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Revamping the flexicurity analytical framework

Conceptual and empirical analysis of the links between flexicurity policies and social outcomes

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Contents

Abstract

Flexicurity is a labour market policy strategy resulting in increased flexibility for employers and higher levels of security for workers. It is a complex and multi-faceted phenomenon lacking a sound and statistically consistent indicator framework. The conceptual framework developed in this paper builds upon the Wilthagen and Tros (2004) flexicurity matrix. We construct flexicurity "drivers" by pooling together variables that are statistically and conceptually related to specific types of flexibility and security. We then obtain statistically consistent aggregate measures for each driver and select three drivers that represent the three corners of the Danish "golden triangle": external numerical flexibility, employment security, and income security. We conduct an empirical analysis on the evolution of the selected flexicurity drivers over time and across EU countries, followed by an analysis of the relationship between selected flexicurity drivers and social outcomes from the Social Scoreboard of the European Pillar of Social Rights. Empirical evidence from the latest years supports the idea of cross-country convergence in terms of external numerical flexibility and polarisation in terms of employment and income security. Our results also show that the higher the flexibility at the onset of the crisis the lower the unemployment rates after the crisis and the more generous the social protection systems the lower the resulting poverty levels. Employment security, however, appears to be related to higher levels of income inequality after the crisis.

Keywords: Flexicurity, composite indicators, European Pillar of Social Rights

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1. Introduction

The concept of flexicurity was originally coined in the Netherlands in the mid-1990s. It referred to a policy strategy to modify job protection for workers on standard contracts and improve job and income security for flexible workers on temporary contracts (Bredgaard 2010, Wilthagen 1998). In the early 2000s, the concept was adopted by Danish policymakers and academics to describe an internal labour market characterised by three elements: liberal dismissal protection, relatively generous unemployment benefit system and active labour market policies—or the "golden triangle" of flexicurity (Madsen 1999, Madsen 2004).

Flexicurity as a policy strategy assumes that win-win combinations of flexibility for employers and security for workers can be achieved in the labour market. Under such premises, flexicurity came for several years to occupy a prominent position in political and academic debates at EU level and is still playing an important role (Bekker 2018). Unfortunately, many of the win-win beliefs underpinning flexicurity proposals have not been sufficiently substantiated by empirical analyses shedding light on the actual positive or negative outcomes of flexicurity policies (Keune and Serrano 2014). In addition, there is a wide consensus among social partners in Europe that the recent crisis has paved the way to flexibilisation policies in the labour market combined with shrinking security. The balance between flexibility and security originally achieved in the Danish model is tilting towards a gradual erosion of the institutions in charge of providing income and employment security (Madsen 2013). The way in which the concept has evolved in practice has condemned the word flexicurity to distrust and very low popularity levels, especially among trade unions. As a result, flexicurity has become today a word with negative ("evil") connotations.

Flexicurity is a complex and multi-faceted phenomenon. There is not yet a sound and well-developed indicator framework to monitor this concept, which partly explains the scarcity of empirical analyses in the field (Chung 2012). The European Commission has come forward with its own indicator framework (EMCO 2009), which draws upon four main flexicurity principles: Flexible and reliable contractual agreements (FRCA), Life-long learning (LLL), Active labour market policies (ALMP) and Modern social security (MSS). However, according to previous statistical assessments (Nardo and Rossetti 2013, Domínguez-Torreiro and Casubolo 2017), the correlation structure among the variables included in each of these four groups is neither sound nor robust. These results do not support the use of composite indicators to summarize the four principles outlined above.

Very often in the existing literature, methodological choices relating to the definition of flexicurity indicator frameworks are subjective or insufficiently explained (Maselli 2010). These methodological choices include the selection of the variables populating the indicator framework, the interpretation of their positive or negative impact on flexibility and security dimensions, and the calculation of aggregate measures. As regards the latter, one of the drawbacks of using flexicurity aggregates or composite measures is that they might end up hiding and blurring situations of shrinking security at the expense of flexibility, as opposed to synergistic combinations of both.

As a way to overcome the limitations and caveats described above, in this work we propose to look back and build upon the flexicurity matrix outlined by Wilthagen and Tros (2004). The flexicurity matrix is a theoretical construct that explicitly differentiates between flexibility and security categories. In our own framework, we assume that the flexicurity variables considered might represent levels of flexibility from the point of view of employers, and levels of security from the point of view of workers. In this light, the same variable can be assumed to have a positive impact on flexibility and a negative impact of security. As regards the grouping of variables, those variables that are conceptually and statistically related have been bundled together into flexicurity "drivers". An aggregated value or composite indicator is calculated for each driver.

The main goal of this study is to define and use composite indicators as a means to reduce the dimensionality of the problem at hand. Using yearly data from 2005 to 2015 at EU country level, firstly we test for the statistical coherence of the flexicurity drivers. Secondly, we use flexicurity drivers to monitor the evolution of flexibility and security over time and across countries. Thirdly, given the importance of social issues in the current EU policy agenda (Bekker 2018), we undertake an econometric analysis of the impact of flexicurity policies on social outcomes in the EU-28. Following Chung (2012), our empirical analysis focuses on the three main building blocks of the Danish "golden triangle" (numerical flexibility, employment security, income security), and accordingly on the three flexicurity drivers that best represent those three building blocks.

Our econometric analysis is based on cross-section linear regression models. These models allow us to study the relationship between drivers and social outcomes. Social outcomes are defined in terms of variables included in the Social Scoreboard of the European Pillar of Social Rights (European Commission 2017a): unemployment, early leavers from education, gender employment gap, income inequality, risk of poverty, and young people neither in employment nor in education. Our results corroborate previous findings of studies that highlight the role of passive and active labour market policies in safeguarding social well-being (Berglund 2015). In particular, selected flexibility and security drivers have a significant positive contribution on social outcomes such as the reduction of the share of population at-risk-of-poverty or social exclusion. Higher initial values in flexibility drivers at the onset of the crisis seem also to contribute to a reduction in the unemployment rates registered after the crisis. Higher income security drivers contribute to reduce poverty. However, on a more negative note, employment security drivers appear to be linked to the presence of higher levels of income inequality after the crisis.

The remainder of the document is structured as follows. Section 2 discusses and explains how we operationalise the concept of flexicurity into flexibility and security drivers. Section 3 describes the data, the statistical consistency of flexibility and security drivers and analyses how flexicurity has evolved at country level over the period considered. Section 4 explains the estimation strategy and identifies the main flexicurity impacts on key social outcomes. Section 5 discusses the results and concludes.

2. Conceptualization

Empirical analyses so far have concluded that the grouping of variables along the categories proposed in the EMCO list to monitor flexicurity is not statistically consistent (Domínguez-Torreiro and Casubolo 2017, Nardo and Rossetti 2013). As a starting point, we propose to draw upon the "flexicurity matrix" (Wilthagen and Tros 2004), which makes a distinction between four possible types of flexibility and four of security. Table 1 summarizes the flexibility and security types in the flexicurity matrix. The third column includes our own proposal of flexicurity drivers, covering a wide range of possible states, efforts and outcomes in national labour markets, and establishing a link between the drivers and specific flexicurity categories. In this section we motivate our selection of drivers from a conceptual point of view. The empirical analysis of the statistical coherence and robustness of the variables included in each driver will be discussed in the next section.

Table 1: Flexibility and security matrix: categories and drivers

Flexicurity components	**Categories**	**Drivers**
Flexibility	External numerical flexibility	EPL and tenure
		Job seekers
		Public expenditure
		Traps
		Family and labour supply
		Low-wage supply
		Transitions
	Internal numerical flexibility	Working time
	Functional flexibility	Human capital – lower education
		Human capital – higher education, LLL and ALMP
	Wage flexibility	Competitive pay and labour cost
Security	Job security	EPL and tenure
		Transitions and self-employment
		Involuntary part time and temporary jobs
	Employment security	Human capital – lower education
		Human capital – higher education, LLL and ALMP
	Income security	Social security support
		In-work poverty
	Work-life balance	Childcare, parenthood and inactivity
		Part-time and low-wage

As shown in Table 1 above, we consider four categories of flexibility:

i. External-numerical flexibility refers to how easy hiring and firing is for employers. We propose several drivers related to the concept of external numerical flexibility:
   - The driver on employment protection legislation (EPL) and tenure encompasses a broad range of regulatory issues, as well as aspects related to stability in the labour market. On the one hand, less stringent EPL increases flexibility. On the other hand, longer job tenures are expected to have a negative impact on flexibility. Longer tenures imply

higher severance rights which make a worker less likely to quit a job or to be dismissed.

- The second driver deals with composition of the pool of job seekers and potential job seekers. External numerical flexibility tends to be higher the larger the availability of unemployed workers in the labour market searching for a job. Along the same lines, a higher share of involuntary part-time workers that would prefer to work full time also increases flexibility. Involuntary temporary workers that are looking for a permanent job play usually the role of active job seekers. Similarly, self-employed workers, that pay their own social security and can be hired for very specific tasks, can be a flexible option for employers.
- Public expenditure in passive labour market policies (PLMP) such as unemployment benefits may have a negative influence on search behaviour, which might result in lower effective labour supply and lower external flexibility. Moreover, passive policies might end up generating "traps". Traps are situations in which workers find themselves better off receiving benefits while unemployed or inactive, rather than working for a low wage and paying taxes. This type of public expenditure combined with the presence of traps result in a reduction of flexibility.
- The interplay between labour and family life is also an important driver of external numerical flexibility. In the absence of proper support for childcare, parenthood and inactivity might be strongly correlated, in particular among women. In addition, workers with dependents other than children may also be forced to reduce their labour supply, which impacts negatively on hiring opportunities for employers.
- The concept of low-wage supply can also be linked to the role of passive labour market policies. When unemployment benefits are low or unavailable, those in unemployment will be forced to actively look for a job and accept almost any offer, even if the salary would be insufficient to allow them to escape from the risk of poverty.
- As regards transitions and flexibility, any shift from temporary to permanent positions would have a negative impact on external numerical flexibility. A positive impact is expected for transitions to the same or higher qualification levels, since there will be a larger supply of better qualified workers with higher mobility.

ii. Internal-numerical flexibility is linked to drivers relating to working time flexibility, to the variability in the number and distribution of working hours, and to how easy it is to adjust them to fit the employers' needs.

iii. Functional flexibility refers to the capacity to adapt swiftly the internal work organization to changes in demand. Main drivers in this area are those related to human capital. Human capital increases functional flexibility by narrowing the gap between the workers' skills and the skills demanded by firms. Human capital is captured by secondary and tertiary educational attainment, but also by life-long learning (LLL), continuous vocational training (CVT) and active labour market policies (ALMP).

iv. Wage flexibility and related drivers deal with the issue of flexible pay, which in turn is highly dependent upon labour market and competitive conditions.

