7. THE ROLE OF GENDER IN THE GOVERNMENT EXPENDITURE AND UNEMPLOYMENT NEXUS: AN INVESTIGATION AT REGIONAL LEVEL FOR TURKEY

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Abstract

We aim to explore the role of gender in the government expenditure and unemployment nexus at regional level for Turkey. For this aim, we use the dataset covering the period 2004-2019 for 26 NUTS-2 regions in Turkey and employ a panel ARDL approach. The obtained empirical findings show that government expenditure and gross domestic product per capita provide overall, female, and male unemployment rates to diminish in the long term, which means the Keynesian approach is valid on the long term. Nevertheless, on the short term, government expenditure induces rises in the male and female unemployment rates. This result indicates the validation of the Abrams Curve Hypotesis in male and female unemployment rates on the short term. Also, inflation rate increases overall and male unemployment rate on the long term, but having significant and positive impact on only female unemployment rate on the short term. All these findings show that gender has a significant role in this nexus. The expected contribution of this study to literature is to investigate the impact of government expenditure on unemployment by gender at regional level for Turkey. We are of opinion that our empirical findings can guide policy makers in active plans fighting unemployment.

Keywords: unemployment, government expenditure, gender, labour market, regional, Abrams Curve, gender discrepancy

JEL Classification: E24, J16, J64, R23, R5, R53

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1. Introduction

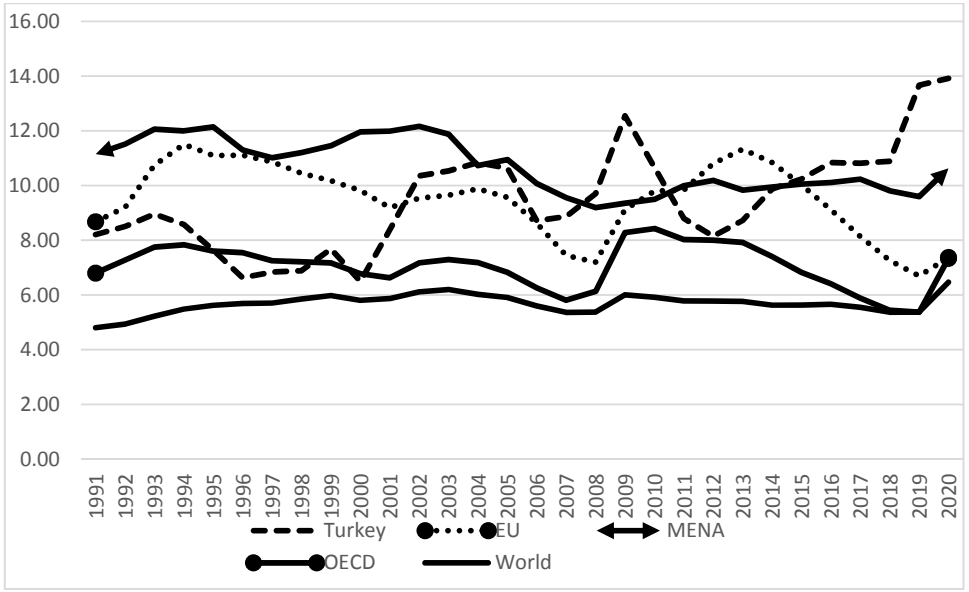
One of the most significant macroeconomic performance indicators of countries is the unemployment rate. Especially, this case is to be more significant in countries which have high level unemployment rate, such as Turkey. In this sense, unemployment rate reached highest level, at 14.7 percent, in February 2019, after the 2008 Global Crisis in Turkey as a developing country (TURKSTAT, 2021). This rate nearly is the highest level in the republic's history.

According to the report of OECD (2018), unemployment rate in Turkey is higher than the average of the OECD countries in the 2002-2017 years. Also, there is a large increase in the unemployment differential based on gender in Turkey as against the OECD countries since 2008. In addition, the WESO Report by ILO (2019) shows that global unemployment rate jumped from 5.0 percent to 5.6 percent in 2009. It has decreased over the last decade. However, unemployment rate has been on an increasing trend in some Central and Western Asian countries, such as Turkey during the recent years.

As shown in Figure 1, Turkey had a unemployment rate below the average of the EU countries before 2000. However, after 2000, unemployment rate has prominently increased in Turkey, unlike in other countries. Especially, unemployment rate has further increased as compared to the EU and the OECD countries due to the currency and debt crisis of Turkey in 2018 and COVID-19 outbreak in 2019.

Figure 1

The Trend of Unemployment Rate for Turkey and Some Country Groups (1991-2020) (%)



Note: EU: European Union, MENA: Middle East & North Africa.

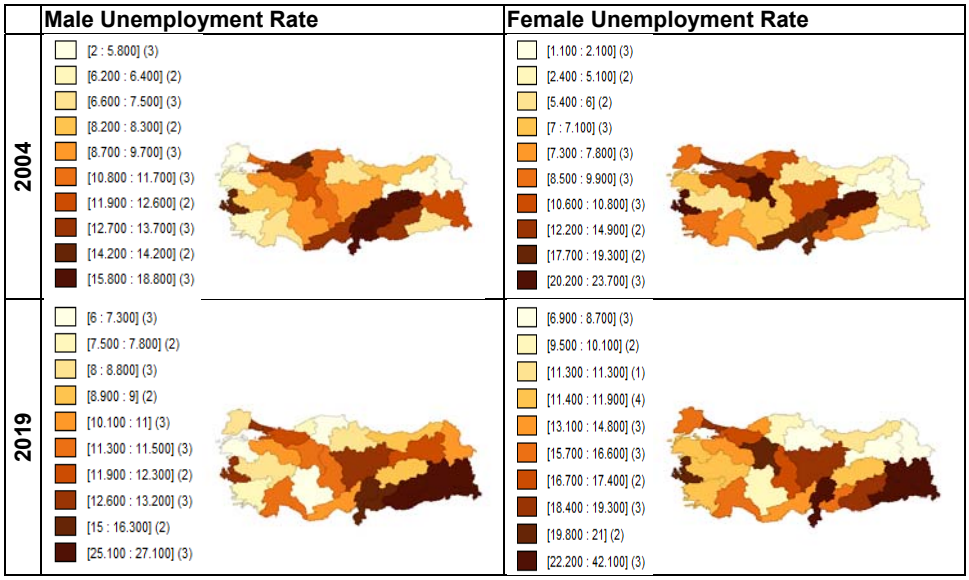
Source: Own graph. Tha data is obtained from WDI (2021) database.

Furthermore, unemployment level has also differed at regional and gender level in Turkey. Figure 2 demonstrates the regional distribution of female and male unemployment rates in Turkey for 2004 and 2019. As is shown in Figure 2, there are regional differentials in unemployment by gender at NUTS-2 level in Turkey. These differentials have prominently rose from 2004 to 2019. Moreover, female and male unemployment have further increased in the Eastern regions as compared to the Western regions. The reason why unemployment is high in these regions might be that agricultural production has gradually decreased in these regions over the recent years. As agriculture and livestock sectors have a significant share in the economy of these regions, decreasing production in these regions has affected employment negatively.

