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Working Paper

Flexicurity: Reconciling Social Security with Flexibility - Empirical Findings for Europe

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Flexicurity: Reconciling Social Security with Flexibility — Empirical Findings for Europe

Hartmut Seifert and Andranik Tangian

WSI-Diskussionspapier Nr. 154[1]

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Abstract

It is empirically shown that the more flexible employment, the more it is precarious. For this purpose, two families of indices, of flexible work and of precarious work, are defined basing on the *Fourth European Survey of Working Conditions 2005* by the European Foundation for the Improvement of Living and Working Conditions. Two methodologies of constructing composite indicators are applied, of the Hans Böckler Foundation, and of the OECD. Both methodologies give very similar results. After the indices have been constructed, the dependence between flexibility and precariousness of work is established by regression analysis with statistical certainty.

Besides, it is revealed that the institutional regulation of employment does not necessarily imply the adequate factual effect. For instance, Turkey and Greece with a strict employment protection legislation have a high labour market flexibility due to a large fraction of employees who work with no contract.

Among other things, it is shown that the employment flexibility has the strongest negative effect on the employability. It implies serious arguments against the recent reconsideration of the function of social security attempted by the European Commission within the flexicurity discourse. The suggested shift from income security towards a high employability cannot be consistently implemented. Our study provides empirical evidence that a high employability can be hardly attained under flexible employment.

Keywords

Flexicurity, labour flexibility, precarious work, composite indicators, European Commission, European Employment Strategy

JEL Classification

C43 — Index Numbers and Aggregation

C51 — Model Construction and Estimation

J21 — Labor Force and Employment, Size, and Structure

J88 — Public Policy

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1. Introduction

The European Commission's (2006) *Green Paper: Modernising Labour Law to Meet the Challenges of the 21st Century* has put *flexicurity* on the top of political agenda. This hybrid term has become one of the more fashionable elements of the European political discourse when it comes to addressing social and economic policies in general and employment policies in particular. But still there is no unambiguous understanding of flexicurity, to say nothing of its operational definition.

The term flexicurity was launched in the Netherlands during the preparation of the *Dutch Flexibility and Security Act* which came into force in 1999. The term was rapidly picked up by labour market researchers, who discovered Denmark as an alternative to the Dutch flexicurity model (WSI 2000). In both countries flexible employment relations are compensated by advantages in social security and employment security, so that many scholars describe flexicurity as a flexibility–security trade-off (Wilthagen and Tros 2004).

The Dutch and Danish experience proves that alternative approaches to simple deregulation of labour market can be successful in providing high levels of flexibility without attaining it at the cost of increased workers insecurity. Hence, flexicurity offers options for a market with a human face, fitting European models of capitalism better than pure flexibilization under the deregulatory approach of the American model.

In both countries — Denmark and the Netherlands — flexicurity is regarded as a response to challenges of globalisation. On the one hand, enterprises can easily adapt to changing needs and requirements. Flexicurity enhances their competitiveness and further economic growth. On the other hand, flexicurity contributes to social coherence by achieving a high degree of employment security and of social security.

Under flexicurity, both dimensions of security – employment and social security — are equally taken into account. However, the approach of the EC *Green Paper* on labour law is rather one-sided, focusing primarily on employment security and turning a blind eye to the second important factor — social security, including income security.

As for flexibilization, the longstanding assumption, that extensive deregulation and flexibilisation of labour market would automatically lead to higher levels of production and therefore, ultimately, to higher income and better social security, is now put in question. Even the OECD retreats from its former radical position. It admits that there is no clear relation between the level of employment protection and the level of unemployment. Consequently, deregulation is not a universal mean to improve labour market performance.

The link between employment protection legislation and employment trends is weaker than suggested in the neo-classical theory. As recognized in a recent OECD paper (Brandt et al. 2005), the deregulation of labour markets in the OECD countries had a little impact on employment. For example, German flexibilization reforms in 1994–2004 were accompanied by increasing unemployment. In Spain, on the contrary, unemployment significantly decreased without any tangible deregulation of the strictly regulated labour market. There is evidence that a high level of employment and a low level of unemployment can be attained under different models of labour market regulations (Howell et al. 2006; OECD 2006; Baker et al. 2005).

These studies also show that flexibility results in a high risk of exacerbating social and income inequalities. Indeed, employees with non-standard contracts have disadvantageous income, lower employment stability and limited access to company-based professional training (OECD 2002 and 2006). Besides, deregulation results in segmented labour markets, with some workers enjoying a high degree of security and others being trapped in less secure employment with poor career prospects.

All these problems should be solved by flexicurity. It is expected that it will improve the employability and mobility of employees, providing stable employment, better access to company-based training, and offering opportunities to move into better jobs.

This paper examines the relationship between flexibility and social security, respectively, precariousness of work in 31 European countries. It starts with defining and operationalizing flexibility and precariousness. The next step describes the model for processing data which stems from *The Fourth European Working Conditions Survey 2005* by the European Foundation (2007). After that two indices of flexibility and precariousness of work are applied to evaluate European countries and to investigate the interdependence between these aspects of work. The paper continues with the main findings. It reveals that flexibility and precariousness of work are correlated with statistical certainty and that flexibility has a significant negative impact on employability.

2. Flexibility of work

Flexibility is regarded as a *sine qua non* of structural change, economic growth and reduction of unemployment (Standing 1999). It covers a broad range of various measures which allow companies to adapt to new situations. At the same time, the concept of flexibility often remains ill-defined. Neither flexibility types are considered and classified with respect to their different functions and their implications for labour market and social security.

According to segmentation theorists (Döringer/Piore 1971), labour market consists of various segments with particular operation rules. To describe the segments, it is appropriate to distinguish between several types of flexibility. Another reason for such a distinction is the necessity to deal with different constellations of emerging problems, like short-term surges in demand, or seasonal and cyclical fluctuations with specific adjustment requirements.

One of basic flexibility classifications was proposed by the OECD (Atkinson 1984; OECD 1986 and 1989). It was originally designed for company adaptation strategies and reflected requirements of employers rather than that of employees. Our considerations (Keller/Seifert 2006) extend and modify this pattern to the end of analysing the influence of flexibilisation on social security and working conditions.

The main distinction is made between *internal* and *external flexibility*. Internal flexibility covers all strategies of deploying the firm's labour to competition needs without resorting to the external labour market. This includes, in particular, adjusting working time (internal numerical flexibilisation), income (wage flexibilisation), and work organisation (functional flexibilisation). By contrast, external flexibility is based above all on ”traditional” ways of adjusting the number of employees by recruitments, dismissals, as well as using fixed-term and temporary agency employment.

The second distinction is made between *numerical*, *functional*, and *monetary (wage) flexibility*. "Numerical" refers to adjustments which can be expressed in some 'labour units': recruitments, dismissals, temporary contracts, variability of working time, overtime work, etc. Functional flexibility characterizes this scope to adjust tasks, work organisation, etc. Monetary flexibility describes the adjustability of wages to the market demand, company performance, and individual productivity.

The types of flexibility interact with each other, e.g. internal numerical and internal functional adjustments are simultaneously negotiated in pacts for employment and competitiveness aimed at reducing both amount of work and labour costs (Sisson/Artiles 1999; Freyssinet/Seifert 2001; Seifert/Massa-Wirth 2005). Alternatively, flexibility forms can substitute one another. For example, internal numerical flexibility can replace external numerical flexibility. To adjust labour input companies have the option to reduce the number of employees or of their working hours. The forms and combinations of flexibility types depend on the national labour market regulation, particular management needs, and the company's cost-benefit balance.

In spite of the evident importance of the topic discussed, there are surprisingly few works on operationalizing and measuring flexibility. The most cited contribution of this kind is the OECD (1999 and 2004) evaluation of external numerical flexibility with a composite indicator of strictness of employment protection legislation (EPL). The indicator is used for international comparisons and for analysis of the influence of labour market regulation on the labour market performance.

The EPL-indicator of the OECD, however, is restricted exclusively to institutional aspects of flexibilization (how rigid is the legal framework) and is based on judgements of the OECD experts (which can be subjective). It reflects neither the factual situation (how regulation is practiced in single countries, its applicability to all labour market segments), nor empirical data (how large are the groups with certain types of contract, how many people are protected/not protected by the legislation). Besides, it evaluates the protection of permanent and fixed-term employment from different viewpoints, so that fixed-term contracts look often much better protected than permanent ones.[2] And, moreover, different forms of internal flexibility are not considered.

3. Social security and precariousness of work

Pros and cons of flexibilization are disputed mainly at the level of logical arguments and normative models rather than at the level of empirical findings. The adherents of liberalization assure that social security will benefit from a relaxed employment protection, because it will stimulate production and bring additional jobs, higher profits, and, consequently, higher tax payments to the state budget. The adherents of the European welfare model fear that flexibility can destabilise employment, deteriorate working conditions, reduce wage level and tax liability of the population, and increase inequality and social tension.

The major issue of the flexicurity debate is the impact of flexibilization on employment regarded from the viewpoint of social security. The first step to operationalise the problem is specifying

[2] EPL-scores of temporary employment are higher than that of temporary employment for Belgium (1.7 and 2.6, respectively), France (2.5 and 3.6), Greece (2.4 and 3.3), Italy (1.8 and 2.1), Norway (2.3 and 2.9), Spain (2.6 and 3.5), and Turkey (2.6 and 4.9); see OECD (2004: 117).

the quality of employment by appropriate criteria, similarly as flexibility is specified by different dimensions. One way of doing it is characterizing employment in terms of *precarious–decent work* (ILO 1999). Keller and Seifert (2006) suggest four criteria:

Income. The level of income should be sufficient for subsistence. The usual reference is the low-wage threshold set at two thirds of the median wage level of the full-time employed.

Employment stability. It is understood in the sense of employment with a minimum of interruptions. This is a prerequisite for independent income and eligibility for social security benefits. Here, employment stability is understood with respect to labour market in general rather than with respect to the current job.

