Scientific Annals of Economics and Business
71 (1), 2024, 43-74
DOI: 10.47743/saeb-2024-0006

Flexicurity in the EU28 Countries: A Multiyear Composite Indicator Proposal

Marina Ferent-Pipas*

Abstract: This study computes a flexicurity index for the EU28 countries for 2001-2019 following the European Commission's four components of flexicurity model. The index allows the ex-post assessment of flexicurity efforts and efficiency. Following the computation of the index, we compare its values against the theoretical flexicurity typologies and against other empirical flexicurity groupings to assess their (dis)similarities. Even though Northern and Western countries generally have higher flexicurity scores than Southern and Eastern states, the study shows some countries deviate from their theoretical performance. Thus, some of the Continental and Mediterranean countries have flexicurity values like those of the Nordic group. Moreover, the flexicurity regimes are not static as the theoretical typology suggests: while Denmark and France are always in the top performers' group, other countries change their performance throughout the 2001-2019 period. The flexicurity index correlates highly with empirical country groupings in the literature. The highest correlation is with country groupings using the European Commission's four components of flexicurity model, followed by the Golden Danish Triangle, and lastly, the Wilthagen and Tros' flexicurity matrix. In the end, we compare EU countries' performance in the flexicurity index scores with their performance in selected employment and unemployment rates, labor productivity, and poverty rates. Results suggest that higher flexicurity performance correlates generally with better labor market and social outcomes, the highest correlations being in the case of labor productivity rates.

Keywords: flexicurity; EU policy; labor markets; composite indicators.

JEL classification: J08; J88; C43.

* Faculty of Economics and Business Administration - Department of Statistics, Forecasting, Mathematics, Universitatea Babeș-Bolyai, Cluj-Napoca, Romania; Multicultural Business Institute, Cluj-Napoca, Romania. e-mail: *marina.ferent@econ.ubbcluj.ro*.

Article history: Received 31 July 2023 | Accepted 11 January 2024 | Published online 6 March 2024

To cite this article: Ferent-Pipas, M. (2024). Flexicurity in the EU28 Countries: A Multiyear Composite Indicator Proposal. *Scientific Annals of Economics and Business*, 71(1), 43-74. https://doi.org/10.47743/saeb-2024-0006.

1. INTRODUCTION

In the early and mid-2000s, the Danish and Dutch success stories inspire policymakers across EU to quickly embrace flexicurity, viewing it as a miraculous policy that fosters employment growth and social inclusion. Therefore, to attain the *Europe 2020*'s goals, in 2007, the European Commission includes flexicurity in its social policy agenda (Muffels and Wilthagen, 2013). The strategy targets increased employment, productivity, and social cohesion by 2020 (European Commission, 2010). Thus, one of its targets is to reach a 75% employment rate for people aged 20-64 by 2020. However, in 2020, the employment rate is only 71.7%. Additionally, the strategy targets a decrease of 20 million people at-risk of poverty[1] by 2020 compared to 2010. Even though the at-risk of poverty rate decreases in the ten years, the change is 8 million people[2] only, instead of 20 million as previously aimed.

Concerning flexicurity, the policy instrument supposed to foster reaching these goals, there are several attempts at benchmarking EU countries' flexicurity efforts for policy advice. These include developing country groupings (Dominguez-Torreiro and Casubolo, 2017), scoreboards (EMCO, 2009), and composite indicators (Manca *et al.*, 2010). However, the European Commission discontinued the development of all these monitoring tools[3]. There is no mention of flexicurity being redefined or ceased. Still, the most recent measures related to flexicurity are the *European pillar for social rights* (2017) and *A new skills agenda* (2016); performance evaluation reports and country recommendations do not go beyond 2015. Moreover, these policy evaluations rely on the theoretical flexicurity clusters (GHK, 2013), draw on a new flexicurity analytical framework (De Pedraza Garcia *et al.*, 2018), or provide general discussions on the policy efforts taken by each Member State (Peer review on flexicurity, 2014 and related documents). Overall, communication challenges akin to those identified in the *Lisbon strategy* by Saltelli *et al.* (2011) are also seen in the context of flexicurity, with the absence of a standardized benchmark and ongoing uncertainty impeding clarity, trust, and adequate research. Thus, the question remains: was flexicurity effective in reaching its proposed outcomes?

Absent an established flexicurity benchmark, this question is challenging to address. One cannot analyze whether countries that successfully integrated flexicurity as their labor market policy are better at employment or poverty rates because it is not clear which are those countries. Therefore, this paper aims at:

(1) Creating a flexicurity index by extending Manca *et al.* (2010)'s four flexicurity subindices for the EU28 countries during 2001-2019 to have a clear benchmark for future analyses.

(2) Comparing the flexicurity index scores with the theoretical flexicurity regimes described by Muffels and Wilthagen (2013) to understand if countries fall into the theoretical typology throughout the analyzed period.

(3) Comparing country performance in the flexicurity index scores with other flexicurity country groupings in the literature for the overlapping country-time sample to understand how (dis)similar they are to each other.

(4) Comparing EU countries' performance in the flexicurity index scores with their performance in selected employment and unemployment rates, labor productivity, and at-risk of poverty rates to understand whether higher flexicurity countries also perform better in flexicurity-related outcomes.

Hence, the main contribution of this paper is the creation of a flexicurity index to benchmark the EU28 countries' flexicurity efforts during the 2001-2019 period. The index follows the European Commission (2007)'s four components of flexicurity model. To this aim, we compute a flexicurity composite indicator by aggregating the Manca *et al.* (2010)'s four subindices[4]: flexible contractual arrangements (FCA), modern social security systems (MSSS), active labor market policies (ALMP), and lifelong learning strategies (LLL). This approach is seen in the recent works of Ferent-Pipas and Lazar (2023) and Nikulin and Gawrycka (2021). Ferent-Pipas and Lazar (2023) compute a flexicurity composite indicator for the EU27 countries for 2005, 2010, and 2015, while Nikulin and Gawrycka (2021) compute it for the Central and Eastern European (CEE) countries, except for Lithuania, for the years 2007 and 2013. The construction of the index brings more clarity and facilitates the analysis of the other three aims of this paper.

Following the construction of the index, a second contribution of this paper stems from its comparison with the theoretical flexicurity regimes. Muffels and Luijkx (2008) and later on, Muffels and Wilthagen (2013) amend the Espring-Andersen's policy regimes typology to describe how European countries perform in relation to flexibility and security from a theoretical perspective. Several empirical studies (e.g., Hastings and Heyes, 2018) find countries that do not fit this theoretical typology. Instead of one- or two-yearly snapshots, the flexicurity index computed here allows for a comparative analysis at different points in time. Performing such a comparison brings understanding on whether referring to the theoretical country grouping in policy recommendations is a valid practice, and if so, under which assumptions. Based on Hastings and Heyes (2018)'s previous results we expect flexicurity scores to show countries that perform differently than their theoretical regime in some years of analysis.

A third contribution of the paper comes from comparing the flexicurity index scores with other empirical country groupings. To this aim, we identify five studies[5] that classify countries according to their flexicurity regime based on quantitative data and methods. Even though these studies have commonalities in their grouping of countries, some dissimilarities appear. Such an example is the case of Portugal, which is classified as either a top, average, or bottom performer in flexicurity, depending on the study. One explanation for this diverse categorization is the difference between studies in the variables used to describe flexicurity. However, the five studies differ in their country and time sample, impeding a straightforward comparison of the country groupings. Hastings and Heyes (2018) find that some countries changed their performance in flexicurity in 2011 compared to 2006, the two years analyzed by their study. This suggests that the differences between the five studies could stem not only from the variables used to describe flexicurity but also from the difference in time and country sample. Thus, the availability of the flexicurity index for each of the periods analyzed by the five identified studies allows comparing it with each one of the country groupings. Such a comparison could shed some light on whether the dissimilarities between the different groupings come exclusively from the variables used or if the studies' different time frames also explain the dissimilar results.

Lastly, the paper assesses the correlation between the EU28 countries' flexicurity scores and their performance in twelve labor market variables related to employment, productivity, and poverty. The variables are listed in the European Commission (2007) as flexicurity outcomes. This brief descriptive analysis brings some assumptions about the relationship between labor market outcomes and flexicurity, opening the way to future more detailed causational studies. The remainder of the paper is structured as follows. Section 2 describes

the theoretical flexicurity typologies and the flexicurity frameworks used in empirical classifications. Next, the construction of the composite indicator – framework, data, methodology, and robustness analysis – is presented at length in Section 3. The flexicurity index scores are compared to the theoretical and other empirical flexicurity regimes in Section 4. Section 5 provides the correlation analysis between the flexicurity index scores and the results in desired labor market outcomes. Lastly, Section 6 summarizes the findings of this study, and Section 7 concludes and discusses some policy implications of the results.

2. FLEXICURITY FRAMEWORKS

Muffels and Luijkx (2008) provide an account of how the EU14 countries perform in relation to flexicurity from a theoretical standpoint. This framework is later extended by Muffels and Wilthagen (2013) to encompass certain Eastern countries (see Figure no. 1). Thus, they name a "flexicurity cluster" formed by the Nordic countries and an "inflexicurity cluster" including the Mediterranean-Southern states and some Eastern ones. Two "trade-off clusters" define the Anglo-Saxon and the Continental regimes. Literature refers to these five country clusters as the "theoretical flexicurity regimes," "theoretical clusters," "theoretical typologies," or "natural clusters" (e.g., Hastings and Heyes, 2018). This paper adopts the same naming convention.

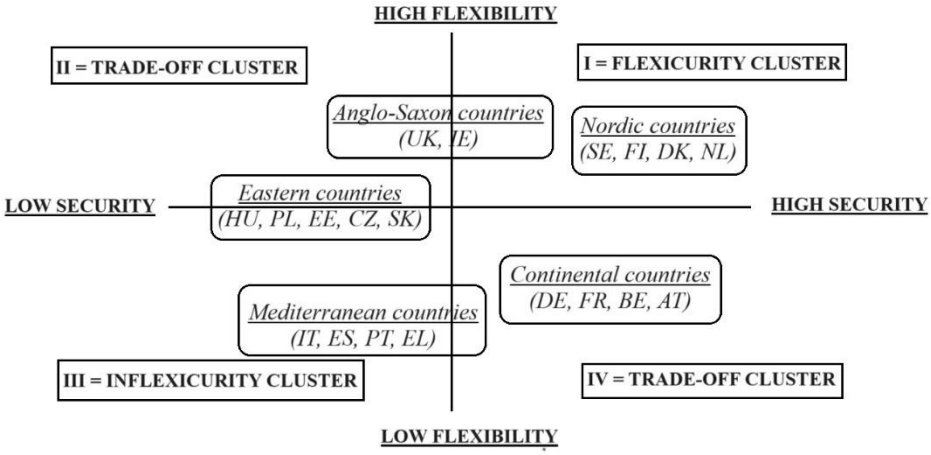


Figure no. 1 – The theoretical country grouping of flexicurity regimes
Source: Muffels and Wilthagen (2013)

To continue, several studies focus on identifying an empirical classification of European countries in relation to flexicurity. These studies are diverse in the flexicurity definition employed, the country sample, and the timeframe considered. Chung (2012) points out the existence of three main flexicurity frameworks used to classify country regimes in the literature, namely: the Wilthagen and Tros (2004) *flexicurity matrix*, the *Danish Golden Triangle* (Madsen, 2004), and the *European Commission's four components of flexicurity model (European Commission, 2007)*.

Firstly, Wilthagen and Tros (2004) flexicurity matrix differentiates between four forms of flexibility that allow for quick adjustments to economic conditions and enhance competition and productivity: numerical-external, numerical-internal, functional, and the flexibility of wage. The matrix also distinguishes four forms of security that improve social inclusion and labor market participation: job, employment, income, and combination security. Country groupings following Wilthagen and Tros (2004) flexicurity matrix include: Muffels and Luijkx (2008) that study the EU15 countries except for Sweden and utilize mixed data from 1994-2001; Auer (2010) that studies the EU15 countries excluding Luxembourg, and using mixed data from the mid-2000s; and lastly, Muffels and Wilthagen (2013) that study the EU25 countries along with Norway and Island, employing mixed data from the years 2005-2006.

