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ADAPTABILITY AND SECURITY: KEY ASPECTS OF THE QUALITY OF EMPLOYMENT IN THE CHANGING LABOUR MARKETS

Adaptibilnost i sigurnost – ključni aspekti kvaliteta
zaposlenosti u uslovima promena na tržištu rada

Abstract

The Principal component analysis (PCA) is used for assessment of the position of Serbia relative to 30 other European countries on the basis of selected dimensions of the quality of employment. The analysis is based mostly on the following key employment quality dimensions: lifelong learning, labour market transitions regarding level of security, flexibility of contracts and perception of workers regarding job security and employability. Results of PCA allow identification of three factors: adaptability, transitions to lower levels of security and temporality, while total explained variability with three detected factors is 80.96%. Cluster analysis shows that Serbia, together with Macedonia, belongs to the cluster group whose main characteristics are low adaptability of the work force accompanied by high flows to lower levels of security and relatively high subjective perception of insecurity of the present job.

Keywords: *quality of employment, lifelong learning, labour market flexibility, labour market security*

Sažetak

Primenom analize glavnih komponenta određen je položaj Srbije u odnosu na 30 evropskih zemalja po osnovu izabranih pokazatelja kvaliteta zaposlenosti. Analiza je zasnovana na sledećim ključnim dimenzijama kvaliteta zaposlenosti: celoživotno učenje, tranzicije ka nižim nivoima sigurnosti na tržištu rada, fleksibilnost ugovora i subjektivna percepcija sigurnosti radnog mesta i zapošljivosti. Rezultati analize glavnih komponenta ukazuju na postojanje tri faktora koja objašnjavaju 80,96% ukupnog varijabiliteta: adaptibilnost, tranzicije ka nižim nivoima sigurnosti i privremenost. Klaster analiza pokazuje da se Srbija, zajedno sa Makedonijom, nalazi u grupi zemalja čije su glavne karakteristike niska adaptibilnost radne snage i visoki tokovi ka nižim nivoima sigurnosti na tržištu rada, zajedno sa relativno visokom subjektivnom percepcijom nesigurnosti radnog mesta.

Ključne reči: *kvalitet zaposlenosti, celoživotno učenje, fleksibilnost tržišta rada, sigurnost na tržištu rada*

Introduction

Quality of employment is a multidimensional phenomenon which we analyse using selected indicators based on the Laeken indicators of job quality and additional indicators constructed according to the UN recommendations. Measuring quality of jobs is usually addressed through three main approaches: macro level (aggregate), meso level (enterprise) and micro level (individual) [6], [11]. Definition and components of the quality of employment depend on the main unit of analysis, i.e. whether it is assessed from the perspective of the society, the corporation or the individual [23]. The main indicators of the quality of employment according to the level of the analysis are presented in Table 1. It is important to stress that there are strong interrelations between these three groups and that, in some cases, the allocation of the elements to the three levels will to some extent depend on the institutional and cultural context [22, p. 14].

Laeken indicators of job quality encompass numerous aspects of this phenomenon (Figure 1).

Over the last decades, quality of employment has become a highly important element within the EU

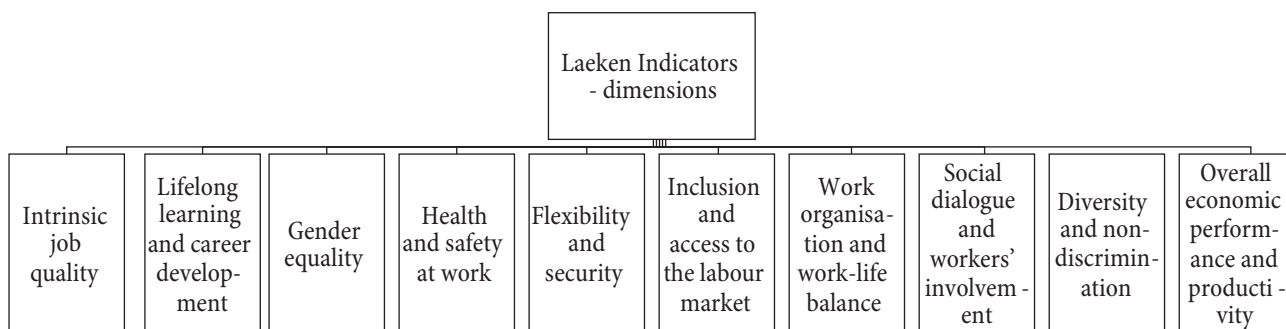
employment policy agenda. In the late 1990s and early 2000s the emphasis has shifted from purely quantitative dimension to the combination of quantitative and qualitative ones, i.e. to employment policies that could enable “more and better jobs” [16]. This approach is closely interrelated with flexicurity – another important concept which also dates from the end of the 1990s. Among the most important common issues between these two concepts in the modern labour markets are flexibility/security aspects and issues related to lifelong learning and career development. As labour market rigidity has often been blamed for poor labour market performance, since the late 1990s many European countries have undertaken reforms towards labour market flexibilisation, making employment protection rules less strict. In some cases, these reforms were focused on the use of temporary and other non-standard forms of employment, while provisions concerning permanent employment contracts did not change much. This has often led to increased labour market segmentation, with rising number of workers with temporary contracts. Instead of being a stepping stone towards a more secure job, these jobs often turned into a kind of a trap, where workers stayed in relatively

Table 1: Three groups of employment quality indicators

Level of analysis	Indicators
Individual level	Conditions and ethics of employment, monetary and non-pecuniary benefits, working time arrangements and work-life balance, employment security and social protection, skills development and training, as well as work motivation and employment-related relationships of an individual
Sector or enterprise level	Specific working time and pay arrangements, tasks to be carried out, autonomy of the worker, relationships with superiors and colleagues, work motivation
Macro level	Minimum working conditions, minimum wages or provisions regarding the prevention of accidents at work

Source: Based on [22].

Figure 1: Laeken indicators of job quality – dimensions



Source: Based on [8].

low quality of employment for a long time and with high perception of job insecurity and precariousness [4]. Issues of employment quality aspects related to the different types of employment contracts have become even more relevant in the era of rapid technological change, which has substantial influence on the modern labour markets giving rise to non-standard forms of employment.

