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EU-SILC Tools: European Socioeconomic Classification - ESeC88 and ESeC08

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Heike Wirth

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Abstract

European inequality research often follows the tradition of using occupational based categorical classification to identify the socioeconomic position of individuals or households (e.g., classes, strata, milieus, occupational groups). In the past, European studies have often used the Erikson-Goldthorpe-Portocarero class (EGP) scheme (cf. Erikson & Goldthorpe 1992). However, the EGP scheme has only been validated for Great Britain (cf. Evans 1992). Variants for other countries are largely based on informed plausibility, following the British model, though operationalisation may vary by country.

As an alternative to the EGP, two other currently available categorical concepts are the ESe**C** (European Socioeconomic **C**lassification) and the ESe**G** (European Socioeconomic **G**roups), both based on the International Standard Classification of Occupation (ISCO). Both concepts are intended to improve cross-country comparative analysis of social inequality in Europe. However, the **ESeC and ESeG differ in their theoretical basis and should not be confused with each other**, and the ESeC and ESeG also cannot readily be transferred into each other. The ESeC is available for ISCO-88 (ESeC88) and ISCO-08 (ESeC08). The ESeG is available for ISCO-08.

In this paper, we focus on the operationalisation of ESeC with EU-SILC cross-sectional data (2004-2020). Alongside this report, we have published syntax files (SPSS, Stata, and R) which can be used for the operationalisation of ESeC and ESeG.

Keywords **EU-SILC, European Socioeconomic Classification, ESeC, ESeC88, ESeC08, European Socioeconomic Groups, ESeG; EU-LFS**

1 Introduction

European inequality research often follows the tradition of using occupation-based categorical approaches to identify the socioeconomic position of individuals or households (e.g., classes, strata, milieus, occupational groups).[1] In the past, European studies have often used the Erikson-Goldthorpe-Portocarero class (EGP) scheme (cf. Erikson & Goldthorpe 1992). However, the EGP scheme has only been validated for Great Britain (cf. Evans, 1992). Variants for other countries are largely based on informed plausibility, following the British model, though operationalisation may vary by country.

As an alternative to EGP, two currently available categorial concepts are the ESe**C** (European Socioeconomic **Classification**) (Rose & Harrison, 2010) and the ESe**G** (European Socioeconomic **Groups**) (Meron et al., 2014), both based on the International Standard Classification of Occupation (ISCO). Both concepts are intended to improve cross-country comparative analysis of social inequality in Europe. However, the ESeC and ESeG differ in their theoretical basis and should not be confused with each other. As well, the ESeC and ESeG cannot readily be transferred into each other (cf. Annex 4, figure 1-9). The ESeC is available for ISCO-88 (ESeC88) and ISCO-08 (ESeC08). The ESeG is available for ISCO-08.

In this paper, we focus on the operationalisation of ESeC based on ISCO-88 and ISCO-08 2-digit using EU-SILC cross-sectional data 2004 – 2020 (Eurostat, 2022). Alongside this report, we have published syntax files—SPSS, Stata, and R—which can be used for the operationalisation of ESeC and ESeG (Wirth & Gilsbach, 2022a,b).[2]

The research project to develop a prototype version of a harmonized European Socioeconomic Classification (ESeC) was funded through the European Commission Sixth Framework Programme (2004-2006). It involved a consortium of academic researchers from Germany, Ireland, Italy, the Netherlands, Sweden and the UK, as well as two National Statistical Institutes, the UK ONS and the French INSEE (Rose & Harrison, 2010). The theoretical foundation of ESeC follows the basic ideas of EGP. However, ESeC is characterized by a harmonized operationalization and validation; i.e., ESeC is based on an agreed and documented standard (Rose & Harrison, 2007, 2010; Wirth et al., 2010).[3] Just as in the EGP, ESeC uses the position in the labour market and the type of employment relationship as the theoretical basis for class assignment. The classes should differ from each other with respect to these criteria while maintaining an internal homogeneity as high as possible within the classes. Table 1 presents the nine classes in the ESeC framework:

[1] Equally prevalent are approaches that draw on occupational scales and favour continuous measures. A review of socio-economic classifications can be found in Connelly et al. (2016) and Christoph et al. (2020).

[2] https://www.gesis.org/en/missy/materials/EU-SILC/tools/datahandling. You can also find the syntax for operationalizing ESeG here. The updated ESeC as well as the ESeG syntax are based on earlier SPSS and Stata versions for EU-SILC 2004-2015 by Anika Herter and Heike Wirth (https://www.gesis.org/gml/european-microdata/eu-silc). For an adapted ESeC-version see https://timgoedeme.com/tools/esec-in-eu-silc/.

[3] For a critical reflection of the ESeC approach, see Filhon et al. (2016), among others.

Table 1: The European Socio-economic Classification (ESeC) Classes and Employment Regulation

	ESeC Class	Common term	Employment regulation
1	Large employers, higher grade professional, administrative and managerial occupations	Higher salariat	Service relationship
2	Lower grade professional, administrative and managerial occupations, and higher-grade technician and supervisory occupations	Lower salariat	Service relationship (modified)
3	Intermediate occupations	Higher-grade white-collar workers	Mixed
4	Small employers and self-employed occupations (excl. agriculture)	Petit bourgeoisie or independents	Not applicable
5	Self-employed occupations (incl. agriculture)	Petit bourgeoisie or independents	Not applicable
6	Lower supervisory and lower technician occupations	Higher-grade blue-collar workers	Mixed
7	Lower services, sales and clerical occupations	Lower grade white collar workers	Labour contract (modified)
8	Lower technical occupations	Skilled workers	Labour contract (modified)
9	Routine occupations	Semi- and non-skilled workers	Labour Contract

Source: https://www.iser.essex.ac.uk/archives/esec/user-guide/the-european-socio-economic-classification (last accessed: October 27, 2022).

For researchers familiar with the EGP concept, the similarity between ESeC and EGP is obvious. What is essential for defining the class position is not the vertical hierarchy of positions (as in a strata model, for example), but the way in which the employment relationship[4] between employers and employees is regulated regarding the two problems, 'work monitoring' and 'human asset specificity.' Since 'self-employed' and 'employees' differ in this respect, it is first distinguished between these two types of class. Within the group of employees, a distinction is made according to whether the employment relationship reflects a 'service relationship' (difficulty of monitoring work and specificity of human capital: high), a 'labour contract' (difficulty of monitoring work and specificity of human capital: low), or if a mixed form of 'service relationship' and 'labour contract' is to be assumed (cf. Figure 1).

With regard to transaction costs, Goldthorpe (2000) sees these different employment relationships as rooted in employer attempts to efficiently ensure the agreed work performance for different types of work tasks. Assembly line or piecework is considered a classic case of work that requires little specific human capital, is easy to control, and can accordingly be compensated with a labour contract for measurably-performed work that does not require a long-term employment relationship. In contrast, work tasks where performance is difficult to control, and which require task-specific human capital or costly investments to develop specific competencies, can be regulated more efficiently under the model of a service relationship. Service contracts do not regulate job performance in detail but instead seek to achieve optimal job performance in other ways: e.g., through higher incomes and income security, salary increases, long-term employment prospects, and

[4] Gil-Hernández et al. (2022) explore how job tasks linked to technological change and economic inequality in the digital age might confound the links between employment relations, classes, and life chances. According to their findings job tasks explain class membership and wage inequality better than employment relations. They are in favour for a fine tuning of the class scheme to better portray market inequalities in the digital age.

opportunities for advancement for good performance. According to Goldthorpe (2000), the employment and remuneration conditions associated with each employment position form the constitutive elements for different life chances associated with membership in each class[5].

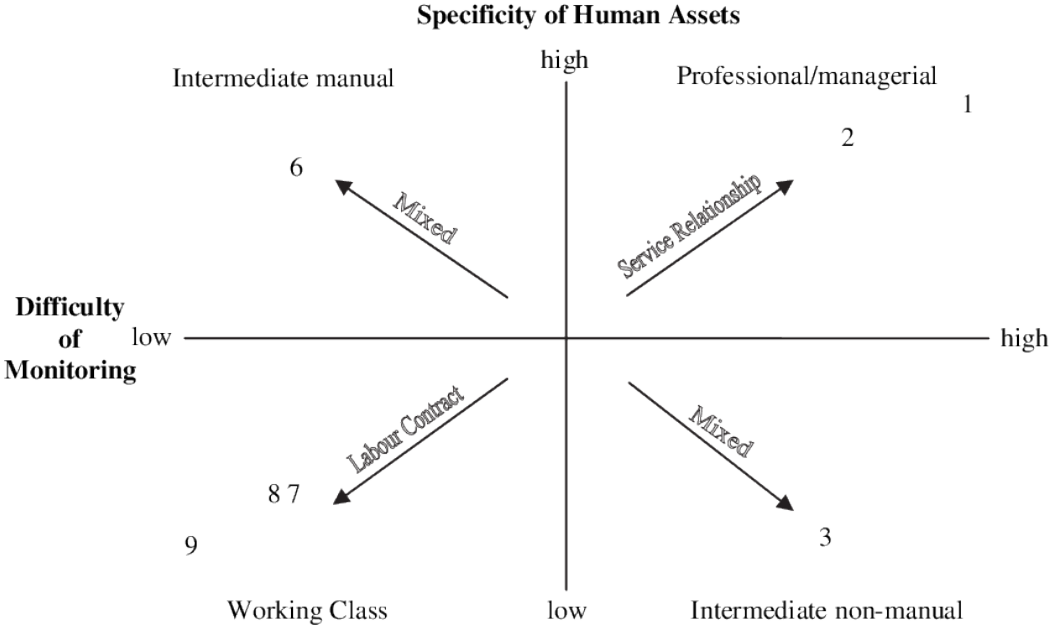


Figure 1: Difficulty of monitoring, specificity of human assets and the ESeC classes (without the self-employed) (Goldthorpe, 2000, p. 223; Rose et al., 2010, p. 23).

Figure 1 illustrates the hypothetical localization of the individual ESeC classes (see Table 1) along the dimensions of difficulty of monitoring and human asset specificity. The activities of workers in ESeC classes 1 and 2 require high specific human capital and are not easily monitored in terms of performance. Their employment relationship is therefore predominantly regulated according to the elements of a service relationship. In contrast, the employment relationship in classes 7, 8, and 9 can be regulated largely according to the characteristics of the labour contract. Intermediate classes 3 and 6 exhibit mixed forms regarding he regulatory relationship. Self-employed persons form two separate ESeC classes, depending on whether they work in the non-agricultural (class 4) or agricultural (class 5) sectors.

The ESeC scheme, as with the EGP, is **not a continuous measure,** but rather captures the qualitative differences in employment status; i.e., that the “classes are not consistently ordered according to any inherent hierarchical principle" (Erikson & Goldthorpe, 2002, p. 33). Nevertheless, in terms of overall economic status, classes 1 and 2 have an advantage over classes 3, 6, 7, 8, and 9 because they have greater long-term income security, are less likely to be laid off and have better prospects of rising earnings over time (Rose & Harrison, 2007, p. 465).

5 Individuals within a social class are assumed to share a similar ‘market situation’ (e.g., income, economic security, economic advancement opportunities) and ‘work situation’ (e.g., authority and control) (Connelly et al., 2016, p. 5).

In the next section, we will explain the operationalization of ESeC based on the EU-SILC data.[6] First, we briefly describe the variables needed and the specific EU-SILC limitations. Second, we focus on the variable ISCO (International Standard Classification of Occupation), as there are limitations for the operationalization of ESeC insofar as ISCO is only available as a two-digit variable in the EU-SILC data and because of a break in the time series from 2010/2011 – 2011/2012 (depending on the country) due to the switch from ISCO-88 to ISCO-08. [7]

[6] So-called online and non-online GIG workers (i.e., persons who work temporary jobs in the service sector as independent contractors or freelancers such as Uber or Lyft drivers, certain food delivery drivers, online tutors or editors, etc.) (https://www.merriam-webster.com/dictionary/gig%20worker) are not mentioned in the ESeC concept. Likewise, the EU-SILC data are not suitable to specifically identify GIG work. However, it can be assumed that this group could be assigned to class 4 due to the self-employment status.

[7] For more information about ESeC based on ISCO-88, see Rose & Harrison (2010). Information for the ESeC based on ISCO-08 is available at the homepage of Eric Harrison (2022): http://ekharrison.weebly.com/european-socio-economic-classification-esec.html. The assignment of ISCO-08 occupations to classes can be found at https://www.ericharrison.co.uk/uploads/2/3/9/9/23996844/esec_08_3_digit_public.xlsx (last accessed: July 26, 2022).

2 Information required to operationalize ESeC

The operationalisation of the ESeC is rather simple. The ESeC distinguishes between three basic employment positions: (1) employers, (2) the self-employed, and (3) employees. Persons who are currently not working or are no longer working are usually assigned to an ESeC class according to their last main activity, however, there is also an optional fourth category which includes the long-term unemployed and persons who have never worked. In order to operationalize ESeC, the following information is required (the corresponding variables in EU-SILC are listed in Table 2):

(1) **Occupation:** International Standard Classification of Occupations (ISCO), preferably at three-digit level (i.e., minor groups).

(2) **Activity status**: Used for the distinction between **employees** and **self-employed persons.** Please note: **in the ESeC, family workers are allocated to employees**.

(3) **Supervisory status**: Needed for the distinction between employees as to whether the position is or includes a supervisory status or is a non-supervisory role.

(4) **Number of employees**: This information is needed for the distinctions between large/small employers and higher/lower managers. [8]

Table 2: Variables used for operationalizing ESeC with EU-SILC data

Information needed	EU-SILC Variables	Reference Period	Observation Unit	Availability
Occupation	PL050-ISCO-88 (2-digit) 2004-2011	Current/last* main activity	All current household members aged 16+	Cross/long
	PL051-ISCO-08 (2-digit) 2011ff	Current/last* main activity		Cross/long
Activity Status (Distinction: Self-employed/Employees)	PL040	Current/last* main activity	All current household members aged 16+	Cross/long
	PL030 2004-2008	Current main activity		Cross/long
	PL031 2009ff	Current main activity		Cross/long
Managerial position (within employees: supervisor/non-supervisor)	PL150	Current main activity	All current household members aged 16+ /or selected respondent (where applies)	Cross
No of Persons working at the local unit (large/small employers; higher/lower Managers)	PL130	Current main activity	All current household members aged 16+ /or selected respondent (where applies)	Cross

* Last main activity for previously active persons

Based on a combination of these variables, a new variable, '**employment status**', was created that distinguishes the following five categories: (1) self-employed with 10 or more employees (**se10+**); (2) self-employed with less than 10 employees (**se<10**); (3) self-employed without employees (**seno**); and, employees (including family workers) with (4) supervisor status (**sup**) or (5) without supervisor status (**emp**). Each occupation was then assigned to one of the nine class positions depending on the employment status. Take, for example, a machine mechanic corresponding to ISCO code 723: a salaried machine mechanic without a supervisory status (emp) is assigned to ESeC 8. If they have a

8 Self-employed persons with more than ten employees do not form a separate class but are assigned to ESeC class 1. This assignment is mainly done for empirical reasons. In most data sets, the number of self-employed with more than 10 employees is very small. For most analytical purposes, it therefore makes little sense to create a separate class for this group.

supervisory function (sup), it is ESeC 6. If the machine mechanic is self-employed and either without employees (seno) or has less than ten employees (se<10), they are assigned to ESeC 4 (non-agricultural self-employed). If the machine mechanic employs at least ten persons (se10+), they are assigned to ESeC 1 (see Figure 2).

ISCO 08		Employment Status				
code	Description	se10+	se<10	seno	sup	emp
(…)		ESeC Classes				
723	Machinery Mechanics and Repairers	1	4	4	6	8
730	Handicraft and Printing Workers	1	4	4	6	8
731	Handicraft Workers	1	4	4	6	8
732	Printing Trades Workers	1	4	4	6	8
(…)						

Figure 2: Example: Combining ISCO and Employment Status to ESeC.

The prototype of the ESeC was implemented using data from the European Social Survey (ESS, Round 1). The information available in the EU-SILC is not always fully equivalent to the information available in the ESS; in particular, in terms of the level of aggregation of the occupational variable (ISCO) in the EU-SILC (we will delve further into the ISCO issue in the next section). Not fully equivalent either are the **supervisory status** (PL150) and the **number of employees** (PL130)**,** which in EU-SILC (cf. Table 2):

- are not known for the last job of those no longer active;
- in some countries, are only available for the so-called selected respondents;[9] and,
- are (up to now) not included in the longitudinal data.

Partially omitting the information on **supervisory status** or the **number of employees** from the operationalization of ESeC would reduce the homogeneity within classes and impair the schema's comparability—between active and non-active individuals, between selected and non-selected respondents, between cross-sectional and longitudinal data, and between countries—and thus would be opposed to ESeC's original concern with cross-national comparability. Therefore, our operationalisation of ESeC for EU-SILC refers to the **currently active persons aged 16+** (**in DK, FI, IS, NL, NO SE, and SI, specifically only to the selected respondent**), and the focus is on the **cross-sectional data**.

The alternative option of creating a simplified ESeC version for all countries and persons is suboptimal, since this approach would weaken the differentiation between the classes.

Additional country-specific issues in EU-SILC (see Table 3) have been considered in the operationalisation as far as possible, and are outlined in the ESeC-syntax.[10]

[9] EU-SILC is a household sample and as a rule all members aged 16+ are part of the survey. However, some countries (DK, FI, IS, NL, NO, SE, and SI) practise the 'selected respondent' model. It refers to a person sample, where the selected respondent is the sample person; the household to which they belong is the sample household. In this model, only the selected respondent is asked all questions at the person level. For the remaining household members, only partial information is available (Wirth & Pforr, 2022).

[10] https://www.gesis.org/en/missy/materials/EU-SILC/tools/datahandling.

Table 3: Country-specific features in EU-SILC (cross-sectional data, 2004 – 2020)

Year	PL050 (ISCO-88)	PL051(ISCO-08)	PL130 no of persons working at the local unit
2004	PT: 11,12=13		NL: <=10; >10
2005	PT: 11,12=13		NL: <=10; >10
2006	PT: 11,12=13		NL: <=10; >10
2007	PT: 11,12=13		NL: <=10; >10
2008	PT: 11,12=13 MT: 1digit		NL: <=10; >10; MT: coarsened**
2009	PT: 11,12=13 MT: 1digit		NL: <=10; >10; MT: coarsened**
2010	PT: 11,12=13 MT 1digit RO: only PL051	RO: only PL051	NL: <=10; >10; MT: coarsened**
2011	PT: 11,12=13 MT: 1digit BE, FI, IE no PL050	PT: 11,12,13=13 MT: 1digit IE, SK coarsened?*	NL: <=10; >10; MT: coarsened**
2012 - 2015		PT: 11,12,13=13 MT: 1digit IE, SK coarsened?*	NL: <=10; >10 MT: coarsened**
2016 - 2020		PT: 11,12 13=13 DE, SI, MT 1digit IE, SK coarsened?*	NL: <=10; >10 MT: coarsened**

* According to marginal distribution, the variable seems coarsened, but the coarsening is neither described nor explained in the documentation.

