Social spending and chronic unemployment: evidence from OECD countries

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Abstract

Purpose – Social spending is at the forefront of the tools used to repair the damage caused by the global epidemic. However, one of the most critical questions in recent days is as follows: what are the effects of social expenditures in eliminating unemployment? The primary purpose of this article is to provide empirical evidence on the impact of social spending on chronic unemployment in the selected organization for economic co-operation and development (OECD) countries.

Design/methodology/approach – In this study, the data of 30 selected OECD countries between 1991 and 2018 have been compiled. First, countries have been divided into four categories according to their spending intensity to determine the effects of social spending on the long-term unemployment rate. Then, the auto-regressive distributed lag (ARDL) approach and the error correction models (ECM) examine the variables' short- and long-term interactions.

Findings – The author found that the change in the share of social expenditures in GDP affects chronic unemployment similarly. This finding is consistent with the results of studies in the literature dealing with the relationship between public sector size and unemployment. However, the research findings are specifically about the effects of social expenditures on chronic unemployment. In this respect, the results reflect that expenditures with passive characteristics have an expansionary effect on long-term unemployment. In addition, the progressive effect of social expenditures on chronic unemployment is increasing in countries with high expenditure intensity. In countries with relatively low spending intensity, the impact of social spending is limited to the short run and is lower.

Originality/value – Multiple studies have reported that public policies developed in line with the incentives of active employment and public or private sector investments reduce the unemployment rate by positively affecting the output/employment level. This study, unlike other studies, focuses on the effects of social expenditures on chronic unemployment. It also compares the effects of social spending on the long-term unemployment rate for countries with varying spending intensities. Therefore, this article tests the impact of social expenditures used against a concrete socioeconomic problem in the OECD sample. In this respect, the findings contribute to the literature by addressing the relationship between social spending and chronic unemployment.

Keywords Public spending management, Social spending, Long-term unemployment, Fiscal policy, OECD

Paper type Research paper

1. Introduction

Today, the most crucial purpose of social spending applied in varied scopes in different countries is to protect citizens against numerous risks and offer individuals a minimum standard of living. In comparison, employment conditions significantly affect individuals' living standards. It is anticipated that a person who obtains a return from the market by using his production factor efficiently will attain a certain level of welfare, even if limited. Otherwise, achieving even the basic standard of living will be impossible. Unemployment, the

most concrete indicator of underemployment, is a phenomenon that should be evaluated in this context. It occurs when a person cannot attain a position in the labor factor into the market process while wishing to. It also has several social, economic and financial ramifications. In this regard, the socioeconomic effects of unemployment can be evaluated under two headings. First, unemployed individuals may not meet their personal needs. According to the literature, unemployment directly affects individuals' access to resources, consumption preferences and living standards (Thorns, 1982; Carbone and Hey, 2004; Doling and Koskiabo, 1990; Eichorn, 2014; Michaillat and Saez, 2019; Hungler, 2022). In addition to the micro effects of unemployment, it brings along macro-scale problems such as income inequality, economic growth, poverty, migration and economic instability (Makaringe and Khobai, 2018; Antolin and Bover, 1997; Wiemers, 2014; Çelikay, 2017; Michaillat and Saez, 2019).

The state, which seeks to establish a minimum standard of living for all members of society, creates and implements numerous policies to address this issue. It is precisely expected from social spending to eliminate the depressing and destructive effects of unemployment on individuals. Public social spending is supposed to be effective in two key areas individual and social (Lindert, 1994; Lindbeck, 2006; Huber *et al.*, 2008; Herwartz and Theilen, 2017; Holden and Sparrman, 2018; Huang and Yang, 2021). The state will primarily compensate for losing the welfare of the individual for unemployment. Thus, it will create a minimum standard of living for the unemployed. This interaction concerns the person and enables them to meet their basic needs. In addition, the individual who can compensate for the loss of welfare will maintain market demand for various goods and services and prevent the negative effects of unemployment on the economy.

The fundamental problem that shapes the study arises precisely at this point. How do the state's social expenditures to improve the welfare of individuals and society impact chronic unemployment on a macro scale? So, this study aims to determine the effects of public social spending on long-term unemployment. By using the social spending and unemployment rate data of the selected 30 organization for economic co-operation and development (OECD) countries between 1991 and 2018, panel ARDL models are performed. The most important constraint of the study is the sample size in terms of the period and countries covered. Undoubtedly, after the 1990s, with the effects of fiscal policies, which were widely and intensely followed in multiple countries, significant changes were made in the structure of the public sector and the composition of social expenditures. This study has been developed using the aforementioned worldwide developments as a reference. In this context, OECD countries, which generally develop compatible policies, were chosen as samples.

To determine the effects of social spending on the long-term unemployment rate, especially in countries with different social spending intensity, the countries are divided into four categories according to their spending intensities. Then, cross-sectional dependency in terms of the data set is tested. Finally, the short- and long-term interactions between variables are examined. The study comprises six parts. The following section tries to draw a theoretical framework for unemployment and social spending. The second section includes preliminary studies in the related literature. The third chapter explains the methodological background of the study, and the fourth chapter mentions the findings from the analysis. The fifth and last section makes the general evaluation of the study.

2. Theoretical background: unemployment and social spending
According to the international labor organization (ILO-2021), the general unemployment rate in the world for 2021 is 6.3%. Today, approximately 200 million people are still struggling with unemployment. Also, 2.5 million more people are expected to be unemployed in 2022. Again, the pandemic, as it shapes every minute of daily life, shows its most serious adverse

effects on employment. In an environment where the young population has been more affected by unemployment even before the Coronavirus disease of 2019 (COVID-19), inevitably, it will become a socioeconomic problem almost as weary as the pandemic for the entire society.

The causes of unemployment assume differences from country to country. For example, the reasons for this difference are the heterogeneous structure of countries, such as their different levels of development, structural features, sociological textures and political preferences. In addition, seasonal conditions, cyclical fluctuations, technological developments or the structural transformation process are the primary factors that directly affect the supply and demand of labor and cause unemployment to change over the years in countries, or regions.

Under the assumption that wages are flexible, market mechanisms are expected to eliminate unemployment immediately. However, even under this assumption, labor supply and demand cannot meet simultaneously because of the structural characteristics of the labor market. If prices and wages are not flexible, it will not be possible for markets to balance at a point reflecting the whole employment level. According to the Keynesian Approach, the public sector must compensate the private sector and develop policies to eliminate the imbalances and underemployment in the markets. Within this framework, it is necessary to intervene with fiscal instruments to eliminate unemployment due to cyclical, structural, technological or frictional reasons.