Another aspect of strong interrelation between the concepts of flexicurity and the quality of employment concerns continuous skills improvement through training and lifelong learning. The main idea behind this approach is enhancement of adaptability of workers in order to meet the changing labour market needs. This is highly relevant in the context of technological changes and the 4th industrial revolution. One of the main issues in this regard is substitution of jobs by technology (i.e. automation, digitalisation, artificial intelligence), where occupations based on more simple tasks and generally –workers with lower educational levels are more exposed to these risks. Competences needed for modern labour markets shift extensively towards more cognitive, problem-solving, creative and interpersonal skills. Aspects of the quality of employment that concern lifelong learning and career development are expected to gain even more importance in the short and middle run, taking into account exposure of modern economies to constant technological changes.

The rest of the analysis is based mostly on the following key dimensions of the quality of employment: intrinsic job quality, lifelong learning and flexibility/security aspect. The paper reads as follows. Second section presents methodological approach and overview of the data used in the analysis. Third section deals with descriptive presentation of position of Serbia regarding selected aspects of employment quality in comparison with the EU-28. Detailed results of PCA and cluster analysis are presented in Section 4. The paper ends with concluding remarks.

Methodology and data

The Principal component analysis (PCA) is used for assessment of the position of Serbia relative to other countries on the basis of selected dimensions of the quality of employment. This method sums information from a larger group of

variables into a limited group of factors [1, p. 568]. Original variables are transformed into new uncorrelated variables named factors. While transforming, it is crucial to keep as much of the original variability as possible. The factors cannot be measured directly, so they are revealed on the basis of the initial variables [1, p. 572]. Interpretation of the factors is based on their correlations with original variables. One of the main strengths of this method is that it can summarise a set of individual indicators while preserving the maximum possible proportion of the total variation in the original data set. It is also important to notice that this method is convenient for cross-country comparisons, since the largest factor loadings are assigned to the individual indicators that have the largest variation across countries, which is a desirable property for cross-country comparisons, as individual indicators that are similar across countries are of little interest and cannot explain differences in performance [17].

Similar approach has been used by Davoine et al. [7], on the basis of the set of Laeken indicators and some complementary variables, such as wage level, work intensity and characteristics of training. The results based on the PCA and cluster analysis document the opposition between northern countries and most of the new member states in terms of working conditions and socio-economic security. Erhel and Guergoat-Larivière also use the PCA in order to obtain a comparative view of job quality regimes in Europe, taking into account their different dimensions [11]. This method revealed some convergence among the New Member States (NMS) that did not appear clearly in the synthetic index approach. The main characteristics of the NMS cluster were: bad working conditions (measured by both objective and subjective variables) and low wage levels, accompanied by high gender segregation as well as low levels of training. These analyses encompassed only EU countries, so there are no results of the relative position of Serbia concerning the main dimensions of the job quality. Savić (2006) uses the PCA approach in order to determine the position of Serbia and other European countries, although a focus of this study has been somewhat different, and it was concentrated more on the sectoral employment structure and vulnerable groups in the labour market (i.e. women and youth) [19]. Variables included in

the model were: percentage of employment in agriculture, percentage of employment in industry, percentage of employment in services, percentage of women in the labour force, unemployment rate and youth unemployment rate. Results of this study [19] showed that, in the group of selected European countries, Serbia and Macedonia had similar position regarding the observed variables.

Our analysis includes 31 European countries: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, FYROM, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovak Republic, Slovenia, Spain, Sweden and the UK. Selection of the indicators for the analysis is based on several key elements of the quality of employment: lifelong learning (i.e. continuous improvement of knowledge and skills in order to enhance adaptability to changing labour market demands); labour market transitions regarding level of security; flexibility of contracts (i.e. share of the employed with temporary contracts) and perception of workers regarding job security and employability. At the same time, choice of the indicators is limited by availability of the relevant, comparable and updated data for the selected countries. Another limiting factor is a ratio of the number of observed countries and the number of original variables. Although there is no single interpretation of what ratio is required for the principal component analysis¹, our starting point is the rule that sets less strict limitations and states that ratio of 3:1 or higher ensures stable solutions in the PCA [18], [10]. In other words, the ratio of the number of countries and the number of observed original variables must be 3:1 or higher. Taking into account all methodological limitations, the following indicators are selected:

1. Lifelong learning – participation rate in education and training (last 4 weeks), age 25 – 64, (*LLL*), 2015²;

¹ For more details, see: [15, p. 24].

² Includes population aged 25-64 that has been attending training, courses, etc., in four weeks preceding the survey. Serbia: Devinfo, http://devinfo.stat.gov.rs/republika_srbija/libraries.aspx/dataview.aspx, other countries: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=trng_lfs_01&lang=en.

2. Percentage of employed individuals who have above basic level of problem-solving skills (age 25 – 64), (*abovebasic_problem_solving_skills*), 2015³;
3. Temporary employees as percentage of the total number of employees (15 – 64), (*temp_share*), 2016⁴;
4. Percentage of the employed persons who agreed with the statement “I might lose my job in the next six months” (*losejob6m*), European Working Conditions Survey, 2015;
5. Percentage of the employed persons who agreed with the statement “If I were to lose or quit my current job, it would be easy for me to find a job of similar salary” (*easytofindjob*), European Working Conditions Survey, 2015;
6. Labour transitions by employment status – from employment to unemployment or inactivity, (*transitions_empl_to_unemplor_inactive*), 2015⁵;
7. Labour transitions by type of contract - transition to less employment security than last year – employees with a permanent job (*transitions_lower_perm*), 2015⁶;
8. Labour transitions by type of contract - transition to less employment security than last year – employees with a temporary job (*transitions_lower_temp*), 2015⁷.

Overview of the selected quality of employment indicators: Serbia vs. EU-28

Involvement in lifelong learning and problem-solving skills

Participation in lifelong learning programmes in Serbia is considerably lower in comparison to most other European countries (Figure 2).

³ Data: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=isoc_sk_dskl_i&lang=en

⁴ Data: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=lfsa_etpgan&lang=en.

⁵ Data: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=ilc_lvh130&lang=en.

⁶ Data: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=ilc_lvh133&lang=en.

⁷ Data: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=ilc_lvh133&lang=en.

Absence of continual improvement of skills and knowledge after completion of formal education can result in uncompetitive level of skills needed to face challenges initiated by technological improvement and digitalisation. In digital competence framework, problem-solving skills are defined as ability to identify digital needs and resources, make informed decisions, solve conceptual problems through digital means, use technologies creatively, solve technical problems or update one's own and others' competences, including the use of online learning resources. In this aspect, competences and skills of the employed in Serbia are significantly below the EU-28 (Figure 3).