Employability. It is understood as the capacity to be employed and is therefore a prerequisite for employment stability. The importance of employability increases because of rapid structural change with corresponding requirements to qualification and functional adaptability. Employability can be secured through lifelong learning.

Integration in social security system. This criterion embraces pension funds, unemployment insurance, and health insurance. Due to the lack of available data this criterion is not considered in the model.

It is suspected that different flexibility forms influence the precariousness forms in different ways. Thus external numerical flexibility affects above all employment stability. Indeed, a loss of a job is usually followed by a career interruption and a certain drawback in re-employment conditions, — although it is conceivable that even a non-benevolent career break finally ends in a better employment situation. Besides, external flexibility includes atypical employment (fixed-term contracts, temporary agency work) with its relative low wages, low employment stability and poor access to company-based training (OECD 2002 and 2006).

By contrast, employment stability should be higher under internal numerical flexibility, because it does not concern dismissals or using atypical employment but is restricted to working time arrangements and internal restructurings. Working time flexibility is inherent in European countries at different degrees. The differences depend on national governmental regulations (European Commission 2001).

Internal numerical flexibility must have no negative impact on employability. Indeed, since the employees work in the company for a long time, both the employees and the company are motivated to improve professional skills. This hypothesis follows considerations of the theory of human capital.

Internal numerical flexibility is likely linked to internal functional flexibility, because workers often switch not only between working time options but also between different tasks within the company. For example, when Volkswagen company reduced the weekly working hours by 20% to 28.8 hours to avoid dismissals in the early 1990s, it was necessary to move employees from one department to another to equalize the different degree of capacity utilisation between departments. Respectively, the employees were charged with new tasks (Promberger et al. 1996).

Besides, internal numerical flexibility with different schedules of working time can cause wage flexibility dependent on duration and location of working hours.

Thus, the criteria of flexibility and precariousness of work can be implemented in partial and aggregate indicators with which the above formulated hypothesis can be empirically tested.

4. Indices of flexibility and social security

Our goal is to construct indices of flexibility and precariousness of work and to analyse their interdependence. The empirical data are taken from the *Fourth European Working Conditions Survey* of the European Foundation (2007) which is based on a questionnaire on various aspects of working conditions. In the *Survey*, 29860 persons from 31 European countries (EU-25 and Bulgaria, Croatia, Romania, Turkey, Norway, and Switzerland) are interviewed. Each country is represented by ca. 1000 interviews, except for Cyprus, Estonia, Malta, Luxembourg, and Slovenia with about 600 interviews each. After having excluded all non-employees (trainees, self-employed, and unemployed), the number of persons considered is reduced to 23788.

The data structure for the model can be imagined as a large table, where each row consists of answers of an individual to selected 42 questions: 29 on flexibility (5 groups by types of flexibility), and 13 on precariousness of work (3 groups); see the Annex for the full list of variables and their groups. Each column with 23788 coded answers to the given question is regarded as a variable. All variables are recoded to respect the rule: the higher the value, the more flexible (precarious) is work; for details see Tangian (2005, 2006, and 2007a –b).

The next step is scaling re-coded variables. We apply two ways of scaling, *normalization*, which is inherent in the methodology of the Hans-Böckler Foundation (HBS), and *standardization*, which is inherent in the methodology of the OECD and Joint Research Center of the European Communities (JRC).

Under normalization (HBS method), the variable's *min* and *max* are reduced to 0 and 1, respectively. Optionally, the variable is expressed in % of its range. For this purpose, every variable $x = (x_1, \ldots, x_n)'$ (in our study n = 23788 employees interviewd) is transformed to

$$y = \frac{x - x_{\min}}{x_{\max} - x_{\min}} \cdot 100\% \quad \text{(normalized variable expressed in \%)}$$

Normalization is not applicable to data with outliers — occasional deviations from ‘typical’ values. In this case normalization clusters ‘typical’ values, making them almost indistinguishable. The data of the *Survey* do not contain outliers, because the codes of answers to survey questions are restricted to a few given values. Continuous variables of large range are calibrated. For instance, income is restricted to 10 deciles. Therefore, normalization can be consistently applied.

An alternative scaling is recommended by the OECD (OECD–JRC 2005 and European Commission 2002). Every variable is *standardized*, that is, its *mean* and *standard deviation* are reduced to 0 and 1. Optionally, the variable is expressed in % of the standard deviation. For this purpose, every variable $x = (x_1, \ldots, x_n)'$ is transformed to

$$y = \frac{x - \mu}{\sigma} \cdot 100\% \quad \text{(standardized variable expressed in \%)} \tag{1}$$

where

$$\mu = \frac{1}{n} \sum_{i=1}^{n} x_i \quad \text{(empirical mean)}$$

$$\sigma = \sqrt{\frac{1}{n-1} \sum_{i=1}^{n} \left(x_i - \mu \right)^2} \quad \text{(unbiased empirical standard deviation).}$$

The 0 value of y corresponds to the mean of the variable x, and 100% — to its 'average deviation from the mean'.

Unlike normalization, this method well discriminates between closely located 'typical' values even in the presence of outliers. In this case the small standard deviation factually enlarges the min–max range and 'moves' the 'typical' values from each other. At the same time, standardization relativizes 'good' and 'bad' values. Therefore standardization is adapted rather for benchmarking than for evaluation.

Taking into account advantages and limitations of normalization and standardization, it makes sense to construct indices by both methods. Under both methods, low-level individual indices are summarized with or without weights. According to OECD–JRC (2005: 21), 'most composite indicators rely on equal weighting, i.e., all variables are given the same weight', and we follow this principle. However, standardization, changing the effective range of variables, implicitly introduces equalizing weights.

Each of eight first-level aggregate individual indices (five for flexibility types and three for precariousness types), called *partial indices*, is obtained by taking the mean of the variables from one of five flexibility or one of three precariousness groups of variables. Under the OECD method, the resulting mean is additionally standardized. The second-level aggregate indices of flexibility and precariousness of work are obtained from partial indices in the same way.

The interpretation of the individual aggregate and partial indices is as follows. Under the HBS method, a partial index means the average (coded) response of the individual to the related questions. 0 and 100 are attained if *all* the questions are answered in the most extreme way.

Under the OECD method, a composite indicator is a weighted sum of low-level variables, with the weights being inversely proportional to their standard deviations. Under multiple aggregation, standardization performs indirect weighting of intermediate aggregates, so that smaller partial indices (intermediate aggregates) can result in a greater final index, and greater partial indices — in a smaller final index.

The difference between the results can be seen in Figures 1–2 with indices of flexibility and precariousness of work for all 31 countries constructed by the HBS method (Figure 1) and OECD method (Figure 2). Each country index is obtained as the national average of the corresponding individual indices.

The contribution of partial indices to the aggregate indices is shown by colour bars with the values of partial indices given in %. The OECD method attributes unequal weights to variables with different range which is reflected by the size of colour bars. For example, under the HBS method, the contribution of externalization flexibility to the aggregate flexibility is the least. Under the OECD method, its role is equalized with other types of flexibility.

The countries are ordered by the aggregate flexibility and precariousness indicated in % at the right-hand end of bars. Under the HBS method, the aggregate index is the mean of the partial indices, and it is proportional to the total length of the colour bars. Under the OECD method, the aggregate index is not proportional to the total length of colour bars. It is seen in the non-monotonic decrease of the total bar length contrary to monotonically decreasing aggregate index — the side effect of successive standardizations.

Due to such misleading effects, *the results of the OECD method can be difficult to interpret*. Still, we provide results obtained by both methods.

Figure 1. Composition of country indices normalized (HBS methodology: 0%—absolute minimum, 100%—absolute maximum) for flexibility and precariousness of work