Secondly, the Danish Golden Triangle flexicurity model has three components: flexible labor markets, generous welfare schemes, and active labor market policies (ALMP). Country groupings following the Golden Triangle model include: Chung (2012), which groups 17 European countries based on mixed data from 2005, 2007, and 2008; and Noja (2018), which clusters the CEE countries based on 2015 data. Lastly, the European Commission's four components of flexicurity model defines flexicurity as the combination of: flexible contractual arrangements, modern social security systems, active labor market policies, and lifelong learning strategies. Empirical works following the European Commission's four principles of flexicurity model include the development of composite indicators and cluster analysis. Thus, Manca *et al.* (2010) develop four composite indicators for the 22-27 EU countries for 2005[6]. Further on, Nikulin and Gawrycka (2021) recompute and aggregate these four indicators into one flexicurity index for the CEE countries for 2007 and 2013. Similarly, Ferent-Pipas and Lazar (2023) construct a flexicurity index for the EU27 countries in 2005, 2010, and 2015. Adopting the same flexicurity definition, Hastings and Heyes (2018) cluster 19 European countries in 2006 and 2011.

Chung (2012) notes that the three research frameworks put different weights on distinct aspects of flexicurity. For example, the active labor market policies and the lifelong learning strategies form a single dimension in the case of the Danish Golden Triangle model. However, the European Commission's four components of flexicurity model considers them as two distinct dimensions of flexicurity. Thus, it is expected that different researchers following different frameworks, obtain different results. However, Chung (2012) claims this is not a problem but a call for researchers to acknowledge the flexicurity definition adopted, in this way highlighting their study's underlying assumptions. The flexicurity index constructed in this paper follows the European Commission's four components of flexicurity model. Therefore, it assumes equal weights for flexibility, security, active labor market policies, and lifelong learning strategies. Moreover, as described in the 'Data and methods' section, the index's composition uses the taxonomy put forward by the European Commission (2007). This research approach is also seen in the previous works of Ferent-Pipas and Lazar (2023), and Nikulin and Gawrycka (2021).

3. DATA AND METHODS

3.1 Flexicurity index

Table no. 1 displays the structure of the flexicurity index following the taxonomy from European Commission (2007) and Manca *et al.* (2010). To compute the index, data for the years 2001 to 2019 are sourced from the European Commission's databases: DG Eurostat,

DG Employment, Social Affairs, and Inclusion, and DG Economic and Financial Affairs; and from the Organization for Economic Co-operation and Development's (OECD) statistics (for more details on data sources, see Annex A). Further on, the construction of the composite indicator involves data treatment, normalization, weighting, and aggregation, as described by Nardo *et al.* (2008) and Becker *et al.* (2019). Lastly, we introduce robustness checks based on the methodological directions of Saisana *et al.* (2005) and Nardo *et al.* (2008).

Table no. 1 – Flexicurity components – hierarchical structure

Index: Flexicurity | *subindex weight inside the flexicurity index: ¼*
Subindex 1: **flexible and reliable contractual arrangements (FCA)** [dimension weight inside FCA subindex: ⅓] Dimension 1: external flexibility Dimension 2: internal flexibility Dimension 3: combined flexibility
Subindex 2: **modern social security systems (MSSS)** [dimension weight inside MSSS subindex: ¼] Dimension 1: overall expenditure and coverage of unemployment benefits Dimension 2: amount and duration of unemployment benefits Dimension 3: financial incentives to take up a job Dimension 4: childcare services
Subindex 3: **active labor market policies (ALMP)** [dimension weight inside ALMP subindex: ⅓] Dimension 1: ALMP expenditure as percentage of gross domestic product Dimension 2: ALMP expenditure per participant Dimension 3: ALMP expenditure per person wanting to work
Subindex 4: **lifelong learning (LLL)** [dimension weight inside LLL subindex: ¼] Dimension 1: provision of continuing vocational training Dimension 2: participation in continuing vocational training Dimension 3: investment in continuing vocational training Dimension 4: participation in lifelong learning schemes

Note: basic variables composing each dimension are presented in Annex A.
Source: based on Manca *et al.* (2010)

To begin with, the first step in data treatment is detecting outliers. To do so, we start by signaling variables whose absolute skewness and kurtosis values exceed 2 and 3.5, respectively, as recommended by Becker *et al.* (2019). For each identified distribution[7], an assessment is made to determine whether the outlier is genuine or the result of a reporting/exporting error. Such errors are found by carefully examining the original time series. For example, a value about ten times greater/lower than the rest of the values in the series could indicate that the period was misplaced. By contrary, if all values of the same country are much greater/lower than the rest of the countries, this could be evidence of a genuine skewed distribution. Other ways of identifying reporting errors include ensuring that all countries report using the same measurement unit and cross-checking with other data sources for the same variable, if available. For current variables, the presence of outlying values is not attributed to any reporting or exporting error but to countries that perform

significantly better than the rest. We want to acknowledge these atypical statistical units in the index score and, as such, refrain from treating these outliers (Becker *et al.*, 2019).

Next, we use the same normalization scheme as Manca *et al.* (2010), that is min-max scaling:

$$x_{min-max_i} = \frac{x_i - min(x)}{max(x) - min(x)} \cdot 100$$

where: $x_{min-max_i}$= the min-max scaled value of x_i; $min\ (x)$ = the lowest value of variable *x*; $max\ (x)$ = the highest value of variable *x*.

Subsequently, following the weights and polarities set forth by Manca *et al.* (2010), we aggregate the min-maxed variables into dimensions and further into the four subindices. Prior to aggregating the dimensions into subindices, we test them for correlation (Table A5). Nardo *et al.* (2008) show that this is common practice to avoid double counting of variables when using equal weights and to minimize the number of variables to increase the index's transparency. However, they argue that relating correlation to the weighting scheme can prove dangerous, unless motivated by the relation of the highly correlated measures to the phenomenon captured by the index.

First, the correlations between the dimensions of the FCA subindex suggest that countries with high external and internal flexibility tend to achieve lower levels of combined flexibility. This is true for all of the 2001-2019 period in the case of internal flexibility. External flexibility, on the other hand, is negatively correlated with combined flexibility only in 2001, 2002, 2006, 2007, and 2011. The strength of the correlation between internal and combined flexibility increases in the last five years of analysis. Second, the 'Financial incentives to take up a job' dimension of the MSSS indicator is negatively (low or moderate) correlated with the other dimensions. This suggests that high levels of security might disincentivize citizens to take up a job. While generally the correlations among dimensions are lower or at similar levels as in 2005-2007 (when initially computed by Manca *et al.* (2010)), the correlation between 'Childcare services' and 'Amount and duration of individual unemployment benefits' increases continuously, until doubling in 2019. This is not a concern in the construction of the MSSS subindex since the two dimensions represent two very different faces of social security systems.

Third, all ALMP dimensions correlate positively, suggesting that a higher share of GDP directed towards ALMP spending also translates into greater spending per participant. The strength of these correlations is moderate or high. Except for the correlation between the first and the third dimension, the other correlations decrease in the next years compared to 2005-2007. In 2006, the correlation between 'Expenditure as percentage of GDP' and 'Spending/participants per person wanting to work' is 0.73. It decreases to 0.65 in 2007 and then increases to 0.89 in 2015, after which it starts decreasing again. Forth and last, all the LLL's dimensions correlate positively. The strength of these correlations is at similar levels to 2005. Therefore, this correlation analysis shows that in case of FCA and MSSS, countries have dissimilar behaviors in different dimensions, while in case of ALMP and LLL, they have similar performance across dimensions. Similar to Nikulin and Gawrycka (2021), we decide not to revise the weights based on correlation analysis.

Finally, each subindex undergoes min-max scaling and the flexicurity index is computed as:

$$Flexicurity\ Index_i = \frac{FCA_i + MSSS_i + ALMP_i + LLL_i}{4}$$

where: $Flexicurity\ Index_i$ = the flexicurity index score of country *i*; FCA_i = the flexible contractual arrangements subindex score of country *i*; $MSSS_i$ = the modern social security systems subindex score of country *i*; $ALMP_i$ = the active labor market policies subindex score of country *i*; and LLL_i = the lifelong learning subindex score of country *i*.

Final flexicurity index scores are presented in Table no. 2.

Table no. 2 – Flexicurity scores rounded – EU28 countries. 2001 to 2019

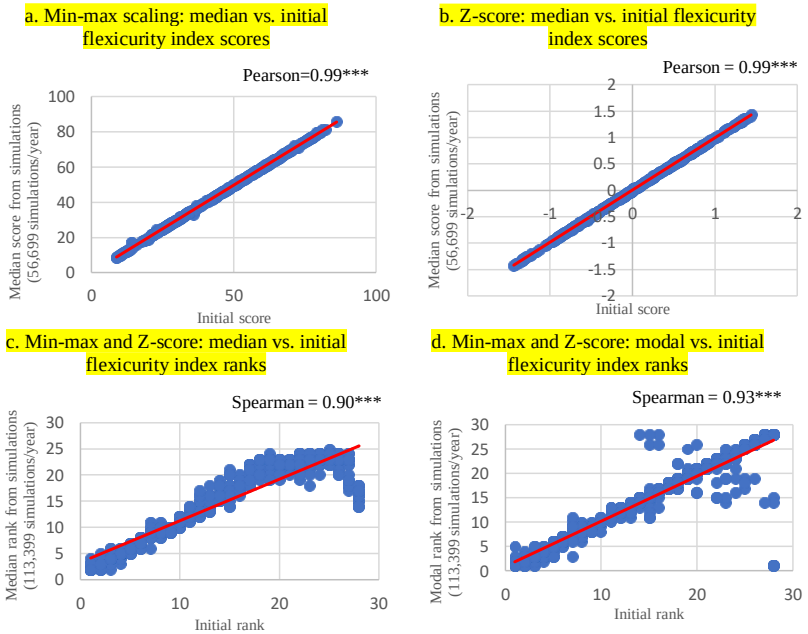
Year / Country	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
BE	65	64	62	62	61	64	68	71	75	70	69	70	69	69	66	70	69	69	69
BG	29	29	28	28	28	28	27	27	26	25	27	31	32	32	31	33	33	34	34
CZ	31	32	32	33	32	33	34	36	37	37	37	38	42	41	43	45	43	47	46
DK	77	78	78	79	76	86	77	79	80	80	81	80	80	79	79	77	77	76	80
DE	60	62	61	61	61	57	53	54	61	58	55	51	52	52	51	53	54	54	53
EE	36	36	35	35	34	36	37	37	46	42	39	33	32	31	31	34	37	49	48
IE	65	66	65	66	67	66	67	70	75	73	68	67	65	65	62	65	62	58	57
EL	31	31	31	29	26	27	28	29	35	29	27	25	22	22	20	24	23	23	28
ES	55	55	55	54	57	56	60	61	64	63	60	59	48	48	46	47	48	48	46
FR	76	76	77	76	77	78	79	80	82	80	77	77	77	78	76	78	77	75	76
HR	13	13	12	12	12	12	12	11	10	10	9	9	10	9	11	12	11	12	13
IT	45	44	44	42	43	40	42	43	47	43	43	43	44	46	50	55	52	46	43
CY	37	36	36	35	34	36	37	39	41	39	38	36	35	31	29	30	30	31	30
LV	21	22	21	22	22	21	19	20	22	22	19	18	20	21	22	26	28	29	28
LT	17	18	10	10	13	16	23	14	13	13	14	24	26	26	22	26	27	28	26
LU	57	59	67	67	74	72	75	67	62	61	60	63	63	62	59	66	68	65	64
HU	25	27	27	27	21	26	26	23	26	28	27	24	24	27	25	29	32	30	30
MT	47	46	45	44	44	39	42	47	45	44	44	45	47	47	42	46	47	45	45
NL	76	74	72	71	70	70	69	73	75	69	68	66	65	64	62	66	68	71	71
AT	52	53	54	49	51	53	51	51	56	53	51	50	51	52	51	54	52	51	50
PL	21	22	21	23	23	23	24	27	29	28	22	22	23	26	23	25	25	26	26
PT	60	58	53	53	54	58	58	62	69	67	63	61	60	60	57	57	57	58	56
RO	34	34	33	33	32	32	31	29	30	31	27	28	26	25	26	26	25	24	23
SL	42	43	43	44	44	44	41	40	47	44	43	43	44	43	41	44	42	42	38
SK	25	25	26	31	33	34	34	34	37	34	31	31	30	30	29	33	33	34	33
FI	59	59	60	61	61	61	60	61	63	60	59	59	60	60	60	62	61	60	60
SE	78	77	75	72	69	68	64	63	64	60	58	58	59	58	56	61	60	58	58
UK	51	52	52	52	52	49	48	49	51	48	48	48	49	49	48	50	49	50	48

Note: Year $= \overline{1,19}$ stands for Year $= \overline{2001,2019}$

3.2 Robustness analysis

Following the recommendations of Nardo *et al.* (2008), at this stage, we reconstruct the index: (1) excluding one variable per subindex at a time and (2) using Z-score instead of min-max scaling. The FCA subindex is composed of 17 variables. When excluding one variable at a time, we obtain 17 different FCA score simulations. Considering the variant that includes all variables, there are 18 possible scenarios. Similarly, the MSSS generates 21 possible score simulations; the ALMP generates 15 simulations; and lastly, for the LLL, we obtain 10 score simulations. All the possible combinations between the four subindices generate 56,700 possible flexicurity score simulations for each year in the sample, including the initial score. Subsequently, we Z-score the variables and recompute the flexicurity index scores. We repeat the inclusion-exclusion of variables simulations in this case. Finally, we rank countries based on all generated scenarios. Since there are two scaling methods, each with 56,700 simulations, this renders 113,400 alternative rankings each year, including the initial rank.

