The Determinants of Regional Unemployment in Turkey: A Spatial Panel Data Analysis

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Abstract

The aim of this study is to analyze spatially the main determinants of regional unemployment in Turkey covering the period of 2008 – 2015 in terms of NUTS2 level. Following this aim a balanced panel data set with 8 years and 26 regions has been used. Spatially lagged dependent variable with spatial fixed effects model results suggests that the main determinants of the regional unemployment are the lagged values of both dependent and independent variables. Moreover all these statistically significant variables affect the dependent variable in positive ways. Also a spatial clustering inclination of regional unemployment in NUTS2 regions has been detected.

Keywords: Regional Unemployment, Regional Migration, Regional Inflation, Spatial Panel Data

Introduction

Regional unemployment rate is one of the most important indicators used in analyzing regional economic issues. It is quite important to analyze the main determinants of regional unemployment rates as regional competitiveness and regional economic growth directly affect the national growth and development, (Elhorst, 2001). Also, the determinants of regional unemployment might provide important data for policy makers.

Recent developments in empirical research on the determinants of regional unemployment imply that internal migration and regional inflation rate may have an important effect on regional unemployment disparities. Because of that, in this study, we will focus on the impact of migration and inflation on regional unemployment disparities. Migration is one of the important variables affecting the labor market in Turkey. The relation between unemployment rate and migration are frequently one of the topics investigated in the literature. The most recent data on this subject in Turkey is in Population and Housing Census made by Turkstat in 2011. According to this census, 12 percent of participants stated that they migrated to find a job. The rate of those who stated that they migrated to change their business is 13.4 %. Immigation of 41.4 percent of the sample relates to any member of the household. Assuming that significant portion of 41.4 per cent of the sample is considered to have migrated to be employed, it can be considered that majority of the sample migrates due to lack of employment opportunities.
Besides, one of the most important variables that is considered to have affected regional unemployment is inflation in the literature (Gozgor, 2013). Thus, inflation might be a crucial variable in determining reasons of regional unemployment.

In this study, employing spatial econometric methods for Turkish NUTS2 regions during 2008 – 2015, we attempt to shed light on the main determinants of regional unemployment and hence produce some policy recommendations to decrease regional unemployment rates. In this respect, the main contribution of this paper is that the most recent regional data are used to analyze the determinants of Turkish regional unemployment levels. In this context, after a brief introduction, empirical analysis is explained by method, model and evidences. Then, empirical results are interpreted and finally some policy recommendations are developed as a conclusion.

Empirical Literature and Analysis
There exist lots of studies in the literature analyzing these determinants with different approaches and methods. It can be seen that empirical studies in the literature indicate that there are lots of determinants of regional unemployment such as labor force participation rate, migration, urbanization, wage rates, employment rates and regional income. In this study, we give brief overview of literature examining the relationship between internal migration, inflation and unemployment.

Regional unemployment has been a critical concept analyzed by numerous researchers from different countries. Especially, it has become one of the most discussed economic issues after the emergence of New Economic Geography Paradigm. Consequently, there are many studies in both empirical and theoretical literature. Since the focus of this study is the spatial analysis, then the empirical studies with spatial methods are given in this section.