** MT: PL130: No. of persons working at the local unit: 1 – 5 = 1, 6–10 =2, 11 and 12 = 3, 13 = 4, 14 = 5, 15= 6

3 The Occupational Variable: ISCO

By far, the most crucial variable to construct the ESeC is the International Standard Classification of Occupation (ISCO), specifically, the EU variant (ISCO (COM)). ISCO is a four-digit hierarchical occupational classification used to classify jobs internationally[11] into so-called 'unit groups.' The unit groups represent the most detailed level (4-digit) of aggregation of the ISCO, which is also aggregated into minor groups (3-digit), sub-major groups (2-digit), and major groups (1-digit) based on similarity in skill level and specialization required for the jobs. Internationally comparable occupational data can thus be produced at four different levels of aggregation.

The first version of the ISCO (ISCO-58) was introduced in 1957. It was superseded in the 1960s by ISCO-68, which in turn was replaced in the 1980s by ISCO-88. ISCO-88, unlike the earlier versions, used the skill level required for an occupation and skill specialization as criteria for assigning similar occupations to groups. In the early 21st century, ISCO-88 was updated to reflect changes in the occupational structure of the labour force, as well as to address known problems in the use of ISCO-88.[12] However, the basic distinctions between major groups, sub-major groups, minor groups, and unit groups have been retained in the revised ISCO-08 classification (cf. Table 4).

Table 4: ISCO-88/ISCO-08: Levels of aggregation

Levels of aggregation	ISCO-88	ISCO-08
	Number of categories	
Major groups (1-digit)	10	10
Sub-major groups (2-digit)	28	43
Minor groups (3-digit)	116	130
Unit groups (4-digit)	390	436

Source: International Labour Organization. (2022a,b).

There are two issues related to the operationalisation of the ESeC which are discussed in the following sections: first, the level of ISCO aggregation available in the EU-SILC data, and second, the transition from ISCO-88 to ISCO-08 and the resulting break in the time series of ESeC distributions.

3.1 ISCO 3-digit (minor groups) versus ISCO 2-digit (sub-major groups)

As a rule, ESeC is operationalised based on ISCO minor groups (3-digit). In EU-SILC, however, ISCO is available only at the sub-major group (2-digit) level. This is not a problem so long as all minor groups within a sub-major group are assigned to the same class. However, if minor groups within a sub-major group are assigned to different classes, there may be discrepancies between ESeC distributions based on the ISCO 3-digit versus the 2-digit. Take for example, sub-major group 23 (equivalent to 230)—'Teaching Professionals'—which is assigned to ESeC Class 2 (except for employment status se10+) (see Figure 3). If, however, minor groups were available in the data, minor groups 231 (College, university and HE [higher education] teaching professionals) and 235 (Other teaching

[11] There are also national occupational classifications, which—as can be seen from the name—reflect the occupational structure at a national level but are less suitable for international use.

[12] https://www.ilo.org/public/english/bureau/stat/isco/.

professionals) would be assigned to ESeC Class 1. Thus, depending on the aggregation level of ISCO, the same occupation may be assigned to different ESeC classes.

ISCO 88		Employment Status				
Code	Description	se10+	se<10	seno	sup	emp
Sub-Major Group		Class Matrix for ESeC				
230/23	Teaching Professionals	1	2	2	2	2
Minor Groups						
231	College, university and HE teaching professionals	1	**1**	**1**	**1**	**1**
232	Secondary education teaching professionals	1	2	2	2	2
233	Primary and pre-primary education teaching professionals	1	2	2	2	2
234	Special education teaching professionals	1	2	2	2	2
235	Other teaching professionals	1	**1**	**1**	**1**	**1**

Figure 3: Example: Assigning ISCO-3-digit respectively ISCO-2-digit to ESeC Classes.

The issue of class assignment discrepancies resulting from less detailed occupational information has been addressed in the ESeC project (Rose & Harrison, 2010). Using the example of the European Social Survey, Rose and Harrison showed that using the ISCO sub-major groups instead of the minor groups for constructing ESeC caused a change of class assignments in 14% of cases. For the remaining 86% of cases, the class assignment did not change.

We replicated this analysis using data from the European Labour Force Survey 2009 (Eurostat, 2021)[13], as the ISCO minor groups are available in the EU-LFS but not the EU-SILC. Table 5 shows the distributions of the ESeC based on minor groups (rows) versus sub-major groups (columns). The cells display the total percentages, i.e., the percentages refer to the total number of cases. Our findings are consistent with the finding of the ESeC project: about 87% of the cases are allocated to identical classes (main diagonal), regardless of whether the ISCO minor or sub-major groups are used. About 13% are assigned to different classes (off diagonal). The deviations are focused on only a few classes and vary between 0.1 and 4.2 percentage points. By far, the largest movement is between class 2 and class 1. Due to the aggregation, more than 4% of all cases switch from class 2 to class 1. Somewhat less pronounced is the movement from class 7 to class 3 (2.7%) and from class 9 to class 7 (2.2%).

[13] For transforming the LFS CSV data into an SPSS-system file we used the syntax provided by GESIS (Stief & Klever, 2022).

Table 5: Correspondence of ESeC classes based ISCO-3-digit versus ISCO 2-digit

	ESeC[b]									
	Total %									
ESeC[a]	1	2	3	4	5	6	7	8	9	Total
1	10.2	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.0
2	4.2	12.8	1.0	0.2	0.0	0.0	0.0	0.0	0.0	18.2
3	0.1	0.0	10.4	0.0	0.0	0.0	0.0	0.0	0.0	10.5
4	0.0	0.1	0.0	9.2	0.0	0.0	0.0	0.0	0.0	9.2
5	0.0	0.0	0.0	0.0	4.2	0.0	0.0	0.0	0.0	4.2
6	0.0	1.0	0.0	0.0	0.0	4.2	0.0	0.0	0.0	5.2
7	0.0	0.0	2.7	0.0	0.0	0.0	9.1	0.0	0.1	11.8
8	0.0	0.0	0.0	0.0	0.0	0.2	0.0	11.3	0.3	11.8
9	0.0	0.0	0.5	0.0	0.0	0.0	2.2	0.0	15.3	18.1
Total	14.4	14.8	14.5	9.4	4.2	4.4	11.3	11.3	15.7	100.0
N	265,769	272,005	267,608	173,198	77,543	80,915	208,142	207,818	289,162	1,842,160

Notes: [a] based on ISCO-88 3-digit (minor groups), [b] based on ISCO-88 2-digit (sub-major groups). Stayers (main diagonal cells) = 86,7%; Movers (off diagonal cells) = 13,3%

Data source: Eurostat (2021); EU-LFS 2009, own calculation, no weighting. 31 countries (EU-Member States and Iceland, Norway, Switzerland).

Next, we turned to the effects on the overall class distributions. Table 5a shows the marginal distributions for both versions. The ESeC distributions differ depending on the ISCO aggregation level, and the changes are most markedly apparent in ESeC classes 1, 2, and 3. The share of ESeC classes 1 and 3 are distinctly higher (14.4 vs. 11.0%; 14.5 vs. 10.5%) and the share of ESeC class 2 distinctly lower (14.8 vs. 18.2%) when based on the ISCO 2-digit. There is also a less pronounced, but still notable, decline in the share of ESeC class 9 (18.1 vs. 15.7%).

The different ISCO versions also affect gender differences in class distribution, and more so for women than for men. Among women, the proportions reverse between ESeC classes 2 and 3: the proportion in ESeC class 2 decreases from 21.5 to 17.4%, while at the same time, the proportion in ESeC class 3 increases from 16.9 to 22.2% (see Table 5a). However, the general pattern of gender segregation in class positions is evident in both versions. Women are overrepresented compared to men in ESeC classes 2, 3, and 7, while men are overrepresented in ESeC Classes 1, 4, 6, and 9.

Table 5a: Marginal Distribution of ESeC by ISCO three-, two-digit and Gender (column %)

	ESeC (based on ISCO-88)	All		Men		Women	
		3-digit	2-digit	3-digit	2-digit	3-digit	2-digit
		Column %					
1	Large employers, higher grade professional, administrative and managerial occupations	11.0	14.4	12.7	15.9	8.9	12.7
2	Lower grade prof./admin./managerial occupations & higher-grade technician/supervisory occupations	18.2	14.8	15.5	12.6	21.5	17.4
3	Intermediate occupations	10.5	14.5	5.0	8.0	16.9	22.2
4	Small employers and self-employed occupations (excl. agriculture)	9.2	9.4	12.2	12.4	5.7	5.8
5	Self-employed occupations (incl. agriculture)	4.2	4.2	5.2	5.2	3.0	3.0
6	Lower supervisory and lower technician occupations	5.2	4.4	6.5	5.6	3.6	2.9
7	Lower services, sales and clerical occupations	11.8	11.3	6.6	6.1	17.9	17.5
8	Lower technical occupations	11.8	11.3	17.3	16.6	5.3	5.0
9	Routine occupations	18.1	15.7	18.8	17.5	17.1	13.5
N		1,842,160	1,842,160	997,776	997,776	844,384	844,384

Data Source: Eurostat(2021). EU-LFS 2009, own calculation, no weighting. 31 countries (EU-Member States and Iceland, Norway, Switzerland).

Thus, regarding the univariate marginal distributions of the ESeC, it certainly makes a difference whether the ESeC is based on ISCO-3-digit or ISCO-2-digit; specifically, the comparability of these two versions is limited.

Further, it stands to reason that a more highly aggregated occupational classification might lead to greater heterogeneity within classes. Therefore, we also examined for selected indicators (shiftwork, evening work, work on Saturdays/Sundays) to understand whether the ISCO aggregation level used for ESeC is reflected in the class-specific distributions of these indicators. The results are presented in Figures 4a-4d.

First, it can be noted that, with respect to these work indicators, the differences **within** the ESeC versions are much more pronounced than the differences **between** the two ESeC versions. Regular shiftwork (Figure 4a) is most prevalent in ESeC classes 6, 7, and 9.[14] Regular Sunday work (Figure 4b) is widespread among the self-employed within agriculture (ESeC 5), where almost 50% usually work on Sundays, with the lower sales and service occupations (ESeC 7) a relatively distant second (just under 30%). Regular Saturday (Figure 4c) work is also most prevalent among the self-employed working in agriculture (70%), as well as outside agriculture (about 50%) and the lower sales and service occupations (40-50%). Regular evening work (Figure 4d) is a feature most often found for the self-employed (ESeC4 and 5) but is also widespread among ESeC classes 7, 6, and 9. The least affected by evening work are the intermediate occupations (ESeC 3) and lower technical occupations (ESeC 8).

[14] Self-employed persons (ESeC 4 and 5) are not included, for obvious reason, because shiftwork is not a feature of self-employment.

Figure 4a: Person does Shiftwork (in %) by ESeC (3d/2d)

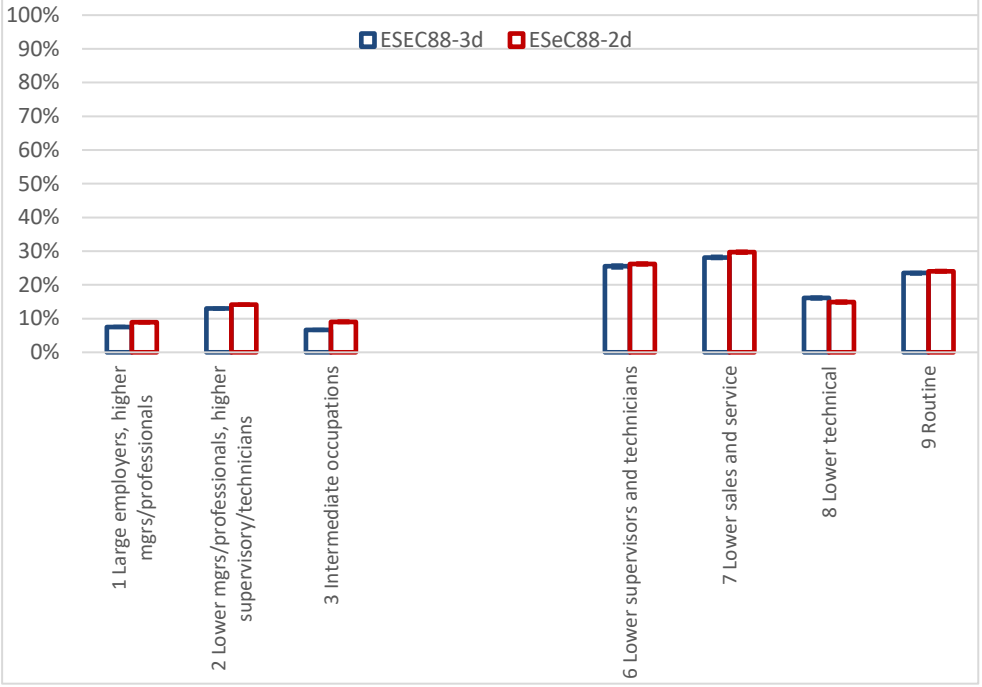
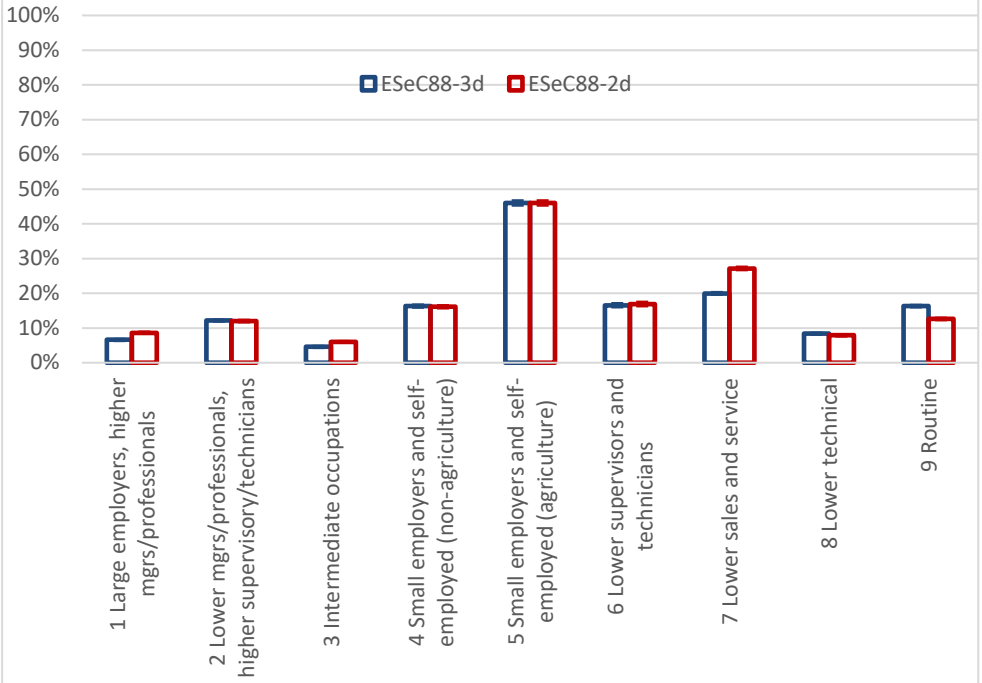
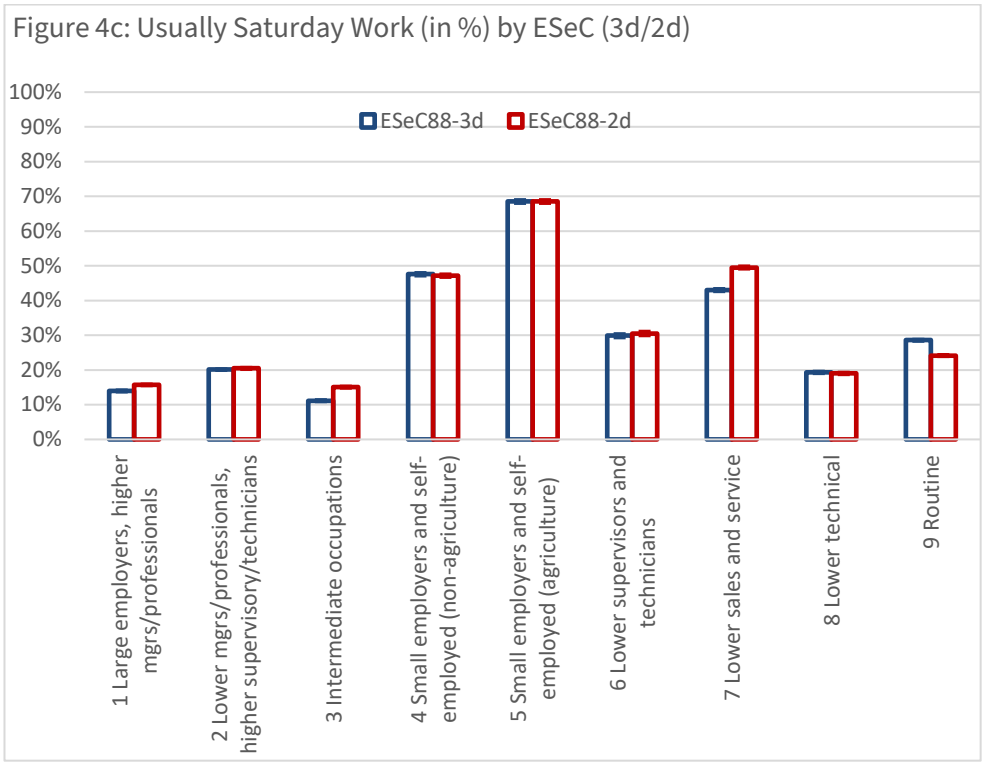


Figure 4b: Usually Sunday Work (in %) by ESeC (3d/2d)





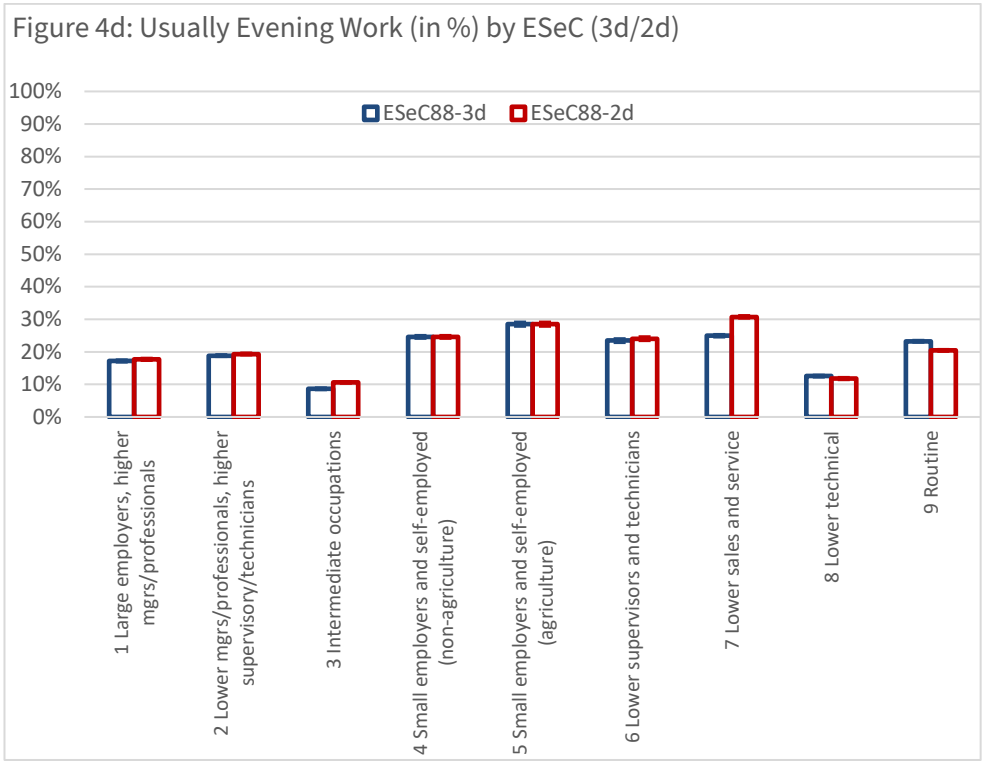


Figure 4a-4d: Data sources: Eurostat (2021). EU-LFS 2009, own calculation, weighted. 31 countries (EU-Member States and Iceland, Norway, Switzerland).

