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Impact of public expenditure in labour market policies and other selected factors on youth unemployment

Igor Cvecic and Danijela Sokolic

Faculty of Economics, University of Rijeka, Rijeka, Croatia

ABSTRACT

This study investigates the impact of selected macroeconomic, demographic, institutional and educational determinants on youth unemployment rates in Europe, with special attention to effects of Active Labour Market Policies on unemployment dynamics. Dynamic panel data estimates have been done with the Generalised Method of Moments on data from 27 E.U. Members States plus Norway (2005–2014). The results indicate significant impact of the main macroeconomic variables on youth unemployment rates, total unemployment rates and shares of young people (15–24 y.o.) neither employed nor in education or training. Other variables show various levels of significance, including variables which describe labour market policies (L.M.P.s). In all estimations, public expenditure in L.M.P.s as a percentage of gross domestic product has statistically significant impact on unemployment rates, with positive coefficients. However, opposite effects have been estimated when using the number of participants in L.M.P.s and public expenditure in L.M.P.s per unemployed person, which suggests that L.M.P.s better target the general unemployed population than the vulnerable group of the unemployed youth.

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1. Introduction

High unemployment rates 'hurt' individuals, but also the economy as a whole, as they result in the irrational waste of resources. This is even more worrisome for countries such as Croatia, Greece or Spain, which have limited financial and demographic possibilities to address future economic and social challenges and prevent further deterioration. Thus, public policies and public expenditures have to be focused on reversing the trends in order to empower the population to become a valuable and indispensable asset to the local, national and regional economy.

The main hypothesis of this paper is that labour market policies (L.M.P.s) significantly affect youth unemployment rates in the European countries. The purpose of this paper is to explore the relation between L.M.P.s and youth unemployment rates (Y.U.R.s). The structure

CONTACT Danijela Sokolic dsokolic@efri.hr

of this paper stresses primarily the idea of the affirmation of specific determinants that have clear influence on youth unemployment in Europe. Therefore, after the introduction section, the second section describes the theoretical framework that was taken into consideration while conducting the analytical research. This part includes a concise perspective on the importance of the youth unemployment issue and its potential effects on European youth and the overall economy. Also, the review explains the importance of L.M.P.s and their impact on youth unemployment. The third section brings a concise display of the current trends in youth unemployment, while the fourth section represents the explanation of the variables and methods used for statistical estimations. The regression outputs and discussion of results are included in the fifth part. Finally, the conclusion section brings the major findings and interpretations of the results alongside with main suggestions for further research.

2. Theoretical Background

Rigid labour markets, recession consequences and tight fiscal policies are likely to result in enduring youth unemployment in Europe (Eichhorst, Hinte, & Rinne, 2013). Persistent high unemployment among young people is a societal and economic problem that becomes more burdensome with the ever-faster changing globalised world. National and supranational policies have to be designed in a way to actively and comprehensively fight this problem. Understanding the specifics of youth unemployment can give a better perspective on how to untangle it, as well as understanding the impacts of specific instruments and policies on youth unemployment.

2.1. What is Youth Unemployment and how does it 'Hurt' the Economy?

'Youth unemployment' usually refers to the level of unemployment among young people aged 15–24 years. This rate takes into account only those who finished schooling and search for a proper job. However, more recently a new indicator has been used quite often: '*Neither Employed nor in Education or Training*' (N.E.E.T.). In most countries, this indicator varies substantially, suggesting a different status for the younger generations in particular countries.

The youth included in N.E.E.T. is at a much higher risk of remaining such, consequentially experiencing poverty and social exclusion (European Commission, 2011). Choudhry, Marelli, and Signorelli (2013) indicate how the Organisation for Economic Co-operation and Development (O.E.C.D.) has also introduced new categories such as the '*poorly integrated*' and the '*left behind youth*' to address specific groups which represent those who have unstable job positions resulting in a frequent transition between temporary jobs and inactivity, and those who face long-term unemployment, which is also a rising problem in Europe. Thus, part of the problem lies in L.M.P.s that do not address youth unemployment specificities adequately and do not treat them separately from other types of unemployment. For example, while trying to enter the job market as entrepreneurs, young people are usually not able to afford the low-paid and irregular working hours, especially in early stages of micro-enterprise establishment (EFILWC, 2009).

Unemployment represents a waste of resources and potentially decreases the gross domestic product (G.D.P.), causing the loss of human capital, wellbeing and even health (Choudhry et al., 2013; Gonzalez Carreras, Kirchner Sala, & Speckesser, 2015). Its fiscal

effect (unemployment benefit expenses, fewer revenues from payroll taxes, etc.) represents a clear burden to already weakened economies, which lack investments into propulsive industries and adequate education systems with effective transitional mechanisms for the inclusion of younger generations into the labour market. Thus, indebted economies have limited funds for improving social conditions, which can also endanger motivating aspects of working and private life in a certain country or region. Moreover, the problem is elevated by the fact that youth usually represents fresh human capital; by being unemployed it does not contribute to the economy and almost certainly loses its value with the exclusion from the labour market.

In the Eurofound study (2012), the cost of young people who are not in employment, education or training in 26 Member States has been estimated to be about €156 billion (representing 1.51% of the E.U.'s G.D.P.). Bell and Blanchflower (2010) state that long-term unemployment, defined as unemployment with duration longer than 12 months, is a major concern for young people since it has a deep impact on their personal development along with an impact on the societies where these young people live. In other words, long-term unemployment can have a profound effect on employability and career development in the medium to long term, consequentially deepening the youth unemployment crisis in the next two to three decades. The labour market has also changed in the past two decades, augmenting its demands of globalisation by moving to a high-skilled and a service-based economy and workforce in Europe, affecting particularly young people (CEDEFOP, 2012).

2.2. Determinants of Youth Unemployment Rates

Essentially, when investigating determinants of youth unemployment, it is necessary to start with factors affecting general unemployment and the labour market. Empirical evidence indicate that high unemployment rates can be reduced with economic growth, labour market reforms and emboldened economic freedom (which contributes to competitiveness and sectoral and production adjustments) (Bernal-Verdugo, Furceri, & Guillaume, 2012). In this respect, macroeconomic conditions and business cycles usually are investigated through G.D.P. growth rates, inflation rates, long-term interest rates, productivity growth, output gap, etc.

Efficient labour markets can be linked to their 'flexibility' (e.g., co-operation between employers and workers, recruitment, dismissal practices, etc.) and 'talent efficiency' (wages and productivity, reliance on professional management, ability to attract and retain talents…). Examining the effects of changes in competitiveness of the national labour market, Filipova, Gottvald, and Šimek (2005) referred to Porter's (1990) 'competitiveness', underlining the importance of innovation and economic dynamism, but also warning that industrialisation to a certain extent encumbers the economy's competitiveness by strengthening the welfare of the workers. Hence, in addition to the institutional environment of enterprises and the resources that are being used innovatively, the third key factor of competitiveness in the knowledge economy era is the quality of human resources, which is continuously adjusting according to changes in qualitative demand (Figure 1).

