compares the two sub-populations with respect to the share of temporary work contracts and the incidence of part time jobs. The latter has been defined as employments whose average weekly work hours do not exceed 35 hours. Again, we observe a clear difference between the two sub-populations in all countries. In particular, the group of minimum earners stands out as containing:

- a considerably higher share of employees with temporary work contracts;
- a higher share of part time employment than the sub-population with higher wages.

In light of cross-country variations in terms of the average age, education, contract type etc among the countries in our sample, it is not straightforward to assess the overall relationship between a particular individual or job characteristic and the probability of being paid at the minimum wage. One way to compute such probabilities is to estimate a logistic model in which the likelihood of being paid the minimum wage is explained with the set variables shown in Table 4. This procedure allows to gauge the effect of each of the variables as a conditional probability while holding the other variables constant. The results of a logistic regression are presented in Section 3.3.

Table 4. Individual characteristics of employees below and above minimum wages (2007)

Individual wage	Average age		Share of female employees		Distribution of employees according to educational attainment (ISCED)					
	<= MW ¹	> MW	<= MW	> MW	<= MW			> MW		
Educational attainment					1	2	3	1	2	3
TYPE I COUNTRIES										
Bulgaria	38.9 (12.5) ²	40.8 (11.7)	51.7 (50.1)	46.4 (49.9)	41.4	54.2	4.4	15.1	62.3	22.6
Hungary	37.4 (11.2)	40.2 (10.8)	43.5 (49.6)	46.8 (50.0)	30.6	66.9	2.6	11.4	64.1	24.5
Ireland	33.5 (14.6)	39.8 (12.5)	56.2 (49.7)	49.9 (50.0)	35.6	52.3	12.2	22.5	36.5	41.0
Poland	36.7 (12.2)	39.5 (11.1)	51.6 (50.0)	46.4 (49.9)	15.2	77.6	7.2	5.7	66.9	27.4
Romania	35.5 (10.0)	39.4 (10.1)	55.5 (50.0)	42.7 (49.5)	30.6	66.3	3.1	10.6	69.1	20.3
Spain	36.1 (13.0)	39.5 (10.7)	65.0 (47.7)	43.4 (50.0)	55.5	20.7	23.8	35.9	25.1	39.0
United Kingdom	41.5 (14.8)	41.4 (12.1)	66.9 (47.1)	50.4 (50.0)	23.5	61.8	14.7	9.4	54.4	36.2
TYPE II COUNTRIES										
Belgium	36.1 (11.7)	41.0 (10.1)	45.7 (49.8)	52.1 (50.0)	29.1	41.5	29.4	16.8	38.4	44.8
Germany	36.7 (14.2)	43.0 (10.6)	54.0 (49.9)	44.9 (49.7)	21.7	68.3	10.1	9.0	56.1	34.9

Notes

1 MW are the (differentiated) national minimum wages) in Type I countries and sector minimum wages in Type II countries

2 Standard errors are in parenthesis

Table 5. Job characteristics of employees below and above minimum wages (2007)

	Share of employees with temporary work contracts		Share of employees working part time	
	<= MW ¹	> MW	<= MW	> MW
TYPE I COUNTRIES				
Bulgaria	18.7 (39.1) ²	5.8 (23.5)	5.1 (22.0)	4.1 (19.8)
Hungary	18.4 (38.8)	8.2 (27.4)	8.7 (28.2)	3.9 (19.2)
Ireland	19.4 (39.6)	7.1 (25.6)	44.2 (49.7)	33.1 (47.1)
Poland	53.8 (49.9)	23.7 (42.5)	11.0 (31.3)	10.0 (30.0)
Romania	10.6 (30.8)	2.6 (16.0)	1.1 (10.4)	1.2 (10.8)
Spain	52.3 (50.0)	24.4 (42.9)	20.7 (40.6)	13.2 (33.9)
United Kingdom	NA	NA	54.5 (49.8)	25.1 (43.4)
TYPE II COUNTRIES				
Belgium	26.5 (44.2)	6.7 (25.0)	33.8 (47.3)	26.4 (44.1)
Germany	35.6 (47.9)	8.6 (28.0)	39.5 (48.9)	19.3 (39.4)

Notes

1 MW are the (differentiated) national minimum wages) in Type I countries and sector minimum wages in Type II countries

2 Standard errors are in parenthesis

3.2.3. Minimum wages in different sectors of activity

Existing studies on the bite of minimum wages have documented significant within-country variation in the bite of minimum wages (see Section 2). One of the main dimensions according to which the wage distribution and the system of minimum wages is structured in most countries are sectors of activity (see, for instance, Madga et al, 2011). In order to examine this aspect in more detail, we have calculated the employment spike at the one-digit level of the NACE (Rev. 1) classification. The latter is available in both the EU-SILC and the GSOEP and is a frequently used tool to compare sectors of activity across different countries.

For countries with clean-cut minimum wage systems the computation of sectoral employment spikes is relatively straightforward. Given that in these countries the minimum wage rates are determined at the national level, the inter-sectoral variation among minimum rates only stems from differences in the socio-demographic composition within each sectors. If, for instance, the national minimum wage for younger employees is set at a lower level, then a sector with many young employees would have a relatively lower minimum wage than other sectors. For each of the seven type I countries in our sample, Annex B includes a table with the lowest, highest, and weighted average minimum wage in each sector of activity.

Annex B also shows the employment spike in the different sectors of activity. Indeed, most

of the countries display considerable infra-national diversity with certain sectors having relatively low proportions of minimum wage earners (such as banking and insurance activities), while other contain many employees that are paid at the minimum (such as the construction sector).

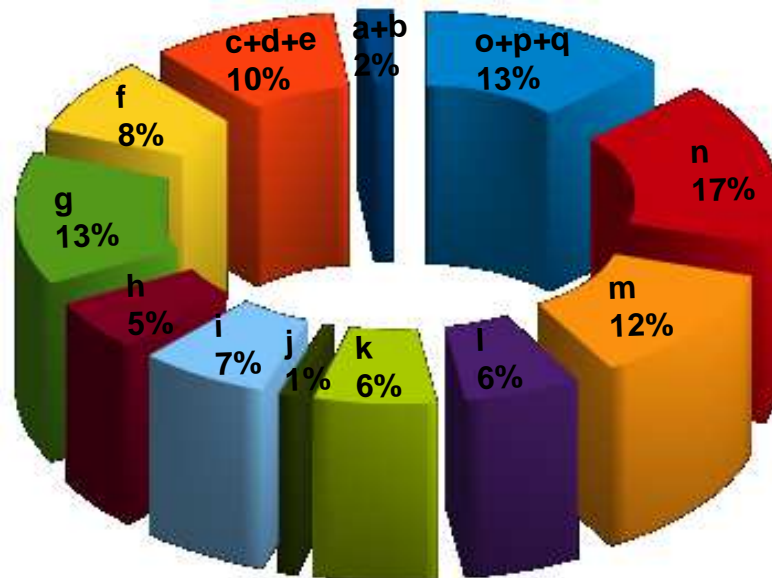
As for countries that have installed a complex system in which many minimum wages are defined at the infra-national level, it is more difficult to calculate the employment spike at the sector level because each sector or sub-sector of activity has its own minimum wage. For the case of Germany, we even went one step further and collected information on separate minimum rates in East and West Germany. Unfortunately, the survey data does generally not allow to match each individual to the applicable minimum wage in light of her age, tenure, residence, occupation, sector etc. In particular, the EU-SILC contains only one-digit NACE codes, while the GSOEP provides information on two-digit sectors. However, the sectoral determination of minimum wages takes place at a more disaggregated level in both countries (e.g. three- or four-digit sectors). What is more, the European nomenclature of activities used in the EU-SILC and the GSOEP does not correspond directly to the way in which the sectors are distinguished in the Belgian *Commissions Paritaires* and the German *Tarifbranchen*. We therefore calculated the sector-level figures shown in Annex B by applying the following procedure: we first established a correspondence between the *Commissions Paritaires* (for Belgium) and the *Tarifbranchen* (for Germany) on the one hand, and the NACE one-digit codes, on the other hand. We then calculated a weighted average of the different minimum wages in each of the one-digit NACE sectors. As was the case for the total employment, the sectoral employment spikes shown for Germany have to be interpreted with care. Since not all workers are covered by collective agreements, the actual figures are somewhat lower depending on the coverage in each sector (in 2010, the sector-level tariff coverage in West Germany was 56 and in East Germany 38 per cent).

The Belgian system defines both national and sectoral minima. Figure 5 shows how the sectoral distribution of the population of minimum wage earners changes if we define them in terms of the weighted average of national minima (panel a) or the sectoral minima (panel b). To the extent that the collective bargaining in certain sectors raises the minimum above the interprofessional rate, the share of these sectors in the population of minimum wage earners will rise. In Belgium, this is notably the case for the construction sector whose share increases from 9 percentage points from 8 to 17 percent (see Figure 5).