When we compare **between the two ESeC versions**, we do find deviations, but as a rule these differences are rather small. The most important deviations can be found for ESeC class 7 and, to a lesser extent, for class 3. In the three indicators 'usually evening work/Saturday work/Sunday work,' the share for ESeC 7 in each case is about 5 percentage points higher when using the ISCO 2-digit than when using the ISCO 3-digit. In contrast, the respective share decreases slightly for routine occupations (ESeC 9). This might be explained by the switches from class 7 to classes 3 and 9 (cf. Table 5) when moving from ISCO minor groups to sub-major groups discussed previously.

We will not delve further into the analysis at this point, since our findings are consistent with earlier research on this issue (cf. Wirth et al., 2010). **However, researchers should be aware of the discrepancies between ISCO 3-digit and ISCO 2-digit (especially in the marginal distributions) when using the ESeC in their analysis. If possible, the ISCO should be adjusted when conducting comparative analyses with different data sources. Moreover, researchers might be advised to indicate which ISCO aggregate level was used for constructing the ESeC when publishing findings.**

With respect to the EU-SILC, there is an additional limitation to consider. Some countries only pass on the ISCO as 1-digit for data confidentiality reasons: specifically, Malta (2008 onwards), Germany (2015 onwards), and Slovenia (2015 onwards).[15] For these countries, the ESeC cannot be operationalised for the respective years, as comparability with previous years and other countries is not possible (see Annex 2, Figures DE, MT, SI). The ESeC syntax provided on the GESIS website deals with these specific countries by setting the ESeCs as missing values for the relevant years (Wirth & Gilsbach, 2022a). It is up to the researchers to undo these country specific missing values. However, this should be an active process and one should be aware of the limited comparability.

3.2 ESeC88 and ESeC08

The prototype of the ESeC was operationalised and validated using ISCO-88; in the following, we will refer to the prototype as **ESeC88**. As mentioned above, in the early 21st century, the ISCO-88 was updated to reflect changes in the occupational structure of the labour force. These included, for example, gaps in coverage of health occupations, occupations in the informal sector, and occupations with low skill requirements. Furthermore, occupations in agriculture, forestry and fishing, and office and service occupations required a more detailed breakdown, as did the grouping of managerial occupations. The updated classification, known as ISCO-08, retained the basic principles of ISCO-88, but made substantial changes in some areas. For example, a number of new sub-major groups, minor-groups, and unit groups were added to ISCO-08, while some ISCO-88 groups were either merged with other groups or split into multiple groups. The number of major groups has not changed, but the sub-major groups, minor groups, and unit groups are more differentiated in the updated version. These changes have caused a break in the time series between ISCO-88 and ISCO-08-based statistics at all levels of the classification hierarchy.

To operationalise the ESeC on the basis of ISCO-08 (hereafter called **ESeC08**), we followed the guidance from a proposal by Harrison (2022).[16]

[15] A complete list (2002-2020) of which countries pass on the ISCO in which form and in which years can be found in Annex 2, Table A1.

[16] https://www.ericharrison.co.uk/uploads/2/3/9/9/23996844/esec_08_3_digit_public.xlsx (access July, 19, 2022).

As with the changes from ISCO 3-digit to 2-digit, we are interested in the shifts between ESeC classes when moving from ISCO-88 to ISCO-08. This question can be explored with EU-SILC data[17], since most countries passed on both versions when they introduced ISCO-08 in 2011 (cf. Table A1, Annex 2). Thus, a correspondence table can be created to identify class changes between ESeC88 and ESeC08. Unfortunately, the EU-LFS does not have data that include both ISCO versions, so we only looked at the change from ESeC88 to ESeC08 for the aggregate level sub-major groups (2-digit) with EU-SILC data.

Table 6 shows the class distribution of the ESeC88 compared to the ESeC08. The numbers in the cells are total percentages based on the total number of cases and countries for which both ISCO versions were available in EU-SILC 2011. First, the overall correspondence between the two versions is high, though slightly lower than the correspondence between the ESeC-2-digit and ESeC-3-digit (cf. Table 5, section 3.1). About 80% of all cases are assigned to the same class, no matter which ISCO version is used, while 20% of the cases are assigned to different classes (Table 6). The deviations vary between 0.1 and 5.1%. In the following, we will focus on the most important changes: the switches between classes which represent more than 1% of all cases. The changes from class 1 to 2 is particularly marked, at 3.9%, while for the reverse, only 1.1% of all cases change from class 2 to 1; i.e., about a quarter of all class changes are due to an exchange between the neighbouring classes 1 and 2. A further quarter of the changes are switches out of class 3, either to class 2 (5.1%) or to class 7 (2.3%) when using ESeC08. Exchanges between classes 1 and 2, and classes 3 and either 2 or 7, therefore account for half of all exchanges. The remaining changes are spread over all classes.

In summary, the transition from ISCO-88 to ISCO-08 causes the largest changes to classes 2 and 3. Class 3 shows the most outflow, while class 2 undergoes the strongest growth. These changes are reasonable if one recalls that the ISCO update had aimed at greater differentiation among specific occupational groups.[18]

[17] For data preparation we used the syntax provided by GESIS (Pforr & Jung, 2022).

[18] For a more sophisticated discussion on reliability measures in the case of changing classification or coding, see, e.g., Mitnik and Cumberworth (2021), and Hayes and Krippendorf (2007).

Table 6: EU-SILC: Correspondence between ESeC88 and ESeC08 (total percentages), based on ISCO 2-digit (sub-major groups)

	ESeC08[b] Total %										
ESeC88[a]	1	2	3	4	5	6	7	8	9	Total	N
1	11.7	**3.9**	0.3	0.0	0.0	0.1	0.0	0.0	0.0	16.0	30,964
2	**1.1**	14.6	0.5	0.1	0.0	0.7	0.3	0.1	0.0	17.4	33,642
3	0.5	**5.1**	7.0	0.0	0.0	0.0	**2.3**	0.0	0.0	15.0	29,027
4	0.4	0.7	0.0	6.4	0.2	0.0	0.0	0.0	0.0	7.8	15,160
5	0.0	0.0	0.0	0.0	3.1	0.0	0.0	0.0	0.0	3.1	5,996
6	0.0	0.6	0.0	0.0	0.0	4.4	0.0	0.4	0.0	5.4	10,470
7	0.0	0.2	0.1	0.0	0.0	0.0	9.3	0.0	0.2	9.8	18,884
8	0.0	0.1	0.0	0.0	0.0	0.0	0.1	9.7	0.4	10.3	19,864
9	0.0	0.2	0.0	0.0	0.0	0.0	0.6	0.5	13.8	15.1	29,206
Total	13.8	25.4	7.9	6.6	3.3	5.1	12.7	10.8	14.4	100.0	
N	26,692	49,020	15,301	12,782	6,422	9,875	24,523	20,773	27,825		193,213

Notes: [a] based on ISCO-88 2-digit (sub-major groups), [b] based on ISCO-08 2-digit (sub-major groups). Stayers (main diagonal cells) = 80%; Movers (off diagonal cells) = 20%.

Data source: Eurostat (2022): EU-SILC 2011, own calculation, data not weighted, N = 193,213; Overall correspondence ESeC88 – ESeC08: 80%; only countries included which released both ISCO-88 and ISCO-08 in EU-SILC 2011.

Next, we turn to the effects of changing ISCO on the class distributions. Table 6a shows the distribution of ESeC88 and ESeC08 by gender.

Table 6a: Distribution of ESeC88 and ESeC08 by Gender (column %)

	All		Men		Women	
ESeC	ESeC88	ESeC08	ESeC88	ESeC08	ESeC88	ESeC08
	Column %					
1 Large employers, higher grade professional, administrative and managerial occupations	16.0	13.8	17.7	15.4	14.2	11.9
2 Lower grade prof./admin./managerial occupations & higher-grade technician/supervisory occupations	**17.4**	**25.4**	**14.8**	**21.2**	**20.3**	**30.1**
3 Intermediate occupations	**15.0**	**7.9**	8.5	5.2	**22.4**	**11.1**
4 Small employers and self-employed occupations (excl. agriculture)	7.8	6.6	9.9	8.4	5.5	4.7
5 Self-employed occupations (incl. agriculture)	3.1	3.3	3.8	4.1	2.4	2.5
6 Lower supervisory and lower technician occupations	5.4	5.1	7.2	6.4	3.4	3.7
7 Lower services, sales and clerical occupations	**9.8**	**12.7**	5.5	7.2	**14.7**	**18.9**
8 Lower technical occupations	10.3	10.8	15.9	16.4	3.9	4.3
9 Routine occupations	15.1	14.4	16.7	15.7	13.3	12.9
N	193,213	193,213	102,732	102,732	90,481	90,481

Notes: Only countries included, where both, ISCO-88 and ISCO-08 were available in the 2011 data

Data source: Eurostat (2022). EU-SILC 2011; own calculation, no weighting.

The use of either ISCO-88 or ISCO-08 result in remarkably different distributions of classes 2 and 3: the share of class 2 increases strongly from 17.4% (ESeC88) to 25.4% (ESeC08), while the share of class 3 goes down by nearly half, from 15% (ESeC88) to 7.9% (ESeC08). Furthermore, there is a marked increase in class 7 (ESeC88: 14.7%, ESeC08: 18.9%). This break in the overall shape of the

ESeC distribution in the time series is roughly the same in all countries: a strong increase of ESeC class 2, while ESeC class 3 has decreased substantially (see Annex 1, Figures AT - UK).

Looking at the gender distributions, it is evident that the break in the time series is mainly caused by the change in the ESeC allocations of women across the classes. The share of women assigned to class 3 has decreased by more than 10 percentage points (22.4% vs. 11.1%), while over the same time, the share of class 2 among women increased by 10 percentage points (20.3% vs. 30.1%). A prominent increase is also evident for class 7 (14.7% to 18.9%). Among men, the changes are focused primarily on class 2 (14.8% to 21.2%). These switches between ESeC88 and ESeC08 are plausible since—as outlined at the beginning of this section—the update of ISCO aimed at, among other things, greater differentiation within the various health occupations as well as a better coverage of office and service occupations (i.e., occupations that are dominated by women).

As we have shown, a noticeable share of women and men are allocated differently into the ESeC depending on the version of the occupational classification. We were also interested in the implications of the different ISCO versions for ESeC classes in terms of 'life chances.' As indicators of life chances, we took the following indicators as exemplars: equivalised disposable income, ability to make ends meet, risk of poverty, general health, lowest monthly income to make ends meet, and ability to keep home adequately (cf. Figures 5a – 5f).

Notwithstanding the differences in the marginal distributions of the ESeC88 and ESeC08, the bivariate associations between ESeC and the chosen indicators remain virtually unchanged. No matter which of the indicators we looked at, the ESeC88 and ESeC08 are almost indistinguishable in their respective distributions. Or, to put it another way, the differences **between** ESeC88 and ESeC08 in the considered indicators are negligible compared to the distributional differences **within** ESeC88 and ESeC08, respectively.

If we take, for example, the equivalised disposable household income (Figure 5a), it is evident that income varies considerably between classes. Regardless of whether ESeC88 or ESeC08, by far the highest disposable household income is found for ESeC class 1, followed by class 2. Intermediate occupation (ESeC 3) and lower supervisors/technicians (ESeC 6) come in third. At the bottom of the scale are lower technical occupation (ESeC 8) and routine occupation (ESeC 9), and very far behind are small self-employed within agriculture (ESeC 5).

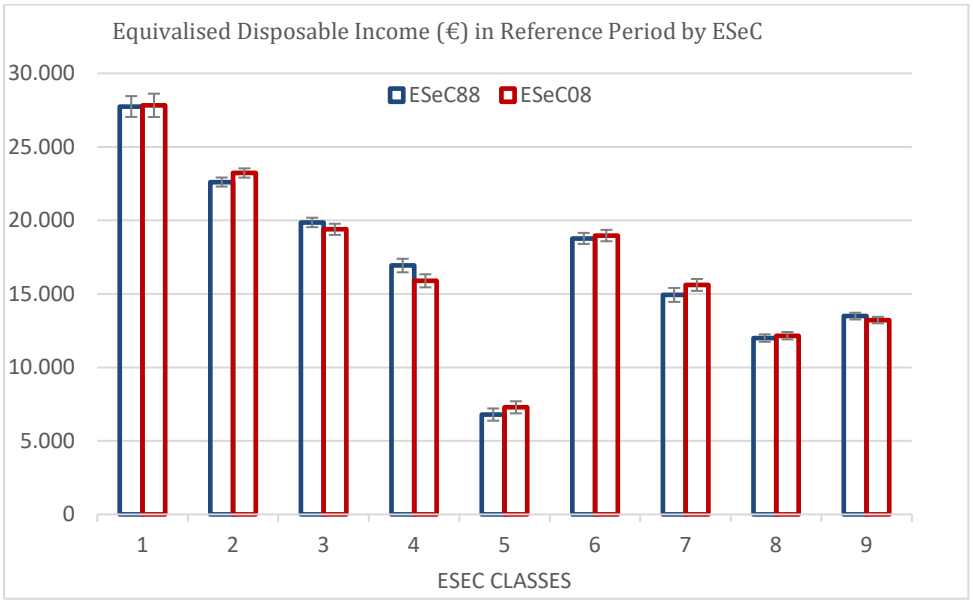


Figure 5a: Equivalised Disposable Yearly Income (€) by ESeC88 and ESeC08, 2011.

Data source: Eurostat (2022). EU-SILC 2011, own calculations, data weighted. Only countries included for which ISCO-88 and ISCO-08 were available in the data. The income reference period is a fixed 12-month period, usually the previous calendar year.

The pattern of the small self-employed within agriculture (ESeC 5) being in the least favourable position is evident in all indicators we looked at. They have a very high risk of poverty (Figure 5b), and their ability to make ends meet is lower compared to all other classes (Figure 5c), although their monthly income needed to make ends meet is also by far the lowest (Figure 5d). Compared to the other classes, their general health is worse (Figure 5e) and they are less able to keep their home adequately warm (Figure 5f). An equally relatively unfavourable position in these indicators is found for ESeC classes 8 and 9, and to a lesser extent also for ESeC 7. The most favourable position in each case is found for ESeC classes 1 and 2. These patterns are the same no matter whether ESeC88 or ESeC08 is used.

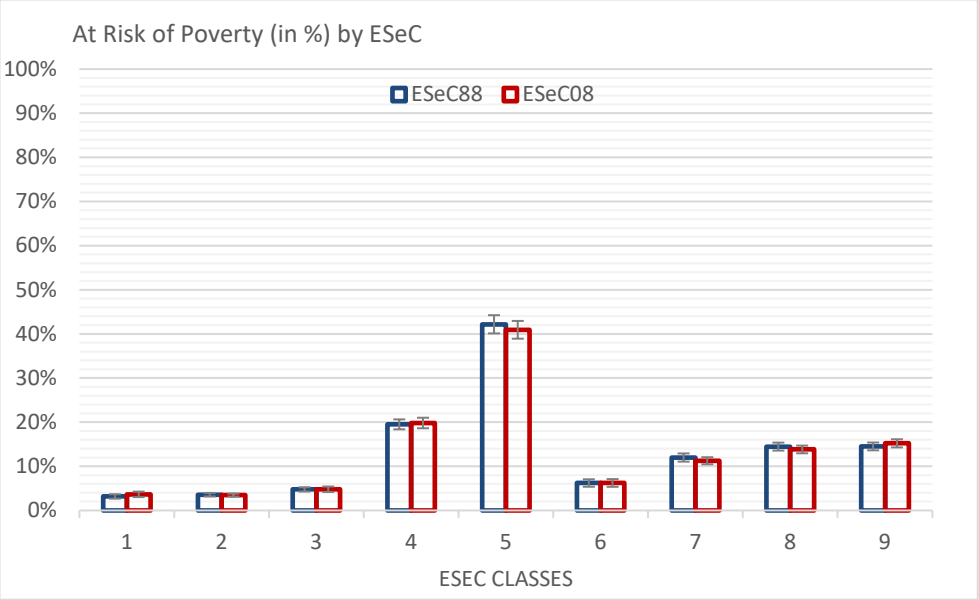


Figure 5b: At Risk of Poverty (in %) by ESeC88 and ESeC08, 2011.

Data source: Eurostat (2022). EU-SILC 2011, own calculations, data weighted. Only included countries for whom ISCO-88 and ISCO-08 were available in the data.

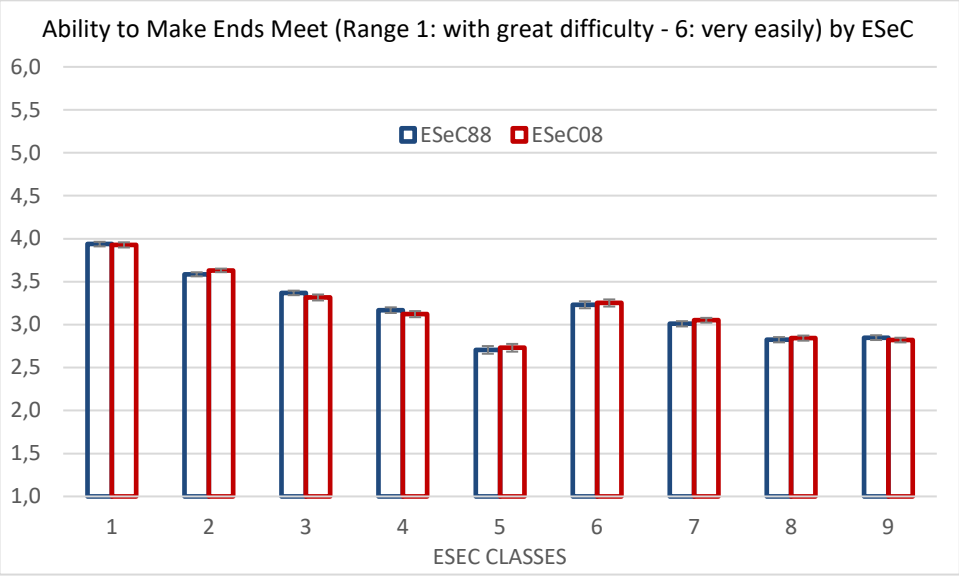


Figure 5c: Ability to Make Ends Meet (Mean) by ESeC88 and ESeC08, 2011.

Data source: Eurostat (2022). EU-SILC 2011, own calculations, data weighted. Only included countries for which ISCO-88 and ISCO-08 were available in the data.