To assess the robustness of the flexicurity index scores and country ranks to these two methodological changes, we first compare initial scores and ranks against median and modal ones (e.g., Saisana *et al.*, 2005; Manca *et al.*, 2010). The robustness of the flexicurity index scores to the exclusion of variables is assessed in Figures no. 2a and 2b. First, Figure no. 2a presents the correlation between the initial flexicurity scores using min-max scaling and the median scores from the other 56,699 possible score simulations/year. Second, Figure no. 2b shows the correlation between initial and additional scores for Z-scoring. In both cases, the correlation between the median score and the initial one is 0.99, suggesting that the indicators' selection induces low variability in the flexicurity scores.



Note: *** represents statistical significance at 1% significance threshold.

Figure no. 2 – Initial Flexicurity scores/ranks against median/modal scores/ranks from simulations

To continue, to assess the robustness of the flexicurity scores to both the exclusion of variables and to the change in the scaling method, we compare country ranks across simulations. By providing a common scale, the ranks enable comparisons between the min-maxed flexicurity index and its Z-scored counterpart. Figures no. 2c and 2d plot the initial rank in the flexicurity index against the median and modal rank from the alternative simulations. Both correlate highly with the initial rank (0.90 and 0.93, respectively), suggesting that no deliberate bias is introduced in the index by either the choice of variables or the scaling method (e.g., Saisana and Saltelli, 2006).

Lastly, starting from the average shift in ranking formula of Nardo *et al.* (2008) (see Equation 1), we derive a more general average rank shift measure across all years, countries, and simulations (see Equations 2 through 4). On average, in the same year, a country shifts 2.75 ranks in ranking from the original ranking due to the choice of variables and the scaling method used. There are no well-defined thresholds or rules of thumb to justify this shift appropriate for a reliable composite indicator. Defining such thresholds at this point would be difficult since the measure is affected by the number and type of robustness checks undertaken by the researcher. However, given the increasing complexity of social and economic policies and the increased popularity of composite indicators as measurement tools, we consider it necessary for the end user (policy regulator, public) to acknowledge the possible deviation of a country from its original rank. In the present case, the upcoming analyses will mostly refer to the index scores and countries' positions in terms of quartiles while paying attention to scores close to each other. Thus, a less than 10% shift in ranking may have a negligible impact, if any, on the conclusions of this study.

$$\overline{R_S} = \frac{1}{M}\sum_{c=1}^{M}\left|Rank_{ref}(CI_c) - Rank(CI_c)\right| \quad (1)$$

$$\overline{R_{Country}} = \frac{1}{S}\sum_{i=1}^{S}\left|Rank_{ref}(CI) - Rank(CI_i)\right| \quad (2)$$

$$\overline{R_{Year}} = \frac{1}{M}\sum_{i=1}^{M}\overline{R_{Country_i}} \quad (3)$$

$$\overline{R_{Total}} = \frac{1}{Y}\sum_{i=1}^{Y}\overline{R_{Year_i}} \quad (4)$$

where: $\overline{R_S}$ = average shift in ranking; $Rank_{ref}(CI_c)$ or $Rank_{ref}(CI)$ = original rank given to the country by the original version of the index; $Rank(CI_c)$ = uncertainty output; M = number of countries; $\overline{R_{Country}}$ = country average shift in ranking in one year across all scenarios; $Rank(CI_i)$ = rank given to the country by the i[th] scenario of the index; S = number of scenarios; $\overline{R_{Year}}$= yearly average shift in ranking across all countries and all scenarios; $\overline{R_{Total}}$= average shift in ranking across all years, countries and scenarios; Y= number of years.

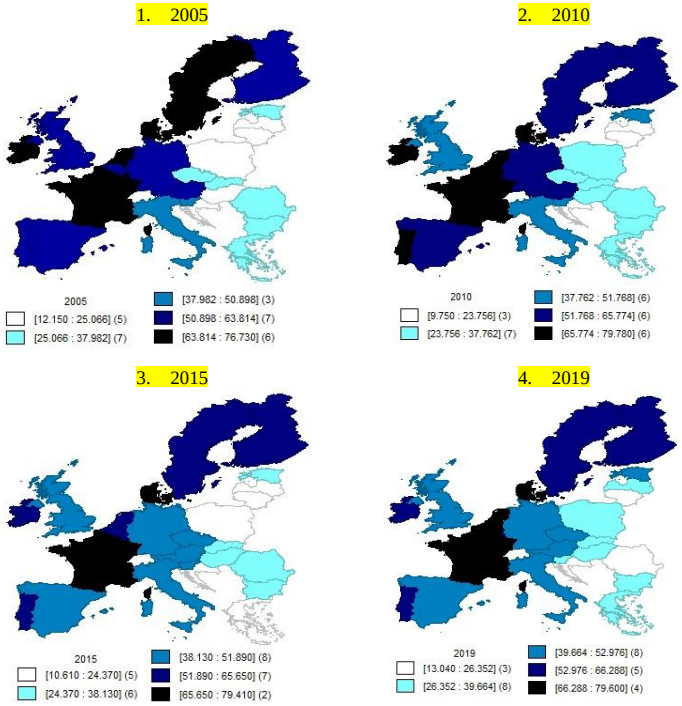
In the end, given that the correlation between the first and third dimension of ALMP increases in the years following Manca *et al.* (2010)'s computations and the rest of

correlations are moderate and high, we recompute the ALMP sub-index with equal weights for all variables (1/14). By doing this, we assume that all dimensions show the same face of ALMP. Further on, we recompute the flexicurity index with the new ALMP values. The new flexicurity index is highly correlated with the initial one (0.99), suggesting that the change in weights for the ALMP does not introduce deliberate bias in the index.

4. FLEXICURITY SCORES VERSUS OTHER FRAMEWORKS

4.1 Flexicurity scores and the theoretical flexicurity regimes

Figure no. 3 shows the spatial distribution of the flexicurity index scores. For space reasons, we only present the maps for 2005, 2010, 2015, and 2019. First, the figure shows the change in time of the EU28 countries' relative performance. For example, Portugal improves its performance in 2010 compared to 2005 (Figures no. 3a and 3b) and deteriorates in 2015 (Figure no. 3c). Spain also has lower scores in 2015 and 2019 than in the previous periods. Among Nordic countries, Denmark is always top performing, while Norway slightly decreases its performance in 2010 compared to 2005 (Figures no. 3a and 3b). Among Eastern countries, Romania has lower scores in 2019 compared to the previous snapshots. Lastly, the Anglo-Saxon countries have a lower performance in 2015 and 2019 compared to 2010 and 2005.



Note: Due to space limitations and to the large number of maps, this paper presents just these four snapshots. Visual representations of other periods can be easily produced based on the flexicurity scores in Table no. 2 or provided by the authors upon request.

Figure no. 3 – Flexicurity scores across the EU28 – Equal intervals maps for 2005, 2010, 2015, and 2019

As described at length in Section 2, the theoretical classification depicted by Muffels and Wilthagen (2013) suggests a spatial distribution of the flexicurity regimes. Thus, Southern countries (Italy, Spain, Portugal, and Greece) are inflexicure; Central countries (Germany, France, Belgium, Austria, and Luxembourg) are in the trade-off area; and the Northern ones (Sweden, Finland, Denmark, and the Netherlands) are flexicure. Also, Eastern countries (Hungary, Poland, Estonia, Czechia, and Slovakia) are inflexicure or closer to inflexicurity than their Western counterparts. A brief visual inspection (see Figures no. 3) suggests that Eastern countries have lower flexicurity scores than Western ones. However, the North-South distribution is not as apparent. Southern countries do not have a homogenous performance: Greece has low flexicurity values in all the years; Italy is an average flexicurity performer; and Spain and Portugal have average and top flexicurity scores. Exemptions from the theoretical typology are also seen in the case of France and Ireland, which are top performers similar to Denmark and the Nordic countries.

To test whether the spatial distribution assumption holds in the case of the flexicurity scores for the 2001-2019 sample, we run a linear regression of the following form for each year:

$$Flexicurity_i = \beta_0 + \beta_1 \cdot Latitude_i + \beta_2 \cdot Longitude_i + \varepsilon_i$$

where: $Flexicurity_i$ is the flexicurity score of country i; $Latitude_i$ and $Longitude_i$ are the latitude and the longitude coordinates of the central points of country i; and ε_i is the error term.

Table no. 3 presents the regression results for each year.

Table no. 3 - Regression results. Dependent variable: Flexicurity scores

Year	Intercept	Latitude	Longitude
2001	28.792 (0.147)	0.665 (0.101)	-1.126*** (0.000)
2002	27.310 (0.160)	0.697* (0.081)	-1.119*** (0.000)
2003	27.973 (0.168)	0.673 (0.105)	-1.126*** (0.000)
2004	25.963 (0.181)	0.715* (0.074)	-1.130*** (0.000)
2005	26.934 (0.162)	0.706* (0.075)	-1.178*** (0.000)
2006	24.989 (0.205)	0.748* (0.067)	-1.154*** (0.000)
2007	31.520* (0.090)	0.619 (0.101)	-1.172*** (0.000)
2008	36.955* (0.060)	0.538 (0.171)	-1.242*** (0.000)
2009	38.603* (0.54)	0.569 (0.155)	-1.282*** (0.000)
2010	38.069** (0.045)	0.526 (0.163)	-1.242*** (0.000)
2011	36.516 (0.056)	0.515 (0.177)	-1.212*** (0.000)
2012	35.306 (0.055)	0.529 (0.151)	-1.190*** (0.000)
2013	29.719 (0.104)	0.623* (0.094)	-1.128*** (0.000)
2014	29.168* (0.100)	0.633* (0.080)	-1.133*** (0.000)
2015	25.772 (0.138)	0.667 (0.062)	-1.099*** (0.000)
2016	27.040 (0.118)	0.694* (0.051)	-1.089*** (0.000)
2017	25.490 (0.137)	0.716** (0.044)	-1.055*** (0.000)
2018	21.183 (0.200)	0.787** (0.024)	-0.990*** (0.000)
2019	20.386 (0.232)	0.787** (0.029)	-0.964*** (0.000)

Note: ***, **, * represent statistical significance at 1%, 5% and 10%, respectively. P-values are reported in parentheses.

Firstly, latitude is positive, though not always statistically significant. These results suggest that, like the theoretical typology, the flexicurity scores generally increase from South to North – flexicurity countries are generally more Northern Europe, while Southern Europe

is inflexicure. However, the lack of or low statistical significance suggests that the difference between North and South is not as apparent every year. Secondly, in line with the theoretical typology and the expectations from Figure no. 3, the longitude is negative and statistically significant, suggesting that Eastern countries have lower flexicurity scores than Western ones.