Similarly, we distinguish between four types of security and related drivers:

i. Job security revolves around the idea of lifetime employment. We identify up to three drivers connected to this particular type of security:
    - EPL and tenure have the opposite effect and interpretation in terms of job security than in terms of external numerical flexibility. From the worker's perspective, security is enhanced by stronger EPL and longer tenures.
    - Temporary and low-paid jobs might be used as a stepping stone towards more secure working conditions. The analysis of drivers reflecting transitions towards permanent contracts and higher salaries are able to shed light on this issue. Higher levels of self-employment are also assumed to reflect negatively upon the overall level of job security in the economy.
    - Finally, higher rates of involuntary uptake of part-time and temporary jobs will also be related to higher job insecurity.

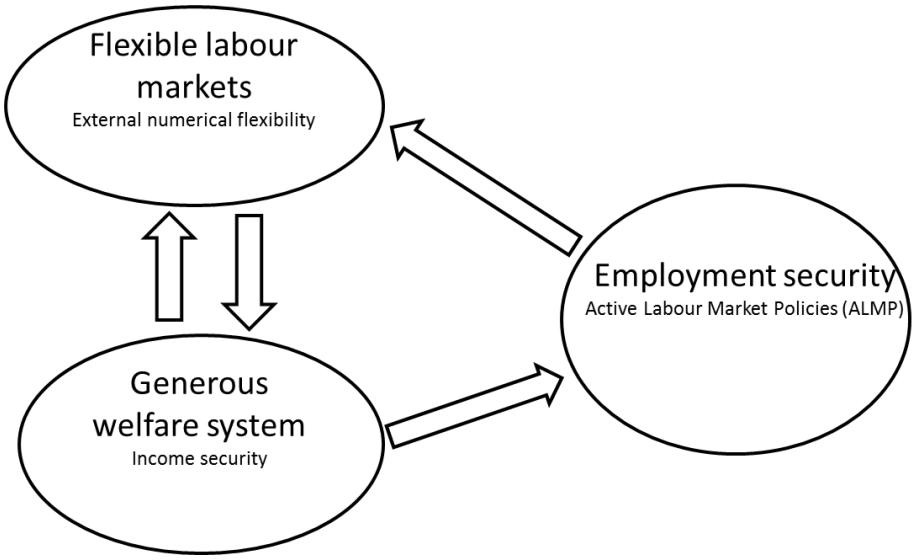
ii. Employment security refers to the probability of staying in employment during the entire career, but not necessarily in the same job with the same employer. Employment and reemployment opportunities are facilitated by the level of human capital acquired by the individual worker. We differentiate between two types of human capital linked to employment security: educational attainment levels and adult learning (LLL and ALMP). The latter are key to mitigate the damaging effect of longer unemployment spells in human capital and skills.

iii. Income security relies heavily upon social security support, passive policies and safety nets. On the other hand, income security is negatively affected by driving forces pulling down income security levels, such as the prevalence of in-work poverty.

iv. Drivers of work-life balance (also called combination security) are related to the ease of combining work with childcare or other activities in private life. Public support for childcare and dependents makes it easier to combine work and family related obligations. The lack of public support might result in higher inactivity rates. Lack of public support might also become the main reason for parents to take up part-time jobs or to fall into a low-wage trap.

According to the Danish "golden triangle" model (see Figure 1), flexicurity policies should aim to simultaneously strengthen external numerical flexibility, income security, and employment security. The three building blocks in this golden triangle are expected to reinforce each other and lead to win-win situations in the labour market for both employers and workers. A labour market with higher external numerical flexibility is expected to facilitate hiring, and subsequently to present higher employment rates and lower unemployment. But since external numerical flexibility also implies a lower level of protection against dismissals, a generous welfare system is needed to guarantee the income security of those made redundant. The sooner those unemployed find a new job, the lower the erosion of their human capital, and the lower the cost of public safety nets. Support for job-seekers in the form of ALMP is also contemplated as a key driver of employment security in the golden triangle.

Figure 1: The Danish golden triangle



Note: Own elaboration, based on Madsen (1999)

The virtuous cycle spinning off the golden triangle is supposed to create positive spillovers on society as a whole, which go beyond the employment and unemployment rates found in the labour market. In particular, it is expected to contribute to more general social outcomes such as the reduction of poverty and inequality. The triangle is also assumed to foster positive impacts on specific social groups. For instance, reducing the number of young people neither in education nor in employment, or supporting the implementation of initiatives facilitating the combination of work and family life.

3. Data on flexicurity variables and drivers

In the present section we describe the data and the aggregation method we have followed to combine the individual variables into flexicurity drivers. We use the EMCO list of flexicurity and job quality indicators (EMCO 2009) to populate the different flexibility/security components, types and drivers. Following the logic outlined in the previous section, we tentatively assign each indicator to the relevant driver and flexibility and security category. The expected sign of the contribution of each variable to flexibility and security is defined as the "direction" of the variable. For example, a higher score on the variable "EPL regular contracts" is expected to impact negatively on external numerical flexibility, and to contribute positively to higher job security. We use pairwise correlations, Principal Component Analysis (PCA) and Reliability Analysis (RA) to pinpoint the variables finally included in each of the flexibility and security drivers. Afterwards, aggregate measures have been calculated for each driver. A descriptive analysis of the evolution of selected drivers over time is presented at the end of this section.

3.1 Combining individual variables into drivers

In our search for more parsimonious specifications, we have followed the approach of grouping individual variables into drivers. Aggregate scales have been calculated for each driver using the arithmetic average (with equal weights) of the underlying normalised variables. Table 2a and 2b show the final list of variables used in the empirical analysis, broken down by flexicurity category and driver. The statistical

coherence of the drivers is analysed using pairwise correlations and multivariate analysis (PCA and RA). Following best practices from the literature (OECD/JRC2008), we first check the raw variables for the presence of outliers and then normalise them to render their values comparable. The "winsorisation" approach has been used for treating outliers. Once the outliers have been treated, the resulting dataset has been normalised using linear min-max normalisation, which rescales variables onto the 0-100 range while taking their expected direction into account. The next step involves analysing the pairwise correlations across variables. Those variables with either too high, too low correlations or significantly negative correlations with the remaining variables in the same driver have been removed from the initial dataset. Removing redundant, "silent" and negatively correlated variables contributes to improve the statistical coherence of the resulting aggregates.

Table 2a: Indicators by flexibility category and driver

Category and driver	Indicators	Direction
External numerical Flexibility		
F.1. EPL and tenure	EPL regular contracts (FRCA_01_r)	-
	EPL temporary contracts (FRCA_01_t)	-
	Job tenure in years - Job duration (FRCA_20)	-
F.2. Job seekers	Unemployment rate (ALMP_02)	+
	Involuntary working on a temporary job(FRCA_11)	+
	Involuntary working part-time (FRCA_12)	+
	Diversity and reason for contractual & working arrangements - self-employed (FRCA_14)	+
F.3. Public expenditure	Net replacement rate after 6 months (MSS_07)	-
	PLMP expenditure on support per person in labour reserve (MSS_02)	-
	Expenditure on PLMP as % GDP (MSS_03)	-
	PLMP participants % of U (MSS_04)	-
F.4. Traps	Unemployment trap (MSS_05)	-
	Low wage trap (MSS_06)	-
	Inactivity trap (WLB_03)	-
F.5. Family and labour supply	Employment impact of parenthood (WLB_04)	-

	Lack of care for children and other dependents - Main reason for inactivity (WLB_07)	-
F.6. Low-wage supply	In-work at-risk-of-poverty (TSDSC320)	+
	At-risk-of-poverty without dependent children no low work intensity (TESSI122)	+
	A t-risk-of-poverty with dependent children no low work intensity (ILC_PEES02)	+
	Net replacement rate after 5 years (MSS_08)	-
F.7 Transitions	Transition from temporary to permanent - 3 year average (FRCA_04)	-
	Transition in labour status and pay levels - Same or higher qualification level (CLLL_06)	+
Internal Numerical Flexibility		
Working time	<No EMCO indicator>	
Functional Flexibility		
F.8. Human capital – lower education	percentage of population having completed at least secondary education (TPS00065)	-
	At least upper secondary educational attainment, age group 20-24 by sex (TPS00186)	+
F.9. Human capital – higher education, LLL and ALMP	Lifelong learning (age 25-64) (CLLL_01)	+
	Public spending on human resources (CLLL_02)	+
	Educational attainment - % aged 30-34 with tertiary educational attainment (CLLL_07)	+
	Expenditure on ALMP per person in labour service (ALMP_04)	+
	Expenditure on ALMP as % GDP (ALMP_05)	+
	Activation - LMP participants per 100 persons wanting to work (ALMP_06)	+
Wage Flexibility		

F.10. Competitive pay and labour cost	Transitions by contract - Pay level (FRCA_06)	-

Table 2b: Indicators by security category and driver

Category and driver	Indicators	Direction
Job security		
S.1. EPL and tenure	EPL regular contracts (FRCA_01_r)	+
	EPL temporary contracts (FRCA_01_t)	+
	Job tenure in years - Job duration (FRCA_20)	+
S.2. Transitions and self-employment	Transition from temporary to permanent - 3 year average (FRCA_04)	+
	Transitions by contract - Pay level (FRCA_06)	+
	Diversity and reason for contractual & working arrangements - self-employed (FRCA_14)	-
S.3 Involuntary part-time and temporary jobs	Diversity and reason for contractual & working arrangements - Involuntary part-time (FRCA_12)	-
	Diversity and reason for contractual & working arrangements - Involuntary temporary (FRCA_11)	-
Employment security		
S.4. Human capital – lower education	Early leavers from education and training (TSDSC410)	-
	Percentage of population having completed at least secondary education (TPS00065)	+
	At least upper secondary educational attainment, age group 20-24 by sex (TPS00186)	+
S.5. Human capital – higher education, LLL and ALMP	Lifelong learning (age 25-64) (CLLL_01)	+
	Public spending on human resources (CLLL_02)	+
	Educational attainment - % aged 30-34 with tertiary educational attainment (CLLL_07)	+