In addition, Güçlü (2017) asserts the existence of two facts regarding unemployment at regional level in Turkey. Firstly, there are significant discrepancies in regional unemployment. Secondly, the unemployment rates of neighboring regions are usually close to each other. And, they also tend to cluster (Güçlü 2017: 94). One may see the existence of these two situations in unemployment by gender in Figure 2.

Figure 2

The Regional Distribution of Unemployment Rate by Gender in Turkey (2004-2019) (%)



Source: Own graph. The data is obtained from TURKSTAT (2021) database.

Generally, we may say that Turkey has a high unemployment rate and that also the unemployment discrepancies among regions and genders have gradually deepened. Hence, this sitiuation is a significant problem which should be solved for Turkey.

In order to solve this problem, there are many studies in literature which have suggested different ways. Government expenditure is also one of these ways. There are two different

approaches which explain the government expenditure and unemployment nexus in theory. According to the classical approach, which is the first of them, the interventions that government makes via public expenditures affect the prices to be formed in the market and have a detrimental effect on the distribution of resources. Thus, growth in the economy is hampered, production is negatively affected and unemployment increases. The Keynesian approach, on the other hand, argues that public sector activity affects the market in a manner that is demanding and full-employment, and emphasizes the need for the state to play an active role to prevent unemployment by means of financial instruments (public expenditures) (Özuğurlu, 2005; Kanca and Bayrak, 2015).

Furthermore, there are many studies which have taken into consideration the government expenditure and unemployment nexus in literature. Almost all papers conclude that there is a positive link between government expenditure and unemployment in accordance with Abrams[3] hypothesis (see Abrams, 1999; Christopoulos and Tsionas, 2002; Christopoulos *et al*., 2005; Feldmann, 2006; Şahin and Özenç, 2007; Feldmann, 2009; Feldman, 2010; Wang and Abrams, 2011; Aysu and Dökmen, 2011; Mahdavi and Alanis, 2013; Al-Saraireh, 2014; Bayrakdar, 2014; Ding, 2014; Nwosa, 2014; Kasau *et al*., 2015; Abubakar, 2016; Dineri and Destek, 2016; Matsumae and Hasumi, 2016; Erdoğan *et al*., 2018; Kovacı *et al*., 2018; Afonso *et al*., 2018; Ertekin, 2020; Özer, 2020). In addition, there are few studies which have found a negative relationship among these variables (Aslan and Kula, 2010; Kanca and Bayrak, 2015; Obayori, 2016; Topal, 2017; Holden and Sparrman, 2018; Manel and Drioucheb, 2020; Saraireh, 2020).

In these studies, researchers have generally considered general unemployment and ignored gender dimension in the investigation of government expenditure and unemployment nexus. Moreover, Altuzarra (2015) has suggested that discrepancies in the drivers of unemployment rate between females and males should be considered to fix the impact of cyclical shocks in determining the government policies.

Therefore, we are of opinion that ignoring the gender discrepancies in the studies related to unemployment creates a significant research gap in the literature. Therefore, unlike the previous studies, we aim to investigate the government expenditure and unemployment nexus for Turkey, considering gender discrimination. For this aim, we use the dataset covering the period from 2004 to 2019 and employ a panel ARDL approach.

Our study has differed from the previous studies in two views. First, to the best of our knowledge, although time dimension generally has been taken into consideration in these studies, the country/region dimension has been ignored. Hence, almost all previous studies only have applied the time series approach, while we employ a panel approach. Therefore, the number of observations has increased. Second, one of the most important contributions of our study is to consider gender discrimination in unemployment in contrast to the previous studies.

Our study proceeds as follows. In Section 2, we review the previous studies investigating the government expenditure and unemployment nexus. Further, in Section 3, we give information about the dataset and method which are employed in the analysis. Later, we present the obtained empirical findings from baseline estimations in Section 4. Lastly, we discuss on emprical findings and suggest policy impllications for policy makers in Section 5.

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[3] *Abrams (1999) asserts that the government size and unemployment nexus is positive. Thus, this nexus was stated as the Abrams Curve. Abrams (1999) consider the government size as total government expenditure by gross domestic product.*

In this study, as contribution to literature, we investigate gender dimension of the government expenditure and unemployment nexus at regional level for Turkey, which has high unemployment rate and gender discrepancies.

2. Literature Review

There are many studies[4] in literature which investigate the government expenditure and unemployment nexus. In Table 1, we summarize the results of these studies. As is known, the first study was made by Abrams (1999). He reveals that the relationship between government size and unemployment is positive. Later, this result was stated as the Abrams Curve.

Abram's theorem has been frequently considered in the subsequent studies and their results have generally promoted this theorem (See Christopoulos and Tsionas, 2002; Christopoulos *et al*., 2005; Feldmann, 2006; Şahin and Özenç, 2007; Feldmann, 2009; Feldman, 2010; Wang and Abrams, 2011; Aysu and Dökmen, 2011; Mahdavi and Alanis, 2013; Al-Saraireh, 2014; Bayrakdar, 2014; Ding, 2014; Nwosa, 2014; Kasau *et al*., 2015; Abubakar, 2016; Dineri and Destek, 2016; Matsumae and Hasumi, 2016; Erdoğan *et al*., 2018; Kovacı *et al*., 2018; Afonso *et al*., 2018; Ertekin, 2020; Özer, 2020). However, there are few studies which have not supported the theorem. According to the results of these studies, government expenditure affects unemployment negatively (See Aslan and Kula, 2010; Kanca and Bayrak, 2015; Obayori, 2016; Topal, 2017; Holden and Sparrman, 2018; Manel and Drioucheb, 2020; Saraireh, 2020).

Table 1

The Summary of Studies in Related Literature

Author	Country	Period	Method	Result
Abrams (1999)	7 OECD countries	1984-1993	OLS	+
Christopoulos and Tsionas (2002)	10 European countries	1961-1999	Panel VAR	+
Christopoulos *et al*. (2005)	10 European countries	1961-1999	Panel CA	+
Feldmann (2006)	19 Industrial countries	1985-2002	GLS	+
Şahin and Özenç (2007)	Turkey	1988-2006	GC	+
Feldmann (2009)	58 Developing countries	1980-2003	Panel OLS	+
Feldman (2010)	52 Developing countries	1985-2003	Panel FGLS	+
Aslan and Kula (2010)	Turkey	2000: Q1-2007: Q3	ECM, GC	-
Wang and Abrams (2011)	20 OECD countries	1970-1999	Panel ECM	+
Aysu and Dökmen (2011)	17 OECD countries	1990-2007	Panel CA	+
Mahdavi and Alanis (2013)	US (50 regions)	1977-2006	Panel CA	+
Murwirapachena *et al*. (2013)	South Africa	1980-2010	VECM	+/-
Seitaridis and Koulakiotis (2013)	15 Eurozone countries	2000-2011	Panel CA	No