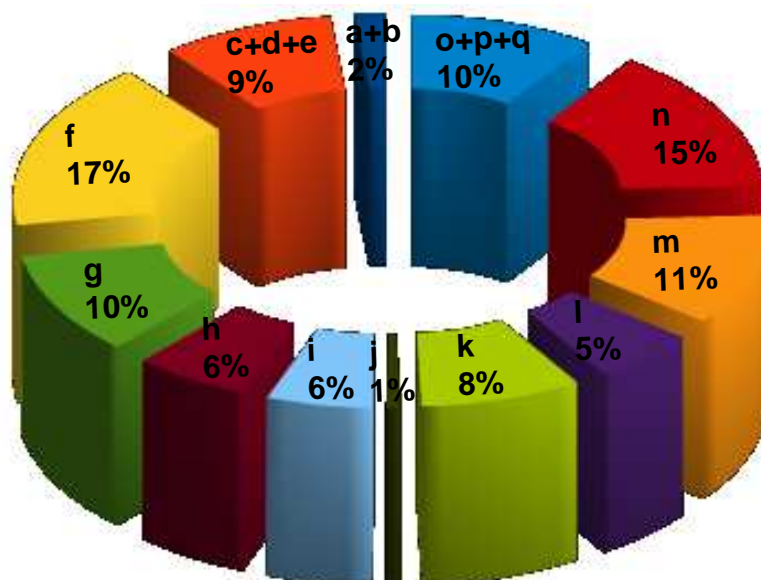
To some extent, the wage distribution at the sector level of a Type II countries resembles the overall wage distribution of a Type I country. This can be seen in Figure 6 which shows the sectoral minima and wage distribution for the transport, storage and communication sector (panel a) and for real estate, renting and business activities (panel b). The vertical red lines in these figures represent respectively the interprofessional minimum wage (7.80 euros) and the sectoral minima in the two sectors. As can be seen, once we disaggregate the total population into sectors of activity, a truncation of the wage distribution appears at the level of the sectoral minimum wage (see Figure 6).

Figure 5. Distribution of minimum wage earners according to sector of activity in Belgium

a) Inter-professional minimum (2007)



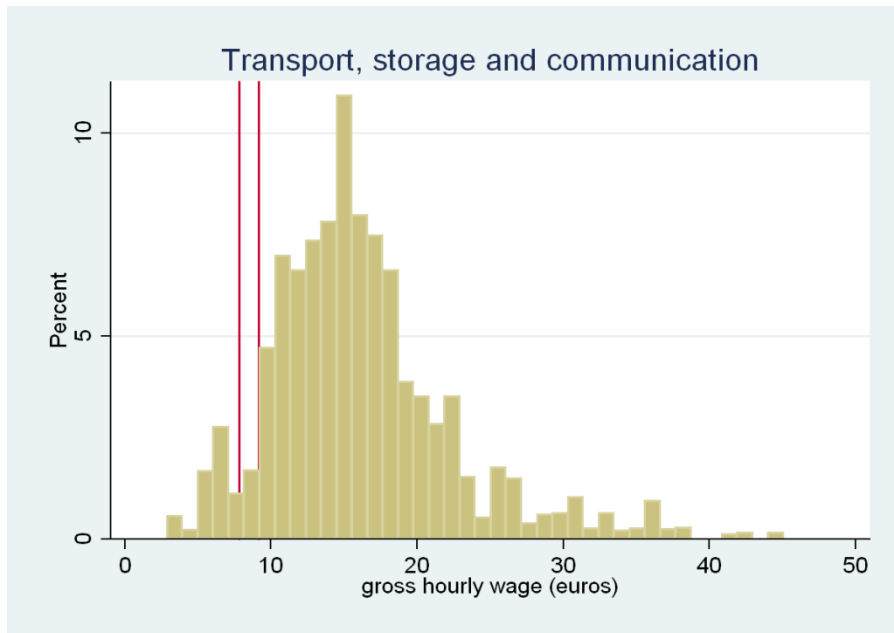
b) Employment-weighted average sector minima (2007)



Sectors according to NACE Rev. 1: a+b = Agriculture, hunting and forestry + Fishing; c+d+e = Mining and quarrying + Manufacturing + Electricity, gas and water supply; f = Construction; g = Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods; h = Hotels and restaurants; i = Transport, storage and communication; j = Financial intermediation; k = Real estate, renting and business activities; l = Public administration and defence, compulsory social security; m = Education; n = Health and social work; o+p+q = Other community, social and personal service activities + Private households with employed persons + Extra-territorial organizations and bodies

Figure 6. Intra-sectoral wage distribution and minimum wages in Belgium (2007)

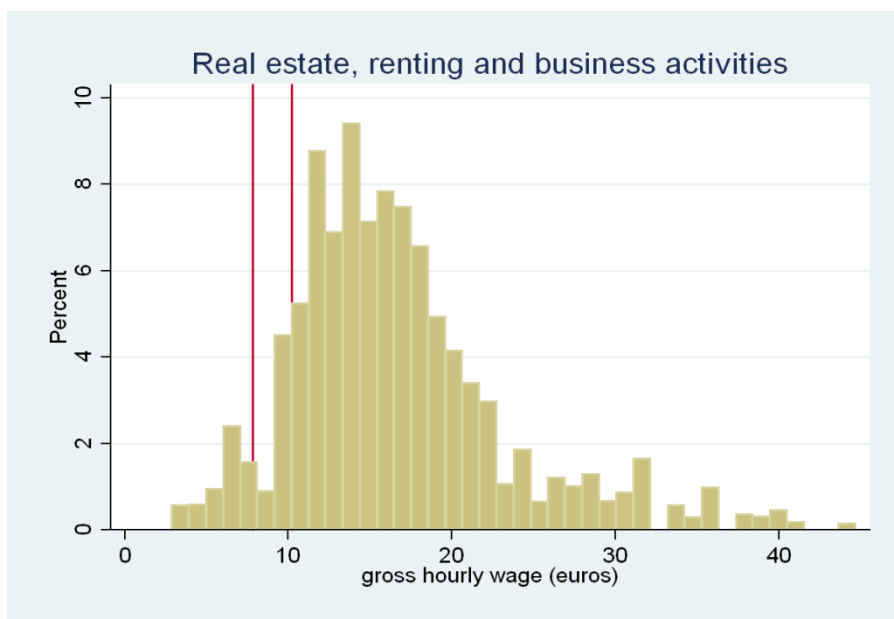
a) Transport, storage and communication



Notes

Data source: BE-SILC; current 2007 euros; vertical red lines indicate levels of interprofessional minimum wage (7.8 euros per hour) and employment-weighted average of sector minimum (9.18 euros per hour)

b) Real estate, renting and business activities



Notes

Data source: BE-SILC; current 2007 euros; vertical red lines indicate levels of interprofessional minimum wage (7.8 euros per hour) and employment-weighted average of sector minimum (10.21 euros per hour)

3.2.4. Household characteristics of minimum wage earners

Finally, we have used the information on household characteristics in the EU-SILC to shed more light on the overall living conditions of minimum wage earners. We notably compared the latter to the rest of the population with respect to the average household size, the total disposable household income, and the risk of poverty.

The average figures for these three variables are shown in Table 6. All countries in our sample show a similar pattern in terms of household size: the population of minimum wage earners consistently live in households that are on average larger compared to the population with higher wages. Unsurprisingly, the average disposable household income is also consistently lower in households with minimum wage earners. Finally, in most of the countries in our sample, the risk of poverty of the household is on average considerably higher for the population of minimum wage earners.

Table 6. Household characteristics of employees below and above minimum wages (2007)

	Household size (in persons)		Household income (2007 euros)		Household at risk of poverty ²	
	<= MW	> MW	<= MW	> MW	<= MW	> MW
TYPE I COUNTRIES						
Bulgaria	4.0 (1.8)1	3.8 (1.6)	1675.5 (1096.6)	3221.2 (1931.3)	41.2 (49.3)	6.1 (24.0)
Hungary	3.6 (1.6)	3.3 (1.3)	3607.2 (1372.4)	5684.2 (2639.4)	24.5 (43.0)	2.9 (16.9)
Ireland	3.5 (1.4)	3.4 (1.3)	22182.0 (9114.8)	32921.1 (16020.4)	12.9 (33.6)	3.7 (18.8)
Poland	3.9 (1.7)	3.6 (1.5)	3772.5 (1922.6)	6158.3 (4233.6)	26.0 (43.9)	6.0 (23.8)
Romania	3.9 (1.4)	3.6 (1.5)	1693.0 (806.9)	3228.8 (1996.7)	25.8 (43.8)	4.0 (19.6)
Spain	3.3 (1.2)	3.2 (1.1)	11289.7 (6811.8)	18078 (8947.9)	29.1 (45.4)	6.3 (24.4)
United Kingdom	3.05 (1.3)	2.9 (1.3)	21280.2 (10953.1)	32311.1 (25534.0)	20.2 (40.2)	4.3 (20.4)
TYPE II COUNTRIES						
Belgium	3.1 (1.5)	3.0 (1.4)	17770.3 (10219.7)	24280.6 (12713.8)	16.4 (37.0)	2.5 (15.6)
Germany	NA	NA	NA	NA	NA	NA

Notes

1 Standard errors are in parenthesis

2 The at-risk-of-poverty threshold is defined as 60 % of the national median equivalised disposable income after social transfers.

