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Flexicurity: Panel Data Analysis for OECD Countries

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ABSTRACT

This study examines the changes in labor market indicators as a reesult of flexicurity policies applied in modern labor markets with panel data analysis for the member countries of the Organization for Economic Development and Cooperation (OECD). Flexibility policy components by the European Commission are grouped under four main headings: flexible and secure contract arrangements, lifelong learning, effective labor market policies, and modern social security system. Indicators of these policy components have been determined to monitor and evaluate the policies implemented, as each country adopts different flexicurity strategies. Using at least one indicator for each component, a data set of 35 OECD countries for the period 2008-2017 was created. The effects of flexicurity practices on the general unemployment rate, youth unemployment rate, long-term unemployment rate, and general employment rate, which are among the main indicators of the labor market, were estimated with panel data analysis models. According to the estimation results of the fixed effects model, which was determined as the most appropriate model, it can be said that the increase in the strictness of the legislation regarding the protection of employment, especially temporary employment, causes the unemployment rates to remain high while decreasing the employment rate. The relatively flexible implementation of the legislation to protect the labor force, the increase in spending on lifelong learning and modern social security practices stand out as factors that support the decrease in unemployment rates and the increase in the employment rate.

Keywords: Flexicurity, Labor Market Flexibility, Labor Market Indicator, Panel Data Analysis, Fixed Effect Model, Robust Estimators.

JEL Classification Codes: C51, J21, J82

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INTRODUCTION

Improvements in wages and additional payments, adjustments in working hours, vacation and leave periods, sickness, care and parental leave, early retirement under certain conditions are based on changes and developments in the labor market. In the event of unemployment, the guarantees provided to the individual have been included in these elements over time. However, these changes have not occurred equally in every country's economy, some labor markets have appeared to be both highly (low) flexible and security, or high (low) security and low (high) flexibility.

The implementation of the practices for flexibility and security as a whole is based on the reforms implemented in the Netherlands and Denmark in the early 1990s and later called "flexicurity" (Mandl and Celikel-Esser, 2012: 7). Regardless of development level, the very low rates of unemployment, which is a problem affecting all societies, with different social and economic dimensions, has created interest in flexible and secure labor markets in European Union countries struggling with high unemployment rates.

High unemployment rates cause many negativities such as decreasing labor force participation rates, increasing the number of dependants of employed people, additional consumption pressure on the savings and investment resources of society and individuals with unemployment benefit practices, decreasing social security income, deterioration of income distribution, decreasing tax revenues, members of unions and bargaining power (Tokol, 2011: 96). While the prolongation of unemployment puts the unemployment problem into a structural appearance and makes its solution difficult, it deeply affects the young people, who are considered to be the most dynamic, sensitive, and important demographic group of societies, economically, socially and psychologically.

Due to the different characteristics of the labor markets in the European Union (EU) countries that want to overcome the unemployment problem and reach the

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full employment level, "common principles" have been determined so that they can design and implement their flexicurity policies.

Besides, policy components and their components were determined to monitor flexibility policies to be implemented and evaluate their results (European Commission, 2013: 37). These components are grouped under four main headings. First of these main headings is flexible and secure contract arrangements, second one lifelong learning, third one effective labor market policies and the latest one modern social security system.

With this study, these policy components developed for the labor markets in the European Union countries are examined for the Organisation for Economic Co-Operation and Development (OECD) countries, including a group of EU member countries. Thus, its applicability in countries or groups of countries other than the European Union was also examined. The analysis has also been carried out within the framework of whether having a more secure and flexible labor market increases or decreaes the unemployment and employment rate, taking into account the policy components listed in the previous paragraph.

The hypothesis of this study, which aims to evaluate how flexicurity practices have taken place in OECD countries as of the current period, is that "Flexicurity practices have a significant effect on labor market indicators - among other factors determining labor market indicators - and this impact varies according to the labor market and/or flexibility indicator". The validity of this hypothesis was examined by panel data estimation methods within the framework of regression analysis.

The study takes as a sample of OECD countries as it covers all major industrialized countries with free market economies and there is also a wealth of literature examining various aspects of flexicurity and other labor market characteristics. Data were taken from OECD and World Bank (WB) databases in the analyzes, which included 35 countries whose data are regularly available. With the data of 35 OECD countries for the period 2008-2017, there is evidence that changes in flexicurity practices have statistically significant effects on unemployment (general, long-term and youth) and overall employment rates.

This study, which deals with the effects of flexicurity on labor market indicators, consists of five chapters. The next part of the study will summarize empirical literature examining the relationship between labor regulations and unemployment and employment. In the third part, statistical and econometric methods related to the research structure consisting of panel data analysis are explained and in the fourth part, statistical analysis and model estimation results are given. In the conclusion part, evaluations were made as a result of the findings obtained from the analyzes and suggestions were made.

LITERATURE REVIEW

Researching the determinants of unemployment, which has many economic, social and psychological effects to achieve high levels of welfare and employment rates, has become the focus of many studies. In this study, the explanatory factors between flexible and secure institutions for the labor market and unemployment and employment in the relevant literature have been comprehensively examined.

Although it does not have a long history, there is also a rich literature OECD (1994), Elmeskov et al. (1998), Nickell et al. (2005), Scarpetta (1996), Stockhammer et al. (2014) that examines flexicurity and other labor market features from different perspectives. A significant part of these studies, some of which OECD (1994), Siebert (1997), Blanchard and Wolfers (2000), IMF (2003), Bernal-Verdugo et al. (2012), indicate that labor market rigidities caused by labor protection practices increases the rate of unemployment and this increase is the main determinant of unemployment for OECD countries.

It has revealed that by labor protection practices are the main determinant in achieving high unemployment rates and the need for structural labor market reforms such as decentralizing wage bargaining, reducing strictness of employment protection, and lowering the minimum wage. Also, it has been advocated by various analyzes and international organizations (EC, OECD, and IMF) that the causes of unemployment could be within labor market institutions.

However, recent literature like Baker et al. (2005), Arestis et al. (2007), Vergeer and Kleinknecht (2012) has shown that empirical correlations defined between labor market institutions and main indicator like unemployment are not robust to establish appropriate forecasting strategies. The reason of this result has explained by Heimberger et al. (2017) and Constancio (2018) differences such as alternative hypotheses, different country groups and time frames to explain unemployment.

Econometric research which are conducted to establish the determinants of decreases and increases unemployment rate in OECD countries, are generally

using labor market institutions as a explanatory variable. For example, legislation of employment protection, population, union denstiy, foreign direct investment, minimum wage and tax wedge are some of the explanatory variables used. However, many studies like Heckman (2007) and Stockhammer and Klar (2011) have shown that between labor market deregulation and changes of 'structural' unemployment in OECD countries have not significant relation and also advocates establishing new regressions that include alternative explanatory variables to explain the change in unemployment rates. And also pecifically, Blanchard ve Wolfers (2000), IMF (2003), and Bassanini and Duval (2006), by controlling some macroeconomic shock variables such as growth rate, long-term interest rate, total factor productivity increase and labor suply/demand, there are studies that examine the relationship between these shock variables and labor market institutions

There are studies like Arestis et al. (2007) and Stockhammer and Klar (2011) arguing that the major variable to explain unemployment to the Keynesian line is the formation of capital rather than labor market institutions. Some other studies like Bassanini and Duval (2006) include the shock variable in empirical analysis as change in commercial conditions affects unemployment (Heimberger, 2019: 3-5).