	Expenditure on ALMP as % GDP (ALMP_05)	+
	Activation - LMP participants per 100 persons wanting to work (ALMP_06)	+
	Expenditure on ALMP per person in labour service (ALMP_04)	+
	LTU (% active population) (ALMP_01)	-
Income security		
S.6. Social security support	PLMP expenditure on support per person in labour reserve (MSS_02)	+
	Expenditure on PLMP as % GDP (MSS_03)	+
	PLMP participants % of U (MSS_04)	+
	Net replacement rate after 6 months (MSS_07)	+
	Net replacement rate after 5 years (MSS_08)	+
S.7. In-work poverty	At risk of poverty rate max secondary education (TSDSC420)	-
	In work at risk of poverty (TSDSC320)	-
	At risk of poverty without dependent children no low work intensity (TESSI122)	-
	At risk of poverty with dependent children no low work intensity (ILC_PEES02)	-
	Inactivity trap (WLB_03)	+
Work Life balance/combination security		
S.8. Childcare, parenthood and inactivity	Child care (WLB_02)	+
	Employment impact of parenthood (WLB_04)	-
	Lack of care for children and other dependents - Main reason for inactivity (WLB_07)	-
S.9. Part-time and low-wage	Lack of care for children and other dependents - Main reason for part-time (WLB_06)	-
	Low wage trap (MSS_06)	-

The grouping of variables into drivers as shown in Table 2a and 2b is supported not only by pairwise correlations, but also by the results of both the Principal Component Analysis (PCA) and Reliability Analysis (RA). Pairwise correlation analysis, PCA and RA are presented in detail in Annex I. In a nutshell, PCA confirms that the variables within each driver tend to share a single latent statistical dimension (eigenvalues for the first principal component in each driver are higher than unity). Cronbach's alpha values obtained for the drivers are also high, usually lying above the 0.65-0.70 threshold. Both results support the internal coherence and reliability of the drivers' aggregate scales. On the contrary, the available data do not support further aggregation of individual drivers into a single flexibility (security) aggregate scale. Low Cronbach's alpha values for the weighted average of flexibility (security) drivers suggest that they are capturing different underlying flexibility (security) phenomena.

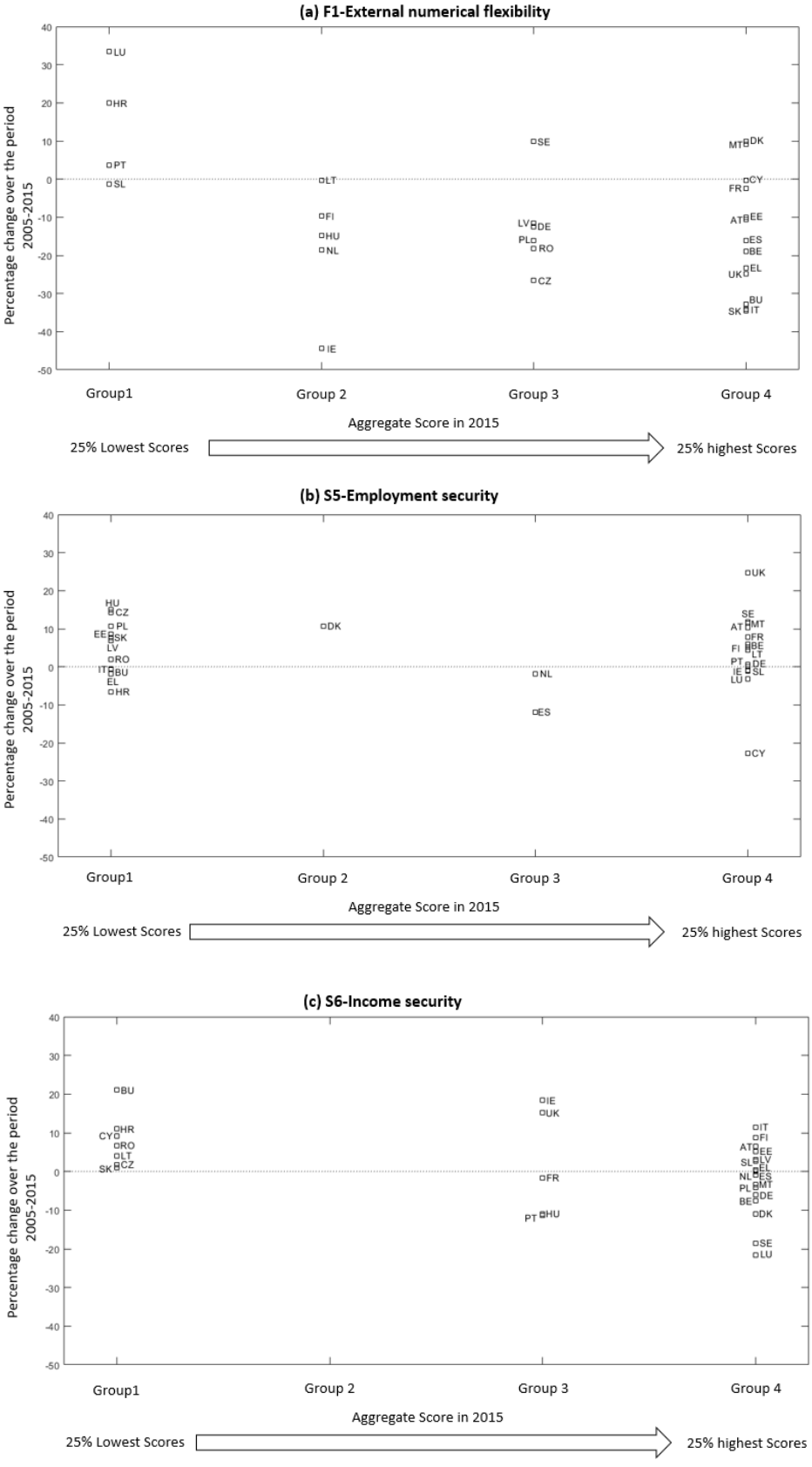
3.2 Evolution of flexicurity drivers across countries

Aggregate measures have been calculated for each driver using arithmetic averages of the normalised scores of the individual indicators. For the sake of parsimony, in our empirical analyses below we focus on three of these measures, those most related to the building blocks of the golden triangle conceptual framework: external numerical flexibility, income security and employment security. As a measure of external numerical flexibility we use the driver F1, defined in Table 2a. As measures of employment security and income security we have selected the drivers S5 and S6 from Table 2b[1].

The evolution of these three drivers over time for the EU28 countries is summarised in Figure 2 below. Countries are classified in four groups in the horizontal axis, according to the aggregate score for each driver in the year 2015, from the lowest 25% (left-hand side of the horizontal axis) to the top 25% (right-hand side of the horizontal axis). The vertical axis represents the percentage change in the aggregate normalised scores calculated for each driver over the period 2005-2015. For example, Luxembourg belongs to the group of low performers in 2015 in F1. At the same time, it presents a positive evolution over the period 2005-2015, with an increase in the normalised scores for the driver F1 well above 30 points.

[1] The analysis is constrained to these three drivers to avoid the problem of "indicator" shopping" (Anderson and Maibom, 2018). Moreover, in the econometric analyses performed in the next section, it is necessary to keep a reduced number of explanatory variables to ensure reliable estimates (i.e., to guarantee sufficient degrees of freedom).

Figure 2: EU28 performance over 2005-2015 in the golden triangle drivers



The most salient feature found in Figure 2 is the highly heterogeneous behaviour across countries and drivers. Starting with F1, on the one hand the countries presenting the lowest scores in 2015 are those that have increased their values the most over the period 2005-2015. On the other hand, most countries showing the highest scores in 2015 reduced their score over the period. This fact is indicative of an overall convergence in terms of our driver of external numerical flexibility. It is remarkable that Slovenia is the only country presenting a low performance in 2015 coupled with a negative evolution since 2005. Conversely, Malta and Denmark are not only in the group of best performers in 2015, but they have also improved their scores when compared to 2005. In terms of S5, certain polarisation is observed as countries tend to concentrate in the groups with the lowest and highest scores. Bulgaria, Italy Greece and Croatia belong to the group with the lowest scores of S5 in 2015 and show a negative evolution of their scores compared to 2005. In the group of top performers, Cyprus stands out due to its sheer drop in the employment security driver over the period considered. When looking at the results corresponding to S6, countries are also polarized in the groups with the lowest and highest scores. All the countries in the top group of lowest scores in 2015 have experienced also an increase over the period considered. The evolution of the countries in the top group of highest scores for S6 is mixed. We find countries that have improved the score with respect to 2005 (e.g., Italy, Finland and Austria), while others have worsened since then (e.g., Denmark, Sweden and Luxembourg). It is worth noting than in the case of Austria and Finland, these two countries show a similar pattern of behaviour in both S5 and S6: top performers in 2015, and a positive evolution for both drivers when compared to their initial scores in 2005.