3.3. Regression analysis

The preceding section compared the population of minimum wage earners to the rest of the labour force and found that the two groups differ on average with respect to individual, job, and household characteristics. In this section, we look at the issue from a different angle and ask what determines the likelihood of receiving a minimum wage. This is done by estimating logistic regressions that predict the conditional probability of receiving the minimum wage in each of the countries under consideration. One of the advantages of this procedure is that it allows to estimate the relationship between the aforementioned characteristics and the likelihood of being a minimum wage earner under *ceteris paribus* conditions, i.e. by holding all other characteristics constant. This is particularly relevant for our question since it allows to disentangle the effects of the different characteristics. For example, we have seen that minimum earners are on average younger and sign on more temporary contracts than the rest of the labour force. But is it the age or the contract type that is linked to the likelihood of receiving minimum wages? And what is the size of these effects in each country?

The dependent variable in the estimated model is a dummy variable that takes the value of 1 if the individual earns the minimum wage that applies to her and 0 otherwise. This variable is then regressed on a set of 16 explanatory variables that capture the following characteristics:

- a dummy variable measuring the existence of a temporary work contract (the reference modality are permanent work contracts)
- a dummy variable for part-time employment, defined as less than 35 weekly work hours (the reference modality is full-time employment with more or equal than 35 weekly work hours)
- a dummy variable capturing whether the individual switched jobs during the past year (the reference modality is absence of job switches)
- three dummy variables capturing the length of labour market experience in number of years (the reference category is less than 5 years of labour market experience)
- two dummy variables indicating the broad occupational categories "low white collar" and "blue collar" occupations that have been defined by regrouping ISCO 88 two-digit occupational categories (the reference category are "high white collar" occupations).¹²
- six dummy variables indicating the individual's age (the reference category are workers aged between 35 and 45 years).
- a sex dummy (the reference category is male)
- two dummy variables for educational attainment based on ISCED levels (the reference category are ISCED levels 3 and 4)

In order to control for employer characteristics, the model also includes three dummies for firm size (measured in terms of number of workers per establishment) and 11 dummies that control for the sector of activity of the employer.

A logistic regression was estimated separately for each of the nine countries in our sample. Table 7 reports the estimated coefficients for the seven countries with clean-cut minimum wage systems; Table 8 shows results for the two countries with complex systems. The reported significance levels are robust to heteroskedasticity. All models are statistically significant at the 1

¹² "High white-collar occupations" correspond to ISCO codes 11, 12, 13, 21, and 22. "Low white-collar occupations" correspond to ISCO codes 23, 24, 31, 32, 33, and 34. "Blue-collar occupations" contain codes 61, 71, 72, 73, 74, 81, 82, 83, 91, 92, 93, and 01.

per cent level and have a good fit, with pseudo-coefficients of determination ranging from 14 (Bulgaria) to 30 per cent (Germany).

A positive coefficient in Tables 7 and 8 indicates that the characteristic is associated with higher odds of receiving minimum wages than the reference group. Take, for example, the coefficient associated with temporary work contacts. In the UK, this coefficient was estimated to be equal to 0.52. Given that we have estimated a logistic regression, this means that the odds of a temporary contract holder of receiving minimum wages are around 68.4 per cent ($0.684 = e^{0.521} - 1$) higher than the odds of a permanent contract holder. Conversely, a negative coefficient indicates a lower probability compared to the reference category. For instance, the coefficient for the highest level of attained education (ISCED levels 5 and 6) in the UK is estimated to be -0.46. Given that the reference category is medium education (ISCED levels 3 and 4), we can say that the odds of a highly educated individual of receiving minimum wages are about 37.1 per cent smaller than the odds of an individual with medium education ($0.371 = e^{-0.464} - 1$).

Estimation results

The results of the regression analysis are broadly in line with the conclusions drawn from the descriptive statistics in the previous section. For most of the nine countries in our sample we observe that:

- temporary contracts are associated with higher odds of receiving minimum wages than permanent contracts (this is the case in Bulgaria, Hungary, Poland, Romania, Spain, Belgium, and Germany)
- a job change increases the odds of receiving minimum wages (Bulgaria, Hungary, Poland, Romania, Spain, and Belgium)
- the longer the work experience on the labour market, the lower are the odds of receiving minimum wages (Ireland, Poland, Spain, Germany, and Belgium)
- females are more likely to receive minimum wages than males in all countries
- relative to medium levels of educational attainment, low education is associated with a greater and high education with a smaller probability of receiving minimum wages in all countries (exceptions are Ireland and Belgium where the coefficient of high education is not significant)
- high white collar occupations are less likely to earn minimum wages than low white collar and blue collar occupations (the blue collar coefficient is significant in all countries)
- the youngest group of workers has higher odds of receiving minimum wages compared to middle-aged workers in Hungary, Ireland, Spain, the UK, Belgium, and Germany. In addition, elderly workers are also more exposed to minimum wages in the latter four countries.

An exception is the effect of part time work: part time is associated with a higher probability of receiving minimum wages in Ireland, the United Kingdom, and Germany; but the opposite effect is observed in Bulgaria, Hungary, Spain, Poland, and Belgium (albeit with insignificant coefficients for Bulgaria, Poland, and Belgium). This suggests that part time work arrangements play a different role depending on the national context.

By and large, the regression results indicate that the sign of the relationships between individual and job characteristics is fairly similar in all countries in our sample; except for part time work, it appears that the underlying mechanisms work in the same direction irrespective of the national context. This being said, it should be noted that the size of the effects can differ substantially across countries. For instance, the positive impact of temporary contracts on the

probability of receiving minimum wages is much higher in the two countries with complex systems (Belgium and Germany) than in the rest of the sample. Also the effect of white- and blue-collar categories differs strongly in magnitude, with coefficients ranging from 0.54 (Ireland) to 1.71 (Romania). In other words, while our regressions suggest that the determinants of earning minimum wages are relatively homogeneous across Europe, we also observe much heterogeneity as to the relative importance of each determinant.

The Belgium minimum wage system is special in that it contains both a binding interprofessional minimum wage that is defined at the national level and sectoral minima established through decentralised collective bargaining. Given that in practice most workers are covered by a sectoral rather than by the national minimum, we have defined Belgium as a complex system. The regression analysis in Table 8 shows why it is important to take the sectoral level into account: if we use the interprofessional minimum wage to define the dependent variable in our model (column 3), almost all coefficients are altered compared to the model using the sectoral minimum wages (the sign of effects remains unchanged). In addition, the coefficient of determination of the sectoral model is 4 percentage points higher compared to the model using the interprofessional minimum, indicating that the former fits better to the variation in the data.

**Table 7: Coefficients from logistic regression - countries with clean-cut systems
(dependent variable: individual earns applicable minimum wage)**