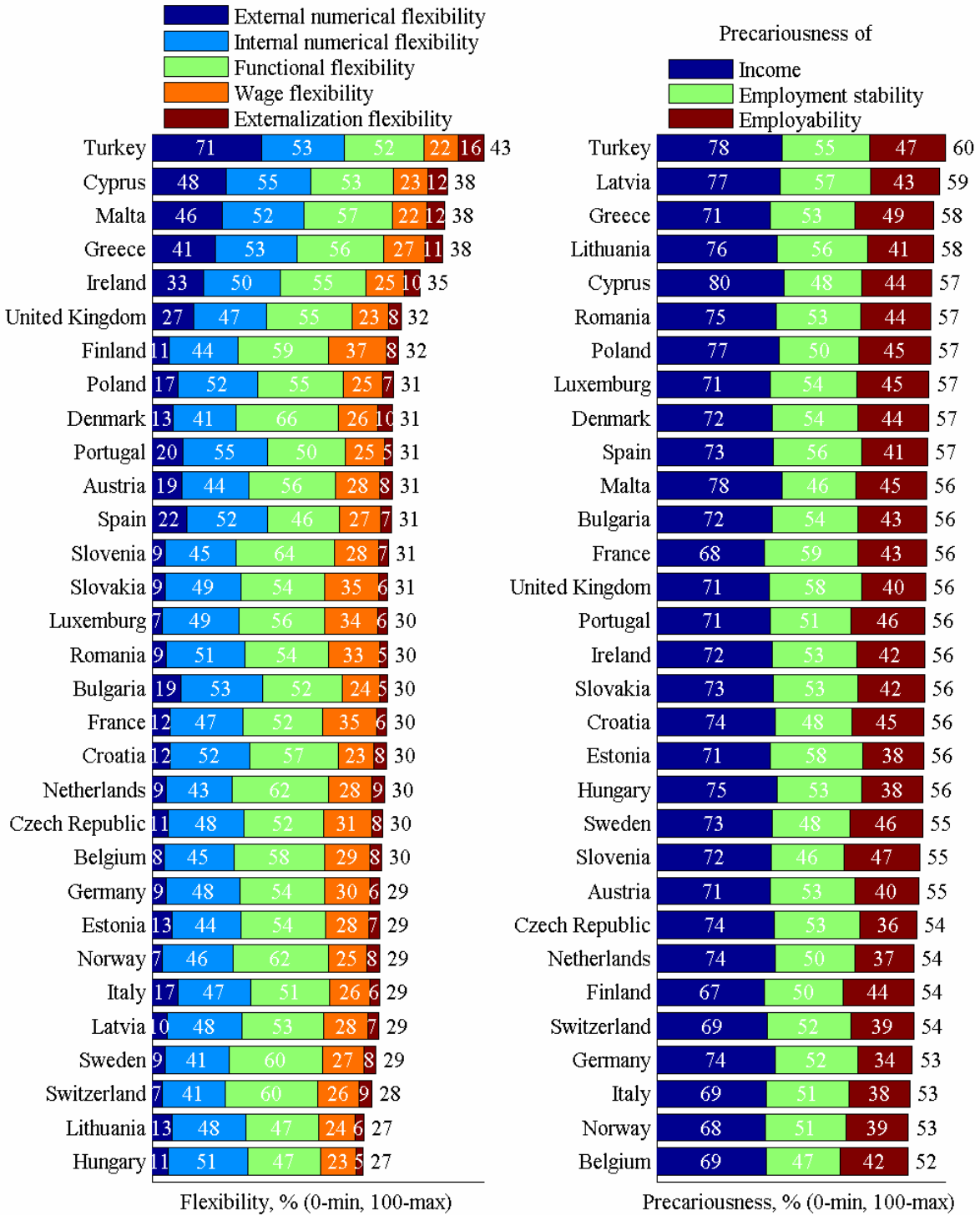
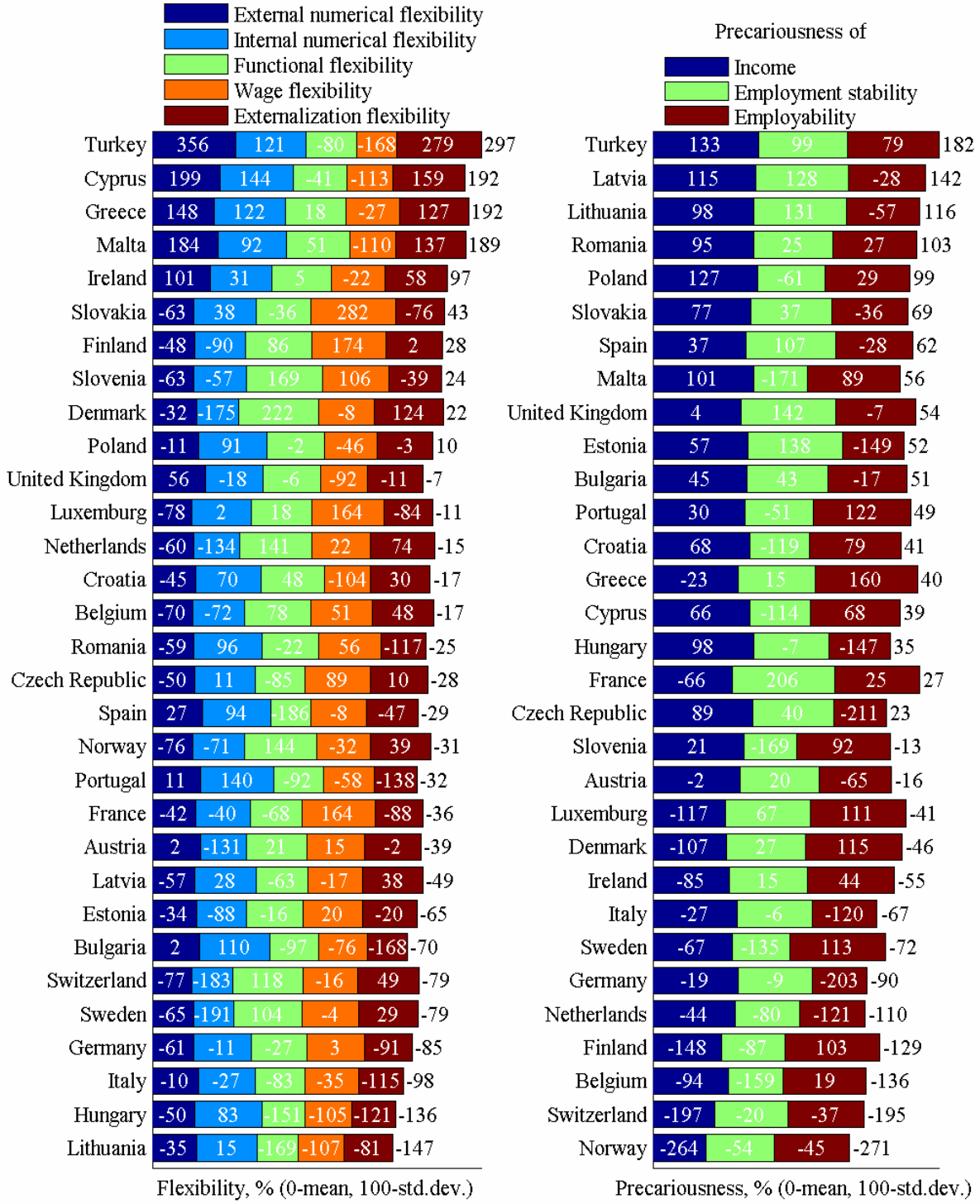


Figure 2. Composition of country indices standardized (OECD methodology: 0%—mean, 100%—standard deviation) for flexibility and precariousness of work



5. Analysis

5.1. Institutional and factual flexibility of work

Figures 1–2 display indices of factual flexibility and precariousness of work in European countries. They show a completely different picture compared to the indicator of employment protection legislation (EPL) of the OECD (2004: 117, for the year 2003); see Table 1. According to the EPL-indicator, Turkey has the most strict employment protection legislation among all the OECD countries. Since the EPL-indicator is generally used to characterize the external numerical flexibility, Turkey would be expected at the bottom of Figures 1 and 2. However, Turkey is at the top, moreover, it has by far the highest external numerical flexibility (71% in Figure 1 and 356% in Figure 2). Figure 2 based on standardized indices additionally shows that Turkey deviates from the European mean 0 upwards twice as much as Lithuania deviates from it downwards (the closest to the European mean 0% is the United Kingdom with flexibility index of -7%).

This contradiction is explained as follows. The OECD evaluation is based on *institutional* arrangements, showing that the Turkish employment protection legislation is the most rigid among the OECD countries. The *empirical* survey reveals that 302 of the sample of 454 employees (in fact, 459 but 5 did not answer) work with no contract, meaning that 67% of all employees are not under labour market regulation and are working in the most flexible way. A similar situation is inherent in Malta, where 201 of 507 = 40% employees work with no contract, Cyprus (201 of 482 = 42%), and Greece (179 of 629 =28%) — another OECD country with a very strict employment protection, see OECD (2004: 117). All of these are displayed in Table 1.

On the other hand, the United Kingdom with a renown relaxed employment protection legislation (ranked by the EPL-index of the OECD as the next to last, the last being the USA) has only 130 of 876 (= 15%) employees with no contract. Since a relaxed employment protection is still more restrictive than none, the United Kingdom with the aggregate flexibility 32% (by the HBS method; in the estimation by the OECD method it is even below the European mean!) finds itself behind Turkey whose strict legislation is factually applicable to 1/3 of employees only.

Thereby *factual and institutional situations drastically differ.*

5.2. Flexibility-security nexus in Europe

Figures 3–4 show the location of European countries on the flexibility–precariousness coordinate plane. No country is located in the bottom-right corner of the plot, where high flexibility coexists with low precariousness or high social security. This main target of the European Commission's flexicurity concept looks hardly attainable in practice. The reality is still far from theoretical considerations.

The regression line in Figure 3 computed by the HBS method for 31 European countries also shows that the precariousness of work grows as flexibility increases. The slope of the regression line is 28% (see the first regression equation beyond the plot). The negligible small P-value $P_F = 0.0034$ excludes the null hypothesis, that the real slope of the line can be zero.

The regression line in Figure 4 computed by the OECD method for 31 countries has the slope 26%, but the countries are located somewhat differently, and the P-value $P_F = 0.1584$.

Table 1. Institutional and factual external numerical flexibility for employees in European countries / ranks

	Institutional flexibility	Factual flexibility		
	Strictness of employment protection legislation ~ the opposite to the external numerical flexibility (OECD 2004, for the year 2003); the ranking relates to flexibility	External numerical flexibility (HBS method)	External numerical flexibility (OECD method)	Employment with no contract
	OECD score 0–5	Normalized %	Standardized %	%
United Kingdom	0.7 / 1	27 / 6	56 / 6	15 / 6
Ireland	1.1 / 2	33 / 5	101 / 5	25 / 5
Switzerland	1.1 / 2	7 / 31	–77 / 30	4 / 20
Denmark	1.4 / 3	13 / 13	–32 / 13	8 / 11
Hungary	1.5 / 4	11 / 20	–50 / 19	4 / 18
Poland	1.7 / 5	17 / 12	–11 / 12	6 / 13
Czech Republic	1.9 / 6	11 / 19	–50 / 20	2 / 27
Italy	1.9 / 6	17 / 11	–10 / 11	9 / 8
Austria	1.9 / 6	19 / 9	2 / 9	11 / 7
Slovakia	1.9 / 6	9 / 25	–63 / 25	2 / 29
Finland	2.0 / 7	11 / 18	–48 / 18	3 / 24
Netherlands	2.1 / 8	9 / 23	–60 / 23	2 / 26
Belgium	2.2 / 9	8 / 28	–70 / 28	3 / 23
Germany	2.2 / 9	9 / 24	–61 / 24	3 / 21
Sweden	2.2 / 9	9 / 27	–65 / 27	1 / 30
Norway	2.6 / 10	7 / 29	–76 / 29	3 / 22
Greece	2.8 / 11	41 / 4	148 / 4	32 / 4
France	3.0 / 12	12 / 16	–42 / 16	5 / 16
Spain	3.1 / 13	22 / 7	27 / 7	9 / 10
Portugal	3.5 / 14	20 / 8	11 / 8	9 / 9
Turkey	3.7 / 15	71 / 1	356 / 1	67 / 1
Estonia	–	13 / 14	–34 / 14	7 / 12
Cyprus	–	48 / 2	199 / 2	42 / 2
Latvia	–	10 / 21	–57 / 21	4 / 19
Lithuania	–	13 / 15	–35 / 15	5 / 15
Luxemburg	–	7 / 30	–78 / 31	1 / 31
Malta	–	46 / 3	184 / 3	41 / 3
Slovenia	–	9 / 26	–63 / 26	2 / 28
Bulgaria	–	19 / 10	2 / 10	6 / 14
Croatia	–	12 / 17	–45 / 17	2 / 25
Romania	–	9 / 22	–59 / 22	5 / 17