According to the real business cycles approach, based on the assumptions of flexible prices, competitive market structures and the existence of consumers with a long-term perspective in decision-making positions within the framework of intergenerational budget constraints, financing the increase in public expenditures by taxation or borrowing reduces the incomes of consumers. They will reduce their spending and idle preferences to compensate for such a decrease in their income. There is pressure to decrease real wages. Hence, real wages may decline to the level where labor supply and demand intersect. Therefore, the effect of public intervention is neutral even if it aims to eliminate unemployment.

The New Keynesian models examine it in the validity case of the Ricardian equivalence assumption, stickiness of nominal prices and the existence of imperfect competition markets. According to the new Keynesian approach, a high output level may pressure real wages. In addition, endogenous growth models establish a relationship between economic growth and public activities. Also, Barro (1990), public expenditures or public policies such as physical and human capital investments may also positively affect the long-term final output.

The quantitative and qualitative adequacy of public policies pursued in the fight against unemployment differs according to the structural conditions of the countries, developments in time and even regional characteristics. It carries social expenditures out to ensure social justice, increase welfare and provide citizens with a minimum standard of living. The effects of these expenditures on unemployment are among the issues that need to be evaluated.

According to Williamson (1998), expenditures made by public authorities within the framework of social protection programs consider social spending. Lindert (1996) broadly expressed social spending as the general framework of social transfers by public authorities and education expenditures. In addition, D'Andria (2008) describes social expenditures as in-kind and cash transfers transferred to persons.

Various international organizations have also treated social spending differently. For example, in the data set Social Expenditure Database organized by the OECD, health, home-family payments, invalidity, unemployment and transfers to the active labor market consider sub-headings of social spending (OECD, 2021a,b,c,d). Again, the United Nations (UN) classifies social spending into two primary groups: health and social protection (e.g. sickness, old age, family benefits, prevention of social exclusion and unemployment) (UN/SDP, 2021).

The International Labor Organization (ILO) includes education expenditures in social spending for the efficiency of resource distribution between generations and the importance of human capital accumulation (ILO, 2021a,b, pp. 37–39).

The purpose of a state is to protect persons against various risks in socioeconomic life with social spending. It is a standard instrument by the public authorities in many areas, such as ensuring equal opportunities among persons, eliminating economic instabilities and combating poverty and the factors that cause poverty. Empirical studies show that in countries where social spending is relatively high, living standards are rising and welfare levels can reach high levels. Therefore, it is an effective policy tool for increasing the welfare of the persons and society (Lindbeck, 2004, p.154). In addition, another reason the state preferred social spending more after the 1980s was the damage caused by the globalization process to the persons living in the society. The aforementioned cause–effect relationship, which tests as the "compensatory effect hypothesis" in the globalization analysis process, explains the more intensive use of social spending by the state as a political preference of persons against both existing and globalization risks.

It is another fact that international competition, which increases with globalization, puts pressure on tax systems. According to the efficiency hypothesis, the pressure in financing public expenditures caused by globalization limits expenditures in terms of quantity and component (Garrett and Mitchell, 2001; Bretschger and Hettich, 2002; Adam and Kammas, 2007; Herwatz and Theilen, 2017). There are also opinions suggesting that global competition can negatively affect social spending policy (Esping-Andersen, 1990; Kaufman and Segura-Ubiergo, 2001; Lindert, 2004). Perceiving social expenditure programs as social costs by political wills for reasons such as globalization, demographic transformation and migration problems is the basis of these views (Kaufman and Segura-Ubiergo, 2001; Eriksen, 2011, p. 244).

In case of an increase in productivity in production through social spending, I can ensure that the tax potential increases and eliminates the social benefit spread to all areas. However, social spending used in inefficient fields will permanently damage the labor market. While the increase in social spending can cause an increase in the income of persons, it will create pressure on the wage expectations of those who supply their labor. Again, the alternative cost of leisure time can increase for those who benefit from social spending. Ultimately, people will prefer to stay idle and keep their wage expectations at a higher value since they have particular income security even though they are not working. In this context, the potential of social spending to eliminate the loss of welfare caused by underemployment and/or to bring a permanent solution to the unemployment problem is an issue that needs to be examined.

3. A brief literature review
Public expenditures, one pillar of fiscal policy, impact on many components of economic life, such as employment, general price level, economic growth, income distribution and cyclical fluctuations. In this context, the functional efficiency of public expenditures and their reflections on economic life are among the subjects widely discussed in the literature [1]. For example, Barro (1981) examined the effects of defense spending between 1889 and 1978 because temporary and permanent public purchases may affect the output level differently. According to this study, temporary public purchases, which may increase to a certain degree, especially during extraordinary periods such as war, have a more expanding effect on output than continuous expenditure. Considering that the findings obtained by Barro (1981) can test specifically for the USA, it is a question of how and in what direction the changes in public expenditures in countries with different socioeconomic characteristics will influence fundamental economic indicators.

The analysis conducted by Karras (1993) on a sample of 37 countries is vital for two cases. Public spending on productive areas can positively affect employment and output levels. In addition, Karras also revealed that the fiscal size of the state might reduce the said positive effects. So, Karras (1993, p. 367) even argued that the optimal public sector share should be 20%. Based on this proposition, I can see an interaction between the size of the public sector and the unemployment rate.

Abrams (1999) conducted a preliminary study that deals with the relationship between the size of the public sector and unemployment. He analyzed different country groups with a model comprising five stages. The most crucial finding in the study using the data of 20 OECD countries between 1984 and 1993 is that a crowding-out effect emerges and unemployment increases as the size of the public sector expand.

Whether the interaction between the public sector size and the unemployment rate among different country groups is in the form of a causal relationship is one of the research topics discussed in the literature. For example, Christopoulos and Tsionas (2002) conducted a causality analysis using data on the unemployment rate and the government size. According to the results, there has been a one-way causality relationship between the government size and the unemployment rate in seven countries (Denmark, France, Ireland, Netherlands, Portugal, Norway and Finland). Also, there is a bidirectional causality relationship in Italy. However, there is no causal relationship between variables in Belgium and the United Kingdom.

Studies conducted after Abrams (1999) aimed to explain the underlying reasons for the effects of the increase in public spending and/or the expansion of the state's fiscal volume on the unemployment rate. It bases the common denominator in these studies on the effects of the resources used in financing public expenditures on other economic components. For example, according to Daveri and Tabellini (2000), taxes on the labor factor put pressure on real wages, causing a decrease in labor demand and an increase in unemployment. Again, Alesina *et al.* (2002) examined the effects of different fiscal policy practices on profitability and investment in a sample of 18 OECD countries from 1960–1996. According to the study's findings, the increase in public expenditures primarily affects the wage components of employees in the public sector and the labor market. In addition, taxation or borrowing applied in financing expenditures indirectly increases labor costs.