The interconnectedness of the economy and the labour market strongly influences the demand for work, while the supply for work unquestionably is under the influence of factors such as employment and activity rates, migrations, changes in skills, duration of education and life-long learning (Cvečić, 2015). In addition, general demographic factors influencing

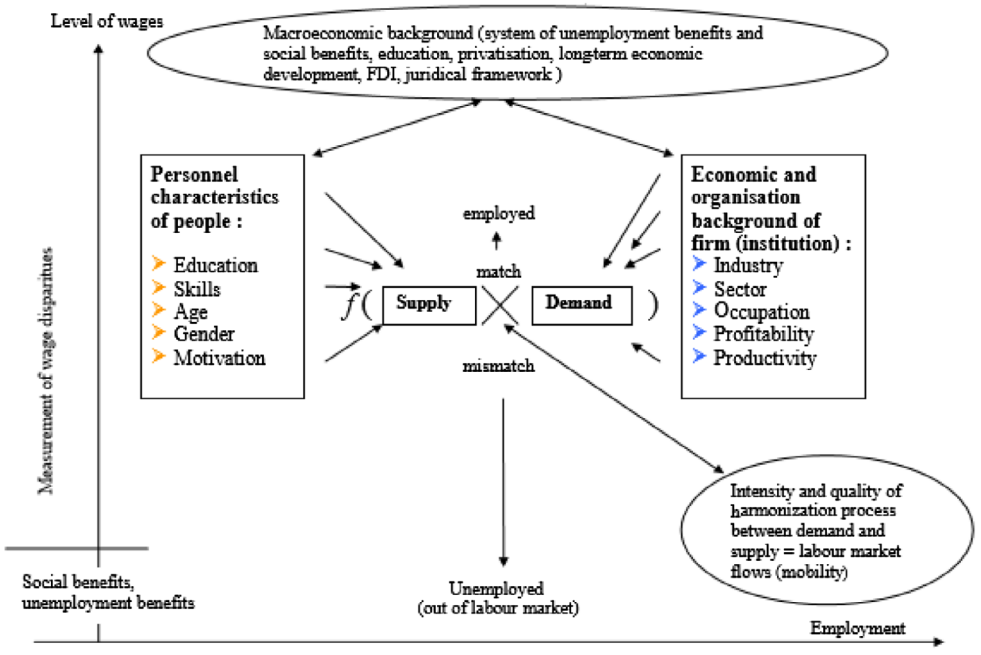

Figure 1. Processes and factors influencing the labour market competitiveness. Source: Filipova, L., Gottvald, J., Šimek, M. (2005).

unemployment include population growth and density, shares of specific age (or sex) groups, average age of youth emancipation and similar.

Lack of labour demand, inadequate workers' skills, institutional factors such as Employment Protection Legislation, labour taxation, tight fiscal positions, extinguishing of industries, disruptive technologies and other factors are often cited as causes of unemployment or inactivity (Siebert, 1997; Sokolić, Kaštelan Mrak, & Katunar, 2014; Eichhorst et al., 2013). Empirical evidence suggest total unemployment rates are higher in regulated (France, Spain, Italy etc.) compared with more liberal labour markets (U.S.A., U.K., Switzerland etc.), which also seems to be the case with Y.U.R. due to weaker employers' possibilities to dismiss young unsuitable workers (Breen, 2005). Younger workers bear the burden of weaker employment contracts, lower qualifications and less experience (Choudhry et al., 2013). However, according to Gervais, Jaimovich, Siu, and Yedid-Levi (2014) high youth unemployment does not necessarily rely on overregulation or barriers to employment, as younger workers are more likely than older workers to find a job (at least in the U.S.A.).

Wrong policies and ineffective institutions aggravate unemployment in the European example (Siebert, 1997). Considering institutional factors influencing youth unemployment, important elements include 'flexibilisation' of the labour market (e.g., 'part-time' employment, less rigid labour laws, etc.) and active L.M.P.s. Studies show that 1 in 5 young people fear losing their jobs (Eurofound, 2010) due to the uncertain jobs and contracts; 42% of young adults have a temporary contract versus only 11% among adult workers (European Trade Union Institute, 2012). Other relevant variables include unemployment benefits, collective bargaining and union density (or coverage), the minimum wage, housing policies,

etc. Choudhry et al. (2013) suggest that high interest rates, taxes, labour and unemployment benefits unfavourably affect the employment levels.

As widely assumed, a Polish study revealed that a young person has much higher chances of finding employment, especially if not seeking it at that moment, if he/she goes through training programmes (Styczyńska, 2013). Adequate education/training systems clearly empower young people to acquire needed skills and knowledge for the future labour market. Thus, it is crucial to encourage the convergence between the labour supply that derives from the institutions providing education/training services and the labour market in order to reduce the labour market mismatch. Breen (2005) stipulates that lower Y.U.R.s have been recorded in countries with good links between the educational system and the labour market resulting in employers better understanding competences of new graduates and thus having more realistic expectations, resulting in more accurate matching of labour demand and supply. But, workers are better matched to employers than in the past, so workers do not have to move as much as to find their 'true calling' (Molloy, Smith, & Wozniak, 2014). Therefore, leaving a job allows a worker to find a better occupational match, which occurs more often among younger workers (Gervais et al., 2014).

Factors such as managerial know-how and the organisation of production significantly contribute to efficient labour markets (Cvečić, 2015). According to some organisational behaviour perspectives, the youth unemployment issue partially lies in the mismatch between employers' preferences and employees' expectations, skills and attitudes (Kaštelan Mrak & Sokolić, 2017). Young people may experience difficulties finding work placement even in circumstances when demand for specific profiles exists, because employers often value more dedication to learning, successful communication and co-operation in work organisation than entrepreneurial skills, math literacy or computer skills. The European Commission report on the Flexibility and Competitiveness of the Labour Market (2005) stresses the importance of functional flexibility for labour productivity, which represents the process of adjustment of jobs according to output demand, with the help of the internal reorganisation of work places.

Finally, structural factors influencing youth unemployment can be diminished by implementing various political strategies to lower the share of early school leavers, to offer more jobs specifically to them, to improve the offer of internships and rehabilitation opportunities or to provide more job opportunities for young people with health impairments, to provide training guarantee programmes, to educate the youth on their health and to prevent early involuntary pregnancies, to provide better childcare provision (Tamesberger, Leitgöb, & Bacher, 2014).

2.3. Labour Market Policies and their Impacts on Youth Unemployment

L.M.P.s have become a major instrument addressing unemployment issues. They are very different between countries, with disparate results. Often, they depend on the national welfare systems, their political environments and even globalisation repercussions, but they tend mostly to be centred on human capital investments and occupations (Bonoli, 2010). Expenditure in L.M.P.s is aimed at reaching its efficient functioning as well as correcting disequilibria, which can be distinguished from other general employment policy interventions.

L.M.P.s explicitly target groups of persons with difficulties in the labour market: unemployed, long-term unemployed, employed at risk of involuntary job loss and inactive persons

Table 1. Public expenditure in Labour Market Policies (% of G.D.P.) in E.U. Member States and Norway.