Explanatory variables	Bulgaria	Hungary	Ireland	Poland	Romania	Spain	UK
Temporary work contract	0.74***	0.76***	0.26	0.76***	0.71**	0.63***	n.a.
Part time (< 35 hours)	-0.96	-0.42*	0.37**	-0.12	0.04	-0.65***	0.52***
Job change during last year	1.03***	0.58***	-0.26	0.58***	0.80***	0.52***	n.a.
Work experience 2 (years = [5;10[)	-0.11	n.a.	-0.92***	-0.01	0.86**	-0.96***	n.a.
Work experience 3 (years = [10;20[)	-0.02	n.a.	-1.25***	-0.16	0.46	-1.17***	n.a.
Work experience 4 (years >=20)	-0.33	n.a.	-1.35***	-0.40*	0.03	-1.29***	n.a.
White collar II occupation ¹	0.48	0.90***	0.42*	0.86***	1.59***	0.39*	0.89***
Blue collar occupation ¹	0.79**	1.43***	0.54**	1.09***	1.71***	0.73***	1.25***
Age category 1 (age = [15;25[)	-0.55	0.95***	0.96**	0.26	0.28	0.58**	0.60***
Age category 2 (age = [25;30[)	0.33	0.29*	0.52	0.04	0.14	0.30	0.48**
Age category 3 (age = [30;35[)	-0.14	0.43***	0.01	-0.24	0.04	0.09	0.33*
Age category 5 (age = [45;60[)	0.04	0.09	-0.10	0.11	-0.11	0.11	0.15
Age category 6 (age >= 60)	0.02	-0.17	0.03	0.36	0.15	0.89***	0.67***
Female	0.50**	0.51***	0.53***	0.62***	0.75***	0.83***	0.53***
Low education (ISCED = [0;2])	0.57***	0.55***	0.46**	0.42***	0.70***	0.33**	0.44***
High education (ISCED = [5;6])	-1.02**	-1.41***	-0.74***	-0.81***	-0.78*	-0.08	-0.46***
Firm size 1 (< 5 workers)	0.58*	0.67***	0.78***	-0.08	0.91***	0.89***	0.54***
Firm size 2 (>= 5 and < 10 workers)	0.31	0.13	0.04	0.09	0.53**	0.08	0.30*
Firm size 4 (>= 20 workers)	-0.62***	-0.43***	-0.48**	-0.58***	-0.33**	0.06	-0.22
NACE1 = A+B (Agriculture, hunting and forestry; Fishing)	-0.18	0.80***	0.47	0.71***	1.24***	0.83***	0.48
NACE1 = F (Construction)	0.31	0.62***	-0.40	0.23*	-0.01	-0.36	-0.23
NACE1 = G (Wholesale and retail trade)	0.10	0.48***	0.07	0.60***	-0.04	0.38*	0.68***
NACE1 = H (Hotels and restaurants)	0.14	0.62***	0.95***	0.84***	0.97***	0.84***	0.99***
NACE1 = I (Transport, storage and communication)	-0.43	0.00	-0.23	0.21	-0.47*	0.78***	-0.09
NACE1 = J (Financial intermediation)	-0.48	-1.24	-2.43**	0.15	-1.27	0.04	-1.18***
NACE1 = K (Real estate, renting and business activities)	0.52	0.81***	-0.28	0.63***	0.25	0.31	0.19
NACE1 = L (Public administration and defence, compulsory social security)	0.70**	0.02	-0.75**	0.21	-0.10	-0.21	-0.58**
NACE1 = M (Education)	-1.09	-0.22	-0.37	-0.39	0.57*	0.28	0.71***
NACE1 = N (Health and social work)	1.24***	-0.19	-0.62*	0.02	0.68**	0.19	0.30
NACE1 = O + P + Q (Other community, social and personal service activities; Private households; Extra-territorial organizations)	1.27***	0.23	0.31	0.22	-0.77	1.01***	0.67***
Observations	3517	6313	2964	10184	5052	10505	6910
Pseudo-R-squared	0.14	0.17	0.21	0.14	0.16	0.15	0.15
Model significance	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes:

Data source: EU-SILC 2007; significance levels: * $p < .1$; ** $p < .05$; *** $p < .01$

1 "High white-collar occupations" correspond to ISCO codes 11, 12, 13, 21, and 22. "Low white-collar occupations" correspond to ISCO codes 23, 24, 31, 32, 33, and 34. "Blue-collar occupations" contain codes 61, 71, 72, 73, 74, 81, 82, 83, 91, 92, 93, and 01.

**Table 8: Coefficients from logistic regression - countries with complex minimum wage systems
(dependent variable: individual earns applicable minimum wage)**

Explanatory variables	Belgium (sector minima)	Belgium (interprof. minima)	Germany (sector minima)
Temporary work contract	0.95***	1.08***	1.42***
Part time (< 35 hours)	-0.08	-0.12	0.91***
Job change during last year	0.90***	0.81***	n.a.
Work experience 2 (years = [5;10[)	-1.06***	-0.86***	-0.40***
Work experience 3 (years = [10;20[)	-1.40***	-1.07***	-0.78***
Work experience 4 (years >=20)	-1.77***	-1.06***	-1.34***
White collar II occupation ¹	0.21	0.12	0.50***
Blue collar occupation ¹	0.78***	0.62***	1.37***
Age category 1 (age = [15;25[)	0.36	0.64**	1.56***
Age category 2 (age = [25;30[)	0.08	0.42	0.55***
Age category 3 (age = [30;35[)	0.17	0.48**	0.25*
Age category 5 (age = [45;60[)	-0.01	-0.15	0.19**
Age category 6 (age >= 60)	1.07***	1.10***	0.81***
Female	0.42***	0.41***	0.61***
Low education (ISCED = [0;2])	0.35**	0.41**	0.50***
High education (ISCED = [5;6])	-0.16	-0.09	-0.56***
Firm size 1 (< 5 workers)	0.70***	0.84***	0.73***
Firm size 2 (>= 5 and < 10 workers)	0.17	0.04	0.12
Firm size 4 (>= 20 workers)	-0.31*	-0.33*	-0.63***
NACE1 = A+B (Agriculture, hunting and forestry; Fishing)	1.42***	1.15**	0.26
NACE1 = F (Construction)	1.73***	0.22	0.21
NACE1 = G (Wholesale and retail trade)	0.41*	0.40	0.22*
NACE1 = H (Hotels and restaurants)	1.58***	0.77**	-0.39*
NACE1 = I (Transport, storage and communication)	0.63**	0.47	-0.44***
NACE1 = J (Financial intermediation)	-0.74	-0.70	0.74***
NACE1 = K (Real estate, renting and business activities)	1.07***	0.40	-0.24*
NACE1 = L (Public administration and defence, compulsory social security)	0.22	0.10	-1.02***
NACE1 = M (Education)	0.86***	0.48	-0.81***
NACE1 = N (Health and social work)	0.81***	0.70***	-1.51***
NACE1 = O + P + Q (Other community, social and personal service activities; Private households; Extra-territorial organizations)	0.87***	0.87***	-0.01
Observations	4999	4999	7705
Pseudo-R-squared	0.19	0.15	0.30
Model significance	0.00	0.00	0.00

Notes:

Data source: BE-SILC 2007 for Belgium, German Socio-economic Panel for Germany; significance levels: * $p < .1$; ** $p < .05$; *** $p < .01$

1 "High white-collar occupations" correspond to ISCO codes 11, 12, 13, 21, and 22. "Low white-collar occupations" correspond to ISCO codes 23, 24, 31, 32, 33, and 34. "Blue-collar occupations" contain codes 61, 71, 72, 73, 74, 81, 82, 83, 91, 92, 93, and 01.

4. Conclusion

Minimum wages continue to stir controversial policy debates. The current economic climate in Europe might contribute to increase the pressure on wages at the bottom of the wage distribution and, as a consequence, renew the interest in wage floors as a tool to protect workers and employees. This paper contributes to a better understanding of minimum wages by providing a solid empirical assessment of minimum wage policies and their socio-economic consequences for a range of European countries.

An obstacle to providing comparable information on wage minima for different countries is the institutional diversity of European minimum wage systems. This diversity reflects the historical evolution of each of the national collective bargaining systems. While one has to acknowledge the existence of national idiosyncrasies, it is nevertheless useful to distinguish European countries with the help of a straightforward typology. Central and Eastern European countries, the UK and Ireland, as well as Luxembourg, the Netherlands, Cyprus, Spain, and Portugal operate minimum wage systems that produce a "clean cut" in the income distribution. By contrast, all of the Nordic countries, Austria, Belgium, Germany, Greece, and Italy operate minimum wage systems that are "complex", i.e. many different minima co-exist side by side so that the left tail of the wage distribution is much smoother in these countries. This typology therefore helps to link the institutional arrangements that underlie the different minimum wage system and the overall shape of the income distribution. The two types also differ with respect to who is affected by minimum wage policies: whereas in clean-cut systems the affected individuals are concentrated in a small segment of the wage distribution, wage floors in complex systems can also affect workers and employees with relatively high remunerations.

In addition to qualitative differences between minimum wage systems, the paper documents international variations in the (absolute and relative) levels of minimum wages. While these levels follow no clear geographical pattern, it appears that complex systems are more likely to generate relatively high wage floors compared to systems that determine a single wage minimum at the national level. By and large, 'clean-cut' systems typically involve social partners to a relatively low extent and offer them merely a consultative function in the process of setting the minimum wage. As a consequence, these countries seem to be less effective in guaranteeing wage floors that help to compress the lower end of the wage distribution and protect wage earners from poverty.

The comparison of the two countries with complex minimum wage systems, Belgium and Germany, suggests that a strong role of collective bargaining does not in itself guarantee higher levels of minimum wages. Indeed, Germany appears to be an important exception to the protective function of collectively bargained minimum wages: we observe considerable differences in minimum wages between sectors and regions, as well as low bargaining coverage in particular in those sectors and regions where wages floors tend to be relatively low. We conclude that collective bargaining has to be embedded in other institutional features (e.g. effective erga omnes procedures, high union and employer densities, high collective bargaining autonomy) in order to generate minimum wages with a strong 'bite'.