4.2 Flexicurity scores and other empirical country groupings

We further discuss the flexicurity index scores and compare them with the similar time analysis of:

- Muffels and Luijkx (2008), Auer (2010) (*Wilthagen and Tros' flexicurity matrix*)
- Chung (2012), Noja (2018) (*Danish Golden Triangle*)
- Hastings and Heyes (2018) (*European Commission's four components of flexicurity*).

The study provides a descriptive comparison and an ANOVA analysis between the flexicurity index scores and each country classification. This might come as a non-orthodox approach since: (1) except for Hastings and Heyes (2018), all the other studies follow a different flexicurity framework than the one used in computing the flexicurity index; (2) the data used in the other studies does not always belong to one specific year; and (3) the sample size for the ANOVA analyses ranges between 10 to 18 countries. Therefore, the results of the following comparisons should be treated with caution. However, given the lack of previous comparative studies, these results could provide a descriptive starting point for future more elaborated research. It proposes a different way of looking at and reconciling the differences between distinct flexicurity frameworks.

4.2.1 Flexicurity scores in the early 2000s

To begin with, in 2001, the top 25% performers in the EU28 flexicurity scores are Belgium, Denmark, Ireland, France, the Netherlands, Sweden, and Germany. Germany is closely followed by Portugal, at less than 0.5 points. These results resemble Muffels and Luijkx (2008) country grouping. They use 1994-2001 data from the European Community Household Panel and focus only on respondents that are men. First, their findings suggest that Belgium, Denmark, Ireland, the Netherlands, Portugal, Austria, and the United Kingdom create the flexicurity cluster[8]. Auer and Chatani (2011) suggest that establishing clear borders and delimiting clusters when countries are close to borders is challenging. As such, the sample size and the border selection could explain the differences between the flexicurity scores and Muffels and Luijkx (2008) country grouping in the placement of Portugal, Germany, and Austria. While Germany and Portugal have close results in the flexicurity index scores, Muffels and Luijkx (2008) place Portugal in a flexicurity cluster and Germany in a trade-off cluster with a moderately low flexibility close to the flexicurity cluster's border. Similarly, Austria is placed in the flexicurity cluster, having a moderately high performance in both flexibility and security dimensions. In the case of our flexicurity index, Austria has an average performance placing in the third quartile.

To continue, the behavior of Mediterranean countries differs from the theoretical typology in both the flexicurity index scores and in the study of Muffels and Luijkx (2008). In contrast to the theoretical clusters, these countries do not show a similar performance. Thus, Greece and Italy are bottom performers and are greatly outperformed by Spain and Portugal.

Table no. 4 shows the ANOVA results between the 2001 flexicurity index scores and the Muffels and Luijkx (2008) country classification. The two frameworks have a medium-strength correlation (0.65). In addition to differences in the flexicurity framework used, the time dimension of the data used could also explain the differences in the two classifications. The flexicurity indicator relies on 2001 data only, while Muffels and Luijkx (2008) classification uses mixed data from 1994 to 2001. Moreover, Muffels and Luijkx (2008) data represent only men, while the flexicurity index accounts for the entire workforce.

Table no. 4 – ANOVA results: Flexicurity index scores and other country groupings

Study	Year study	Year flexicurity index	Sample size	ANOVA F-statistic (p-value)	Eta
Flexicurity framework: *Wilthagen and Tros' flexicurity matrix*					
Muffels and Luijkx (2008)	1994-2001	2001	14	2.377 (0.131)	0.65
Auer (2010)	Mid-2000s	Average 2004-2006	14	3.120* (0.075)	0.7
Flexicurity framework: *Danish Golden Triangle*					
Chung (2012)	2005-2008	2005	16	3.464** (0.046)	0.75
Noja (2018)	2015	2015	10	5.578** (0.036)	0.78
Flexicurity framework: *European Commission's four components of flexicurity*					
Hastings and Heyes (2018)	2006	2006	18	11.91*** (0.000)	0.91
Hastings and Heyes (2018)	2011	2011	18	7.682*** (0.003)	0.79

Note: ***, **, * represent statistical significance at 1%, 5% and 10%, respectively. P-values are reported in parentheses.

4.2.2 Flexicurity scores in the mid and late-2000s

The flexicurity index scores show that in the mid-2000s, Luxembourg, Slovakia, and Slovenia improve their performance while Germany and Greece deteriorate theirs. Otherwise, countries remain in the same performance quartile as in the early 2000s. We compare the flexicurity index scores with the country groupings of Auer (2010), Chung (2012), and Hastings and Heyes (2018). Among them, the study of Hastings and Heyes (2018) follows the *European Commission's four components of flexicurity* model. In 2006, they find that the Netherlands, Denmark, Belgium, France, Germany, Norway[9], Sweden, Austria, and Finland form a similar top-performing cluster. In 2006, the top 25% flexicurity index scores are those of the Netherlands, Denmark, Belgium, France, Sweden, Ireland, and Luxembourg[10]. They are followed by Austria, Germany, Finland, Portugal, Spain, and the United Kingdom, countries that are the top 50% performers. Further on, Hastings and Heyes (2018) group Slovakia, Czechia, Hungary, Italy, and Greece in a similar moderately low-performing cluster. The flexicurity index showcases them as the bottom 50% of countries. Lastly, Poland achieves a lower performance in the flexicurity index and forms a distinct group in Hastings and Heyes (2018) – an inflexible labor market with low spending on social security. Therefore, there is a general concordance between the 2006 flexicurity index scores and the Hastings and Heyes (2018) country grouping, the two frameworks being highly correlated – 0.91 (see Table no. 4).

Using mixed data from 2005, 2007, and 2008, Chung (2012) performs a flexicurity cluster analysis of 16 EU countries, following the *Danish Golden Triangle* flexicurity framework. Her country grouping correlates highly (0.75) with the 2005 flexicurity index scores (see Table no. 4). In 2005, the highest flexicurity scores are those of France, Denmark, the Netherlands, Sweden, Ireland, and Belgium. In 2007 and 2008, Sweden, Ireland, and Belgium exchange

positions, but otherwise, the hierarchy remains similar. Conversely, Chung (2012) clusters Denmark, Finland, the Netherlands, and Sweden as countries with high or medium to high performance in all the *Danish Golden Triangle*'s dimensions. France, Ireland, and Belgium, on the other hand, are grouped as countries with medium or medium to high performance. Further on, among the common sample, Poland, Greece, Czechia, and Italy are bottom performers in the flexicurity index in all three years. Except for Czechia, Chung (2012) classifies them as bottom performers in two or three of the *Danish Golden Triangle*'s dimensions.

Lastly, Auer (2010) provides a country grouping of flexicurity regimes for 14 EU countries for the mid-2000s. The study does not use data from one specific year to construct the country grouping. Therefore, as in the case of Muffels and Luijkx (2008) and Chung (2012), the difference in the time interval of the dataset poses one more challenge in comparing the two frameworks. Even so, there is a strong correlation (0.7) between Auer (2010) country grouping and the 2004-2006 average flexicurity index scores (see Table no. 4). They disagree in the performance of Spain and Portugal. Auer (2010) places the two countries in the same group as Italy and Greece, while the flexicurity index considers Spain and Portugal better performers than the other two Mediterranean countries. Using the same dataset as Auer (2010), Auer and Chatani (2011) also place Spain in a distinct cluster. Auer (2010) assigns Belgium, France, and Germany to the trade-off cluster of high security and low flexibility. However, all the countries are close to the flexicurity border. Conversely, the performance of these three continental countries in the flexicurity index is similar to the Nordic countries' performance.

To sum up, for the mid-2000s, the flexicurity index scores correlate highest with the country grouping of Hastings and Heyes (2018). Their study uses the same flexicurity framework as the index, data from one year, and a sample of 18 EU countries. In comparison, the correlations between the flexicurity index scores and the country groupings of Chung (2012) and Auer (2010) are lower but still moderately high. These studies are dissimilar to the flexicurity index in the adopted definition. Also, they use data from mixed years and have lower country sample sizes.

4.2.3 Flexicurity scores in the early and mid-2010s

There are two studies classifying EU countries' flexicurity regimes in the mid-2010s. First, Hastings and Heyes (2018) use data from 2011 and follow the *European Commission's four components of flexicurity* model. Second, Noja (2018) uses data from 2015 and clusters Central and Eastern European (CEE) countries based on the *Danish Golden Triangle*.

To begin with, the bottom 50% of countries (Slovakia, Czechia, Hungary, Italy, and Greece) remain unchanged in 2011 compared to 2006 in both the flexicurity index and in Hastings and Heyes (2018)'s cluster analysis. At the other end, the highest 50% flexicurity scores are those of Denmark, France, Belgium, the Netherlands, Ireland, Portugal, Spain, Luxembourg, Finland, Sweden, Germany, Austria, and the United Kingdom. In Hastings and Heyes (2018), Portugal and Spain form a distinct cluster along with Poland. Also, the United Kingdom remains an outlier. The similarity between the two frameworks decreases from 2006 but remains at a high 0.79 (see Table no. 4).

To continue, the flexicurity scores of the year 2015 are highly correlated (0.78) with the CEE clustering of Noja (2018) (see Table no. 4). Best CEE performers in the flexicurity index were Czechia and Slovenia. In Noja (2018), they perform high in security and have average performance in the rest of dimensions. Lowest flexicurity scores are those of Poland,

Lithuania and Latvia, countries that cluster together in the low security – medium to low flexibility and ALMP in the case of Noja (2018). Even though Hastings and Heyes (2018) and Noja (2018) follow different flexicurity definitions and focus on different country samples, their correlation to the flexicurity index is similar.

5. FLEXICURITY INDEX SCORES AND LABOR MARKET PERFORMANCE

European Commission (2007) sets the following flexicurity outcomes: the total employment rate, the employment rates of women and older workers, the youth and long-term unemployment rates, the labor productivity, and the at-risk of poverty rates (see variable definition and availability in Table B1). This section examines the correlation between the flexicurity index scores and these labor market outcomes. Besides a correlation analysis, we compare the labor market performance of the EU countries that scored highest in the flexicurity index (top 25% countries) with the lowest scores (bottom 25% countries). For simplicity, we split the 2001-2019 sample into five periods (four 5-year periods and one 4-year period). This last exercise is similar to the one performed by Auer (2010) for 2000-2005, except that instead of comparing 5-year averages, we compare median values. This avoids outliers impacting the mean measurement. Furthermore, while Auer (2010) compares the five flexicurity countries with the other 10 in his sample, we contrast the highest with lowest flexicurity scores' achievers, similar to Madsen *et al.* (2013). In line with the same authors, we present the scores obtained by each country in addition to the group's median score. This approach enables us to identify group heterogeneities, if any.

To begin with, the employment rates and the flexicurity scores are positively correlated (see Table no. 5a or Figure no. B1). When comparing top flexicurity performers to bottom ones in the employment rates, the highest difference is in the case of older workers: in the 2001-2005 period, the median employment rate of people aged 55-64 years is 1.65 times greater in high flexicurity countries compared to the low flexicurity ones (see Table no. 5a). However, this gap decreases to 1.11 and 1.12 times in the subsequent periods. It then increases to 1.28 times in 2016-2019 (Table no. 5b). The sharp decrease in 2006-2010 from 2001-2005, followed by a minor increase in 2016-2019, holds for the total employment rate and the employment rate of women. It's worth highlighting that Lithuania and Latvia stand out as the best performers in employment rates within the bottom 25% flexicurity group. They outperform the weakest rates in the top 25% flexicurity group, namely those of France, Ireland, Belgium, Luxembourg, and the Netherlands.

Further on, increased flexicurity scores are related to decreased youth and long-term unemployment rates (see Table no. 5a or Figure no. B1). However, France and Ireland (top flexicurity performers) have similar median values to Poland, Latvia, or Lithuania (bottom flexicurity performers). As seen in Table no. 5b, the relative difference between top and bottom flexicurity performers is significantly higher in 2006-2010 (-31%) and 2011-2015 (-37%) than in 2015-2019 (-17%). These two periods include the Global financial crisis of 2008-2009 and the European sovereign debt crisis of 2010-2013.