Temporary contracts

One of significant dimensions of security and quality of employment relates to permanency of job, i.e. permanent contract vs. some of the temporary forms of employment (fixed-term contract, seasonal or casual job). In Serbia, most of the employees (76.4%) have permanent contracts, while

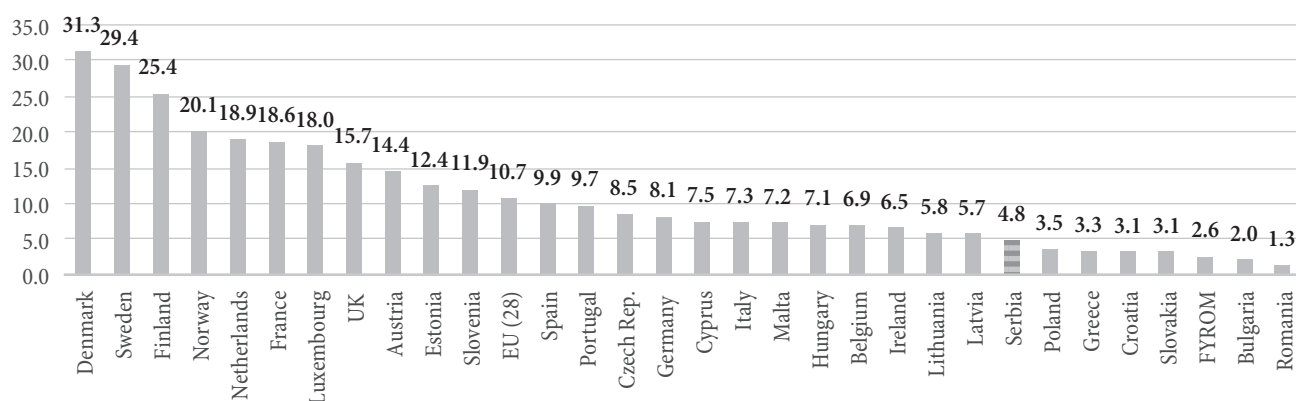
remaining 23.6% are in temporary forms of employment. Although it may seem that the share of employees with permanent contracts is high, the comparison with other European countries shows that it is actually considerably lower than the EU-28 (Figure 4).

Within a population aged 15+ in Serbia, more than 90% (i.e. 90.4%) of the employees in temporary forms of employment are engaged in these forms of employment because they cannot find a permanent job⁸. (This (or similar) situation is found only in few more European countries (Figure 5)).

According to the LFS data, recent labour market recovery was followed by a decline in quality of employment due to the expansion of non-standard employment, which adversely affected the quality of employment, in terms of job security, wages, access to retirement benefits, holiday and sick pay and on-job trainings [14, p. 344].

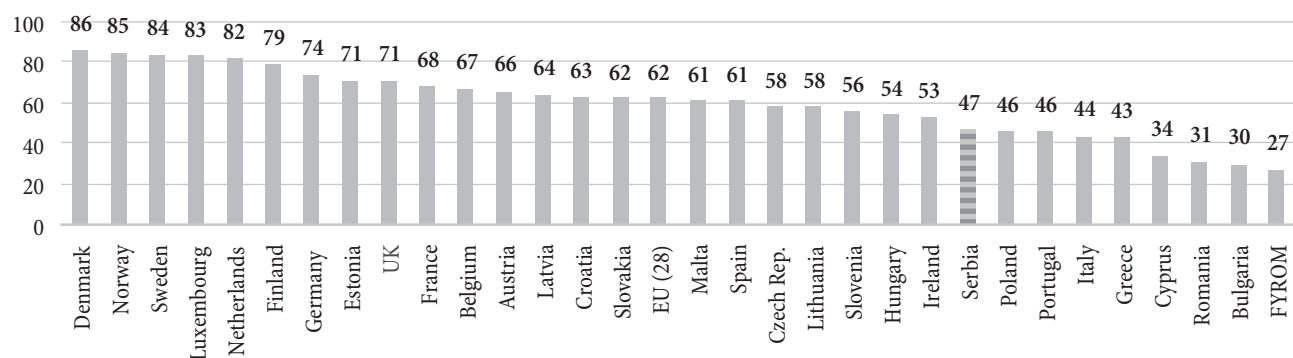
⁸ Possible reasons are: one cannot find permanent job; one does not want a permanent job; contract is valid for probation period; employment contract is valid for training period only.

Figure 2: Participation rate in education and training in the last 4 weeks (25–64), 2015 (LFS)



Source: LFS (Devinfo database) and Eurostat.

Figure 3: Employed individuals aged 25 to 64 who have above basic problem-solving skills, 2015, %



Source: Eurostat.

LFS data also give insight into how employees materialize basic employment-based rights: entitlement to health insurance, entitlement to pension insurance, right to annual paid holiday and right to paid sick leave⁹. Data for 2016 show that roughly 9% of employees do not exercise right to pension and/or health insurance, while 13% do not exercise rights to paid holiday and/or paid sick leave.

For all employment-based rights covered by the LFS data, the number of employees who are not entitled to a specific work-based right is larger than the number of informal employees (not including self-employed and unpaid family workers), which means that these problems

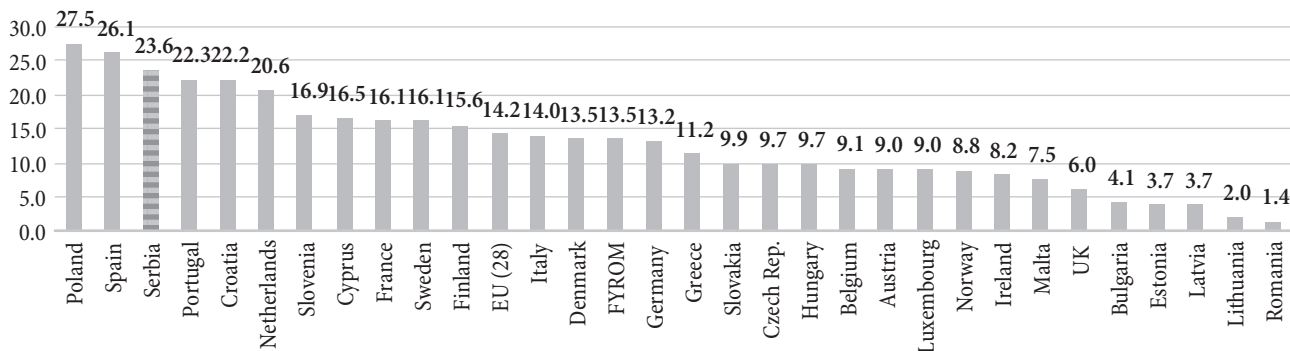
are common in formal employment, too. Part of the problem relates to a type of contract and/or type of employment, since persons who work under contracts for temporary or occasional jobs and other contracts related to work performed outside employment relationship do not have all of these rights according to the labour legislation of the Republic of Serbia.