An important contribution of the paper is to provide a statistical panorama of the population of minimum wage earners. Compared to the rest of the population, the empirical results show that this group is characterised by a lower average age; on average more female employment; lower levels of educational attainment than workers with higher wages; a considerably higher share of employees with temporary work contracts; and a higher share of part time employment than the

sub-population with higher wages. Even more important in terms of the affected individuals' well being is the finding that in all countries in the sample minimum wage earners live in bigger households that dispose of significantly lower income and that are at a higher risk of living in poverty.

These relationships between individual characteristics and minimum wages stand up to the regression analysis we carried out. A logistic regression modelling the likelihood of receiving minimum wages in each of the nine countries in our sample suggests that the underlying effects work in the same direction across Europe. In other words, the relationships between individual and job characteristics and the likelihood of receiving minimum wages have the same signs in most countries (the effect of part time being the only exception to this rule). While this led us to conclude that the determinants of being a minimum wage earner are relatively similar across Europe, we also noted that the magnitude of the different effects is rather heterogeneous.

There are several lines of investigation in which our results could be extended. We finish by briefly mentioning the most relevant suggestions for further comparative research on minimum wages in Europe.

A first line of investigation could take into account that the composition of the population affected by the Kaitz index might differ across countries; it would therefore be advisable to compare Kaitz indices for groups with similar characteristics (such as age, gender, occupation, educational attainment, contract type etc.). Our paper documents that the effect of these categories differs in magnitude (albeit not in sign) across Europe; a differentiation of Kaitz indices might be able to account for some of this cross-country variation.

Second, it would be useful to compare the empirical results presented in this paper with the national minimum wage data that is published by other sources such as the OECD database, both in terms of the absolute and relative level of minimum wages and the corresponding employment spikes. Given that standard analyses typically fail to account for the infra-national differentiation of minimum wage rates, it is notably interesting to what extent our employment-weighted figures differ from sources that do not apply this correction. In addition, a comparison with other sources would also allow to pinpoint which knowledge gaps have been filled by our research, in particular as regards Type II countries that are typically not included in international comparisons.

Finally, this paper was restricted to nine countries and it would certainly be useful to extent the analysis to other countries. For instance, important cases that could be included in further research along the lines presented here are France, the Netherlands, or Italy. Given the complexity of the German case, it would also be useful to combine the information presented above with more accurate data on collective bargaining coverage at the sector level.

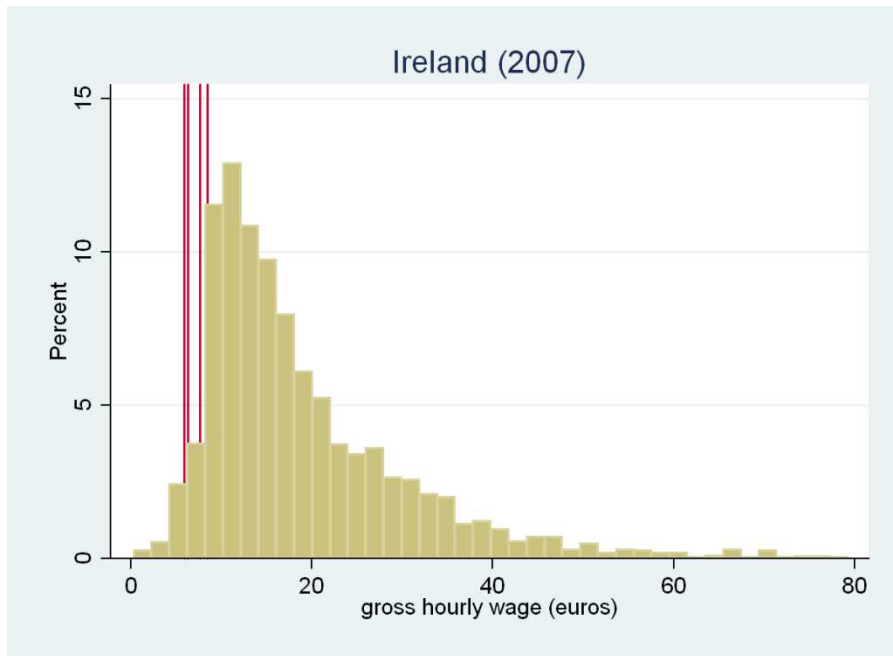
References

- Addison, J. and McK. Blackburn (1999). "Minimum Wages and Poverty", *Industrial and Labor Relations Review*, 52(3): 393-409.
- Brown, G., G. Giroy and A. Kohen (1982). "The Effect of the Minimum Wage on Employment and Unemployment", *Journal of Economic Literature*, 20: 487-528.
- Cahuc, P. and A. Zylberberg (2004). *Labor Economics*. Cambridge: MIT Press.
- Card, D. and A. Krueger (1995). *Myth and Measurement: The New Economics of the Minimum Wage*. Princeton: Princeton University Press.
- Checci D. C. and Lucifora (2002). "Unions and Labour Market Institutions in Europe", *Economic Policy*, 17(35): 363-408.

- Dolado, J, F. Kramarz, S. Machin, A. Manning, D. Margolis, and C. Teulings (1996). “The Economic Impact of Minimum Wages in Europe”, *Economic Policy*, 23: 319–370.
- Fairchild, D. (2004). “Does the Minimum Wage Help the Poor?”, *Forum for Social Economics*, 34(1-2) : 31-42.
- Fanti, L. and L. Gori (2011). “On Economic Growth and Minimum Wages”, *Journal of Economics*, 103(1): 59-82.
- Fitzenberger, B. (2009). “Anmerkungen zur Mindestlohndebatte: Elastizitäten, Strukturparameter und Topfschlagen.” *ZAF*, 42: 85-92.
- Frick, J. and Krell, K. (2009) *Einkommensmessungen in Haushaltspanelstudien für Deutschland: Ein Vergleich von EU-SILC und SOEP*, SOEPpapers, 237, Berlin, DIW.
- Funk, L. and H. Lesch (2006). “Minimum Wage Regulations in Selected European Countries.” *Intereconomics*, 41(2): 78-92.
- ILO (2010) . *Global Wage Report 2010/11: Wage policies in times of crisis*. Geneva: International Labour Office.
- Kaitz, H. (1970) “Experience of the Past: The National Minimum Wage”, *US Department of Labor, Bureau of Labor Statistics: Youth unemployment and minimum wages*, 1657.
- Kampelmann, S. and F. Rycx (2013) “Does institutional diversity account for pay rules in Germany and Belgium?”, *Socio-economic Review*, 11(1), 131-157.
- Kennan, J. (1995) “The Elusive Effects of Minimum Wages”, *Journal of Economic Literature*, 33(4), 1949-1965.
- Koeniger, W., M. Leonardi, and L. Nunziata (2007) “Labor Market Institutions and Wage Inequality,” *Industrial and Labor Relations Review*, 60 (3), 340-356.
- Machin, S. and A. Manning (1997) “Minimum wages and economic outcomes in Europe,” *European Economic Review*, 41(3-5), 733-742.
- Magda, I., Tojerow, I., Rycx, F., and D. Valsamis (2011) “Wage Differentials across Sectors in Europe: An East-West Comparison”, *Economics of Transition*, 19(4), 749-769.
- Neumark, D. and W. Wascher (2004) “Minimum Wages, Labor Market Institutions, and Youth Employment: A Cross-National Analysis”, *Industrial and Labor Relations Review*, 57(2), 223-248.
- Neumark, D., M. Schweitzer and W. Wascher (2004) “Minimum Wage Effects Throughout the Wage Distribution”, *Journal of Human Resources*, 29(2), 425-450.
- Neumark, D. and W. Wascher (2008) *Minimum Wages*, Cambridge: The MIT Press.
- OECD (1998) ‘Making the Most of the Minimum: Statutory Minimum Wages, Employment and Poverty’ in : *Employment Outlook*. Paris: OECD.
- Rycx, F. (2003) “Industry Wage Differentials and the Bargaining Regime in a Corporatist Country”, *International Journal of Manpower*, 24(4), 347-366.
- Scarpetta, S. (1996) “Assessing the Role of Labour Market Policies and Institutional Settings on Unemployment: A Cross-Country Study”, *OECD Economic Studies*, 26, 43-98.
- Stigler, G. (1946) “The Economics of Minimum Wage Legislation”, *American Economic Review*, 36, 358-365.

