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Facultatea de Ştiinţe Economice şi Gestiunea Afacerilor
ŞCOALA DOCTORALĂ DE ŞTIINŢE
ECONOMICE ŞI GESTIUNEA AFACERILOR

DOCTORAL THESIS

Quantitative approaches in studying labor market flexicurity

-SUMMARY-

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CLUJ-NAPOCA

2024

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Key words: flexicurity, labor market policy, EU policy, labor markets, composite indicators, labor market transitions, employment inflows, unemployment outflows, panel data regressions, fixed effects two stage least squares, work-life balance, well-being, multilevel regression, repeated cross-sections, European Working Conditions Survey

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Introduction: Research aims and added value

The labor market policy studied in this thesis is 'flexicurity.' Its origins are generally attributed to the mid-1990s – early 2000s' Dutch and Danish labor markets. These countries differentiated from the rest of the European states by reaching low levels of unemployment rates as well as better youth and women insertions. At the same time, they kept inflation rates at low levels. Their labor market policy achieved the efficiency of highly flexible markets while providing high levels of security, therefore the term 'flexicurity.' Even though the flexibility and security dimensions were previously considered irreconcilable, flexicurity quickly gained popularity due to its catchy name and due to the Dutch and Danish "miracle stories." Besides its attractivity to the policymakers and to the general public, flexicurity attracted the attention of researchers from labor economics, human resource management, and industrial relations alike. However, after its adoption and popularization in the European Union at large, the policy raised controversy in terms of its measurement and attributed outcomes. Flexicurity was a means and a compass in the *European Employment Strategy* to reach both *Lisbon* (European Parliament, 2000) and *Europe 2020* (European Commission, 2010) goals. It continues to attract research and policy interest due to its inherent multidimensionality and multidisciplinarity.

Using the latest data and suitable methodology approaches, this thesis aims to bring new evidence to this popular, yet controversial labor market policy. We believe the studies undertaken in this thesis have their merits in bringing more clarity and opening new research opportunities. The thesis is structured in five chapters – two theoretical chapters, followed by three empirical ones. To begin with, *Chapter 1* is a historical literature review covering the evolution of labor market policy and academic debate on flexibility versus security, the emergence of flexicurity, its adoption in the European Union, and policy expectations. Further on, *Chapter 2* describes the widely accepted flexicurity definitions and frameworks. Following one of these definitions, *Chapter 3* constructs the hitherto lengthiest period-available composite indicator to measure the

flexicurity efforts inside the EU28 countries. The index is used in *Chapter 4* to evaluate the cross-country performance in employment inflow rates relative to flexicurity efforts. Lastly, the study described in *Chapter 5,* analyzes the association between flexicurity and employee work-life balance.

By doing so, the thesis brings to the literature three main contributions and some minor ones. ***The first contribution*** of this thesis is the construction of the flexicurity index in *Chapter 3*. The index follows the European Commission's four components of flexicurity model (European Commission, 2007), is available for the 2001-2019 period for all the EU28 countries and proved robust to different sources of uncertainty. As will be discussed in extenso in *Chapter 2*, hitherto, the literature lacked a flexicurity measure available for long periods of time. Pre-existent country groupings and composite indicators were available only for one or two years and were generally focused on the EU15 countries, hindering proper policy monitoring and evaluation. *First*, we hope that due to its length and extensive country sample, the flexicurity index created here will enable future research. *Second*, even if the study does not end the debate on the flexicurity definition and measurement, the high association between the flexicurity index scores and previous empirical country groupings could attract more acceptance to the multifaceted dimension of flexicurity.

Additionally, the lengthy time frame of the index enabled findings that strengthen the need for a long-term updated measure to provide proper communication and policy advice. *First*, we show that country regimes are time-dynamic in relation to flexicurity. Therefore, country groupings may change their composition in time. This aspect was previously suggested only by the study of Hastings and Heyes (2018). They clustered the same 18 countries in relation to flexicurity for both 2006 and 2011. *Second*, we add to the conclusions of previous studies (Hastings and Heyes, 2018; Muffels and Luijkx, 2008) that some countries diverge from their natural clusters in terms of performance in flexicurity efforts. Referring to theoretical or outdated classifications when evaluating labor market performance can thus provide misleading results.

In *Chapter 4*, the thesis brings a ***second contribution*** to the literature by adding to the underexplored area of the employment inflow rate-flexicurity association. The study uses an extensive, up-to-date database to analyze the relationship between flexicurity

and employment inflows inside the EU28 countries. Besides the addition of flexicurity among the determinants of employment inflow rate, the database used enables some *additional contributions*. *First*, most of the previous studies focus on the member states of the Organization for Economic Co-operation and Development (OECD). Thus, some Central and Eastern European (CEE) countries that are not part of the OCED are often neglected in this already sparse literature. Therefore, this study brings an important contribution to the literature since its results are also applicable to the CEE. *Second*, by using 2007-2019 data, this disseration provides more updated results than previous articles (for example, Bachman and Felder (2021)'s analysis ends in 2013).

The third contribution of the thesis stems from exploring the relationship between national flexicurity efforts and employee work-life balance in *Chapter 5*. When flexicurity was promoted by the European Commission, it was expected that the policy would also generate improved employment quality. While the effectiveness of flexicurity policies on other employee well-being dimensions was studied before, there are no studies on the association between an employee's perceived work-life balance and national flexicurity efforts. Therefore, the study described in this chapter fills this gap. A *minor additional contribution* of this chapter comes from the repeated cross-sectional nature of the study. Using this approach not only strengthened the results but also pointed to the existence of a decreasing trend in cross-country differences in work-life balance.

A more detailed description of each chapter follows below.

Chapter 1 introduces the reader to the history of 'flexicurity.' It first presents the definition and measurement of labor market flexibility and its link to efficient labor markets by providing an ample literature review. Further on, it describes security through policy measures that aim at increasing labor market equity. The chapter also briefs empirical and theoretical research that positioned the two labor market policies in antithetical positions suggesting that efficient labor markets are not equitable and vice versa. The change in social standards in the early 1990s generated the emergence of 'transitional labor markets,' a concept that further facilitated the appearance of a new labor market policy – 'flexicurity.' The last sections of *Chapter 1* describe the three most referred flexicurity regimes - those of the Netherlands, Denmark, and the

European Commission – and emphasize common traits and differences between them. The ending section summarizes the main takeaways of the chapter.

Chapter 2 presents the theoretical flexicurity typologies as proposed by Muffels and Wilthagen (2013) for the EU15 and selected CEE countries. The chapter describes the spatial distribution highlighted by this depiction, where Northern and Western countries are, generally, more performant than the Southern and Easter ones in terms of flexicurity. Further on, the chapter proceeds at presenting the most used flexicurity frameworks, namely *Wilthagen and Tros' flexicurity matrix* (Wilthagen and Tros, 2004), the *Danish golden triangle* (Madsen, 2004), and the *European Commission's four components of flexicurity model* (European Commission, 2007).

Each section is dedicated to a different framework and includes the theoretical description and empirical country groupings, or composite indicators found in the literature. By doing so, the chapter emphasizes the different assumptions taken by researchers when following one or the other definition of flexicurity. Lastly, the chapter compares the empirical country groupings against each other, highlighting similarities and discrepancies. Similarly, the empirical groups are compared against the theoretical flexicurity typologies. The ending section summarizes the main takeaways of the chapter.

Chapter 3 constructs a flexicurity index following the *European Union's four components of flexicurity model*. The composite indicator monitors the flexicurity efforts of the EU28 countries for the 2001-2019 period and will be used in the estimations of *Chapters 4* and *5*. Therefore, this chapter discusses the research methodology – data collection, preprocessing, weighting, and aggregation scheme. Further on, the study presents an extensive robustness analysis that assesses the sensitivity of the index to the inclusion/exclusion of basic variables and the standardization method as well as some considerations on the weighting scheme.

Subsequently, based on this composite indicator's scores, the study describes the EU28 countries' flexicurity performance during 2001-2019. In this section, the chapter also focuses on the spatial distribution of the flexicurity index scores. Therefore, following a visual inspection based on quantile maps, the study estimates a series of regressions

(one per each year) having as dependent variable the country's flexicurity index score and as independent variables, the latitude and longitude of the country's centroid. Both the visual inspection and the results of the estimated regressions suggest that there are both similarities and discrepancies between the countries' performance in the flexicurity index scores and their theoretical performance based on Muffels and Wilthagen (2013)'s depiction.