Also, Algan *et al.* (2002) examined how and in which way public employment affects the private sector employment with their analysis in the sample of OECD countries within the constraint of the 1960–2000 time frame. According to the results obtained in the study, each 100-unit business area created by the public sector causes the exclusion of 150 unit businesses in the private sector. In addition, employment created in the public sector decreases the labor force participation rate and increases unemployment. It has similar findings to the study by Christopoulos *et al.* (2005). They have discussed the size of the public sector and the unemployment rate data of 10 European countries between 1961 and 1991 in this study. The results show a positive relationship between the fiscal size of the state and the unemployment rate, confirming the Abrams curve.

Policies' reflections may also vary according to the directing of the expenditures to productive areas and their continuity. For example, Feldman (2006), in his study examining the relationship between the fiscal size of the state and the unemployment rate for the period between 1985 and 2002 in 19 industrialized countries, concluded that as the volume of expenditures expands, the unemployment rate will increase. Abrams and Wang (2006) stated in their analysis, using the data of 20 OECD countries between 1970 and 1999, that the fiscal size of the state is one of the major determinants of the unemployment rate. However, social transfers and financial incentives also significantly affect the unemployment rate. In addition, Brückner and Pappa (2012), in their study on a sample of 10 OECD countries, concluded that a shock in public spending could directly affect critical variables in the labor

market, such as unemployment and labor force participation rate. These findings also support the results of Barro (1981). In their studies, Brückner and Pappa (2012) argued that fiscal expansion increases the labor force participation rate, employment and unemployment rate, and the theoretical framework of the New Keynesian approach can explain this increase.

Employment policies against unemployment are examined under two main headings as, active and passive policies, according to the type and effects of the intervention. Active employment policies include "e.g. public and private employment services, vocational training programs, subsidized employment programs, encouragement of entrepreneurship and programs for young people"; passive employment policies are "e.g. unemployment insurance/allowance, severance/notice pay and early retirement" in the form. The passive employment policy aims to eliminate the negative reflections of unemployment and improve the income level. However, it has been seen that in some research results, the unemployment rate as the resources used in this context increase (Valetta and Kuang, 2010).

There are also studies in the literature that public expenditures have the potential to reduce unemployment due to the increase in total demand. For example, Phelps (1994, 1999) argues that an increase in public procurement will cause an increase in real prices in the goods and capital markets. Therefore, the demand for labor, which is the substitute for capital, will increase, achieving a lower unemployment rate. Sparrman (2011) conducted an empirical study of 20 OECD countries from 1960 to 2007. According to the results of the research, it has been found that the increase in public expenditures reduces the unemployment rate, unlike other studies. In addition, the wage payments made within public sector employment have one of the most significant effects on the unemployment rate from different public expenditures. Public investments also significantly affect the unemployment rate, but other nonwage expenditures do not affect employment. Again, Holden and Sparrman (2018) got different results in their study with a sample of 20 OECD countries from 1980 to 2007.

Some empirical studies prove that active employment policies reduce unemployment (Belot and Van Ours, 2000; Blanchard and Wolfers, 2000; Murtin and Robin, 2018; Escudero, 2018; Michaillat and Saez, 2019; Hussein al-Tai, 2019; Huang and Yang, 2021). For example, Belot and Van Ours (2000) conducted a study with the data of 17 OECD countries covering the period 1960–1999. According to the findings, the unemployment rate can reduce in countries with effective labor market institutions (e.g. taxes on labor, benefits provided to the unemployed and practices of protecting employment) because these institutions can tackle unemployment more efficiently. Similarly, Escudero (2018) states that active employment policies enable unqualified individuals to find jobs.

Numerous studies in the literature examine the link between public expenditures and unemployment from different perspectives and arrive at diverse conclusions. In fact, preliminary studies have dealt with the subject with more holistic approach. Following a similar technique, further research has focused on the impacts of the size of the public sector, total public expenditure and government expenditure concentration on the economic system. Several studies have also investigated the effects of efficient public expenditures, such as investments in fixed capital or incentives, unemployment and output. Nonetheless, the purpose of this study is to contribute to the literature by concentrating on how and in what way social expenditures, which are explicitly termed welfare spending, affect chronic unemployment. Social spending can have two alternative effects on unemployment. First, it positively affects employment through demand and reduces chronic unemployment. Secondly, it disrupts the fabric of the labor market by relatively increasing the alternative cost of work or wage expectations. However, which of these alternatives will emerge is one of the main problems that must be explained. In addition, it may also differ according to the conditions, such as the level of development of the countries, the economic situation they are in or the intensity of social expenditure. So, the study classifies countries into four clusters based on the intensity of their social spending, allowing for a comparison of the impact of

social expenditures on unemployment in groupings of countries with varied expenditure compositions. Frankly, in countries with low social spending intensity, social spending is expected to positively impact employment through demand and alleviate chronic unemployment through the multiplier mechanism. On the other hand, in countries with high social expenditure intensity, social expenditures can affect chronic unemployment by increasing the alternative cost of working. So, in the study, the consistency or validity of these expectations will also be tested with the empirical analysis.

Chronic unemployment is one of the greatest threats to economic systems. Therefore, future research can evaluate the effects of subcomponents of social spending on long-term unemployment. Furthermore, the sample size for this study is limited to only 30 OECD countries. In future work, it would be useful to broaden the sample may be enlarged to include Latin American, Asian or African countries, allowing for more precise comparisons.

4. Research methodology

Most of the preliminary studies in the literature focus on social spending as a subcomponent of public expenditures (Lindert, 1994; De Grauwa and Polan, 2005; Lindbeck, 2006; Castles and Obinger, 2007; Huber *et al.*, 2008). It is a matter of curiosity how the social spending which develops by the state in order to eliminate various economic and social risks affects chronic unemployment. Based on this problem, dynamic panel data analysis methods have been used in the study to determine the effects of social spending on unemployment. The study's fundamental hypothesis, shaped by the Abrams model and other empirical investigations in the literature, is that 'there is a significant relationship between social spending and chronic unemployment.' This hypothesis formulates with the following functional equation:

The Long-Term Unemployment Rate $= f$ (*Social Expenditures*; $\overline{\text{Other Factors}}$, $''such\,as\,GDPpc,\,Direct\,Investment,\,Inflation,\,Polpulation,\,etc.''$)

The relationship between variables is tested with the following model:

$$\text{LtermUn}_{it} = \alpha_0 + \beta_1 \text{segdp}_{it} + u_{it} \tag{1}$$

i: 1, ..., 30 (All Sample) t: 1, . . ., 28 (1991–2018) Model 1

i: 1, ..., 4 (less < x < 15%) t: 1, . . ., 28 (1991–2018) Model 2

i: 1, ..., 10 (15% ≤ x < 20%) t: 1, . . ., 28 (1991–2018) Model 3

i: 1, ..., 9 (20% ≤ x < 25%) t: 1, . . ., 28 (1991–2018) Model 4

i: 1, ..., 7 (25% ≤ x < more) t: 1, . . ., 28 (1991–2018) Model 5

for $i = 1, \ldots, N; t = 1, \ldots, T$, where N refers to the number of countries in the panel and T refers to the number of observations over time [2].