Figure 3. Dependence between aggregated flexibility and precariousness indices normalized (HBS methodology) for European countries: BE—Belgium, CZ—Czech Republic, DK—Denmark, DE—Germany, EE—Estonia, EL—Greece, ES—Spain, FR—France, IE—Ireland, IT—Italy, CY—Cyprus, LV—Latvia, LT—Lithuania, LU—Luxemburg, HU—Hungary, MT—Malta, NL—Netherlands, AT—Austria, PL—Poland, PT—Portugal, SI—Slovenia, SK—Slovakia, FI—Finland, SE—Sweden, UK—United Kingdom, BG—Bulgaria, HR—Croatia, RO—Romania, TR—Turkey, NO—Norway, CH—Switzerland

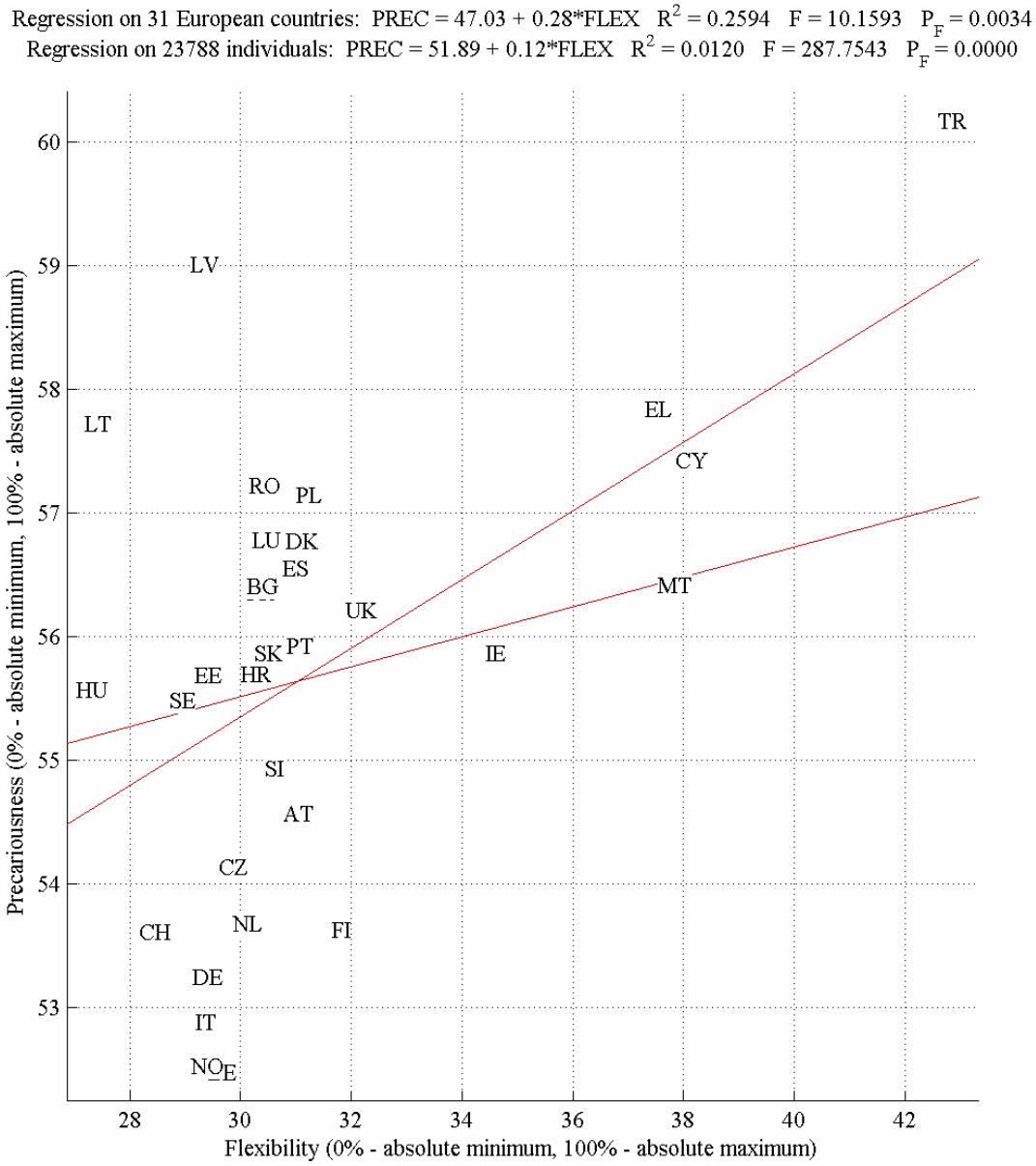
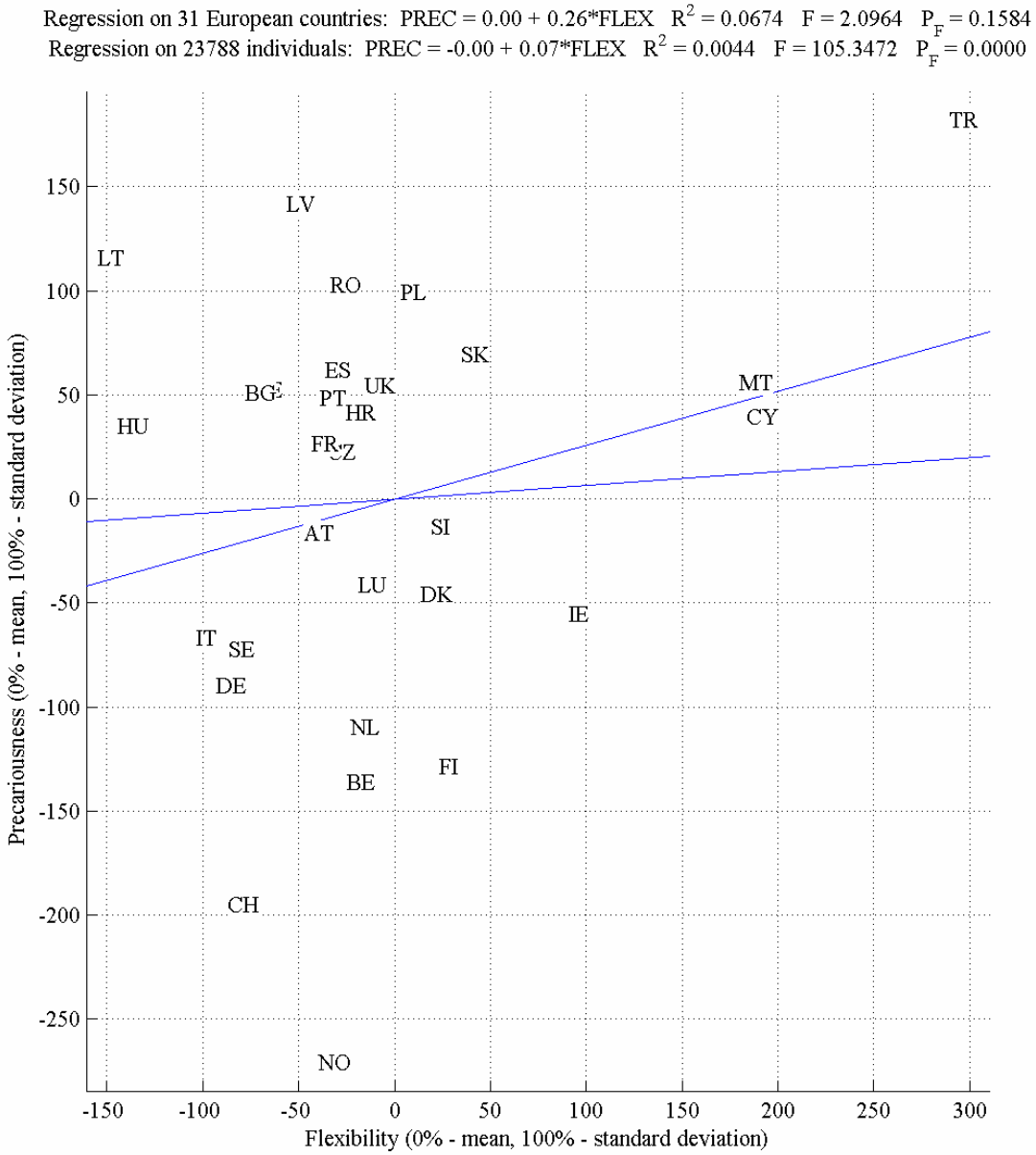


Figure 4. Dependence between aggregated flexibility and precariousness indices standardized (OECD methodology) for European countries: BE—Belgium, CZ—Czech Republic, DK—Denmark, DE—Germany, EE—Estonia, EL—Greece, ES—Spain, FR—France, IE—Ireland, IT—Italy, CY—Cyprus, LV—Latvia, LT—Lithuania, LU—Luxemburg, HU—Hungary, MT—Malta, NL—Netherlands, AT—Austria, PL—Poland, PT—Portugal, SI—Slovenia, SK—Slovakia, FI—Finland, SE—Sweden, UK—United Kingdom, BG—Bulgaria, HR—Croatia, RO—Romania, TR—Turkey, NO—Norway, CH—Switzerland



The second regression line in both plots is fitted to 23788 individuals. It is less steep, having the slope 12% and 7% for the indices computed by the HBS and OECD methods, respectively (see the second equation over the plots). However, due to a much larger number of observations than for countries the P-value $P_F = 0.0000$ is negligibly small, so that the fact of positive correlation between flexibility and precariousness of work is statistically certain both under HBS and OECD methods.