Perceived job security and changes in employment security

One of important indicators showing perceived job security is the share of the employed who consider that they could lose their job within the next 6 months [22, p. 39]. According to the European Working Conditions Survey (EWCS) data, almost one quarter (23%) of the employed in Serbia agreed with the statement “I might lose my job in the next 6 months”. Perceived job security defined in

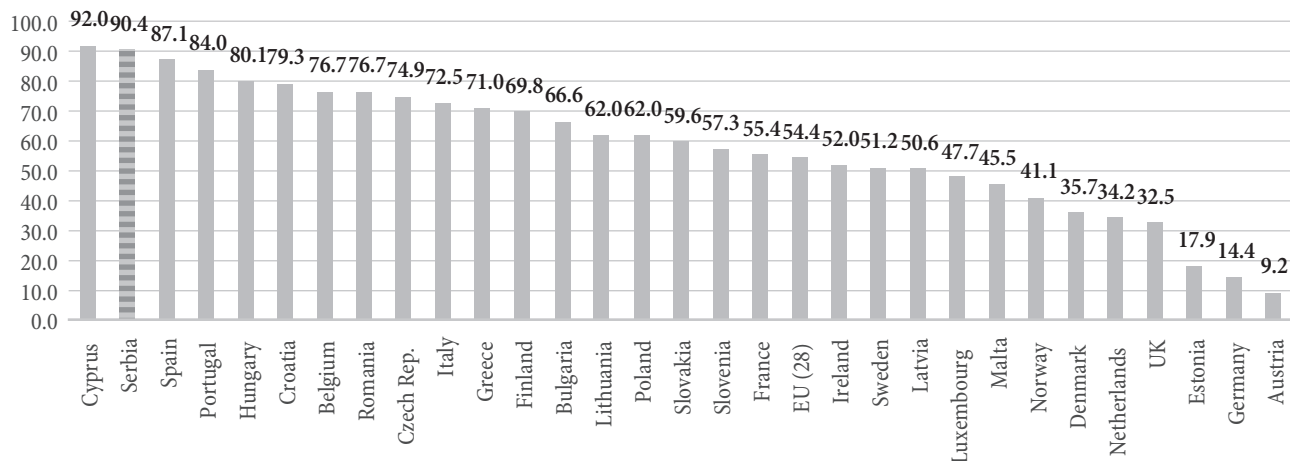
9 According to the LFS methodology, paid sick leave relates to the sick leave with the compensation equal to 65% of wage. In case the compensation is paid in amount less than 65% of wage, this is not considered as a paid sick leave. The same applies to a leave granted due to pregnancy and maternity/paternity leave. Paid annual holiday includes compensation equal to 100% of wage. Lower compensation is not considered as a paid annual holiday.

Figure 4: Temporary employees as percentage of the total number of employees (15–64), 2016



Source: LFS, Eurostat.

Figure 5: Percentage of employees with a temporary job (15+) who specified that the main reason for such engagement is inability to find a permanent job, 2016



Source: LFS, Eurostat.

this way is lower in Serbia than in the EU-28 in all of the observed categories (in other words, shares of persons who think they might lose their job within the next 6 months are higher for Serbia than for the EU-28, Figure 7). This is particularly evident in the group ‘employees without permanent job’, where almost half of the employed consider that they could lose their job within the next half year period. These data indicate very common sense of insecurity in the labour market.

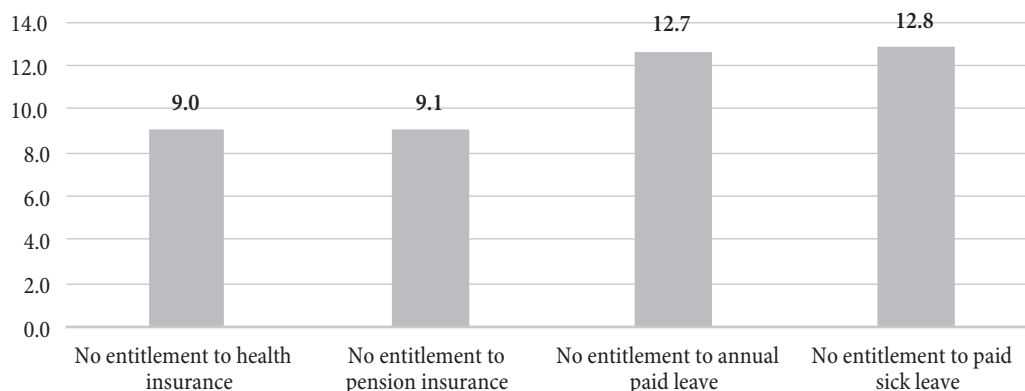
Speaking of another dimension of the subjective perceived labour market (in)security reflected by the

employed person’s attitude on probability of finding another job of similar salary¹⁰, data for Serbia show that only 28% of the employed agreed with the statement “If I were to lose or quit my current job, it would be easy for me to find a job of similar salary” (Figure 8).

Data on perceived (subjective) employment insecurity based on the EWCS are supported by the objective data on labour market flows towards lower levels of security.