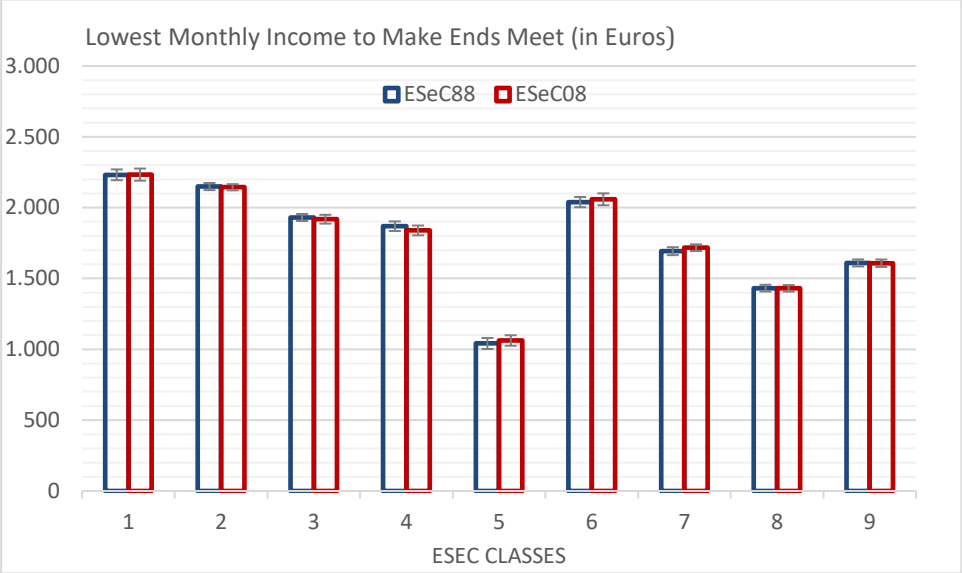


Figure 5d: Lowest Monthly Income to Make Ends Meet (Mean) by ESeC88 and ESeC08, 2011.

Data source: Eurostat (2022). EU-SILC 2011, own calculations, data weighted. Only included countries for which ISCO-88 and ISCO-08 were available in the data.

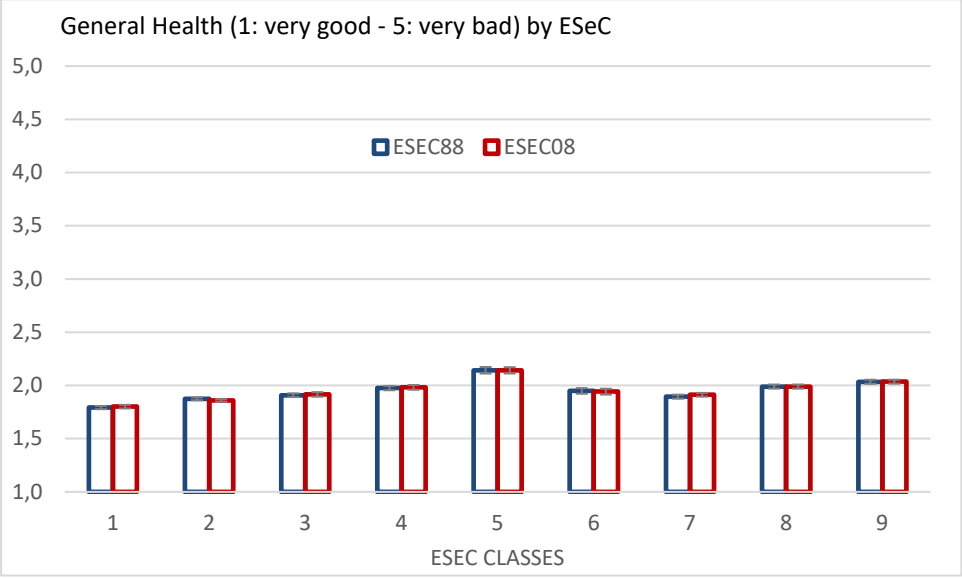


Figure 5e: General Health (Mean) by ESeC88 and ESeC08, 2011.

Data source: Eurostat (2022). EU-SILC 2011, own calculations, data weighted. Only included countries for which ISCO-88 and ISCO-08 were available in the data.

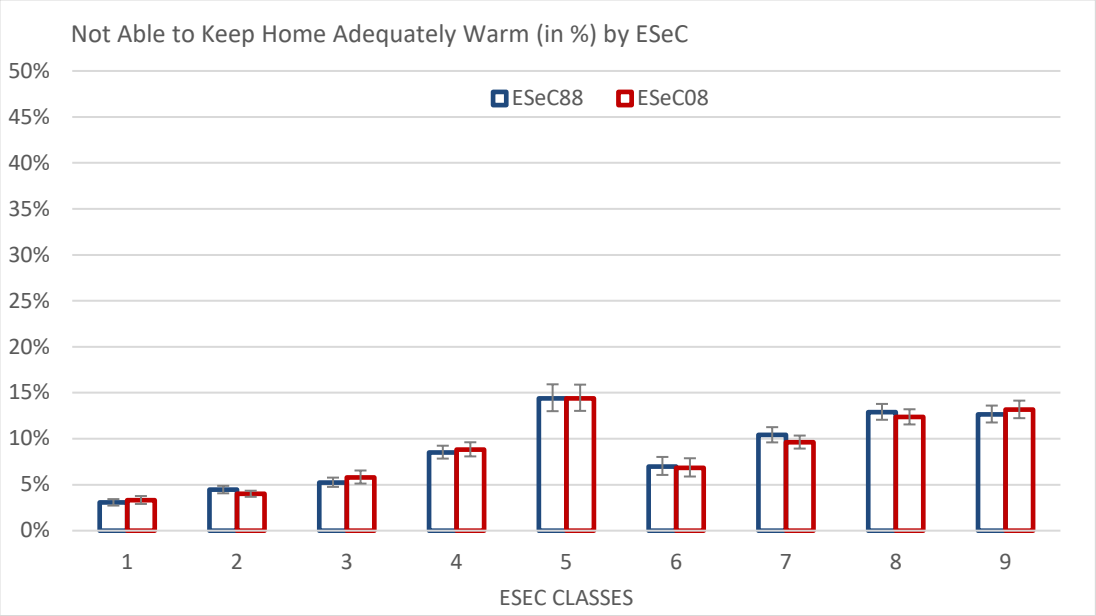


Figure 5f: Not Able to Keep Home Adequately Warm (in %) by ESeC88 and ESeC08, 2011.

Data source: Eurostat (2022). EU-SILC 2011, own calculations, data weighted. Only countries included for which ISCO-88 and ISCO-08 were available in the data.

In summary, although the switch from ISCO-88 to ISCO-08 leads to visible changes in the marginal distributions of ESeC, the changed composition of the classes in our substantive indicators has had, at best, little impact. However, we do want to highlight again that the EU average was considered here throughout (and only for countries for which we were able to generate both ESeC88 and EseC08 in EU-SILC 2011). In detail, of course, there may be deviations in country-specific analyses. But, since both the ESeC88 and ESeC08 are available for the 2011 survey year, researchers can easily check this for their own questions.

4 Conclusion

In conclusion, the ESeC can be operationalised with EU-SILC cross-sectional data, but there are differences from the original operationalisation with ESS data:

(1) In EU-SILC, the ESeC is generated only for the active population;

(2) In EU-SILC, the ESeC is generated based on the two-digit ISCO classification; and,

(3) In EU-SILC, there are 'deviations' in operationalisation for individual countries due to country-specific anonymisation measures and the ‘selected respondent’ concept

The analyses in this report with the EU-Labour Force Survey data (Eurostat, 2021) show that the marginal distribution of the ESeC changes when using the ISCO 2-digit instead of the ISCO 3-digit such that ESeC marginal distributions based on different ISCO aggregations are not comparable. However, in terms of content validity, the use of the ISCO 2-digit does not appear to affect the ESeC in any lasting way.

The change from ISCO-88 to ISCO-08 affects all data sets that use the ISCO. In the EU-SILC, the switch is most noticeable in a break in the ESeC time series: the share of ESeC 3 decreases sharply, while the share of ESeC 2 increases significantly. The effects of class position on life chances, on the other hand, seem less affected, at least with respect to the indicators we considered.

Researchers should be aware of the discrepancies between ISCO 3-digit and ISCO 2-digit (especially in the marginal distributions) when using ESeC in their analysis. If possible, the ISCO should be adjusted when conducting comparative analyses with different data sets. Moreover, researchers are advised to indicate which ISCO aggregate level and which ISCO version was used for constructing the ESeC when publishing their results.

Since the numbering of classes from 1 to 9 could be misunderstood, finally, it should be pointed out again that the numbers 1 to 9 are just labels, they do not represent a scale. The ESeC scheme is **not a continuous measure**, but rather captures the qualitative differences in employment status, i.e., that the “classes are not consistently ordered according to any inherent hierarchical principle" (Erikson & Goldthorpe, 2002, p. 33).

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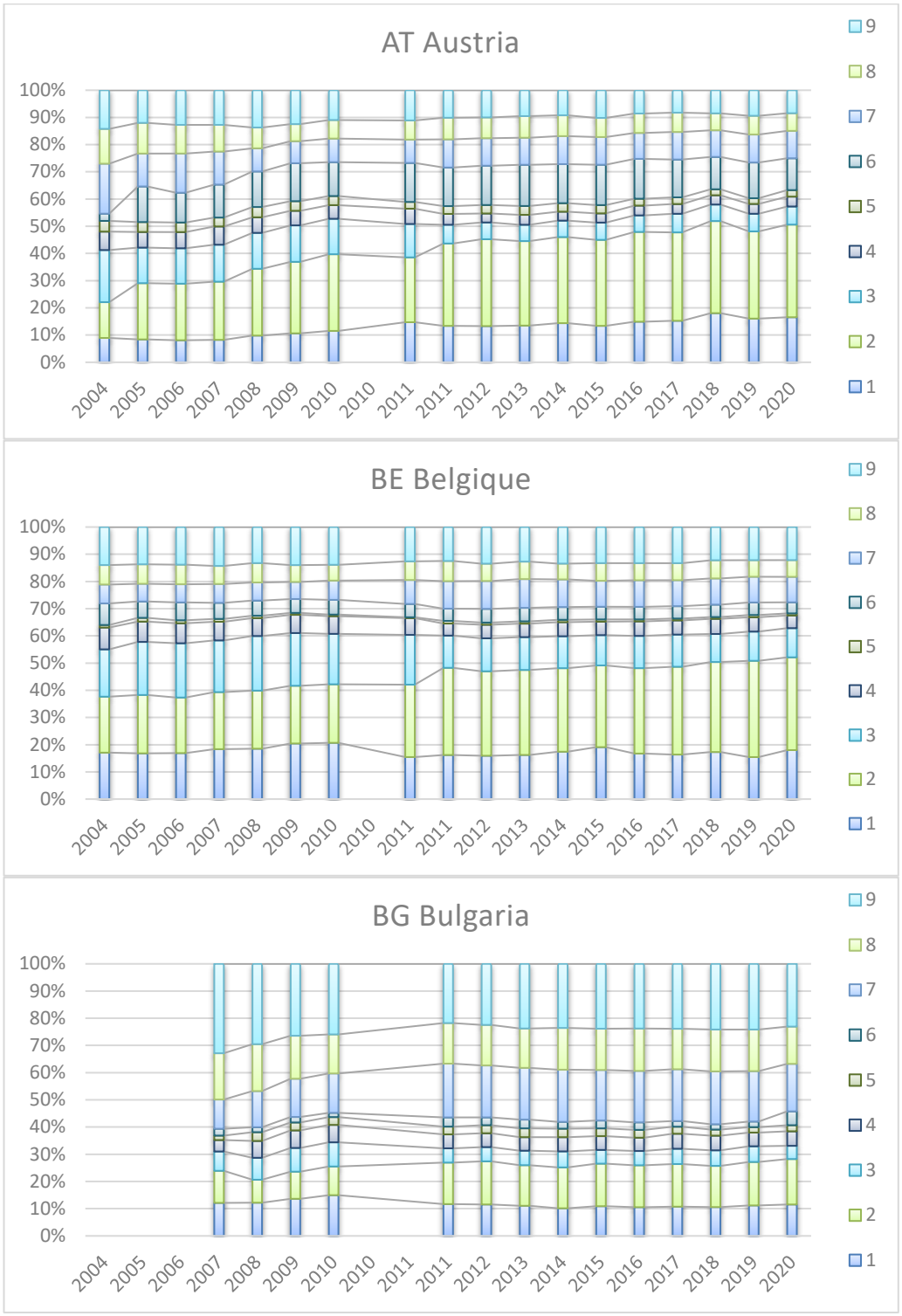
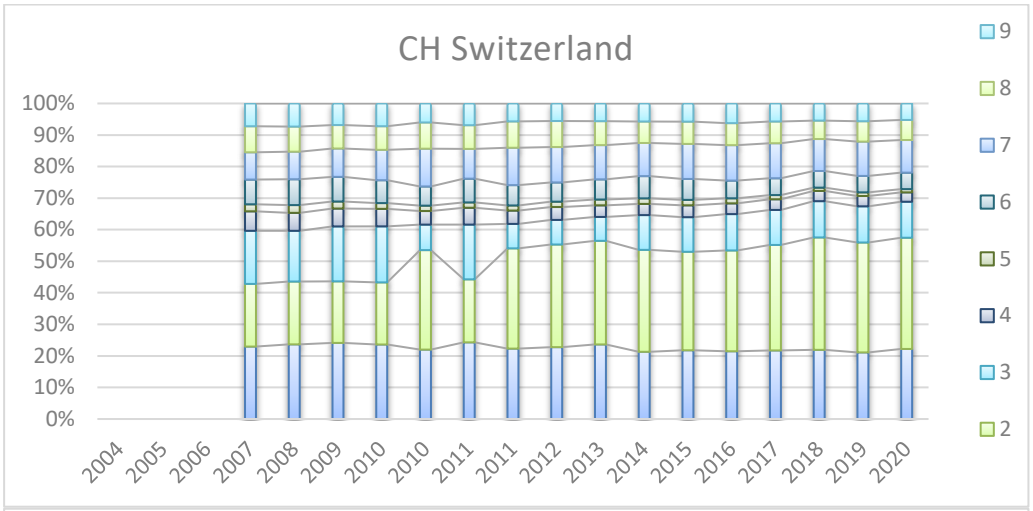
Annex 1

Figure AT – UK: ESeC88 (2004 -2011) – EseC08 (2011 onwards) over Time.

Source: Eurostat (2022): EU-SILC 2004-2020. Own calculations, data not weighted.