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BE	2.93	2.769	**2.599**	**2.641**	3.05	2.968	2.878	2.829	2.803	2.68
BG	0.654	0.56	0.452	0.431	0.608	0.557	0.556	0.66	0.803	0.621
CZ	0.451	0.452	0.427	0.401	0.679	0.668	0.528	0.476	0.543	0.594
DK	**3.654**	**3.12**	2.594	2.391	3.153	3.645	3.515	**3.485**	**3.486**	**3.379**
DE	3.032	2.563	2.034	1.885	2.449	2.176	1.759	1.618	1.643	1.595
EE	**0.186**	**0.15**	**0.147**	0.275	1.584	1.072	0.711	0.719	0.675	0.593
IE	1.446	1.459	1.551	2.017	3.272	3.657	3.275	3.232	2.961	2.609
GR	0.465	0.52	0.491	0.606	0.9	0.945	.	.	0.849	0.858
ES	2.087	2.114	2.122	2.53	**3.676**	**3.882**	**3.611**	.	3.382	2.991
FR	2.893	2.695	2.501	2.332	2.835	2.984	2.737	2.802	2.911	3.007
HR	.	.	.	.	.	.	.	0.642	0.708	0.618
IT	1.169	1.084	0.99	1.105	1.629	1.662	1.578	1.867	1.888	1.876
CY	.	0.677	0.539	0.507	0.806	0.917	1.191	1.331	1.509	1.069
LV	0.508	0.508	0.428	0.454	1.329	1.26	0.696	0.499	0.552	0.55
LT	0.337	0.387	0.408	0.389	0.899	0.775	0.551	0.471	0.462	0.428
LU	1.12	1.038	0.949	0.95	1.353	1.281	1.201	1.334	1.391	1.316
HU	0.706	0.689	0.698	0.708	1.141	1.344	1.082	1.08	1.116	1.122
MT	.	0.526	0.477	0.474	0.491	**0.495**	0.501	0.526	0.486	0.501
NL	2.919	2.522	2.136	1.984	2.484	2.554	2.384	2.492	2.782	2.805
AT	2.069	2.041	1.851	1.776	2.251	2.186	1.981	1.978	2.161	2.209
PL	1.28	1.158	1.005	0.903	0.949	1.016	0.704	0.752	0.836	0.789
PT	1.862	1.696	1.484	1.465	1.978	1.981	1.839	2.08	2.132	1.877
RO	0.537	0.416	0.339	**0.262**	**0.444**	0.591	**0.359**	**0.282**	**0.251**	**0.224**
SI	0.687	0.647	0.491	0.44	0.981	1.192	1.26	1.125	1.21	1.002
SK	0.593	0.642	0.574	0.679	0.911	0.916	0.776	0.682	0.624	0.552
FI	2.651	2.466	2.174	2.038	2.621	2.667	2.354	2.351	2.576	2.84
SE	2.281	2.135	1.626	1.333	1.734	1.825	1.726	1.874	1.991	1.914
UK	0.589	0.485	0.458	0.521	0.732	0.685	.	.	.	.
NO	1.221	0.861	0.745	0.666	0.992	1.095	0.965	0.87	0.835	0.882

Notes: BE – Belgium; BG – Bulgaria; CZ – Czech Republic; DK – Denmark; DE – Germany; EE – Estonia; IE – Ireland; GR - Greece; ES – Spain; FR – France; HR – Croatia; IT – Italy; CY – Cyprus; LV – Latvia; LT – Lithuania; LU – Luxembourg; HU – Hungary; MT – Malta; NL – the Netherlands; AT – Austria; PL – Poland; PT – Portugal; RO – Romania; SI – Slovenia; SK – Slovakia; FI – Finland; SE – Sweden; UK – United Kingdom; NO – Norway.
Source: Eurostat (2017). European Commission - Directorate general for employment, social affairs and inclusion (DG EMPL).

who would like to enter the labour market, disabled people, as well as young individuals. According to the O.E.C.D. (1993), active programmes include: (1) public employment services and administration, (2) labour market training, (3) youth measures (i.e., measures for unemployed and disadvantaged youth and support of apprenticeship and related forms of general youth training), (4) subsidised employment, (5) measures for the disabled. Passive or income maintenance programmes include unemployment compensations and early retirement for labour market reasons.

The European Commission (2016), regarding the total L.M.P. expenditure, distinguishes: 'services' (activities of the public employment service and similar), active 'measures' (training, supported employment and rehabilitation, employment incentives, direct job creation, start-up incentives) and more passive measures named as 'supports' (out-of-work income maintenance and support, early retirement). Table 1 presents figures related to the public expenditure in L.M.P. in various European countries as a percentage of their G.D.P.

In 2014, the E.U. average expenditure in L.M.P. measures amounted to 1.91% of G.D.P., with basically 40% of them being '*active*' and 60% being '*passive*' measures (i.e., *out-of-work income*). Among other relevant O.E.C.D. countries, Canada recorded 0.91, the U.S.A. 0.71 and Japan only 0.62% of their G.D.P. related to L.M.P. measures (Hörisch, Shore, Tosun, & Werner, 2014). More comprehensive analysis usually includes figures on active policy

measures per unemployed person relative to average earnings, or the number of participants on active programmes relative to the size of the labour force (Martin, 2000).

Scarpetta (1996) affirmed a robust correlation between active L.M.P.s (A.L.M.P.s) and unemployment rates. But, the nature of specific effects and different cases blurs the wider picture. Calmfors (1994) tried to indicate and determine the different effects of A.L.M.P.s: matching process on the labour market, participation effects and competition of labour, deadweight loss effects (e.g., support for recruitment or training which would have occurred anyway), substitution effects (i.e., adverse effects on specific employees by creating jobs for others), reduced welfare losses/displacement effects, productivity effects, work-test effects (which can reduce the number of non-genuine job seekers), tax effects (the effects of financing A.L.M.P.s) and effects on other policies.

As Schömann (1995) points out, several macroeconomic analyses conducted during the early 1990s suggested that A.L.M.P.s are particularly efficient when the economy is about to leave a recession. Thus, considering L.M.P. measures and their impacts at this moment is very important for addressing youth unemployment. However, only a few studies have explicitly included the youth employment programmes. The difference between total and youth unemployment has to be taken into account (Gonzalez Carreras et al., 2015; Choudhry et al., 2013; Tomić, 2016), not only regarding their causes and impacts, but also because of different types of measures used to alleviate them.

Furthermore, impacts of A.L.M.P.s on youth unemployment can be assessed on the micro and macro level, as well as for their social benefits. The impact and the design of specific national L.M.P.s vary considerably across Europe (Gonzalez Carreras et al., 2015). Microeconomic studies usually evaluate specific measures or programmes, but their results were usually inconclusive or restricted and often suggested a neutral, weak or even negative effect – for instance Caliendo, Künn, and Schmidl (2011) concluded that public sector job schemes in Germany did not show any effect at all in the long run and were harmful in the short run. These types of studies require complex research and usually are problematic because of scarce data.

Although the literature suggests some evidence of macroeconomic impacts of A.L.M.P.s, these are also modest, uncertain, partial and usually include aggregate unemployment and job matching (Calmfors, 1994; Speckesser, 2004; Dauth, Hujer, & Wolf, 2010; Hujer, Rodrigues, & Wolf, 2009). Negative effects were estimated in several cases (e.g., Gautier, Muller, Van Der Klaauw, Rosholm, & Svarer, 2012 concluded that, despite the decline in unemployment rates due to some active employment measures, increased government spending and congestion on the labour market can reduce welfare). An additional problem is that the impact of A.L.M.P.s on unemployment can be biased as some participants in these measures are not included in the unemployed figures (Scarpetta, 1996).

Long-term impacts on social benefits for young people are practically incomparable due to the scarcity of data and especially because of different policy systems and economic and social environments in individual economies. However, several studies show that youth unemployment today creates costs to individuals and the society well into the future (Bell & Blanchflower, 2011; Eurofound, 2012). For instance, Coles, Godfrey, Keung, Parrott, and Bradshaw (2010), while investigating N.E.E.T.s, emphasised longer-term costs due to reduced lifetime employment, lost and reduced wages, weaker health, criminal prospects, social exclusion and general wellbeing. According to Woessmann and Piopiunik (2010) increased educational attainment of weaker pupils in Germany (based on estimates of