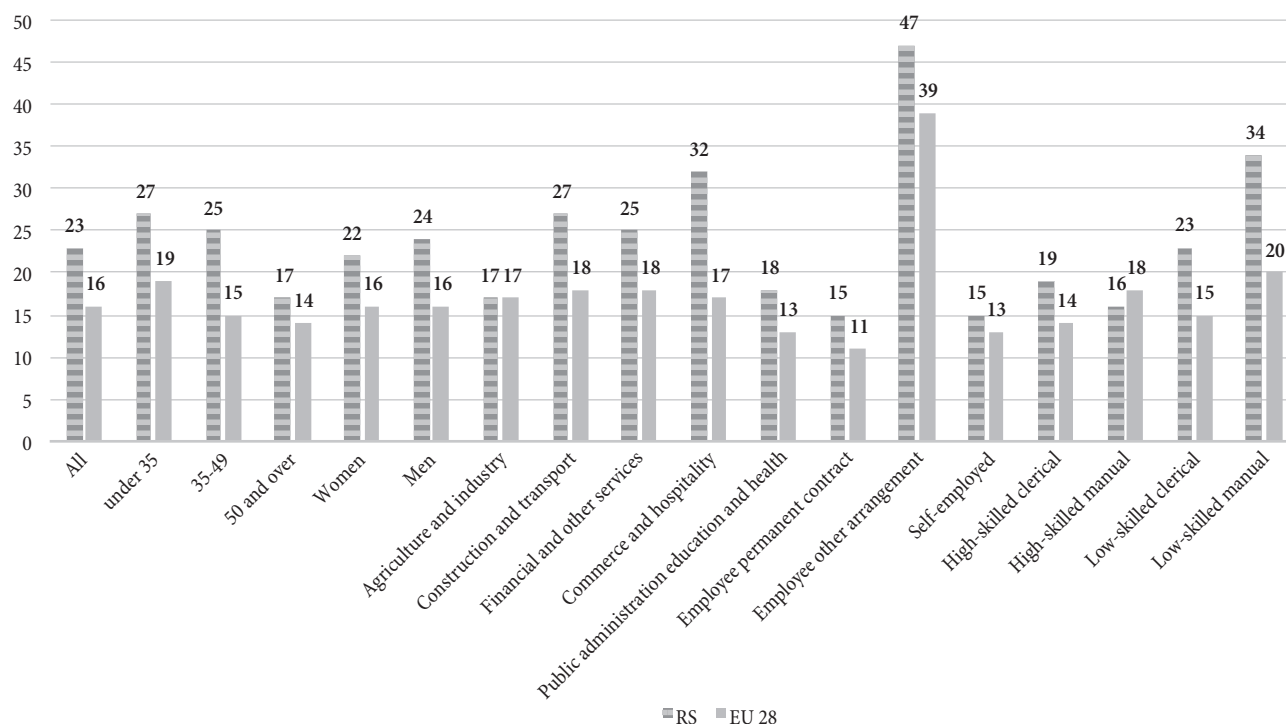
¹⁰ Percentage of the employed persons who agreed with the statement “If I were to lose or quit my current job, it would be easy for me to find a job of similar salary”, European Working Conditions Survey, 2015.

Figure 6: Employment rights in Serbia (employees aged 15+), 2016
employees 15+



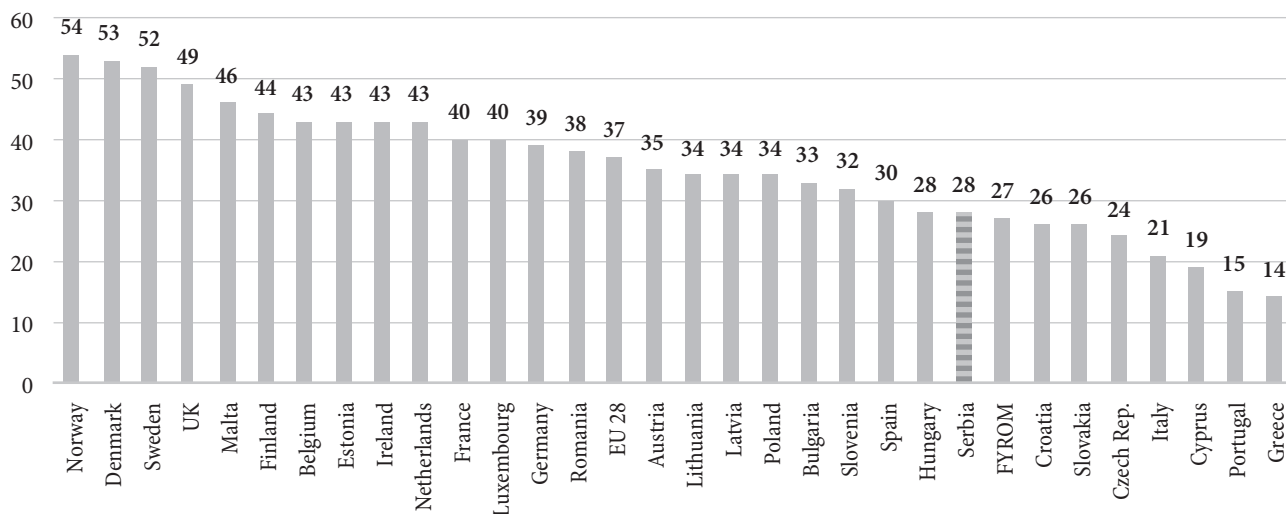
Source: LFS, 2016.

Figure 7: Share of the employed who think they could lose their job in the next 6 months, Serbia and EU-28, 2015



Source: EWCS.

Figure 8: Percentage of the employed persons who agreed with the statement “If I were to lose or quit my current job, it would be easy for me to find a job of similar salary” in selected European countries, 2015



Source: EWCS.

If we take a look at transitions from one labour market status to another one with lower employment security, we can see that such transitions are more frequent in Serbia in comparison to the EU-28 (Table 2). Other usual labour market security indicators, such as employment protection legislation index, expenditures for active labour market policies, coverage of unemployment benefit system, etc., also point to relatively low levels of labour market security in Serbia. Among other factors, last changes in the Labour Law have probably exerted, beside the direct effects on the average wage, an indirect negative impact on private consumption as a consequence of reduction in job security, or at least because of the widespread perception of increased job insecurity [2, p. 218].

Table 2: Labour transitions to less employment security than last year (2015)

	Serbia	EU (28)
Employees with a permanent job	14.4%	7.9%
Employees with a temporary job	32%	15%
Employed persons except employees	34.1%	5.2%
Employed to unemployment or inactivity	17.3%	6.3%

Source: Eurostat

Results and discussion

The Bartlett’s test of sphericity is used to test the null hypothesis that the individual indicators in a correlation matrix are uncorrelated, i.e. that the correlation matrix is an identity matrix. The Kaiser–Meyer–Olkin measure of

sampling adequacy compares the correlations and the partial correlations between variables. If the partial correlations are relatively high compared to the correlations, the KMO measure is small, and a low-dimensional representation of the data is not possible [20]. KMO value higher than 0.5 and p-value of the Bartlett’s test suggest that the use of the PCA is justified (Table 3).