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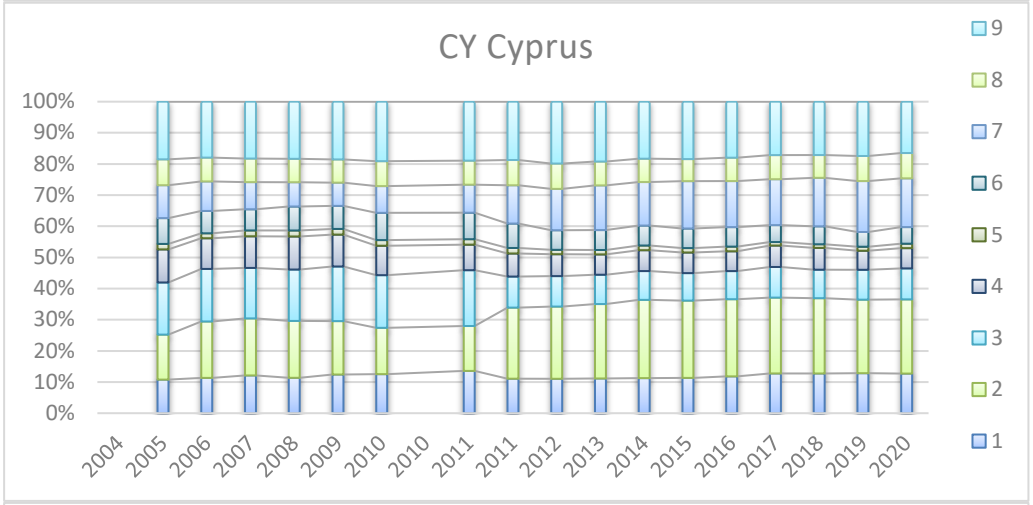
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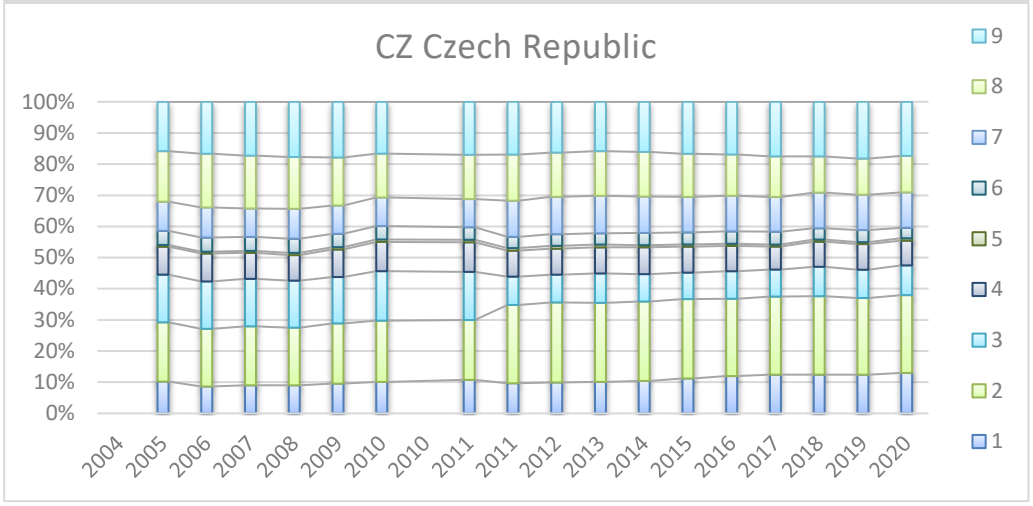
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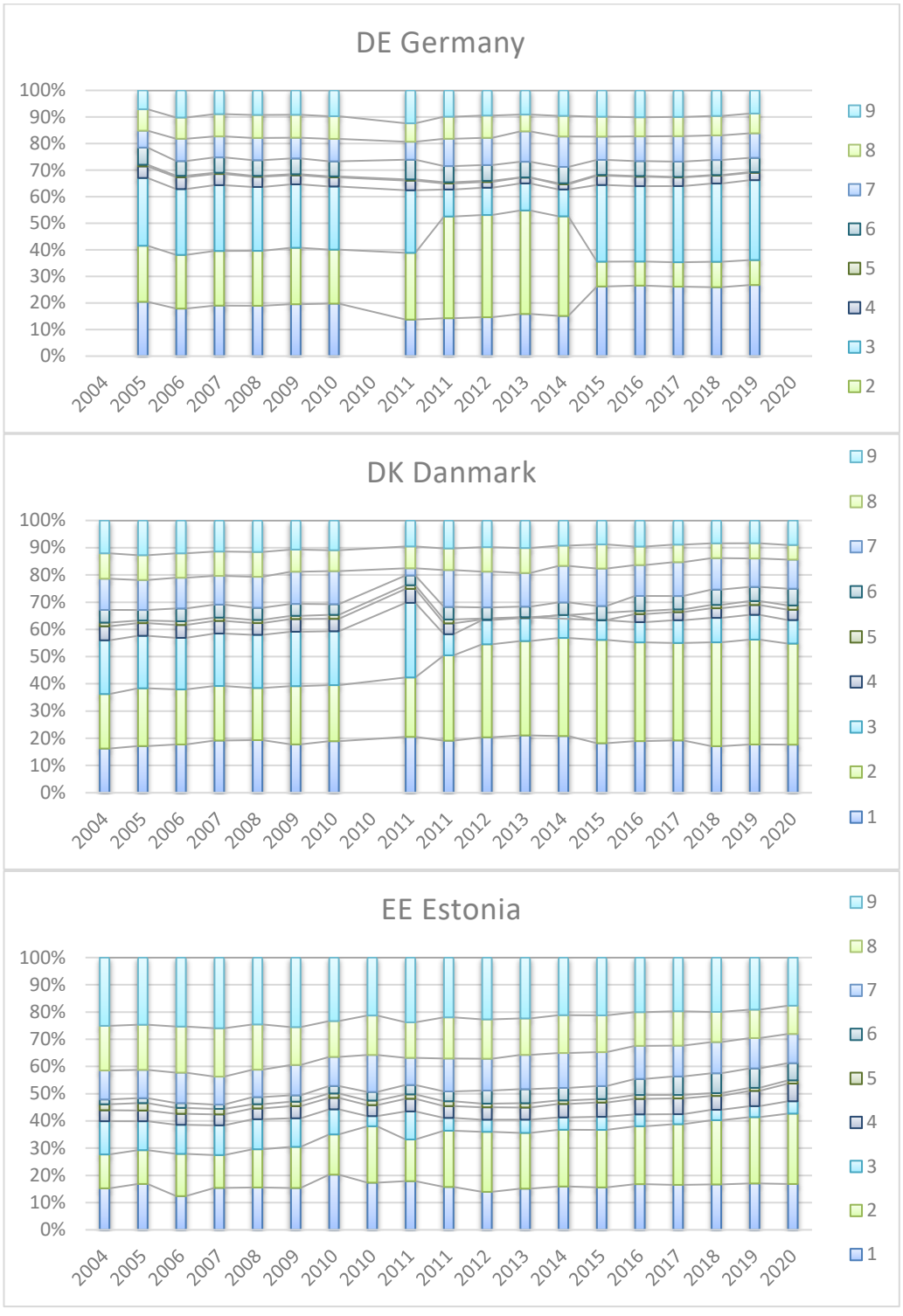
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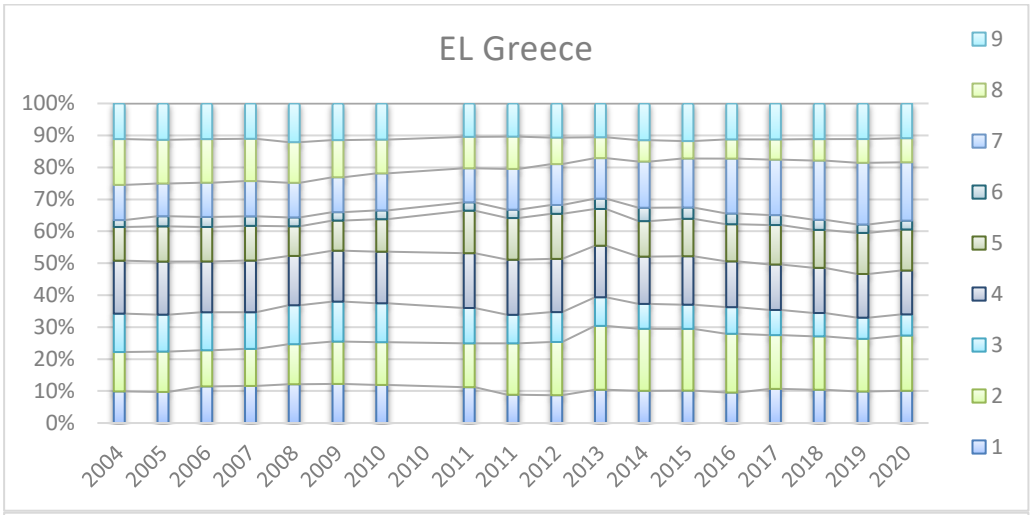
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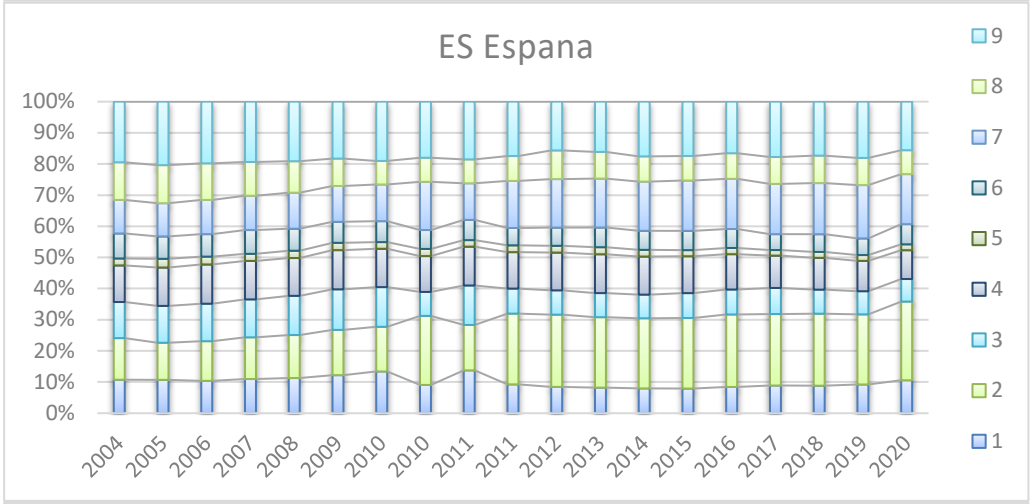
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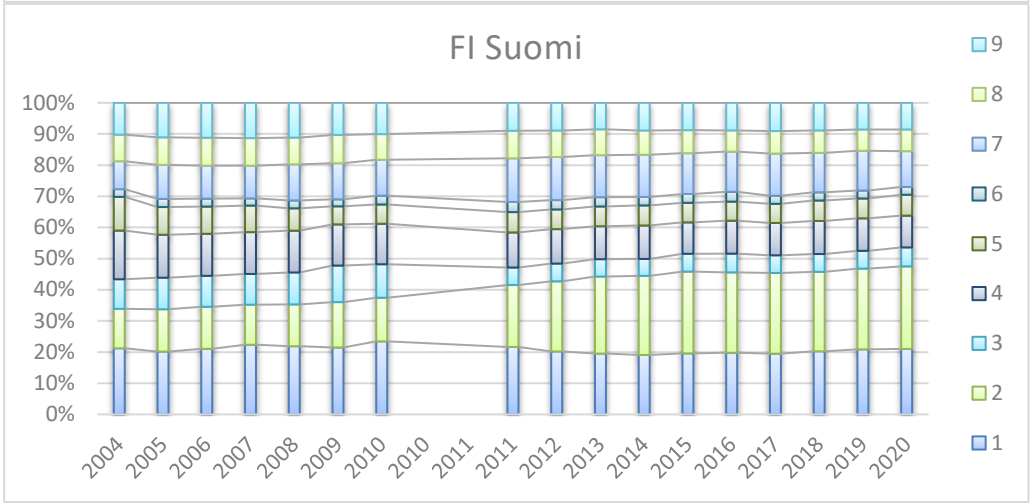
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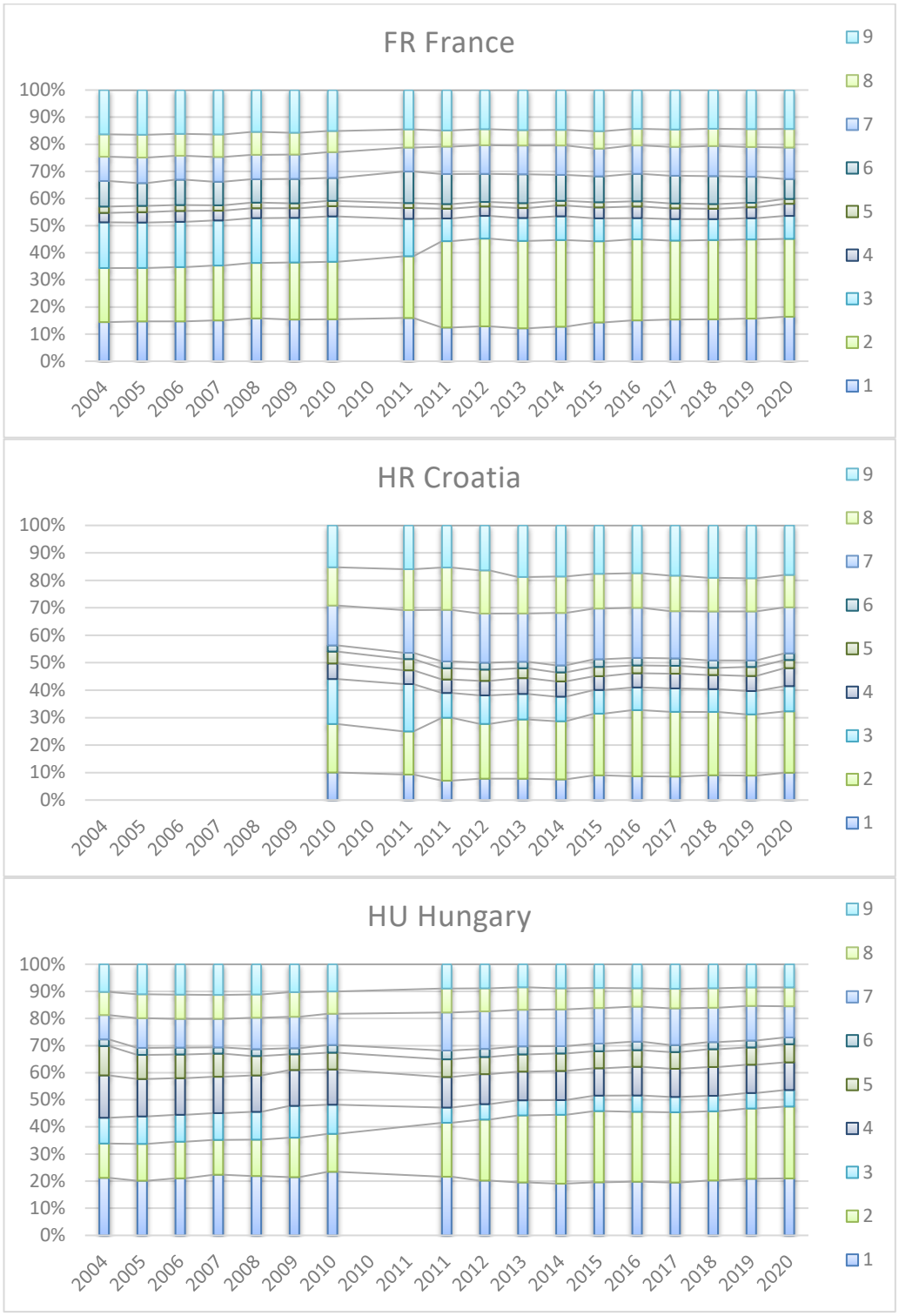
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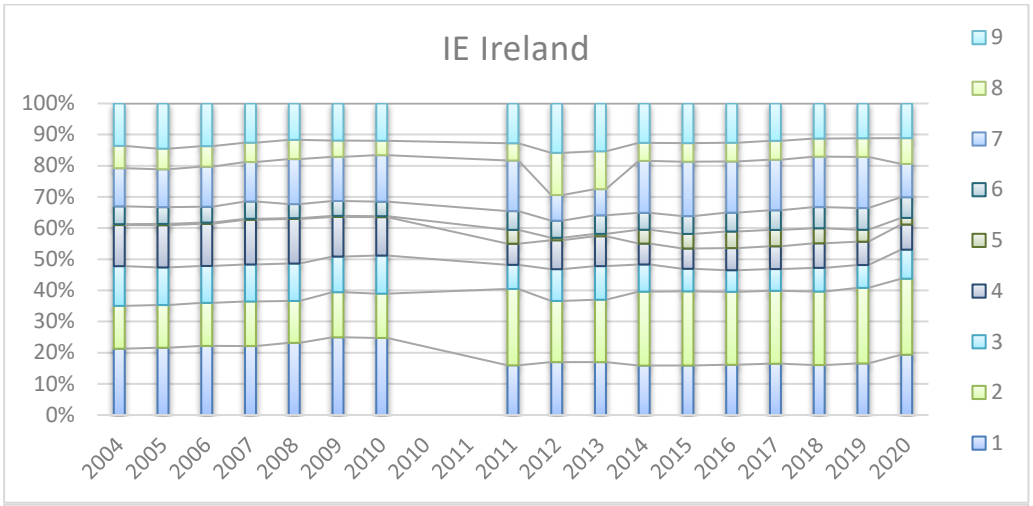