[4] *See Abrams, 1999; Christopoulos and Tsionas, 2002; Christopoulos* et al*., 2005; Feldmann, 2006; Feldmann, 2010; Wang and Abrams, 2011; Aysu and Dökmen, 2011; Seitaridis and Koulakiotis, 2013; Holden and Sparrman, 2018.*

Author	Country	Period	Method	Result
Al-Saraireh (2014)	Jordan	2000-2010	OLS	+
Bayrakdar (2014)	Turkey	2000: Q1-2013: Q4	ARDL	+
Ding (2014)	34 OECD countries	1980-2010	Panel LSDV	+
Nwosa (2014)	Nigeria	1980-2011	OLS	+
Kasau *et al*. (2015)	Indonesia (34 regions)	2007-2013	SEM	+
Kanca and Bayrak (2015)	Turkey	1980-213	CA, GC	-
Kaya *et al*. (2015)	Turkey	1990-2013	GC	No
Abubakar (2016)	Nigeria	1981-2015	SVAR	+
Dineri and Destek (2016)	Turkey	1985-2014	ARDL	+
Durkaya and Ceylan (2016)	Turkey	2002:Q1-2014Q4	ARDL, TYC	Yes
Matsumae and Hasumi (2016)	Japan	-	DSGE	+
Obayori (2016)	Nigeria	1980-2013	ECM	-
Topal (2017)	Turkey (26 regions)	2004-2016	ECM, ARDL-PMG	-
Holden and Sparrman (2018)	20 OECD countries	1980-2007	WG	-
Erdoğan *et al*. (2018)	Turkey	2006:Q1-2016:Q2	VAR	+
Kovacı *et al*. (2018)	28 EU countries	2005-2016	DPA	+
Topal and Günay (2018)	Turkey	1965-2016	ARDL	-/+
Bölükbaş (2018)	Turkey	2005:Q1-2018:Q1	TYC	Yes
Afonso *et al*. (2018)	8 Emerging countries	1980-2015	Panel OLS	+
Abouelfarag and Qutb (2020)	Egypt	1980-2017	CA, VECM	+
Bektaş (2020)	Turkey	1990-2017	GC	Yes
Ertekin (2020)	Turkey	1980-2017	CA, GC	+
Manel and Driouche (2020)	Algeria	1970-2018	SVAR	-
Özer (2020)	Turkey	1980-2018	FKPSS, FSCT, FMOLS, DOLS, TYC	+
Sağdıç and Yıldız (2020)	Turkey (26 regions)	2004-2018	Panel ARDL	-/+
Saraireh (2020)	Jordan	1990-2019	ARDL	-
Singh and Shastri (2020)	India	1987-2017	ARDL	No

Note: OLS: Ordinary Least Squares, VAR: Vector Autoregression, CA: Cointegration Analysis, GLS: Generalized Least Squares, GC: Granger Causality, FGLS: Flexible Generalized Least Squares, ECM: Error Correction Model, VECM: Vector Error Correction Model, SEM: Structural Equation Modeling, LSDV: Least Squares Dummy Variable Regression, ARDL: Autoregressive-Distributed Lag, TYC: Toda-Yamamoto Causality, SVAR: Structural VAR, DSGE: Dynamic Stochastic General Equilibrium, PMG: Pooled Mean Group, WG: Within-Group Estimator,DPA: Dynamic Panel Data Analysis, FKPSS: Fourier KPSS test, FSCT: Fourier Shin Cointegration Test, FMOLS: Fully Modified OLS, DOLS: Dynamic OLS.

In the previous studies for Turkey, Şahin and Özenç (2007), Bayrakdar (2014), Erdoğan *et al*. (2018), Ertekin (2020), and Özer (2020) find that there is a positive effect of government expenditure on unemployment, while Aslan and Kula (2010), Kanca and Bayrak (2015), and Topal (2017) evidence that there is a negative relationship between these variables. These

studies have generally investigated country level and used time series, unlike Topal (2017) and Sağdıç and Yıldız (2020).
Nevertheless, as far as it is known, gender factor has been neglected in all these studies. We are of opinion that this situation creates a significant research gap in the literature. Especially, unemployment discrepancies based on gender and regional level in Turkey have gradually deepened over the recent years. Therefore, to combat high unemployment and gender discrepancies, we think that gender dimension of the impact of government expenditure on unemployment at regional level for Turkey should been investigated. The aim of this study is to explore the role of gender in the impact of government expenditure on unemployment at regional level for Turkey.

3. Data and Methodology

In this chapter, in order to investigate the impact of government expenditure on unemployment by gender at regional level in Turkey, we give information about the dataset and methology which are considered in the analysis.
For this aim, as dependent variables, we consider overall (UNM), female (FUNM), and male (MUNM) unemployment rates. We use government expenditure (GOV) as independent variable and consider gross domestic product per capita (PERCAP), and inflation rate based on consumer price index (INF) as control variables.
The logarithmic forms of all these variables are used. The dataset covers the period 2004-2019 for 26 regions at NUTS-2 level. The data regarding unemployment types (overall, female, and male unemployment) and gross domestic product per capita are obtained from TURKSTAT (2021) database. Moreover, consumer price index is achieved by EVDS (2021) database. Government expenditure data is acquired by BUMKO (2021) database. In this study, we cannot expand the time range of the dataset, as all variables considered in the analysis generally start from 2004 at regional level for Turkey.
Table 2 demonstrates the descriptive statistics. As Table 2 shows, the means of overall, female and male uneployment rates are 10.33, 11.26, and 9.82, respectively. This result shows that the female unemployment rate is averagely higher than the male unemployment rate. The average annual inflation rate is 0.039. Skewness of all varibles is positive, which means right-skewed. The Jarque-Bera statistics relating to the so-called variables are higher than the critical value (chi-squared table value with two degree of freedom). The null hypothesis of normal distribution is rejected for all variables.

Table 2

The Descriptive Statistics

	UNM	FUNM	MUNM	GOV	PERCAP	INF
Mean	10.33486	11.26851	9.829808	6910578.	19494.06	0.039704
Median	9.800000	10.50000	8.900000	4480919.	15902.56	0.036441
Maximum	30.90000	42.10000	27.10000	74436733	86798.44	0.072853
Minimum	1.800000	0.900000	2.000000	555285.0	3061.164	0.017765
Std. Dev.	4.350606	5.857562	4.336461	8366927.	13512.38	0.011857
Skewness	1.216176	1.020293	1.275830	4.114596	1.582464	1.259662
Kurtosis	5.350875	5.404960	4.960365	25.82488	6.069478	3.799186
JB	198.3445	172.4290	179.4693	10204.04	336.9334	113.5175
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

Note: JB = Jarque-Bera.