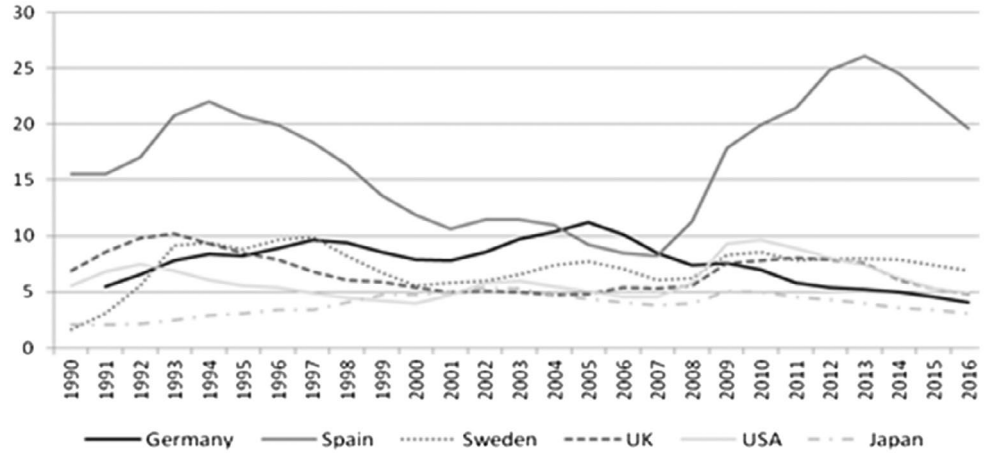

Figure 2. Total Unemployment trends in Europe, the U.S.A. & Japan (% of active population 15–74). Source: Eurostat (2017). Employment and unemployment; (LFS) Database.

macroeconomic growth models) would increase the G.D.P. per capita in present values by €34,000, concluding that high-quality educational opportunities have to be increasingly funded in order to reduce the costs for the whole society.

Summarising all previously mentioned research, it is important to stress how limiting it is to aggregately analyse and determine the impacts of A.L.M.P.s, especially on Y.U.R.s. Nevertheless, there is a need for comprehensive indicators and methods to assess policy effectiveness and their long-term benefits/costs to the European and national economies.

3. Trends in E.U. Unemployment Statistics

Compared with the U.S.A. and Japan, most E.U. Member States (for instance, Spain) have experienced higher unemployment rates during the last few decades (Figure 2), which could be the result of specific economic and structural conditions, as well as the result of specific institutional/legal frameworks (including education systems and specific policies). Although the E.U. has set up specific strategies and instruments to help its Member States in reducing unemployment and creating new skills and jobs, the main liability still lies within the national regulation and financial incentives.

The following tables (Table 2 and 3) show the main unemployment figures in the E.U. by each country. The youth unemployment issue becomes more evident with the following display of unemployment rates, which accentuate very high levels of unemployment during the last decade, reaching more than 40% (sometimes even more than 50%) among the youth in Southern European Member States.

While the Total Unemployment Rates (T.U.R.s) vary between E.U. Member States every year, the differences became more evident as the aftermath of the Big Crisis and the recession. The best and worst performing Member States in specific years have been bolded in both tables, usually concerning the same countries; however, not necessarily. For instance, Finland and Sweden perform very well in the Youth long-term unemployment rates (0.7–1.7%, far below the E.U. average of 4–8%); however the Y.U.R.s vary from 16.5 to 24.8%, which is similar to other E.U. countries.

Table 2. Total Unemployment and youth unemployment trends in the E.U.

	Total unemployment rate (% of active population; 15–74 y.o.)					Youth unemployment rates (15–24 y.o.; %)				
	2007	2010	2013	2014	2015	2007	2010	2013	2014	2015
EU28	7.2	9.6	10.9	10.2	9.4	15.5	21.0	23.7	22.2	20.3
BE	*7.5*	*8.3*	*8.4*	*8.5*	*8.5*	*18.8*	*22.4*	*23.7*	*23.2*	*22.1*
BG	*6.9*	*10.3*	*13*	*11.4*	*9.2*	*15.1*	*21.9*	*28.4*	*23.8*	*21.6*
CZ	*5.3*	*7.3*	*7*	*6.1*	***5.1***	*10.7*	*18.3*	*19.0*	*15.9*	*12.6*
DK	***3.8***	*7.5*	*7*	*6.6*	*6.2*	***7.5***	*14.0*	*13.1*	*12.6*	***10.8***
DE	*8.5*	*7*	***5.2***	***5***	***4.6***	*11.9*	***9.8***	***7.8***	***7.7***	***7.2***
EE	*4.6*	*16.7*	*8.6*	*7.4*	*6.2*	*10.1*	*32.9*	*18.7*	*15.0*	*13.1*
IE	*4.7*	*13.9*	*13.1*	*11.3*	*9.4*	*9.1*	*27.6*	*26.8*	*23.9*	*20.9*
GR	*8.4*	*12.7*	***27.5***	***26.5***	***24.9***	***22.7***	*33.0*	***58.3***	***52.4***	***49.8***
ES	*8.2*	***19.9***	***26.1***	***24.5***	***22.1***	*18.1*	***41.5***	***55.5***	***53.2***	***48.3***
FR	*8*	*9.3*	*10.3*	*10.3*	*10.4*	*18.8*	*22.5*	*24.1*	*24.2*	*24.7*
HR	***9.9***	*11.7*	***17.3***	***17.3***	***16.3***	***25.2***	*32.4*	***50.0***	***45.5***	***43.0***
IT	*6.1*	*8.4*	*12.1*	*12.7*	*11.9*	*20.4*	*27.9*	*40.0*	*42.7*	*40.3*
CY	***3.9***	*6.3*	*15.9*	*16.1*	*15*	*10.2*	*16.6*	*38.9*	*36.0*	*32.8*
LV	*6.1*	***19.5***	*11.9*	*10.8*	*9.9*	*10.6*	***36.2***	*23.2*	*19.6*	*16.3*
LT	*4.3*	***17.8***	*11.8*	*10.7*	*9.1*	***8.4***	***35.7***	*21.9*	*19.3*	*16.3*
LU	***4.2***	***4.6***	***5.9***	*6*	*6.5*	*15.2*	*14.2*	*15.5*	*22.6*	*17.3*
HU	*7.4*	*11.2*	*10.2*	*7.7*	*6.8*	*18.0*	*26.4*	*26.6*	*20.4*	*17.3*
MT	*6.5*	*6.9*	*6.4*	***5.8***	*5.4*	*13.5*	*13.2*	***13.0***	***11.7***	*11.8*
NL	***4.2***	***5***	*7.3*	*7.4*	*6.9*	***5.9***	***8.7***	*13.2*	*12.7*	*11.3*
AT	*4.9*	***4.8***	***5.4***	***5.6***	*5.7*	*9.4*	***9.5***	***9.7***	***10.3***	***10.6***
PL	***9.6***	*9.7*	*10.3*	*9*	*7.5*	***21.7***	*23.7*	*27.3*	*23.9*	*20.8*
PT	*9.1*	*12*	*16.4*	*14.1*	*12.6*	*16.7*	*22.8*	*38.1*	*34.8*	*32.0*
RO	*6.4*	*7*	*7.1*	*6.8*	*6.8*	*20.1*	*22.1*	*23.7*	*24.0*	*21.7*
SI	*4.9*	*7.3*	*10.1*	*9.7*	*9*	*10.1*	*14.7*	*21.6*	*20.2*	*16.3*
SK	***11.2***	*14.5*	*14.2*	*13.2*	*11.5*	*20.3*	*33.6*	*33.7*	*29.7*	*26.5*
FI	*6.9*	*8.4*	*8.2*	*8.7*	*9.4*	*16.5*	*21.4*	*19.9*	*20.5*	*22.4*
SE	*6.1*	*8.6*	*8*	*7.9*	*7.4*	*19.3*	*24.8*	*23.5*	*22.9*	*20.4*
UK	*5.3*	*7.8*	*7.6*	*6.1*	***5.3***	*14.3*	*19.9*	*20.7*	*17.0*	*14.6*

Source: Eurostat (2017). Employment and unemployment; (LFS) Database.

As seen in Table 2, Y.U.R.s are usually greater than T.U.R.s. In more recent years, Germany, the Czech Republic, Malta, the United Kingdom and Austria have managed to lower the T.U.R.s below 6%. Denmark, Estonia, Luxemburg, Hungary, the Netherlands and Romania have close figures, while Poland's trend looks quite promising. The opposite situation goes for countries such as Greece, Spain, Croatia and Cyprus, with figures between 15–25% in 2015.