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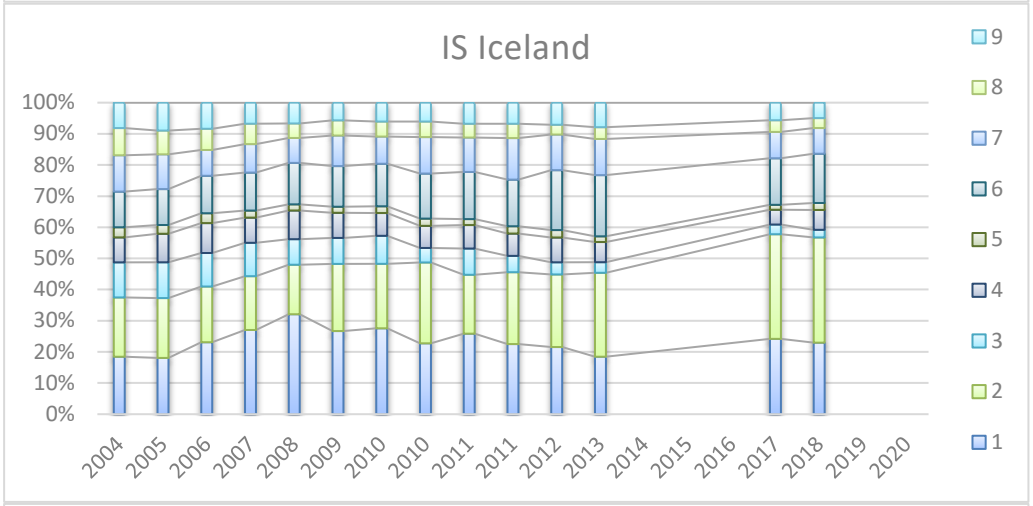
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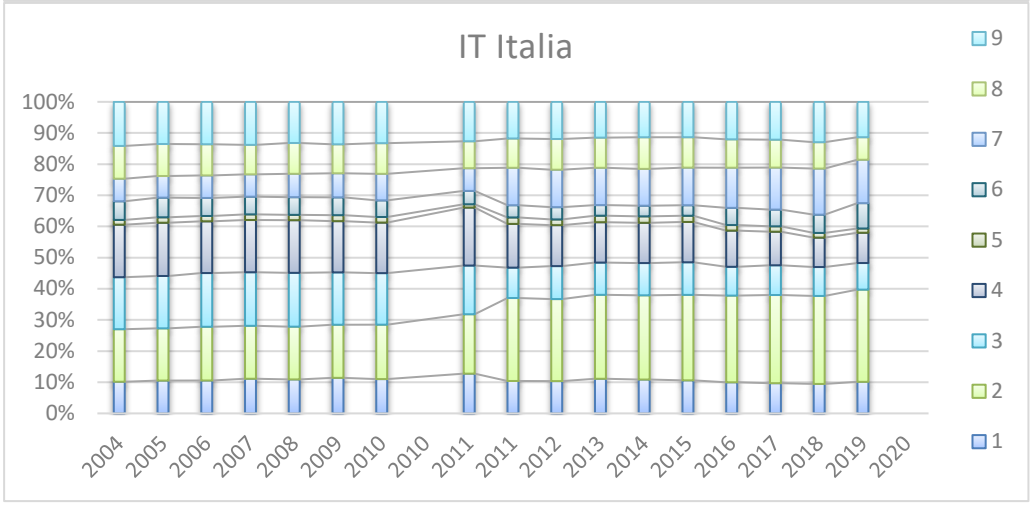
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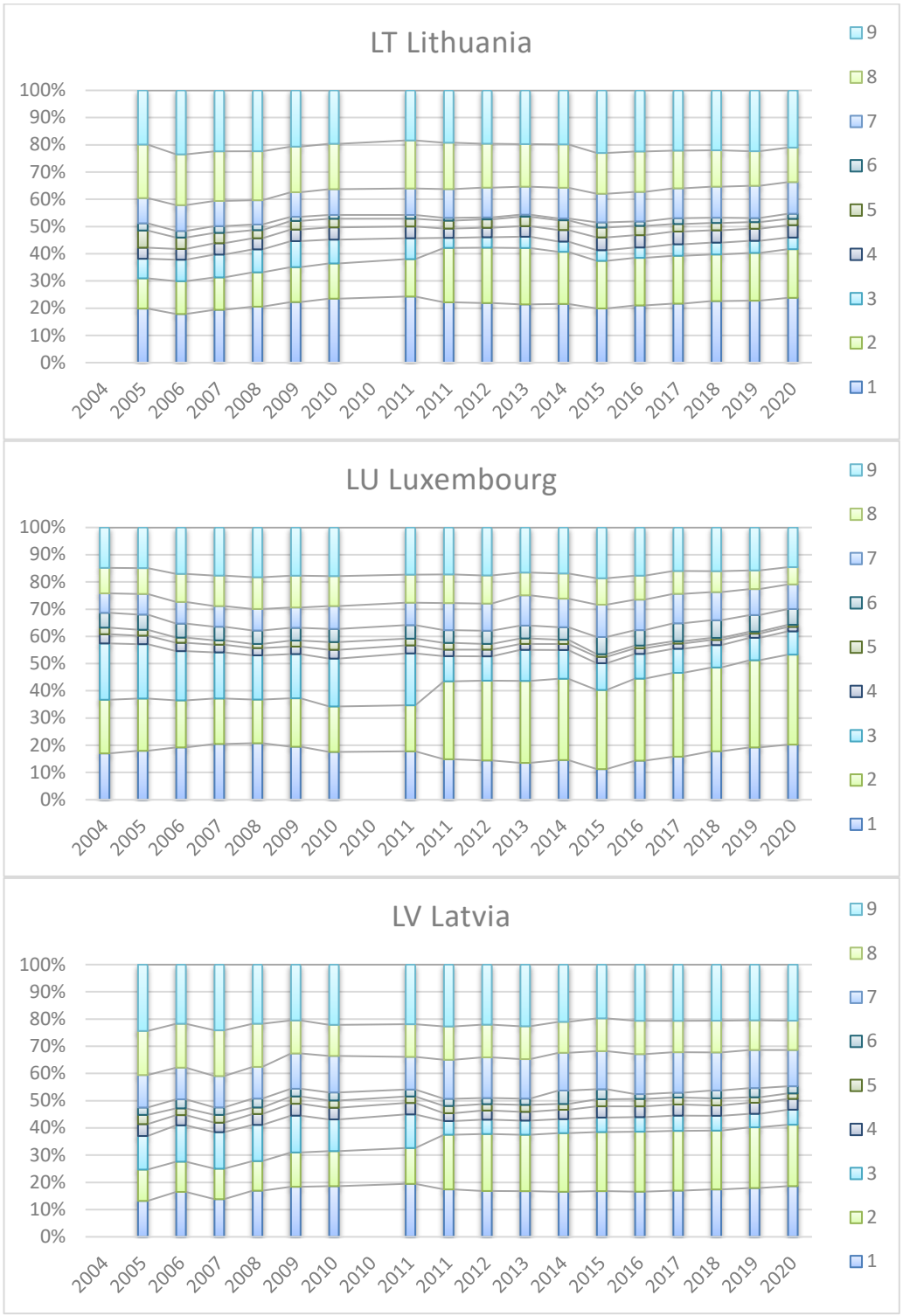
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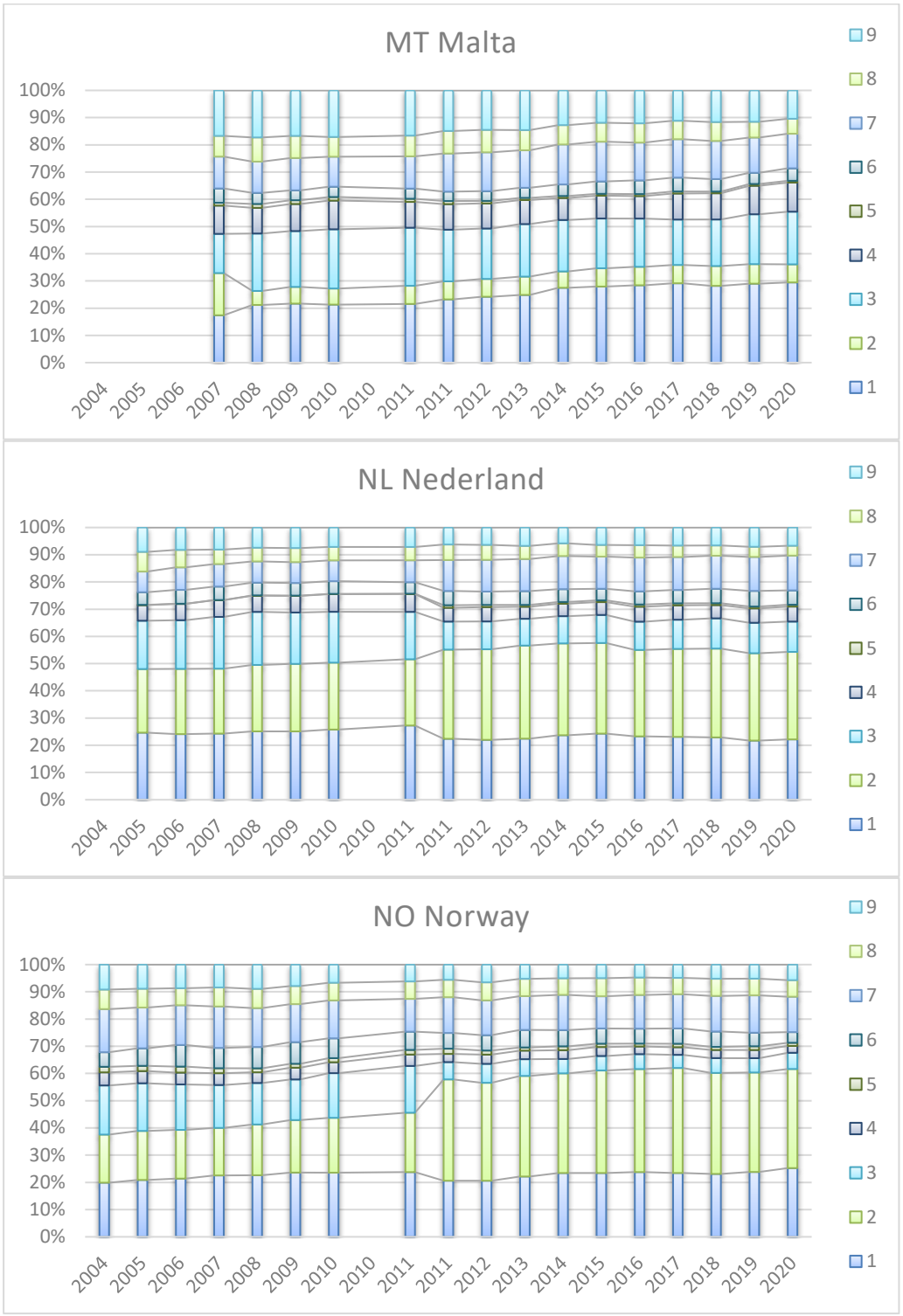
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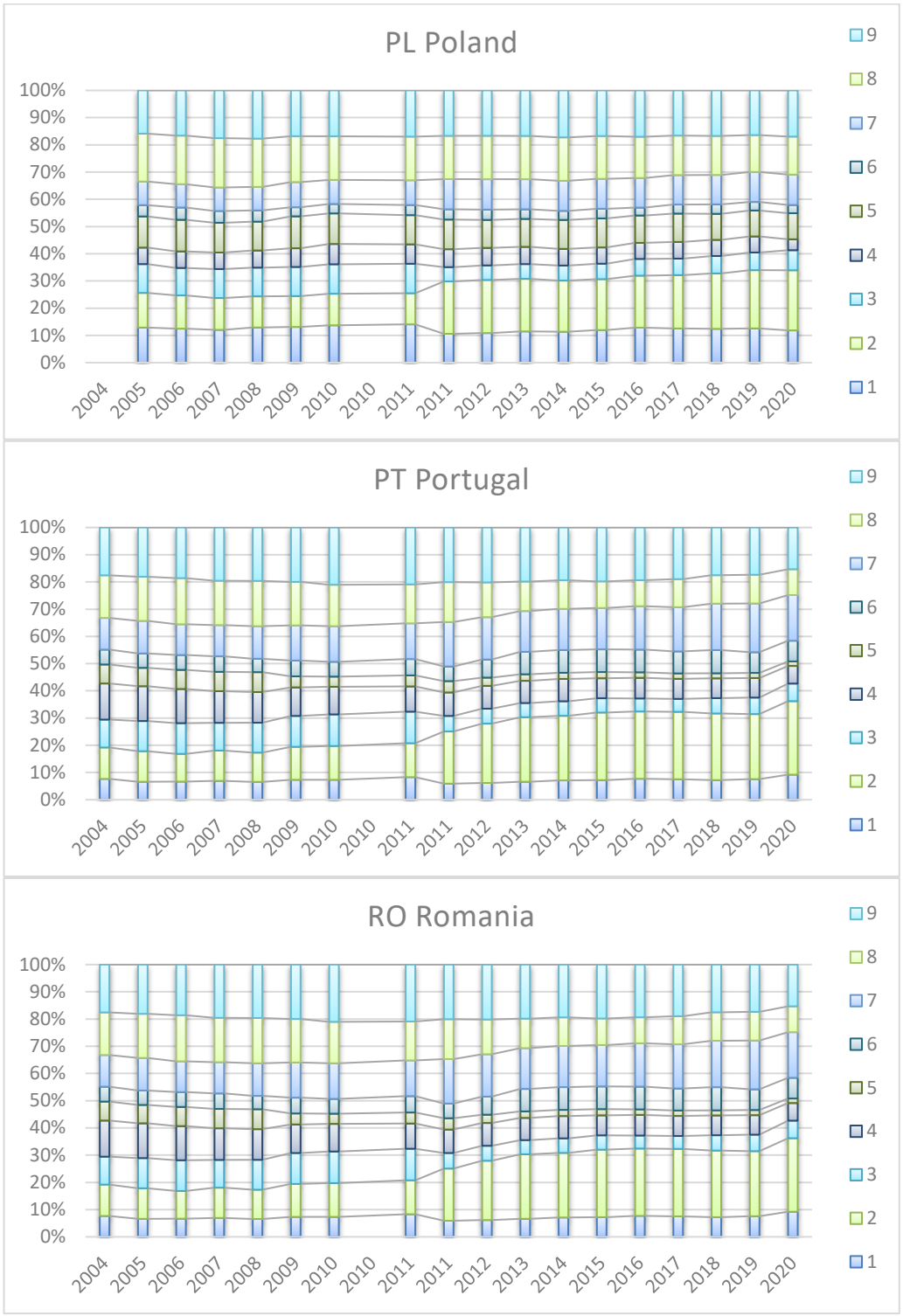
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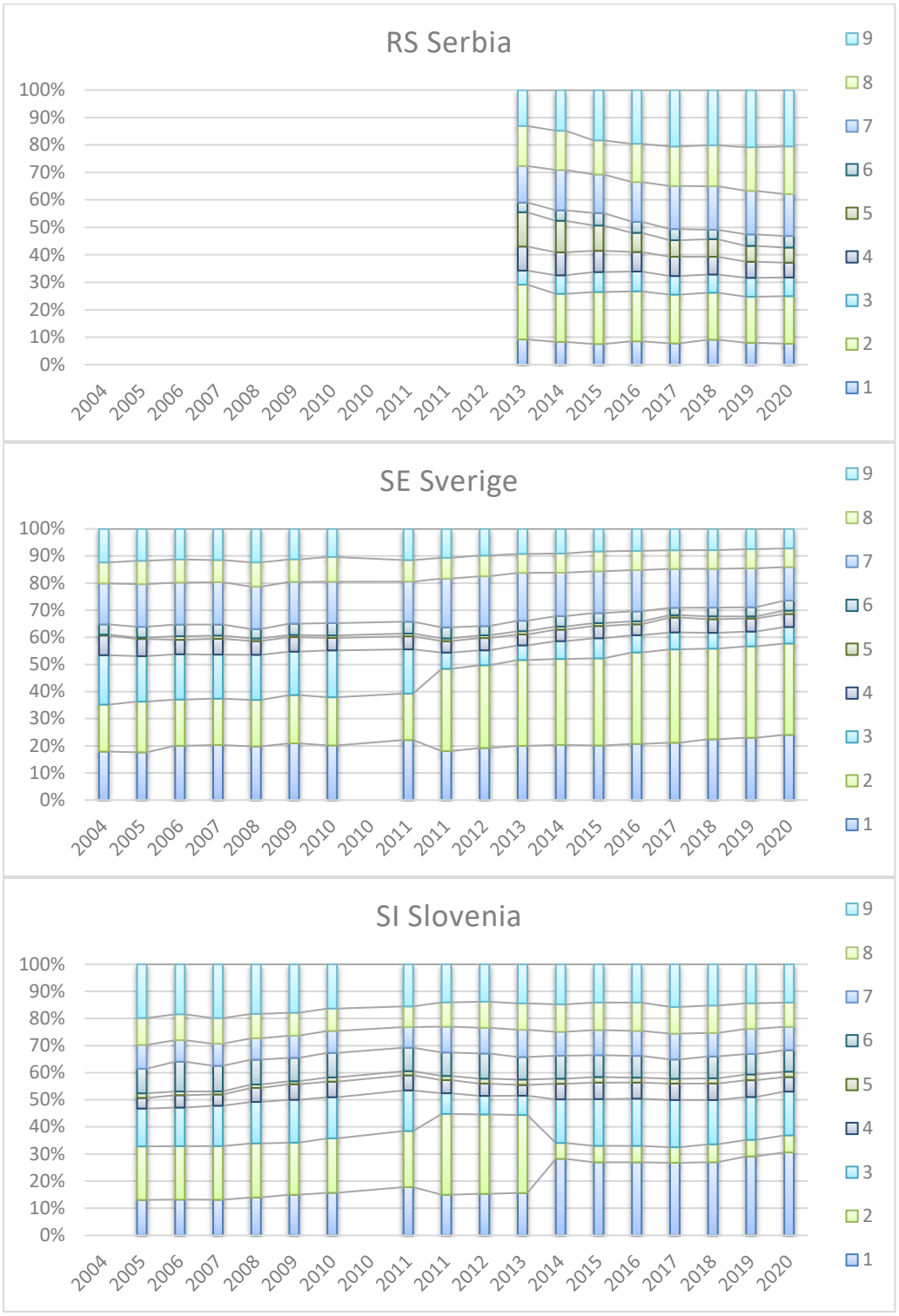
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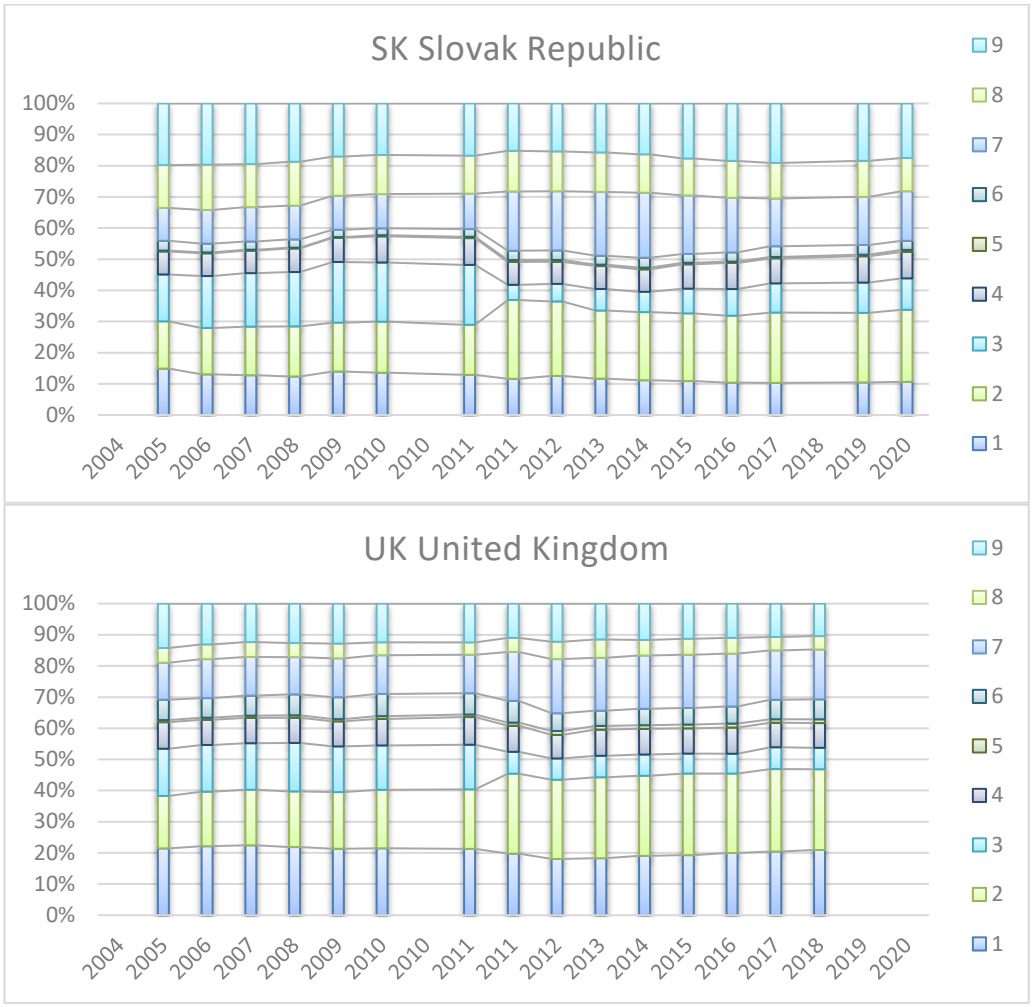
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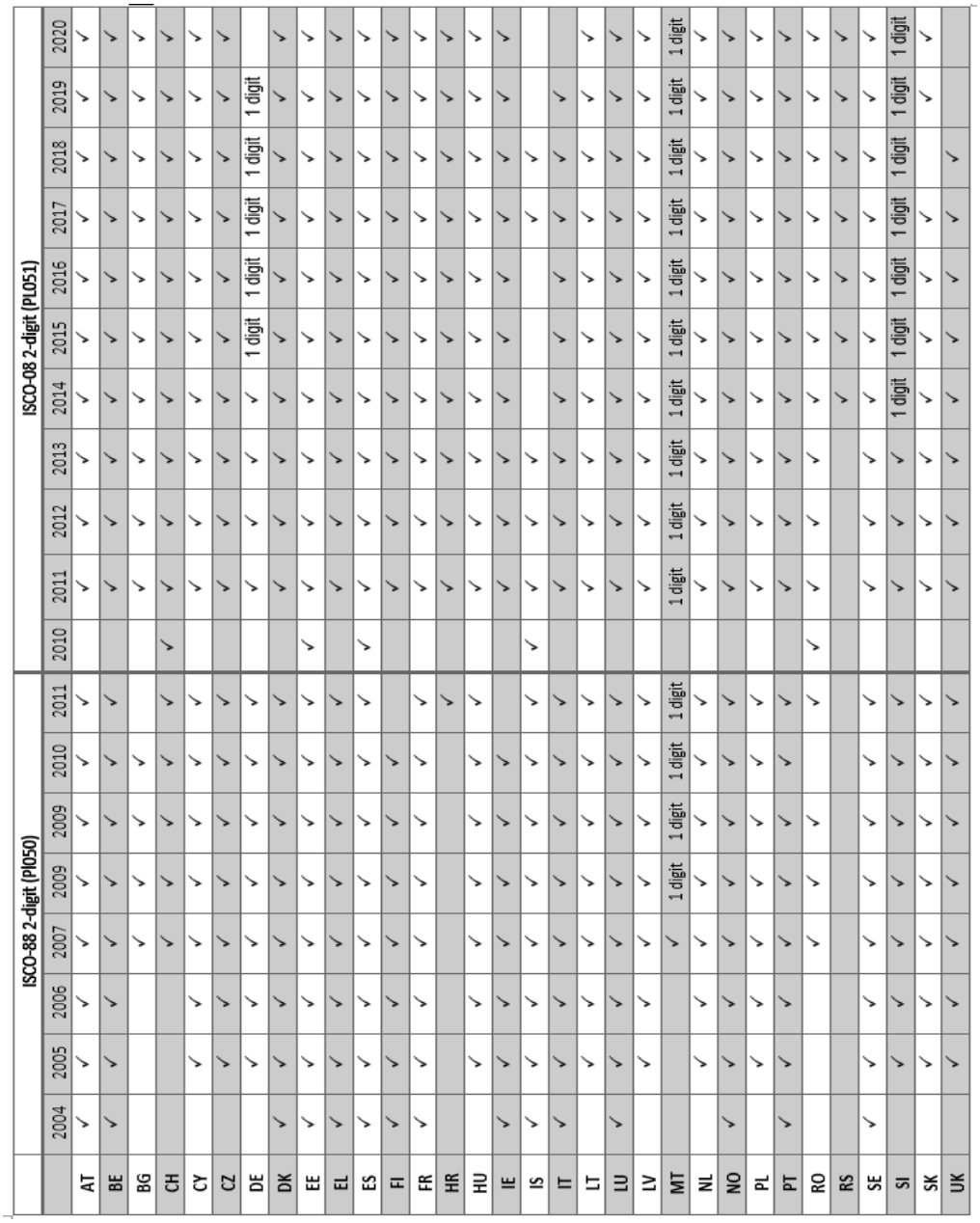
Annex 2