Table no. 5a – Median labor market outcomes for top and bottom flexicurity performers 2001-2005

Year	Countries		Median employment rate			Median unemployment rate		Median labor productivity	
			Total (20-64 years)	Women (20-64 years)	Older workers (55-64 years)	Youth (15-24 years)	Long-term	Per person employed	Per hour worked
Correlation with the flexicurity index			0.46***	0.36***	0.27***	-0.29***	-0.43***	0.81***	0.75***
2001-2005	Top 25%	Denmark	78.1	73.6	59.5	-	-	109.2	126.8
		France	69.2	63	36.3	22.3	28	120.2	132.3
		Ireland	70.8	59.8	49.2	-	-	140.8	126.1
		Netherlands	75.3	66.6	43.2	-	-	120.9	142.2
		Sweden	78.5	76.6	68.6	-	-	118.2	124.1
		Median	75.3	66.6	49.2	22.3	28	120.2	126.8
	Bottom 25%	Bulgaria	58.7	54.7	30.7	-	-	37	37.6
		Croatia	58.4	50.5	28	-	-	67.8	59.3
		Hungary	62	55.1	28.9	-	-	68.8	63.2
		Latvia	67.4	62.6	42.9	-	-	52.8	42.2
		Lithuania	69.6	65.3	46.7	-	-	55.7	49.1
		Poland	57.7	51.8	27.1	-	-	61.9	50.2
		Median	60.4	54.9	29.8	-	-	58.8	49.7
	Relative difference median		25%	21%	65%	-	-	104%	155%

Note: ***, ** represent statistical significance at 1% and 5%, respectively significance thresholds. For employment rates the sample is EU28 countries, 2001-2019. For unemployment rates the sample includes only the 2009-2019 period and excludes the UK. For productivity indicators the sample is EU28 without the UK, 2005-2019.

Table no. 5b – Median labor market outcomes for top and bottom flexicurity performers 2006-2019

Year	Countries		Median employment rate			Median unemployment rate		Median labor productivity	
			Total (20-64 years)	Women (20-64 years)	Older workers (55-64 years)	Youth (15-24 years)	Long-term	Per person employed	Per hour worked
2006-2010	Top 25%	Belgium	67.6	61	34.5	22.2	44	130.4	137.9
		Denmark	78.7	74.3	56	14.6	15.8	109.5	127.8
		France	69.5	64.9	38.2	23.5	27.4	117.9	128.2
		Ireland	73.4	63.3	53.1	26.3	39.1	138.3	126.7
		Netherlands	76.2	69.4	50	12	21.8	120.2	141.9
		Median	73.4	64.9	50	22.2	27.4	120.2	128.2
	Bottom 25%	Bulgaria	68.4	63.5	44.9	22.3	44.7	39.7	39.5
		Croatia	63.9	56.4	37.1	28.8	58.3	70.4	61.2
		Latvia	73.2	68.4	53.4	34.8	39.6	56.9	47.9
		Lithuania	71.3	68	51.2	32.7	33.3	62.5	54.5
		Poland	64.3	57.3	31.6	22.5	31.5	62.5	50.9
		Median	68.4	63.5	44.9	28.8	39.6	62.5	50.9
	Relative difference median		7%	2%	11%	-23%	-31%	92%	152%
2011-2015	Top 25%	Belgium	67.2	62.1	41.7	22.5	45.7	130.3	135.1
		Denmark	74.7	71.2	58.8	14.8	27.6	115	132.8
		France	69.4	65.5	45.6	25.8	28.9	116.4	125.5
		Ireland	66.5	61.3	51.2	26.7	59.5	143.3	140.9
		Netherlands	76.4	70.6	59.2	12.9	32.3	113.6	132.6
		Median	69.4	65.5	51.2	22.5	32.3	116.4	132.8

Year	Countries		Median employment rate			Median unemployment rate		Median labor productivity	
			Total (20-64 years)	Women (20-64 years)	Older workers (55-64 years)	Youth (15-24 years)	Long-term	Per person employed	Per hour worked
	Bottom 25%	Croatia	59.2	53.6	37.8	42.3	65.8	73.3	64.1
		Hungary	63	56.9	37.9	25.4	48	73.4	69.3
		Latvia	69.7	67.7	54.8	23.2	53.8	63.2	53.8
		Lithuania	69.9	68.6	53.4	21.9	45.1	73.2	63.6
		Median	66.4	62.3	45.7	24.3	50.9	73.3	63.9
	Relative difference median		5%	5%	12%	-7%	-37%	59%	108%
2016-2019	Top 25%	Belgium	69.1	64.6	49.3	17.7	45.7	129.5	133.7
		Denmark	77.1	73.6	68.7	11.4	22.4	115.9	136.3
		Finland	75.3	73.5	64	18.9	34.3	108.2	110.4
		France	71	67.2	51.8	22.8	31.1	115.4	124.3
		Luxembourg	71.8	67.8	40.2	16.2	31.5	167.5	181
		Netherlands	78.6	73.5	66.7	9.7	32.6	110.3	125.2
		Median	73.5	70.6	57.9	17	32.1	115.6	129.4
	Bottom 25%	Croatia	64.4	59.2	41.6	25.6	42	74.6	66.9
		Greece	58.7	48.6	39.7	42.9	64.3	72.4	57.8
		Lithuania	76.9	76.1	67.3	12.6	35.5	75.9	65.9
		Poland	71.6	64.3	48.6	13.4	29.6	75.9	61.4
		Median	68	61.8	45.1	19.5	38.7	75.3	63.6
	Relative difference median		8%	14%	28%	-13%	-17%	54%	103%

Next, labor productivity shows the strongest correlation with the flexicurity index scores: 0.81 and 0.75 in the case of labor productivity per employee and labor productivity per hour worked, respectively (see Table no. 5 or Figure no. B2). In the beginning period (2001-2005), the median labor productivity per hour worked is 2.55 times higher in the top 25% flexicurity countries than in the bottom group, while the median per person employed productivity is 2.04 times greater (see Table no. 5a). In the last analyzed period (2016-2019), the per-hour difference decreases to 2.03 times, and the per-person one to 1.54 times (see Table no. 5b).

To continue, in terms of poverty rates, we examine: the in-work at-risk of poverty rate (in-work AROP), the at-risk of poverty and social exclusion rate (AROPE), the at-risk of poverty rate, severe material and social deprivation rate (SMSD), and lastly, the share of population living in households with very low work intensity. Data on these indicators are available only from 2005 in case of AROP and in-work AROP, and from 2015 onwards in case of the rest. Except for the low work intensity variable, all poverty-related indicators are negatively correlated with the flexicurity index scores (see Table no. 6 or Figure no. B2). Nevertheless, Croatia, a bottom flexicurity performer seems to have similar poverty values to the ones of the top 25% flexicurity countries. Lastly, the gap in (in work) at-risk of poverty rates and severe material and social deprivation rates increases slightly in the 2016-2019 period from 2011-2015.

Table no. 6 – Median poverty rates for top and bottom flexicurity performers

Year	Countries		Median poverty rates				
			In-work AROP	AROPE	AROP	SMSD	Low Work Intensity
Correlation with the flexicurity index (sample: EU28 countries)			-0.32***	-0.48***	-0.50***	-0.48***	0.20***
2011-2015	Top 25%	Belgium	4.5	21.6	15.3	7.2	15
		Denmark	5.5	18.6	12.1	3.2	11.9
		France	7.8	18.4	13.7	6.8	8.3
		Ireland	5.4	25.4	16.2	9.4	18.8
		Netherlands	5	16.4	11	3.2	10
		Median	5.4	18.6	13.7	6.8	11.9
	Bottom 25%	Croatia	6	24.4	20	8.4	12.3
		Hungary	6.7	30.6	14.9	24.1	8.8
		Latvia	8.9	30	19.4	15.4	7.7
		Lithuania	9.1	29.4	19.2	14.6	9.1
		Median	7.8	29.7	19.3	15	9
	Relative difference median		-31%	-37%	-29%	-55%	33%
2016-2019	Top 25%	Belgium	4.9	21.3	15.7	6.9	13.8
		Denmark	5.7	17.5	12.5	3.6	10.3
		Finland	3	16.3	11.6	1.9	11.3
		France	7.4	18.3	13.5	6.7	7.6
		Luxembourg	11.2	19.7	16.6	1.8	6.7
		Netherlands	5.9	16.5	13.2	2.6	9.2
		Median	5.8	17.9	13.4	3.1	9.7
	Bottom 25%	Croatia	5.4	22.8	19.4	6.6	10
		Greece	12	31.3	19.4	17.2	14
		Lithuania	8.3	29.2	22.4	13.2	9.3
		Poland	9.8	18.5	15.2	4.9	5.8
		Median	9.1	26	19.4	9.9	9.6
	Relative difference median		-36%	-31%	-31%	-69%	1%

Note: AROP = At-risk of poverty rate; AROPE = At-risk of poverty and social exclusion rate; SMSD = Severe material and social deprivation rate (for full definitions and measurements see Annex - Table no. B1). ***, ** represent statistical significance at 1% and 5%, respectively significance thresholds. For AROP and in-work AROP the sample is EU28 countries, 2005-2019. For the other indicators the sample includes only the 2015-2019 period.

Finally, flexicurity scores show a positive low-strength correlation with people living in households with very low-work intensity (see Table no. 6). This correlation indicates that increased flexicurity scores correspond to an increased share of the population (aged 0-64) living in households where the adults (aged 18-64) worked 20% or less of their total work potential during the past year. The gap between the countries in the top compared to the bottom flexicurity quartiles decreases notably in the 2016–2019-time interval compared to 2011-2015: initially, the top flexicurity countries have 1.33 times greater median low work intensity rate; however, in 2016-2019, the median rate is almost similar to the one in the bottom flexicurity countries (only 1.01 times greater). To get some quick insights on the possible source of these results, we check the correlation between the low work intensity rate and the share of population part-time work because they could not find a full-time job. It is 0.52. We discuss some policy implications in the ending section of this article.

To sum up, the gap in labor market performance between top and bottom flexicurity performers tends to narrow from 2001 to 2019. The labor market productivity shows the highest correlation with the flexicurity index. All other selected labor market indicators show low or moderate correlations of expected signs: positive in the case of employment rates and negative in the case of unemployment and poverty rates. The low-work intensity rate is negatively correlated to flexicurity. All correlations are statistically significant at 1% or 5% significance thresholds and there is generally a more than 10% gap in labor market performance between top and bottom flexicurity countries. However, in some cases, bottom flexicurity countries match or outperform the values of top countries in selected labor market indicators.

6. FINDINGS AND DISCUSSIONS

This article aimed at constructing a flexicurity index, comparing its scores with the theoretical flexicurity typologies and with the other flexicurity country groupings in the literature, and lastly, producing a comparative analysis of performance in flexicurity index scores and selected labor market and social outcomes. In regard to the main aim of this paper, the flexicurity index is computed for the EU28 countries for the 2001-2019 period following the European Commission's four components of flexicurity model. Methodologically, the index is robust to the choice of variables and the standardization method used. In line with Hastings and Heyes (2018), the index scores show that the flexicurity regimes are dynamic, and countries change their typology over time.

To continue, when comparing the flexicurity index scores with the theoretical flexicurity typologies described by Muffels and Luijkx (2008) and Muffels and Wilthagen (2013), we find that for the entire analyzed period, Eastern countries have significantly lower flexicurity scores than their Western counterparts. This finding is in line with the theoretical framework. However, some dissimilarities arise further from the comparative analysis. First, some Continental countries (France and Belgium) scored similarly to the Nordic ones. Second, even though, not consistent for all the years, the Anglo-Saxon and the Iberian countries, particularly Ireland and Portugal, show similar flexicurity scores with the Nordic countries, as well. Thus, the flexicurity index agrees with Muffels and Luijkx (2008) and Hastings and Heyes (2018) in that Continental countries and Ireland are high flexicurity achievers instead of theoretical compromisers of either flexibility or security. They also agree that Portugal and Spain deviate from their theoretical Mediterranean cluster, characterized as inflexicure.

Further on, a comparative analysis shows that the flexicurity index scores share similarities with the other flexicurity country groupings proposed in the literature. Despite the methodological dissimilarities between the flexicurity index and the country groupings – the flexicurity definition, the choice of variables, and the methods - the five country groupings reviewed correlate moderately high (0.65-0.91) with the flexicurity index. It seems that the highest correlations are in the case of country groupings using the same flexicurity definition (European Commission's four components of flexicurity model), followed by the Danish Golden Triangle, and lastly, by the Wilthagen and Tros' flexicurity matrix. Moreover, the correlation is higher with country groupings that use data from one single year, instead of mixed years' data. These comparisons with previously validated country groupings strengthen the robustness of the index and suggest that it captures well the essence of flexicurity.