Table 3: KMO and Bartlett’s test

KMO and Bartlett’s test		
Kaiser-Meyer-Olkin measure of sampling adequacy		.597
Bartlett’s test of sphericity	Approx. Chi-Square	128.731
	df	28
	Sig.	.000

Source: Authors’ calculation.

The most often used procedures to determine the number of components are based on inspection of the correlation matrix eigenvalues: the Cattell’s scree test [5] and the Kaiser rule [13]. According to the scree test (Figure 9), only those components above the point of inflection on a plot of eigenvalues ordered by diminishing size should be retained. Kaiser rule recommends that only eigenvalues at least equal to one are retained (Table 4). Both the scree plot test and the Kaiser rule point to conclusion that three factors should be retained in the analysis (Table 4 and Figure 9).

After choosing the number of factors to keep, it is a standard practice to perform rotation so as to enhance the interpretability of the results and to obtain a clear pattern

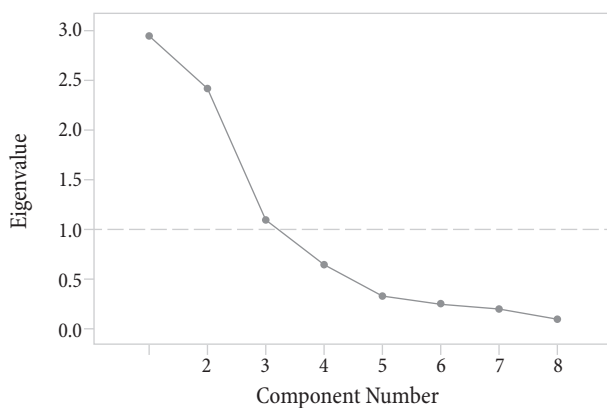
Table 4: Total variance explained

Total variance explained							
Component	Initial eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings ^a
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	2.958	36.974	36.974	2.958	36.974	36.974	2.427
2	2.421	30.265	67.239	2.421	30.265	67.239	2.599
3	1.098	13.719	80.958	1.098	13.719	80.958	2.086
4	.654	8.176	89.135				
5	.331	4.139	93.274				
6	.250	3.125	96.399				
7	.194	2.425	98.824				
8	.094	1.176	100.000				

Extraction method: Principal component analysis
a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

Source: Authors' calculation.

Figure 9: Scree plot



Source: Authors' calculation.

of loadings [9]. Rotated factor loadings after Varimax rotation are shown in Table 5¹¹.

Results allow identification of three factors:

- 1) adaptability relates to high level of problem-solving digital skills, high participation in lifelong learning programs and perception that the probability for finding a new job in the next 6 months is high. This factor explains 37% of the total variability;
- 2) transitions to lower levels of security which encompasses all three relevant variables (labour transitions by employment status – from employment to unemployment or inactivity; transitions to less employment security than last year for employees with a permanent job; and transitions to less employment security than last

year for employees with a temporary job) explains further 30.3% of variability;

- 3) temporality, the third factor, is related to the subjective perception of the person that there is high probability of losing a job within the next 6 months and with the share of employees with temporary contracts. This factor explains 13.7% of total variability.

Total explained variability with three detected factors is 80.96%¹². In order to give a simpler graphical overview of the position of each country, we can show the positions of the countries in focus in two-dimensional space, using the first two factors which explain most of the variability (Figure 10).

In the next step we perform cluster analysis based on inputs from PCA. Hierarchical cluster analysis was used to determine optimal number of clusters, using Ward's method and squared Euclidean distance. Based on previously defined number of clusters, K-means clustering was performed. The results are shown in Table 6 and Figure 11.

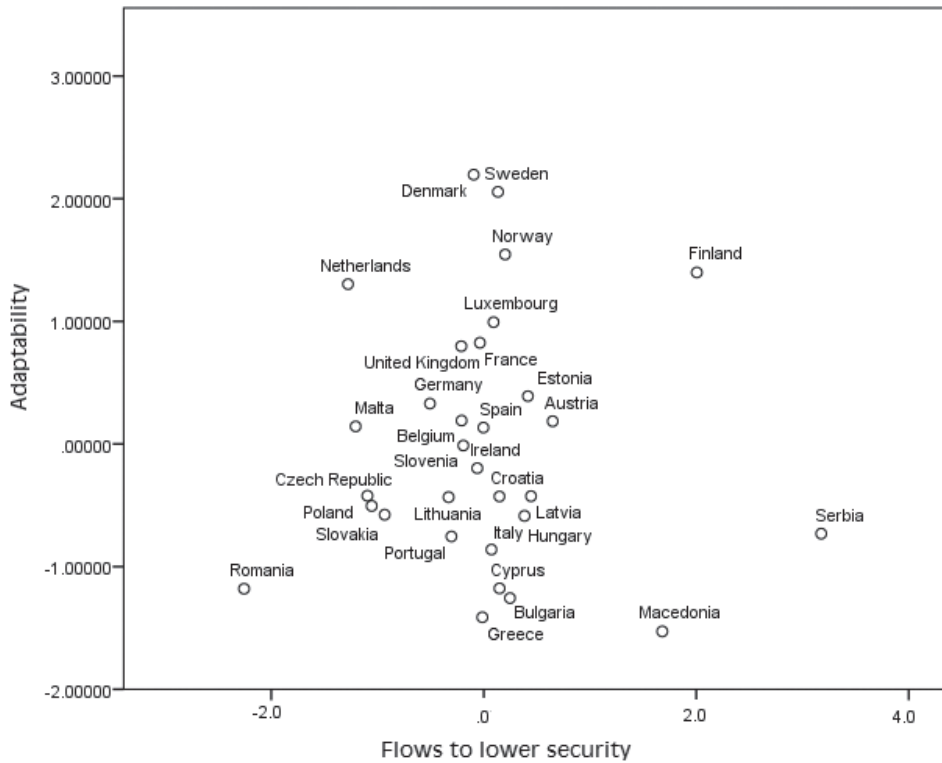
11 Oblimin rotation method gives very similar results and interpretation of the factors does not change.

12 One of the criteria used to determine how many factors to retain is 'total variance explained' criterion, which indicates how much of the variability in the data has been modelled by the extracted factors. The literature varies on how much variance should be explained before the number of factors is sufficient. Satisfying level of variability depends on the type of the problem. It is often suggested that 70% of the variance should be accounted for, while in some papers even 50% of the explained variability is considered acceptable [3]. Ultimately, the decision of how many factors to retain should be made based on comprehensibility and interpretability in the context of the research [21].