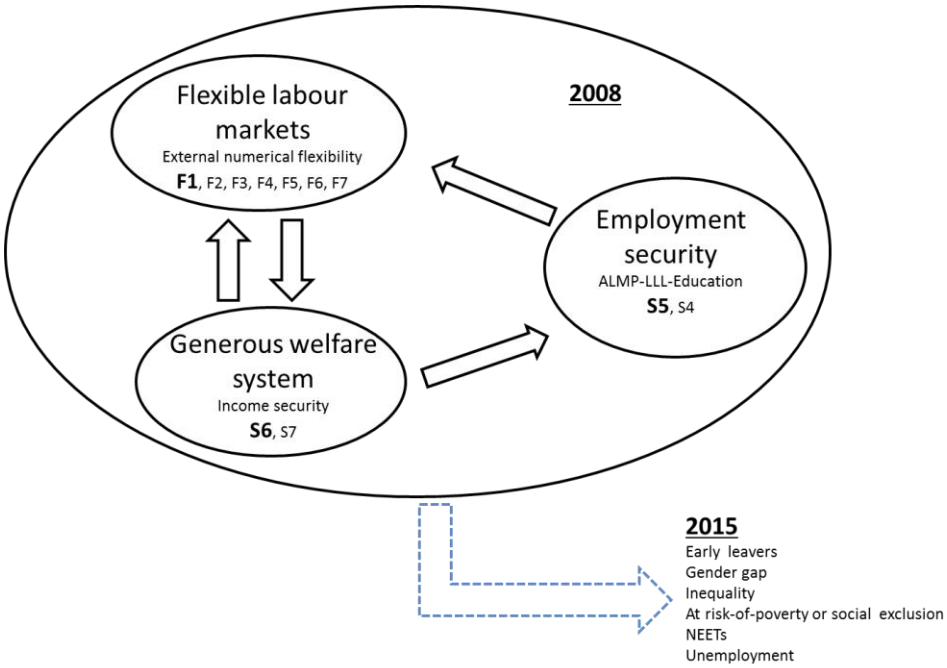
4. Econometric analyses: Social outcomes and flexicurity drivers

4.1. Estimation strategy and econometric specification

In this section we explore the relationship between flexicurity drivers and social performance. We check the hypothesis of whether the golden triangle drivers measured at the onset of the crisis in 2008 had a significant impact on the social performance of the EU28 countries in the year 2015 (latest available data at the time of this study) (see Figure 3). We base our results on cross-sectional linear regression models estimated by ordinary least squares (OLS). This econometric approach is suitable for the analysis of policies that have substantial impacts on the longer term, but only quite small effects in the short run. This is precisely the case of flexicurity related policies such as ALMP (European Commission 2017b). In addition, the complexity of economic processes and the importance of economic structures and path dependence make cross-sectional models very useful to mitigate possible problems of endogeneity.[2]

[2] Endogeneity is a challenging issue to cope with in applied econometrics (Dall'erba and LeGallo, 2008). The problem is partly mitigated when, as it is our case, the explanatory variables are measured at the beginning of the sample period (Fukuda 2012, Crespo-Cuaresma et al. 2012). Moreover, it is widely recognized that the use of cross-sectional linear models with lag values of the explanatory variables as instruments of their current values is a valid strategy to alleviate the problem of endogeneity and double causality when there is not a long list of likely instruments to choose from (Peiró-Palomino and Tortosa-Austina 2016).

Figure 3: Conceptual framework underlying the linear regression models



Source: Own elaboration

Based on the conceptual framework described above, we specify the following linear regression model for the econometric analysis:

$$Y_{2015} = X_{2008} \cdot \beta \quad + C_{2008} \cdot \gamma + D \cdot \delta + \varepsilon_{2015} \qquad (1)$$

where Y, the set of dependent variables, refers to social outcomes for EU-28 countries in 2015 listed and defined in Table 3. Therefore, we formulate and estimate six regressions models for evaluating the effect of the flexicurity drivers on each one of the social outcomes represented in Y.[3]

Table 4 provides information about the independent variables grouped in the matrices X, C and D. The three flexicurity drivers (F1, S5, S6) selected to represent the three vertices of the golden triangle (flexible labour markets, employment security and income security, respectively) are included in X. C contains a set of control variables that contribute to obtain more reliable and robust estimates of the relationship of flexicurity drivers and socioeconomic outcomes. As control variables we include the lagged value of the dependent variable (L) to account for historical factors that are omitted in our model (Wooldridge 2012). The logarithm of GDP per capita (ln_GDP) controls for differences in wealth across countries. The annual average growth rate of GDP per capita controls for heterogeneity in the economic situation for each country (ΔGDP). The variables in X and C are evaluated in the year 2008—except for ΔGDP which, by definition, is calculated as the annual average growth rate in the period 2008-2015. We also use country dummies

[3] Prior to estimating our econometric models, missing values have been imputed for the social outcome variables, as well as for the normalised variables underlying the flexicurity drivers. The 'Amelia II' software package (Honaker et al. 2011) has been used to impute the missing values in our dataset. More precisely, missing data has been filled in taking advantage of the cross-section time-series functionality of the software.

to control for the outliers identified in the estimation process[4]. These dummies, included in the matrix D, reduce the possible bias caused by omitted country-specific variables. Finally, and according to the postulates of the classical regression model, ε is the disturbance term which is assumed to be an independent and identically distributed (*i.i.d*) random variable.

The validity of our modelling specification and the robustness of our estimates rely upon the fulfilment of the underlying *assumptions* of the *classical linear regression* model (Wooldridge, 2012). We use several diagnostic measures to validate our estimated models. First, we employ a goodness of fit measure (the adjusted-R^2) to summarize the discrepancies between the observed values and the estimated values. Second, we apply the Breusch-Godfrey Lagrange Multiplier (LM) test and the Ljung-Box (L-B) test to detect any significant serial correlation in the estimated residuals. Third, we use the Breusch-Pagan-Godfrey (B-G-P) test and the White test to check the hypothesis of homoscedasticity. We run the Jarque-Bera test to validate the null hypothesis of normality in the distribution of the residuals. Finally, we employ the Ramsey's RESET Test to check our model specification, i.e. whether the linear functional form is correct and relevant variables are not omitted in the model.

Table 3. Explained variables included in the econometric analysis

SOCIAL OUTCOMES (DEPENDENT VARIABLES)			
Variable	**Concept**	**Definition**	**Source**
Y_1	**Early Leavers from Education and Training**	Percentage of the population between 18 and 24 years old with at most secondary education who were not in further education or training during the last four weeks preceding the survey in 2015.	Social Scoreboard for the European Pillar of Social Rights (https://composite-indicators.jrc.ec.europa.eu/social-scoreboard/)
Y_2	**Gender Gap**	Difference between the employment rates of men and women of working age in 2015.	
Y_3	**Income Inequality**	Ratio of total income received by the 20 percent of the population with the highest income over the income received by the 20 percent of the population with the lowest levels of income in 2015.	

[4] The detection of outliers is based on the DFFFIT analysis. We first estimated equation (1) without country dummies, and computed the DFFITS to detect influential observations in the regression. Then, outliers are defined as those observations for which the value of the DFFITS is greater than $2 \cdot (P/N)^{1/2}$, where P is the number of parameters to be estimated and N the number of observations.

Y_4	**At Risk of Poverty or Social Exclusion (AROPE)**	Percentage of the population who is either at risk of poverty or social exclusion (severely deprived or living in a household with low work intensity in 2015.	
Y_5	**Young People Not in Education, Employment or Training (NEET)**	Percentage of young people aged between 15 and 24 years old who are neither working nor studying or doing a training job in 2015.	
Y_6	**Unemployment Rate**	Unemployed people as a percentage of the labour force in 2015.	

Table 4. Independent variables included in the econometric analysis

FLEXICURITY MEASURES AND CONTROLS (EXPLANATORY VARIABLES)						
MATRIX		**Variable**		**Concept**	**Definition**	**Source**
Flexicurity	**X**	**Flexibility**	**F1**	**External Numerical Flexibility in the Labour Market**	Aggregated value of the driver "*EPL and tenure*" in 2008.	Own elaboration
		Security	**S5**	**Employment Security**	Aggregated value of the driver "*Human Capital* – higher education, LLL and ALMP" in 2008.	
			S6	**Income Security**	Aggregated value of the driver "*Social security support*" in 2008.	
Control	**C**	**L**		**Lagged Dependent Variable**	Value of the dependent variable in 2008.	Social Scoreboard for the European Pillar of Social Rights
		ln(GDP)		**GDP per capita**	Natural *logarithm* of *GDP per capita in 2008*	Eurostat
		∆GDP		**Economic Growth**	Annual average growth rate of GDP per capita over the period 2008-15.	
Outliers	**D**			**Country Dummies**	Dummy for each country detected as outlier according to the DFFIT analysis.	Own elaboration

4.2. Econometric Results

The upper part of Table 5 shows the estimated coefficients for the independent variables in the models, which correspond to the six social outcomes selected for this study. The first finding to be underlined is the positive and statistically significant effect of the lagged value of each social outcome at the onset of the crisis (L) on its corresponding value in 2015. This result indicates the presence of path dependence or a persistent effect in the evolution of social outcomes: the past value of each social outcome has a significant impact on its own future value.

The economic growth over the period 2008-2015, measured by the GDP per capita growth rate (ΔGDP), has a negative and significant impact on the 2015 values of percentage of NEETs (Y_5) and level of unemployment (Y_6). Conversely, the impact of ΔGDP on early leavers from education and training (Y_1) is significantly negative. The sign and significance of the estimated coefficients are in line with the usual economic assumptions. For instance, economic growth is expected to increase the demand for labour in the job market and to create new job opportunities. This will lead to a reduction in unemployment rates. At the same time, economic growth and job opportunities may pave the way for NEETs by raising the opportunity cost of education. As a result, the younger cohorts have less of an incentive to continue studying, thus increasing the rate of early leavers.

Another relevant result is the non-significance of the coefficients associated to wealth in the economy, as measured by the logarithm of GDP per capita (ln_GDP). Differences in wealth across countries in 2008 do not seem to have a statistically significant impact on the social outcomes observed in 2015.

Regarding the flexicurity drivers included in our model, countries with higher external numerical flexibility in their labour markets in 2008 as measured by F1 tend to have lower levels of unemployment (Y_6) and people at risk of poverty or social exclusion (Y_4) in 2015. Our results suggest that flexibility might facilitate hiring by employers and subsequently contribute to a reduction in unemployment rates and poverty. However, higher flexibility does not have a significant impact on inequality levels, early leavers, NEETs, or gender gap.

The employment security driver (S5) is found to have a significantly positive impact on the levels of income inequality (Y_3). Eligibility criteria and participation in life-long learning programs or ALMP may contribute to explain this result. Depending on their design, these programs may benefit workers in the higher end of the wage distribution rather than low-paid, low-educated workers and the unemployed. Microeconomic evaluation of the impact of these policies could contribute to shed some light on this issue, but it is beyond the scope of this study

Finally, our proxy for income security (S6) has a negative and significant impact on the percentage of people at risk of poverty or social exclusion (Y_4). At the same time, it exerts a significant and positive impact on the levels of early leavers (Y_1). These two opposite impacts reflect the pros and cons of passive policies. On the one hand, safety nets and higher income security lead to a reduction of poverty. On another hand, the presence of safety nets minimizes the opportunity cost of dropping out from school and entering the labour force.