Lastly, regarding labor market performance, descriptive statistics show that, generally, countries that score highest in the flexicurity index also have better labor market performance.

Hence, the strongest correlation with the flexicurity index is in the case of labor market productivity. Even though lower, differences in median employment and unemployment rates still favor the high flexicurity countries. The labor market performance gap between high and low flexicurity countries is narrower in 2016-2019 compared to 2001-2005. To continue, high flexicurity achievers are better performers in the case of poverty rates as well. In this case, the gap does not change much throughout the analyzed period. Top flexicurity countries perform worse at low work intensity rates than the bottom flexicurity ones. However, the gap narrows to 1% in 2016-2019.

7. CONCLUSIONS AND POLICY IMPLICATIONS

The main contribution of this paper is providing a much-needed long-term flexicurity measure for the EU28 countries. Once more, the European Commission promoted a policy that attracted conversation around it but failed to deliver a coherent statistical discourse. This caused confusion and controversy around the subject. From 2007 to 2020, researchers focused more on critiquing the vagueness of the term (Calmfors, 2007), understanding the state and the future of the policy (Bekker, 2018), or explaining and defining the concept (Chung, 2012) than on assessing its strengths and its weaknesses - justified since flexicurity's main weakness is the poor communication of its definition. As a result, flexicurity was apparently abandoned without any conclusive remarks on its performance. Thus, we reinforce Saltelli *et al.* (2011) recommendations and stress the need for translating EU policy into indicators to enable continuous benchmarking and progress monitoring.

Therefore, promoting and monitoring a consistent EU-level measure increases the policy's visibility and fosters evidence-based policymaking. It facilitates a clear understanding of the policy's aims and bases changes and recommendations on statistical figures and estimations. These build trust in the EU's promoted policies and bring support from other actors. In addition to the active engagement of citizens and institutions in EU programs, having a coherent statistical framework allows researchers to contribute with their assessments, analyses, and policy recommendations. Moreover, while gathering data for constructing the flexicurity composite indicator, we struggled with identifying the data sources for the constituent variables. Even though the variables are agreed on and put forward in the European Commission (2007) and are afterward used by Manca *et al.* (2010), they are not part of an integrated database. They are not even in the same data portal, some variables being stored by Eurostat, others by other European Commission's Directorates. We thus end our recommendations for improved evidence-based policy making with having a single portal to store all EU data. Such a change gives researchers easy access to the data related to different EU policies, minimizing the time and effort spent in data gathering, and increasing their focus on the data analysis and research implications stages. This ultimately benefits the EU and its Member States since more research and of better quality can be dedicated to the EU policy.

The rest of this paper's objectives further strengthen these policy recommendations and bring additional implications, which we discuss next. First, the high correlation between a flexicurity indicator constructed based on the initial set of variables set by the European Commission (2007) and the other five country groupings in the existing literature suggests that a good enough measure for flexicurity benchmarking can be computed. Second, countries deviating from the theoretical flexicurity typologies indicate that the flexicurity index should be monitored and updated regularly to provide adequate policy advice. The same policy

implication results from countries changing performance in the flexicurity index over time. The use of the theoretical framework or of measures constructed for one point in time when analyzing the long-term performance or change in time of labor market outcomes inside the EU countries can provide misleading or confusing results. Moreover, having a long-term measure in place, changes in policy recommendations can be justified based on data.

Had there been a sound statistical framework already set in place by the European Commission, the research of other stakeholders could have focused more on the implications of flexicurity, generating a richer understanding of whether the last decade's flexicurity efforts attained their goals and whether externalities existed. This is beyond the scope and possibilities of this article. However, we can hint at some brief policy recommendations from the comparative analysis between flexicurity and labor market outcomes as a first use case of the flexicurity index. The analysis is correlational and not causational. Thus, further investigation is needed to understand whether flexicurity efforts enhance labor market and social outcomes or if countries that successfully adopted flexicurity had better labor market and social outcomes beforehand. Except for the low work intensity rate, all the analyzed variables are better off in the case of high flexicurity countries, suggesting that further causational investigation can unveil interesting results with important policy implications.

Therefore, it seems that flexicurity could have been a means to reach Europe 2020's goals of increased employment, productivity, and social cohesion. Among all, the high positive correlation between labor productivity and flexicurity strikes most, supporting the European Commission (2007) assumption that the costs of the flexicurity efforts are offset by the increased productivity rates. Even though, as described in the Introduction section, neither the employment nor the at-risk of poverty rate explicit targets were met, flexicurity may have contributed to getting closer to them. Reducing poverty among EU citizens remains a top priority in the Europe 2030 strategy. Had flexicurity been constantly monitored in previous years, it could have been part of the new strategy.

Since the retirement ages are similar or even higher in top flexicurity countries compared to bottom ones, the big difference in unemployment rates of older employees can be due to the better-performing insertion mechanisms of the high flexicurity countries. Also, the significantly better performance of top flexicurity countries in the two crisis periods could suggest that these mechanisms were subject to austerity measures in the case of low flexicurity countries. Should a causational relation be established, flexicurity efforts should increase in low-performant countries, particularly in the case of Croatia, Greece, or Poland, where are both the lowest flexicurity scores and the lowest employment rates of older people. Investments in effective reinsertion mechanisms for older people become more important in the context of an aging European population in a period of rapid social and technological change.

The positive correlation between the flexicurity index scores and the low work intensity rate opens an interesting and lengthy discussion. Some countries with low flexicurity scores, such as Croatia or Greece, have higher low-work intensity rates than the Netherlands, France, Luxembourg, or Denmark, but these are exemptions rather than the norm. An important policy question here is: should this be a concern, and if yes, under which circumstances? To begin with, the correlation is low. Moreover, it seems that the gap between high and low-flexicurity countries narrows significantly in the last years of the analysis. Therefore, had flexicurity remained a policy interest in the EU, the main recommendation forward would have been to continue to monitor the relation between flexicurity and the low-work intensity rate. It might be that the positive correlation becomes non-significant in the future due to the apparent decreasing rate of top flexicurity countries.

To continue, since flexicurity is also positively correlated with employment rates, higher low-work intensity rates in higher flexicurity countries could suggest that flexicurity eases people's access to jobs, but these jobs are not their full work time potential. This assumption is backed by the positive correlation between the low work intensity rate and the share of involuntary part-time employees. A first implication of this finding is that penalizing countries for the involuntary part-time rate in the flexicurity index should remain in the index's future versions.

Secondly, without social benefits, such an indication could lead to precarious living conditions. The (in-work) at-risk of poverty rates and the severe material and social deprivation rate are negatively correlated with the flexicurity scores. Since these rates are computed after social transfers, future research could investigate whether low work intensity rates are compensated by generous social benefits in the case of high flexicurity countries. Such research could clarify if flexicurity settings lead to increased employment rates at the expense of involuntary part-time and increased social benefits. If so, given the highly positive correlation of flexicurity with labor productivity, a last future research question is: do the increased productivity rates net out the incurred social benefits? Otherwise, the findings of this paper, facilitated by the flexicurity index, seem to encourage the integration of flexicurity for better labor market and social outcomes.

ORCID

Marina Ferent-Pipas http://orcid.org/0000-0001-9635-1304

References

Auer, P. (2010). What's in a Name? The Rise (and Fall?) of Flexicurity. *The Journal of Industrial Relations, 52*(3), 371-386. http://dx.doi.org/10.1177/0022185610365646

Auer, P., & Chatani, K. (2011). Flexicurity: still going strong or a victim of the crisis? *Research handbook on the future of work and employment relations* (pp. 253-278): Edward Elgar Publishing. http://dx.doi.org/10.4337/9780857936363.00022

Becker, W., Benavente, D., Dominguez-Torreiro, M., Moura, C., Neves, A., Saisana, M., & Vertesy, D. (2019). COIN Tool: User Guide. *Publications Office of the European Union*. http://dx.doi.org/10.2760/523877

Bekker, S. (2018). Flexicurity in the European Semester: Still a relevant policy concept? *Journal of European Public Policy, 25*(2), 175-192. http://dx.doi.org/10.1080/13501763.2017.1363272

Calmfors, L. (2007). Flexicurity: an answer or a question? Swedish Institute for European Policy Studies. *Swedish Institute for European Policy Studies (SIEPS)*.

Chung, H. (2012). Measuring Flexicurity: Precautionary Notes, a New Framework, and an Empirical Example. *Social Indicators Research, 106*(1), 153-171. http://dx.doi.org/10.1007/s11205-011-9800-2

De Pedraza Garcia, P., Alvarez Diaz, M., & Dominguez Torreiro, M. (2018). *Revamping the flexicurity analytical framework: conceptual and empirical analysis of the links between flexicurity policies and social outcomes*. Retrieved from https://knowledge4policy.ec.europa.eu/publication/revamping-flexicurity-analytical-framework-conceptual-empirical-analysis-links-between_en

Dominguez-Torreiro, M., & Casubolo, C. (2017). *Exploratory analysis of flexicurity dimensions across EU countries: a statistical assessment and consensus clustering approach*. Retrieved from https://op.europa.eu/en/publication-detail/-/publication/7f382479-fb3a-11e7-b8f5-01aa75ed71a1/language-en

EMCO. (2009). *Monitoring and analysis of Flexicurity policies*. Retrieved from https://ec.europa.eu/social/search.jsp?mainCat=&subCat=&year=&country=&advSearchKey=Monitoring+and+analysis+of+Flexicurity+policies+&mode=advancedSubmit&langId=en&searchType=&search=Search

European Commission. (2007). *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions Youth Opportunities Initiative* Retrieved from https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM%3A2007%3A0359%3AFIN%3AEN%3APDF

European Commission. (2010). *Europe 2020: A European strategy for smart, sustainable, and inclusive growth*. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52010DC2020

Ferent-Pipas, M., & Lazar, D. (2023). Flexicurity and self-perceived work–life balance in the EU27: A repeated cross-sectional multilevel analysis. *Economic and Industrial Democracy*, Advance online publication. http://dx.doi.org/10.1177/0143831X231213024

GHK, I. (2013). *Evaluation of flexicurity 2007-2010: Final Report*. Retrieved from https://ec.europa.eu/social/search.jsp?advSearchKey=Evaluation+of+flexicurity+2007-2010%3A+Final+Report&mode=advancedSubmit&langId=en

Hastings, T., & Heyes, J. (2018). Farewell to flexicurity? Austerity and labour policies in the European Union. *Economic and Industrial Democracy, 39*(3), 458-480. http://dx.doi.org/10.1177/0143831X16633756

Madsen, P. K. (2004). The Danish model of 'flexicurity': experiences and lessons. *Transfer: European Review of Labour and Research, 10*(2), 187-207. http://dx.doi.org/10.1177/102425890401000205

Madsen, P. K., Molina, O., Møller, J., & Lozano, M. (2013). Labour market transitions of young workers in Nordic and southern European countries: The role of flexicurity. *Transfer: European Review of Labour and Research, 19*(3), 325-343. http://dx.doi.org/10.1177/1024258913495348

Manca, A. R., Governatori, M., & Mascherini, M. (2010). *Towards a set of composite indicators on flexicurity: A comprehensive approach*. Retrieved from Luxembourg: https://publications.jrc.ec.europa.eu/repository/handle/JRC58069

Muffels, R., & Luijkx, R. (2008). Labour market mobility and employment security of male employees in Europe: 'trade-off' or 'flexicurity'? *Work, Employment and Society, 22*(2), 221-242. http://dx.doi.org/10.1177/0950017008089102

Muffels, R., & Wilthagen, A. C. (2013). Flexicurity: A New Paradigm for the Analysis of Labor Markets and Policies Challenging the Trade-Off Between Flexibility and Security. *Sociology Compass, 7*(2), 111-122. http://dx.doi.org/10.1111/soc4.12014

Nardo, M., Saisana, M., Saltelli, A., Tarantol, a. S., Hoffmann, A., & Giovannini, E. (2008). Handbook on Constructing Composite Indicators: Methodology and User Guide. *OECD*.