Chalmers & Greenwood (1985) employs simultaneous equation estimation for US counties for the 1960 – 1970 period. The authors suggest that the effect of net in-migration on regional unemployment is an important empirical question due to the fact that it causes both regional labor supply and demand to increase; the former directly and the latter indirectly. Hofler & Murphy (1989) estimates the effect of net migration on the unemployment rate for 50 regions covering the period of 1960 – 1979. Findings suggest positive impact of migration on the dependent variable. Badinger & Url (2002) applies spatial filtering technique for 72 Austrian regions in 1991. Results show that there is some interactions between regions (up to 180 km) in labor market that indicates labor mobility in terms of migration. Hence migration has been found as an important determinant of regional unemployment. Moreover, Overman & Puga (2002) employs OLS estimation procedure for 147 European NUTS2 regions for the period 1986 – 1996. They find a clustering inclination across European regions. Results suggest that regional in-migration as policy enhancing regional labor supply. Niebuhr (2003) analyses 359 NUTS2 and NUTS3 European regions for 1986 – 2000 period. This study suggests that there is no significant impact of regional migration on regional unemployment and also geographical distribution of unemployment exhibits clustering behavior. Patachini & Zenou (2007) applies spatial methods for a dynamic panel data model. They examine clustering behaviour of regional unemployment and regional labor migration for 288 UK regions for the time period of 1985 – 2003. Also, they detect that regional migration and lagged value of regional unemployment are important determinants of regional unemployment. Vega and Elhorst (2016) applies simultaneous equations model for 1973 – 2013 period and they find that regional unemployment exhibits clustering behavior in Netherland’s provinces. Additionally, Lopez-Bazo et al (2013) for Spain, Lottman (2012) for Germany and Cracolica et al (2007) for Italy employ spatial econometric methods to examine the reasons of regional unemployment differences.

There are also some empirical studies investigating this topic for Turkey. Filiztekin (2008) applies spatial parametric and nonparametric methods at province level and indicates that the regional unemployment rate differences increase between 1980 and 2000. This study finds that there exist unemployment clusters especially in South-East of Turkey. Also, in this study, it has been stated that the determinants of regional unemployment rate are different in 1980 and 2000. In 1980, employment growth rate is the main determinant but in 2000, human capital becomes to be the main determinant of regional unemployment rate. As another study, Gozgor (2012) analyzes the regional inflation rates and regional unemployment rates with panel unit root tests for the 2004 – 2011 period. He finds some evidences in favor of the existence of hysteresis impacts on regional unemployment rates. Karaalp and Gulel (2016) examine regional unemployment differences for Turkish NUTS2 regions during 2008 – 2012 by the use of spatial autocorrelation techniques. Findings suggest that labor force participation rates for males, young population, the share of agriculture in regional economy and education level are the main determinants of regional unemployment rates.

1 For an extensive literature analysis please see Elhorst (2003).
2 For a comprehensive literature analysis, the study of Elhorst (2003) can be seen.
Spatial Panel Data Analysis
Spatial econometrics is a subfield of econometrics that takes into consideration the existence of spatial effects (Anselin, 1988). Spatial effects mainly occur as a result of spatial dependence or spatial heterogeneity, and they directly affect the development of economic procedures. In this context, the main determinants of regional unemployment are examined by the help of spatial methods in this study. In this respect, spatial analysis includes 26 NUTS2 regions of Turkey during 2008 – 2015. Accordingly, a balanced panel data set including 8 years and 26 regions is used for estimations. In estimated econometric model, the dependent variable is regional unemployment rate and the independent variables are net regional migration rate, regional inflation rate, one-year lagged values of net regional migration rate, one-year lagged values of regional inflation rate, one-year lagged values of regional unemployment rate and the spatial weight matrix. Consequently, a spatial panel data model which has both properties of autoregressive and distributed lag models is estimated. In the process of variable selection, the related empirical literature has been followed and all the data used in estimations have been collected from TSI (Turkish Statistical Institute).

Empirical Method and Model
For spatial estimation process, first of all a spatial weight matrix for 26 NUTS2 regions, has been formed. Aforesaid matrix has been constructed in the light of neighborhood relationship and queen method. In this context, the matrix consists of ’1’s showing border neighbors and ’0’s showing no neighborhood relationship. This matrix is a symmetrical matrix is of 26*26.

After forming the spatial weight matrix, the model below has been formed to estimate:

Unemp\_it = \beta_1 \text{Mig}_it + \beta_2 \text{Inf}_it + \beta_3 \text{LMig}_it + \beta_4 \text{LUnemp}_it + \beta_5 \text{LInf}_it + \beta_6 W*\text{Unemp}_it + e_it

(1)

In this model Unemp is the dependent variable and it shows the regional unemployment rate. Mig is the net regional migration rate\(^3\); Inf is the regional inflation rate in terms of CPI (Consumer Price Index); LMig is the one-year lagged value of regional migration rate; LUnemp is the one-year lagged value of regional unemployment rate; LInf is the one-year lagged value of regional inflation rate and W*Unemp is the spatial weight parameter. Lastly, e is the error term and it reflects the possible impacts of all other determinants on the dependent variable. The expressions of it at the end of all the variables show that the data is a panel data having \(i\) regions and \(t\) years. The reason why a panel data set is used in estimations is the superiority of panel data sets over cross section and time series data sets. A panel data set consists of both cross sections and time series and hence gives more information. Moreover, panel data sets provide more efficient estimation results with higher degrees of freedoms (Baltagi, 2001).