Thus, *the regression analysis reveals a positive dependence between aggregate flexibility and aggregate precariousness of work all over Europe. The flexicurity domain of high flexibility and low precariousness is attained by no country.*

5.3. Impact of flexibility of work on employability

A more detailed analysis of the impact of flexibility of work on its precariousness is displayed in Figures 5–6, each replacing $34 \cdot 3 = 102$ graphs as in Figures 3–4. The first figure reflects the results obtained by the HBS method, and the second one — by the OECD method. Figure 7 displays both plots together to visualize the compatibility of the results obtained by both methods. As one can see, both methods give similar results, so consider Figure 5 (computed by the HBS method).

Figure 5 shows the regression coefficients for the dependence of partial indices of precariousness of work on single variables as well as on partial flexibility indices. If the dependence is questionable (the null hypothesis, that the coefficient is equal to 0, has probability > 0.05) then the regression coefficient is printed in grey font colour.

The figures show the following:

- External numerical flexibility has a low and often statistically non-significant influence on all precariousness dimensions except for employment stability which precariousness increases as flexibility grows
- Internal numerical flexibility implies a somewhat precarious income but improves the employability which is not surprising
- Functional flexibility increases the aggregate precariousness, especially the precariousness of employability, but has a positive influence on income and employment stability. The relative strong correlation between flexibility and precariousness of employability can be explained by a reciprocal influence of precariousness of employability on flexible employment. One can imagine that those with low employability are often employed flexibly rather than normally, finding themselves in the vicious circle of flexible–precarious work with little chances to escape
- Wage flexibility has little influence on the aggregate precariousness of work, decreases employability, but makes some positive impact on income and employment stability
- Externalization flexibility improves income, does not much affect employment stability, and decreases employability

The ranking and values of regression coefficients show that *the impact of functional flexibility on precariousness of employability is by far stronger than any other interaction. The next is the impact of wage flexibility, again on precariousness of employability.*

Figure 5. Regression coefficients for the dependence of aggregate indices of precarious work on low-level and aggregate indices of flexible work computed for 23788 individuals by the HBS method; non-significant deviation from zero with (P-value>0.05) is shown by grey font color

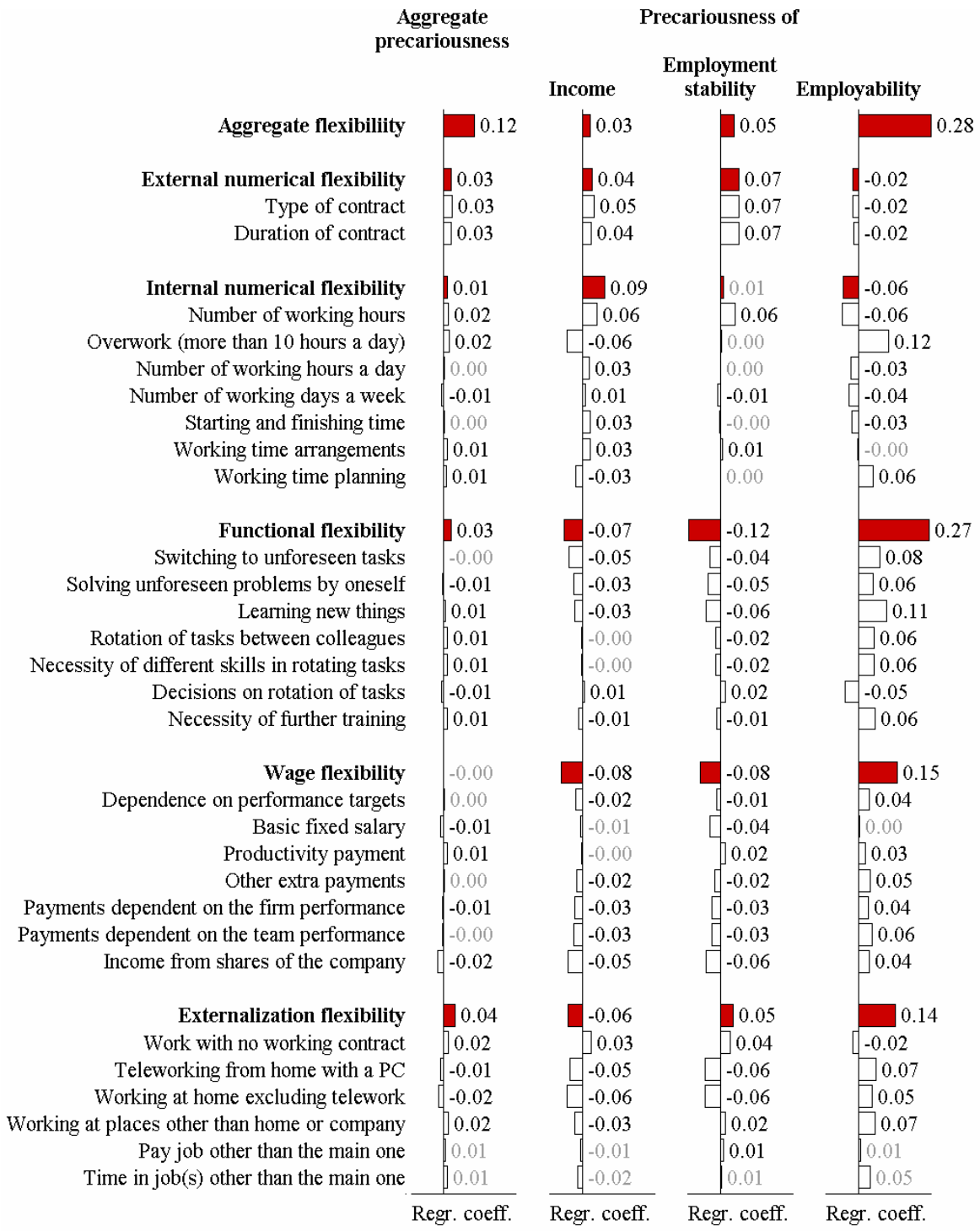


Figure 6. Regression coefficients for the dependence of aggregate indices of precarious work on low-level and aggregate indices of flexible work computed for 23788 individuals by the OECD method; non-significant deviation from zero (P-value>0.05) is shown by grey font color

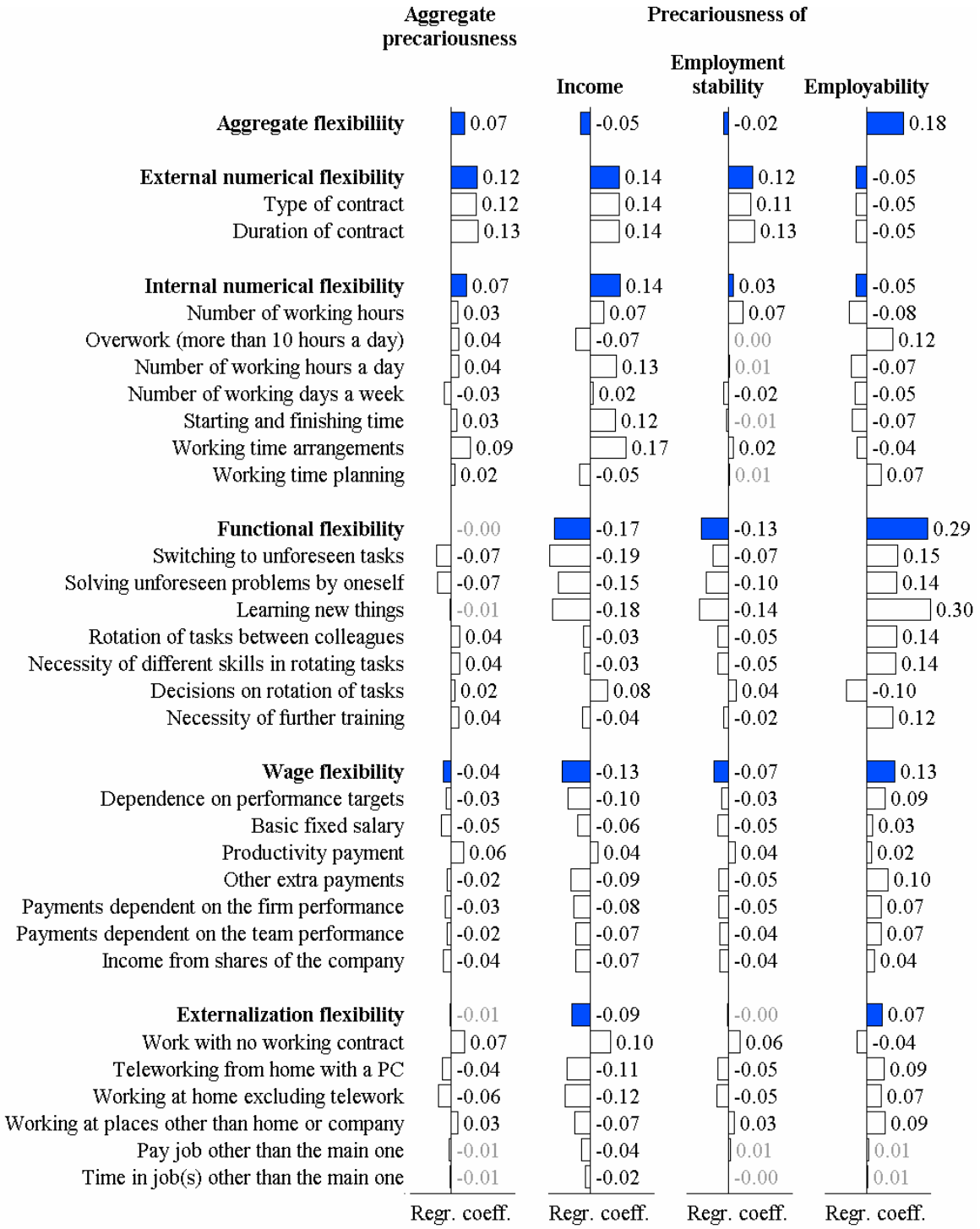


Figure 7. Regression coefficients for the dependence of aggregate indices of precarious work on low-level and aggregate indices of flexible work computed for 23788 individuals by the HBS method (1st bars, red for aggregate indices) and by the OECD method (2nd bars, blue for aggregate indices); non-significant deviation from zero with (P-value>0.05) is shown by grey font color