Nikulin, D., & Gawrycka, M. (2021). Implementation of the Concept of Flexicurity in the Selected Countries of Central Eastern Europe. Ekonomista. *Ekonomista, 1*, 118-141. http://dx.doi.org/10.52335/dvqigjykfff4

Noja, G. G. (2018). Flexicurity models and productivity interference in C.E.E. countries: A new approach based on cluster and spatial analysis. *Ekonomska Istrazivanja, 31*(1), 1111-1136. http://dx.doi.org/10.1080/1331677X.2018.1456356

Saisana, M., & Saltelli, A. (2006). Sensitive issues in the development of composite indicators for policy-making. *In Simulation in Industry and Services Conference*.

Saisana, M., Saltelli, A., & Tarantola, S. (2005). Uncertainty and sensitivity analysis techniques as tools for the quality assessment of composite indicators. *ournal of the Royal Statistical Society Series A: Statistics in Society, 168*(2), 307-323. http://dx.doi.org/10.1111/j.1467-985X.2005.00350.x

Saltelli, A., D'Hombres, B., Jesinghaus, J., Manca, A., Mascherini, M., Nardo, M., & Saisana, M. (2011). Indicators for European Union Policies. Business as Usual? *Social Indicators Research, 102*(2), 197-207. http://dx.doi.org/10.1007/s11205-010-9678-4

Wilthagen, T., & Tros, F. (2004). The concept of 'flexicurity': A new approach to regulating employment and labour markets. *Transfer: European Review of Labour and Research, 10*(2), 166-186. http://dx.doi.org/10.1177/102425890401000204

ANNEXES

Annex A – Data and methods

Table no. A1 – Components of the Flexible Contractual Arrangements (FCA) subindex

	Variable	Source	Polarity	Weight
	Dimension 1: External flexibility			
	Data availability: 2001-2019			
1.1.	Fixed term contracts rate	Eurostat	+	1/18
1.2.	Involuntary fixed term contracts rate	Eurostat	-	1/18
1.3.	Self-employment rate	Eurostat	+	1/18
1.4.	Strictness of rules: regular contracts	OECD.Stat	-	1/18
1.5.	Strictness of rules: temporary contracts (versus regular contracts)	OECD.Stat	+	1/18
1.6.	Strictness of rules: collective dismissals	OECD.Stat	-	1/18
	Dimension 2: Internal flexibility			
	Data availability: 2001-2019; for (*) is 2014			
2.1.	Part-time work rate	Eurostat	+	1/15
2.2.	Involuntary part-time work rate	Eurostat	-	1/15
2.3.	Share of employees for whom overtime is main reason for actual hours worked being different from usual hours worked (*)	Eurostat	+	1/15
2.4.	Share of employees for whom variable hours is the main reason for actual hours worked being different from usual hours worked (*)	Eurostat	+	1/15
2.5	Irregular working times			
	2.5.1. Evening work rate	Eurostat	+	1/75
	2.5.2. Night work rate (*)	Eurostat	+	1/75
	2.5.3. Saturday work rate	Eurostat	+	1/75
	2.5.4. Sunday work rate	Eurostat	+	1/75
	2.5.5. Shift work rate	Eurostat	+	1/75
	Dimension 3: Combined flexibility			
	Data availability: 2001-2019			
3.1.	Inactivity due to lack of suitable care services for children and other dependents	Eurostat	-	1/6
3.2.	Part-time work due to lack of suitable care services for children and other dependents	Eurostat	-	1/6

Note: Dimension 2 is composed of five variables (part-time work, involuntary part-time work, overtime, variable working hours, and irregular working times), each receiving a 1/5 weight in the dimension (1/15 in the sub-index). Irregular working time is further composed of five measures: share of workers doing evening, night, Saturday, Sunday, and shift work. As such, each one of these five variables are weighted 1/25 in dimension 2 (1/75 in the FCA sub-index).

Source: based on Manca *et al.* (2010); Nikulin and Gawrycka (2021); Ferent-Pipas and Lazar (2023)

Table no. A2 – Components of the Modern Social Security Systems (MSSS) subindex

	Variable	Polarity	Weight
	Dimension 1: Overall spending and coverage of unemployment benefits		
	Data availability: 2001-2019		
	Data source: D.G. Employment, Social Affairs & Inclusion		
1.1.	Share of people wanting to work receiving out-of-work income support	+	1/12
1.2.	Expenditure on out-of-work income maintenance	+	1/12
1.3.	Expenditure on out-of-work income maintenance per person wanting to work	+	1/12
	Dimension 2: Financial incentives to take up a job		
	Data availability: 2001-2019		
	Data source: D.G. Economic and Financial Affairs		

	Variable	Polarity	Weight
2.1.	Unemployment trap (67% gross earnings of an average worker, single person)	-	1/20
2.2.	Unemployment trap (67% gross earnings of an average worker, one-earner couple with 2 children)	-	1/20
2.3.	Inactivity trap (67% gross earnings of an average worker, single person)	-	1/20
2.4.	Inactivity trap (67% gross earnings of an average worker, one-earner couple with 2 children)	-	1/20
2.5.	Inactivity trap (67% gross earnings of an average worker, two-earner couple with 2 children)	-	1/20
	Dimension 3: Amount and duration of individual unemployment benefits		
	Data availability: 2001-2019		
	Data source: D.G. Economic and Financial Affairs		
3.1.	Net replacement rate after 6 months (67% gross earnings of an average worker, single person)	+	1/24
3.2.	Net replacement rate after 12 months (67% gross earnings of an average worker, single person)	+	1/24
3.3.	Net replacement rate after 60 months (67% gross earnings of an average worker, single person)	+	1/24
3.4.	Net replacement rate after 6 months (67% gross earnings of an average worker, one-earner couple with 2 children)	+	1/24
3.5.	Net replacement rate after 12 months (67% gross earnings of an average worker, one-earner couple with 2 children)	+	1/24
3.6.	Net replacement rate after 60 months (67% gross earnings of an average worker, one-earner couple with 2 children)	+	1/24
	Dimension 4: Childcare services		
	Data availability: 2001-2019		
	Data source: D.G. Eurostat		
	... 1-29 hours per week		
4.1.	0 to 2 years	+	1/36
4.2.	3 years to compulsory school age	+	1/36
4.3.	Compulsory school age to 12 years	+	1/36
	... 30 hours or more per week		
4.4.	0 to 2 years	+	2/36
4.5.	3 years to compulsory school age	+	2/36
4.6.	Compulsory school age to 12 years	+	2/36

Note: Dimension 4 relates to combination security (work-life balance security). It makes a distinction between childcare services of 1-29 hours a week and those of 30 or more hours. Since the latter allow combining a full-time work schedule with family life, they are weighted double in the dimension.

Source: based on Manca *et al.* (2010); Nikulin and Gawrycka (2021); Ferent-Pipas and Lazar (2023)

Table no. A3 – Components of the Active Labor Market Policies (ALMP) subindex

	Variable	Polarity	Weight
	Dimension 1: Expenditure as percentage of GDP		
	Data availability: 2001-2019		
	Data source: D.G. Employment, Social Affairs & Inclusion		
1.1.	Expenditure on labor market services	+	1/18
1.2.	Expenditure on training services	+	1/18
1.3.	Expenditure on employment incentives	+	1/18
1.4.	Expenditure on supported employment and rehabilitation	+	1/18
1.5.	Expenditure on direct job creation	+	1/18
1.6.	Expenditure on start-up incentives	+	1/18
	Dimension 2: Spending per participant in millions of euros		
	Data availability: 2001-2019		
	Data source: D.G. Employment, Social Affairs & Inclusion		
2.1.	Spending per participant on training services	+	1/15

	Variable	Polarity	Weight
2.2.	Spending per participant on employment incentives	+	1/15
2.3.	Spending per participant on supported employment and rehabilitation	+	1/15
2.4	Spending per participant on direct job creation	+	1/15
2.5.	Spending per participant on start-up incentives	+	1/15
	Dimension 3: Spending/participants per person wanting to work		
	Data availability: 2001-2019		
	Data source: D.G. Employment, Social Affairs & Inclusion		
3.1.	Spending per person wanting to work on labor market services	+	1/9
3.2.	Spending per person wanting to work on training, employment incentives, supported employment and rehabilitation, direct job creation, and start-up incentives	+	1/9
3.3.	Share of participants receiving training, employment incentives, supported employment and rehabilitation, direct job creation, or start-up incentives over total number of persons wanting to work	+	1/9

Source: based on Manca *et al.* (2010); Nikulin and Gawrycka (2021); Ferent-Pipas and Lazar (2023)

Table no. A4 – Components of the Lifelong Learning (LLL) subindex

	Variable	Polarity	Weight
	Dimension 1: Percentage of firms providing continual vocational training		
	Data availability: 2005, 2010, 2015		
	Data source: D.G. Eurostat		
1.1.	Share of enterprises providing continual vocational training	+	1/7
	Dimension 2: Participation in continual vocational training		
	Data availability: 2005, 2010, 2015		
	Data source: D.G. Eurostat		
2.1.	Share of employees participating in continual vocational training		
	2.1.1. Men	+	1/14
	2.1.2. Women	+	1/14
2.2.	Hours in continual vocational training per employee	+	1/7
	Dimension 3: Investment in continual vocational training		
	Data availability: 2005, 2010, 2015		
	Data source: D.G. Eurostat		
3.1.	Share of cost with continual vocational training from total labor cost	+	1/7
3.2.	Direct cost of continual vocational training per employee	+	1/7
3.3.	Labor cost of participants in continual vocational training per employee	+	1/7
	Dimension 4: Participation in lifelong learning		
	Data availability: 2001-2019		
	Data source: D.G. Eurostat		
4.1.	Share of population aged 25-64 participating in education and training over the four weeks prior to the survey		
	4.1.1. Men	+	1/14
	4.1.2. Women	+	1/14

Note: Variables that refer to the total population receive a 1/7 weight. Variables that are gender disaggregated receive a 1/14 weight for each gender.

Source: based on Manca *et al.* (2010); Nikulin and Gawrycka (2021); Ferent-Pipas and Lazar (2023)

Table no. A5 - Pearson's correlation between dimensions

Flexible contractual arrangements			
	Dimension 1: External flexibility	*Dimension 2: Internal flexibility*	*Dimension 3: Combined flexibility*
Dimension 1: External flexibility	1	[0.12; 0.27]	[-0.13; 0.09]
Dimension 2: Internal flexibility	[0.12; 0.27]	1	[-0.42; -0.19]
Dimension 3: Combined flexibility	[-0.13; 0.09]	[-0.42; -0.19]	1

Modern social security systems				
	Dimension 1: Overall spending and coverage of unemployment benefits	*Dimension 2: Financial incentives to take up a job*	*Dimension 3: Amount and duration of individual unemployment benefits*	*Dimension 4: Childcare services*
Dimension 1: Overall spending and coverage of unemployment benefits	1	[-0.53; -0.3]	[0.37; 0.64]	[0.27; 0.43]
Dimension 2: Financial incentives to take up a job	[-0.53; -0.3]	1	[-0.57; -0.29]	[-0.46; -0.23]
Dimension 3: Amount and duration of individual unemployment benefits	[0.37; 0.64]	[-0.57; -0.29]	1	[0.08; 0.68]
Dimension 4: Childcare services	[0.27; 0.43]	[-0.46; -0.23]	[0.08; 0.68]	1

Active labor market policies			
	Dimension 1: Expenditure as percentage of GDP	*Dimension 2: Spending per participant in millions of euros*	*Dimension 3: Spending/participants per person wanting to work*
Dimension 1: Expenditure as percentage of GDP	1	[0.43; 0.71]	[0.64; 0.89]
Dimension 2: Spending per participant in millions of euros	[0.43; 0.71]	1	[0.46; 0.76]
Dimension 3: Spending/participants per person wanting to work	[0.64; 0.89]	[0.46; 0.76]	1