Since flexicurity practices are a set of policies followed to regulate the labor market, it is important to determine the marginal effects of these practices on various labor market indicators within the framework of statistical and econometric analyzes. After the flexicurity approach, which had successful results in the labor market basic indicators with its implementation in Denmark and the Netherlands for the first time, has started to take place on the agenda of the European Union and candidate countries, with the proposal of the European Commission for each country to develop its own unique flexicurity policies. In this study, it is aimed to be a pioneer in improving the scope of the studies by including OECD countries in the analysis of flexicurity and labor market indicators of European Union countries, which are frequently performed in the literature. In addition, the diversity and diversity of the indicators used to explain flexicurity make this study different and unique from the studies in the literature in the countries covered in the study.

Method

When examining the relationships between the panel data set and the variables, the differences between cross-section units and between times can be taken into account.

A general panel data model with K explanatory variables in which Y_{it} shows the value for i unit ($i = 1, \ldots, N$) in t time period ($t = 1, \ldots, T$) is as given in Equation (1.1).

$$Y_{it} = \alpha_{it} + \beta_{it} X_{it} + u_{it} \quad (1.1)$$

Here u_{it} stands for the error term and has a distribution $uit \sim N(0, \sigma_u^2)$ in all time and all units. Y_{it} shows the dependent variable value at time t of the ith cross section unit, $X1_{it}, \ldots, X_{it}$ k independent variables ith unit value at time t, and β_{it} the slope coefficients (Baltagi, 2005:11).

Panel data models are divided into three groups, first of all classical model, second one fixed coefficient model, and another one random coefficient model. Fixed and random coefficient (homogeneous) models are divided into two groups whic are fixed effect and random effect models and Swamy type and Hsiao type models respectively.

Fixed Effect Model (FEM)

These are models in which the constant coefficient, which is called individual effects or group effect, which has characteristics specific to the cross-section units in the error term of the model, changes from section to section or over time.

$$y_{it} = \alpha + \beta x_{it} + u_{it} \quad (1.2)$$

$$u_{it} = \mu_i + \lambda_t + v_{it}$$

$$y_{it} = \alpha + \beta x_{it} + \mu_i + \lambda_t + v_{it} \qquad i = 1, \ldots, N;\ t = 1, \ldots, T \quad (1.3)$$

As seen in Equation (1.3), μ_i denotes unobservable unit effects, λ_t unobservable time effects and υ_{it} stochastic error term.

Random Effect Model (REM)

These models have no constant coefficient for each cross section and time and these effects are considered as a random variable.

$$y_{it} = \alpha + \beta x_{it} + u_{it} \quad (1.4)$$

$$u_{it} = \mu_i + \lambda_t + v_{it}$$

$$y_{it} = \alpha + \beta x_{it} + \mu_i + \lambda_t + v_{it} \qquad i = 1, \ldots, N;\ t = 1, \ldots, T \quad (1.5)$$

The important point in this model is to find specific error components belonging to unit or unit and time.

To decide which of the panel data models is appropriate, Breush-Pagan Test (PM - REM), Hausmann Test (FEM - REM), Chow Test (PM - FEM) are used.

Hausmann Test

Hausman test developed to investigate whether there is a significant difference between fixed effect and random effects model parameter estimators and determines which of the estimators are more effective.

In the H_0 hypothesis of the Hausman test, it is assumed that the model is a random effect model and no relationship between the error term and the explanatory variables. Also this model is estimated by the generalized least squares method.

$$H = (\hat{\beta}_{SE} - \hat{\beta}_{TE})' [\mathrm{Var}(\hat{\beta}_{SE}) - \mathrm{Var}(\hat{\beta}_{TE})] - 1 (\hat{\beta}_{SE} - \hat{\beta}_{TE}) \quad (1.6)$$

The Hausman test statistic H obtained is compared with the chi-square value of k degrees of freedom and it is decided to accept or reject the hypothesis.

Panel Data Models: Hypothesis Tests

To obtain reliable results from the analyzes performed in the study, the basic assumptions about the panel data models should be tested. In this context, assumptions about heteroscedasticity, autocorrelation and cross-sectional dependency will be examined.

Cross-Section Dependency

Cross-section dependency is based on the assumption that other units that make up the panel will be affected by the macroeconomic shock occurring in any of the units considering today's macroeconomic conditions. Performing analysis without considering the cross-sectional dependency between the series will cause the results to be biased and inconsistent. Cross section dependency can be examined with Berusch-Pagan (1980) LM test, Pesaran (2004) CD test, Friedman test and Frees tests. Since the number of countries (N) considered in this study is larger than the period (T) dimension, cross-section dependency was tested with the Pesaran CD_{LM} test. It is assumed that there is no cross-sectional dependency in the null hypothesis established for the Peseran CD test. The CD_{LM} test statistic is based on the estimation of the binary correlation coefficients between residuals which shown equation (1.7).

$$CD_{LM} = \sqrt{\frac{2T}{N(N-1)}} \sum_{i=1}^{N-1} \sum_{j=i+1}^{N} \hat{\rho}_{ij} \quad (1.7)$$

Under the hypothesis that $N \to \infty$ and T are large enough, there is no relationship between the cross sections, the test statistic CD_{LM} shows a standard normal distribution (Pesaran, 2004: 9).

Heteroscedasticity

While there are different tests developed to test heteroscedasticity in the panel data model, the M-Wald test is widely used within the fixed effects model, while the Breusch-Pagan Lagrange Multiplier test and Levene, Brown and Forsythe test are among the tests that are widely used within the scope of random effects models.

The modified Wald test investigates whether the variance varies by a unit under the null hypothesis that the unit variances are equal to the panel mean. Test statistics are given in W equation (1.8). The W test statistic fits the χ^2 distribution with N degrees of freedom (Greene, 2003: 323: 324).

$$W = \sum_{i=1}^{N} \frac{(\hat{\sigma}_i^2 - \sigma^2)^2}{f_{ii}} \quad (1.8)$$

The Breusch-Pagan Lagrange Multiplier test investigates whether the variance varies according to the units under the null hypothesis that the variance does not differ by units. Breusch-Pagan Lagrange Multiplier test statistics are given in LM equation (1.9). The LM test statistic fits the χ^2 distribution with degrees of freedom of 1.

$$LM = \frac{NT}{(T-1)} \left[\frac{\sum_{i=1}^{N} (\sum_{t=1}^{T} e_{it}^2)}{\sum_{i=1}^{N} \sum_{t=1}^{T} e_{it}^2} - 1 \right] \quad (1.9)$$

Autocorrelation

Among the tests used to test the autocorrelation problem in panel data analysis are Baltagi-Wu's Local Best Invariant Test, Bhargava, Franzini and Narendranathan's Durbin Watson Test and Lagrange Multiplier, Expanded Lagrange Multiplier and Wooldridge F tests. Because it is a general test, the Wooldridge F test is superior to other tests.