The dynamic panel data analysis I have used to determine how the change in the share of social expenditures in the gross domestic product affects chronic unemployment also considers the degree to which variables are affected by the lagged values of the previous periods. Thus, the dynamic interaction between variables can be investigated in the analysis process (Tatoğlu, 2012, p. 65).

At the first stage in the analysis process, the cross-sectional dependency of the series is examined with the test developed by Pesaran (2004). Cross-section dependency is essential for the selection of unit root tests. Without cross-sectional dependency, the first-generation unit root tests can be used. However, in the presence of cross-sectional dependency, second-generation unit root tests give consistent and effective results. Also, the "Cross Section

Generalized Dickey–Fuller" (CADF) test, one of the second-generation panel unit root tests and also takes into account the cross-sectional dependency used for testing the stationarity of the series (De Hoyos and Sarafidis, 2006, pp. 482–485; Safaridis, Yamagata and Robertson, 2009, p. 150).

Cointegration tests are used to determine whether there is a cointegrated relationship between variables that become stable at the same level under the assumption of homogeneity or heterogeneity. Whether the coefficient of equation (1) varies in terms of units is essential for selecting the appropriate cointegration test. For this reason, Delta Homogeneity Test developed by Pesaran and Yamagata (2008) performs. In this test, the null hypothesis is "the slope coefficient is homogeneous for all cross-section units ($\beta i = \beta$)", and the heterogeneity of the cross-section units is tested. According to the results, I can choose cointegration tests that can derive effective results under the assumptions of homogeneity or heterogeneity.

I use four cointegration tests developed by Westerlund in the analysis, which derive consistent results under the assumption of homogeneity. The group means statistics are the first two cointegration tests (Ga and Gt). The null hypothesis of the two tests is that "there is no cointegrated relationship between variables for all units." The other two tests (Pa and Pt) reflect the overall panel. In the last part, I use error correction models to examine the series' short- and long-term interactions. The mean group estimator assumes that units maintain heterogeneity in both the short and long run (Pesaran and Smith, 1995). However, the pooled mean group estimator estimates that units are heterogeneous in the short run and homogeneous in the long run (Pesaran *et al.*, 1999). Also, I preferred the Hausman test, which examines whether there is a significant difference between the long-term coefficients obtained by the two estimators for choosing between the mean group estimator and pooled mean group estimator.

5. Results and discussion
In the empirical part, I use the social spending and the long-term unemployment rate data of 30 OECD countries for the years 1991–2018 in order to determine the short- and long-run effects of social spending on unemployment. Neofiscal policies, which started to be implemented globally, especially in the 1990s, directly affected the economic structures of different countries. Indeed, policies on a national scale have begun to be determined according to the new conditions. In this context, while creating the data set, OECD countries, which generally have similar processes in the period mentioned above, were taken as a basis. The OECD includes members with very different sociological and managerial characteristics and has a common denominator in determining, implementing and reporting financial policies.

The main scope of the study is social spending realized by the public sector. In this context, "the share of social spending in GDP [3]" is selected as an independent variable in the analysis process. The dependent variable is long-term unemployment [4] within the scope adopted by the OECD. In order to reveal the effects of social spending on long-term unemployment rates in countries with different social spending intensities, I divide the countries in the sample into four categories according to their spending composition. I repeat the designed models according to these groups. Table 1 provides the summary statistics of the data set.

Factors such as the decrease or increase in the purchasing power of money, the change in the demographic structure and the transformation in the scope and diversity of public activities make it difficult to make an unbiased estimation of public social expenditures per capita. Social expenditures in GDP represent the portion of output in an economy that the government uses for social purposes. In addition, it is expected that external conditions such as changes in purchasing power or demographic differentiation can be neutralized in a model

Variables/descriptions	Codes/Groups[***]		Mean	Std.Dev.	Min.	Max.	Obs
Social Spending[*]	30 Countries	overall	19.567	6.219	2.600	34.200	840
Segdp =		between		5.912	6.071	29.035	30
Social Spending/GDP "x"		within		2.201	12.237	26.771	28
	x<15%[a]	overall	8.311	3.047	2.600	13.827	112
		between		2.399	6.071	10.572	4
		within		2.221	3.723	13.024	28
	15% ≤ x < 20%[b]	overall	17.285	2.208	11.300	24.630	280
		between		1.019	15.498	18.971	10
		within		1.984	10.082	23.412	28
	20% ≤ x < 25%[c]	overall	21.462	2.890	13.100	29.000	252
		between		1.464	19.719	24.162	9
		within		2.538	14.132	28.665	28
	25% ≤ x[d]	overall	26.823	2.366	22.400	34.200	196
		between		1.313	25.167	29.035	7
		within		2.029	22.349	33.009	28
Long Term Unemployment[**]	30 Countries	overall	29.678	16.764	0.220	73.500	840
LtUn =		between		15.588	1.547	56.302	30
Unemployed ≥12 months/		within		6.788	7.756	48.008	28
Unemployed Rate	x ≤ 15%	overall	11.140	14.445	0.22	45.95	112
		between		16.578	1.548	30.283	4
		within		4.766	1.436	26.806	28
	15% ≤ x < 20%	overall	24.889	15.168	4.060	64.340	280
		between		13.760	11.791	46.711	10
		within		7.806	4.126	43.220	28
	20% ≤ x < 25%	overall	38.329	15.515	5.350	73.500	252
		between		14.244	10.822	56.302	9
		within		7.711	16.406	56.567	28
	25% ≤ x	overall	33.689	13.145	9.490	62.370	196
		between		13.169	20.289	52.040	7
		within		4.819	20.586	46.940	28

Note(s): [*] Social spending is a cash assistance provided by the public sector. It includes the following; 1) directly provided for goods and services, 2) social-purpose tax expenditures, 3) low-income households, elderly people are benefits provided for the disabled, the sick, the unemployed, or the youth.cash in current US$.[OECD (2021a,d), Social spending (indicator). DOI: 10.1787/7497563b-en (Accessed on 22 November 2021)]
[**] The long-term unemployment refers to people who have been unemployed for 12 months or more. The long-term unemployment rate shows the proportion of these long-term unemployed among all unemployed. [(OECD (2021c), long-term unemployment rate (indicator). DOI: 10.1787/76471ad5-en (Accessed on 22 November 2021)]
[***] K-means clustering method has been used to determine country groups. "a", "b", "c" and "d" represent thresholds for social spending intensity. Also, threshold values have been determined by reference to the overall mean, between minimum and maximum statistics of the series. The mean value gives the overall average of the group. Between minimum indicates the lowest value, and between maximum is the highest value for the relevant country group
[a] Türkiye, Chile, Mexico and Korea Rep
[b] Iceland, United States, Israel, Australia, Ireland, Canada, Switzerland, Czech Republic, Japan and New Zealand
[c] United Kingdom, Portugal, Greece, Poland, Luxembourg, Netherlands, Norway, Spain and Italy
[d] Germany, Denmark, Belgium, Austria, Finland, Sweden and France

Table 1.
Summary statistics

that references the share of social expenditures in GDP. Therefore, the variable of "social spending in GDP" has been preferred assuming that it will reflect the social aspect of the state more unbiasedly in analysis.