Regarding the Y.U.R.s, before 'The Crises' the average E.U. rate was 15.5% for the 15–24 year-old Europeans, but it suddenly rose (23.7% in 2013). The trend in the last three years suggests a better prospect for most countries; however, it is still an astonishingly significant problem for Greece, Spain, Croatia and Italy where the figures vary between 40% and 50% (2015). Germany, the E.U. economic and political 'leader', managed to achieve a much better result for its younger generations: only 7.2% in 2015. The next best performers regarding Y.U.R.s are Denmark and Austria, but with more than 10% of unemployed youth. Strong economic performances by these countries, combined with institutional efficiency and dual-education systems (which support vocational education and training), achieved stable Y.U.R.s.

Some other important economies did not manage to reduce these rates significantly – Sweden, Belgium, Poland have still Y.U.R.s above 20%, while France has a rising 24.7% in 2015. A significant change in Y.U.R.s, compared with the pre-crises years, can be observed in the cases of Ireland, Cyprus, Latvia, Lithuania and Portugal. The Baltic States, including

Table 3. Youth long-term unemployment and N.E.E.T.s in the E.U.

	Youth long-term unemployment rate (12 months or longer); %					Young people neither in employment nor in education and training (15–24 years) - % of the total population in the same age group				
	2007	2010	2013	2014	2015	2007	2010	2013	2014	2015
EU28	4.0	6.0	8.0	7.8	6.5	.	.	.	.	.
BE	*5.6*	*6.7*	*7.3*	*8.0*	*7.9*	*11.2*	*10.9*	*12.7*	*12*	*12.2*
BG	*6.3*	*8.9*	*13.2*	*11.7*	*11.1*	***19.1***	***21***	***21.6***	***20.2***	***19.3***
CZ	*3.5*	*5.8*	*6.2*	*4.4*	*3.8*	*6.9*	*8.8*	*9.1*	*8.1*	*7.5*
DK	.	***0.9***	***1.3***	***1.1***	***0.9***	***4.3***	***6***	***6***	***5.8***	***6.2***
DE	*3.7*	*2.6*	*1.8*	*1.8*	***1.6***	*8.9*	*8.3*	*6.3*	*6.4*	***6.2***
EE	*3.1*	*12.2*	*6.5*	*4.4*	*2.0*	*8.9*	*14*	*11.3*	*11.7*	*10.8*
IE	*1.9*	*11.5*	*10.9*	*9.2*	*7.8*	*10.8*	***19.2***	*16.1*	*15.2*	*14.3*
GR	*9.4*	*11.7*	***30.3***	***31.5***	***28.0***	*11.3*	*14.8*	***20.4***	*19.1*	*17.2*
ES	*1.8*	*12.1*	***21.9***	*21.5*	*16.9*	*12*	*17.8*	*18.6*	*17.1*	*15.6*
FR	*4.4*	*6.6*	*6.5*	*7.2*	*7.0*	*10.7*	*12.7*	*11.2*	*11.4*	*12*
HR	***11.6***	***16.0***	***25.3***	***22.6***	***20.2***	*12.9*	*15.7*	*19.6*	***19.3***	***18.5***
IT	*8.2*	***12.3***	*21.0*	***25.1***	***22.0***	***16.1***	***19***	***22.2***	***22.1***	***21.4***
CY	*2.4*	*2.8*	*12.7*	*10.7*	*8.0*	*9*	*11.7*	*18.7*	*17*	*15.3*
LV	*1.2*	*12.0*	*6.8*	*4.7*	*4.4*	*11.9*	*17.8*	*13*	*12*	*10.5*
LT	.	*10.8*	*4.4*	*4.4*	.	*7.1*	*13.2*	*11.1*	*9.9*	*9.2*
LU	.	*3.7*	*3.6*	.	.	***5.7***	***5.1***	***5***	***6.3***	***6.2***
HU	*6.5*	*10.3*	*8.6*	*6.7*	*4.6*	*11.5*	*12.6*	*15.5*	*13.6*	*11.6*
MT	*3.7*	*3.9*	*3.2*	*3.2*	*3.5*	*11.5*	*9.5*	*9.9*	*10.5*	*10.4*
NL	***0.7***	***1.0***	*2.2*	*2.3*	*2.0*	***3.5***	***4.3***	***5.6***	***5.5***	***4.7***
AT	*1.3*	***1.6***	***1.4***	*1.4*	*1.7*	*7.4*	*7.4*	*7.3*	*7.7*	*7.5*
PL	*7.5*	*4.8*	*8.7*	*7.4*	*6.1*	*10.6*	*10.8*	*12.2*	*12*	*11*
PT	*4.6*	*6.9*	*13.8*	*12.6*	*9.9*	*11.2*	*11.4*	*14.1*	*12.3*	*11.3*
RO	***9.7***	*7.2*	*9.0*	*8.7*	*8.1*	***13.3***	*16.6*	*17*	*17*	*18.1*
SI	*3.0*	*4.9*	*8.5*	*7.6*	*5.8*	*6.7*	*7.1*	*9.2*	*9.4*	*9.5*
SK	***11.6***	***18.4***	*20.6*	*17.0*	*14.4*	*12.5*	*14.1*	*13.7*	*12.8*	*13.7*
FI	***0.9***	***1.6***	***1.0***	***1.0***	*1.7*	*7*	*9*	*9.3*	*10.2*	*10.6*
SE	***0.7***	*1.7*	*1.5*	***1.3***	***1.2***	*7.5*	*7.7*	*7.5*	*7.2*	*6.7*
UK	*2.2*	*4.7*	*5.9*	*4.7*	*3.2*	*11.9*	*13.6*	*13.2*	*11.9*	*11.1*

Source: Eurostat (2017). Employment and unemployment; (LFS) Database.

Estonia, have managed to reduce high Y.U.R.s in a relatively short period, suggesting a high level of flexibility and/or adaptability in the labour market. This is not the case for countries that, for example, encourage internships and apprenticeships, replacing them with quality employment for young people, thus hindering them from entering the labour market (European Youth Forum Publication, 2012).

Youth long-term unemployment in the E.U., comprising those among the youth who try to find jobs longer than 12 months, is declining in the last three observed years, even in the worst performing counties, such as Greece (28%), Italy (22%) and Croatia (20.2%; all in 2015). Nordic figures are incomparable – around 1%. Obviously young Danish, Swedes and Finns are included in the labour market but tend to stay employed for a relatively short period. On the other hand, young Southern Europeans have much fewer opportunities for work, even for seasonal or periodical jobs (although the issue of undeclared work should be taken into account).

Finally, the right side of Table 3 presents the figures for the Young people N.E.E.T. as a percentage of the total population in the same age group (15–24 years). In this case, Italy, Bulgaria, Croatia and Romania lead the group of worst performers, with figures of 18–22% in most recent years. They are accompanied by Greece, Spain, Cyprus and Ireland, with a slightly better but still worrying situation. More efficient in the inclusion of the

unemployed youth into educational and/or training programmes seem to be countries such as the Netherlands (only 4.7% of N.E.E.T.s in 2015), as well as Luxembourg, Denmark, Germany, Sweden, Austria and the Czech Republic. This indicator especially highlights the difference between the 'European Core' states and the so-called 'E.U. Periphery'.