In the Wooldridge autocorrelation test, the presence of autocorrelation in the panel data set is investigated by using the errors obtained from the first order differences model. F test statistics for the Wooldridge test are given in equation (1.10).

$$F = \frac{\sum_{i=1}^{N} \sum_{t=1}^{T-1} \sum_{s=t+1}^{T} \hat{f}_{it} \hat{f}_{is}}{\sqrt{\sum_{i=1}^{N} (\sum_{t=1}^{T-1} \sum_{s=t+1}^{T} \hat{f}_{it} \hat{f}_{is})^2}} \quad (1.10)$$

Table 1. Flexicurity Indicators

Indicators	Abbreviation	
Stricness of employment protection for regular contracts *It covers individual and collective layoffs, including arrangements for typical contract workers.*	EPRC	*Flexible and Reliable Contract Arrangements*
Stricness of employment protection for temporary contracts *Includes arrangements for employees on temporary contracts.*	EPT	
The Ratio of Active Labor Market Expenditures in GDP *Indicates the ratio of expenditure on relevant policies to national income.*	ALMP	*Effective Labor Market Policy*
Number of Higher Education Graduates / Population *It is taken as an indicator of investments made in human capital.*	EA	*Life Long Learning*
Net Replacement Rate *It shows that (a) decrease in family income in the inicial(initial) period of unemployment.*	NNR	*Modern Social Security System*
Inactivity Trap Rate *It is an indicator of the higher income that an individual who has expired unemployment benefit, cannot benefit from any assistance or benefits from social assistance, (, yok) when compared to the income he/she will earn in case of employment.*	ITR	

Robust Estimator

When one or more of heteroscedasticity, autocorrelation and cross section dependency problems are detected, standard errors should be corrected without changes in parameter estimates and robust standard errors should be used. In this study, the Driscoll-Kraay Estimator (Tatoğlu, 2012: 241) was used to generate robust standard errors in cases where at least one of the heteroscedasticity, autocorrelation and cross-section dependency problems exist in fixed effect models, Huber, Eicker, White Estimator was used to overcome the heteroscedasticity problem in fixed and random effect models and Arellano, Froot and Rogers Estimators were used in the presence of heteroscedasticity and autocorrelation in the fixed and random effects model.

Sample

The hypothesis of this study is that flexicurity practices have a significant effect on labor market basic indicators – among other factors determining labor market indicators – and this effect differs according to flexicurity indicator. The validity of this hypothesis was examined by panel data estimation methods within the framework of regression analysis. The flexicurity indicators considered within the scope of this hypotheses are given in Table 1 and which is prepared from the literature studies on the instrumental variables covered in this study and the effects of these variables on employment and unemployment types are in Table 2. The data set was limited to the years 2008-2017 in order to represent more countries in the study.

Components related to flexicurity policies were determined by the European Commission and a list of indicators was created to be used in monitoring the policies of each component. In this study, the indicators used in measurement and evaluation within the framework of the concept of flexicurity are given in Table 1 together with their abbreviations and the components they belong to.

An economic model is functional structures in order to reveal the relationships between variables with their marginal effects under simplifying assumptions, and it is very important to estimate the model parameters with an appropriate estimator. Although the number of periods for flexicurity indicators is an obstacle to making separate analyzes for each country[1], the right empirical estimates could be obtained within the framework of this study, considering the specific benefits of the panel data.

More country experience and a longer observation will reveal these effects more strongly. Below, the expected effects of flexicurity indicators on unemployment and employment types are presented in a Table 2 within the framework of the relevant literature.

Within the scope of this study, the economic growth rate, inflation rate, population growth rate, average wages, long-term interest rate, foreign direct

[1] OECD countries which ared selected for panel data analysis are Australia, Austria, Beguim, Canada, Chile, Chezck, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Irland, Israel, Italy, Japan, Korea, Latvia, Litvania, Luxemburg, Mexico, Netherland, New Zeland, Norway, Poland, Portugual, Slovakia, Slovenia, Spain, Switzerland, Turkey, UK, USA.

investments, union density, labor productivity growth rate and tax wedge are controlled in models which estimated. The level of general economic activities fluctuates depending on the increase or decrease in real incomes and unemployment of economies. Relationships between employment and real GDP, which is an indicator of general economic activities, occur according to these fluctuations. Leaving aside the peculiarities of the periods of expansion and contraction, it can be said that the ultimate goal of the regulations for labor markets is to keep the welfare conditions of individuals who supply their labor under different conditions at a certain level. In this context, with the flexicurity model - in the simplest sense - low unemployment rates are targeted if flexible hiring and firing in question. Besides, it can be aimed to create resistance to a big contraction in employment with flexicurity practices. In this framework, economic growth and labor productivity growth are used as explanatory variable in the model. This is because productivity growth is determined by savings and physical capital investments, new technology and human capital.

Inflation is a steady increase in the general level of prices, and during periods of high inflation a higher payment is made for the same amount of goods and services purchased than during periods of relatively low inflation. Changes in the inflation rate cause negative effects on real GDP and therefore the whole economy with a decrease in investments, deterioration of the information distributed between prices and economic units, and less productive use of resources, etc. As long as increases in real GDP in an economy, that is, economic growth can reduce the rate of unemployment and inflation, the purchasing power of individuals in that economy tends to increase and sustainable growth can be achieved with income distribution. The relationship between unemployment and inflation is associated with increases in industrial production in the literature. This is attributed to a process in the form of prices that tend to decline when the increase in the total supply of increased employment opportunities creates a greater total demand increase than this (Şentürk and Akbaş, 2014: 5829). Therefore, the inflation rate is also included in the model.