In order to examine the stationarity of the variables used in the study, it is first necessary to determine whether they have cross-sectional dependencies. Ultimately, the estimates to be made

with the first-generation unit root tests will be inconsistent in the presence of cross-sectional dependency. In this context, I have performed the Pesaran (2004) Lagrange multiplier for cross sectional dependence (CDLM) test for using the (N > T) data of 30 OECD countries for 28 years.

The results of the CD test in Table 2–A show that the null hypothesis "There is no cross-sectional dependency in the series" is rejected at a 1% significance level ($p < 0.01$) for all variables. According to the findings, there is cross-section dependence in all variables. Therefore, I will use second-generation unit root tests in the stationarity test. Table 2–B gives the values of the CADF test, which can derive consistent estimates by taking into account the cross-sectional dependency in the series. It shows the results of the cross-sectionally augmented Dickey-Fuller (CADF) unit root test for the variables considered. According to the test results, I understand that the null hypothesis "The series under consideration is not stationary" could not be rejected for variables at the level, and they contain unit roots. At the first level, the null hypothesis is rejected at a 1% significance level ($p < 0.01$), so the series become stationary.

Table 2–C shows the homogeneity test results for the four models constructed within the analysis. The null hypotheses of the Delta_tilde and Corrected Delta_tilde tests are that there is a homogeneous slope coefficient (i = β) for all cross-section units. According to the test results, the null hypothesis cannot be rejected for all five models.

Because the series related to social spending and the unemployment rate is stable at I (1), the Westerlund cointegration test has been used to test whether there is a cointegrated relationship between them in the long run. Table 2–D lists the test results. According to the findings, the null hypothesis that "there is no cointegrated relationship between variables" in the model developed for the whole sample is rejected by all four subtests (Gt: $p < 0.01$; Ga: $p < 0.05$; Pt: $p < 0.05$; Pa: $p < 0.01$). The country group where the size of social spending is "15% and less" was also rejected by three of the four tests (Gt: $p < 0.05$; Pt: $p < 0.05$; Pa: $p < 0.05$) in the model that examines the cointegrated relationship between variables. In addition, in the model where the size of social expenditures is between 15 and 20%, it is observed that the null hypothesis is rejected by the Gt ($p < 0.01$), Pt ($p < 0.01$) and Pa ($p < 0.10$) subtests. In the model that tests the cointegrated relationship in the group with a social

Cross sectional dependency/Unit root	CDLM A		Unit Root Test B			
	Test stats	p-value	CADF – I(0)	p-value	CADF – I(1)	p-value
Segdp_30	33.547***	0.000	0.374	0.646	−13.674***	0.000
Segdp- $x<15\%$	5.888***	0.006	−0.329	0.371	−2.718***	0.003
Segdp-$15\%\leq x<20\%$	7.146***	0.006	−1.280	0.100	3.254***	0.001
Segdp-$20\%\leq x<25\%$	9.33***	0.000	−0.296	0.384	−3.600***	0.000
Segdp-$25\%\leq x$	6.835***	0.000	−0.196	0.422	−7.865***	0.003
LtUn _30	10.673***	0.000	0.093	0.537	−10.716***	0.000
LtUn - $x<15\%$	4.237***	0.008	−0.909	0.182	−3.113***	0.001
LtUn -$15\%\leq x<20\%$	4.721***	0.000	−1.127	0.163	−3.166 ***	0.001
LtUn -$20\%\leq x<25\%$	5.882***	0.000	−0.127	0.449	−2.759***	0.003
LtUn -$25\%\leq x$	6.968***	0.000	−0.186	0.426	−7.410***	0.001

Homogeneity/Cointegration	Delta Tilde C			Westerlund test D		
	(p-value)	Lag	Gt (p-value)	Ga (p-value)	Pt (p-value)	Pa (p-value)
LtUn-segdp (30)	0.25 (0.6173)	1.1	−2.707 *** (0.000)	−8.899** (0.043)	−10.298** (0.014)	−6.472*** (0.006)
LtUn-segdp $x<15\%$	0.19 (0.6638)	1.25	−2.944*** (0.005)	−9.676 (0.181)	−4.674** (0.044)	−9.553** (0.012)
LtUn-segdp $15\%\leq x<20\%$	0.18 (0.6545)	1.1	−2.800*** (0.000)	−5.962 (0.765)	−7.327 *** (0.004)	6.293 * (0.091)
LtUn-segdp $20\%\leq x<25\%$	0.07 (0.7907)	0.67	−2.297 ** (0.045)	−12.436 *** (0.002)	−5.773 * (0.091)	−7.125 ** (0.035)
LtUn-segdp $25\%\leq x$	0.02 (0.9511)	1.57	3.291*** (0.000)	−11.101 ** (0.029)	−5.937 (0.022)	−6.788* (0.080)

Source: Author's estimation
*, ** and *** indicate levels of significance at 1%, 5% and 10%, respectively

expenditure size between 20% and Ga rejects 25%, statistically significant null hypotheses ($p < 0.01$), Pt ($p < 0.10$) and Pa ($p < 0.10$) subtests. Finally, in the country group with a size of social spending greater than 25%, the null hypothesis also rejected by all four subtests (Gt: $p < 0.01$; Ga: $p < 0.05$; Pt: $p < 0.01$; Pa: $p < 0.01$).