The lower part of Table 5 presents the results of the diagnostic checking of our models. The goodness of fit and the diagnosis of the residuals support the adequacy of our model specifications and the reliability of our estimates. The Adjusted-R2 is high for all the estimated models, ranging from a value of 0.83 in the models corresponding NEETs (Y_5) and unemployment (Y_6), to 0.91 in the case of early leavers (Y_1). The high goodness of fit indicates that the estimated models are able to explain most of the variability

observed in the dependent variables. The diagnostic checking does not detect any problem of serial correlation or heteroscedasticity in the residuals of the model, which implies that the ordinary least squares (OLS) estimates in the regression models are efficient. Moreover, the Jarque-Bera test does not reject the null hypothesis that the residuals are normally distributed for any of the regressions. The Ramsey's RESET test does not reveal any problem of neglected nonlinearities at 5 percent level of significance for any of the specifications.

Table 5: Results of the OLS regression over the period 2008-2015

				Social Outcomes					
VARIABLES				$Y_{1,2015}$	$Y_{2,2015}$	$Y_{3,2015}$	$Y_{4,2015}$	$Y_{5,2015}$	$Y_{6,2015}$
Constant				11.479	-6.677	2.192	-22.675	7.589	18.015
Flexicurity	**Flexibility**	**External Numerical**	$F_{1,2008}$	0.004	0.039	-0.006	-0.035*	-0.023	-0.061*
	Security	**Employment Security**	$S_{5,2008}$	-0.048	-0.009	0.023*	0.067	0.001	0.0773
		Income Security	$S_{6,2008}$	0.055**	-0.018	-0.013	-0.063*	-0.014	-0.046
Control Variables		L_{2008}		0.553***	0.843***	1.159***	1.021***	1.056***	0.695***
		ln_GDP_{2008}		-0.946	0.323	-0.279	2.435	-0.403	-1.035
		ΔGDP_{08-15}		6.200**	5.613	-0.348	-7.904	-4.549**	-15.781***
				DIAGNOSTIC CHECKING					
Adjusted-R^2				0.91	0.88	0.86	0.87	0.83	0.83
Heterocedasticity			**B-P-G Test**	0.65 (0.74)	0.99 (0.47)	1.329 (0.29)	0.537 (0.84)	0.546 (0.79)	1.399 (0.26)
			White Test	0.753 (0.66)	0.62 (0.75)	1.330 (0.29)	0.449 (0.90)	0.595 (0.75)	0.939 (0.52)
Autocorrelation			**LM Test**	0.008 (0.93)	0.41 (0.53)	0.007 (0.94)	0.013 (0.91)	0.653 (0.43)	0.005 (0.94)
			L-B Test	0.012 (0.91)	0.51 (0.48)	0.008 (0.93)	0.018 (0.89)	0.630 (0.43)	0.008 (0.93)
Normality (Jarque-Bera Test)				0.581 (0.75)	0.43 (0.81)	0.830 (0.66)	4.437 (0.11)	0.802 (0.67)	1.680 (0.43)

Model Specification (Ramsey Reset Test)	0.113 (0.91)	0.42 (0.68)	0.914 (0.37)	0.217 (0.83)	1.110 (0.28)	1.940* (0.07)

Note: *, **, *** statistically significant at the 10%, 5% and 1% levels, respectively.

5. Conclusions and discussion

From the Danish "golden triangle" perspective, flexicurity is the combination of liberal dismissal protection, relatively generous unemployment benefit system and active labour market policies. Flexicurity has been fostered as a policy strategy at EU level due to its potential to result in win-win situations: more flexibility for employers and more security to workers. However, flexicurity proposals have not been sufficiently substantiated by empirical analyses. There are several reasons explaining this situation. First, flexicurity is a complex and multi-faceted phenomenon without a sound and well-developed monitoring framework. Second, many flexicurity related indicators have a positive impact on flexibility while negative one on security. Third, the conceptual grouping of the indicators included in the EMCO list lacks statistical soundness and robustness. Against that background, we come up with a proposal of a more conceptually and statistically consistent indicator framework, and conduct an empirical analysis of the links between flexicurity policies and economic outcomes.

Our indicator framework builds upon the Wilthagen and Tros (2004) flexicurity matrix that explicitly differentiates between four types of flexibility and four types of security. Flexibility and security indicators are contemplated from the point of view of employers and workers, respectively. Furthermore, we construct flexicurity "drivers" by pooling together variables that are conceptually related to each other and to a specific type of flexibility or security. Finally, we obtain statistically consistent aggregate measures for each driver. Three flexicurity drivers have been chosen to represent the flexibility and security types that constitute the three main building blocks of the Danish "golden triangle": external numerical flexibility, employment security, and income security. To represent external numerical flexibility we use the driver F1, which includes EPL and tenure. For employment security we use the driver F5, which includes human capital acquired from educational attainment levels, adult learning (LLL and ALMP) and the negative impact of LTU on human capital. For income security we use the driver S6, which includes passive policies and net replacement rates.

Using yearly data from 2005 to 2015, we monitor the evolution of these three drivers over time and across EU countries. The observed patterns of behaviour are highly heterogeneous across countries and drivers. There is a convergence in terms of external numerical flexibility (F1), since the countries with the lower scores in 2015 are those increasing their values the most over the period 2005-2015, whilst the opposite is true for most of the countries with the highest scores in 2015. As regards employment security (S5), country scores tend to be polarised, i.e. clustered around either the lowest or the highest scores. Finally, EU countries also appear to be polarised to a certain extent with regards to income security (S6). However, the evolution of the top performing countries in 2015 is somewhat mixed. Amongst the top performers, some have improved their S6 score with respect to 2005 (e.g., Italy, Finland and Austria), while others have worsened (e.g., Denmark, Sweden and Luxembourg).

Our econometric analysis delves into the relationship between selected flexicurity drivers and selected social outcomes included in the Social Scoreboard of the European Pillar of Social Rights. The initial conditions in each country are measured by the levels of flexicurity drivers F1, S5 and S6 in 2008. Social scoreboard variables gauge country performance in terms of social outcomes after the crisis. Empirical evidence from the econometric analysis shows that selected flexibility and security drivers have a significant positive contribution on social outcomes such as the reduction of the share of population at-risk-of-poverty or social exclusion. Higher initial values in flexibility drivers at the onset of the crisis contribute to a reduction in the unemployment rates after the crisis. As expected, more generous welfare system reduced poverty. However, on a more negative note and contrary to expectations, employment security drivers appear to

be linked to the presence of higher levels of income inequality after the crisis. Altogether, the results above support only partially the win-win beliefs of flexicurity proponents. However, they also call for further research on design and access to active labour market policies, education and training.