	Aggregate precariousness	Precariousness of Income	Precariousness of Employment stability	Precariousness of Employability
Aggregate flexibiliity	0.12 /0.07	0.03 /-0.05	0.05 /-0.02	0.28 /0.18
External numerical flexibility	0.03 /0.12	0.04 /0.14	0.07 /0.12	-0.02 /-0.05
Type of contract	0.03 /0.12	0.05 /0.14	0.07 /0.11	-0.02 /-0.05
Duration of contract	0.03 /0.13	0.04 /0.14	0.07 /0.13	-0.02 /-0.05
Internal numerical flexibility	0.01 /0.07	0.09 /0.14	0.01 /0.03	-0.06 /-0.05
Number of working hours	0.02 /0.03	0.06 /0.07	0.06 /0.07	-0.06 /-0.08
Overwork (more than 10 hours a day)	0.02 /0.04	-0.06 /-0.07	0.00 /0.00	0.12 /0.12
Number of working hours a day	0.00 /0.04	0.03 /0.13	0.00 /0.01	-0.03 /-0.07
Number of working days a week	-0.01 /-0.03	0.01 /0.02	-0.01 /-0.02	-0.04 /-0.05
Starting and finishing time	0.00 /0.03	0.03 /0.12	-0.00 /-0.01	-0.03 /-0.07
Working time arrangements	0.01 /0.09	0.03 /0.17	0.01 /0.02	-0.00 /-0.04
Working time planning	0.01 /0.02	-0.03 /-0.05	0.00 /0.01	0.06 /0.07
Functional flexibility	0.03 /-0.00	-0.07 /-0.17	-0.12 /-0.13	0.27 /0.29
Switching to unforeseen tasks	-0.00 /-0.07	-0.05 /-0.19	-0.04 /-0.07	0.08 /0.15
Solving unforeseen problems by oneself	-0.01 /-0.07	-0.03 /-0.15	-0.05 /-0.10	0.06 /0.14
Learning new things	0.01 /-0.01	-0.03 /-0.18	-0.06 /-0.14	0.11 /0.30
Rotation of tasks between colleagues	0.01 /0.04	-0.00 /-0.03	-0.02 /-0.05	0.06 /0.14
Necessity of different skills in rotating tasks	0.01 /0.04	-0.00 /-0.03	-0.02 /-0.05	0.06 /0.14
Decisions on rotation of tasks	-0.01 /0.02	0.01 /0.08	0.02 /0.04	-0.05 /-0.10
Necessity of further training	0.01 /0.04	-0.01 /-0.04	-0.01 /-0.02	0.06 /0.12
Wage flexibility	-0.00 /-0.04	-0.08 /-0.13	-0.08 /-0.07	0.15 /0.13
Dependence on performance targets	0.00 /-0.03	-0.02 /-0.10	-0.01 /-0.03	0.04 /0.09
Basic fixed salary	-0.01 /-0.05	-0.01 /-0.06	-0.04 /-0.05	0.00 /0.03
Productivity payment	0.01 /0.06	-0.00 /0.04	0.02 /0.04	0.03 /0.02
Other extra payments	0.00 /-0.02	-0.02 /-0.09	-0.02 /-0.05	0.05 /0.10
Payments dependent on the firm performance	-0.01 /-0.03	-0.03 /-0.08	-0.03 /-0.05	0.04 /0.07
Payments dependent on the team performance	-0.00 /-0.02	-0.03 /-0.07	-0.03 /-0.04	0.06 /0.07
Income from shares of the company	-0.02 /-0.04	-0.05 /-0.07	-0.06 /-0.04	0.04 /0.04
Externalization flexibility	0.04 /-0.01	-0.06 /-0.09	0.05 /-0.00	0.14 /0.07
Work with no working contract	0.02 /0.07	0.03 /0.10	0.04 /0.06	-0.02 /-0.04
Teleworking from home with a PC	-0.01 /-0.04	-0.05 /-0.11	-0.06 /-0.05	0.07 /0.09
Working at home excluding telework	-0.02 /-0.06	-0.06 /-0.12	-0.06 /-0.05	0.05 /0.07
Working at places other than home or company	0.02 /0.03	-0.03 /-0.07	0.02 /0.03	0.07 /0.09
Pay job other than the main one	0.01 /-0.01	-0.01 /-0.04	0.01 /0.01	0.01 /0.01
Time in job(s) other than the main one	0.01 /-0.01	-0.02 /-0.02	0.01 /-0.00	0.05 /0.01
	Regr. coeff.	Regr. coeff.	Regr. coeff.	Regr. coeff.

5.4. Dependence of precariousness and flexibility of work within European countries

Figure 8 (four sheets) represents the values of regression coefficients for the dependence between first-level and second-level aggregate indices computed with the HBS method for 31 countries. The countries are ordered by the decreasing dependence between aggregate indices (in the top-left plot). As one can see, the strongest dependence of precariousness of work on its flexibility is inherent in Norway, Germany, Poland and Croatia. The results for the indices constructed by the OECD method are similar, and we do not provide them here.

Since the number of employees interviewed in each country is about 400–800, which is much less than the total 23788, the statistical significance of the null-hypothesis (that the regression coefficient is equal to 0) is no longer negligibly small. The regression coefficients which deviation from 0 is statistically not significant (P-value > 0.05) are printed in grey font colour.

Note that Turkey with highest flexibility and highest precariousness of work (Figure 1) does not show a statistically significant dependence between both indices. At the same time, Norway with a relatively low flexibility and lowest precariousness of work (Figure 1) has the strongest dependence between both factors. One can suppose that the flexibility–precariousness dependence is strong in the countries with a well regulated and *little segmented* labour market. The countries with a strict regulation but segmented labour markets (as Turkey, where 2/3 employees work with no contract) can show no significant flexibility–precariousness dependence.

We conclude that *a high/low degree of interdependence between flexibility and precariousness of work within a country can be attained regardless of the level of both factors.* To explain the degree of interdependence other conditions should be taken into account (trust in government, tradition, etc.).

6. Conclusions

1. Composite indices of flexibility and precariousness of work and of their aspects are constructed by methodologies of the Hans Böckler Foundation, and of the OECD. Both families of indices show that the institutional regulation of employment does not necessarily imply the adequate factual effect. For instance, Turkey and Greece with a strict employment protection legislation have in practice a high labour market flexibility due to a large fraction of employees who work with no contract.

2. The analysis of interaction of flexibility and precariousness indices shows that the more flexible employment, the more it is precarious. Employment flexibility has the strongest negative effect on employability.

3. It implies serious arguments against the recent reconsideration of the function of social security attempted by the European Commission. A shift from income security towards a high employability within the flexicurity strategy cannot be consistently implemented. Our study provides empirical evidence that a high employability can hardly attained under flexible employment regimes.

Figure 8. Sheet A. Regression coefficients for normalized (HBS methodology) dependence of aggregate and partial indices of work precariousness from aggregate and partial flexibility indices by country; a non-significant difference of the coefficient from 0 ($P\{H_0\} > 0.05$) is shown by grey font color: BE—Belgium, CZ—Czech Republic, DK—Denmark, DE—Germany, EE—Estonia, EL—Greece, ES—Spain, FR—France, IE—Ireland, IT—Italy, CY—Cyprus, LV—Latvia, LT—Lithuania, LU—Luxemburg, HU—Hungary, MT—Malta, NL—Netherlands, AT—Austria, PL—Poland, PT—Portugal, SI—Slovenia, SK—Slovakia, FI—Finland, SE—Sweden, UK—United Kingdom, BG—Bulgaria, HR—Croatia, RO—Romania, TR—Turkey, NO—Norway, CH—Switzerland