Further on, the chapter compares country index scores with previous classifications found in the literature (and presented in *Chapter 2*). Lastly, the chapter provides a descriptive analysis of the labor market performance and the flexicurity index scores. The chapter concludes with extensive policy and future research recommendations based on the obtained results.

Chapter 4 analyzes the link between flexicurity and employment inflows rate. The study's sample includes the EU28 countries during the 2007-2019 period. The first section presents the policy and economic context, the research objective and the value added of the study. The second section describes the dependent and independent variables, the literature review, and initial research assumptions. The estimation methodology and regression results are fully described in the third section. The final estimations are carried out through two-way fixed-effects two-stage least squares. The dependent variable is the employment inflows rate. Independent variables include the flexicurity index, other labor market variables (collective bargaining coverage rate, trade union density, minimum wage policy), economic and business environment variables (GDP growth rate, trade openness, top marginal tax rate, business, trade, and credit market regulations), and labor market supply and demand characteristics (the distribution of workers based on education and that of firms based on size).

Additional specifications include testing the robustness of the flexicurity index's coefficient to various changes in core and non-core variables. Therefore, we use different instruments; we replace country and time fixed effects with European regions, and recessionary periods; and we stepwise remove non-core variables. The sign and statistical significance of the flexicurity's coefficient are insensitive to these changes. Conclusions and policy implications are discussed in the ending part.

Chapter 5 studies the relationship between national flexicurity efforts and employees' perceptions of work-life balance. To this aim, the study uses data on about 74,000 EU27 employees from the three latest waves of the *European Working Conditions Survey*. The first section presents the policy context, the research objective, and the addressed literature gap. The second section thoroughly describes the literature linking flexicurity-related policies to quality in employment variables, emphasizes the lack of evidence on the work-life balance variable, and discusses the research hypothesis. Following, data and methodology are described in the third section. The estimations are carried out using a two-level logistic regression (one for each year of analysis). The methodology accounts for the nested structure of the data.

The dependent variable is self-perceived work-life balance, expressed as a binary variable. Besides the flexicurity index, independent variables include information on the sociodemographic characteristics of the surveyed employees (age, gender, migration status, education level and care responsibilities). Moreover, independent variables include national socioeconomic, and technological variables (the growth rate of the gross domestic product, gender pay gap, and the growth rate of the internet access). The fourth section presents estimation results. Robustness of results is ensured through reporting bootstrapped standard errors (1,000 samples) and using a forward-stepwise estimation strategy. Moreover, in additional estimations, we use a larger pool of independent variables that were not added from start due to the decrease in sample size generated by the missing values. Conclusions and policy implications are discussed in the ending section.

A concluding chapter ends the thesis. It summarizes general conclusions and policy implications of the thesis. It also acknowledges limitations and proposes future research directions of the studies undertaken by the thesis.

Summary of Chapter 1: 'Flexibility' and 'security' from rivals to teammates – a historical review

The work presented in this chapter was partly published in "Ferent-Pipas, M. (2023), ***'Flexibility' and 'security' from rivals to teammates: a short history of flexicurity***, Review of Economic Studies and Research Virgil Madgearu, Faculty of Economics and Business Administration, Babeș-Bolyai University of Cluj-Napoca, Vol. 16, Issue 2, pp.15-31 (DOI: 10.24193/RVM.2023.16.102)."

The word 'flexicurity' was coined in 1995 by the Dutch sociologist Hans Adriaansens to describe a labor market policy that encompasses both 'flexibility' and 'security' and engages all the social partners in a trustful and supportive dialog for policy design and implementation. The fact that flexicurity is the joint effort and dialogue between employees, employers, and policy regulators is one of the arguments assuming that it provides win-win situations - favorable outcomes to workers, firms, and countries. It is an interdisciplinary policy studied by labor, social and political economists, industrial relations, and human resource development researchers (see, for example, Kornelakis, 2014; Wilthagen, 1998; and Wilthagen and Tros, 2004). To understand the definitions of flexicurity, it is important to understand its history and note the early understanding of its components.

While all articles discuss, in parts, the history of flexicurity and present some of its definitions, objective historical reviews of the policy are scarce. Therefore, the **aim of this chapter** is tracing the progression of public policy and scholar views of labor market legislation and interventions that eventually led to the emergence of flexicurity in the mid-1990s and its further evolution until today's interpretations of the term. To reach this aim, we do an extensive revision of policy documents and academic articles.

In doing so, this chapter contributes to the scarce body of literature dedicated to the study of the history of flexicurity in several ways. First, in addition to Muffels and Wilthagen (2013), the current study categorizes typologies of 'flexibility' and 'security' by reconciling previous comprehensive literature review studies. To continue, Kornelakis (2014) described the evolution of flexibility and its emergence into flexicurity. The current study goes beyond his work by extending his flexibility classification to encompass the systematic reviews of Boyer (1987) and Streeck (1987). Furthermore, in addition to Kornelakis (2014), this chapter provides a broad classification of the various security measures and their intended outcomes.

Second, this chapter describes the Dutch, the Danish, and the European Union's flexicurity stories. It lists the commonalities and the dissimilarities between these three flexicurity regimes. In doing so, it adds to Chung (2012) that highlighted the existence of three frameworks that can be used in flexicurity research by describing their roots. We believe that this approach contributes to explaining the existence of various definitions of flexicurity and better comprehending each one of them.

To begin with, **flexibility** was understood in many forms. Studies cited flexible policy regarding wage setting, low employment protection, atypical working contracts, and varying social contribution. It also included varying pay, working hours, and conditions to incentivize and improve the adaptability of the workforce and thus meet business needs. These measures were linked to increased labor market efficiency (see, for example, Streeck, 1987; Boyer, 1987; Kornelakis, 2014; Casey et al., 1999).

To continue, traditional labor market **security** measures encompass employment protection legislation, unemployment insurance, collective wage bargaining, minimum wages, trade unions and the right to strike, pension schemes, paid vacations and sick leaves, and other health and safety insurances (see, for example, Giersch, 1985 or Muffels and Wilthagen, 2013). These measures aimed at empowering workers to face labor market uncertainties and improving employment quality. While flexible labor markets were linked to increased efficiency, secure markets increased equity.

Therefore, in Muffels and Wilthagen (2013) words, the general academic and public view of the 1980s agreed that a trade-off between flexibility and security was inevitable.

Promoting flexibility meant increasing labor market efficiency by enabling firms to adjust smoothly to changes. Raising labor market equity by protecting workers' security decreased the ability of firms to adjust to business cycles, thus minimizing flexibility. Institutions and social policy were thus generally seen to distort labor market efficiency. Flexibility, on the other hand, was seen as generating insecurity and low employment quality.

However, the change in the 'flexibility' - 'security' paradigms emerged as a natural response to the change in social standards. As Schmid (1995a) notes, 'full employment' can be achieved if institutions and policies adapt to a modernized definition of 'full employment.' Modern institutions should consider equal opportunities for men and women and should relate to the values and needs of the life cycle. Such institutions promote policies that support 'transitional employment' - throughout their career, a person could transition between employment, unemployment, education, private domestic activities, or retirement, as well as between part-time and full-time work to cope with life demands and adapt to business needs.

Transitional labor market advocates were supporters of the flexibilization of labor markets but claimed that it might bring perceived feelings of insecurity and uncertainty that could discourage employees from engaging in transitions. Consequently, social security measures were seen as needed to mitigate financial and social insecurities associated with job loss, care responsibilities, or retraining needs. In a transitional labor market, the state encourages transitions by minimizing the associated monetary, psychological, and legal costs both for workers and companies (Wilthagen and Rogowski, 2002). Therefore, transitional labor markets were seen as not only more efficient but also more equitable than previous systems since they could help reintegrate long-term unemployed who would otherwise have little to no chance of returning to work (Schmid, 1995a).

Some authors consider 'flexicurity' as a catchier term to describe 'transitional labor markets' since the two concepts partially overlap in their definitions. Others suggest that flexicurity comprises the set of policy measures to reach transitional labor markets. However, the term received public attention following the success stories of the

Netherlands and Denmark. The two countries succeeded in minimizing the unemployment rates and increasing the labor market participation of vulnerable groups in the late 1990s and early 2000s while raising social security and life quality and keeping the inflation rates constant.