Finally, while comparing different countries, it has to be clear that differences in the statistics can be a reflection of institutional differences. For instance, unlike in Germany and Austria, where apprentices are included in the total labour force because vocational education and training is delivered primarily by firms, most of other European countries operationalise that through college-based practices. Also, some countries in Central Europe (Slovenia, Lithuania, Hungary…) have very low unemployment rates among the 15–19-year-olds, unlike in the case of Italy, Spain and the U.K., because of different systems of secondary education (Gonzalez Carreras et al., 2015).

4. Methodology and Data

The Y.U.R. includes all unemployed persons aged 15–24 without any work, available for work and seeking work actively (ILO, 2014). Panel data were create for the econometric analysis of specific determinants on the Y.U.R.s. Data on 27 E.U. countries were used (data for Estonia was not available) plus Norway in the period of 10 years (last available data includes the 2005–2014 period). For reporting panel data estimates, a dynamic panel data approach was employed to assess the effects of macroeconomic, educational, demographic, labour market and regulation on youth unemployment, N.E.E.T. and total unemployment. Dynamic panel data models are used to remove time-invariant level differences between countries and to capture the dynamic development of the dependent variables (youth unemployment, N.E.E.T. and total unemployment separately). They exclude unobserved heterogeneity on the effectiveness of policy programmes and institutions in cross-national research. Moreover, all dependent variables (Y.U.R.s, N.E.E.T.s and T.U.R.s) report levels in the previous year very similar to the level in the present year.

Also included are dummy variables for years to remove time effects, which are constant across countries. At the same time, variables summarising policy and circumstances change over time and across countries. In addition, the policy variables (L.M.P.) also depend on the previous levels of the outcome variable. To conclude, dynamic panel models are a function of independent variables and the dependent variable in previous years ('lagged dependent variables'), which can capture both country-level heterogeneity and dynamics in labour market outcomes (Gonzalez Carreras et al., 2015).

It is only logical to assume that public expenditure in L.M.P.s is most probably correlated to total and youth unemployment. An increased unemployment rate could induce the public sector to spend more on the improvement and expansion of A.L.M.P.s. Therefore, it is difficult to estimate how a variation in A.L.M.P. can affect youth unemployment, when A.L.M.P. itself depends on (youth) unemployment. This relation between unemployment and A.L.M.P. expenditure makes the analysis sensitive to simultaneous causality bias (endogeneity bias). To avoid endogeneity bias in the econometric models leading to false estimations and conclusions, a dynamic linear model was implemented – specifically, the two-step Generalised Method of Moments (G.M.M.) estimator for dynamic panel data models, proposed by Arellano and Bond (1991) and further extended by Blundell and Bond (1998). The G.M.M. estimator has been widely applied to similar macroeconomic studies

to account for endogeneity of regressors (e.g., youth unemployment should be negatively affected by L.M.P.s, but L.M.P.s could also be more effective because of adequate labour market regulation) and to take into account potential non-stationarity of unemployment rates (youth, N.E.E.T. and T.U.R.s) that could cause biased estimates of the fixed effects estimator (Gonzalez Carreras et al., 2015, p. 10). Moreover, it is also used for a robustness check. This estimator produces consistent parameter estimates for a finite number of time periods and a large cross-sectional dimension. According to Zajc Kejžar, Kostevc, and Zaninović (2016), G.M.M. estimator uses moment conditions in which lagged levels of the dependent variable are instruments for the differenced equations, while lagged differences of dependent variable are used as instruments for equations in levels.

The results of the empirical estimations are presented in Tables 6. Arellano Bond and Sargan test results are also reported.

Although effects of different variables on the Y.U.R.s were evaluated, the study is specifically interested in the impact of public expenditure in L.M.P.s on the youth unemployment rate (*YUEM*). Thus, a two-step estimator in equation was computed and the following model is proposed:

$$\mathrm{YUEM}_{i,t} = \beta_0 + \beta_1 * \mathrm{YUEM}_{i,t-1} + X_{i,t}\beta_k + \lambda_t + e_{it}$$

Where X is a matrix of the following regressors (k=6):

$$\mathrm{X}_{\mathrm{i,t}} = \beta_1 + \beta_2 * \mathrm{LMexp}_{\mathrm{it}}\beta_3 * \mathrm{MECON}_{\mathrm{it}} + \beta_4 * \mathrm{EDU}_{\mathrm{it}} + \beta_5 * \mathrm{REG}_{\mathrm{it}} + \beta_6 * \mathrm{MIG}_{\mathrm{it}} + \beta_7 * \mathrm{LM}_{\mathrm{it}}$$

Where YUEM_{it} represents the dependent variable of the youth unemployment rate in country *i* at time *t*. LMPexp_{it} represents the public expenditure in L.M.P.s either as a percentage of G.D.P. or per unemployed person, or, in the third case it is expressed indirectly, in the number of participants included in L.M.P.s.

The difference between effects of L.M.P.s on youth and N.E.E.T. and total unemployment was also investigated.

Regression estimation for NEET:

$$\mathrm{NEET}_{\mathrm{i,t}} = \beta_0 + \beta_1 * \mathrm{NEET}_{\mathrm{i,t-1}} + \mathrm{X}'_{\mathrm{i,t}}\beta_{\mathrm{k}} + \lambda_{\mathrm{t}} + e_{\mathrm{it}}$$

Regression estimation for TOTAL unemployment:

$$\mathrm{TOTAL}_{\mathrm{i,t}} = \beta_0 + \beta_1 * \mathrm{TOTAL}_{\mathrm{i},t-1} + \mathrm{X}'_{\mathrm{i,t}}\beta_{\mathrm{k}} + \lambda_{\mathrm{t}} + e_{\mathrm{it}}$$

All non-observed shocks absorbed in the proposed model are captured by including dummy variables based on year effects (λ_t). The residual is labelled as e_{it}.

MECON_{it} represents the **macroeconomic indicators** in a specific country in a specific year. For the macroeconomic situation in a country, we have selected gross domestic product (G.D.P.) growth rates and inflation rates.

$$\mathrm{MECON}_{\mathrm{it}} = \mathrm{GDP}_{\mathrm{it}} + \mathrm{Inflation}_{\mathrm{it}}$$

Main **macroeconomic variables** are statistically significant and have negative coefficients in these models, indicating favourable impact on reducing *YUEM*.

Explanatory variables are added and their effects on *YUEM* observed. Explanations, unit of measurement and sources of all data used in the regression analysis are given in Table 4.

Table 4. List of variables with explanations and data sources.

N°	Variable	Abbreviation	Group	Explanation	Source
1	Youth unemployment	YUEM	DEP	Unemployment, youth total (% of total labour force ages 15–24)	World Bank Data
2	Youth not in Education, Employment, or Training	NEET	DEP	Share of youth not in Not in Education, Employment, or Training (NEET), total (% of youth population)	World Bank Data
3	Total unemployment	TOTAL	DEP	Total unemployment (% of total labour force)	World Bank Data
4	GDP	GDP	MACRO	GDP growth (annual %)	World Bank Data
5	Inflation	INFL	MACRO	GDP deflator (annual %)	World Bank Data
6	Public expenditure in L.M.P. per unemployed person	PEXP	LAB	Public expenditure in LMP per unemployed person, in EUR	Eurostat Database
7	Public expenditure for labour market policies	PELMP	LAB	Public expenditure in labour market (LM) policies, % GDP	World Bank Data
8	Participants in labour market policies	PARTLMP	LAB	Participants in labour market policies (number)	Eurostat Database
9	Long-term unemployment	LTU	LAB	Share of long-term unemployment in total unemployment (% of total unemployment)	World Bank Data
10	Migrations	MIG	DEMO	Crude rate of net migration plus adjustment	Eurostat Database
11	Duration of compulsory education	DURED	EDU	Duration of compulsory education (years)	World Bank Data
12	Unemployment with tertiary education	UETE	EDU	Unemployment with tertiary education (% of total unemployment)	World Bank Data
13	Economic Freedom Index	ECFREE	REG	Degree of economic freedom index. Index is composed of five elements separately evaluated on scale from 0 to 10 (Size of Government – Expenditures, Taxes and Enterprises; Legal Structure and Security of Property Rights; Access to Sound Money; Freedom to Trade Internationally; Regulation of Credit, Labour, and Business)	Fraser Institute Database
14	Labour market regulation index	LMR	REG	Labour market reform index. Index is composed of six elements separately evaluated on scale from 0 to 10: mandated cost of worker dismissal, mandated cost of hiring, hiring and firing regulations, centralised collective bargaining, minimum wage, conscription	Fraser Institute Database

Note: DEP – dependent variable; MACRO – macroeconomic variables; LAB – labour market specific variables; DEMO – demographic variables; EDU – educational variables; OEC – overall economic variable.
Source: Authors.