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Annex

A.I.2: EMCO variables grouped by flexibility drivers – pairwise correlations

	EPL regular contracts (FRCA_01_r)	EPL temporary contracts (FRCA_01_t)	Job tenure in years - Job duration (FRCA_20)	Unemployment rate (ALMP_02)	Diversity and reason for contractual & working arrangements - Involuntary temporary (FRCA_11)	Diversity and reason for contractual & working arrangements - Involuntary part-time (FRCA_12)	Diversity and reason for contractual & working arrangements - self-employed (FRCA_14)	Net replacement rate after 6 months (MSS_07)	PLMP expenditure on support per person in labour reserve (MSS_02)	Expenditure on PLMP as % GDP (MSS_03)	PLMP participants % of U (MSS_04)	Unemployment trap (MSS_05)	Low wage trap (MSS_06)	Inactivity trap (WLB_03)	Employment impact of parenthood (WLB_04)	Lack of care for children and other dependents - Main reason for inactivity (WLB_07)	In work at risk of poverty (TSDSC320)	At risk of poverty without dependent childdren no low work intensity (TESSI122)	At risk of poverty with dependent childdren no low work intensity (ILC_PEES02)	Net replacement rate after 5 years (MSS_08)	Transition from temporary to permanent - 3 year average (FRCA_04)	Transition in labour status and pay levels Same or higher qualification level (CLLL_06)	perc of population having completed at least secondary education (TPS00065)	At least upper secondary educational attainment, age group 20-24 by sex (TPS00186)	Lifelong learning (age 25-64) (CLLL_01)	Public spending on human resources (CLLL_02)	Educational attainment - % aged 30-34 with tertiary education attainment (CLLL_07)	Expenditure on ALMP per person in labour service (ALMP_04)	Expenditure on ALMP as % GDP (ALMP_05)	Activation - LMP participants per 100 persons wanting to work (ALMP_06)	Transitions by contract - Pay level (FRCA_06)
FRCA_01_r	1.00	0.24	0.37	0.03	-0.11	-0.17	-0.24	0.08	-0.07	-0.03	-0.13	0.14	-0.27	-0.26	-0.23	-0.33	-0.19	-0.18	-0.11	-0.46	-0.36	-0.20	0.41	0.39	0.17	-0.11	0.48	0.06	0.04	0.01	-0.24
FRCA_01_t	0.24	1.00	0.39	-0.19	-0.27	-0.30	-0.12	0.21	0.20	0.22	0.14	0.18	-0.23	-0.45	-0.32	-0.36	-0.40	-0.29	-0.17	-0.18	-0.49	-0.15	0.36	0.27	0.29	0.06	-0.16	-0.06	0.00	-0.39	-0.26
FRCA_20	0.37	0.39	1.00	-0.32	-0.30	-0.28	-0.58	-0.04	-0.06	0.03	0.03	-0.17	-0.18	-0.42	-0.13	-0.14	-0.23	-0.05	-0.22	-0.04	-0.32	-0.16	0.28	-0.10	0.49	0.38	0.38	0.25	0.30	0.08	-0.51
ALMP_02	0.03	-0.19	-0.32	1.00	0.43	0.59	0.33	0.16	0.22	-0.26	0.16	0.12	0.36	0.34	0.27	0.08	0.27	0.32	0.29	0.19	0.26	-0.10	-0.07	0.05	-0.30	-0.14	0.08	-0.35	-0.08	-0.19	0.06
FRCA_11	-0.11	-0.27	-0.30	0.43	1.00	0.62	0.49	0.32	0.31	0.05	0.13	0.10	0.33	0.43	0.07	0.03	0.32	0.26	0.42	0.27	0.25	-0.03	-0.20	-0.03	-0.37	-0.15	0.07	-0.38	-0.27	-0.15	0.17
FRCA_12	-0.17	-0.30	-0.28	0.59	0.62	1.00	0.47	0.17	0.35	-0.05	0.28	0.17	0.50	0.60	0.19	0.10	0.55	0.57	0.67	0.29	0.27	-0.10	-0.21	-0.08	-0.42	-0.38	-0.08	-0.42	-0.19	-0.29	0.14
FRCA_14	-0.24	-0.12	-0.58	0.33	0.49	0.47	1.00	0.17	0.21	0.01	0.13	0.31	0.15	0.53	0.17	0.05	0.43	0.24	0.39	0.15	0.33	0.05	-0.38	0.00	-0.40	-0.38	-0.28	-0.37	-0.25	-0.21	0.37
MSS_07	0.08	0.21	-0.04	0.16	0.32	0.17	0.17	1.00	0.63	0.54	0.53	0.50	0.39	0.50	-0.28	-0.36	0.01	0.10	0.24	0.30	-0.24	-0.05	0.34	0.48	-0.41	-0.19	-0.20	-0.57	-0.54	-0.49	-0.04
MSS_02	-0.07	0.20	-0.06	0.22	0.31	0.35	0.21	0.63	1.00	0.74	0.87	0.41	0.60	0.48	-0.18	-0.15	0.30	0.32	0.53	0.46	-0.41	-0.27	0.17	0.27	-0.41	-0.15	-0.43	-0.79	-0.65	-0.71	-0.09
MSS_03	-0.03	0.22	0.03	-0.26	0.05	-0.05	0.01	0.54	0.74	1.00	0.68	0.35	0.30	0.23	-0.27	-0.11	0.17	0.14	0.38	0.38	-0.51	-0.10	0.30	0.34	-0.31	-0.10	-0.34	-0.37	-0.60	-0.43	-0.01
MSS_04	-0.13	0.14	0.03	0.16	0.13	0.28	0.13	0.53	0.87	0.68	1.00	0.31	0.47	0.44	-0.09	-0.12	0.37	0.39	0.46	0.67	-0.32	-0.22	0.23	0.18	-0.23	-0.16	-0.38	-0.55	-0.51	-0.53	-0.04
MSS_05	0.14	0.18	-0.17	0.12	0.10	0.17	0.31	0.50	0.41	0.35	0.31	1.00	0.49	0.43	-0.35	-0.37	0.21	0.06	0.24	-0.05	-0.30	-0.10	-0.02	0.20	-0.28	-0.40	-0.33	-0.43	-0.46	-0.40	0.13
MSS_06	-0.27	-0.23	-0.18	0.36	0.33	0.50	0.15	0.39	0.60	0.30	0.47	0.49	1.00	0.55	-0.13	-0.10	0.30	0.27	0.39	0.21	-0.28	-0.29	-0.27	-0.08	-0.51	-0.20	-0.32	-0.59	-0.53	-0.41	-0.07
WLB_03	-0.26	-0.45	-0.42	0.34	0.43	0.60	0.53	0.50	0.48	0.23	0.44	0.43	0.55	1.00	0.12	0.05	0.45	0.38	0.50	0.37	0.13	0.02	-0.20	0.07	-0.58	-0.40	-0.36	-0.55	-0.49	-0.32	0.25
WLB_04	-0.23	-0.32	-0.13	0.27	0.07	0.19	0.17	-0.28	-0.18	-0.27	-0.09	-0.33	-0.13	0.12	1.00	0.71	0.28	0.44	0.11	0.18	0.36	0.15	-0.11	0.00	0.24	0.33	0.37	0.19	0.30	0.10	0.15
WLB_07	-0.33	-0.36	-0.14	0.08	0.03	0.10	0.05	-0.36	-0.15	-0.11	-0.12	-0.37	-0.10	0.05	0.71	1.00	0.25	0.29	0.23	0.13	0.21	0.01	-0.21	-0.16	0.08	0.14	0.02	0.26	0.27	0.18	0.17
JQ_1	-0.19	-0.40	-0.23	0.27	0.32	0.55	0.43	0.01	0.30	0.17	0.37	0.21	0.30	0.45	0.28	0.25	1.00	0.82	0.73	0.36	0.00	-0.14	-0.17	-0.23	-0.36	-0.34	-0.12	-0.27	-0.31	-0.13	0.24
JQ_3	-0.18	-0.29	-0.05	0.32	0.26	0.57	0.24	0.10	0.32	0.14	0.39	0.06	0.27	0.38	0.44	0.29	0.82	1.00	0.64	0.43	0.05	-0.09	0.08	-0.04	-0.16	-0.08	0.08	-0.23	-0.18	-0.22	0.04
JQ_5	-0.11	-0.17	-0.22	0.29	0.42	0.67	0.39	0.24	0.53	0.38	0.46	0.24	0.39	0.50	0.11	0.23	0.73	0.64	1.00	0.35	-0.12	-0.24	0.05	0.09	-0.54	-0.41	-0.29	-0.47	-0.43	-0.43	0.22
MSS_08	-0.46	-0.18	-0.04	0.19	0.27	0.29	0.15	0.30	0.46	0.38	0.67	-0.05	0.21	0.37	0.18	0.13	0.36	0.43	0.35	1.00	0.09	-0.06	0.18	0.00	-0.05	0.00	-0.15	-0.15	-0.16	-0.11	0.04
FRCA_04	-0.36	-0.49	-0.32	0.26	0.25	0.27	0.33	-0.24	-0.41	-0.51	-0.32	-0.30	-0.28	0.13	0.36	0.21	0.00	0.05	-0.12	0.09	1.00	0.42	-0.29	-0.18	0.09	0.00	0.22	0.24	0.38	0.35	0.26
CLLL_06	-0.20	-0.15	-0.16	-0.10	-0.03	-0.10	0.05	-0.05	-0.27	-0.10	-0.22	-0.10	-0.29	0.02	0.15	0.01	-0.14	-0.09	-0.24	-0.06	0.42	1.00	-0.11	0.00	0.08	0.04	0.24	0.18	0.07	0.14	0.24
JQ_11	0.41	0.36	0.28	-0.07	-0.20	-0.21	-0.38	0.34	0.17	0.30	0.23	-0.02	-0.27	-0.20	-0.11	-0.21	-0.17	0.08	0.05	0.18	-0.29	-0.11	1.00	0.72	0.11	0.01	0.18	-0.01	-0.01	-0.20	-0.21
JQ_12	0.39	0.27	-0.10	0.05	-0.03	-0.08	0.00	0.48	0.27	0.34	0.18	0.20	-0.08	0.07	0.00	-0.16	-0.23	-0.04	0.09	0.00	-0.18	0.00	0.72	1.00	-0.15	-0.06	0.09	-0.24	-0.21	-0.39	-0.05
CLLL_01	0.17	0.29	0.49	-0.30	-0.37	-0.42	-0.40	-0.41	-0.41	-0.31	-0.23	-0.28	-0.51	-0.58	0.24	0.08	-0.36	-0.16	-0.54	-0.05	0.09	0.08	0.11	-0.15	1.00	0.54	0.40	0.60	0.66	0.34	-0.29
CLLL_02	-0.11	0.06	0.38	-0.14	-0.15	-0.38	-0.38	-0.19	-0.15	-0.10	-0.16	-0.40	-0.20	-0.40	0.33	0.14	-0.34	-0.08	-0.41	0.00	0.00	0.04	0.01	-0.06	0.54	1.00	0.42	0.26	0.33	0.06	-0.29
CLLL_07	0.48	-0.16	0.38	0.08	0.07	-0.08	-0.28	-0.20	-0.43	-0.34	-0.38	-0.33	-0.32	-0.36	0.37	0.02	-0.12	0.08	-0.29	-0.15	0.22	0.24	0.18	0.09	0.40	0.42	1.00	0.37	0.35	0.29	-0.08
ALMP_04	0.06	-0.06	0.25	-0.35	-0.38	-0.42	-0.37	-0.57	-0.79	-0.37	-0.55	-0.43	-0.59	-0.55	0.19	0.26	-0.27	-0.23	-0.47	-0.15	0.24	0.18	-0.01	-0.24	0.60	0.26	0.37	1.00	0.77	0.80	-0.05
ALMP_05	0.04	0.00	0.30	-0.08	-0.27	-0.19	-0.25	-0.54	-0.65	-0.60	-0.51	-0.46	-0.53	-0.49	0.30	0.27	-0.31	-0.18	-0.43	-0.16	0.38	0.07	-0.01	-0.21	0.66	0.33	0.35	0.77	1.00	0.63	-0.19
ALMP_06	0.01	-0.39	0.08	-0.19	-0.15	-0.29	-0.21	-0.49	-0.71	-0.43	-0.53	-0.40	-0.41	-0.32	0.10	0.18	-0.13	-0.22	-0.43	-0.11	0.35	0.14	-0.20	-0.39	0.34	0.06	0.29	0.80	0.63	1.00	-0.07
FRCA_06	-0.24	-0.26	-0.51	0.06	0.17	0.14	0.37	-0.04	-0.09	-0.01	-0.04	0.13	-0.07	0.25	0.15	0.17	0.24	0.04	0.22	0.04	0.26	0.24	-0.21	-0.05	-0.29	-0.29	-0.08	-0.05	-0.19	-0.07	1.00