To explore the role of gender in the impact of government expenditure on unemployment at regional level for Turkey, we employ panel ARDL approach. In preferring this approach, we follow the previous studies (see Topal, 2017; Sağdıç and Yıldız, 2020). This approach allows to obtain short-term and long-term coefficients ignoring of whether the variables are I(0) or I(1). Therefore, we use the panel ARDL approach developed by Pesaran and Shin (1997, 1999) and Pesaran and Smith (1995) to examine the short-term and long-term relationships between government size and unemployment. The various variables with various lags can be included in the ARDL model.

The two approaches used to estimate the ARDL model are Mean Group Estimation (MG) and Pooled Mean Group Estimation (PMG). Mean Group Estimation (MG) developed by Pesaran and Smith (1995) estimate long-term parameter using the mean of long-term parameters in autoregresive distributed lag (ARDL) model.Therefore, this model allows the long-term parameters to vary by units. Pooled Mean Group Estimation (PMG) developed by Pesaran, Shin and Smith (1999) is composed of MG, which allows both constant and slope parameters to vary by units, and fixed effect estimator, which stipulates that constant parameter change, but slope parameters are fixed.Therefore, PMG keeps long-term parameter fixed, while allowing short-term parameters and error variance to vary by units.

The models to investigate the role of gender in the impact of government expenditure on unemployment are as follows:

Model 1: UNM=f(GOV, INF, PERCAP)

Model 2: FUNM=f(GOV, INF, PERCAP)

Model 3: MUNM=f(GOV, INF, PERCAP)

We investigate the cointegration relationship through the Durbin-Hausman test proposed by Westerlund (2008). The test lets panel cointegration to investigate if the dependent variable is stationary but the independent variables are I (1) or I (0). In addition, this test allows the slope coefficients to be homogenous or heterogenous and considers cross-sectional dependence (Westerlund, 2008: 196-198).

After determining the long term cointegration relationships between these variables, the short-term and long-term coefficients are obtained. The long-term equations based on the ARDL model are as follows:

$$UNM_{it} = \beta_{0i} + \sum_{i=1}^{k} \beta_{1i} UNM_{j,t-i} + \sum_{i=0}^{l} \beta_{2i} GOV_{j,t-i} + \sum_{i=0}^{m} \beta_{3i} INF_{j,t-i} + \sum_{i=0}^{n} \beta_{4i} PERCAP_{j,t-i} + \varepsilon_{it} . \quad (1)$$

$$FUNM_{it} = \beta_{0i} + \sum_{i=1}^{k} \beta_{1i} FUNM_{j,t-i} + \sum_{i=0}^{l} \beta_{2i} GOV_{j,t-i} + \sum_{i=0}^{m} \beta_{3i} INF_{j,t-i} + \sum_{i=0}^{n} \beta_{4i} PERCAP_{j,t-i} + \varepsilon_{it} . \quad (2)$$

$$MUNM_{it} = \beta_{0i} + \sum_{i=1}^{k} \beta_{1i} MUNM_{j,t-i} + \sum_{i=0}^{l} \beta_{2i} GOV_{j,t-i} + \sum_{i=0}^{m} \beta_{3i} INF_{j,t-i} + \sum_{i=0}^{n} \beta_{4i} PERCAP_{j,t-i} + \varepsilon_{it} \quad (3)$$

In the above equations, k, l, m and n indicate the appropriate lag lengths. For determining the model to be used in order to obtain long-term coefficients, $(m+1)^k$ equations are estimated. k is total number of variables and m is maximum lag length.

The error correction models based on ARDL model constituted to obtain the short-term coefficients are as follows:

$$\Delta UNM_{it} = \alpha_{0i} + \sum_{i=1}^{k} \alpha_{1i} \Delta UNM_{j,t-i} + \sum_{i=0}^{l} \alpha_{2i} \Delta GOV_{j,t-i} + \sum_{i=0}^{m} \alpha_{3i} \Delta INF_{j,t-i} + \sum_{i=0}^{n} \alpha_{4i} \Delta PERCAP_{j,t-i} + \delta_i ECT_{i,t-1} + \varepsilon_{it} . \quad (4)$$

$$\Delta FUNM_{it} = \alpha_{0i} + \sum_{i=1}^{k} \alpha_{1i} \Delta FUNM_{j,t-i} + \sum_{i=0}^{l} \alpha_{2i} \Delta GOV_{j,t-i} + \sum_{i=0}^{m} \alpha_{3i} \Delta INF_{j,t-i} + \sum_{i=0}^{n} \alpha_{4i} \Delta PERCAP_{j,t-i} + \delta_i ECT_{i,t-1} + \varepsilon_{it} . \quad (5)$$

$$\Delta MUNM_{it} = \alpha_{0i} + \sum_{i=1}^{k} \alpha_{1i} \Delta MUNM_{j,t-i} + \sum_{i=0}^{l} \alpha_{2i} \Delta GOV_{j,t-i} + \sum_{i=0}^{m} \alpha_{3i} \Delta INF_{j,t-i} + \sum_{i=0}^{n} \alpha_{4i} \Delta PERCAP_{j,t-i} + \delta_i ECT_{i,t-1} + \varepsilon_{it} \; . \quad (6)$$

Where, α_{1i}, α_{2i}, α_{3i} and α_{4i} indicate short-term coefficients. ECT represents the error correction term. δ_i indicates the speed of adjustment. The parameter of δ_i should be lower than 1 and negative. In the study, the long- and short-term equations are estimated using Pooled Mean Group (PMG) and Mean Group (MG).

4. Empirical Results

Before testing the stationarity of the variables, we apply the cross-sectional dependence test, because unit root tests in panel data model are separated into two groups as first generation and second generation. Although the first-generation panel unit root tests ignore cross-sectional dependence, the second-generation unit root tests consider cross-sectional dependence. The results of cross-sectional dependence test are showed in Table 3. Because of N (26) > T (16), the Pesaran CD test is considered. The Pesaran CD test can be formulated as follows:

$$CD = \sqrt{\frac{2T}{N(N-1)}} \left(\sum_{i=1}^{N-1} \sum_{j=i+1}^{N} \hat{p}_{ij} \right) \quad (7)$$

In the above equation, T is time period, N is the number of cross- sections, and $\hat{p}_{ij}$ is the correlation between i. and j. error terms (Baltagi, 2005: 247).

$$\hat{p}_{ij} = \sum_{t=1}^{T} \frac{e_{it} e_{jt}}{\left(\sum_{t=1}^{T} e_{it}^2\right)^{\frac{1}{2}} \left(\sum_{t=1}^{T} e_{jt}^2\right)^{\frac{1}{2}}} \quad (8)$$

According to Table 3, cross-sectional dependence for all variables is found to be valid.