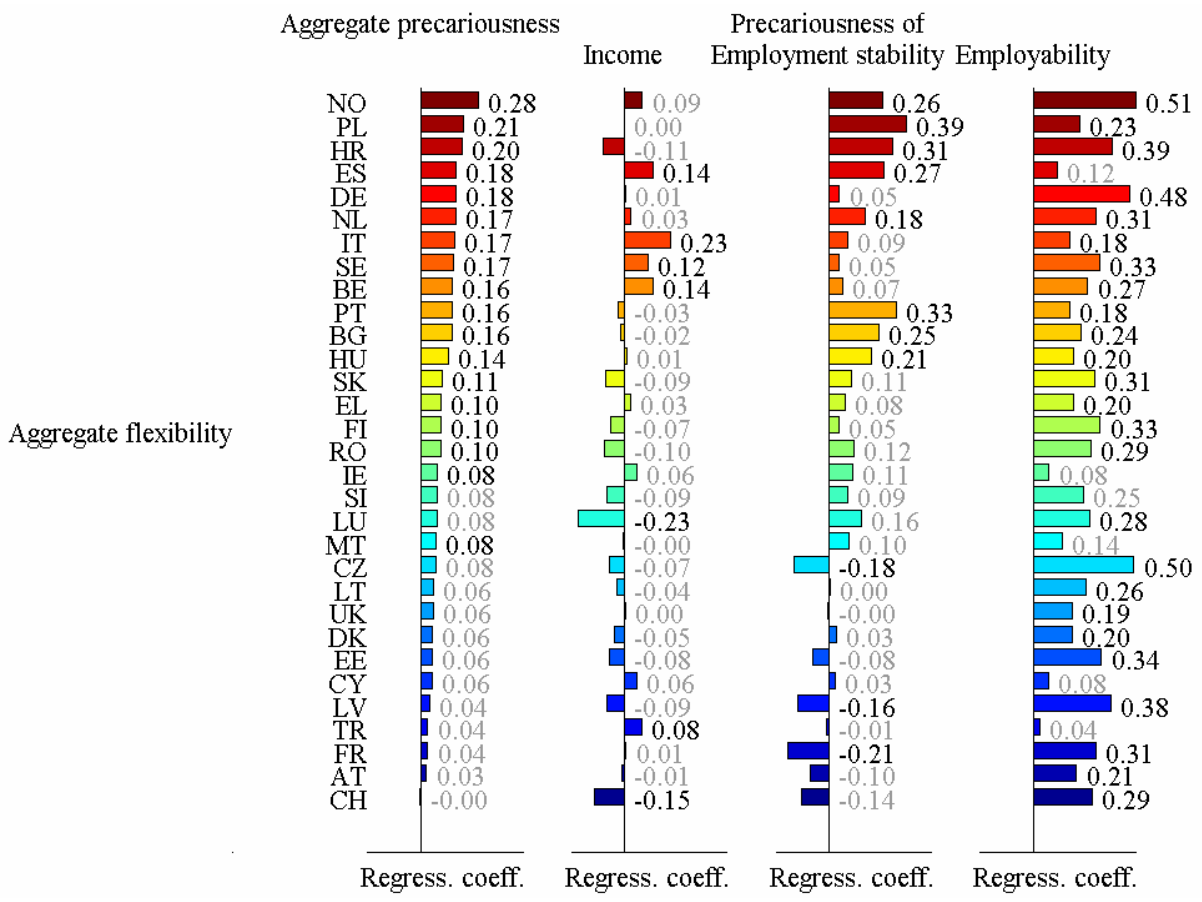


Figure 8. Sheet B. Regression coefficients for normalized (HBS methodology) dependence of aggregate and partial indices of work precariousness from aggregate and partial flexibility indices by country

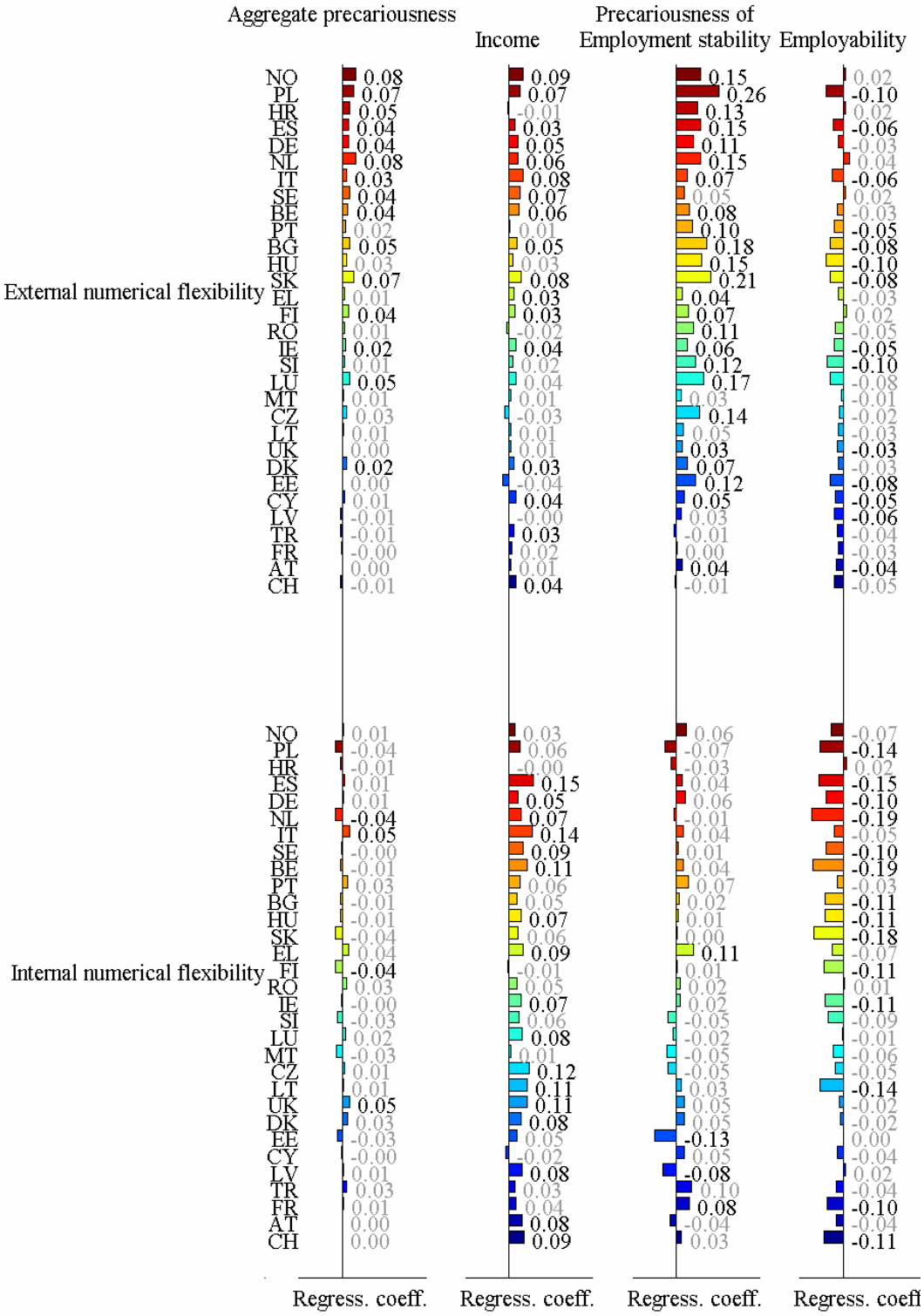


Figure 8. Sheet C. Regression coefficients for normalized (HBS methodology) dependence of aggregate and partial indices of work precariousness from aggregate and partial flexibility indices by country

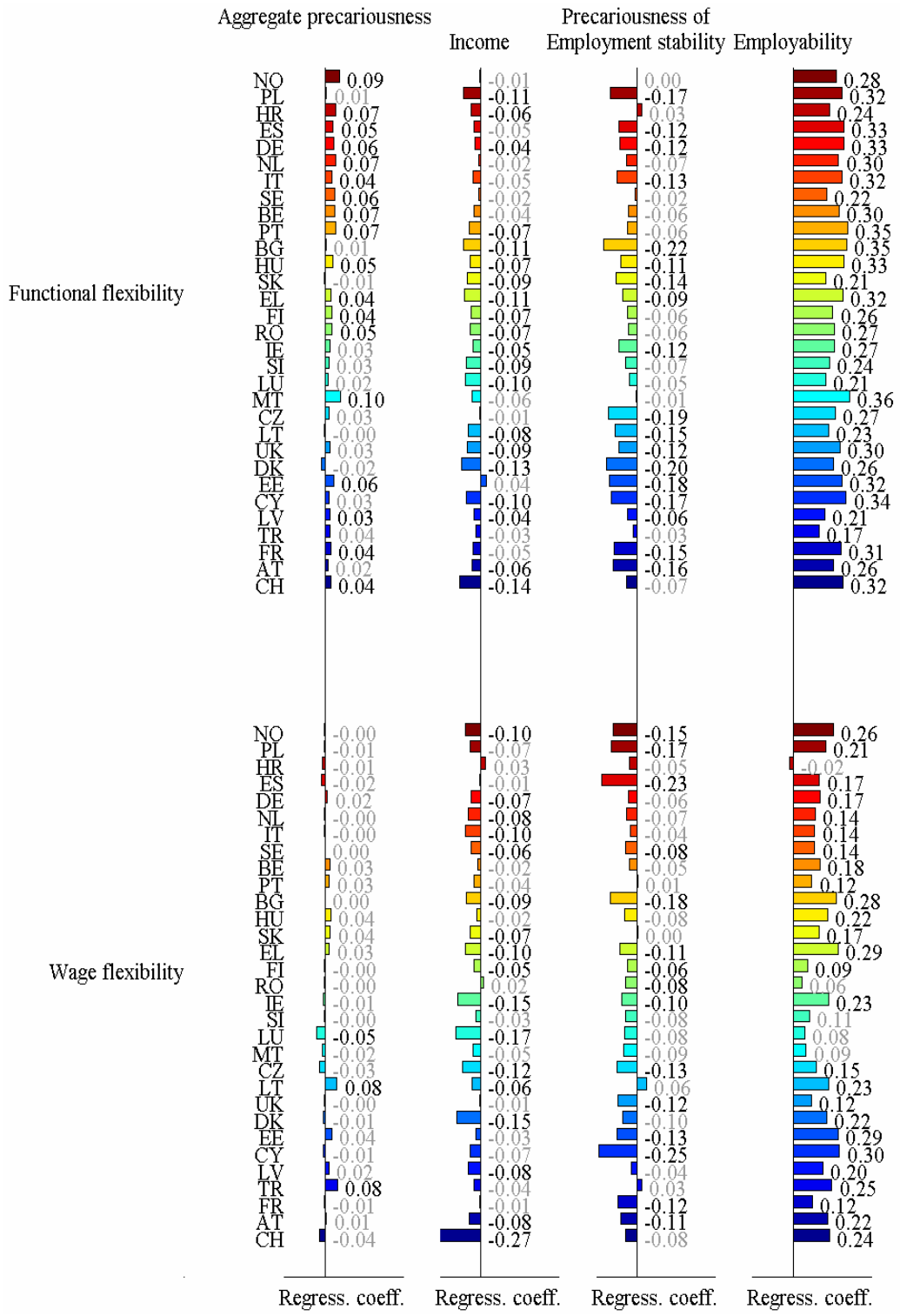
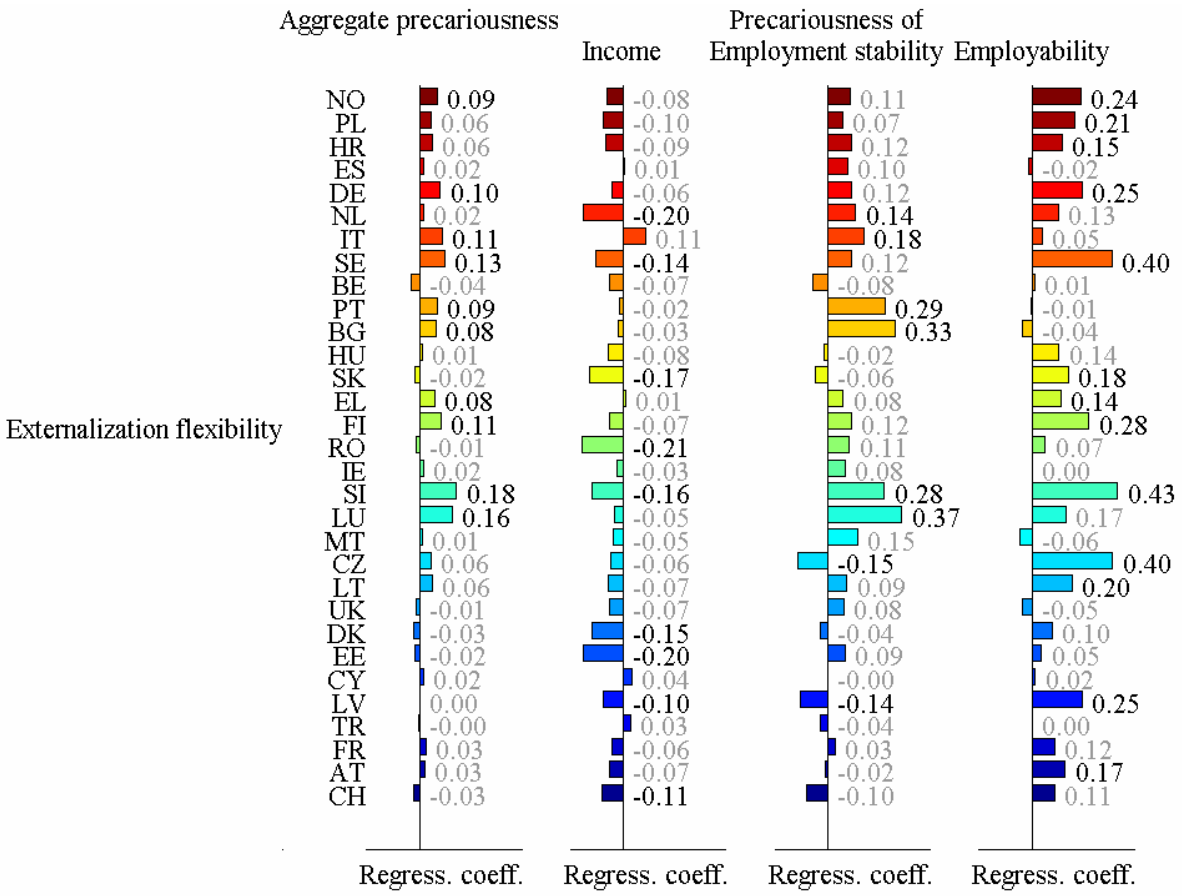