Table A1: Eurostat (2022) EU-SILC 2004-2020- Availability of ISCO over Years by Country, own compilation.



	ISCO-88 2-digit (PI050)											ISCO-08 2-digit (PL051)															
	2004	2005	2006	2007	2009	2010	2011	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
AT	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BE	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BG				✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CH				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CY		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CZ		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DE		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	1 digit	1 digit	1 digit	1 digit	1 digit	
DK	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
EE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
EL	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
ES	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
FI	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
FR	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
HR							✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
HU		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
IE	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
IS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓		
IT	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	
LT		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
LU	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
LV		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MT				✓	1 digit	1 digit	1 digit		1 digit	1 digit	1 digit	1 digit	1 digit	1 digit	1 digit	1 digit	1 digit	1 digit
NL		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NO	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PL		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PT	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
RO				✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
RS												✓	✓	✓	✓	✓	✓	✓
SE	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
SI		✓	✓	✓	✓	✓	✓		✓	✓	✓	1 digit	1 digit	1 digit	1 digit	1 digit	1 digit	1 digit
SK		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓		✓	✓
UK		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		

Annex 3

Table A2: ISCO-88 - Class matrix for ESeC88:

Source: https://www.iser.essex.ac.uk/wp-content/uploads/files/esec/nsi/matrices/Euroesec%20matrix.xls (last access: April, 7, 2021. Please note: this link does no longer work)

ISCO Code	Description	Employment status					If missing	
		se10+	se<10	seno	sup	emp	ess sc	mode
010	Armed forces (officers)	1	1	1	1	1	1	sup
011	Armed forces (other ranks)	3	3	3	2	3	3	emp
100	Legislators, senior officials and managers	1	4	4	1	1	1	sup
110	Legislators and senior officials	1	1	1	1	1	1	sup
111	Legislators and senior government officials	1	1	1	1	1	1	sup
114	Senior officials of special interest organisations	1	1	1	1	1	1	sup
120	Other corporate managers	1	4	4	1	1	1	sup
121	Directors and chief executives	1	4	4	1	1	1	sup
122	Production and operations managers	1	4	4	2	2	2	sup
123	Other specialist managers	1	4	4	1	1	1	sup
130	Managers of small enterprises nes	1	4	4	2	2	4	self
131	Managers of small enterprises	1	4	4	2	2	4	self
200	Professionals	1	1	1	1	1	1	emp
210	Phys, math, engin science professionals	1	1	1	1	1	1	sup
211	Physicists, chemists and related professionals	1	1	1	1	1	1	sup
212	Mathematicians, statisticians and related professionals	1	1	1	1	1	1	emp
213	Computing professionals	1	1	1	1	1	1	emp
214	Architects, engineers and related professionals	1	1	1	1	1	1	sup
220	Life science and health professionals	1	1	1	1	1	1	sup
221	Life science professionals	1	1	1	1	1	1	sup
222	Health professionals (exc. nursing)	1	1	1	1	1	1	sup
223	Nursing and midwifery professionals	1	2	2	2	2	2	sup
230	Teaching Professionals	1	2	2	2	2	2	emp
231	College, university and HE teaching professionals	1	1	1	1	1	1	emp
232	Secondary education teaching professionals	1	2	2	2	2	2	emp
233	Primary and pre-primary education teaching professionals	1	2	2	2	2	2	emp
234	Special education teaching professionals	1	2	2	2	2	2	emp
235	Other teaching professionals	1	1	1	1	1	1	emp
240	Other professionals	1	1	1	1	1	1	sup
241	Business professionals	1	1	1	1	1	1	emp
242	Legal professionals	1	1	1	1	1	1	sup
243	Archivists, librarians and related information professionals	1	2	2	2	2	2	emp
244	Social science and related professionals	1	2	2	2	2	2	emp
245	Writers and creative performing artists	1	2	2	2	2	2	emp
246	Religious professionals	1	2	2	2	2	2	sup
247	Public service administrative professionals	1	2	2	2	2	2	sup

ISCO Code	continued Description	Employment status					If missing	
		se10+	se<10	seno	sup	emp	ess sc	mode
300	Technicians and associate professionals	1	4	4	2	3	3	emp
310	Physical, engineering & science ass professionals	1	2	2	2	2	2	emp
311	Physical and engineering science technicians	1	2	2	2	2	2	sup
312	Computer associate professionals	1	2	2	2	2	2	emp
313	Optical and electronic equipment operators	1	4	4	2	6	6	emp
314	Ship and aircraft controllers and technicians	1	2	2	2	2	2	sup
315	Safety and quality inspectors	1	4	4	6	6	6	emp
320	Life science and health associate professionals	1	2	2	2	2	2	sup
321	Life science technicians and related associate professionals	1	2	2	2	2	2	emp
322	Health associate professionals (exc. Nursing)	1	2	2	2	2	2	emp
323	Nursing and midwifery associate professionals	1	2	2	2	2	2	emp
330	Teaching associate professionals	1	4	4	2	3	3	emp
331	Primary education teaching associate professionals	1	4	4	2	3	3	emp
332	Pre-primary education teaching associate professionals	1	4	4	2	3	3	emp
333	Special education teaching associate professionals	1	4	4	2	3	3	emp
334	Other teaching associate professionals	1	2	2	2	2	2	emp
340	Other associate professionals	1	4	4	2	3	3	sup
341	Finance and sales associate professionals	1	4	4	2	3	3	emp
342	Business service agents and trade brokers	1	2	2	2	2	2	emp
343	Administrative associate professionals	1	4	4	2	3	3	emp
344	Customs, tax and related government associate professionals	2	2	2	2	2	2	emp
345	Police inspectors and detectives	2	2	2	2	2	2	sup
346	Social work associate professionals	1	4	4	2	3	3	emp
347	Artistic, entertainment and sports associate professionals	1	4	4	2	3	3	emp
348	Religious associate professionals	1	2	2	2	2	2	emp
400	General Clerks	1	4	4	2	3	3	emp
410	Office Clerks	1	4	4	2	3	3	emp
411	Secretaries and keyboard operators	1	4	4	2	3	3	emp
412	Numerical clerks	1	4	4	2	3	3	emp
413	Material-recording and transport clerks	1	4	4	6	7	7	emp
414	Library, mail and related clerks	1	4	4	6	9	9	emp
419	Other office clerks	1	4	4	2	3	3	emp
420	Customer services clerks	1	4	4	2	3	3	emp
421	Cashiers, tellers and related clerks	1	4	4	6	7	7	emp
422	Client information clerks	1	4	4	6	7	7	emp
500	Service, shop, market sales workers	1	4	4	6	7	7	emp
510	Personal and protective service workers	1	4	4	6	7	7	emp
511	Travel attendant and related workers	1	4	4	6	7	7	emp
512	Housekeeping and restaurant service workers	1	4	4	6	9	9	emp
513	Personal care and related workers	1	4	4	6	7	7	emp
514	Other personal services workers	1	4	4	6	7	7	emp
516	Protective service workers	3	3	3	6	7	7	emp
520	Models, salespersons and demonstrators	1	4	4	6	7	7	emp
521	Fashion and other models	1	4	4	2	2	2	emp
522	Shop, stall and market salespersons and demonstrators	1	4	4	6	7	7	emp

ISCO Code	continued Description	Employment status se10+	se<10	seno	sup	emp	If missing ess sc	mode
600	Agricultural and fisheries workers	1	5	5	6	8	5	self
610	Skilled agriculture and fisheries workers	1	5	5	6	8	5	self
611	Market gardeners and crop growers	1	5	5	6	8	5	self
612	Animal producers and related workers	1	5	5	6	8	5	self
613	Crop and animal producers	1	5	5	6	8	5	self
614	Forestry and related workers	1	5	5	6	8	8	emp
615	Fishery workers, hunters and trappers	1	5	5	6	8	8	emp
621	Subsistence agriculture and fishing workers	5	5	5	5	5	5	no data
700	Craft and related workers	1	4	4	6	8	8	emp
710	Extraction and building trades workers	1	4	4	6	8	8	emp
711	Miners, shotfirers, stonecutters, carvers	1	4	4	6	8	8	emp
712	Building frame and related trades workers	1	4	4	6	8	8	emp
713	Building finishers and related trades workers	1	4	4	6	8	8	emp
714	Painters, building structure cleaners and related trades	1	4	4	6	8	8	emp
720	Metal, machinery and related trades	1	4	4	6	8	8	emp
721	Metal moulders, welders, sheet-metal workers etc	1	4	4	6	8	8	emp
722	Blacksmiths, tool makers and related trades	1	4	4	6	8	8	emp
723	Machinery mechanics and fitters	1	4	4	6	8	8	emp
724	Electrical and electronic equipment mechanics and fitters	1	4	4	6	8	8	emp
730	Precision, handicraft, craft printing and related workers	1	4	4	6	6	6	emp
731	Precision workers in metal and related materials	1	4	4	6	6	6	emp
732	Potters, glass makers and related trades	1	4	4	6	8	8	emp
733	Handicraft workers in wood, textile, leather & related materials	1	4	4	6	8	8	emp
734	Craft printing and related trades workers	1	4	4	6	8	8	Emp
740	Other craft and related workers	1	4	4	6	8	8	emp
741	Food processing and related trades workers	1	4	4	6	8	8	emp
742	Wood treaters, cabinet makers and related trades	1	4	4	6	8	8	emp
743	Textile, garment and related trades	1	4	4	6	8	8	emp
744	Pelt, leather and shoemaking rades	1	4	4	6	8	8	emp
800	Plant and machine operators and assemblers	1	4	4	6	9	9	sup
810	Stationary plant and related operators	1	4	4	6	9	9	emp
811	Mining and mineral-processing plant operators	1	4	4	6	9	9	sup
812	Metal-processing plant operators	1	4	4	6	9	9	emp
813	Glass, ceramics and related plant operators	1	4	4	6	9	9	emp
814	Wood-processing and papermaking plant operators	1	4	4	6	9	9	emp
815	Chemical-processing plant operators	1	4	4	6	9	9	emp
816	Power production and related plant operators	1	4	4	6	9	9	emp
817	Industrial robot operators	1	4	4	6	9	9	emp
820	Machine operators and assemblers	1	4	4	6	9	9	emp
821	Metal and mineral products machine operators	1	4	4	6	9	9	emp
822	Chemical products machine operators	1	4	4	6	9	9	emp
823	Rubber and plastic products machine operators	1	4	4	6	9	9	emp
824	Wood products machine operators	1	4	4	6	9	9	emp
825	Printing, binding and paper products machine operators	1	4	4	6	8	8	emp
826	Textile, fur and leather products machine operators	1	4	4	6	9	9	emp
827	Food and related products machine operators	1	4	4	6	9	9	emp
828	Assemblers	1	4	4	6	9	9	emp
829	Other machine operators nec	1	4	4	6	9	9	emp
830	Drivers amd mobile plant operators	1	4	4	6	9	9	emp
831	Locomotive engine drivers and related workers	1	4	4	6	8	8	emp
832	Motor vehicle drivers	1	4	4	6	9	9	emp
833	Agricultural and other mobile plant operators	1	4	4	6	9	9	emp
834	Ships deck crews	1	4	4	6	8	8	emp

ISCO Code	continued Description	Employment status					If missing	
		se10+	se<10	seno	sup	emp	ess sc	mode
900	Elementary occupations general	1	4	4	6	9	9	emp
910	Sales and services elementary occupations	1	4	4	6	9	9	emp
911	Street vendors and related workers	1	4	4	6	7	4	self
912	Shoe cleaning and other street services elementary occupations	1	4	4	6	9	9	emp
913	Domestic and related helpers, cleaners and launderers	1	4	4	6	9	9	emp
914	Building caretakers, window and related cleaners	1	4	4	6	9	9	emp
915	Messengers, porters, doorkeepers and related workers	1	4	4	6	9	9	emp
916	Garbage collectors	1	4	4	6	9	9	emp
920	Agricultural, fishery and related labourers	1	5	5	6	9	9	emp
921	Agricultural, fishery and related labourers	1	5	5	6	9	9	emp
930	Labourers in mining, construction, manufacturing, transport	1	4	4	6	9	9	emp
931	Mining and construction labourers	1	4	4	6	9	9	emp
932	Manufacturing labourers	1	4	4	6	9	9	emp
933	Transport labourers and freight handlers	1	4	4	6	9	9	emp

Table A3: ISCO-08 - Class matrix for ESeC08 (Harrison, 2022):

Source https://www.ericharrison.co.uk/european-socio-economic-classification-esec.html

Class matrix for ESeC 2008 rev

Code	Description	Employment status				
	continued	se10+	se<10	seno	sup	emp
011	Commissioned armed forces officers	1	1	1	1	1
021	NCOs	3	3	3	2	3
031	Other ranks	3	3	3	2	3
100	Managers	1	4	4	1	1
110	Chief execs, senior officials and legislators	1	1	1	1	1
111	Legislators and senior officials	1	1	1	1	1
112	Managing directors and chief execs	1	1	1	1	1
120	Admin and commercial managers	1	4	4	1	1
121	Business services and admin managers	1	4	4	1	1
122	Sales, marketing and development managers	1	4	4	1	1
130	Production and specialized services managers	1	4	4	1	1
131	PM in agriculture, fishing, forestry	1	5	5	2	2
132	Manufacturing, mining, construction and distribution managers	1	4	4	2	2
133	ICT service managers	1	4	4	1	1
134	Professional service managers	1	4	4	1	1
140	Hospitality, retail and other services	1	4	4	2	2
141	Hotel and restaurant managers	1	4	4	2	2
142	Retail and wholesale trade managers	1	4	4	2	2
143	Other services managers	1	4	4	2	2
200	Professionals	1	1	1	1	1
210	Science and engineering professionals	1	1	1	1	1
211	Physical and earth science professionals	1	1	1	1	1
212	Mathematicians, actuaries and statisticians	1	1	1	1	1
213	Life science professionals	1	1	1	1	1
214	Engineering professionals	1	1	1	1	1
215	Electrotechnology professionals	1	1	1	1	1
216	Architects, planners, surveyors and designers	1	1	1	1	1
220	Health professionals	1	1	1	1	1
221	Medical doctors	1	1	1	1	1
222	Nursing and midwifery professionals	1	2	2	2	2
223	Traditional and complementary medicine professionals	1	2	2	2	2
224	Paramedical practitioners	1	4	4	6	6
225	Veterinarians	1	1	1	1	1
226	Other health professionals	1	1	1	1	1
230	Teaching Professionals	1	1	1	1	1
231	University and HE teachers	1	1	1	1	1
232	Vocational Education teacher	1	1	1	1	1
233	Secondary education teachers	1	2	2	2	2
234	Primary and pre-primary teachers	1	2	2	2	2
235	Other teaching professionals	1	1	1	1	1
240	Business and administrative professionals	1	1	1	1	1
241	Finance professionals	1	1	1	1	1
242	Administration professionals	1	2	2	2	2
243	Sales, marketing and PR professionals	1	1	1	1	1
250	ICT Professionals	1	1	1	1	1
251	Software and applications developers	1	1	1	1	1
252	Database and network professionals	1	2	2	2	2

Class matrix for ESeC 2008 rev

continued

Code	Description	Employment status				
		se10+	se<10	seno	sup	emp
260	Legal, social and cultural professionals	1	2	2	2	2
261	Legal professionals	1	1	1	1	1
262	Librarians, archivists and curators	1	2	2	2	2
263	Social and religious professionals	1	1	1	1	1
264	Authors, journalists and linguists	1	2	2	2	2
265	Creative and performing artists	1	2	2	2	2
300	Technicians and associate professionals	1	4	4	2	3
310	Science and engineering ass profs	1	2	2	2	2
311	Physical and engineering science technicians	1	2	2	2	2
312	Mining, manufacturing and construction technicians	1	2	2	2	2
313	Process control technicians	1	4	4	2	6
314	Life science and related technicians	1	2	2	2	2
315	Ship and aircraft controllers and technicians	1	2	2	2	2
320	Health associate professionals	1	4	4	6	6
321	Medical and pharmaceutical technicians	1	2	2	2	2
322	Nursing and midwifery associate professionals	1	2	2	2	2
323	Traditional and complementary medicine ass profs	1	2	2	2	2
324	Veterinary technicians and assistants	1	4	4	6	3
325	Other health associate professionals	1	4	4	2	3
330	Business and administration associate professionals	1	1	1	1	1
331	Financial and mathematical ass profs	1	1	1	1	1
332	Sales and purchasing agents and brokers	1	1	1	1	1
333	Business service agents	1	2	2	2	2
334	Administrative and specialized secretaries	1	4	4	2	3
335	Government regulatory associate professionals	2	2	2	2	2
340	Legal, social, cultural and related associate professionals	1	4	4	2	3
341	Legal, social and religious associate professionals	1	2	2	2	3
342	Sports and fitness workers	1	4	4	2	3
343	Artistic, cultural and culinary associate professionals	1	4	4	2	3
350	Information and communications technicians	1	4	4	2	3
351	ICT Ops and user support technicians	1	4	4	2	3
352	Telcoms and broadcast technicians	1	4	4	2	3
400	Clerical support workers	1	4	4	2	3
410	General and keyboard clerks	1	4	4	2	3
411	General office clerks	1	4	4	2	3
412	Secretaries (general)	1	4	4	2	3
413	Keyboard operators	1	4	4	2	3
420	Customer services clerks	1	4	4	6	7
421	Tellers, money collectors and related	1	4	4	6	7
422	Client information workers	1	4	4	6	7
430	Numerical and material recording clerks	1	4	4	2	3
431	Numerical clerks	1	4	4	2	3
432	Material recording and transport clerks	1	4	4	2	7
440	Other clerical support workers	1	4	4	6	3
441	Other clerical support workers	1	4	4	6	3

Class matrix for ESeC 2008 rev

continued

Code	Description	Employment status				
		se10+	se<10	seno	sup	emp
500	Services and sales workers	1	4	4	6	7
510	Personal services workers	1	4	4	6	7
511	Tavel attendants, conductors and guides	1	4	4	6	7
512	Cooks	1	4	4	6	7
513	Waiters and bartenders	1	4	4	6	7
514	Hairdressers, beauticians and related workers	1	4	4	6	7
515	Building and housekeeping supervisors	1	4	4	6	7
516	Other personal service workers	1	4	4	6	7
520	Sales workers	1	4	4	6	7
521	Street and Market Salespersons	1	4	4	7	9
522	Shop Salespersons	1	4	4	6	7
523	Cashiers and Ticket Clerks	1	4	4	6	7
524	Other Sales Workers	1	4	4	6	7
530	Personal Care Workers	1	4	4	6	7
531	Child Care Workers and Teachers' Aides	1	4	4	6	7
532	Personal Care Workers in Health Services	1	4	4	6	7
540	Protective Services Workers	3	3	3	6	7
541	Protective Service Workers	3	3	3	6	7
600	Skilled Agricultural, Forestry and Fishery Workers	1	5	5	6	8
610	Market-oriented Skilled Agricultural Workers	1	5	5	6	8
611	Market Gardeners and Crop Growers	1	5	5	6	8
612	Animal Producers	1	5	5	6	8
613	Mixed Crop and Animal Producers	1	5	5	6	8
620	Market-oriented Skilled Forestry, Fishery and Hunting Workers	1	5	5	6	8
621	Forestry and Related Workers	1	5	5	6	8
622	Fishery Workers, Hunters and Trappers	1	5	5	6	8
630	Subsistence Farmers, Fishers, Hunters and Gatherers	5	5	5	5	5
631	Subsistence Crop Farmers	5	5	5	5	5
632	Subsistence Livestock Farmers	5	5	5	5	5
633	Subsistence Mixed Crop and Livestock Farmers	5	5	5	5	5
634	Subsistence Fishers, Hunters, Trappers and Gatherers	5	5	5	5	5
700	Craft and Related Trades Workers	1	4	4	6	8
710	Building and Related Trades Workers (exc Electricians)	1	4	4	6	8
711	Building Frame and Related Trades Workers	1	4	4	6	8
712	Building Finishers and Related Trades Workers	1	4	4	6	8
713	Painters, Building Structure Cleaners and Related Trades Workers	1	4	4	6	8
720	Metal, Machinery and Related Trades Workers	1	4	4	6	8
721	Sheet and Structural Metal Workers, Moulders and Welders, and Related Workers	1	4	4	6	8
722	Blacksmiths, Toolmakers and Related trades Workers	1	4	4	6	8
723	Machinery Mechanics and Repairers	1	4	4	6	8
730	Handicraft and Printing Workers	1	4	4	6	8
731	Handicraft Workers	1	4	4	6	8
732	Printing Trades Workers	1	4	4	6	8
740	Electrical and Electronics Trades Workers	1	4	4	6	8
741	Electrical Equipment Installers and Repairers	1	4	4	6	8
742	Electronics and Telecommunications Installers and Repairers	1	4	4	6	6
750	Food Processing, Wordworking, Garment and Other Craft and Related trades Workers	1	4	4	6	8
751	Food processing and Related Trades Workers	1	4	4	6	8
752	Wood Treaters, Cabinet-makers and related Trades Workers	1	4	4	6	8
753	Garment and Related Trades Workers	1	4	4	6	8
754	Other Craft and Related Workers	1	4	4	6	8