Appendix A: Wage distribution and minima per country

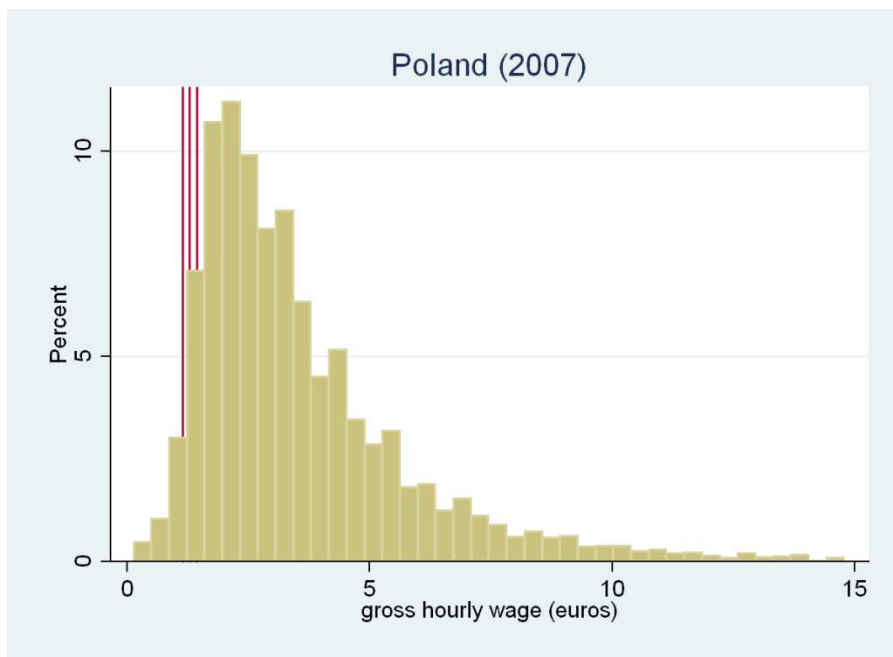
Figure A.1. Wage distribution and minima in Ireland (2007)



Notes

Data source: IE-SILC; current 2007 euros; vertical red lines represent levels of national minima (differentiated by age, educational activity, and job tenure)

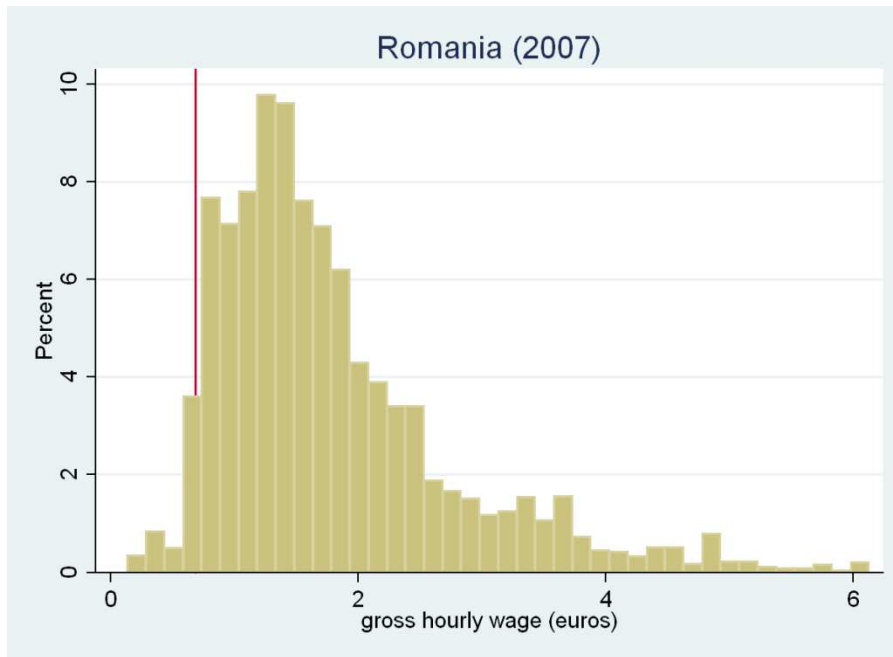
Figure A.2. Wage distribution and minima in Poland (2007)



Notes

Data source: PL-SILC; current 2007 euros; vertical red lines represent levels of national minima (differentiated by labour market experience)

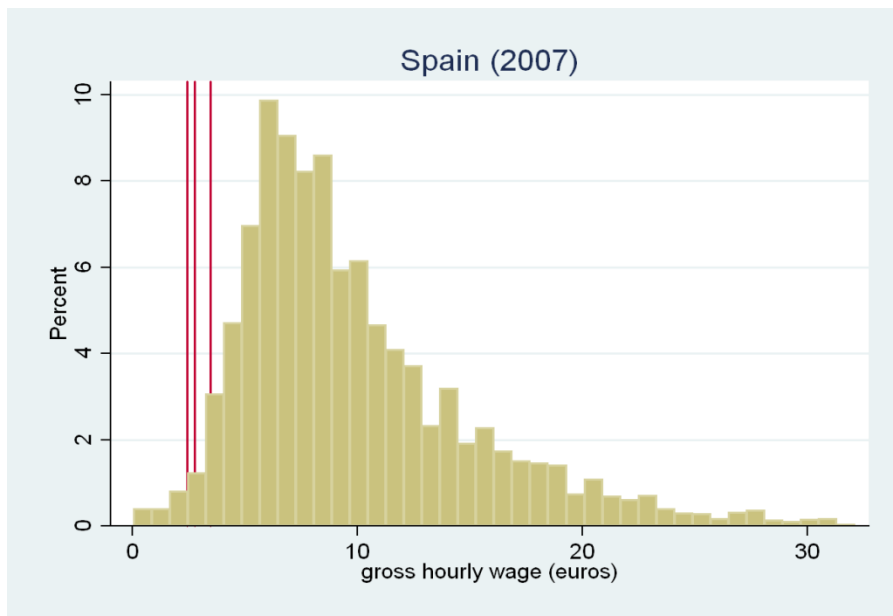
Figure A.3. Wage distribution and minima in Romania (2007)



Notes

Data source: RO-SILC; current 2007 euros; vertical red line represents level of national minimum wage

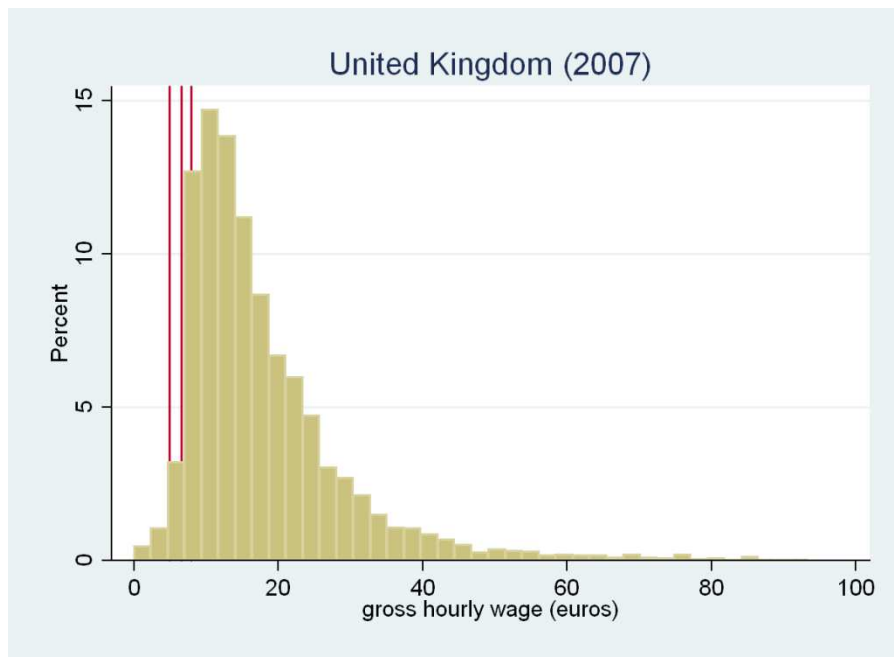
Figure A.4. Wage distribution and minima in Spain (2007)



Notes

Data source: ES-SILC; current 2007 euros; vertical red lines represent levels of national minima (differentiated by disability status, educational activity, and job tenure)

Figure A.5. Wage distribution and minima in the United Kingdom (2007)



Notes

Data source: UK-SILC; current 2007 euros; vertical red lines represent levels of national minima (differentiated by age)

Appendix B: Levels of minimum wages and share of minimum wage earners by sector and country