Table 3

The Results of Cross-Sectional Dependence Test

Test	PERCAP	GOV	INF	UNM	FUNM	MUNM
BP LM	5176.731***	5170.666***	4269.861***	1069.282***	1029.818***	1504.926***
P LM	189.2808***	189.0429***	153.7104***	28.17335***	26.62542***	45.26070***
B LM	188.4141***	188.1762***	152.7818***	27.30668***	25.75875***	44.39404***
P CD	71.94944***	71.90712***	65.27740***	24.05370***	17.51446***	29.21831***

Note: ***, **, * represent significance levels at %1, %5, and %10, respectively. BP LM: Breusch-Pagan LM, P LM: Pesaran scaled LM, B LM: Bias-corrected scaled LM, P CD: Pesaran CD.

We apply the CADF unit root test developed by Pesaran (2004), which takes into account cross-sectional dependence and is second-generation unit root test. The CADF regression is as follows:

$$\Delta y_{it} = \alpha_i + p_i^* y_{i,t-1} + d_0 \bar{y}_{t-1} + d_1 \Delta \bar{y}_t + \varepsilon_{it} \quad (9)$$

$$\Delta y_{it} = \alpha_i + p_i^* y_{i,t-1} + d_0 \bar{y}_{t-1} + \sum_{j=0}^{p} d_{j+1} \Delta \bar{y}_{t-j} + \sum_{k=1}^{p} c_k \Delta y_{it-k} + \varepsilon_{it}. \quad (10)$$

Firstly, the CADF regression is estimated for each i unit in the panel model. Then, the Pesaran CIPS statistic is calculated by averaging of t statistics based on lagged values. The CIPS statistics is formulated as follows (Baltagi, 2005: 249-250):

$$CIPS = \frac{1}{N} \sum_{i=1}^{N} CADF_i \quad (11)$$

Table 4

The Results of the Pesaran Unit Root Test

Variables	CIPS Statistics		CIPS Statistics	
	Intercept		Intercept and Trend	
PERCAP	-1.300 (2)		-1.954(2)	
∆PERCAP	-2.393(1)***		-3.801(0)***	
GOV	-1.504(1)		-1.932 (1)	
∆GOV	-2.274(1)**		-3.260(0)***	
INF	-2.850(1)		-2.748(1)	
UNM	-2.753(1)***		-3.373 (1)	
FUNM	-2.386(1)***		-3.154(1)***	
MUNM	-2.621(1)***		-3.044(1)***	
Critical values	%10	-2.070	%10	-2.590
	%5	-2.170	%5	-2.690
	%1	-2.340	%1	-2.880

Note: ***, **, * represent significance levels at %1, %5, and %10 respectively. ∆ indicates first difference of the variable.

The results of the Pesaran unit root test are showed in Table 4. As Table 4 shows, PERCAP and GOV are I(1), while INF, UNM, FUNM and MUNM are I(0). After investigating the stationarity structures of all variables, the long-term relationship between these variables is detected with cointegration tests. The cointegration tests differ based on whether model includes cross-sectional dependence and is homogenous. Therefore, we apply the Pesaran and Yamagata (2008) Delta test, which tests whether the coefficients in the cointegration equation are homogenous. The results are displayed in Table 5.

Table 5

The Results of the Delta Test and the Cross-Sectional Dependence Test

	Delta Test Statistics		Cross-Sectional Dependence Statistics	
	Delta Tilde	Delta Tilde Adj.	CD-LM	CD-LM Adj.
Model 1	0.450	0.551	10.275***	5.1975***
Model 2	0.443	0.543	4.549***	1.7925**
Model 3	0.221	0.271	12.238***	6.9651***

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

From the results of Pesaran and Yamagata (2008) Delta test, it is inferred that the slope coefficients are homogenous, because the null hypothesis of homogenous slope coefficients cannot be rejected, which means that estimation results do not change in term of cross-section unit. Furthermore, there is cross-sectional dependence in the so-called cointegration models. Therefore, we investigate the cointegration relationship through the Durbin-Hausman test proposed by Westerlund (2008). The test lets panel cointegration to investigate if the dependent variable is stationary but the independent variables are I(1) or I(0). In addition, this test allows the slope coefficients to be homogenous or heterogenous and considers cross-sectional dependence (Westerlund, 2008: 196-198). The results of the Westerlund Durbin Hausman cointegration test are shown in Table 6.

Table 6

The Results of the Westerlund (2008) Durbin Hausman Test

	Model 1	Model 2	Model 3
Durbin Hausman Group Statistics	-2.772***	-2.911***	-2.887***
Durbin Hausman Panel Statistics	-9.595***	-7.748**	-11.164***

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

The Durbin-Hausman test developed by Westerlund (2008) investigates the presence of the cointegration relationship through two tests which are the Durbin-Hausman group test and the Durbin-Hausman panel test. The Durbin-Hausman group test enables the change in the autoregresive parameters from one unit from another. The null hypothesis for the so-called test indicates no cointegration, while the alternative hypothesis states the cointegration relationship for at least some of the units. Furthermore, the Durbin-Hausman panel test allows the autoregressive parameter to be the same for all units. The null hypothesis for the so-called test states no cointegration, but the alternative hypothesis indicates the cointegration relationship for all panel. According to Table 6, the cointegration relationship is valid for Model 1, Model 2, and Model 3.

After determining the long-term cointegration relationship, we estimate the long-term and short-term coefficients using the PMG and MG estimations. We aim to impose common long-run effects by applying Pooled Mean Group (PGM), and when applying Mean Group (MG) no restictions are imposed. For each model, appreciate lag length is detected by Akaike information criteria. Accordingly, ARDL (1,2,1,2) model is valid for Model 1, Model 2, and Model 3. PMG and MG estimations of each ARD (1,2,1,2) models are showed in Table 7. The Hausman test is used to determine suitable model. Hausman test statistic is calculated as follows:

$$H = \left(\hat{\beta}_{MG} - \hat{\beta}_{PMG}\right)' \left[Avar\left(\hat{\beta}_{MG}\right) - Avar\left(\hat{\beta}_{PMG}\right)\right]^{-1} \left(\hat{\beta}_{MG} - \hat{\beta}_{PMG}\right). \quad (12)$$

The null hypothesis of the Hausman test is that PMG model estimations are valid, while the alternative hypothesis is that MG model estimations are valid. According to Table 7, the null hypothesis of PMG model is not rejected for Model 1, Model 2, and Model 3. Thus, PMG models are valid for Model 1, Model 2, and Model 3.

As the results in Table 7 show, on the long term the coefficients regarding government expenditure are statistically significant for all types of unemployment. Accordingly, a 1 percent increase in government expenditure decreases overall unemployment rate, female unemployment, and male unemployment by 0.095, 0.50, and 2.25 percent, respectively.