Serbia, together with Macedonia, belongs to the 4th cluster, whose main characteristics are low adaptability of the employed (as defined in the previous sections),

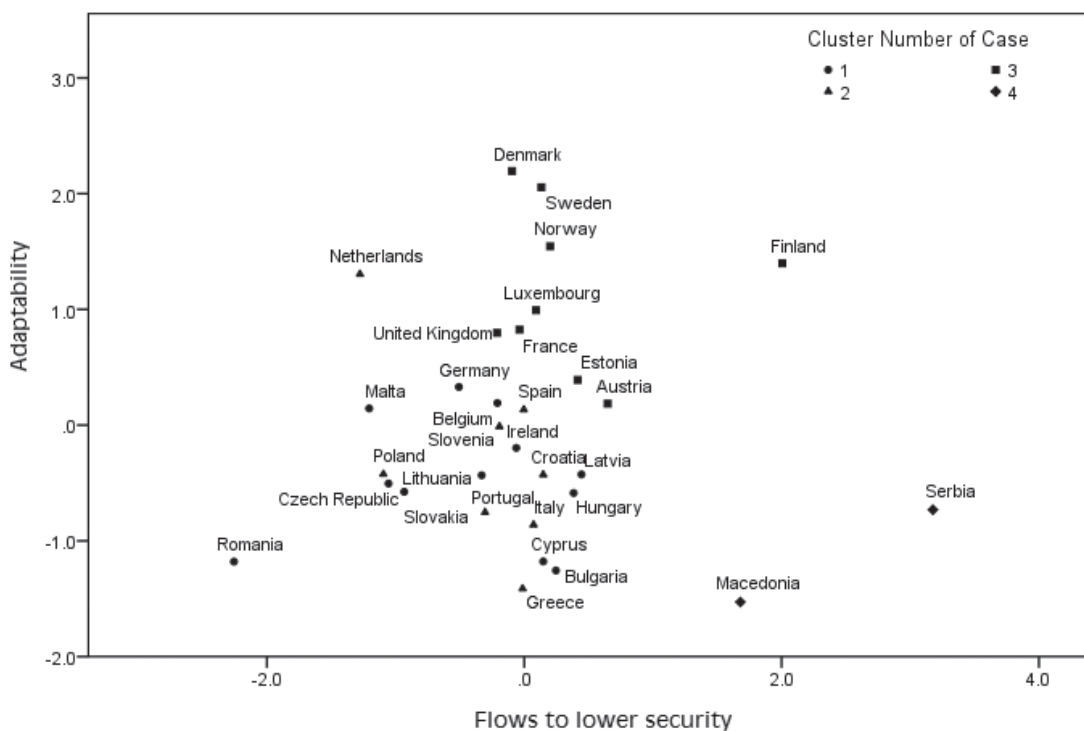
accompanied by high flows to lower level of security, and relatively high subjective perception of insecurity of the present job.

Figure 10: Country positions based on the first two factors



Source: Authors' calculation.

Figure 11: Country positions based on the first two factors combined with the results of the cluster analysis



Source: Authors' calculation.

Table 6: Country groups (results of the cluster analysis)

Cluster	Countries	Main characteristics of the cluster
1	Lithuania, Latvia, Malta, Ireland, Belgium, Slovakia, Germany, Romania, Bulgaria, Cyprus, Czech Republic, Hungary	Lower perception of insecurity in the present job and/or low temporality of employment
2	Netherlands, Greece, Italy, Slovenia, Croatia, Portugal, Spain, Poland	High perception of insecurity in the present job
3	Norway, Luxembourg, Denmark, Finland, Sweden, Estonia, United Kingdom, Austria, France	High adaptability
4	Macedonia, Serbia	High flows to insecurity, low adaptability

Source: Authors' calculation.

Low level of the lifelong learning culture and adaptability of the workforce can cause further structural problems in the Serbian labour market in the future, especially in the context of rapid technological change. The impact of contemporary technological changes on the labour market of a particular country or region depends on a large number of factors: economic structure, qualifications and occupational structure of the labour force, ability of the workforce to make the necessary adjustments to the set of needed knowledge and skills, as well as how new technologies have already been introduced in a particular country or region. On the one hand, new jobs are being created and the existing ones are disappearing under the influence of automation and robotization. According to the World Bank, estimated share of employment that is susceptible to automation in Serbia is 65.8%. Taking into account the slower speed of introduction of new technologies, this percentage is somewhat lower, amounting to about 47.3% [24, p. 129]. On the other hand, due to application of new technologies, even in the cases when jobs are not susceptible to technology substitution, the nature and organization of work change. Both aspects of change lead to significant changes related to the knowledge and skills needed in the labour market, which points out the necessity of constant improvement of the workforce's competences. As the development of digital technology accelerates obsolescence of skills, the inclusion in the lifelong learning system and enhancement of the workforce adaptability becomes necessary in order to provide an adequate response to this type of challenge.

The other important aspect of quality of employment in Serbia are high flows to lower levels of security, which is accompanied by high personal perception of insecurity. Along with high levels of informal employment and vulnerable employment, the share of employees with

temporary contracts is high in comparison with other European countries, with more than 90% of persons engaged in temporary forms of employment stating as the main reason the fact that they cannot find a permanent job. In contrast to the situation in Serbia, we can cite an example of Austria, where the share of temporary employees in the total number of employees is significantly lower (9%), with about a third of them stating as the main reason for temporary employment the fact that one does not want a permanent job, while as many as 46% are in temporary employment because they are in the process of education or training. In those cases, the positive sides of the flexible forms of employment are completely emphasized. In cases where the temporary form of employment is the only (and necessary) choice, there is often a danger that the employee remains trapped in the lower quality jobs which can reinforce the duality in the labour market.

Conclusion

The analysis is based on 31 European countries and eight original variables covering key dimensions of the quality of employment: intrinsic job quality, lifelong learning and flexibility/security. The results showed that Serbia has unfavourable position concerning selected quality of employment aspects in comparison to other selected countries. Principal Component Analysis allowed identification of three factors: adaptability, transitions to lower levels of security and temporality, while cluster analysis showed that Serbia, together with Macedonia, belongs to the cluster group whose main characteristics are low adaptability of the work force accompanied by high flows to lower level of security and relatively high subjective perception of insecurity of the present job.