Foreign direct investments have the potential to create new jobs and reduce unemployment in the countries they travel to. Among OECD countries such as Turkey, Hungary, Mexico, and Lithuania are implementing policies to encourage foreign direct investment. For these reasons, the ratio of foreign direct investments to

Table 2. Expectations of Independent Variables on Employment and Types of Unemployment

Independent Variable		Expectation Unemployment	Expectation Employment
Stricness of employment protection for regular contracts	**EPRC**	+/-	+/-
Stricness of employment protection for temporary contracts	**EPT**	+/-	+/-
The Ratio of Higher Education Graduates to Population 25-64 (%)	**EA**	-	+
ALMP Expenditures on GDP (%)	**ALMP**	-	+
Net Replacement Rate (%)	**NNR**	+/-	+/-
Inactivity Trap Rate (%)	**ITR**	+/-	+/-
Economic Growth Rate (%)	**GR**	-	+
GDP Growth Rate Per Hour Worked (%)	**WH**	-	+
Inflation Rate (%)	**INF**	-	-
Foreign Direct Investments in GDP (%), Net Inflows	**FDI**	-	+
Population Growth Rate (%)	**POP**	+/-	+/-
Average Wage (Ln)	**AW**	+	-
Union Density (%)	**UD**	+	-
Long Term Interest Rate (%)	**LTIR**	+	-
Tax Wedge (%)	**TW**	+	-

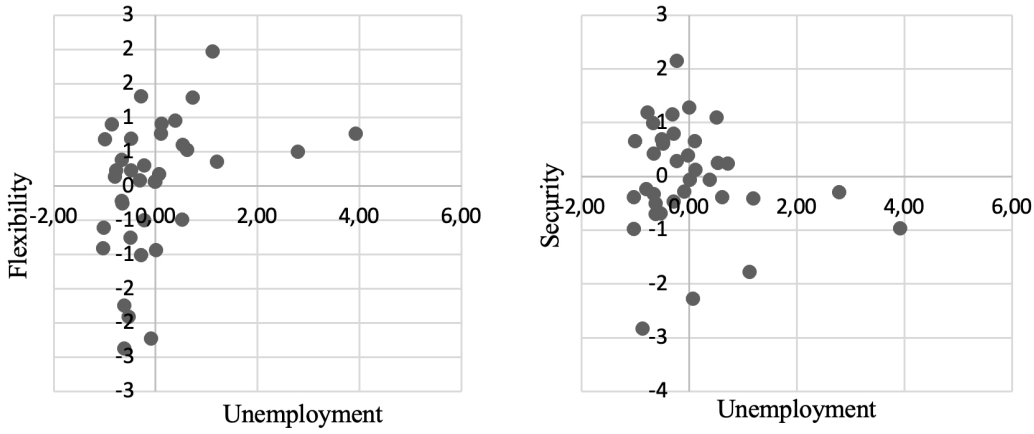

Figure 1: General Unemployment Rate - Flexibility - Security Scatter Plot[2]

GDP as entry into the country is also controlled in the model. The labor force creation potential of the country is included in the model with the population growth rate.

The union density, average wage and tax wedge which are an indicator of protective labor market practises used in the model because they are prejudiced to the bargaining position in wage negotiations in favor of workers and inhibit the functioning of labor markets and cause wage rigidity while long-term interest included in the model because an increase in long-term interest rates will increase the cost of capital and slow investments.

As stated in Table 2 which is prepared from the literature studies on the instrumental variables covered in this study and the effects of these variables on employment and unemployment, the effect of stricness of employment protection -regular and temporary- are uncertain (β_1, β_2<,>0); The effect of higher education graduate rate and the ratio of ALMP expenditures in GNP is negative (β_3, β_4<0); The effect of the net substitution rate and the inactivity trap rate is uncertain (β_5, β_6<,>0); the growth rate, the GNP index per hour worked, the inflation rate is negative (β_7, β_8, β_9, β_{10}, <0) and the effect of the population growth rate is uncertain β_{11}>;<0); tax wedge, union density, average wage and long-term interest rate effects were found to be positive (β_{12}, β_{13}, β_{14}, β_{15}, >0).

EMPRICAL FINDINGS

The variability in the flexicurity indicators and the relationships between them were first considered together with the labor market indicators and given in Table 3 for the years 2008-2017. As can be seen, while within country averages are lower than the averages across countries and for the whole data set, the standard deviations, which are a measure of the variability of the observations, are higher within the country than between countries and the whole data set. This indicates that there is a variability of the assured flexibility indicators and that this variability can be a determinant of the variability in labor market indicators. As expected, the smallest and largest values for each elasticity indicator are smaller or larger than the others when the data set is considered as a whole.

While the average unemployment rate for 35 OECD countries is about 8.1%, these averages are about 33% and 19% for long-term and youth unemployment, respectively. When the means of these three unemployment indicators are evaluated together with their standard deviations, the coefficient of variation is 0.54, 0.51 and 0.51, respectively, and it can be said that the variability in the unemployment rate is slightly higher than the others. The OECD average for the employment rate (ER) is 66.7% and its standard deviation value is 7.33.

The correlation coefficients estimated by the panel data set (see Table 3) indicate that there is a unidirectional relationship between EPRC and EPT at the level of 45%, an inverse linear relationship at the level of 63% between EPRC and EA, and 40% between EPT and EA, and it shows that these are statistically significant at the 0.1% level. Other relatively high and statistically significant correlations were between NNR and ITR (92%), ALMP with NNR (34%), and ALMP with ITR (39%).

Unemployment and employment indicators are also linearly related among themselves, and it has been determined that there is a relatively high and statistically significant linear relationship between flexicurity indicators. Around 50% of linear relationships have been determined between EPRC and LUR, EA and LUR, and NNR and ER. These preliminary analyzes indicate that there may be evidence that flexicurity indicators have a decisive influence on unemployment and employment rates.

[2] While creating scatter diagrams, flexibility and asecurity dimensions obtained as a result of factor analysis and labor market indicators were used and labor market indicators were also standardized.

Table 3. Summary Statistics - Flexicurity and Labor Market Indicators-2008-2017

Indicator		Mean	Standard Deviation	Min	Mak
Flexicurity Indicator					
EPRC	All Data	2.339	0.556	0.960	3.560
	Between Country		0.544	0.960	3.293
	Within Country		0.104	1.840	2.867
EPT	All Data	2.075	1.016	0.210	4.960
	Between Country		0.998	0.210	4.914
	Within Country		0.195	1.180	2.970
EA	All Data	32.695	9.966	12.041	56.710
	Between Country		9.540	15.607	52.638
	Within Country		2.737	21.979	40.269
ALMP	All Data	0.524	0.385	0.00	2.040
	Between Country		0.368	0.009	1.892
	Within Country		0.097	-0.027	0.829
NNR	All Data	78.115	12.891	46.00	102.000
	Between Country		12.357	50.454	100.500
	Within Country		3.987	65.215	99.815
ITR	All Data	76.028	15.899	27.000	102.00
	Between Country		15.219	31.454	100.300
	Within Country		4.881	45.028	97.828
Labor Market Indicator					
UR	All Data	8.127	4.396	2.730	27.490
	Between Country		3.875	3.470	20.475
	Within Country		2.160	-3.768	15.951
LUR	All Data	32.816	16.716	0.220	73.500
	Between Country		15.573	0.518	61.505
	Within Country		5.915	9.154	49.248
YUR	All Data	18.920	9.727	4.830	56.230
	Between Country		8.476	7.809	45.013
	Within Country		4.818	-2.462	34.665
ER	All Data	66.758	7.333	44.230	86.530
	Between Country		7.238	48.407	81.966
	Within Country		2.325	59.635	75.235

Figure 1 allows the consideration of the general unemployment rate with the flexibility and security components. As can be seen, the decrease in flexibility in labor markets, in other words, rigid labor markets bring high unemployment rates. According to the scatter plot created between the security and the general unemployment rate, the high level of secure practices shows that there is a reducing effect on unemployment rates.