Table 7

The Results of the PMG and MG Estimations of ARDL

Variables	PMG	MG	PMG	MG	PMG	MG
	Model 1(ARDL (1,2,1,2))		Model 2 (ARDL (1,2,1,2))		Model 3 (ARDL (1,2,1,2))	
Long Term Relationship						
GOV	-0.0953**	-6.6110***	-0.5028**	-2.2960**	-2.2510***	-9.9761**
	(0.0514)	(2.5707)	(0.2743)	(1.0169)	(0.3026)	(5.4126)
INF	6.1673***	0.8422	-0.6850	2.2308***	5.3139***	8.4758
	(0.1312)	(6.3957)	(0.5053)	(0.8484)	(0.6010)	(5.5092)

Variables	PMG	MG	PMG	MG	PMG	MG
	Model 1(ARDL (1,2,1,2))		Model 2 (ARDL (1,2,1,2))		Model 3 (ARDL (1,2,1,2))	
PERCAP	-4.2939***	8.0182	-1.3861***	1.5945	-0.9133**	6.7940
	(0.1110)	(6.4204)	(0.4579)	(1.3033)	(0.4179)	(4.9463)
Short Term Relationship						
EC	-0.4387***	-0.8229***	-0.5146***	-0.9801***	-0.3829***	-0.7673***
	(0.0911)	(0.1123)	(0.0667)	(0.0755)	(0.0565)	(0.1024)
ΔGOV	0.7023	2.0050***	1.5683*	3.4816***	1.7950**	2.2908***
	(0.7823)	(0.7899)	(0.8741)	(13183)	(0.8113)	(0.6178)
ΔGOV(-1)	-0.3163	-0.7837***	-0.2621	-1.2132**	-0.7608	-0.9871***
	(0.4610)	(0.3698)	(0.5003)	(0.5200)	(0.4549)	(0.3665)
ΔINF	-0.3132	-2.5870	1.9280***	-2.6273**	-0.0321	-2.4703***
	(0.9136)	(1.0751)***	(0.7222)	(1.3399)	(0.8620)	(0.9928)
ΔPERCAP	0.0770	-0.6839	-2.2764***	-2.6217**	-1.8514***	-0.8174
	(0.6031)	(1.0639)	(0.6589)	(1.0919)	(0.4538)	(0.9793)
ΔPERCAP(-1)	-0.4309**	0.3124	0.5959	1.0144**	0.2626	0.1888
	(0.2462)	(0.3258)	(0.3705)	(0.4698)	(0.2390)	(0.3426)
C	2.3394***	5.2035***	-0.0301	3.8536	2.8631***	6.1011
	(0.5376)	(0.9067)	(0.0766)	(1.3486)	(0.4383)	(1.0211)***
HT	5.37		4.28		4.01	

Note: The delay length was selected by the AIC. ***, **, * represent significance levels at %1, %5, and %10, respectively. Δ indicates the first difference of the variable. The variable EC is the error correction term and c is the constant term. Values in parentheses indicate standard errors, HT: Haussman Test. The lag length is determined by Akaike information criteria.

In other words, the higher government expenditure is, the lower unemployment rate is. This result is consistent with Aslan and Kula (2010), Kanca and Bayrak (2015), Obayori (2016), Topal (2017), Holden and Sparrman (2018), Manel and Driouche (2020), and Saraireh (2020). Unlike these studies, we also find that government expenditure further decreases male unemployment as compared to female unemployment. The reason why this happens is that male employment is higher than female employment in Turkey. The second variable considered in the analysis is inflation rate. The influence of inflation on overall and male unemployment rate is statistically significant. Hence, a 1 percent increase in inflation leads to increase in overall and male unemployment rate by 6.167 and 5.3139 percent, respectively. Unlike Polat (2019)'s study, which finds that inflation decreases unemployment, our empirical results are consistent with the study of Berentsen *et al*. (2011), which indicates the existence of positive correlation between inflation and unemployment. The third variable is gross domestic product per capita. All coefficients of this variable in the three models are statistically significant. Therefore, a 1 percent increase in gross domestic product per capita reduces overall, female, and male unemployment rate by 4.29, 1.39, and 0.913 percent, respectively. This result is in line with Okun (1962)'s law, which asserts that a rise in gross domestic product growth decrases unemployment rate.

On the short term, government expenditure has no significant impact on overall unemployment. This result is confirmed by Singh and Shastri (2020). Also, we reveal that government expenditure leads to increase in male and female unemployment. Hence, a 1 percent increase in government expenditure induces increase in female and male

unemployment rate by 1.57 and 1.79 percent, respectively. This finding is supported by Abrams (1999)'s view. Hence, it is consistent with Christopoulos and Tsionas (2002), Christopoulos *et al*. (2005), Feldmann (2006), Şahin and Özenç (2007), Feldmann (2009), Feldman (2010), Wang and Abrams (2011), Aysu and Dökmen (2011), Mahdavi and Alanis (2013), Al-Saraireh (2014), Bayrakdar (2014), Ding (2014), Nwosa (2014), Kasau *et al.* (2015), Abubakar (2016), Dineri and Destek (2016), Matsumae and Hasumi (2016), Erdoğan *et al*. (2018), Kovacı *et al*. (2018), Afonso *et. al.* (2018), Ertekin (2020), and Özer (2020). Moreover, inflation has a positive influence on female unemployment rate. Therefore, a 1 percent increase in inflation leads to increase in female unemployment rate by 1.93 percent. As mentioned before, this finding is consistent with Berentsen *et al*. (2011). Lastly, the coefficients related to gross domestic product per capita are statistically significant for female and male unemployment models. Hence, a 1 percent increase in gross domestic product per capita reduces female and male unemployment rate by 2.28 and 1.85 percent, respectively. As in the long term, these findings are consistent with Okun (1962)'s law.

In addition, error correction terms are statistically significant and negative for the three models. Deviations from equilibrium in the regional level may be adjusted in overall, female, and male unemployment models by 44, 52, and 38 percent one year later, respectively. Moreover, while the system balances two years later in the overall and female unemployment model, it balances two and a half years later in the male unemployment model.

5. Conclusion and Discussion

Unemployment is one of the most important problems for the developing countries such as Turkey. In order to solve this problem, different policies have been applied in every country. One of these political tools is government expenditure.

However, in literature, Abrams (1999) evidences that government expenditures induce increase in unemployment. Although majority of the later studies have supported this result, few studies have not supported this view. The common point of all these studies is to neglect gender dynamics.

Hence, in this study, we investigate gender dimension of the government expenditure and unemployment nexus at regional level for Turkey. The reason why Turkey is especially considered is that it has high unemployment rate and gender discrepancies in unemployment. For this aim, we use the dataset covering the period 2004-2019 for 26 regions at NUTS-2 level.

According to the results of ARDL, although overall and male unemployment models are coherent each other on short and long term, the results of female unemployment model are different. Hence, this highlights that unemployment should be considered as gendered. Generally, our empirical findings reveal that government expenditure decreases overall, male and female unemployment rates on the long term. This result is consistent with Aslan and Kula (2010), Kanca and Bayrak (2015), Obayori (2016), Topal (2017), Holden and Sparrman (2018), Manel and Driouche (2020), and Saraireh (2020). It shows that the Keynesian approach is valid on the long term. Nevertheless, on the short term, government expenditure induces rises in the male and female unemployment rates, which indicates the validation of the Abrams Curve Hypothesis for Turkey.