Under the assumption that the variables are I (1) and cointegrated, the error terms must be I (0) for all i, and they are independently distributed across t. taking the maximum lag length for LtUn and Segdp is confirmed by Akaike Information Criterion (AIC) and Schwarz Bayesian Criterion (SBC), which is one lag. So, the models such as ARDL (1, 1) proposed by Pesaran *et al.* (1999) is as follows:

$$LtUn_{it} = \gamma_i + \lambda_i LtUn_{i,t-1} + \delta_{0i} segdp_{it} + \delta_{1i} segdp_{i,t-1} + \varepsilon_{it} \tag{2}$$

Also, the error correction model is:

$$\Delta LtUn_{it} = \phi_i \left(LtUn_{i,t-1} - \widehat{\theta}_{0i} - \widehat{\theta}_{1i} segdp_{i,t-1} \right) + \delta_{1i} segdp_{i,t} + \vartheta_{it} \tag{3}$$

where $\phi_i = -(1 - \lambda_i)$, $\widehat{\theta}_{0i} = \frac{\gamma_i}{1-\lambda_i}$, $\widehat{\theta}_{1i} = \frac{\delta_{0i}+\delta_{1i}}{1-\lambda_i}$.

With the panel error correction models, the direction of interaction between variables can be observed in the short and long-term context. Table 3 contains the mean group estimator results for the models.

I use the Hausman test to determine the heterogeneity of long-term parameters for the five models considered in the analysis. Thus, it will be determined which of the mean group estimators pooled with the mean group estimator is appropriate. The test results show that the null hypothesis based on "the existence of a common long-run coefficient" cannot be rejected for all models. Therefore, a pooled mean group estimator is suitable for all models.

Model 1 considers the relationship between the share of social spending in GDP and chronic unemployment for the whole sample. It shows that the error correction term, which reveals the long-term interaction between the two variables, is negative and statistically significant at the 1% level. However, only about 7% of the imbalances between variables can be corrected in the next period. According to Model 1, there is a statistically 1% significant and positive relationship between the share of social spending in GDP and chronic unemployment in the short term ($p < 0.01$). One unit increase in the share of social spending in GDP increases the unemployment rate by 0.55 units in the short run. In the long run, the interaction becomes more severe. It is seen that a one-unit increase in the share of social spending in GDP, in the long run, increases the unemployment rate by 2.07 units ($p < 0.01$).

Model 2 gives the analysis results for four countries with the lowest social spending intensity (15% or less). The error correction term, which shows the long-term interaction between variables, is negative and statistically significant at a 1% level. According to the error correction term, 28% of the imbalances that will occur between the variables will be eliminated in the next period. Besides, it shows that the coefficients reflecting the effects of social spending on chronic unemployment in the short and long run are positive but statistically insignificant. According to Table 3, the increases in the share of social spending in GDP will affect Türkiye and South Korea's unemployment rate in the short-term positive ($p < 0.01$). In Mexico, unlike other countries, the increase in social expenditures reduces chronic unemployment by 0.42 units ($p < 0.05$) in the short run.

Model 3 includes the results of the analysis designed in a sample of countries that are among developed countries, such as the USA, Canada, Australia, Japan, Ireland and Switzerland and whose share of social expenditures in GDP varies between 15 and 20%. According to the results obtained by the pooled mean group estimators, the error correction term showing the long-term interaction between the variables is negative and statistically

	Model 1 30 Countries	Model 2 x< 15%	Model 3 15% < x<20%	Model 4 20% < x<25%	Model 5 25% < x
segdp (Long-Run)	2.0722***	0.0926	0.3844	0.8522***	0.7170***
Error correction term (φ)	−0.0648***	−0.2831***	−0.0669*	−0.1469***	−0.1611**
segdp −1 (Short Run)	0.5564***	0.3466	0.7638***	0.5484**	0.4068***
Constant	−2.2762***	1.2588***	−0.2872***	−1.9925***	−2.1042**
Log Likelihood	−879.2049	−128.7257	−226.1181	−316.4534	−210.7991
Obs	810	108	270	243	189
Group	30	4	10	9	7
Hausman Test: Prob > χ^2	0.97	1.77	0.05	0.19	0.15

Countries	Long-Run	ECT	Short Run
Türkiye	0.7093	−0.1244*	0.8062***
Chile		−0.2574**	0.1405
Mexico		−0.1938*	−0.4244**
Korea Rep		0.0142	0.9672***
Iceland	0.2379	−0.1164	1.1088***
The United States		−0.1640***	1.572***
Israel		−0.0532*	0.7251
Australia		−0.0666*	−0.0007
Ireland		−0.0332	1.006***
Canada		−0.0140	0.8803***
Switzerland		−0.3327**	0.0778
Czech Republic		−0.0852	0.9294***
Japan		0.1129**	0.3301***
New Zealand		−0.0854*	0.6243***
The United Kingdom	0.1951***	−0.0822**	0.6643***
Portugal		−0.0366	0.8183***
Greece		0.0115	0.9522***
Poland		−0.0332	0.3315
Luxembourg		−0.1846*	0.0988
The Netherlands		−0.1446	0.2217
Norway		−0.1932*	0.0777
Spain		−0.0118	2.0754***
Italy		−0.0234	0.4240*
Germany	0.1895***	−0.0218	0.5027***
Denmark		−0.2162***	0.5939***
Belgium		−0.0462	0.4221***
Austria		−0.5707***	−0.0712
Finland		0.0053	0.6393***
Sweden		0.0030	0.6410***
France		−0.0382	0.7197***

Source: Author's estimation
*, ** and *** indicate levels of significance at 1%, 5% and 10%, respectively

significant at the 10% level. However, only 7% of the imbalances that will arise between variables in a certain period will be eliminated in the next period. A one-unit increase in the share of social expenditures in GDP increases chronic unemployment by an average of 0.76 units in the short run ($p < 0.01$). Although the interaction between the two variables is in the same direction, it is not statistically significant in the long run. Table 3 provides an

opportunity to make a detailed assessment of ten countries. A change in the share of social expenditures in GDP in the short term affects chronic unemployment in the same direction in Iceland, the USA, Ireland, Canada, Japan, New Zealand and the Czech Republic ($p < 0.01$).

Model 4 enables us to test the analysis designed for nine countries whose social spending intensity varies between 20 and 25%. According to the findings, the error correction term, which shows the long-term interaction between variables, is negative and statistically significant at a 1% level. Approximately 15% of the imbalance that will occur in a period between variables will be eliminated in the next period. A one-unit increase in the share of social expenditures in GDP will increase chronic unemployment by 0.55 units in the short run ($p < 0.05$). In the long run, the interaction between the two variables is in the same direction ($p < 0.01$). Table 3, which includes detailed results for nine countries, shows that the error correction term is statistically significant for the United Kingdom ($p < 0.05$), Luxembourg ($p < 0.10$), and Norway ($p < 0.10$). In this context, 8% of the imbalances between the two variables in the UK, 19% in Luxembourg and 19% in Norway will be eliminated in the next period. In addition, the increase in the share of social expenditures in GDP in the short term in the United Kingdom, Portugal, Greece and Spain increases chronic unemployment in the short term ($p < 0.01$).