According to Figure 2, which enables long-term unemployment rate to be handled together with flexibility and assurance components, the increase in flexibility in labor markets brings along lower long-term unemployment rates. According to the scatter plot created between the security and long-term unemployment rate, the high level of secure practices shows that there is a decreasing effect on long-term unemployment rates.

Figure 3 allows the youth unemployment rate to be considered together with the flexibility and assurance components. As can be seen, the decrease in flexibility in labor markets, in other words, rigid labor markets bring along high youth unemployment rates. According to the scatter plot created between the security and youth unemployment rate, the high level of secure practices shows that there is a decreasing effect on youth unemployment rates.

According to Figure 4, which allows the general employment rate to be handled together with the flexibility and security components, the increase in both flexibility and security in the labor market brings along high general employment rates.

Table 4. Correlation Matrix – Flexicurty and Labor Market Indicators

	EPRC	EPT	EA	ALMP	NNR	ITR	UR	LUR	YUR	ER
EPRC	1									
EPT	0.503***	1								
EA	-0.597***	-0.350***	1							
ALMP	0.079	0.094	-0.089	1						
NNR	0.050	0.051	0.066	0.412***	1					
ITR	0.061	0.028	0.014	0.430***	0.928***	1				
UR	0.155**	0.217***	-0.269***	0.064	-0.220***	-0.125*	1			
LUR	0.483***	0.255***	-0.566***	-0.070	-0.035	0.008	0.514***	1		
YUR	0.182**	0.286***	-0.295***	0.114	-0.218***	-0.130*	0.943**	0.458***	1	
ER	-0.275***	-0.382***	0.421***	0.150*	0.404***	0.346***	-0.647***	-0.453***	-0.707***	1

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

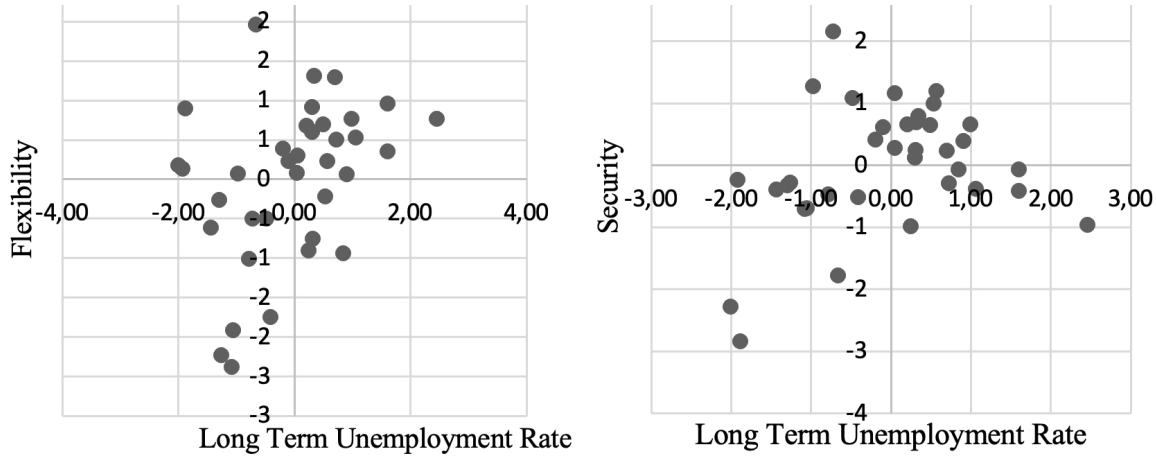

Figure 2: Long Term Unemployment Rate –Flexibility – Security Scatter Plot

The forecasting model in its most general form Y_{it} - shows that i*th* country in period *t* for each labor market indicator - is defined by Equation (5.1). The reference year is 2008.

For the models established to examine the effects of flexicurity indicators on unemployment and its types and also employment, estimates were made using Pooled OLS, Fixed Effects, Random Effects methods. The F test result shows that the classical model is invalid in all models and that the model has unit and / or time effects. This situation shows that the FEM or REM is more appropriate. In the study, Hausmann test was applied and the result is that the FEM is valid for UR, LUR, YUR and ER models.

The explanatory power of the independent variables by the dependent variables in the model, R^2, and the ratio of the unit effect variance to the total variance were evaluated with the rho coefficient. Rho coefficient is quite high in all models and accordingly, it can be said that there is a strong unit effect in models. Also, cross-section dependency of the models was examined with Pesaran CD test statistics. There is cross-sectional dependency in general unemployment, youth unemployment and general employment models. For heteroscedasticity problem Modified Wald test was performed and the result was obtained that the variance varies according to the units. Finally, the autocorrelation test of the models was examined with the Wooldridge F Test, and autocorrelation problems were found in all models.

According to the basic assumption tests, there are autocorrelation and heteroscedasticity problems in all models. Accordingly, it was determined that the most suitable error estimation method among Robust error method estimator is Huber, Eicker, and White.

$$Y_{it} = \beta_0 + \beta_1 EPRC_{it} + \beta_2 EPT_{it} + \beta_3 EA_{it} + \beta_4 ALMP_{it} + \beta_5 NNR_{it} + \beta_6 ITR_{it} + \beta_7 GR_{it} + \beta_8 INF_{it} + \beta_9 WH + \beta_{10} FDI_{it} + \beta_{11} POP_{it} + \beta_{12} AW_{it} + \beta_{13} TW + \beta_{14} UD_{it} + \beta_{15} LTIR_{it} + \varepsilon_{it} \quad (5.1)$$