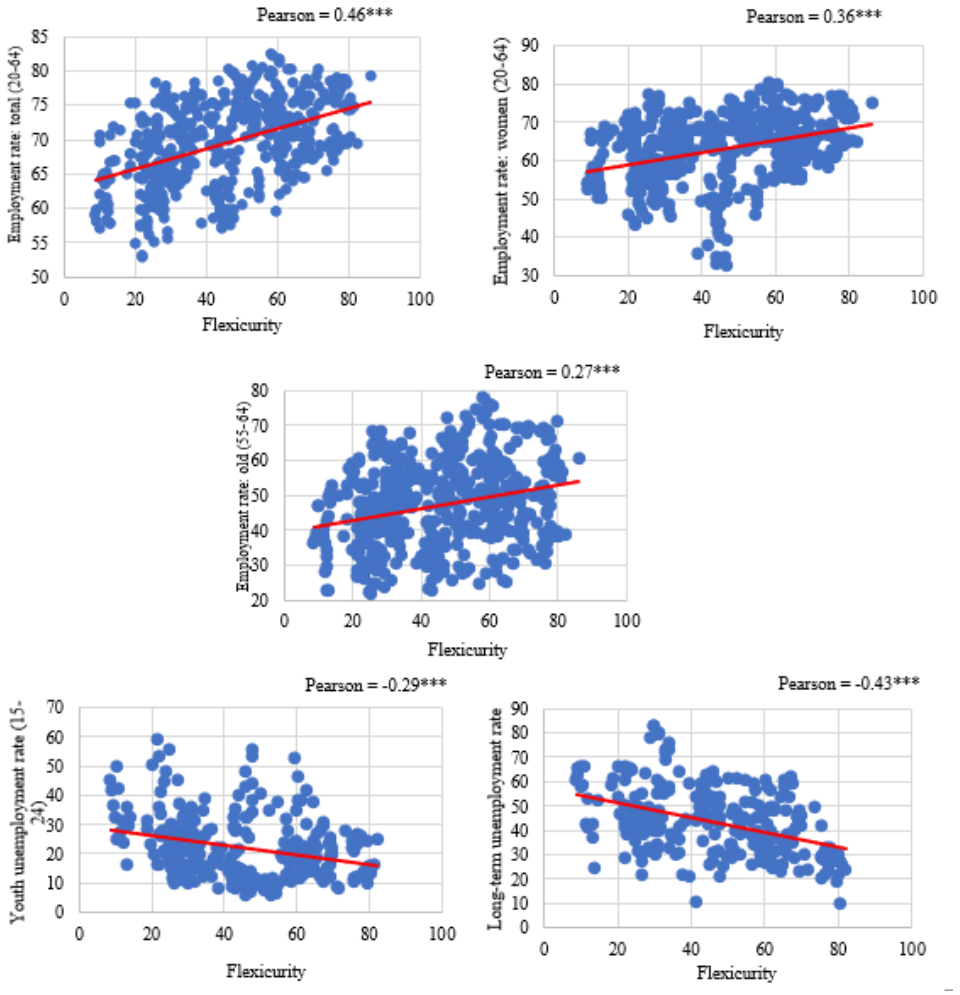
Lifelong learning				
	Dimension 1: Percentage of firms providing continual vocational training	*Dimension 2: Participation in continual vocational training*	*Dimension 3: Investment in continual vocational training*	*Dimension 4: Participation in lifelong learning*
Dimension 1: Percentage of firms providing continual vocational training	1	[0.71; 0.76]	[0.72; 0.8]	[0.68; 0.77]
Dimension 2: Participation in continual vocational training	[0.71; 0.76]	1	[0.8; 0.91]	[0.4; 0.51]
Dimension 3: Investment in continual vocational training	[0.72; 0.8]	[0.8; 0.91]	1	[0.4; 0.58]
Dimension 4: Participation in lifelong learning	[0.68; 0.77]	[0.4; 0.51]	[0.4; 0.58]	1

Note: In squared brackets are the minimum and the maximum Pearson's correlation coefficients during the 2001-2019. Yearly correlation values are available upon request

Annex B – Evaluating labor market performance

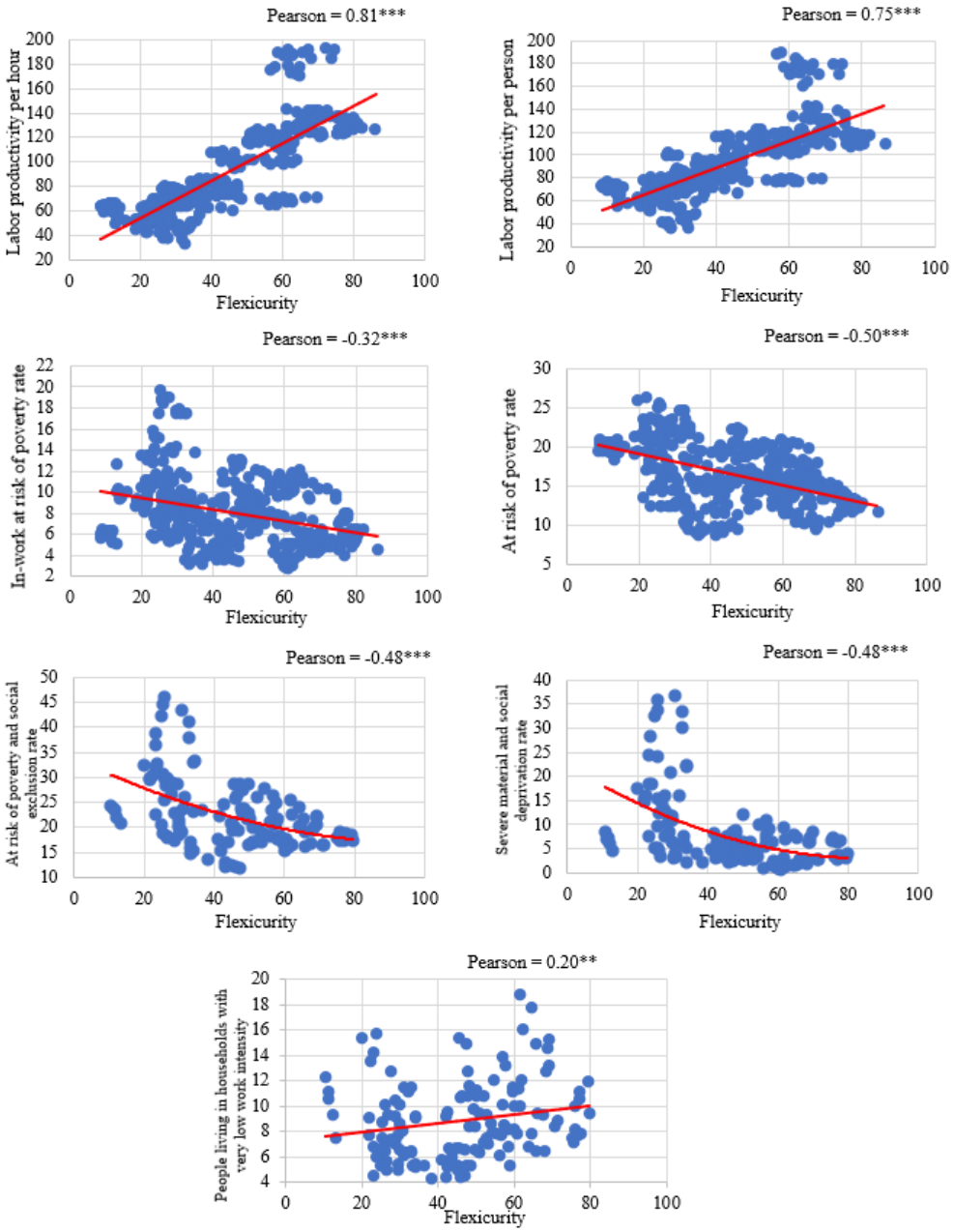
Table no. B1 – Labor market performance indicators

Variable	Measurement	Availability
Employment rate, total	% active population aged 20-64	2001-2019 (missing: Croatia 2001)
Employment rate, women	% active population aged 20-64	2001-2019 (missing: Croatia 2001)
Employment rate, older workers	% active population aged 55-64	2001-2019 (missing: Croatia 2001)
Youth unemployment rate	% active population aged 15-24	2009-2019 (UK missing completely)
Long-term unemployment rate	% unemployed population aged 20-64	2009-2019 (UK missing completely)
Labor productivity per person employed	% EU27 (from 2020) total (based on million purchasing power standards), current prices	2005-2019 (UK missing completely)
Labor productivity per hour worked	% EU27 (from 2020) total (based on million purchasing power standards), current prices	2005-2019 (UK missing completely)
In-work at-risk-of-poverty rate	Share of employed population aged 18 and over with an equivalized disposable income below 60 % of the national median equivalized disposable income (after social transfers)	2005-2019 (missing: Bulgaria, Croatia, and Portugal 2005; Croatia 2006; UK 2019)
People at risk of poverty or social exclusion (AROPE)	Share of population either at risk of poverty, or severely materially or socially deprived, or living in households with very low work intensity	2015-2019 (missing: UK2019)
At-risk-of-poverty rate (AROP)	Share of population with an equivalized disposable income below 60% of the national median equivalized disposable income (after social transfers)	2005-2019 (missing: Bulgaria, Croatia, and Portugal 2005; Croatia 2006; UK 2019)
Severe material and social deprivation rate (SMSD)	Share of population that cannot afford 7 or more of the following: i) pay rent or utility bills; ii) keep home adequately warm; iii) face unexpected expenses; iv) eat meat, fish or a protein equivalent every second day; v) a week holiday away from home; vi) have access to a car/van for personal use; vii) replace worn out furniture; viii) replace worn-out clothes with some new ones; ix) have two pairs of properly fitting shoes; x) spend a small amount of money each week on oneself; xi) have regular leisure activities; xii) get together with friends/family for a drink/meal at least once a month; and xiii) have an internet connection	2015-2019 (missing: UK 2019)
People living in households with very low work intensity	Share of population aged 0-64 living in households where the adults (aged 18-64) work 20% or less of their total work potential during the past year	2015-2019 (missing: UK 2019)



Note: *** represents statistical significance at 1% significance threshold. For employment rates the sample is EU28 countries, 2001-2019. For unemployment rates the sample includes only the 2009-2019 period and excludes the UK.

Figure no. B1 – Correlation between flexicurity index scores and employment and unemployment rates



Note: ***, ** represent statistical significance at 1% and 5%, respectively significance thresholds. For productivity indicators the sample is EU28 without the UK, 2005-2019. For AROP and in-work AROP the sample is EU28 countries, 2005-2019. For the other poverty rates the sample includes only the 2015-2019 period.

Figure no. B2 – Correlation between flexicurity index scores and labor productivity and poverty indicators

Notes

[1] People with an equivalized disposable income below 60 % of the national median equivalized disposable income (after social transfers).

[2] In 2010 there were 81 million people at-risk of poverty inside the EU27_2007 (2007-2013). In 2018 there were 85 million people at-risk of poverty inside the EU27_2007 (2007-2013). For 2019 and 2020, the at-risk poverty rate is computed only for EU27_2020 (72 and 73 million people, respectively).

[3] Manca *et al.* (2010) computed the flexicurity sub-indices for selected EU27 countries: FCA -2005 to 2008; MSSS -2005 to 2007; ALMP -2005 to 2007; LLL -2005.

[4] (EMCO, 2009) has been previously criticized by Dominguez-Torreiro and Casubolo (2017) and De Pedraza Garcia *et al.* (2018) mix input, process and output variables in creating their sub-indices.

[5] In the Web of Science collection, at the time of writing this paper.

[6] 2005 is the only year available for all four flexicurity components. Manca *et al.* (2010) computed and made available the scores for FCA for 2005-2008, MSSS for 2005-2007, and ALMP for 2004-2007. LLL is only available for 2005.

[7] This was the case of 7 variables, namely: LMP expenditure: cat.4, Employment incentives; LMP expenditure: cat.5, Supported employment and rehabilitation; LMP expenditure: cat.6, Direct job creation; LMP expenditure: cat.7, Start-up incentives; LMP services (cat 1): spending per person wanting to work; LMP measures (cat 2-7): spending per person wanting to work; and Expenditure on out-of-work income maintenance per person wanting to work.

[8] Sweden is not part of the empirical analysis of Muffels and Luijkx (2008).

[9] Norway is not part of our sample.

[10] Luxembourg is not part of Hastings and Heyes (2018) sample.