Finally, Model 5 reflects the analysis performed in a sample of seven countries with a social spending intensity of 25% or more. According to the findings, the error correction term, which shows the long-term interaction between variables, is negative and statistically significant at a 1% level. Approximately 16% of the imbalance that will occur in a period between variables will be eliminated in the next period. It is also observed that a one-unit change in social expenditure intensity in both the short and long run will affect chronic unemployment in the same direction ($p < 0.01$). One unit increase in social spending intensity will increase the unemployment rate to 0.41 in the short run; in the long run, it will increase by 0.72 units. According to the detailed results of the seven countries in Table 2, the error correction term is negative and statistically significant only for Denmark ($p < 0.01$) and Austria ($p < 0.01$). 22% of the imbalances between variables in Denmark and 57% in Austria can be eliminated in the next period. In addition, a one-unit change in the share of social expenditures in GDP in Germany, Denmark, Belgium, Finland, Sweden and France affects chronic unemployment in the same direction in the short run ($p < 0.01$). Among the countries in this group, only in Austria, a statistically insignificant but reverse interaction is observed between social spending intensity and unemployment.

All these findings show that social spending in GDP has an augmentative effect on chronic unemployment. There might be a variety of motives for this interaction: 1) it is possible to increase the alternative cost of working through social expenditures. Frankly, the potential of a guaranteed income or a sense of security may make someone eager to be unemployed. 2) The individual's salary expectations may rise due to social expenditures. In other words, this may be the outcome of the rising pressure of social spending on wages in the labor market. 3) Taxes and similar tools used to finance social expenditures can inflict an undue strain on the economy and labor market.

It is not a coincidence that the countries with the lowest expenditure intensity are clustered within the already developing economies. On the other hand, those with the highest expenditure intensity are concentrated in developed countries. Individual living circumstances are better in countries with a large concentration of social spending. However, the distorting effects of social spending on the labor market are considerably more robust in these economies.

According to the descriptive statistics in Table 1, the chronic unemployment rate is over 35%, especially in countries with a social spending intensity of more than 20%. This ratio indicates that 35 out of every 100 unemployed persons in a particular period can still not find work in the long run. According to the findings, raising the percentage of social expenditures

in GDP impairs the labor market's ability to create self-treatment against unemployment and even worsens it, increasing chronic unemployment. Of course, social spending is not the only source of the problem. Social spending is composed of numerous subcomponents. The reason might be the predominance of passive elements in these sub-headings. In this context, more concrete policy suggestions will be made based on evaluations of these sub-items in future research.

Based on these data, I may conclude that the intensity of social expenditures in GDP influences the workforce composition in favor of the unemployed. Although not considered in my models, I anticipate that a rise in the proportion of social spending in GDP will have a contractionary effect on employment. This connection is particularly pronounced in countries with high spending intensity. The phenomenon of chronic indicates that unemployment has grown and employment has been negatively impacted, depending on the level of social expenditure. In other words, the intensity of social expenditures can be regarded as a factor in the progression of long-term and chronic unemployment.

6. Concluding remarks

Social expenditures aim to increase social welfare by ensuring that the person has a minimum standard of living. *Unemployment* is a risk affecting the quality of life and social welfare. One of the welfare state's primary duties is to eliminate unemployment's harmful effects on individuals and society. Social spending is the principal instrument for achieving this objective. Consequently, these expenditures can compensate for the welfare loss. Thus, the widespread negative effect of unemployment on socioeconomic life can be prevented (at least partially). It is a matter of curiosity how and to what extent social expenditures, which shape toward eliminating the negative reflections of unemployment, will affect chronic unemployment on a macro scale because social spending can positively affect the employment volume through the expansion effect, which will affect the total demand level. However, there is no doubt that increasing social expenditures also cause the need for extra public finance. Remarkably, the difficulties in financing social expenditures lead to an increase in the need for public borrowing. This situation puts upward pressure on interest rates in many developing countries experiencing structural problems and negatively affects investments and employment. Unfortunately, the mentioned chronic dilemma often causes social spending programs to be seen as the first item to be abandoned.

The study has revealed the effects of public social spending on long-term unemployment with the data of 30 selected OECD countries between 1991 and 2018. The error correction models for the panel and country groups show that social spending intensity and chronic unemployment are cointegrated. In addition, I found that changing in social expenditures in GDP in all models will affect chronic unemployment in the same direction in the short and long term. These findings support the results of studies in the literature dealing with the relationship between public sector size and unemployment. Nevertheless, it reflects that social spending feeds chronic unemployment differently and uniquely.

Long-term unemployment, which the research takes to reference, is the percentage of the jobless who have been out of work for more than 12 months out of the total unemployed. It can also be described as chronic unemployment. The high long-term unemployment rate is indicative of dysfunctional labor markets. This scenario is highlighted as a specific concern area in developing employment policy. The findings obtained with the models constructed during the analysis revealed that an increase in the share of social expenditures in GDP would increase the share of those who have been unemployed for 12 months or more in the total unemployed. This interaction is higher in countries with high social spending, such as Denmark, Austria and Sweden. However, in countries with a very low social expenditure density, such as Türkiye or Mexico, the interaction weakens and is observed only in the short term.

There is much evidence in the literature that governmental policies designed with incentives for active employment or investments reduce unemployment by favorably influencing output/employment favorably (Escudero, 2018; Murtin and Robin, 2018; Holden and Sparrman, 2018; Brüchner and Pappa, 2012; Sparrman, 2011; Herwatz and Theilen, 2017; Hussein al-Tai, 2019; Michaillat and Saez, 2019; Kang, 2021; Huang and Yang, 2021; Albertini et al., 2021; Goemans, 2022). How social expenditures boost total demand will affect employment is worth addressing. This study's findings reveal that social spending in the sample of OECD countries is far from showing an effect of alleviating the unemployment problem by creating additional employment. In this regard, one may argue that the social expenditures component mitigates the demoralizing impacts of unemployment, similar to passive employment programs. However, it raises unemployment rather than reducing it. Undoubtedly, after the 1990s, with the effects of neoliberal policies, which were widely and intensely followed in different countries, significant changes were made in the structure of the public sector and the composition of social expenditures. The results obtained in the study also reveal the effects of these policies followed.

The most significant limitation of this study is selecting a sample of a restricted number of countries and a certain period to generate a balanced panel data set. However, even within this sample, it is apparent that Türkiye, Mexico and Chile are notably distinct from other countries. In this regard, it is believed that future research can diversify empirical data on this issue by separating countries' groups. In addition, it is believed that future research should examine the effects of subcomponents of social spending on the unemployment rate. Specifically, considering education expenses within the purview of social expenditures makes it possible to investigate whether education and other social expenditures reflect on unemployment differently.

Notes

1. There are many empirical studies on public expenditures, unemployment and social spending. For convenience, it is mentioned here and provides a summary in Appendix.