Table 5. Descriptive statistics.

N°	Variable	Obs	Mean	Std. Dev.	Min	Max
	Country	372	16	8.956318	1	31
2	Youth unemployment	341	19.71642	9.867932	5.4	58
3	N.E.E.T.	339	11.92864	6.162612	3.44	42.43
4	Total unemployment	341	8.499707	4.264694	2.3	27.2
5	Public expenditure in L.M.P. per unemployed person	257	6,640.262	5,670.516	543.18	29,498.7
6	Public expenditure for labour market policies	305	1.490862	.9647714	.184	4.205
7	Participants in labour market policies	295	383,811.4	675,696.4	522	4,256,636
8	G.D.P.	372	1.972061	3.820348	−14.81416	26.27606
9	Inflation	372	2.618401	3.039527	−9.75288	20.14865
10	Duration of compulsory education	341	10.06452	1.372611	6	12
11	Economic Freedom Index	341	7.414692	.391142	6.29	8.5
12	Labour market regulation index	341	6.380735	1.191358	2.871486	8.465398
13	Long-term unemployment	339	38.19145	15.13852	3.4	73.5
14	Migrations	372	2.476344	6.575637	−25.2	22.2
15	Unemployment with tertiary education	341	15.78827	6.375628	2.9	36.2

Source: Authors.

Explanatory variables are related to **education** (duration of compulsory education and the rate of unemployed with tertiary education), **regulation** influencing overall economic conditions in a given country (economic freedom index and labour market regulation index), **demographic dynamics** (migrations) and **labour market** (long-term unemployment rates, N.E.E.T., participants in L.M.P.s and public expenditure for L.M.P. as % G.D.P.). Descriptive statistics on all variables in empirical estimations are given in Table 5.

Effects of three different measurements of **labour market policies** are observed in order to conclude on their suitability for policy decision-making: public expenditure in L.M.P.s per unemployed person, public expenditure in L.M.P.s as a share in G.D.P. and participants in L.M.P.s. In addition lagged shares of long-term unemployed in total unemployment were used in the estimations.

$$\mathrm{LAB}_{it} = \mathrm{LMexp}_{it} + \mathrm{Long-termUnempl}_{i,t-1}$$

For education-related estimators the following variables were used:

$$\mathrm{EDU}_{it} = \mathrm{DurationCompulsory}_{it} + \mathrm{UnemplTertiaryEdu}_{it}$$

For **education-related variables,** duration of compulsory education and the rate of unemployed with tertiary education were selected.

For regulation-related estimators the following variables were used:

$$\mathrm{REG}_{it} = \mathrm{EconFreedom}_{it} + \mathrm{LMRegulation}_{it}$$

The level of regulation (assessed through Economic Freedom Index and Labour Market Regulations Index) was expected to contribute to specific categories of unemployment. As a representative of the **overall economic situation** in a country, the Fraser's 'Economic Freedom of the World' Index is based on five topical areas: Size of Government; Legal System and Security of Property Rights; Sound Money; Freedom to Trade Internationally; Regulation, and the higher the Index, more flexible and less regulated the economy. The Labour Market Regulation Index is a fragment of The Economic Freedom Index specifically designed to measure labour market flexibility. Many types of labour market regulation infringe the economic freedom of employees and employers. More prominent types include

Table 6. Estimations on determinants of Youth Unemployment Rate (estimations 1–9).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	YOUTH UNEM.	YOUTH UNEM.	YOUTH UNEM.	NEET	NEET	NEET	TOTAL UNEM.	TOTAL UNEM.	TOTAL UNEM.
VARIABLES	Public expend. in LMP per unempl.	Public expenditure in LMP, % GDP	Participants in LM policies	Public expend. in LMP per unempl.	Public expenditure in LMP, % GDP	Participants in LM policies	Public expend. in LMP per unempl.	Public expenditure in LMP, % GDP	Participants in LM policies
Lagged youth unempl. (L1)	0.826***	0.767***	0.850***						
	(0.0425)	(0.0310)	(0.0436)						
Lagged NEET (L1)				0.432***	0.446***	0.495***			
				(0.0603)	(0.0316)	(0.0501)			
Lagged total unempl. (L1)							0.854***	0.749***	0.927***
							(0.0452)	(0.0463)	(0.0367)
Public expend. in LMP/unempl.	−7.48e-05			−0.000121***			−3.01e-05		
	(0.000107)			(3.73e-05)			(4.73e-05)		
Public expend. in LMP,%GDP		2.889***			1.879***			1.841***	
		(0.630)			(0.215)			(0.384)	
Participants in LM policies			−2.56e-06***			−9.95e-07***			−5.87e-07**
			(5.67e-07)			(2.58e-07)			(2.59e-07)
GDP	−0.408***	−0.373***	−0.425***	−0.135***	−0.0916***	−0.135***	−0.186***	−0.156***	−0.196***
	(0.0328)	(0.0263)	(0.0326)	(0.0149)	(0.0142)	(0.0123)	(0.0179)	(0.0155)	(0.0157)
Inflation	−0.296***	−0.228***	−0.246***	−0.0762***	−0.0826***	−0.121***	−0.113***	−0.0630**	−0.118***
	(0.0590)	(0.0529)	(0.0528)	(0.0201)	(0.0182)	(0.0172)	(0.0312)	(0.0281)	(0.0258)
Migration	−0.273	0.0269	0.472	−0.647***	−0.380	−0.261*	−0.0997	0.355*	0.0337
	(0.481)	(0.514)	(0.601)	(0.183)	(0.279)	(0.156)	(0.110)	(0.190)	(0.0598)
Duration of compulsory edu.	−0.0885	−0.235***	−0.221***	0.105***	−0.0153	−0.00602	−0.0553**	−0.112***	−0.0952***
	(0.0847)	(0.0790)	(0.0679)	(0.0322)	(0.0295)	(0.0215)	(0.0248)	(0.0183)	(0.0167)
Unemployed with tertiary edu.	−3.925**	−1.501	−3.592**	−2.321***	−0.890*	−1.026*	−2.156***	−1.069**	−1.226**
	(1.589)	(1.624)	(1.810)	(0.487)	(0.457)	(0.588)	(0.464)	(0.514)	(0.610)
Economic freedom index	0.530	0.207	−0.392	0.603***	0.0236	0.871**	−0.0518	−0.181	−0.139
	(0.431)	(0.607)	(0.479)	(0.112)	(0.316)	(0.360)	(0.239)	(0.126)	(0.132)

(*Continued*)