In 1998, the Dutch legislators introduced the *Flexibility and security act* (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 1998) – the regulation of the **Dutch dual model**. The Act regarded higher employee protection to increase work flexibility. The Dutch flexicurity model was an organic outcome of an attempt at a deregulation process of the labor market. Following the European trend of the 1980s, the Dutch policymakers aimed at labor market deregulation, in particular dismissal legislation on standard contracts and atypical work. When analyzing the social acceptance of flexibility, they stumbled upon a social dilemma on the conditions for and limitations of flexibility. On the one hand, flexibility fostered job creation and increased the chances of having a job for disadvantaged categories (women and ethnic minorities). On the other hand, it weakened workers' position in the labor market. While flexibilization brought about clear advantages, regulation and security had to be provided to mitigate disadvantages – social security measures for atypical workers.

Further on, around the same period appeared the **Danish golden triangle**. It described a flexicurity model with low employment protection and high unemployment benefits coupled with labor market training and education provided by the state. Specific to the Danish labor markets were the activation measures adopted from 1994 to 2000. These refer to requirements to participate in job training and education or active job search mechanisms to continue receiving unemployment benefits. Active labor market measures also include wage subsidies and practical introduction to enterprises (Madsen, 2003; Madsen, 2004).

Later on, inside the **European Union**, flexicurity was seen as "*a further concretization of the so-called European Social Model*" (Muffels and Wilthagen, 2013). It united the policies of the highly regulated regimes of the Continental and Southern European countries with the ones of the highly flexible Anglo-Saxon regimes (Muffels and Wilthagen, 2013). The European Commission's flexicurity model is outlined in the Towards common principles of flexicurity communication (European Commission,

2007). It lists four equally important and mutually supportive constituent pillars, namely:

- flexible and reliable contractual arrangements (through modern labor laws and organization of labor);
- modern social security systems (through labor institutions that encourage labor market mobility and help people balance their work responsibilities with their care and other private ones);
- active labor market policies (through programs that promote training and retraining of unemployed, therefore reducing unemployment spells and easing transitions to new jobs); and
- comprehensive lifelong learning strategies (through initiatives that promote the continual training and retraining of workers at the workplace, therefore increasing the adaptability and employability of workers).

The common trait in the three regimes - the Dutch, the Danish, and that of the European Commission - is the openness to dialog in policymaking and the promise of win-win scenarios. At first sight, some differentiations appear, with the Danish flexicurity model putting more apparent weight on activation policies than the Dutch system. Also, the European Commission's model differentiates between activation measures and lifelong learning. Given these different approaches, different flexicurity definitions also emerged and thus the policy concept posed problems in measurement, benchmarking, and cross-country comparisons (z; Burroni and Keune, 2011). *Chapter 2* presents the three working frameworks in measuring flexicurity efforts and related empirical country classifications.

Summary of Chapter 2: Flexicurity definition and measurement. Research frameworks and empirical country groupings

This chapter's **research objectives** are:

(1) Updating the works of Bertozzi and Bonoli (2009) and Chung (2012) in identifying and describing the main flexicurity definitions and frameworks used to classify country regimes.

(2) Presenting the empirical country groupings and composite indicators for each framework.

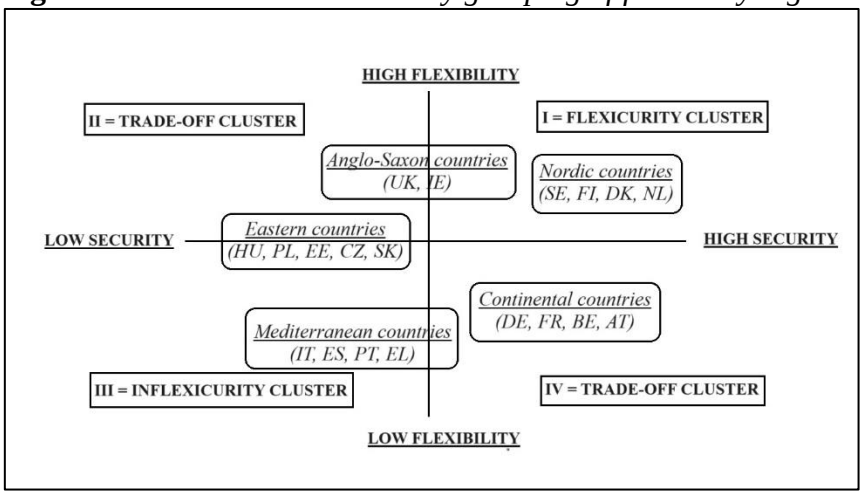
(3) Comparing the empirical country groupings with the theoretical typologies of Muffels și Wilthagen (2013).

(4) Comparing empirical country groupings against each other, highlighting similarities and differences between them.

Casey et al. (1999) 's observation about the definition of flexibility holds for flexicurity, too. As discussed in *Chapter 1*, the definition and exact measurement of flexibility and security differed in parts from study to study. Their follower, flexicurity seems to have taken the same path. *Chapter 2* begins by presenting the theoretical country grouping in relation to flexicurity. It further describes the three main flexicurity frameworks used in specialized literature and related country groupings or composite indicators. First, we present the *Wilthagen and Tros (2004)'s flexicurity matrix* that distinguishes between different types of flexibility and security of a cohesive flexicurity strategy. Second, we describe the *Danish golden triangle* described by Madsen (2004), a model that integrates flexibility, security, and active labor market policies. Third, we illustrate the *European Commission's four principles of flexicurity* model (flexibility, security, active labor market policies, and lifelong learning) established by the *Towards Common Principles on Flexicurity Communication* (European Commission, 2007).

To begin with, a **theoretical country grouping** (the specialized literature also uses "theoretical typologies," and "theoretical/natural regimes") was proposed by Muffels and Luijkx (2008) for the EU14 countries and later extended by Muffels and Wilthagen (2013) to include some Eastern countries (see Figure 2.1).

Figure 2.1. *The theoretical country grouping of flexicurity regimes*



Source: Ferent-Pipas (2024)

To continue, **Wilthagen and Tros (2004)'s flexicurity matrix** differentiates between four forms of flexibility that allow for quick adjustments to economic conditions and enhance competition and productivity. They allow for employment level and intensity adjustments to fit the businesses' needs. Additionally, they include variable working conditions, variable pay and downward wage adjustment to meet business' needs and adjust to changing labor market and economic conditions.

The matrix also distinguishes four forms of security that improve social inclusion and labor market participation. They guarantee employment security, income continuation even in case paid work ceases and the employee's ability to reconcile work and personal life tasks. Flexicurity provides the four flexibility forms at the same time as the security ones.

Country groupings following *Wilthagen and Tros (2004)'s flexicurity matrix* include:

- Muffels and Luijkx (2008) – sample: EU15 countries (except for Sweden), mixed data from 1994-2001 (male respondents only);

- Auer (2010) – sample: EU15 countries (except for Luxembourg), mixed data from mid-2000s;
- Muffels and Wilthagen (2013) – sample: EU25 countries and Norway and Island, mixed data from 2005-2006.

Table 2.1. summarizes the three empirical country groupings. The commonalities are Denmark and Sweden (flexicurity cluster), Italy and Greece (inflexicurity cluster), and France and Germany (trade-off low flexibility-high security cluster). The differences in variables and samples (countries and years) used could explain the differences in the resulting country groups. For the aim of this chapter, we only highlight these differences.

Table 2.1. *Flexicurity clusters based on Wilthagen and Tros (2004)'s flexicurity matrix*

Cluster	**Flexibility**	**Security**	**Countries:** Auer (2010)	**Countries:** Muffels and Wilthagen (2013)	**Countries:** Muffels and Luijkx (2008)
Flexicurity	↑	↑	**Denmark**, **the Netherland**, Sweden, **Finland**, **Austria**	**Denmark**, Norway, Sweden, **Finland**, Iceland, **UK**, Estonia	**Denmark**, **the Netherland**, **Austria**, **Portugal**, **Belgium**, **Ireland**, **UK**
Trade-off 1	↑	↓	**Ireland**, **UK**	Spain, Hungary, Slovakia, Latvia	**Spain**
Trade-off 2	↓	↑	**France**, **Belgium**, **Germany**	**France**, **Belgium**, **Germany**, **Austria**, ***Portugal***, **the Netherlands**, Cyprus, Czechia, Slovenia	**Germany**, Luxembourg, **France**
Inflexicurity	↓	↓	**Italy**, **Spain**, **Greece**, **Portugal**	**Italy**, **Greece**, ***Portugal***, Poland, Lithuania, **Ireland**, Luxembourg	**Greece**, **Italy**, **Finland**

Note: In **Bold** are countries that were sampled in all the analyzed studies. In *Italics* are countries that scored on the borderline between two clusters.