A.I.2: EMCO variables grouped by security drivers – pairwise correlations

	FRCA_01_r	FRCA_01_t	FRCA_20	FRCA_04	FRCA_06	FRCA_14	FRCA_12	FRCA_11	JQ_10	JQ_11	JQ_12	CLLL_01	CLLL_02	CLLL_07	ALMP_05	ALMP_06	ALMP_04	ALMP_01	MSS_02	MSS_03	MSS_04	MSS_07	MSS_08	JQ_6	JQ_1	JQ_3	JQ_5	WLB_03	WLB_02	WLB_04	WLB_07	WLB_06	MSS_06
	EPL regular contracts (FRCA_01_r)	EPL temporary contracts (FRCA_01_t)	Job tenure in years - Job duration (FRCA_20)	Transition from temporary to permanent - 3 year average (FRCA_04)	Transitions by contract - Pay level (FRCA_06)	Diversity and reason for contractual & working arrangements - self-employed (FRCA_14)	Diversity and reason for contractual & working arrangements - Involuntary part-time (FRCA_12)	Diversity and reason for contractual & working arrangements - Involuntary temporary (FRCA_11)	Early leavers from education and training (TSDSC410)	perc of population having completed at least secondary education (TPS00065)	At least upper secondary educational attainment, age group 20-24 by sex (TPS00186)	Lifelong learning (age 25-64) (CLLL_01)	Public spending on human resources (CLLL_02)	Educational attainment - % aged 30-34 with tertiary educational attainment (CLLL_07)	Expenditure on ALMP as % GDP (ALMP_05)	Activation - LMP participants per 100 persons wanting to work (ALMP_06)	Expenditure on ALMP per person in labour service (ALMP_04)	LTU (% active population) (ALMP_01)	PLMP expenditure on support per person in labour reserve (MSS_02)	Expenditure on PLMP as % GDP (MSS_03)	PLMP participants % of U (MSS_04)	Net replacement rate after 6 months (MSS_07)	Net replacement rate after 5 years (MSS_08)	At-risk-of-poverty-rate max secondary education (TSDSC420)	In work at risk of poverty (TSDSC320)	At risk of poverty without dependent childdren no low work intensity (TESSI122)	At risk of poverty with dependent childdren no low work intensity (ILC_PEES02)	Inactivity trap (WLB_03)	Child care (WLB_02)	Employment impact of parenthood (WLB_04)	Lack of care for children and other dependents - Main reason for inactivity (WLB_07)	Lack of care for children and other dependents - Main reason for part-time (WLB_06)	Low wage trap (MSS_06)
FRCA_01_r	1.00	0.24	0.37	-0.36	-0.24	-0.24	-0.17	-0.11	-0.36	-0.41	-0.43	-0.17	0.11	-0.46	-0.04	-0.01	-0.06	0.02	-0.07	-0.03	-0.13	0.08	-0.43	0.28	-0.19	-0.18	-0.11	-0.26	0.00	0.23	0.33	0.09	0.27
FRCA_01_t	0.24	1.00	0.39	-0.49	-0.26	-0.12	-0.18	-0.27	-0.29	-0.36	-0.27	-0.29	-0.06	0.16	0.00	0.39	0.06	-0.10	0.20	0.22	0.14	0.21	-0.18	-0.03	-0.48	-0.29	-0.17	-0.45	0.10	0.32	0.36	0.07	0.23
FRCA_20	0.37	0.39	1.00	-0.32	-0.51	-0.52	-0.28	-0.30	-0.03	-0.28	0.10	-0.49	-0.38	-0.38	-0.30	-0.08	-0.25	-0.41	-0.06	0.03	0.03	-0.04	-0.04	0.01	-0.23	-0.05	-0.22	-0.42	-0.31	0.13	0.14	0.05	0.18
FRCA_04	-0.36	-0.49	-0.32	1.00	0.26	0.33	0.27	0.25	0.09	0.29	0.18	-0.09	0.00	-0.22	-0.38	-0.32	-0.24	0.19	-0.41	-0.51	-0.32	-0.24	0.09	-0.31	0.00	0.05	-0.12	0.13	-0.30	-0.36	-0.21	0.06	0.28
FRCA_06	-0.24	-0.26	-0.51	0.26	1.00	0.37	0.14	0.17	0.04	0.21	0.05	0.29	0.29	0.08	0.19	0.07	0.05	0.18	-0.09	-0.01	-0.04	-0.04	0.04	-0.07	0.24	0.04	0.22	0.25	0.12	-0.15	-0.17	-0.05	0.07
FRCA_14	-0.24	-0.12	-0.58	0.33	0.37	1.00	0.47	0.49	0.23	0.38	0.00	0.40	0.38	0.28	0.25	0.21	0.37	0.40	0.21	0.01	0.13	0.17	0.15	0.03	0.43	0.24	0.39	0.53	0.28	-0.17	-0.05	-0.21	-0.15
FRCA_12	-0.17	-0.30	-0.28	0.27	0.14	0.47	1.00	0.62	0.33	0.21	0.08	0.42	0.38	0.08	0.19	0.29	0.42	0.53	0.35	-0.05	0.28	0.17	0.29	0.43	0.55	0.57	0.67	0.60	0.23	-0.19	-0.10	-0.39	-0.50
FRCA_11	-0.11	-0.27	-0.30	0.25	0.17	0.49	0.62	1.00	0.26	0.20	0.03	0.37	0.15	-0.07	0.27	0.15	0.38	0.37	0.31	0.05	0.13	0.32	0.27	0.24	0.32	0.26	0.42	0.43	0.16	-0.07	-0.03	-0.48	-0.33
JQ_10	-0.36	-0.29	-0.03	0.09	0.04	0.23	0.33	0.26	1.00	0.83	0.84	0.17	0.09	0.23	0.08	-0.11	0.14	-0.04	-0.01	-0.23	-0.08	-0.25	-0.07	-0.04	0.30	0.07	0.11	0.20	-0.05	0.09	-0.04	0.00	-0.41
JQ_11	-0.41	-0.36	-0.28	0.29	0.21	0.38	0.21	0.20	0.83	1.00	0.72	0.11	0.01	0.18	-0.01	-0.20	-0.01	0.04	-0.17	-0.30	-0.23	-0.34	-0.18	-0.25	0.17	-0.08	-0.05	0.20	-0.18	-0.11	-0.21	0.05	-0.27
JQ_12	-0.39	-0.27	0.10	0.18	0.05	0.00	0.08	0.03	0.84	0.72	1.00	-0.15	-0.06	0.09	-0.21	-0.33	-0.24	-0.16	-0.27	-0.34	-0.18	-0.48	0.00	-0.27	0.23	0.04	-0.09	-0.07	-0.33	0.00	-0.16	0.10	-0.08
CLLL_01	-0.17	-0.29	-0.49	-0.09	0.29	0.40	0.42	0.37	0.17	0.11	-0.15	1.00	0.54	0.40	0.68	0.34	0.68	0.45	0.41	0.31	0.23	0.41	0.05	0.41	0.36	0.16	0.54	0.58	0.78	0.24	0.08	-0.19	-0.51
CLLL_02	0.11	-0.06	-0.38	0.00	0.29	0.38	0.38	0.15	0.09	0.01	-0.06	0.54	1.00	0.42	0.33	0.06	0.26	0.30	0.15	0.10	0.16	0.19	0.00	0.24	0.34	0.08	0.41	0.40	0.50	0.33	0.14	0.09	-0.20
CLLL_07	-0.48	0.16	-0.38	-0.22	0.08	0.28	0.08	-0.07	0.23	0.18	0.09	0.40	0.42	1.00	0.35	0.29	0.37	0.10	0.43	0.34	0.38	0.20	0.15	0.05	0.12	-0.08	0.29	0.36	0.52	0.37	0.02	-0.10	-0.32
ALMP_05	-0.04	0.00	-0.30	-0.38	0.19	0.25	0.19	0.27	0.08	-0.01	-0.21	0.66	0.33	0.35	1.00	0.63	0.77	0.23	0.65	0.60	0.51	0.54	0.16	0.51	0.31	0.18	0.43	0.49	0.71	0.30	0.27	-0.15	-0.53
ALMP_06	-0.01	0.39	-0.08	-0.35	0.07	0.21	0.29	0.15	-0.11	-0.20	-0.33	0.34	0.06	0.29	0.63	1.00	0.80	0.28	0.71	0.43	0.53	0.49	0.11	0.51	0.13	0.22	0.43	0.32	0.55	0.10	0.18	-0.31	-0.41
ALMP_04	-0.06	0.06	-0.25	-0.24	0.05	0.37	0.42	0.38	0.14	-0.01	-0.24	0.60	0.26	0.37	0.77	0.80	1.00	0.42	0.79	0.37	0.55	0.57	0.15	0.54	0.27	0.23	0.47	0.55	0.68	0.19	0.26	-0.33	-0.59
ALMP_01	0.02	-0.10	-0.47	0.19	0.18	0.40	0.53	0.37	-0.04	0.04	-0.16	0.45	0.30	0.10	0.23	0.28	0.42	1.00	0.30	-0.06	0.24	0.24	0.16	0.19	0.23	0.22	0.34	0.42	0.28	-0.15	-0.04	-0.39	-0.37
MSS_02	-0.07	0.20	-0.06	-0.41	-0.09	0.21	0.35	0.31	-0.01	-0.17	-0.27	0.41	0.15	0.43	0.65	0.71	0.79	0.30	1.00	0.74	0.87	0.68	0.46	0.57	0.30	0.32	0.53	0.48	0.68	0.18	0.15	-0.52	-0.60
MSS_03	-0.03	0.22	0.03	-0.51	-0.01	0.01	-0.05	0.05	-0.23	-0.30	-0.33	0.31	0.10	0.34	0.60	0.43	0.37	-0.06	0.74	1.00	0.68	0.54	0.38	0.41	0.17	0.14	0.38	0.23	0.52	0.27	0.11	-0.27	-0.30
MSS_04	-0.13	0.14	0.03	-0.32	-0.04	0.13	0.28	0.13	-0.08	-0.23	-0.18	0.23	0.16	0.38	0.51	0.53	0.55	0.24	0.87	0.68	1.00	0.53	0.67	0.46	0.37	0.39	0.46	0.44	0.47	0.09	0.12	-0.41	-0.47
MSS_07	0.08	0.21	-0.04	-0.24	-0.04	0.17	0.17	0.32	-0.25	-0.34	-0.48	0.41	0.19	0.20	0.54	0.49	0.57	0.24	0.63	0.54	0.53	1.00	0.30	0.32	0.01	0.10	0.24	0.50	0.60	0.28	0.36	-0.24	-0.39
MSS_08	-0.46	-0.18	-0.04	0.09	0.04	0.15	0.29	0.27	-0.07	-0.18	0.00	0.05	0.00	0.15	0.16	0.11	0.15	0.16	0.46	0.38	0.67	0.30	1.00	0.19	0.36	0.43	0.35	0.37	0.03	-0.18	-0.13	-0.41	-0.21
JQ_6	0.28	-0.03	0.01	-0.31	-0.07	0.03	0.43	0.24	-0.04	-0.25	-0.27	0.41	0.24	0.05	0.51	0.51	0.54	0.19	0.57	0.41	0.46	0.32	0.19	1.00	0.41	0.49	0.60	0.44	0.41	-0.13	-0.10	-0.37	-0.43
JQ_1	-0.19	-0.40	-0.23	0.00	0.24	0.43	0.55	0.32	0.30	0.17	0.23	0.36	0.34	0.12	0.31	0.13	0.27	0.23	0.30	0.17	0.37	0.01	0.36	0.41	1.00	0.82	0.73	0.45	0.22	-0.28	-0.25	-0.24	-0.30
JQ_3	-0.18	-0.29	-0.05	0.05	0.04	0.24	0.57	0.26	0.07	-0.08	0.04	0.16	0.08	-0.08	0.18	0.22	0.23	0.22	0.32	0.14	0.39	0.10	0.43	0.49	0.82	1.00	0.64	0.38	0.09	-0.44	-0.29	-0.28	-0.27
JQ_5	-0.11	-0.17	-0.22	-0.12	0.22	0.39	0.67	0.42	0.11	-0.05	-0.09	0.54	0.41	0.29	0.43	0.43	0.47	0.34	0.53	0.38	0.46	0.24	0.35	0.60	0.73	0.64	1.00	0.50	0.47	-0.11	-0.23	-0.43	-0.39
WLB_03	-0.26	-0.45	-0.42	0.13	0.25	0.53	0.60	0.43	0.20	0.20	-0.07	0.58	0.40	0.36	0.49	0.32	0.55	0.42	0.48	0.23	0.44	0.50	0.37	0.44	0.45	0.38	0.50	1.00	0.38	-0.12	-0.05	-0.29	-0.50
WLB_02	0.00	0.10	-0.31	-0.39	0.12	0.28	0.23	0.16	-0.05	-0.18	-0.33	0.74	0.50	0.52	0.71	0.55	0.68	0.28	0.62	0.52	0.47	0.60	0.03	0.41	0.22	0.09	0.47	0.38	1.00	0.51	0.36	-0.12	-0.47
WLB_04	0.23	0.32	0.13	-0.36	-0.15	-0.17	-0.19	-0.07	0.09	-0.11	0.00	0.24	0.33	0.37	0.30	0.10	0.19	-0.15	0.18	0.27	0.09	0.28	-0.18	-0.13	-0.28	-0.44	-0.11	-0.12	0.51	1.00	0.71	0.22	-0.13
WLB_07	0.33	0.36	0.14	-0.21	-0.17	-0.05	-0.10	-0.03	-0.04	-0.21	-0.16	0.08	0.14	0.02	0.27	0.18	0.26	-0.04	0.15	0.11	0.12	0.36	-0.13	-0.10	-0.25	-0.29	-0.23	-0.05	0.36	0.71	1.00	0.37	-0.10
WLB_06	0.09	0.07	0.05	0.06	-0.05	-0.21	-0.39	-0.48	0.00	0.05	0.10	-0.19	0.09	-0.10	-0.15	-0.31	-0.33	-0.39	-0.52	-0.27	-0.41	-0.24	-0.41	-0.37	-0.24	-0.28	-0.43	-0.29	-0.12	0.22	0.37	1.00	0.31
MSS_06	0.27	0.23	0.18	0.28	0.07	-0.15	-0.50	-0.33	-0.41	-0.27	-0.08	-0.51	-0.20	-0.32	-0.53	-0.41	-0.59	-0.37	-0.60	-0.30	-0.47	-0.39	-0.21	-0.43	-0.30	-0.27	-0.39	-0.55	-0.47	-0.13	-0.10	0.31	1.00