Estimation Results
Table 1 below includes the estimation results. In order to find the most proper model for the estimations, three different versions of spatial models as pooled, fixed effects and random effects are estimated and LR test results are compared. As a result of this comparison, for this study it has been found that pooled model with spatially lagged dependent variable and spatial fixed effects is the best fitted model for our model.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Significance rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mig</td>
<td>0.031963</td>
<td>***1; **5; %10</td>
</tr>
<tr>
<td>Inf</td>
<td>-0.059370</td>
<td></td>
</tr>
<tr>
<td>LMig</td>
<td>0.069337*</td>
<td></td>
</tr>
<tr>
<td>LUnemp</td>
<td>0.505594***</td>
<td></td>
</tr>
<tr>
<td>LInf</td>
<td>0.287481**</td>
<td></td>
</tr>
<tr>
<td>W*Unemp</td>
<td>0.245999***</td>
<td></td>
</tr>
<tr>
<td>R-square</td>
<td>0.7916</td>
<td></td>
</tr>
<tr>
<td>LR-test</td>
<td>50.8790 (p value=0.0025)</td>
<td></td>
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</tbody>
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Note:

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\(^3\) It includes only domestic immigration to NUTS2 regions.
Estimation results indicate that the main determinants of regional unemployment rate are regional migration, the lagged values of dependent and independent variables and also spatial weight matrix. Spatial weight parameter underlines that there is a spatial clustering inclination of regional unemployment rate and this result shows that geographically close regions exhibit similar regional unemployment figures.

Conclusions
New Economic Geography Paradigm has become to be popular since the second half of the 20th century and hence the importance of regions at national and international scales has been underlined more frequently. Nowadays, it’s widely accepted that if regions put their competitive capabilities in action, they can directly increase national economic growth rates and also they can bring nations competitive advantages in international platform. Consequently, regional policies affecting regional competitiveness and development process are seen as key factors for both regional and national economies. In this context, it’s quite important to analyze regional economic issues and to find good policies to resolve important regional problems. Based on this approach, the main determinants of regional unemployment rates in Turkey are examined during 2008 – 2015. Empirical results indicate that the main determinants of regional unemployment rate in NUTS2 regions of Turkey are regional migration rate, regional inflation rate, lagged values of regional unemployment rate, lagged values of regional inflation rate, lagged values of regional migration rate and spatial weight matrix. Findings suggest that current regional unemployment rate is affected positively by regional net migration rate, one-year lagged values of regional unemployment rate and one-year lagged values of regional inflation rate. Moreover spatial clustering evidence indicates that geographically close regions express similar unemployment rates. These results imply that Turkish regional authorities should decrease regional migration and inflation rates in order to decrease regional unemployment rates. Also, if the spatial clustering inclination is taken into account, then it can be said that if regions with high unemployment rates begin to decrease their unemployment rates, then their neighbors would also benefit from this result. However, since it is quite hard to achieve declining unemployment rates for regions by themselves, it could be a good policy option to form some regional platforms and policy actions in those geographically close regions could work together. In this respect, the first thing that comes to mind is the regional development agencies in the regions. Regional development agencies can be used to construct a platform for regions and effectively apply national policies at regional levels.

References


Elhorst, P. (2001). The Mystery of Regional Unemployment Differentials; A Survey Of Theoretical And Empirical Explanations, s.n..


This article is a chapter in a book (*Unregistered Employment*). If you want to access full version of the book please click: [http://library.ecoei.org/book/unregistered-employment/](http://library.ecoei.org/book/unregistered-employment/)

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