As the development of digital technology accelerates obsolescence of skills, enhancement of the workforce adaptability becomes necessary in order to provide an adequate response to this type of challenge. However, participation in lifelong learning programmes in Serbia is considerably lower in comparison to most other European countries. This is accompanied by lower level of some of the key aspects in digital competencies framework. Absence of continual improvement of skills and knowledge after completion of formal education can result in uncompetitive level of skills needed to face challenges initiated by technological improvement and digitalisation. Data on employed persons' attitudes on probability of finding another job of similar salary show that in Serbia only 28% of the employed agreed with the statement "If I were to lose or quit my current job, it would be easy for me to find a job of similar salary", in contrast to 37% for the EU-28, which points to possible problems in both security and adaptability aspects.

One of the more significant dimensions of security and quality of employment relates to permanency of job. In Serbia, almost one quarter of employees is in temporary forms of employment (fixed-term contract, seasonal or casual jobs). Although it may seem that the share of employees with permanent contracts is high, comparison with other European countries shows that it is actually considerably lower than in the EU. Within a population aged 15+ in Serbia, more than 90% of the employees in temporary forms of employment are engaged in these forms of employment because they cannot find a permanent job. This (or similar) situation is found only in few other European countries. One of the important indicators showing perceived job security is the share of the employed who consider that they could lose their job within the next six months. According to the European Working Conditions Survey data, almost one quarter of the employed in Serbia consider that they might lose their job in the following half year period, which indicates very common sense of insecurity in the labour market. Data on perceived (subjective) employment insecurity based on the EWCS are supported by the objective data on labour market flows towards lower levels of security. If we take a look at transitions from one labour market

status to another one with lower employment security, we can see that such transitions are more frequent in Serbia in comparison to the EU-28.

All of these aspects point to the comparatively low quality of employment in selected dimensions. Low levels of the lifelong learning culture and adaptability of the workforce can cause further structural problems in the Serbian labour market in the future, while high flows to lower security and high temporality can impose a danger that the employee remains trapped in the lower quality jobs.

References

1. Aaker, D. A., Kumar, V., & Day, G. S. (2008). *Marketinško istraživanje*. Beograd: Ekonomski fakultet.
2. Arandarenko, M., & Aleksić, D. (2016). Not all jobs are created equal: How not to misread the labour force statistics in Serbia. *Ekonomika preduzeća*, 65(3-4), 211-224.
3. Beavers, A. S., Lounsbury, J. W., Richards, J. K., Schuyler, H. W., Skolits, G. W., & Esquivel, S. L. (2013). Practical considerations for using exploratory factor analysis in educational research. *Practical assessment, research & evaluation*, 18.
4. Boeri, T. (2008). *The paradox of disappearing European unemployment*. Retrieved from <http://www.voxeu.org/index.php?q=node/1075>.
5. Cattell, R. B. (1966). The scree test for the number of factors. *Multivariate Behavioral Research*, 1(2), 245-276.
6. Cloutier, L. (2008). *La qualité de l'emploi au Québec, développements conceptuels et création d'une typologie. État actuel de la réflexion*. Québec: Institut de la statistique du Québec.
7. Davoine, L., Erhel, C., & Guergoat-Larivière, M. (2008). *A taxonomy of European labour markets using quality indicators*. Paris: Université Paris 1 Pantheon-Sorbonne.
8. European Commission. (2008). *Measuring the quality of employment in the EU - Employment in Europe Report*. Luxembourg: European Commission - Office for Official Publications of the European Communities.
9. European Commission. (2016). *10-Step guide for the construction of a composite indicator*. EU Science Hub - Joint Research Centre (JRC). Retrieved from <https://ec.europa.eu/jrc/en/coin/10-step-guide/step-3>.
10. Grossman, G. D., Nickerson, D. M., & Freeman, M. C. (1991). Principal component analyses of assemblage structure data: Utility of tests based on eigenvalues. *Ecology*, 72(1), 341-347.
11. Erhel, C. & Guergoat-Larivière, M. (2011). *Job quality: A comparative perspective on the basis of EU indicators*. WISO-Wirtschafts- und Sozialpolitische Zeitschrift.
12. Guergoat-Larivière, M., & Marchand, O. (2012). Définition et mesure de la qualité de l'emploi: une illustration au prisme des comparaisons européennes. *Économie et statistique*, 23-42.
13. Kaiser, H. F. (1960). The application of electronic computers to factor analysis. *Educational and Psychological Measurement*, 141-151.

14. Kovačević, M., Pantelić, V., & Aleksić, D. (2017). Trends and challenges in Serbian labour market: Change in the nature of jobs and labour underutilization. *Ekonomika preduzeća* (5-6), 341-354.
15. Nardo, M., Saisana, M., Saltelli, A., & Tarantola, S. (2005). *Tools for composite indicators building*. European Commission - Joint Research Centre - Institute for the Protection and Security of the Citizen Econometrics and Statistical Support to Antifraud Unit.
16. OECD. (2003). *OECD Employment Outlook 2003 - Towards more and better jobs*. Paris: OECD.
17. OECD. (2008). *Handbook on constructing composite indicators: Methodology and user guide*. Paris: Joint Research Centre-European Commission. OECD publishing.
18. Peres-Neto, P. R., Jackson, D. A., & Somers, K. M. (2003). Giving meaningful interpretation to ordination axes: assessing loading significance in principal component analysis. *Ecology*, 84(9), 2347-2363.
19. Savić, M. (2006). Principal components analysis of employment in Eastern Europe. *Panoeconomicus*, 53(4), 427-437.
20. StataCorp. (2013). *Stata 13 Base Reference Manual*. College Station, TX: Stata Press. Retrieved from <https://www.stata.com/manuals13/mvpcapostestimation.pdf>
21. Suhr, D. (2006). Exploratory or confirmatory factor analysis? *SAS Users Group International Conference* (pp. 1-17). Cary: SAS Institute, Inc.
22. United Nations. (2015). *Handbook on measuring quality of employment – a statistical framework*. United Nations Economic Commission for Europe.
23. Vermeylen, G. (2005). *Quality in work and employment in the European Working Conditions Survey*. Working Paper no. 4. UNECE/ILO/Eurostat Seminar on the Quality of Work, Geneva, May 11 to 13, 2005. Retrieved from <http://www.unece.org/fileadmin/DAM/stat>.
24. World Bank. (2016). *World development report 2016: Digital dividends*. Washington, DC.: World Bank Group. doi:10.1596/978-1-4648-0671-1.



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