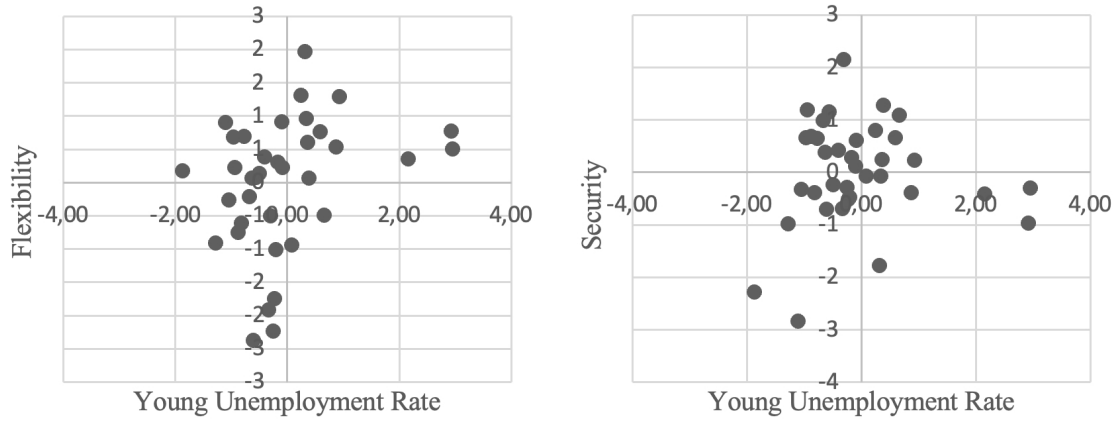

Figure 3: Young Unemployment Rate – Flexibility– Security Scatter Plot

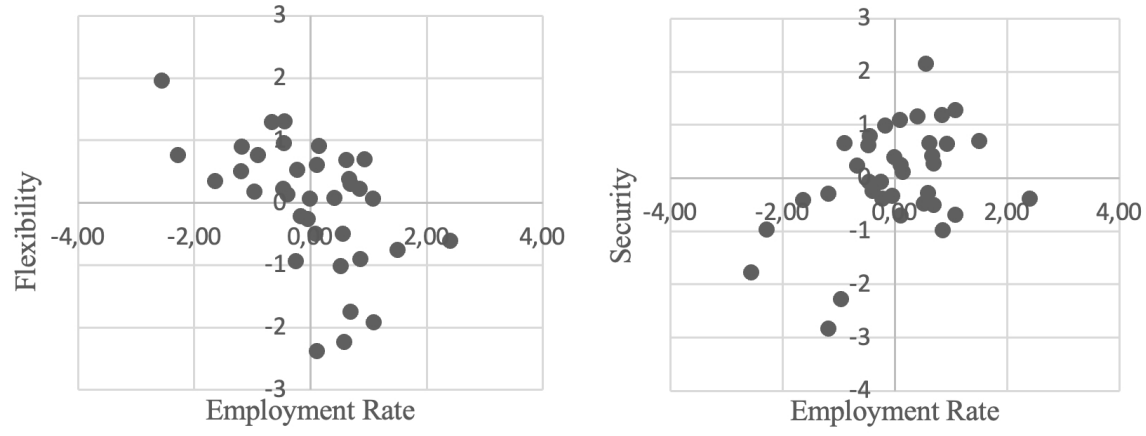

Figure 4: Employment Rate – Flexibility– Security Scatter Plot

Against the possible explanatory endogenous variable problem in estimation models – although the fixed effects model provides some protection against the internality problem – model estimations were also obtained with Arellano and Bond (1991) and Arellano and Bover (1995) estimators and are presented in the appendix. As it is known, these two estimators have been defined for panel data models with a dynamic structure, and the related lagged labor market indicator variable is expected to accumulate a significant part of the effect. In the dynamic model estimations for each labor market indicator, the lagged dependent variable values were estimated statistically significant and positive. However, Arellano and Bond (1991) estimated the lagged dependent variable coefficients smaller than Arellano and Bover (1995). The estimates of Arellano and Bover (1995) for the effects of flexicurity indicators on the relevant labor market indicators support the estimation results given here.

Table 5 shows fixed effects estimation result for models under considerations. According to the UR estimation results, while EPT and EA had a statistically significant effect on the unemployment rate, other flexicurity indicators hadn't. If stricness of employment protection for temporary contracts and higher education graduation rate increase by 1 point in OECD countries, the unemployment rate increases by 0.02 and 0.33 points, respectively. In the model, inflation rate, population growth rate, average wages have a decreasing and union density and long-term interest rate have an increasing effect on the unemployment rate, and these effects are statistically significant.

It can be said that the EPT and EA has a strong positive effect on the long-term unemployment rate at 1% significance level. Accordingly, 1 point increase in EPT and EA in OECD countries increases the long-term unemployment rate by 0.08 and 1.10 points, respectively. No statistically significant relationship was found between other flexicurity indicators and long-term unemployment rate. While the economic growth rate and long-term interest rate, which are labor market and macroeconomic indicators, have an increasing effect on the long-term unemployment rate, inflation rate,

Table 5. Estimated Model Results

Variables	UR	LUR	YUR	ER
EPRC	-0.011	0.016	-0.054*	-0.003
	(0.012)	(0.035)	(0.029)	(0.013)
EPT	-0.024**	-0.084***	-0.068***	0.031***
	(0.009)	(0.029)	(0.024)	(0.010)
EA	0.337***	1.102***	0.850***	-0.194**
	(0.066)	(0.198)	(0.163)	(0.073)
ALMP	0.521	-2.273	0.087	-0.487
	(0.965)	(2.870)	(2.369)	(1.055)
NNR	0.003	-0.154	0.060	0.091*
	(0.048)	(0.145)	(0.119)	(0.053)
ITR	0.019	0.102	-0.014	-0.064
	(0.036)	(0.109)	(0.090)	(0.040)
GR	-0.032	0.934***	-0.183	-0.023
	(0.045)	(0.136)	(0.113)	(0.050)
WH	-0.067	0.001	-0.254**	0.002
	(0.044)	(0.130)	(0.108)	(0.048)
INF	-0.291***	-0.801***	-0.693***	0.298***
	(0.076)	(0.229)	(0.189)	(0.084)
FDI	-0.005	0.016	-0.021	0.007
	(0.011)	(0.034)	(0.028)	(0.013)
POP	-1.153***	-2.029**	-2.475***	0.508
	(0.321)	(0.955)	(0.788)	(0.351)
UD	0.138*	0.108	0.505***	-0.179**
	(0.072)	(0.216)	(0.178)	(0.079)
AW	-0.079**	-0.335***	-0.123	0.080**
	(0.033)	(0.098)	(0.081)	(0.036)
TW	-0.018	0.429	-0.212	-0.092
	(0.112)	(0.332)	(0.274)	(0.122)
LTIR	0.573***	0.825**	1.371***	-0.753***
	(0.124)	(0.370)	(0.305)	(0.136)
Constant	0.824**	3.511***	1.367	-0.094
	(0.344)	(1.024)	(0.845)	(0.376)
Observation	230	227	227	230
R^2	0.409	0.501	0.417	0.425
Adjusted R^2	0.269	0.384	0.280	0.288
R^2_between	0.012	0.014	0.051	0.023
R^2_within	0.409	0.501	0.417	0.425
Rho	0.954	0.966	0.972	0.988
Corr	-0.805	-0.680	-0.888	-0.690
Sigma	0.062	0.215	0.196	0.078
sigma_e	0.013	0.039	0.032	0.014
sigma_u	0.060	0.212	0.193	0.076
U_i	0.060	0.212	0.193	0.076
RMSE	0.013	0.039	0.032	0.014
F	8.538	12.24	8.713	9.121
Hausmann Test	28.09	47.59	33.69	45.65
	(0.021)	(0.000)	(0.004)	(0.000)
Pesaran CD Test	6.128	2.728	6.596	6.279
	(0.000)	(0.006)	(0.000)	(0.000)
Wooldridge F Test	56.799	25.599	31.438	86.932
	(0.000)	(0.000)	(0.000)	(0.000)
M-Wald Test	1476.68	2639.67	676.59	1112.54
	(0.000)	(0.000)	(0.000)	(0.000)

(.) robust standart errors. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

population growth rate, and average wage variables have a decreasing effect and these effects are statistically significant.