Source: Own processing based on Auer (2010), Muffels and Wilthagen (2013), and Muffels and Luijkx (2008).

Further on, the **Danish golden triangle** flexicurity model, also known as **Madsen (2004)'s golden triangle** following the author that popularized it, has three components: flexible labor markets, generous welfare schemes, and active labor market policies (ALMP).

Country groupings following the *Danish golden triangle* include:

- Chung (2012) – sample: 17 European countries, mixed data from 2005, 2007, 2008;
- Noja (2018) – sample: CEE countries, 2015.

The two country-clusterings are summarized in Table 2.2. Since the two country samples differ greatly it is difficult to make comments on the (dis)similarity between the findings of the two studies. We may remark the similarity in case of Czechia and Poland. Additionally, even though the flexicurity framework differs, it is interesting to note in case of Chung (2012) that the above-average performers in all dimensions are countries identified as belonging to the flexicurity cluster in Auer (2010), Muffels and Wilthagen (2013) and Muffels and Luijkx (2008). The observation holds for the below-average performers and the members of the inflexicurity cluster.

Table 2.2. *Flexicurity clusters based on Madsen (2004)'s Golden Triangle*

Cluster	**Countries**	**Flexibility**	**Security**	**ALMP**
Chung (2012) clusters - flexicurity efforts:				
1 (flexicurity)	Denmark, Finland, the Netherlands, Sweden	medium to high	↑	high to medium
2	Austria, Belgium, Czechia, France, Norway	medium to low	medium to high	medium
3	Germany, Ireland, Portugal, Spain	medium to high	medium to high	medium
4	Poland, United Kingdom	↑	↓	↓
5 (inflexicurity)	Greece, Italy	↓	↓	↓
Noja (2018) clusters - flexicurity efforts:				
1	Romania, Bulgaria, Hungary	↑	↓ (RO) / ↑ (BG, HU)	↓ (RO, BG) / ↑ (HU)
2	Lithuania, Estonia, Latvia, Poland	Medium	↓	medium to low
3	Slovenia, Czechia, Slovakia	medium to low	↑	medium to low

Note: This table splits Chung (2012)'s fourth cluster (Greece, Italy, Poland, United Kingdom) into two clusters based on the performance in the flexibility dimension.
Source: Own elaboration based on Chung (2012) and Noja (2018)

Lastly, the **European Commission's four principles** (also cited as **pillars** or **components**) **of flexicurity model** defines flexicurity as the combination of: (1) flexible and reliable contractual arrangements – FCA; (2) modern social security systems – MSSS; (3) comprehensive lifelong learning strategies - LLL; and (4) effective active, labor market policies – ALMP.

The *Danish golden triangle* included lifelong learning in the active labor market policy strategy. The *four principles of flexicurity* model puts more emphasis on work force training than previous frameworks have done by having the two different components of lifelong learning and active labor market policies (Chung, 2012). *The towards common principles of flexicurity communication* (European Commission, 2007) set out the measures comprised in each of the four flexicurity components.

Empirical works following the *European Commission's four principles of flexicurity model* include:

- four composite indicators: Manca et al. (2010) – sample: 22-27 EU countries, 2005[1];
- country clustering: Hastings and Heyes (2018) – sample: 19 European countries, two clusters: 2006 and 2011.

In case of the 2005 indicators' scores developed by Manca et al. (2010) (see Table 2.3), the Northern countries and the Netherlands are top performers in ALMP and LLL and mostly have above-average performance in MSSS and FCA. However, Sweden shows below-average scores in the FCA component in all the available years. For the same dimension, Denmark had moderate performance in 2005 but top performance in the rest of the years. With few exemptions, Central and Eastern European countries show the lowest scores in all the dimensions.

[1] 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.

Table 2.3. *Manca et al. (2010) four principles of flexicurity scores in 2005*

Country	Flexible and reliable contractual arrangements (FCA)	Modern social security systems (MSSS)	Active labor market policies (ALMP)	Lifelong learning (LLL)
BE	532	486	277.85	539
BG	527	NA	72.52	69
CZ	445	329	50.31	551
DK	496	530	NA	801
DE	466	460	251.51	405
EE	460	374	37.88	296
GR	623	447	NA	37
ES	533	471	178.27	356
FR	597	480	211.05	692
IE	367	405	258.54	NA
IT	521	459	196.44	NA
CY	NA	451	NA	317
LV	NA	336	38.66	74
LT	500	295	41.08	131
LU	461	367	414.57	703
HU	442	404	62.98	282
MT	NA	388	NA	429
NL	562	423	328.16	621
AT	492	371	236.42	488
PL	617	290	113.49	175
PT	626	499	162.83	228
RO	NA	NA	42.89	113
SI	545	329	104.08	382
SK	495	345	75.92	472
FI	595	410	279.75	NA
SE	456	439	347.92	808
UK	516	372	159.48	NA

Source: Manca et al. (2010)

To continue the composition of the country clusters found by Hastings and Heyes (2018) for 2006 and 2011, respectively is summarized in Table 2.4.

Table 2.4. *Flexicurity clusters in Hastings and Heyes (2018)*

Cluster	**Flexibility**	**Security**	**Countries 2006**	**Countries 2011**
Anglo-outlier 1	High	moderate	United Kingdom	United Kingdom
Anglo-outlier 2	Moderate	High	Ireland	-
Northern Europe	Moderate	moderate-high	Denmark, the Netherlands, Norway, Sweden, Finland, Austria, Belgium, Germany, France	Denmark, the Netherlands, Norway, Sweden, Finland, Austria, Belgium, Germany, France, *Ireland*
Southern and Eastern (Visegrad) Europe	moderate-low	moderate-low	Greece, Italy, Hungary, Czechia, Slovakia	Greece, Italy, Hungary, Czechia, Slovakia
Iberian	Low	Moderate	Spain, Portugal	Spain, Portugal, *Poland*
Eastern outlier	Low	Low	Poland	-

Source: Hastings and Heyes (2018)

Note: In *Italics* countries that changed clusters in 2011 compared to 2006.

Some conclusions can be drawn in relation to the objectives of this chapter. First, the literature presents three main flexicurity definitions and frameworks (same as Bertozzi and Bonoli, 2009 and Chung, 2012). Second, the empirical classifications suggest that countries deviate from their theoretical cluster. Third, we identified three limitations that rise difficulties in the comparability of empirical classifications:

(1) The literature lacks studies that include all the European Union member countries.

(2) The literature lacks studies that repeat the classification for more than two different years.

(3) Some of the studies use data from different years depending on availability.

Further on, the study of Hastings and Heyes (2018) suggests that countries deviate in time from their initial clusters. Additionally, differences in cluster composition arise not only between different flexicurity frameworks, but also between studies using the same framework, but employ different country and time samples, or different variables. This highlights the importance of addressing the limitations of the current state of literature.

While having the above-mentioned limitations in mind, the Northern European countries and the Netherlands seem to be best performers in most of the empirical analyses. Conversely, Greece, Italy, and some Eastern European countries seem to be bottom performers.

This dissertation will adopt the *European Commission's four principles of flexicurity* framework. *Chapter 3* will compute a composite indicator following the European Commission (2007) and Manca et al. (2010) guidelines. This composite indicator is to our knowledge the longest flexicurity measure. This provides the advantage of being able to assess the country's positions in different years under the same framework. Additionally, it allows for comparisons with other frameworks for the overlapping years.

Summary of Chapter 3: Flexicurity efforts in the EU28 countries - a multiyear composite indicator proposal

The study presented in this chapter was partly published in "Ferent-Pipas, M. (2023), ***Flexicurity in the EU28 countries: a multiyear composite indicator proposal***, Scientific Annals of Economics and Business, Alexandru Ioan Cuza University of Iași, Vol. 31, Issue 1, pp. 1-32 (DOI: 10.47743/saeb-2024-0006)."

This chapter's **research objectives** are:

(1) Creating a flexicurity index by extending Manca et al. (2010)'s four flexicurity subindices for the EU28 countries during 2001-2019; this allows addressing the sample limitations identified in *Chapter 2* and having a clear benchmark for future analyses.

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

(3) Comparing country performance in the flexicurity index scores with the empirical flexicurity country groupings discussed in *Chapter 2* 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.