Furthermore, empirical findings show that inflation affects positively the overall and male unemployment on the long term, but affects positively the female unemployment on the short

term. These results could be interpreted in the sense that female labor force should be supported more during high inflation periods in Turkey. Lastly, the gross domestic product per capita decreases the overall, male and female unemployment rates on both the long and short term.

In light of all these informations, inflation targeting should be one of the most important targets of government. If government keeps down inflation, unemployment might decrease on the long term. Government must continue to increase government expenditure in the Eastern and South-Eastern regions, which have high unemployment rates. Furthermore, it should consider regional and gender differences. Moreover, employment generating policies should been considered for economic growth. Investments and encouragements should be directly channeled to employment-generating areas.

The expected contribution of our study to science is to consider the gender discrepancies in the government expenditure and unemployment nexus at regional level for Turkey. Furthermore, the limitation of our study is that the time range of dataset cannot be expanded, because there is no regional data in Turkey for pre-2004. Future research could investigate the gender dimension of the government expenditure and unemployment nexus at sectoral level for Turkey or other countries which have high unemployment rates and gender discrepancies in unemployment.

References

Abouelfarag, H.A. and Qutb, R., 2020. Does Government Expenditure Reduce Unemployment in Egypt? *Journal of Economic and Administrative Sciences*, pp.1-20.

Abrams, B.A., 1999. The Effect of Government Size on the Unemployment Rate. *Public Choice*, 99(3-4), pp.395–401.

Abubakar, A.B., 2016. Dynamic Effects of Fiscal Policy on Output and Unemployment in Nigeria: An Econometric Investigation. *CBN Journal of Applied Statistics*, *7*(2), pp.101-122.

Afonso, A., Şen, H. and Kaya, A., 2018. Government Size, Unemployment and Inflation Nexus in Eight Large Emerging Market Economies*. REM Working Paper*. No. 038-2018.

Al-Saraireh, S.I., 2014. The Relationship between Unemployment Rate in Jordan with Rates of Foreign Labor Force, Government Expenditure, and Economic Growth. *International Journal of Business and Social Science*, *5*(3), pp.294-301.

Altuzarra, A., 2015. Measuring Unemployment Persistence by Age and Gender. *Romanian Journal of Economic Forecasting*, 4, pp.110-133.

Aslan, A. and Kula, F., 2010. Kamu Sektör Büyüklüğü-İşsizlik İlişkisi: Abrams Eğrisi'nin Türkiye Ekonomisi için Testi. *Maliye Dergisi*, 159, pp.155-166.

Aysu, A. and Dökmen, G., 2011. An Investigation on the Relationship between Government Size and Unemployment Rate: Evidence from OECD Countries. *Sosyoekonomi*, 2, pp.179-190.

Baltagi, B.H., 2005. *Econometric Analysis of Panel Data.* John Wiley Sons. 3. Press.

Bayrakdar, S., 2014. *Kamu Büyüklüğü ve İşsizlik Arasındaki İlişkinin Analizi: Türkiye Örneği*. İstanbul Üniversitesi, Sosyal Bilimler Enstitüsü, Basılmamış Doktora Tezi, İstanbul.

Bektaş, A., 2020. Türkiye'de Kamu Yatırım Harcamları ile İşsizlik Arasındaki Nedensellik İlişkisi. *Cumhuriyet Üniversitesi İktisadi ve İdari Bilimler Dergisi*, 21(1), pp.1-29.

Berentsen, A., Menzio, G. and Wright, R., 2011. Inflation and unemployment in the long run. *American Economic Review*, *101*(1), pp.371-398.

Bölükbaş, M., 2018. Kamu Büyüklüğü İşsizliğin ve Genç İşsizliğin Nedeni Midir? Türkiye örneği. *Aydın İktisat Fakültesi Dergisi*, *3*(2), pp. 1-17.

BUMKO, 2021. [online] Available at: <https://www.hmb.gov.tr/bumko-butce-buyuklukleri-ve-butce-gerceklesmeleri> [Accessed in March 2021].

Christopoulos, D.K. and Tsionas, E.G., 2002. Unemployment and Government Size: Is There any Credible Causality? *Applied Economics Letters*, *9*(12), pp.797-800.

Christopoulos, D.K., Loizides, J. and Tsionas, E.G., 2005. The Abrams Curve of Government Size and Unemployment: Evidence from Panel Data. *Applied Economics,* 37(10), pp.1193-1199.

Dineri, E. and Destek, M.A., 2016. Türkiye'de Kamu Sektör Büyüklüğü ve işsizlik ilişkisi: Abrams eğrisi üzerine bir analiz. EUREFE Bildiri Kitabı. 1. e-ISBN 978-975-8254-54-5, pp.491─508.

Ding, H., 2014. Unemployment and Welfare State: What do the Data Tell Us? *Journal of Social Science for Policy Implications*, 2(2), pp.197-226.

Durkaya, M. and Ceylan, S., 2016. İşsizliğin Azaltılmasında Kamu Kesimi Büyüklüğünün Rolü. *Finans Politik & Ekonomik Yorumlar*, 53(615), pp.23-40.

Erdoğan, A., Erdoğan, S. and Erdaş, H., 2018. Kamu Büyüklüğünün Türkiye Ekonomisine Yönelik VAR Analizi. *Dumlupınar Üniversitesi Sosyal Bilimler Dergisi*, 55, pp.119-131.

Ertekin, Ş., 2020. Türkiye'de Kamu Kesimindeki Büyümenin İşsizlik Üzerindeki Etkisi: 1980 Sonrası Dönem Analizi. *İzmir İktisat Dergisi*, 35(1), pp. 141-154.

EVDS, 2021. [online] Available at: <https://evds2.tcmb.gov.tr/>. [Accessed in March 2021].

Feldmann, H., 2006. Government Size and Unemployment: Evidence from Industrial Countries. *Public Choice*, 127(3-4), pp. 443-459.

Feldmann, H., 2009. Government Size and Unemployment: Evidence from Developing Countries. *The Journal of Developing Areas,* pp. 315-330.

Feldmann, H., 2010. Government Size and Unemployment in Developing Countries. *Applied Economics Letters*. 17(3), pp. 289-292.

Güçlü, M., 2017. Regional Unemployment Disparities in Turkey. *Romanian Journal of Economic Forecasting*, 20(2), pp. 94-108.

Holden, S. and Sparrman, V., 2018. Do Government Purchases Affect Unemployment? *The Scandinavian Journal of Economics,* 120(1), pp.124-158.

ILO, 2019. World Employment and Social Outlook – Trends 2019, [online] Available at: <https://www.ilo.org/global/research/global-reports/weso/2019/lang--en/index.htm>. [Accessed in March 2021].

Kanca, O. and Bayrak, M., 2015. Kamu Harcamaları Bileşenleri ile İşsizlik Arasındaki İlişki (Türkiye Örneği). *Gazi İktisat ve İşletme Dergisi*. 1(2), pp. 55-74.