It can be said that EPRC and EPT and EA have a negative effect on the youth unemployment rate. Accordingly, 1 point increase in EA and EPRC and EPT increases the youth unemployment rate by 0.05, 0.06, and 0.85 points, respectively, in OECD countries. Other flexicurity indicators, labor market and macroeconomic indicators which are GDP change rate per hour, inflation rate, population growth rate, union density have a reducing effect and long-term interest rate variables have an increasing effect on the youth unemployment rate, also these effects are statistically significant.

It can be said that the EPT and the EA has a negative effect on employment rates, while the net replacement rate has a positive effect. Accordingly, 1 point increase on EA and EPT in OECD countries decrease the youth unemployment rate by 0.03, 0.19, respectively, while the net replacement rate increases by 0.09 points. Among other variables, inflation rate and average wages, union density increasing the youth employment rate and long-term interest rate have a decreasing effect, and these effects are statistically significant.

DISCUSSION

Reducing labor market rigidities in OECD countries is seen as among the policies implemented to reduce the unemployment rate. However, although the relationship between the strictness of employment protection and the unemployment rate is theoretically uncertain, most of the studies in the literature show that this relationship is neutral or somewhat negative. Nickell and Layard (1999) and Bassanini and Duval (2009) have not found evidence that high unemployment rate is achieved as labor market rigidity increases. Siebert (1997) argues that making the labor market more flexible with the labor market institutions in European countries will solve the unemployment problems. Blanchard and Wolfers (2000) suggest that stricter labor market practices are determinants of high unemployment rates, especially in European countries. On the other hand, Bernal-Verdugo, Furceri, and Guillaumel (2012) have obtained results that general unemployment and thus youth unemployment and long-term unemployment rates are reduced by making more flexible labor markets more flexible. Muller and Berger (2013) conclude that the length of unemployment periods is negatively affected by the strictness of employment protection legislation with individual dismissal and typical employment contracts. The more difficult transition from unemployment to employment or from employment to unemployment in countries where the legislation on protection of employment is stricter has a negative impact on long-term unemployment rates (European Commission, 2006: 40).

International organization like OECD (1994), OECD (2004), OECD (2006), European Commission (2006), World Bank (2006) point out that the strictness of employment protection negatively affects the labor market expectations of young people. This situation indicates that young people have problems entering the labor market and cause high youth unemployment rates. OECD (2006), Bertola et al. (2002), Jimeno and Rodriguez Palenzuela (2002) and OECD (2004) have same opinion. Besides, Esping-Andersen (2000), Heckman et al (2000), Addison and Texeira (2003), Botero et al. (2004), Cahuc and Zylberberg (2004), Breen (2005), Allard and Lindert (2006), Autor et al. (2006), Kahn (2006), Noelke (2011)'s studies also support this view. As the strictness of the employment protective increases, it restricts employment opportunities for young people and causes high youth unemployment rates by extending the job seeking period of young people who will enter the labor market for the first time. The lack of work experience of young people and the possible difference in productivity compared to an older employee and an increase in the stricness of employment protection are expected to increase youth unemployment. Strict legislative practices applied to the protection of employment have a negative impact on the employability of young people, who are among the disadvantaged groups, due to reasons such as lack of experience, knowledge about job seeking and employment opportunities, and unclear labor market expectations (Noelke, 2011:1-5).

Strict legislative practices make termination of employment very difficult for the employer, while job switch is a difficult process for the employee. This situation reduces hiring and firing and affects the character of unemployment experiences. Individuals who are new in the labor market are also faced with the risk of unemployment due to the strict legislation (Bertola, Boeri and Cazes, 2000: 57). Boeri and Garibaldi (2007) show that the transition from a strict employment protection legislation to a "two-tier" regime increased employment growth. This regime has been defined as the more liberalization of contracts for temporary employment while maintaining unchanged protection in permanent contracts (Amine and Montreuil, 2018: 8).

Higher education level ensures stability in the labor market for individuals and thus reduces the risk of being unemployment. As the education level rises, individuals

have higher participation in the labor market and their active presence in the labor market is generally longer than those with low education. Education have a major role in enabling individuals to acquire the necessary skills in terms of entering the labor market and lifelong learning (LLL) (Ionela, 2012: 4400). However, raising the education level is not the only way to overcome the unemployment problem. Education policies should be linked to macroeconomic policies and provide attractive labor market opportunities for skilled people. In this context, Mishel (2011) thinks that the unemployment particularly in crisis conditions, is not caused by the lack of a job but from the lack of appropriate job. However, Pissarides (2003) states that unemployment rates have decreased in some countries only by associating education and employment policies with flexible labor markets and monetary reform policies. Participation of individuals who is long-term unemployed in lifelong learning activities aims to increase their competitiveness in the labor market and to re-participate in the labor market. Besides, individuals need lifelong education programs that will provide access to educational opportunities to increase their employability, increase and / or change job-related skills and competencies, and life-enhancing activities (Chapman and Aspin, 1997: 52-53). Well-designed active labor market policies, including vocational training and lifelong learning programs, can reduce skills mismatches, but will not be sufficient to significantly increase employment unless supported by the labor market and macroeconomic policies (Gbohoui, 2019: 4).

The results obtained from this study can be explained by the mismatch of qualifications and skills between demand and supply of labor in the labor market, the inability to create qualified jobs, and the incompatibility between education policies and labor market policies. As a result of the global economic crises, disinformation in labor market opportunities caused young people to stay in education for a longer time and start working after compulsory education, and high youth unemployment rates occurred. At this point, LLL policies emerge as a strategic tool developed to increase employability and solve the youth unemployment problem. However, instead of questioning the dynamics that cause increase youth unemployment, which is a structural economic problem, LLL policies focusing on educating young people and unemployed young people into education and training have turned youth unemployment into an individual problem with an educational nature. For this reason, determining target groups (such as NEET, early school leaving, social exclusion) comes to the fore in the creation of lifelong learning policies. Assuming that continuing education of young people will lead to a decrease in youth unemployment can complicate the problem, especially in countries with high unemployment levels (Valiente, Capsada-Munsech, and Otero, 2020: 11-16).

It is concluded that the effect of the increase in unemployment benefits on unemployment is generally uncertain in the literature. However, efficient unemployment insurance/benefit practices aim to encourage the unemployed to seek suitable jobs and reduce unemployment periods. Le Barbanchon (2013) points out that unemployment benefits contribute greatly to low unemployment rates, but the skill/ qualification mismatch.

Mortensen (1977) states that generous unemployment benefits can reduce work incentives and create long-term benefit dependency. Krueger and Meyer (2002) find that a 10% increase in unemployment benefits increased the average duration of unemployment by around 5%. For example, Luxembourg net replacement rate for a married couple with 2 children who previously earned 67% of the average wage is over 100%, is the highest among OECD countries. It is stated that such a high rate reduces the incentive to seek a job in case of unemployment and creates unemployment traps, especially for low-skilled low-wage workers (Gbohoui, 2019: 18). Eugster (2015) has obtained the result that the net replacement rate has no effect on employment opportunity or earnings.