Methodologically, to meet the research objective (1) we follow the *European Commission's four principles of flexicurity framework*. Therefore, the computed index is composed of four subindices: flexible contractual arrangements – FCA; modern social security systems – MSSS; lifelong learning strategies – LLL; and active labor market policies – ALMP. In computing it and assessing its robustness, we followed the

guidelines of Saisana et al. (2005), Saisana and Saltelli, (2006), Nardo et al. (2008), and Becker et al. (2019).

The used taxonomy is the one proposed by Manca et al. (2010). Thus, the construction of the index involved collecting data on the variables proposed by Manca et al. (2010). Sources included: Eurostat, DG EMPL[2], DG ECFIN[3], and OECD. Following, we min-max scaled all the variables on a 0-100 scale. Further on, we aggregated variables into subindices based on the weights and directions proposed by Manca et al. (2010) – in principle equal-weighting inside subindex and dimension. Lastly, the flexicurity index equal-weights the four subindices (FCA, MSSS, ALMP, and LLL):AICI

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

where:

- $Flexicurity_i$ = the flexicurity score of country *i*
- FCA_i = flexible and reliable contractual arrangements in country *i*
- $MSSS_i$ = modern social security systems in country *i*
- $ALMP_i$ = active labor market policies in country *i*
- LLL_i= lifelong learning in country *i*

A few words on the **justification** for the preference of **equal-weights allocation** follow. Based on our understanding, the European Commission's four components flexicurity model is one integrated policy strategy that encompasses four complementary components that develop synchronically, as opposed to four strategies that develop separately (for example, the flexibility of firing and hiring cannot be developed without having in mind the social security and activation components).

Therefore, we translate this "one integrated policy strategy" into one equal-weighted composite indicator. To continue, by adopting an equal weight allocation inside the flexicurity index, we assume that each component has equal status. We do so for two reasons. First, equal weights allocation is the most appealing weighting scheme in the

[2] European Commission, Directorate-General for Employment, Social Affairs & Inclusion

[3] European Commission, Directorate-General for Economic and Financial Affairs

absence of a clearly established empirical or statistical guideline supporting a different weights allocation (for example, Manca et al., 2010; Nardo et al., 2008). Second, the European Commission (2007) considers the four components as "mutually supportive constituent pillars of flexicurity." Hence, in the current index we translate mutual support into "equal partners" that have equal status.

Final flexicurity index scores (rounded) are presented in **Table 3.1**.

Table 3.1. *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

Source: Ferent-Pipas (2024)

Mainly, the **robustness analysis** focuses on testing the sensitivity of the flexicurity index score to (1) removal of basic variables and (2) Z-scoring variables instead of min-

max scaling them. However, we also perform two alternative robustness checks to assess the sensitivity of the flexicurity index to changing weights.

Therefore, in testing the *sensitivity of the flexicurity indicator to the removal of basic variables* we first compare initial scores with average and median ones from the alternative simulations. In the latter cases, the flexicurity index is computed by alternatively dropping one of the basic variables constituting the subindices. Initial scores are very close to average and median ones. Moreover, 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.

Next, the correlation between the flexicurity index scores computed using min-max scaling and the ones computed using Z-score is 0.98. This suggests that the *normalization method* induces low variability in the flexicurity scores. Further on, to test the *sensitivity of the flexicurity ranks to removal of basic variables in conjunction to Z-scoring* we compare the initial country rankings with the median and modal ranks in cases when flexicurity scores were computed with removed variables and/or Z-scored variables. These are very similar to each other. The correlation between initial ranks and median ranks from simulations is 0.90. The correlation between initial ranks and modal ranks from simulations is 0.93. These results suggest that the original flexicurity index, despite being developed by using one scaling method and a fixed set of variables, provides a robust picture of the EU states' flexicurity efforts. Lastly, 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.

Aggregating the subindices using the Mazziotta-Pareto method (Mazziotta and Pareto, 2016) instead of the equal-weighted linear aggregation also induces low sensitivity in the index scores. The correlation between the MPI version and the initial flexicurity scores is 0.97. This suggests that countries tend to have a similar performance in all flexicurity subindices, and thus, the flexicurity index has low sensitivity to the penalty introduced by the Mazziotta-Pareto method. Similar results are found when the weights of the ALMP subindex are changed.

Further on, to meet the research objective (2) we perform a spatial statistical analysis. Thus, to test the spatial distribution assumption in case of the flexicurity scores for the 2001-2019 sample, we run a linear regression for each year having as dependent variable the flexicurity index scores; independent variables are the latitude and the longitude of the country's centroids.

Next, to meet the research objective (3), we provide a descriptive comparison and an ANOVA analysis between the flexicurity index scores and each country grouping discussed in *Chapter 2*. Lastly, research objective (4) is accomplished by examining the correlation between the flexicurity index scores and the selected 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).

Regarding **findings**, when comparing the flexicurity index scores with the theoretical flexicurity regimes (research objective 2) we found that for the entire analyzed period, Eastern countries had significantly lower flexicurity scores than their Western counterparts consistent with the theoretical typologies. However, some dissimilarities arose 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, showed similar flexicurity scores with the Nordic countries, as well. Therefore, the flexicurity index agrees with Muffels and Luijkx (2008) and Hastings and Heyes (2018) in that Continental countries and Ireland were high flexicurity achievers instead of theoretical compromisers of either flexibility or security. Likewise, Portugal and Spain deviated from their theoretical Mediterranean cluster, characterized as inflexicure, in both the flexicurity index scores and the two above-mentioned studies.

Further on, despite the methodological dissimilarities between the flexicurity index and the other empirical country groupings – the flexicurity definition, the choice of variables, and the methods - the five country groupings reviewed correlated moderately high (0.65-0.91) with the flexicurity index (research objective 3). The highest correlations were in the case of country groupings using the same flexicurity definition, i.e. the European Commission's four components of flexicurity model. They were

followed by those using the Danish golden triangle, and lastly, by the Wilthagen and Tros' flexicurity matrix. Additionally, the correlation was 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.

In the end, countries that score highest in the flexicurity index also had better labor market performance (research objective 4). Thus, the strongest correlation with the flexicurity index was in the case of labor market productivity. Even though lower, differences in median employment and unemployment rates still favored the high flexicurity countries. The labor market performance gap between high and low flexicurity countries was narrower in 2016-2019 compared to 2001-2005. To continue, high flexicurity achievers were better performers in the case of poverty rates also. However, in this case, the gap did not change much throughout the analyzed period. Top flexicurity countries performed worse at low work intensity rates than the bottom flexicurity ones. Even so, the gap narrows to 1% in 2016-2019.

Some **policy implications and limitations** of this study are carefully summarized in the *Conclusions* section of this *Summary*.

Summary of Chapter 4: Flexicurity and employment inflows in the EU28 countries - a panel data analysis

At the time of writing this thesis, part of the study presented in this chapter was revised and resubmitted following the second round of review to the "International Journal of Manpower, Emerald: Ferent-Pipas, M., ***Flexicurity and employment inflows in the EU28 countries: a panel data*** **analysis**."

This chapter **aims at** analyzing the relationship between flexicurity and the employment inflows rate. To this aim, it extends the Bachman and Felder (2021)'s employment inflows model by accommodating flexicurity and additional labor market, economic, and business environment-related variables.

In regards to the **data** used, the study focuses on the EU28 countries over the 2007-2019 period. The dependent variable of interest is the employment inflows from unemployment. However, in additional regressions, the study also considers the separate men's and women's employment inflows rates. To continue, the independent variable of interest is the flexicurity index computed in *Chapter 3*. Control variables include labor market variables (minimum wage, collective bargaining coverage rate, and trade union density), economic and business environment variables (GDP growth rate, trade openness, freedom to trade internationally, top marginal tax rate, business regulations, credit market regulations), and labor supply and demand characteristics (the distribution of workers based on education and that of firms based on size). Data sources include the Eurostat, ILOstat, and Fraser institute.

To continue, the estimation **methodology** used is the Two-Way Fixed Effects Two-Stage Least Squares (Two-Way FE 2SLS) model. This model addresses endogeneity concerns in regards the flexicurity index and the GDP growth rate. First, we suspect reverse causality between flexicurity and employment inflow rate since changes in labor market reforms can happen as reactions to beneficial or difficult labor market

circumstances. Second, we suspect the same in the case of GDP growth rate since a larger pool of employed people leads to increased economic growth (Bachmann and Felder, 2021; Agovino and Rapposelli, 2017a).