Table B.1. Belgium

NACEI	Label NACE Rev.1 : To use until the 2008 operation included	Obs.	Percent	Minimum Minimum in sector	Maximum Minimum in sector	Employment-weighted average of sector minima	Proportion of minimum earners in sector			Kaitz index	
							interprofessional minimum wage	sector minimum wage	scenario MW = 0.5*median	interprofessional minimum wage	sector minimum wage
a+b	Agriculture, hunting and forestry + Fishing	32	0.6	7.92	9.41	9.17	0.20	0.30	0.20	0.67	0.76
c+d+e	Mining and quarrying + Manufacturing + Electricity, gas and water supply	930	18.2	7.94	11.73	9.13	0.04	0.06	0.04	0.48	0.55
f	Construction	299	5.9	10.54	11.61	11.60	0.09	0.33	0.09	0.58	0.84
g	Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	471	9.2	7.80	13.21	8.58	0.10	0.13	0.10	0.59	0.63
h	Hotels and restaurants	90	1.8	9.45	9.45	9.45	0.21	0.39	0.14	0.71	0.84
i	Transport, storage and communication	358	7.0	8.74	9.18	9.18	0.07	0.09	0.06	0.52	0.60
j	Financial intermediation	250	4.9	8.46	8.46	8.46	0.01	0.02	0.01	0.38	0.40
k	Real estate, renting and business activities	374	7.3	7.80	10.64	10.21	0.06	0.13	0.06	0.52	0.66
l	Public administration and defence, compulsory social security	633	12.4	9.18	9.18	9.18	0.03	0.05	0.03	0.49	0.56
m	Education	605	11.9	9.09	9.10	9.10	0.07	0.11	0.07	0.46	0.53
n	Health and social work	765	15.0	8.00	9.10	8.84	0.08	0.11	0.07	0.53	0.58
o+p+q	Other community, social and personal service activities + Private households with employed persons +Extra-territorial organizations and bodies	293	5.8	7.80	9.17	8.75	0.16	0.19	0.15	0.62	0.68
All sectors -		5100	100	7.80	13.21	9.22	0.07	0.11	0.07	0.52	0.60

Table B.2. Bulgaria

NACE1	Label NACE Rev.1 : To use until the 2008 operation included	Obs.	Percent	Minimum			Proportion of minimum earners in sector			Kaitz index	
				Minimum in sector	Maximum Minimum in sector	Employment-weighted average of sector minima	interprofessional minimum wage	sector minimum wage	scenario MW = 0.5*median	interprofessional minimum wage	sector minimum wage
a+b	Agriculture, hunting and forestry + Fishing	264	5.98	0.48	0.53	0.53	0.12	-	0.28	0.54	-
c+d+e	Mining and quarrying + Manufacturing + Electricity, gas and water supply	1543	38.77	0.48	0.53	0.53	0.05	-	0.10	0.38	-
f	Construction	73	1.7	0.48	0.53	0.53	0.04	-	0.04	0.36	-
g	Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	517	13.95	0.48	0.53	0.53	0.07	-	0.15	0.45	-
h	Hotels and restaurants	201	5.71	0.48	0.53	0.53	0.08	-	0.18	0.45	-
i	Transport, storage and communication	283	7.37	0.48	0.53	0.53	0.02	-	0.05	0.36	-
j	Financial intermediation	71	2.07	0.48	0.53	0.53	0.01	-	0.02	0.27	-
k	Real estate, renting and business activities	164	4.29	0.48	0.53	0.53	0.05	-	0.12	0.40	-
l	Public administration and defence, compulsory social security	293	7.99	0.48	0.53	0.53	0.04	-	0.07	0.36	-
m	Education	233	5.45	0.48	0.53	0.53	0.01	-	0.06	0.42	-
n	Health and social work	185	4.61	0.48	0.53	0.53	0.12	-	0.20	0.55	-
o+p+q	Other community, social and personal service activities + Private households with employed persons +Extra-territorial organizations and bodies	77	2.10	0.48	0.53	0.53	0.12	-	0.24	0.45	-
All sectors	-	3904	100	0.48	0.53	0.53	0.06	-	0.12	0.41	-

Table B.3. Germany

NACEI	Label NACE Rev.1 : To use until the 2008 operation included	Obs.	Percent	Minimum Minimum in sector	Maximum Minimum in sector	Employment-weighted average of sector minima			Proportion of minimum earners in sector			Kaitz index	
						West	East	Total	interprofessional minimum wage	sector minimum wage	scenario MW = 0.5*median	interprofessional minimum wage	sector minimum wage
a+b	Agriculture, hunting and forestry + Fishing	108	0.94	4.87	8.43	7.00	6.65	6.86	-	0.24	0.21	-	0.76
c+d+e	Mining and quarrying + Manufacturing + Electricity, gas and water supply	2125	24.85	6.67	11.80	8.53	8.46	8.53	-	0.19	0.11	-	0.59
f	Construction	454	5.56	5.26	10.00	9.65	8.61	9.42	-	0.23	0.10	-	0.78
g	Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	1099	13.62	7.08	9.15	7.65	7.41	7.62	-	0.30	0.21	-	0.77
h	Hotels and restaurants	221	3.04	4.81	9.15	5.34	4.81	5.26	-	0.26	0.39	-	0.69
i	Transport, storage and communication	469	5.47	3.91	8.40	7.13	5.71	6.71	-	0.15	0.12	-	0.45
j	Financial intermediation	366	3.92	10.97	12.21	11.36	11.23	11.35	-	0.20	0.10	-	0.68
k	Real estate, renting and business activities	888	10.16	6.36	7.87	7.87	6.36	7.54	-	0.23	0.18	-	0.51
l	Public administration and defence, compulsory social security	697	7.25	7.2	7.61	7.61	7.20	7.54	-	0.05	0.03	-	0.52
m	Education	755	6.65	7.2	7.61	7.61	7.20	7.54	-	0.12	0.10	-	0.47
n	Health and social work	1114	12.47	4.33	5.45	5.45	4.33	5.28	-	0.09	0.15	-	0.36
o+p+q	Other community, social and personal service activities + Private households with employed persons +Extra-territorial organizations and bodies	537	6.04	6.22	9.02	7.31	7.08	7.29	-	0.27	0.23	-	0.66
All sectors	-	8833	99.97	3.91	12.21	7.76	7.04	7.63	-	0.19	0.14	-	0.58

Table B.4. Spain

NACEI	Label NACE Rev.1 : To use until the 2008 operation included	Obs.	Percent	Minimum Minimum in sector	Maximum Minimum in sector	Employment-weighted average of sector minima	Proportion of minimum earners in sector			Kaitz index	
							interprofessional minimum wage	sector minimum wage	scenario MW = 0.5*median	interprofessional minimum wage	sector minimum wage
a+b	Agriculture, hunting and forestry + Fishing	307	2.60	2.42	3.46	3.44	0.09	-	0.21	0.57	-
c+d+e	Mining and quarrying + Manufacturing + Electricity, gas and water supply	2107	18.37	2.42	3.46	3.43	0.03	-	0.06	0.39	-
f	Construction	1216	10.84	2.42	3.46	3.43	0.02	-	0.04	0.43	-
g	Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	1394	12.91	2.42	3.46	3.41	0.04	-	0.10	0.48	-
h	Hotels and restaurants	665	5.55	2.42	3.46	3.41	0.09	-	0.16	0.52	-
i	Transport, storage and communication	628	5.64	2.42	3.46	3.43	0.04	-	0.06	0.39	-
j	Financial intermediation	346	3.54	2.42	3.46	3.37	0.02	-	0.04	0.25	-
k	Real estate, renting and business activities	801	8.01	2.42	3.46	3.39	0.03	-	0.07	0.41	-
l	Public administration and defence, compulsory social security	1284	10.07	2.42	3.46	3.39	0.02	-	0.04	0.29	-
m	Education	897	7.74	2.42	3.46	3.37	0.03	-	0.04	0.23	-
n	Health and social work	874	7.33	2.42	3.46	3.40	0.02	-	0.04	0.33	-
o+p+q	Other community, social and personal service activities + Private households with employed persons +Extra-territorial organizations and bodies	808	7.41	2.42	3.46	3.41	0.10	-	0.20	0.52	-
All sectors	-	11327	100	2.42	3.46	3.41	0.04	-	0.08	0.40	-

Table B.5. Hungary

NACEI	Label NACE Rev.1 : To use until the 2008 operation included	Obs.	Percent	Minimum Minimum in sector	Maximum Minimum in sector	Employment-weighted average of sector minima	Proportion of minimum earners in sector			Kaitz index	
							interprofessional minimum wage	sector minimum wage	scenario MW = 0.5*median	interprofessional minimum wage	sector minimum wage
a+b	Agriculture, hunting and forestry + Fishing	244	3.5	1.51	1.51	1.51	0.32	-	0.17	0.79	-
c+d+e	Mining and quarrying + Manufacturing + Electricity, gas and water supply	1744	26.74	1.51	1.51	1.51	0.09	-	0.03	0.59	-
f	Construction	534	8.36	1.51	1.51	1.51	0.25	-	0.14	0.73	-
g	Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	859	13.79	1.51	1.51	1.51	0.14	-	0.06	0.66	-
h	Hotels and restaurants	218	3.74	1.51	1.51	1.51	0.20	-	0.07	0.73	-
i	Transport, storage and communication	499	7.82	1.51	1.51	1.51	0.09	-	0.03	0.52	-
j	Financial intermediation	159	2.58	1.51	1.51	1.51	0.01	-	0.00	0.39	-
k	Real estate, renting and business activities	390	6.31	1.51	1.51	1.51	0.13	-	0.05	0.50	-
l	Public administration and defence, compulsory social security	555	8.3	1.51	1.51	1.51	0.06	-	0.02	0.39	-
m	Education	600	8.58	1.51	1.51	1.51	0.03	-	0.01	0.41	-
n	Health and social work	496	6.91	1.51	1.51	1.51	0.05	-	0.01	0.54	-
o+p+q	Other community, social and personal service activities + Private households with employed persons +Extra-territorial organizations and bodies	215	3.36	1.51	1.51	1.51	0.12	-	0.05	0.54	-
All sectors	-	6513	100	1.51	1.51	1.51	0.12	-	0.05	0.57	-