Table 6. (*Continued*).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	YOUTH UNEM.	YOUTH UNEM.	YOUTH UNEM.	NEET	NEET	NEET	TOTAL UNEM.	TOTAL UNEM.	TOTAL UNEM.
Labour market regulat. Index	0.0588*	0.0708***	0.0958***	−0.0243**	0.00371	−0.0217*	−0.0309*	−0.00553	−0.0143
	(0.0303)	(0.0273)	(0.0270)	(0.0119)	(0.0140)	(0.0121)	(0.0171)	(0.0120)	(0.0113)
Long-term unempl. (L1)	−0.171***	−0.0827**	−0.144***	−0.0330***	0.00311	−0.00790	−0.102***	−0.0643***	−0.103***
	(0.0268)	(0.0338)	(0.0149)	(0.00768)	(0.00376)	(0.00579)	(0.00790)	(0.0115)	(0.00728)
Year	0.0388	0.151*	0.107	0.0710*	0.00925	−0.00878	0.0540	0.0502**	0.0465*
	(0.112)	(0.0882)	(0.0869)	(0.0392)	(0.0467)	(0.0490)	(0.0387)	(0.0242)	(0.0263)
Constant	−36.43	−286.2	−176.4	−116.1	−4.811	28.96	−84.27	−91.77*	−76.88
	(225.9)	(175.0)	(177.1)	(78.76)	(90.49)	(94.11)	(74.78)	(49.75)	(54.21)
Observations	207	231	221	204	228	218	207	231	221
Number of ID	28	28	28	28	28	28	28	28	28
AB(1)[a] z	−2.1911	−2.5074	−2.635	−2.3513	−2.8747	−1.9961	−2.4143	−2.2436	−2.4808
Prob > z|	0.0284	0.0122	0.0084	0.0187	0.0040	0.0459	0.0158	0.0249	0.0131
AB(2)[b] z	−.16794	−1.3487	−.48074	−.5717	−1.1613	−1.0377	.50265	−1.5376	.02559
Prob > z|	0.8666	0.1774	0.6307	0.5675	0.2455	0.2994	0.6152	0.1242	0.9796
Sargan[c] chi2	21.58721	18.64862	22.76385	19.38957	19.87627	16.92239	22.41964	18.33603	23.69342
df	43	44	44	43	44	44	43	44	44
Prob > chi2	0.9974	0.9997	0.9966	0.9993	0.9994	0.9999	0.9960	0.9998	0.9947

Notes: Standard errors in parentheses *** $p<0.01$, ** $p<0.05$, * $p<0.1$.
[a]Arellano-Bond test for AR(1) zero autocorrelation in first-differenced errors (z, p).
[b]Arellano-Bond test for AR(2) zero autocorrelation in first-differenced errors (z, p).
[c]Sargan test of overidentifying restrictions.
Source: Authors.

minimum wages, dismissal regulations, centralised wage setting, extension of union contracts to nonparticipating parties, and conscription. The labour market regulation index measures the extent to which these restraints upon economic freedom are present. Higher index values mean that a country allows market forces to determine wages and establish the conditions of hiring and firing, and refrain from the use of conscription.

In the end, only migration was included in the estimations as the variable related to **demographic dynamics** (crude rate of net migration). The authors attempted to include population concentration in the metropolis region in the estimations, but the data were not available for many countries included in the panel.

5. Analysis and Discussion

According to the estimations, public expenditure in L.M.P.s measured in the percentage of G.D.P. has a statistically significant impact on Y.U.R.s. However, in all estimated models (on Y.U.R.s = *YUEM*, N.E.E.T.s = *NEET* and T.U.R.s = TOTAL) the coefficient of the impact of public expenditure in L.M.P. measured in the share of G.D.P. is positive, indicating that its increase elevates the Y.U.R.s, N.E.E.T.s and T.U.R.s.

In the case of the *YUEM model*, if the share of public expenditure in L.M.P. per G.D.P. increases by one (+1% of G.D.P.), the Y.U.R. will increase by 288.9 percentage points. Given that in most cases these expenditure range from 0.5–3% of G.D.P., an increase of 1 p.p. would represent a significant change in a national policy (for instance, in 2014 Croatia had expenditure of 0.618% G.D.P. for L.M.P., and a raise to 1.6% of G.D.P. would represent a huge increase – more than 2.6 times). In the case of *NEET* and *TOTAL models*, if the share of public expenditure in L.M.P. per G.D.P. increases by one (+1% of G.D.P.), the N.E.E.T.s and T.U.R.s will increase by 187.9 and 184.1 percentage points, respectively, indicating a better fit of L.M.P. and related instruments for these two categories.

Public expenditure in L.M.P.s measured in monetary units per unemployed persons lowers the rate of unemployed youth, especially in the case of *NEET*, where not only the coefficients are negative, but also the impact tends to be statistically significant. The same applies if the number of participants involved in L.M.P.s is taken into account: if the number of L.M.P. users is increased, Y.U.R.s, N.E.E.T.s and T.U.R.s tend to decrease, although in this analysis only the direction of changes was proved, and not their statistical significance.

Lagged relative shares of long-term unemployed in total unemployment have a significant impact on all three dependent variables. No matter whether public expenditure in L.M.P.s is measured in percentage of G.D.P. or in monetary units per unemployed person, or if simply the number of participants in L.M.P.s is considered, the coefficient of lagged long-term unemployment as a percentage in total unemployment is negative, perhaps signalling that more and more youth, N.E.E.T. and total unemployed are becoming part of long-term unemployment statistics.

Labour Market Regulation Index is a measure of engaging in labour market reforms related to mandated costs of worker dismissals, mandated costs of hiring, hiring and firing regulation, centralised collective bargaining, minimum wage and conscription in order to regulate and reduce unemployment. A higher value of the L.M.R. Index indicates less restrictive regulation and more flexible practices, which should theoretically have positive effects on unemployment. However, this variable is found to be statistically significant in the case of most estimations, but only in the case of youth unemployment its coefficient is

positive, which means that less restrictive regulation and more flexible practices, contrary to theoretical framework, tend to have negative effects on Y.U.R.s, while positive on N.E.E.T.s and total unemployment.

Education-related variables suggest that longer duration of compulsory education diminishes youth and T.U.R.s. This is not applicable to N.E.E.T.s, where duration of compulsory education has statistically significant negative effects on the rate of N.E.E.T.

The rate of unemployed with tertiary education has a negative effect on unemployment among youth and N.E.E.T., as well as on total unemployment. These findings are consistent with theoretical assumptions of preference of unemployed towards staying in education over employment in times of economic disturbance and scarce employment opportunities. Finally, migrations are reducing N.E.E.T. and T.U.R.s, but according to the estimations, they have no statistically significant effect on Y.U.R.s.

6. Conclusion

As this study estimated effects of L.M.P.s and other variables on total, youth unemployment and N.E.E.T. rates, the G.M.M. was used to estimate the relations in a dynamic panel model framework. The results suggest that public expenditure for L.M.P.s (when compared with G.D.P.) does not have a positive effect on youth unemployment, but when compared with the number of unemployed this variable actually might be beneficial to Y.U.R.s. A similar situation can be observed when the number of participants in L.M.P. measures is included as the main variable for L.M.P. Statistical significance in the estimations is clearer in the case of L.M.P. as a percentage of G.D.P., as well as when the number of L.M.P. participants is included.

Furthermore, as the estimations included (lagged) total unemployment, youth unemployment and N.E.E.T. rates, the study found that stronger significance of L.M.P. variables occurs when the dependent variable is the number of young people N.E.E.T. All three L.M.P. variables were statistically significant for models with N.E.E.T. Moreover, all estimated variables were significant when N.E.E.T. and the public expenditure in L.M.P. per unemployed were combined.

Besides macro-estimations, clearer impacts of L.M.P.s can be observed through microeconomic modelling, but for that to be possible extensive research has to be conducted in order to collect relevant data. Also, further research is needed to analyse the adequacy of specific public policy instruments, or at least those with high shares of public money spent to provide a way out of unemployment for young Europeans, which are certainly the most valuable asset of today's Europe.

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