Therefore, the baseline model for this study is:

First stage:

$$Flexicurity_{i,t} = \sum \rho_m Instrument_{i,t} + \sum \delta_k Z_{i,t} + \kappa_i + \lambda_t + u_{i,t}$$

$$GDPgrowth_{i,t} = \sum \delta_m Instrument_{i,t} + \sum \delta_k Z_{i,t} + \nu_i + \tau_t + \mu_{i,t}$$

Second stage:

$$Employment\ inflows_{i,t} = \beta_1 \widehat{Flexicurity}_{i,t} + \beta_2 \widehat{GDPgrowth}_{i,t} + \sum \beta_k Z_{i,t} + \alpha_i + \gamma_t + \epsilon_{i,t}$$

where:

- $Instrument_{i,t}$ is the vector of instruments, containing: $\Delta\ \text{GDPgrowth}_{i,t-j},\ j = \overline{1,3}$ and $\Delta\ \text{Flexicurity}_{i,t-j},\ j = \overline{1,2}$;
- $Z_{i,t}$ is the vector of control variables;
- $\kappa_i, \nu_i, and\ \alpha_i$ are the country fixed effects;
- $\lambda_t, \tau_t, and\ \gamma_t$ are the time fixed effects; and
- $u_{i,t}, \mu_{i,t,}$ and $\epsilon_{i,t}$ are the error terms.

In the baseline model, we use internal instruments. In choosing the optimal set of instruments, we follow Ullah et al. (2021) and Donald and Whitney (2001). Therefore, we look for the maximization of the F-statistic and that of the Adjusted R-Squared of the first stage regression. Alternatively, we look for the minimization of the Mean Squared Error of the 2SLS estimator.

To ensure the **robustness of results**, in additional specifications, we test the sensitivity of the flexicurity's coefficient to: (1) the change of instruments; (2) the removal of different non-core variables; and (3) the consideration of recessionary periods and European regions. Regression results of the baseline model (Model 1) and of the models with different sets of instruments (Models 2 and 3) are presented in **Table 4.1**.

Table 4.1. *Regression results*

Regressor		**2WayFEM 2SLS (Model 1)**	**2WayFEM 2SLS (Model 2)**	**2WayFEM 2SLS (Model 3)**
Flexicurity		0.344* (0.072)	0.348** (0.042)	0.353** (0.044)
Minimum wage dummy		1.699 (0.428)	1.617 (0.490)	1.696 (0.431)
Collective bargaining		0.115** (0.037)	0.116** (0.039)	0.115** (0.037)
Δ Trade union density		-0.305 (0.422)	-0.311 (0.432)	-0.306 (0.421)
GDP growth rate		0.377*** (0.006)	0.397 (0.514)	0.366*** (0.007)
Δ Freedom to trade internationally		-1.505 (0.472)	-1.627 (0.568)	-1.478 (0.481)
Δ Trade openness		0.026 (0.49)	0.028 (0.618)	0.026 (0.490)
Top marginal tax rate		-0.324 (0.465)	-0.317 (0.473)	-0.331 (0.462)
Business regulations		1.408 (0.284)	1.302 (0.339)	1.407 (0.285)
Credit market regulations		-0.181 (0.743)	-0.187 (0.735)	-0.187 (0.735)
% firms with 10-19 employees		0.793 (0.629)	0.787 (0.653)	0.799 (0.63)
% firms with 20-49 employees		-4.142 (0.211)	-4.175 (0.278)	-4.122 (0.214)
% firms with 50-249 employees		-2.102 (0.711)	-2.513 (0.727)	-2.182 (0.709)
% firms with more than 250 employees		67.686** (0.045)	72.317* (0.058)	68.141** (0.047)
Education ISCED 3-4: % employees		-0.249 (0.206)	-0.243 (0.402)	-0.242 (0.198)
Education ISCED 5-8: % employees		-0.281 (0.196)	-0.274 (0.211)	-0.278 (0.196)
R-squared		73.35%	73.16%	73.34%
Adj. R-squared		68.59%	68.36%	68.58%
Within R-squared		16.35%	16.21%	16.28%
No. obs.		364	364	364
Instruments		$\Delta\ \text{GDPgrowth}_{i,t-j}$, $j = \overline{1,3}$ $\Delta\ \text{Flexicurity}_{i,t-j}$, $j = \overline{1,2}$	$\text{Life expectancy}_{i,t}$ $\Delta\ \text{Flexicurity}_{i,t-j}$, $j = \overline{1,2}$	$\text{Life expectancy}_{i,t}$ $\Delta\ \text{GDPgrowth}_{i,t-j}$, $j = \overline{1,3}$ $\Delta\ \text{Flexicurity}_{i,t-j}$, $j = \overline{1,2}$
Weak instruments: Sanderson-Windmeijer conditional F-test	Flexicurity	21.133*** (0.000)	15.624*** (0.000)	17.349*** (0.000)
	GDP growth	11.385*** (0.000)	2.348* (0.097)	9.532*** (0.000)
Wu-Hausman endogeneity test		0.683 (0.506)	0.664 (0.515)	0.723 (0.486)
Sargan J test		1.093 (0.779)	0.525 (0.469)	1.625 (0.804)

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

Regarding the main aim of this chapter, the flexicurity's coefficient was positive and showed similar magnitude in all estimated regressions suggesting that, in line with prior expectations, flexicurity relates to increased employment inflow rates. These results suggest that flexicurity could have been a pathway to reaching the *European employment strategy* and *Europe 2020 strategy* (European Commission, 2010) goal of having smoother labor market transitions. Additional **findings, tentative policy implications, and limitations** of this chapter are summarized in detail in the *Conclusions* chapter of this *Summary*.

Summary of Chapter 5: Flexicurity and self-perceived work-life balance in the EU27 - a repeated cross-sectional multilevel analysis

The study presented in this chapter was partly published in "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, Sage, Advance online publication (DOI: 10.1177/0143831X231213024)."

This chapter **aims at** analyzing the association between flexicurity and self-perceived work-life balance.

In regards to the **data** used, the study focuses on about 74,000 EU27[4] employees aged 15-65 from the three latest waves of the European Working Conditions Survey (EWCS): 19,495 employees (2005), 25,714 employees (2010), and 28,740 employees (2015). The dependent variable is self-perceived work-life balance. It is measured using the EWCS's question: "*In general, how do your working hours fit in with your family or social commitments outside work?*" We define the dependent variable of work-life balance as dichotomous – employees who perceive work-life balance (1) are those who said that their working hours fit in very well or well with their family or social commitments outside work; their proportion in 2005, 2010, and 2015 samples was of 78%, 81%, and 82%, respectively. All others perceive work-life imbalance (0).

To continue, the independent variable of interest is the flexicurity index elaborated in *Chapter 3*. Control variables include individual and country characteristics. First, individual characteristics include the respondents' age, gender, migrant status, education, and care responsibilities[5]. They are taken from the European Working

[4] Present study excludes Croatia in its estimations due to insufficient data.

[5] Childcare responsibilities are assessed on whether or not the respondent cares daily for a child; elderly/disabled care responsibilities are assessed on whether or not the person cares daily or several times a week for a person that is old or has a disability.

Conditions Survey. Second, data on country-level variables come from Eurostat. These variables include the growth rates of GDP per capita, internet access, and the gender pay gap, variables that proxy the economic, technological, and social context.

Further on, the **estimation methodology** used is the two-level logistic model with a binary outcome. This kind of estimation presumes that country characteristics, namely flexicurity, and socioeconomic and technological variables, impact the individual's work-life balance. Therefore, the classical logistic regression can distort parameter estimates and standard errors because it fails to account for the nested structure of the data. We estimate a separate regression for each year[6]. The model is:

$$logitE(Y_{ij}) = \gamma_{00} + \gamma_{10}SD_{ij} + \gamma_{20}CR_{ij} + \gamma_{01}Flexicurity_j + \gamma_{02}SE_j + e_{ij} + u_j$$

where:

- Y_{ij}= work-life balance of individual *i* in country *j*;
- SD_{ij} and CR_{ij}= vectors of sociodemographic and care responsibilities variables;
- γ_{00} = country-level intercept;
- $Flexicurity_j$ = flexicurity indicator for country *j*;
- SE_j = vector of socioeconomic and technological variables of country *j*; and
- e_{ij} and u_j= within and between-country errors.