Annex I.3. Flexibility drivers – PCA and Cronbach-alpha results

Group 1# FRCA_01_r FRCA_01_t FRCA_20

	PC1	PC2	PC3
SS loadings	1.673	0.757	0.570
Proportion Var	0.558	0.252	0.190
Cumulative Var	0.558	0.810	1.000
Proportion Explained	0.558	0.252	0.190
Cumulative Proportion	0.558	0.810	1.000

Cronbach-alpha: 0.61

Group 2# ALMP_02 FRCA_11 FRCA_12 FRCA_14

	PC1	PC2	PC3	PC4
SS loadings	2.479	0.693	0.497	0.331
Proportion Var	0.620	0.173	0.124	0.083
Cumulative Var	0.620	0.793	0.917	1.000
Proportion Explained	0.620	0.173	0.124	0.083
Cumulative Proportion	0.620	0.793	0.917	1.000

Cronbach-alpha: 0.80

Group 3# MSS_07 MSS_02 MSS_03 MSS_04

	PC1	PC2	PC3	PC4
SS loadings	3.010	0.531	0.341	0.118
Proportion Var	0.752	0.133	0.085	0.030
Cumulative Var	0.752	0.885	0.970	1.000
Proportion Explained	0.752	0.133	0.085	0.030
Cumulative Proportion	0.752	0.885	0.970	1.000

Cronbach-alpha: 0.89

Group 4# MSS_05 MSS_06 WLB_03

	PC1	PC2	PC3
SS loadings	1.989	0.577	0.434
Proportion Var	0.663	0.192	0.145
Cumulative Var	0.663	0.855	1.000
Proportion Explained	0.663	0.192	0.145
Cumulative Proportion	0.663	0.855	1.000

Cronbach-alpha: 0.70

Group 6# JQ_1 JQ_3 JQ_5 MSS_08

	PC1	PC2	PC3	PC4
SS loadings	2.713	0.755	0.373	0.160
Proportion Var	0.678	0.189	0.093	0.040
Cumulative Var	0.678	0.867	0.960	1.000
Proportion Explained	0.678	0.189	0.093	0.040
Cumulative Proportion	0.678	0.867	0.960	1.000

Cronbach-alpha: 0.83

Group 9# CLLL_01 CLLL_02 CLLL_07 ALMP_04 ALMP_05 ALMP_06

	PC1	PC2	PC3	PC4	PC5	PC6
SS loadings	3.359	1.200	0.674	0.383	0.240	0.144
Proportion Var	0.560	0.200	0.112	0.064	0.040	0.024
Cumulative Var	0.560	0.760	0.872	0.936	0.976	1.000
Proportion Explained	0.560	0.200	0.112	0.064	0.040	0.024
Cumulative Proportion	0.560	0.760	0.872	0.936	0.976	1.000

Cronbach-alpha: 0.83

Annex I.4. Security drivers – PCA and Cronbach-alpha results

Group 1# FRCA_01_r FRCA_01_t FRCA_20

	PC1	PC2	PC3
SS loadings	1.673	0.757	0.570
Proportion Var	0.558	0.252	0.190
Cumulative Var	0.558	0.810	1.000
Proportion Explained	0.558	0.252	0.190
Cumulative Proportion	0.558	0.810	1.000

Cronbach-alpha: 0.61

Group 2# FRCA_04 FRCA_06 FRCA_14

	PC1	PC2	PC3
SS loadings	1.641	0.746	0.613
Proportion Var	0.547	0.249	0.204
Cumulative Var	0.547	0.796	1.000
Proportion Explained	0.547	0.249	0.204
Cumulative Proportion	0.547	0.796	1.000

Cronbach-alpha: 0.58

Group 4# JQ_10 JQ_11 JQ_12

	PC1	PC2	PC3
SS loadings	2.595	0.285	0.120
Proportion Var	0.865	0.095	0.040
Cumulative Var	0.865	0.960	1.000
Proportion Explained	0.865	0.095	0.040
Cumulative Proportion	0.865	0.960	1.000

Cronbach-alpha: 0.92

Group 5# CLLL_01 CLLL_02 CLLL_07 ALMP_05 ALMP_06 ALMP_04 ALMP_01

	PC1	PC2	PC3	PC4	PC5	PC6	PC7
SS loadings	3.575	1.206	0.918	0.590	0.378	0.191	0.141
Proportion Var	0.511	0.172	0.131	0.084	0.054	0.027	0.020
Cumulative Var	0.511	0.683	0.814	0.899	0.953	0.980	1.000
Proportion Explained	0.511	0.172	0.131	0.084	0.054	0.027	0.020

Cumulative Proportion	0.511	0.683	0.814	0.899	0.953	0.980	1.000

Cronbach-alpha: 0.83

Group 6# MSS_02 MSS_03 MSS_04 MSS_07 MSS_08

	PC1	PC2	PC3	PC4	PC5
SS loadings	3.366	0.780	0.480	0.291	0.084
Proportion Var	0.673	0.156	0.096	0.058	0.017
Cumulative Var	0.673	0.829	0.925	0.983	1.000
Proportion Explained	0.673	0.156	0.096	0.058	0.017
Cumulative Proportion	0.673	0.829	0.925	0.983	1.000

Cronbach-alpha: 0.87

Group 7# JQ_6 JQ_1 JQ_3 JQ_5 WLB_03

	PC1	PC2	PC3	PC4	PC5
SS loadings	3.214	0.746	0.575	0.326	0.139
Proportion Var	0.643	0.149	0.115	0.065	0.028
Cumulative Var	0.643	0.792	0.907	0.972	1.000
Proportion Explained	0.643	0.149	0.115	0.065	0.028
Cumulative Proportion	0.643	0.792	0.907	0.972	1.000

Cronbach-alpha: 0.85

Group 8# WLB_02 WLB_04 WLB_07

	PC1	PC2	PC3
SS loadings	2.064	0.666	0.270
Proportion Var	0.688	0.222	0.090
Cumulative Var	0.688	0.910	1.000
Proportion Explained	0.688	0.222	0.090
Cumulative Proportion	0.688	0.910	1.000

Cronbach-alpha: 0.76

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