Table B.6. Ireland

NACEI	Label NACE Rev.1 : To use until the 2008 operation included	Obs.	Percent	Minimum Minimum in sector	Maximum Minimum in sector	Employment-weighted average of sector minima	Proportion of minimum earners in sector			Kaitz index	
							interprofessional minimum wage	sector minimum wage	scenario MW = 0.5*median	interprofessional minimum wage	sector minimum wage
a+b	Agriculture, hunting and forestry + Fishing	35	0.83	5.93	8.48	8.43	0.30	-	0.28	0.81	-
c+d+e	Mining and quarrying + Manufacturing + Electricity, gas and water supply	385	11.04	5.93	8.48	8.41	0.07	-	0.06	0.48	-
f	Construction	255	8.58	5.93	8.48	8.39	0.10	-	0.12	0.53	-
g	Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	504	15.94	5.93	8.48	8.33	0.14	-	0.14	0.68	-
h	Hotels and restaurants	206	6.66	5.93	8.48	8.29	0.23	-	0.21	0.79	-
i	Transport, storage and communication	175	4.54	5.93	8.48	8.44	0.06	-	0.04	0.52	-
j	Financial intermediation	194	5.83	5.93	8.48	8.33	0.01	-	0.01	0.34	-
k	Real estate, renting and business activities	308	10.24	5.93	8.48	8.35	0.07	-	0.07	0.57	-
l	Public administration and defence, compulsory social security	434	12.26	5.93	8.48	8.44	0.02	-	0.02	0.39	-
m	Education	262	7.40	5.93	8.48	8.43	0.06	-	0.05	0.35	-
n	Health and social work	431	11.80	5.93	8.48	8.39	0.08	-	0.07	0.51	-
o+p+q	Other community, social and personal service activities + Private households with employed persons +Extra-territorial organizations and bodies	172	4.89	5.93	8.48	8.27	0.23	-	0.23	0.63	-
All sectors	-	3361	100	5.93	8.48	8.37	0.09	-	0.09	0.53	-

Table B.7. Poland

NACEI	Label NACE Rev.1 : To use until the 2008 operation included	Obs.	Percent	Minimum Minimum in sector	Maximum Minimum in sector	Employment-weighted average of sector minima	Proportion of minimum earners in sector			Kaitz index	
							interprofessional minimum wage	sector minimum wage	scenario MW = 0.5*median	interprofessional minimum wage	sector minimum wage
a+b	Agriculture, hunting and forestry + Fishing	247	1.93	1.14	1.43	1.42	0.19	-	0.22	0.65	-
c+d+e	Mining and quarrying + Manufacturing + Electricity, gas and water supply	3097	29.14	1.14	1.43	1.42	0.08	-	0.09	0.48	-
f	Construction	996	9.17	1.14	1.43	1.42	0.11	-	0.13	0.52	-
g	Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	1369	53.65	1.14	1.43	1.41	0.15	-	0.18	0.61	-
h	Hotels and restaurants	224	2.13	1.14	1.43	1.41	0.27	-	0.28	0.70	-
i	Transport, storage and communication	773	7.53	1.14	1.43	1.42	0.08	-	0.09	0.44	-
j	Financial intermediation	256	2.79	1.14	1.43	1.42	0.05	-	0.06	0.31	-
k	Real estate, renting and business activities	596	6.29	1.14	1.43	1.42	0.10	-	0.11	0.50	-
l	Public administration and defence, compulsory social security	821	7.85	1.14	1.43	1.42	0.05	-	0.05	0.35	-
m	Education	996	9.51	1.14	1.43	1.42	0.03	-	0.03	0.30	-
n	Health and social work	704	6.50	1.14	1.43	1.42	0.04	-	0.05	0.46	-
o+p+q	Other community, social and personal service activities + Private households with employed persons +Extra-territorial organizations and bodies	373	3.75	1.14	1.43	1.42	0.12	-	0.15	0.50	-
All sectors	-	10452	100	1.14	1.43	1.42	0.09	-	0.10	0.48	-

Table B.8. Romania

NACEI	Label NACE Rev.1 : To use until the 2008 operation included	Obs.	Percent	Minimum Minimum in sector	Maximum Minimum in sector	Employment-weighted average of sector minima	Proportion of minimum earners in sector			Kaitz index	
							interprofessional minimum wage	sector minimum wage	scenario MW = 0.5*median	interprofessional minimum wage	sector minimum wage
a+b	Agriculture, hunting and forestry + Fishing	114	2.02	0.69	0.69	0.69	0.14	-	0.23	0.60	-
c+d+e	Mining and quarrying + Manufacturing + Electricity, gas and water supply	1615	30.21	0.69	0.69	0.69	0.04	-	0.08	0.47	-
f	Construction	385	8.32	0.69	0.69	0.69	0.03	-	0.06	0.43	-
g	Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	836	17.64	0.69	0.69	0.69	0.05	-	0.10	0.47	-
h	Hotels and restaurants	118	2.46	0.69	0.69	0.69	0.18	-	0.22	0.64	-
i	Transport, storage and communication	576	11.78	0.69	0.69	0.69	0.03	-	0.06	0.43	-
j	Financial intermediation	112	2.21	0.69	0.69	0.69	0.01	-	0.02	0.29	-
k	Real estate, renting and business activities	255	5.09	0.69	0.69	0.69	0.03	-	0.07	0.39	-
l	Public administration and defence, compulsory social security	249	4.83	0.69	0.69	0.69	0.02	-	0.06	0.30	-
m	Education	317	5.90	0.69	0.69	0.69	0.05	-	0.08	0.37	-
n	Health and social work	297	5.92	0.69	0.69	0.69	0.07	-	0.09	0.40	-
o+p+q	Other community, social and personal service activities + Private households with employed persons +Extra-territorial organizations and bodies	181	3.63	0.69	0.69	0.69	0.03	-	0.08	0.47	-
All sectors	-	5055	100	0.69	0.69	0.69	0.05	-	0.08	0.44	-

Table B.9. United Kingdom

NACEI	Label NACE Rev.1 : To use until the 2008 operation included	Obs.	Percent	Minimum Minimum in sector	Maximum Minimum in sector	Employment-weighted average of sector minima	Proportion of minimum earners in sector			Kaitz index	
							interprofessional minimum wage	sector minimum wage	scenario MW = 0.5*median	interprofessional minimum wage	sector minimum wage
a+b	Agriculture, hunting and forestry + Fishing	60	0.87	4.85	7.86	7.63	0.21	-	0.26	0.70	-
c+d+e	Mining and quarrying + Manufacturing + Electricity, gas and water supply	1094	15.40	4.85	7.86	7.82	0.06	-	0.05	0.49	-
f	Construction	402	5.82	4.85	7.86	7.77	0.05	-	0.05	0.50	-
g	Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	963	14.37	4.85	7.86	7.67	0.16	-	0.12	0.68	-
h	Hotels and restaurants	204	3.23	4.85	7.86	7.53	0.28	-	0.26	0.78	-
i	Transport, storage and communication	420	6.11	4.85	7.86	7.83	0.06	-	0.04	0.54	-
j	Financial intermediation	328	4.88	4.85	7.86	7.78	0.02	-	0.01	0.44	-
k	Real estate, renting and business activities	775	10.98	4.85	7.86	7.84	0.08	-	0.06	0.42	-
l	Public administration and defence, compulsory social security	682	9.62	4.85	7.86	7.84	0.03	-	0.02	0.43	-
m	Education	819	10.96	4.85	7.86	7.84	0.11	-	0.09	0.49	-
n	Health and social work	938	12.80	4.85	7.86	7.80	0.10	-	0.09	0.55	-
o+p+q	Other community, social and personal service activities + Private households with employed persons +Extra-territorial organizations and bodies	344	4.97	4.85	7.86	7.73	0.15	-	0.12	0.63	-
All sectors	-	7029	100	4.85	7.86	7.78	0.10	-	0.08	0.53	-