To ensure the **robustness of results**, the study reports bootstrapped standard errors (1,000 samples) and statistical significance based on t-test probabilities, and uses a forward-stepwise estimation strategy. Results on the most general model are presented in **Table 5.1**. In alternative regressions, we include household size, financial position in the household, sector, establishment size, seniority level, second job, commuting time, and growth rate of cars newer than two years. The additional control variables are not added from the beginning of the research due to many missing values which reduce the sample size.

[6] We do this for practical reasons. First, some of the questions changed slightly from one year to the other, and the EWCS does not always provide adjusted comparable answers. Second, the data is repeated cross-sections and not panel data. In this case, pooling all years in the same regression would add one extra-level – three-level logistic regression: individual, country, and year.

Table 5.1. *Two-level logistic regression results for most general model, all waves*

Dependent variable: work-life balance (1=the working hours fit in very well or well with the family or social commitments outside work; 0=otherwise)			
Independent variables	**2005**	**2010**	**2015**
Intercept	0.521** (0.232)	1.063 *** (0.295)	1.425 *** (0.201)
I. Individual characteristics			
Age: 15-19	-0.403 *** (0.057)	-0.202 *** (0.054)	-0.259 *** (0.050)
Age: 30-39	-0.443 *** (0.053)	-0.189 *** (0.048)	-0.506 *** (0.043)
Age: 40-49	-0.293 *** (0.053)	-0.156 *** (0.047)	-0.265 *** (0.042)
Gender: female	0.276 *** (0.036)	0.260 *** (0.034)	0.263 ***(0.032)
Migrant	-0.237 *** (0.085)	-0.105 ** (0.046)	-0.267 *** (0.055)
Education: none/primary/lower-secondary	-0.109 ** (0.050)	0.034 (0.044)	-0.032 (0.051)
Education: tertiary	0.149 *** (0.048)	0.232 *** (0.041)	0.102 *** (0.036)
Childcare	-0.102 **(0.041)	-0.153 *** (0.037)	-0.093 *** (0.036)
Elderly/Disabled care	-0.149 *** (0.050)	-0.083 * (0.047)	-0.202 *** (0.052)
II. Country characteristics			
Flexicurity	0.016 *** (0.003)	0.010 *** (0.003)	0.006 * (0.003)
GDP/capita - growth rate	0.005 (0.026)	0.023 * (0.014)	0.008 (0.010)
Gender pay gap	0.020 * (0.011)	0.011 (0.010)	-0.001 (0.008)
Internet access - growth rate	-0.0001 (0.002)	-0.032 ** (0.015)	0.014 (0.018)
ICC null model: 0.015			
Interclass correlation (ICC)	0.014	0.024	0.013
Proportion change in variance (PCV)	68.74%	54.75%	14.57%
Bayesian Information Criterion (BIC)	19485.00	24457.84	26763.64
Marginal R-squared ($R^2_{GLMM(m)}$)	4.84%	3.63%	2.16%
Conditional R-squared ($R^2_{GLMM(c)}$)	6.17%	5.93%	3.40%
No. obs.	19495	25714	28740
No. countries	27	26	27

Note: ***, **, * represent statistical significance at 1%, 5% and 10%, respectively.

The 2010 estimation excludes Germany due to missing data on education level.

Source: Based on Ferent-Pipas and Lazar (2023)

In regards to the **findings** related to the main aim of this chapter, in all the estimated models, the coefficient of flexicurity was statistically significant and positive. This suggests that the higher a country scores in flexicure policies, the likelier its citizens are to report satisfactory work-life balance.

Further on, concerning flexicurity's contribution to the variance explained, the study assessed both the marginal R-squared and the proportion change in variance following the recommendation of Nakagawa and Schielzeth's (2013). Both measures suggested a decreasing trend in flexicurity's contribution to explaining the variation in work-life balance. This could question the policy's (future) relevance to work-life balance strategies. Still, since the between-country differences in work-life balance narrowed significantly from 2005 to 2015, it is reasonable to expect that the country-level variables make a lower contribution to explaining work-life balance compared with individual-level characteristics (seen through marginal R-squared).

Additionally, from a research perspective, we consider that these findings highlight the value of the repeated cross-sectional design of this study, which allowed us to make contribution comparisons between the three analyzed years. From a policy advice perspective, we would rather interpret these findings as a recommendation to monitor both work-life balance and flexicurity. This is because different economic situations could lead to austerity and a decrease in flexicurity and therefore negatively impact work-life balance. Moreover, in the spirit of evidence-based policymaking, data collection and sharing are essential for adequate research as monitoring both flexicurity and work-life balance measures translates into providing researchers with data and fostering more empirical findings.

Additional **findings, tentative policy implications, and limitations** of this chapter are carefully summarized in the *Conclusions* chapter of this *Summary*.

Conclusions: Policy implications, research limitations, and future directions

This chapter describes the policy implications and current research limitations. It presents future research directions that build upon current research findings or limitations. Furthermore, it explores the adjustment of the present research to different contexts.

I consider the main challenge of this thesis was its too broadly defined aims and objectives. From some perspectives, it could be considered the thesis' *main limitation* and argue that rather than focusing on one aspect of flexicurity and deepening the research in that direction, the thesis addresses three distinct areas, which burdens their exploration. In the following paragraphs, I will address this limitation from the perspective of each research direction undertaken in this thesis: the construction of the composite indicator, the analysis of the links between employment inflow rates and flexicurity, and lastly, the analysis of the links between work-life balance and flexicurity. For each direction, I will present policy implications, possible limitations, and areas of improvement. By addressing this limitation case by case, I hope to convince the reader that while challenging and not without limitations, the thesis has broad aims as a consequence of data availability constraints. Moreover, approaching flexicurity from various perspectives facilitated not only quantifying the level of flexicurity but also evaluating its outcomes and drawing policy implications regarding the labor market.

To begin with, the composite indicator constructed in *Chapter 3 (Flexicurity efforts in the EU28 countries - a multiyear composite indicator proposal and policy outcome evaluation)* has multiple implications both for the specialized literature and for formulating policy recommendations by decision factors. First and foremost, the work in *Chapter 4* and *Chapter 5* relied on the index created here. Also, it is the part of this thesis that not only contributes considerably to the literature by providing a benchmark

but also takes the extra mile in comparing the results with the rest of the country groupings in the literature. Thus, the findings of *Chapter 3* have several ***policy implications***. *First*, the study provides the lengthiest time available tool to benchmark and monitor flexicurity efforts inside the EU28 countries, providing means to future research in the area. Moreover, this research agrees with Saltelli et al. (2011) and highlights the European Commission's communication fallacy of disrupting policy monitoring tools, raising confusion and controversy around a much-promoted policy. The index's robustness to methodological changes, and its high association with other empirical country groupings show that the policy could have been translated into a coherent monitoring tool.

Second, a key challenge in creating the composite indicator was identifying the data sources for the constituent variables as they were not part of an integrated database but rather stored by different European Commission's Directorates. Therefore, having a single portal to store all EU data and thus, easing researchers' access to it is one other policy recommendation in order to improve the amount and quality of policy-related research.

Third, the study found that countries deviate from their theoretical clusters. It also found that countries changed their position in relation to flexicurity efforts throughout time. This last finding was enabled by the length of the index and, to our knowledge, was previously suggested only by Hastings and Heyes (2018). These findings imply the need for a long-term updated flexicurity measure. The use of theoretical clusters or 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 could provide misleading or confusing results.

Fourth, the correlation analysis between the flexicurity index and the flexicurity expected outcomes – (un)employment, labor market productivity, and poverty rates – provide a starting point for discussing causational relations. The higher the flexicurity efforts are, the higher the employment and productivity rates, and lower the unemployment and poverty rates. Therefore, flexicurity may have contributed to getting closer to *Europe 2020 strategy*'s goals of increased employment and reduced poverty

rates. 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.

A distressing aspect found here that deserves future study was the positive association between the flexicurity index and the share of people living in very low work intensity households which was positively correlated with the flexicurity index. This could be a sign that flexicurity facilitates people's access to jobs, but these jobs are not their full work time potential, particularly since the share of involuntary part-time employees is also positively correlated with the low work intensity rate. 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. A second question left for future study is whether, absent of social benefits, the low work intensity rate leads to precarious living conditions. Lastly, we recommend reassessing the association in future studies. It might be that it becomes non-significant in the next years since top flexicurity countries seem to have decreased their low work intensity rates in the last years.