Figure 8. Sheet D. Regression coefficients for normalized (HBS methodology) dependence of aggregate and partial indices of work precariousness from aggregate and partial flexibility indices by country



Annex: variables used in constructing indicators of flexibility and precariousness of work

The answers of individuals constitute the rows of the table numbered from 1 to 23788. The columns contain coded answers of individuals to the survey questions relevant to our study. The selected questions are grouped into three sections.

Flexibility. This section includes the questions on flexibility of work grouped according to the OECD (1989: 13–20) classification of flexibility types (for a more refined classification see Keller and Seifert 2006: 237):

1. *External numerical flexibility*, that is, is the ease of 'hiring and firing' which manifests itself in the mobility of workers between employers (external job turnover). This type of flexibility is reflected by the survey variables linked to the following questions:
   - Type of contract (`q3b`): indefinite contract, fixed term contract, temporary agency work contract, or work with no contract
   - Duration of contract, in months (`q3c`)

2. *Internal numerical flexibility*, that is, variability of standard number and of standard distribution of working hours. The relevant survey questions are as follows:
   - Number of working hours per week (derivative from `q15a` and `q15b`): as one will or not as one will
   - Overwork (more than 10 hours a day), in number of times a month (`q14e`)
   - Number of working hours every day (`q16aa`): variable or constant
   - Number of working days every week (`q16ab`): variable or constant
   - Starting and finishing hours (`q16ac`): variable or constant
   - Working time arrangements (`q17a`): set by the company, choice from several option, reasonable adaptability to individual wishes, or full adaptability
   - Working time planning (`q17b`): on the same day, the day before, several days in advance, several weeks in advance, no changes of schedule

3. *Functional flexibility*, that is, the changeability of tasks, of teams, and of the content of work. It is reflected in the mobility of workers within enterprizes (internal job turnover). This type of flexibility is reflected by the following survey questions:
   - Frequency of interrupting a task and switching to unforeseen tasks (`q22a`): very often, fairly often, occasionally, or never
   - Solving unforeseen problems by oneself (`q23c`): yes or no
   - Learning new things (`q23f`): yes or no
   - Rotation of tasks between colleagues (`q26a`): yes or no

- Necessity of different skills in rotating tasks (`q26a1`): yes or no
- Decision on rotation of tasks (`a2a`): by boss, by boss and team, or by team
- Necessity of further training (`q27.1`): yes or no

4. *Wage flexibility*, that is, dependence of salaries and wages on labour market or competitive conditions. This type of flexibility is reflected by the following survey questions:

   - Dependence of work on performance targets (`q21c`): yes or no
   - Basic salary (`ef6a`): yes or no
   - Piece rate or productivity payment (`ef6b`): yes or no
   - Other extra payments (`ef6f`): yes or no
   - Payments based on the overall performance of the firm (`ef6g`): yes or no
   - Payments based on the overall performance of the team/group (`ef6h`): yes or no
   - Income from shares of the company (`ef6i`): yes or no

5. *Externalization flexibility*, that is, such forms as distance working, teleworking, virtual organisations and self-entrepreneurial activities. This type of flexibility is revealed by the following questions of the survey:

   - Work with no working contract (`q3b`, fifth option): yes or no
   - Teleworking from home with a PC (`q11g`): always, almost always, 3/4 of the time, half of the time, 1/4 of the time, almost never, or never
   - Working at home excluding telework (`q11h`): always, almost always, 3/4 of the time, half of the time, 1/4 of the time, almost never, or never
   - Working in places other than home or company, e.g. client's premises, on the road (`q11i`): always, almost always, 3/4 of the time, half of the time, 1/4 of the time, almost never, or never
   - Engagement in job(s) other than the main paid job (`q9a`): no, occasional, seasonal, regular
   - Number of hours a week in job(s) other than the main paid job, in hours a week (`q9b`)

Precariousness. According to the typology of precariousness of work given by Keller and Seifert (2006: 239), the relevant survey questions are classified into three groups. The fourth dimension of precariousness, integration in social security, cannot be characterized by the survey questions and is not considered.

1. *Income* which for precarious work is *ceteris paribus* lower than in decent work. To measure the income factor, the following questions are considered.

   - Harmonized net monthly income, in 10 harmonized levels (`ef5`). The survey uses ten income deciles, that is, 10%-population groups for the given country; for details see European Foundation (2007: 96–100). Delimiters (= income figures which separate decile groups) used by European Commission (2005: 179ff) as income indices are inappropriate for our purposes, because they do not allow finding the average income in each group.

- Harmonized net hourly earnings (derivative from `ef5` and `q8a`), as the harmonized monthly income divided by the number of hours worked a week (`q8a`) and further divided by 4.33 weeks a month
- Non-harmonized net monthly income, in EUR (`ef5` recalculated). For each country, the 10 income deciles are given by 9 income delimiters in the national currency (Ibid.: 100). For low-earners (1st group) the income is taken as 2/3 of the 1st delimiter. For top-earners (10th group) it is the last (9th) delimiter enlarged by the distance to the next to last delimiter ($= 2 \times 9\text{th delimiter} - 8\text{th delimiter}$). For all other groups their income is approximated by the mean of its delimiters. Finally, all the values are expressed in EUR rated on 1st November 2005 (recall that the *Survey* has been performed from September 19 to November 30, 2005).
- Non-harmonized net hourly earnings, in EUR (derivative from `ef5` recalculated and `q8a`), as the non-harmonized monthly income divided by the number of hours worked a week (`q8a`) and further divided by 4.33 weeks a month
- Payment comparing to payment standards (`q37b`): fair, rather fair, moderate, rather not fair, not fair

2. *Employment stability*, that is, the certainty of remaining at work. Among other things, we refer to the past practice to estimate future prospects:

   - Stability at the current work, in tenure years in the company reduced to the length of the working life (derivative from `hh2b, q2b`, and `q2d`):

$$\text{Stability} = \frac{\text{Tenure in the company, in years}}{\text{Age} - \max\{14, \text{Age of the end of the full} - \text{time education}\}}$$

   - Stability at the current work, in tenure years in the company reduced to the duration of employment after the end of full-time education (derivative from `q2c`, and `q2d`):

$$\text{Stability} = \frac{\text{Tenure in the company, in years}}{\max\{1, \text{Duration of employment, in years}\}}$$

   - Risk of unemployment in 6 months (`q37a`): very high, rather high, moderate, rather low, very low
   - Uncomfortable feeling at work (`q37d`): very high, rather high, moderate, rather low, very low

3. *Employability*
   - Ability to do the work after 60 (`q35`): yes, no will, no
   - Career perspectives (`q37c`): good, rather good, modest, rather bad, bad
   - Learning/training possibilities (`q37e`): good, rather good, modest, rather bad, bad
   - Influence of work on health and safety (`q32`): bad influence, no influence

The fourth section of Table 1, **Partial indices**, is reserved for five first-level aggregate flexibility indices (*External numerical flexibility*, *Internal numerical flexibility*, etc.) and three first-level

aggregate precariousness indices (*Income*, *Employment stability*, and *Employability*). These indices are obtained for every individual by the procedure described in the next section.

The fifth section of Table 1, **Aggregate indices**, is reserved for second-level aggregate flexibility and precariousness individual indices. Their construction is also described below.

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