Class matrix for ESeC 2008 rev

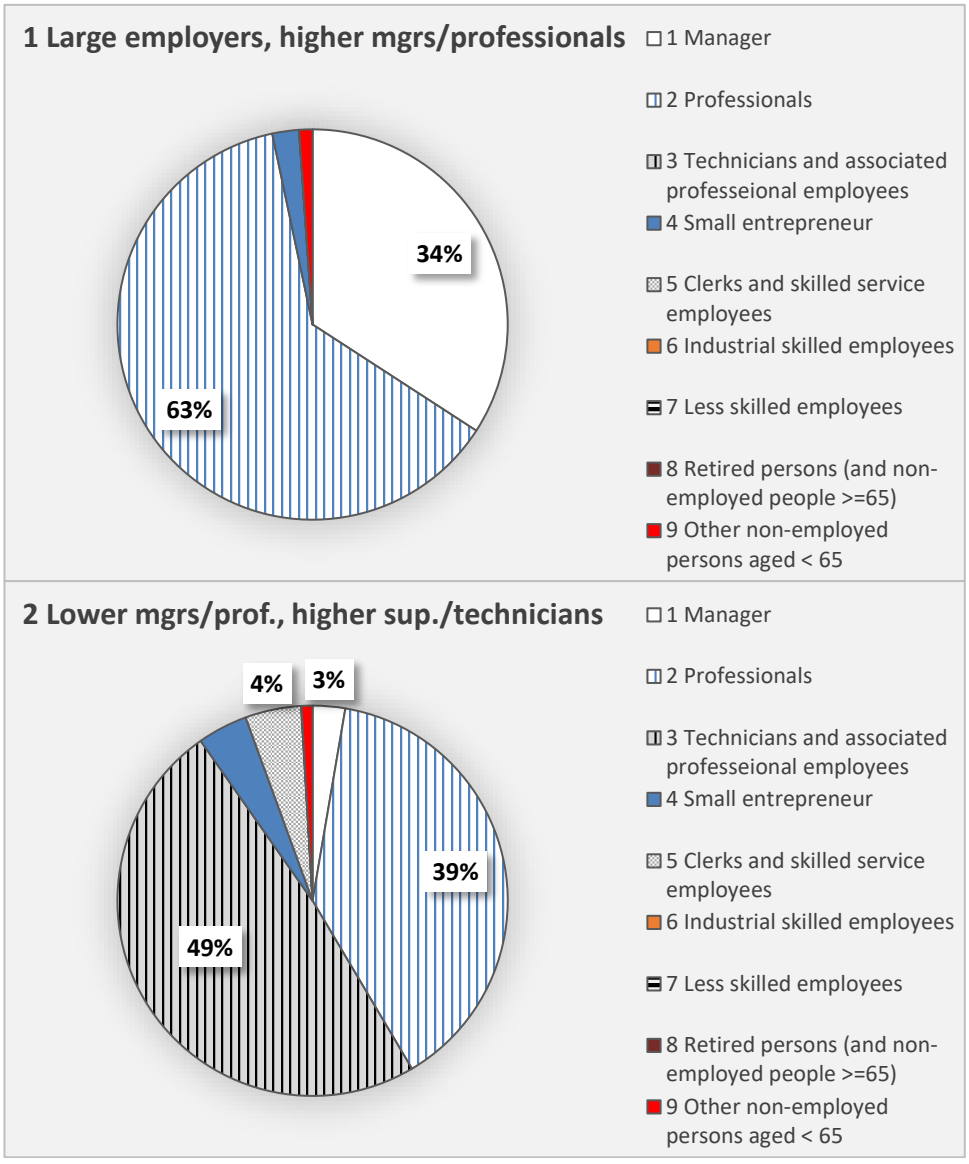
continued

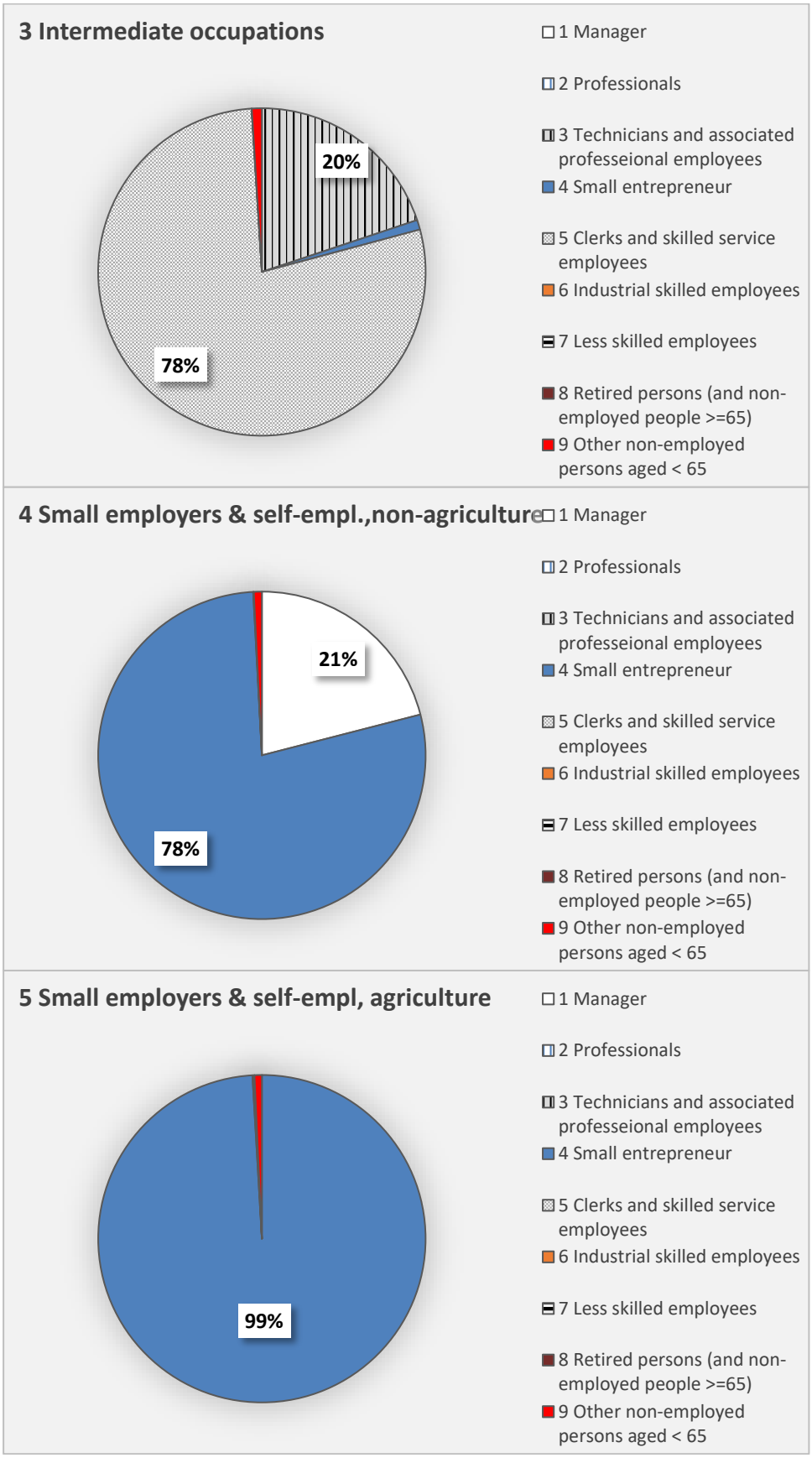
Code	Description	Employment status				
		se10+	se<10	seno	sup	emp
800	Plant and Machine Operators and Assemblers	1	4	4	6	9
810	Stationary Plant and Machine Operators	1	4	4	6	9
811	Mining and Mineral Processing Plant Operators	1	4	4	6	9
812	Metal Processing and Finishing Plant Operators	1	4	4	6	9
813	Chemical and Photographic Products Plant and Machine Operators	1	4	4	6	9
814	Rubber, Plastic and Paper Products Machine Operators	1	4	4	6	9
815	Textile, fur and leather products machine operators	1	4	4	6	9
816	Food and related products machine operators	1	4	4	6	9
817	Wood-processing and papermaking plant operators	1	4	4	6	9
818	Other Stationary Plant and Machine Operators	1	4	4	6	9
820	Assemblers	1	4	4	6	9
821	Assemblers	1	4	4	6	9
830	Drivers and Mobile Plant Operators	1	4	4	6	8
831	Locomotive Engine drivers and Related Workers	1	4	4	6	8
832	Car, Van and Motorcycle Drivers	1	4	4	6	9
833	Heavy Truck and Bus Drivers	1	4	4	6	8
834	Mobile Plant Operators	1	4	4	6	9
835	Ships' Deck Crews and Related Workers	1	4	4	6	8
900	Elementary Occupations	1	4	4	6	9
910	Cleaners and Helpers	1	4	4	6	9
911	Domestic, Hotel and Office Cleaners and Helpers	1	4	4	6	9
912	Vehicle, Window, Laundry and other hand cleaning workers	1	4	4	6	9
920	Agricultural, forestry and fishery Labourers	1	5	5	6	9
921	Agricultural, forestry and fishery labourers	1	5	5	6	9
930	Labourers in mining, construction, manufacturing and transport	1	5	5	6	9
931	Mining and construction labourers	1	4	4	6	9
932	Manufacturing labourers	1	4	4	6	9
933	Transport and storage labourers	1	4	4	6	9
940	Food preparation assistants	1	4	4	6	9
941	Food preparation assistants	1	4	4	6	9
950	Street and related sales and services workers	1	4	4	6	9
951	Street and related services workers	1	4	4	6	9
952	Street vendors (excluding Food)	1	4	4	6	9

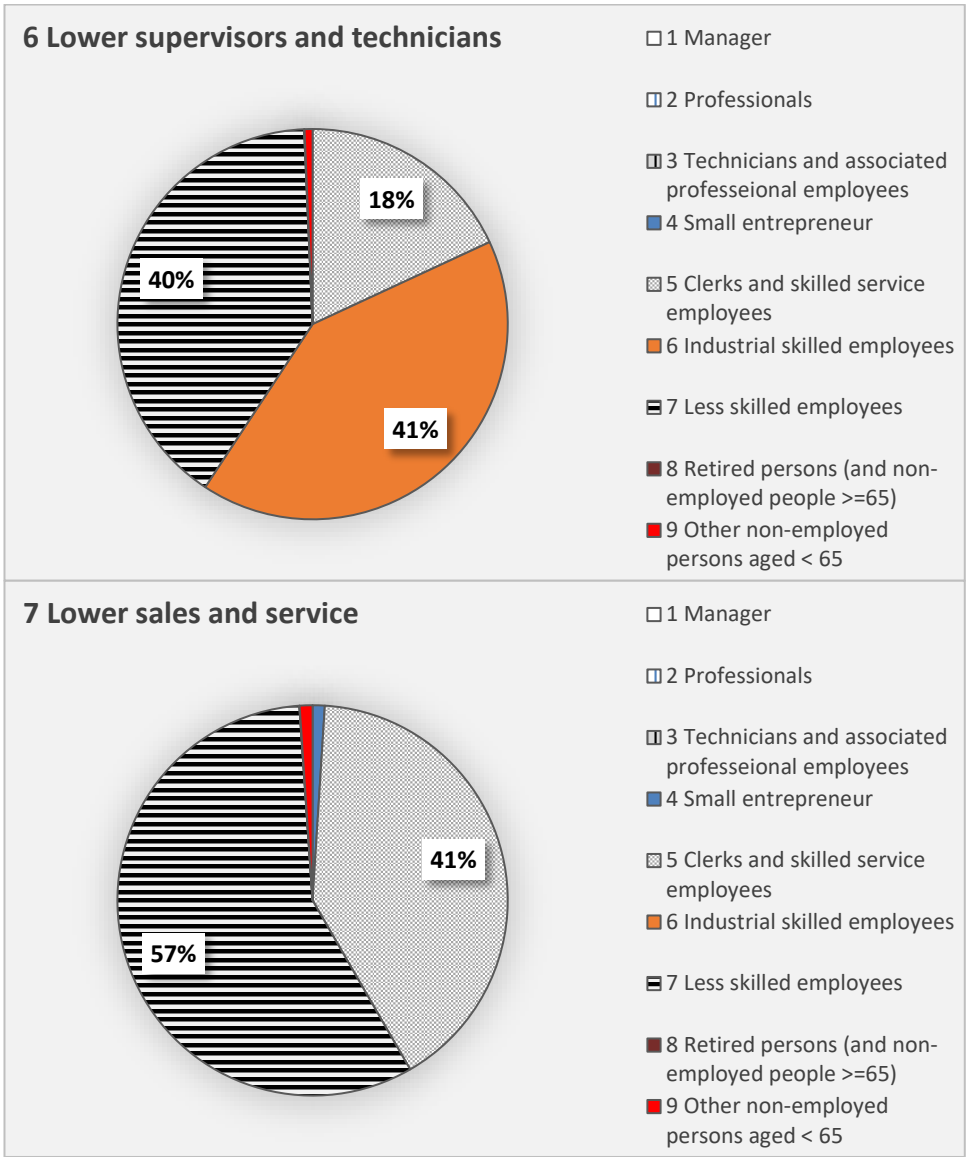
Annex 4

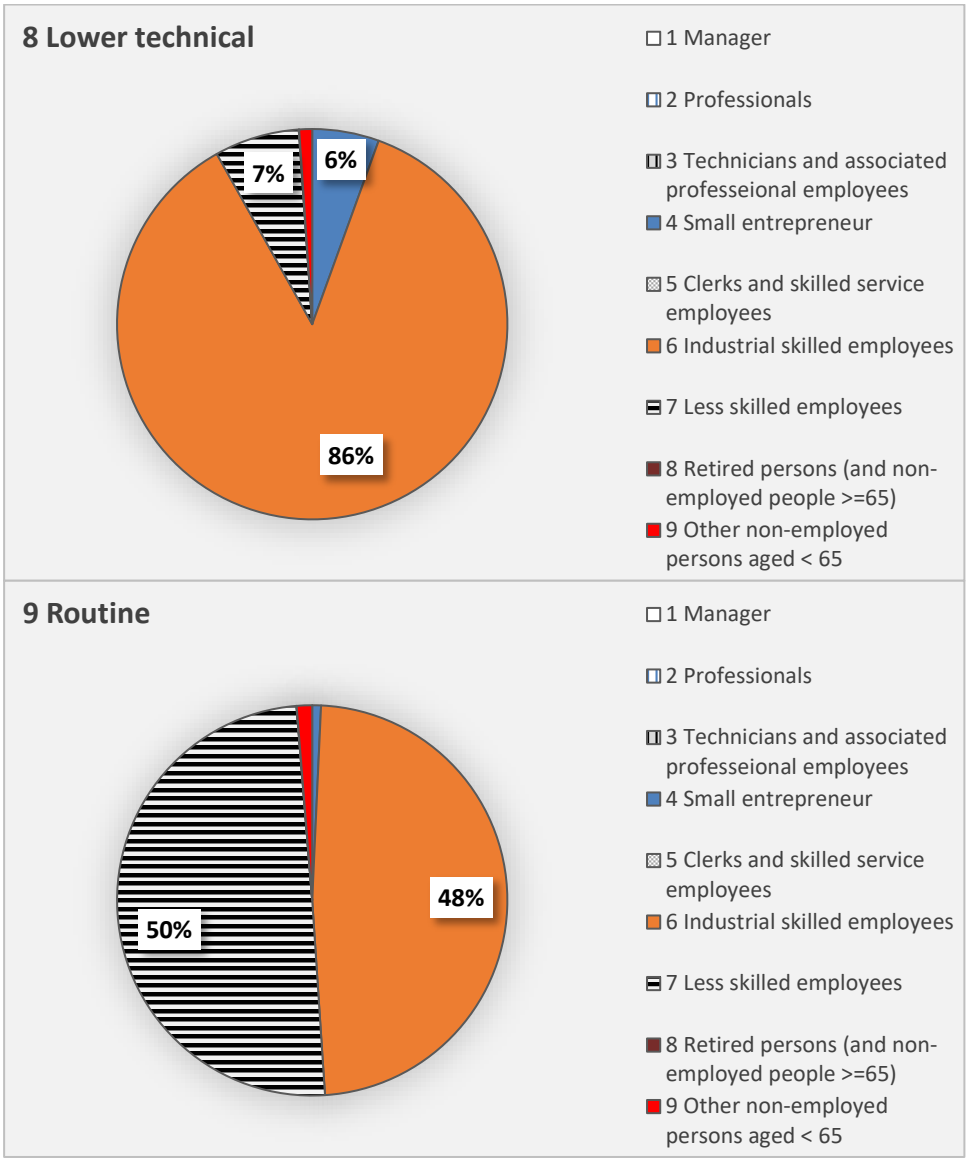
Figure 1 -9: ESeC08 by ESeG:

Source: Eurostat (2022): EU-SILC 2011. Own calculations, data not weighted




3 Intermediate occupations
20%
78%
1 Manager
2 Professionals
3 Technicians and associated professeional employees
4 Small entrepreneur
5 Clerks and skilled service employees
6 Industrial skilled employees
7 Less skilled employees
8 Retired persons (and non-employed people >=65)
9 Other non-employed persons aged < 65
4 Small employers & self-empl.,non-agriculture
21%
78%
1 Manager
2 Professionals
3 Technicians and associated professeional employees
4 Small entrepreneur
5 Clerks and skilled service employees
6 Industrial skilled employees
7 Less skilled employees
8 Retired persons (and non-employed people >=65)
9 Other non-employed persons aged < 65
5 Small employers & self-empl, agriculture
99%
1 Manager
2 Professionals
3 Technicians and associated professeional employees
4 Small entrepreneur
5 Clerks and skilled service employees
6 Industrial skilled employees
7 Less skilled employees
8 Retired persons (and non-employed people >=65)
9 Other non-employed persons aged < 65


6 Lower supervisors and technicians
18%
40%
41%
1 Manager
2 Professionals
3 Technicians and associated professeional employees
4 Small entrepreneur
5 Clerks and skilled service employees
6 Industrial skilled employees
7 Less skilled employees
8 Retired persons (and non-employed people >=65)
9 Other non-employed persons aged < 65
7 Lower sales and service
41%
57%
1 Manager
2 Professionals
3 Technicians and associated professeional employees
4 Small entrepreneur
5 Clerks and skilled service employees
6 Industrial skilled employees
7 Less skilled employees
8 Retired persons (and non-employed people >=65)
9 Other non-employed persons aged < 65


8 Lower technical
7%
6%
86%
1 Manager
2 Professionals
3 Technicians and associated professeional employees
4 Small entrepreneur
5 Clerks and skilled service employees
6 Industrial skilled employees
7 Less skilled employees
8 Retired persons (and non-employed people >=65)
9 Other non-employed persons aged < 65
9 Routine
50%
48%
1 Manager
2 Professionals
3 Technicians and associated professeional employees
4 Small entrepreneur
5 Clerks and skilled service employees
6 Industrial skilled employees
7 Less skilled employees
8 Retired persons (and non-employed people >=65)
9 Other non-employed persons aged < 65