Kasau, M.I. Rahmatiah, H.J. Madris, H. and Suhab, S., 2015. Effect of Government Spending on Employment through Investment and its Impact on the Eastern and Western Indonesia. *International Journal of Research in Social Science*s, 5(5), pp. 55-64.

Kaya, D.G. Kaygısız, A.D. and Altuntepe, N., 2015. Türkiye'de Kamu Harcamalarının Toplam İstihdama Etkisi Üzerine Bir Değerlendirme. *Journal of Economics & Administrative Sciences*. 17(1), pp. 83-96.

Kovacı, S., Belke, M. and Bolat, S., 2018. Kamu Büyüklüğünün İşsizlik Üzerindeki Etkisi: Avrupa Birliği Ülkelerinden Kanıtlar. *SOSCON Conference Paper*, pp. 184-196.

Mahdavi, S. and Alanis, E., 2013. Public Expenditures and the Unemployment Rate in the American States: Panel Evidence. *Applied Economics*. 45(20), pp. 2926-2937.

Manel, A. and Driouche, D.M., 2020. Dynamic Effect of Government Expenditure on Unemployment in Algeria: A Structural Vector Autoregressive Approach 1970-2018. *Namaa revue d'économie et de commerce*, *4*(2), pp.166-176.

Matsumae, T. and Hasumi, R., 2016. Impacts of Government Spending on Unemployment: Evidence from A Medium-Scale DSGE Model. *ESRI Discussion Series*. No. 329.

Murwirapachena, G., Choga, I., Maredza, A. and Mavetera, N., 2013. Fiscal Policy and Unemployment in South Africa: 1980–2010. *Mediterranean Journal of Social Sciences,* 4(6), pp. 579-587.

Nwosa, P.I., 2014. Government Expenditure, Unemployment and Poverty Rates in Nigeria. *Journal of Research in National Development*, 12(1), pp. 77-84.

Obayori, J.B., 2016. Fiscal Policy and Unemployment in Nigeria. *The International Journal of Social Sciences and Humanities Invention*, 3(2), pp. 1887-1891.

OECD, 2018. OECD Economic Survey of Turkey 2018, [online] Available at: <http://www.oecd.org/economy/surveys/Turkey-2018-OECD-economic-survey-overview.pdf> [Accessed in March 2021].

Okun, A.M., 1962. Potential GNP: Its Measurement and Significance. *Proceedings of the Business and Economics Section of the American Statistical Association*, Washington, DC: American Statistical Association, pp. 98–104.

Özer, M.O., 2020. Kamu Harcamları ve İşsizlik Arasındaki İlişki: Abrams Eğrisinin Türkiye için Sınaması. *Karadeniz Teknik Üniversitesi Sosyal Bilimler Enstitüsü Sosyal Bilimler Dergisi*, 10(20), pp. 307-322.

Özuğurlu, Y., 2005. Kamu Harcamalarının Bölüşüm İlişkileri Üzerine Etkisi: Türkiye Açısından Bir Değerlendirme. *Ekonomik Yaklaşım,* 16(55), pp.69-88.

Pesaran, M.H. and Yamagata, T., 2008. Testing Slope Homogeneity in Large Panels. *Journal of Econometrics*, *142*(1), pp.50-93.

Pesaran, M.H., Shin, Y. and Smith, R.P., 1999. Pooled Mean Group Estimation of Dynamic Heterogeneous Panels. *Journal of the American Statistical Association*, 94(446), pp.621-634.

Pesaran, M.H. and Shin, Y., 1997. *Long-Run Structural Modelling*. University of Cambridge, Cambridge.

Pesaran, M.H. and Shin, Y., 1999. An Autoregressive Distributed Lag Modeling Approach to Cointegration Analysis. In: Strom, S., ed. 2000, *Econometrics and Economic Theory in the 20th Century*, Chapter 11, The Ragnar Frisch Centennial Symposium, Cambridge University Press, Cambridge.

Pesaran, M.H. and Smith, R., 1995. Estimating Long-Run Relationship from Dynamic Heterogeneous Panels. *Journal of Econometrics*, 68, pp. 79-113.

Pesaran, M.H., 2004. General Diagnostic Tests for Cross Section Dependence in Panels. *Cambridge Working Papers in Economics*, 0435, Faculty of Economics University of Cambridge.

Polat, E., 2019. İşsizlik ile Enflasyon Arasındaki İlişki: Türkiye'deki Düzey-2 Bölgeleri için Ampirik Bir Analiz. *Yönetim ve Ekonomi: Celal Bayar Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, *26*(3), pp.783-799.

Sağdıç, E.N. and Yıldız, F., 2020. Bölgesel Düzeyde Kamu Harcamalarının İşsizlik Düzeyi Üzerindeki Etkisi: Türkiye Örneği. *Dumlupınar Üniversitesi Sosyal Bilimler Dergisi*, (64), pp.208-226.

Şahin, M. and Özenç, Ç., 2007. Kamu Harcamaları ile Makro Ekonomik Değişkenler Arasındaki Nedensellik İlişkileri. *Yönetim Bilimleri Dergisi*. 5(2), pp.177-200.

Saraireh, S., 2020. The Impact of Government Expenditures on Unemployment: A Case Study of Jordan. *Asian Journal of Economic Modelling*, 8(3), pp.189-203.

Seitaridis, M. and Koulakiotis, A., 2013. Unemployment and Government Expenditure in the Eurozone: A Panel Data Analysis. *Public and Municipal Finance*, 2(2), pp.35-46.

Singh, D. and Shastri, S., 2020. Public Expenditure on Education, Educational Attainment and Unemployment Nexus in India: An Empirical Investigation. *International Journal of Social Economics*, 47(5), pp.663-674.

Topal, M.H. and Günay, H.F., 2018. Türkiye'de Abrams Eğrisi Hipotezinin Geçerliliği. *In ICPESS (International Congress on Politic, Economic and Social Studies)*, 5.

Topal, M.H., 2017. Türkiye'de Kamu Yatırımlarının İstihdam Üzerindeki Etkisi: Bölgesel Bir Analiz (2004-2016). *Global Journal of Economics and Business Studies*. 6(12), pp. 186-204.

TURKSTAT, 2021. [online] Available at: <http://tuik.gov.tr/Start.do> [Accessed in March 2021].

Wang, S. and Abrams, B.A., 2011. The Effect of Government Size on the Steady-State Unemployment Rate: A Dynamic Perspective. [online] Available at: <http://graduate.lerner.udel.edu/sites/default/file ... 2011/UDWP2011-12.pdf> [Accessed in August 2019].

WDI, 2021. [online] Available at: <https://databank.worldbank.org/source/world-development-indicators> [Accessed in March 2021].

Westerlund, J., 2008. Panel Cointegration Tests of the Fisher Effect. *Journal of Applied Econometrics*, 23(2), pp.193-223.