2. Considering the basic assumptions of the preferred method, a single independent variable and its lagged values are included in the construction phase of the model. This preference also constitutes the most critical limitation of the study. There are two reasons for such a restriction. First, there is no concrete and generally accepted conclusion in the literature regarding the effects of various variables such as GDP per capita, capital investment, public sector size, population, inflation, wages or migration on the long-term/chronic unemployment rate. In addition, the missing data for the countries in the sample is another reason that prevents such a comprehensive analysis from being carried out with a balanced panel data set. In this framework, empirical design is based on a single explanatory variable ARDL model based on the basic assumptions of simple regression models. Also, it is assumed that other factors potentially affecting chronic unemployment are estimated in the error term. It is thought that this model can be developed by examining the effects of other factors mentioned in future studies on chronic unemployment.

3. Factors such as the decrease or increase in the purchasing power of money, the change in the demographic structure, and the transformation in the scope and diversity of public activities make it difficult to make an unbiased estimation of public social expenditures per capita. Social expenditures in GDP show how much of the output in an economy is used for social purposes by the government. In addition, it is expected that external conditions such as changes in purchasing power or demographic differentiation can be neutralized in a model that references the share of social expenditures in GDP. Therefore, the variable of "social spending in GDP" has been preferred assuming that it will reflect the social aspect of the state more unbiasedly in analysis.

4. An unemployed is a person of working age who is ready and willing to work but cannot find a job. This definition is essential in terms of making comparisons between countries on an international scale. However, this study chose the long-term unemployment rate as the dependent variable.

In contrast to the unemployment rate, the "long-term unemployment rate" represents the share of all unemployed people who have been unemployed for 12 months or more. This rate is assumed to reflect the chronic unemployment phenomenon more concretely in the analysis.

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Appendix

Author/s	Period	Country	Variables	Methodology	Main findings
Karras (1993)	1955–1984	37 Countries	Employment, output, permanent and transitory government consumption	Panel OLS, GLS, 2SLS, 2SGLS	The permanent changes in government consumption impact output and employment more than temporary (or cyclical) changes. The output elasticity of government consumption is positive but declines with increases in government size
Abrams (1999)	1984–1993	20 OECD member countries	Government size, unemployment	OLS	Unemployment increases as the size of the public sector expands in industrialized countries
Daveri and Tabellini (2000)	1965–1995	14 OECD member countries	Unemployment, male unemployment, GDPpc, schooling, real wage and taxes	OLS, GLS, 2SLS	Taxes on the labor factor put pressure on real wages, cause a decrease in labor demand and an increase in unemployment

Table A1.
Review of literature

(*continued*)

Author/s	Period	Country	Variables	Methodology	Main findings
Belot and Van Ours (2000)	1960–1999	17 OECD member countries	Tax, replacement rate, employment protection, union density, centralization and interactions	Panel OLS (Country fixed effects and Time period fixed effect)	The unemployment rate can reduce in countries with effective labor market institutions (taxes on labor, benefits provided to the unemployed, practices protecting employment, etc.)
Blanchard and Wolfers (2000)	1960–4, 1990–4, 1995+	20 OECD member countries	Replacement rate, benefit length, active labor policy, employment protection, tax wedge, union coverage, union density and coordination	Panel OLS (Country fixed effects and Time period fixed effect)	The macroeconomic environment and institutions can lead to a substantial decline in unemployment
Christopoulos and Tsionas (2002)	1961–1999	10 European countries	Unemployment rate, the size of public sector	Panel causality	There is unidirectional causality from government size to the unemployment rate
Alesina et al. (2002)	1960–1996	18 OECD member countries	Public expenditures (government wage bill, purchases of goods by the government and transfers), wage, taxation (taxes on labor income, indirect taxes and business taxes), labor cost	Panel OLS, 2SLS	The increase in public expenditures primarily affects the wage components of employees in the public sector and the labor market.
Algan et al. (2002)	1960–2000	17 OECD member countries	Public employment, replacement rate, benefit length, union density/ coverage, coordination, tax rate, protection	OLS, GLS	Employment created in the public sector decreases the labor force participation rate and increases unemployment
Christopoulos et al. (2005)	1961–1991	10 European countries	Public sector size, unemployment rate	Panel causality	The study found that there is unidirectional causality from government size to unemployment rate

(continued) **Table A1.**

Author/s	Period	Country	Variables	Methodology	Main findings
Feldman (2006)	1985–2002	19 industrialized countries	Public expenditures, fiscal size and unemployment rate	GLS estimates with country specific random effects	When public expenditures expand, the unemployment rate will increase
Abrams and Wang (2006)	1970–1999	20 OECD member countries	Fiscal size, social transfers, financial incentives and unemployment rate	Panel OLS, Structural error correction model	The fiscal size of the state is one of the major determinants of the unemployment rate
Sparrman (2011)	1960–2007	20 OECD member countries	Public expenditures, unemployment rate, wage payment, public investment and none-wage payment	Panel OLS, Random/Fixed effect	The increase in public expenditures reduces the unemployment rate
Brückner and Pappa (2012)		10 OECD member countries	Public expenditures, labor force and unemployment rate	VAR, sVAR	A shock in public spending could directly affect critical variables in the labor market.
Çelikay (2017)	2008–2015	Turkey, 81 cities	Unemployment rate, public spending and internal migration	Panel causality	There is a one-way causality between immigration and unemployment rates and public spending in the short and long run. The versatile and intricate relationship between public spending, one of the most important instruments of fiscal policy with unemployment and migration are both a cause and a consequence of regional imbalances
Holden and Sparrman (2018)	1980–2007	20 OECD member countries	The change in government purchases, labor-market institutions, monetary regime, The export market indicator, fiscal consolidation episodes, gross public debt	The robust WG estimator, sVAR	Increased government purchases equal to 1% of GDP are estimated to increase the employment rate by 0.24% points

Table A1.

(*continued*)

Author/s	Period	Country	Variables	Methodology	Main findings
Murtin and Robin (2018)	1985–2007	9 OECD member countries	Unemployment, job destruction rate, job finding rate, tax wedge, Product market regulation, Employment protection, ALMP training, ALMP incentives, ALMP placement and employment services and initial replacement rate	Simulated method of moments,	Placement and employment services, UI benefit reduction and product market deregulation are the most prominent policy levers for unemployment reduction
Escudero (2018)	1985–2010	31 advanced countries	Labor market indicators (Unemployment rate, low-skilled unemployment rate, employment rate, low-skilled employment rate, LFPR, low-skilled LFPR), training, employment incentives, cluster, start-up incentives, gross replacement rate, union density	OLS, FGLS	Active labor market policies matter at the aggregate level, mainly through appropriate management and implementation

Table A1.

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