Therefore, starting from the correlation analysis in the last part of *Chapter 3*, a *future research direction* is represented by the exploration of these relations from a causational perspective. While the employment and unemployment rates were extensively studied, the at risk of poverty ones are relatively new and underexplored areas.

The study in *Chapter 3* has three limitations. First, due to its novelty, the dataset used to compute the index contained missing values. They were treated through either interpolation or replacement with the next/previous observation. Thus, the research results could be impacted by the treatment of missing values. Building upon this limitation, a future research direction is testing the impact of missing data treatment on the flexicurity index scores. This implies updating the dataset with the real values when they are available. Then, the index scores could be recomputed using the new dataset. Subsequently, these new scores could be compared with the ones computed in this thesis. Given the robustness of the index to the inclusion/exclusion of variables, we expect that it is robust also to the missing data treatment.

Second, the small sample size (10-18 countries) when comparing the index scores with the other country groupings in the literature poses questions on the results' statistical significance. *Third*, comparing country groupings that use different flexicurity definitions and frameworks might seem inadequate. However, while I acknowledge the validity of both claims, I argue that the comparison provides a starting point in reaching an agreement on the measurement of flexicurity.

Even invalidating the associations does not invalidate the index scores. They are validated by following a clear-established flexicurity definition and by the uncertainty analysis. This correlation analysis is an extra-exercise. Moreover, the association analysis shows that the higher the difference in flexicurity definitions and frameworks used, the lower the correlation between the flexicurity measures. Thus, the association provides empirical proof to the intuitively logical guideline suggested by Chung (2012) that the first step in any flexicurity research is choosing the definition and framework.

Even though lower, the correlations between the composite indicator and groupings using *the Danish golden triangle* or the *Wilthagen and Tros' flexicurity matrix* were moderate to high. This finding suggests that even when using different definitions, flexicurity proxies indicate the same countries as being top and bottom performers. Therefore, even though not without limitations, this exercise shows that consensus can be reached and flexicurity benchmarks can be created without much loss of information. As a future research direction**,** one way to overcome the sample size limitation mentioned here and thus strengthen the statistical significance of the correlation results is by recreating all the country groupings for the entire 2001-2019 period (and for the EU28 country sample) following the framework and methodology of the respective studies.

Additionally, had the thesis focused exclusively on building the composite indicator and assessing its robustness and evolution, it could have focused on reconstructing the index in different contexts, such as developing a NUTS 2 or NUTS 3 version of the index. At the time of writing this thesis, most of the variables needed to create the index are not available at NUTS level, even though have different values among regions in

the same country. In some cases (for example, inactivity due to lack of suitable care service), NUTS level data could be computed from EU surveys such as the *Labor Force Survey (LFS)*. The thesis leaves this topic to be addressed by *future research.*

Furthermore, future studies could also test the impact of the COVID-19 lockdown on the index scores by updating them for the 2020-2022 period. Data was not available at the time of writing this thesis. However, following the latest Eurostat's release (March, 15, 2024), in most cases, data is now available for 2020 and 2021. For some variables (for example, fixed term contracts), data is released even for 2022.

To continue, the findings from the study on employment inflow rates in *Chapter 4 (Flexicurity and employment inflows in the EU28 countries - a panel data analysis)* have a variety of ***policy implications***. *First*, the study suggests that flexicurity eases transitions from unemployment into employment, as advocated by its proponents. *Second*, when estimating different regressions for men and women, flexicurity's coefficient was positive and statistically significant only in the case of the employment inflows of men. This might suggest that women are in fact not benefiting from the policy in case of their unemployment to employment transitions, even though they are one of the targeted categories.

Third, a robustness check suggested that increased flexicurity efforts have a greater positive contribution in the Baltics and some Balkan states (Estonia, Latvia, Lithuania, Bulgaria, and Romania) compared to the Northern and Anglo-Saxon ones (Denmark, Finland, the Netherlands, Sweden, Ireland, and the United Kingdom). Therefore, policy regulators from the former group of countries should be more interested in promoting flexicure policies.

I describe below several future research directions. First, given moderation analysis between flexicurity and regions was part of a robustness check and outside the study's main scope we suggest interpreting its results with caution. Therefore, instead of replacing country fixed effects with regional dummies, future studies could address the cross-region differences in the association between flexicurity and employment inflows rate by using regression models that account for the nested structure of countries into regions (for example, multilevel analysis).

Secondly, since flexicurity aims at improving the labor market position of younger and older workers, the research could benefit from testing current findings on employment inflow rates for different age brackets. Currently, macro-level data is not available. Therefore, future research could derive employment inflow rates by age from the EU Labor Force Survey. Additionally, future studies could use survey data and multilevel analysis to gain greater insights on the strength and direction of the association between flexicurity and transitions into employment for different worker sub-groups.

Lastly, the study developed in *Chapter 5 (Flexicurity and self-perceived work-life balance in the EU27 - a repeated cross-sectional multilevel analysis)* has its merits in investigating a topic previously neglected by the well-being literature on flexicurity – self-perceived work-life balance. It also brings some novel findings due to its repeated cross-sectional structure. The results of this study have, therefore, several ***policy implications***.

First, the between countries difference in perceived work-life balance narrowed in the 2005-2015 period. So did the amount of variation for which the country (through institutions, social norms etc.) is responsible. These findings suggest that in the ten years, the EU27 countries indeed converged to similar institutions and values. *Second*, the positive association between flexicurity and work-life balance reinforces the European Commission's monitoring of work-life balance as a flexicurity outcome. This finding also supports the monitoring of flexicurity as part of the mental health at the workplace and employment quality agendas as an input to work-life balance.

Since age, gender, and educational level, among others, are significant predictors of work-life balance, how would flexicurity impact the work-life balance of individuals of different ages or educational levels? Would flexicurity have a differentiated impact on the work-life balance of men compared to that of women? Digging more into the role theory, would flexicurity have a different impact on employees with childcare responsibilities versus employees with elderly care responsibilities? Is economic growth a mediator of the association found in this study? How do cultural indicators moderate the association between flexicurity and work-life balance? The thesis leaves these questions to be explored by *future research.*

Reverting to the findings of current research following the emergence of COVID-19 could constitute an interesting *future research direction* since restrictions made work-life boundaries softer, limited after-work activities, and showed different ways of doing business and life. This direction could be studied using data from the *European Working Survey 2021 wave* (microdata was not available at the time of writing *Chapter 5* of this thesis). Alternatively, such research could employ data from *The Wage Indicator Survey of Living and Working in Coronavirus Times 2020*, T*he Joint Research Centre Survey on COVID-19,* or T*he Eurofound Living, Working, and COVID-19 Survey*.

These three surveys were conducted by reputable agencies and covered multiple countries but have the drawback of being voluntary web-based surveys. Further on, the regression analysis should also incorporate the restrictions in place. The reassessment of the flexicurity index to post-COVID-19 era, as discussed in the future directions of *Chapter 3,* is needed before proceeding with this research. Similarly, if there were a flexicurity index for NUTS 2 or NUTS 3, testing the results of this study in a regional specification would be an additional *future research direction* since the European Working Conditions Survey provides such a disaggregation.

Lastly, self-perceived work-life balance (the feeling that working hours fit in very well or well with family or social commitments outside work) is only one way of measuring work-life balance. *Future research* could consolidate current results by using other, less-used work-life balance measurements. These could include the variables (and combinations): "frequency of worrying about work when not working," "frequency of feeling too tired after work to do some of the household chores which need to be done," "frequency of feeling that the job prevented you from giving the time wanted to the family," "frequency of finding it difficult to concentrate on the job because of the family responsibilities," "frequency of finding that family responsibilities prevented you from giving the time needed to the job," "frequency of working in the free time to meet work demands," "simplicity of taking an hour or two off during working hours to take care of personal or family matters."

Econometric models are useful tools in exploring questions, yet they are not physical laws and are thus subject to different uncertainties. They are subjected to data

availability and quality, to the general level of knowledge on the topic and on the research methods, and to their authors' research orientations and knowledge biases (Saltelli et al., 2020). This thesis explicitly presented the underlying research assumptions that conduced to the choice of variables and methodology. Moreover, the thesis produced extensive robustness checks in case of each empirical chapter to ensure low sensitivity of results to the modelling uncertainties. The robustness cautions are adequate to each type of research methodology and data characteristics – composite indicator construction, panel data regression, and nested data regression.

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