Unemployment insurance / benefits are practices that encourage the unemployed to seek suitable jobs and reduce unemployment. Theoretically, generous unemployment benefits may lead to reduced employment efforts of individuals, slowing return to employment, and improved employment quality. In the literature, different results were obtained in the studies about the effect of the level of unemployment benefits on the duration of unemployment. For example, Lalive et al. (2006) and Meyer and Mok (2007) have found that the increase in unemployment benefits increases the duration of unemployment. Generally, the unemployed and long-term unemployed who are not entitled to benefit from unemployment insurance are provided with social aid income by mean-tested. If the amount of this income obtained is higher than the income to be obtained in case of employment, high rates of inactivity trap will occur. In this case, it will cause a decrease in people's interest in the labor market and an increase in the risk of structural unemployment (Stovicek and Turrini, 2012: 8). Also, a generous payment scheme can improve

the quality of employment in terms of rejoining the workforce because it encourages individuals to accept stable and well-paid jobs. This means that individuals can refuse when faced with a low-wage job offer in the hope of obtaining a better opportunity.

CONCLUSION AND POLICY RECOMMENDATIONS

Labor markets are becoming more dynamic and fluid due to processes such as globalization and flexibility, and different forms of security created by each country with their own communities have faced more and more difficulties with the increase in the number of employees. With the concept of flexicurity, which has come to the fore in recent years, to eliminate this problem, at least by providing income security, it reduces the risks of those working in flexible employment forms and unemployed individuals. Successful efforts are underway to compensate through redistribution of income.

On the other hand, the concept of flexicurity has several shortcomings, such as the high burden on public finances and the fact that it is an expensive labor market policy. In addition to this, the approaches of countries regarding the problems that arise in the labor market structure and their ability to produce solutions differ considerably from each other.

Every country that implements applications for flexicurity policies should make arrangements for flexible employment forms, taking into account their own labor market dynamics. While high employment rates are among the main factors that increase the amount of GDP per capita, the increase in expenditures made within the scope of lifelong learning is one of the main factors supporting the increase in employment rates and the decrease in unemployment rates. Employment rates are relatively higher in countries where the ratio of GDP allocated to active employment policies is above the OECD average. Countries that have reached a high level of welfare protect individuals under the roof of a strong social security system.

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APPENDIX

Arellano–Bond Estimation Results

VARIABLES	UR	LUR	YUR	ER
EPRC	-0.014*	-0.022	-0.0110	-0.0128*
	(0.006)	(0.031)	(0.022)	(0.006)
EPT	-0.002	-0.009*	-0.012*	0.004*
	(0.005)	(0.031)	(0.010)	(0.002)
EA1	0.082***	0.315**	0.840**	-0.523***
	(0.043)	(0.200)	(0.128)	(0.049)
ALMP	0.222	0.210	-2.120	-0.142
	(0.620)	(3.105)	(2.412)	(0.352)
NNR	-0.024*	-0.002	-0.028	0.020*
	(0.024)	(0.102)	(0.089)	(0.003)
ITR	0.009	0.014	-0.009	-0.011
	(0.012)	(0.072)	(0.060)	(0.014)
GR	-0.102	0.910***	0.011*	-0.069**
	(0.016)	(0.088)	(0.027)	(0.018)
FDI	-0.012	0.004	-0.002	0.001
	(0.006)	(0.021)	(0.023)	(0.006)
INF	-0.008**	-0.132**	-0.036*	0.045*
	(0.044)	(0.221)	(0.182)	(0.026)
POP	-0.126**	0.184	-0.419**	0.160
	(0.218)	(0.901)	(0.644)	(0.152)
UD	0.023**	0.100	0.078	-0.040**
	(0.052)	(0.197)	(0.132)	(0.032)
TW	0.104	0.822*	0.104	-0.029
	(0.08)	(0.301)	(0.229)	(0.062)
AW	-0.014*	-0.241***	-0.037*	0.005*
	(0.021)	(0.105)	(0.076)	(0.011)
LTIR	0.109	0.031	0.356**	-0.196*
	(0.072)	(0.350)	(0.128)	(0.054)
WH	-0.003	0.042	0.008	-0.001
	(0.026)	(0.106)	(0.062)	(0.002)
L.UR	0.532***			
	(0.014)			
L.LUR		0.465***		
		(0.033)		
L.YUR			0.623***	
			(0.074)	
L.ER				0.878***
				(0.046)
Constant	-0.222	4.245***	-0.228	0.101
	(0.113)	(1.187)	(0.745)	(0.118)
sargan	108.5	102.3	96.68	56.52
chi2	328.4	201.8	205.4	67.55
sig2	0.000	0.000	0.000	0.000

Arellano – Bover Estimation Results

VARIABLES	UR	LUR	YUR	ER
EPRC	-0.001	-0.035	-0.002	-0.026***
	(0.004)	(0.012)	(0.024)	(0.003)
EPT	-0.005	-0.071**	-0.014*	0.014***
	(0.003)	(0.013)	(0.011)	(0.004)
EA	0.115***	0.423***	0.861***	-0.634***
	(0.021)	(0.128)	(0.112)	(0.026)
ALMP	1.642**	3.785	-1.812	-1.377*
	(0.630)	(3.385)	(2.326)	(0.532)
NNR	-0.011	0.0308	-0.176*	0.026**
	(0.027)	(0.139)	(0.091)	(0.022)
ITR	0.008	0.064	-0.024	-0.023
	(0.018)	(0.105)	(0.041)	(0.012)
GR	-0.174***	1.076***	0.378*	-0.069***
	(0.024)	(0.116)	(0.089)	(0.001)
FDI	-0.009	0.044	-0.003	0.005
	(0.034)	(0.032)	(0.022)	(0.003)
INF	-0.048**	-0.044**	-0.071***	0.048*
	(0.004)	(0.126)	(0.145)	(0.093)
POP	-0.065**	-1.004**	-1.195**	0.011
	(0.102)	(1.113)	(0.745)	(0.148)
UD	0.052**	0.074*	0.077**	-0.262***
	(0.035)	(0.158)	(0.087)	(0.089)
TW	0.065	0.545	0.004	-0.032
	(0.049)	(0.278)	(0.132)	(0.048)
AW	-0.004**	-0.348**	-0.081*	0.014*
	(0.014)	(0.156)	(0.014)	(0.005)
LTIR	0.148	0.312	0.237	-0.132***
	(0.002)	(0.118)	(0.362)	(0.033)
WH	-0.018	0.106	0.069	-0.006
	(0.043)	(0.107)	(0.080)	(0.041)
L.UR	0.621***			
	(0.034)			
L.LUR		0.732***		
		(0.020)		
L.YUR			0.755***	
			(0.021)	
L.ER				0.921**
				(0.052)
Constant	0.008	0.341	0.028	0.015
	(0.081)	(0.619)	(0.274)	(0.081)
Sargan	126.5	92.46	84.98	80.12
chi2	2498	532.8	999	1684
sig2	0.000	0.000	0.000	0.000