The Relations Between Unemployment and Entrepreneurship in Turkey: Schumpeter or Refugee Effect?

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Abstract

The main purpose of this study is to determine the relations between unemployment and entrepreneurship in Turkey. Thus, it is empirically investigated whether the effects of Schumpeter and Refugee are valid or not. In the study, the Autoregressive Distributed Lag – ARDL method was adopted and Turkey's 2000-2016 period data were used. The results of estimation show that there is an inverse relationship between entrepreneurship and unemployment. Accordingly, when the rate of entrepreneurship increases, unemployment decreases or vice versa. Causality is from entrepreneurship to unemployment. In other words, the while the Schumpeter effect is valid, it is concluded that the Refugee effect is invalid.

Key Words : Entrepreneurship, Unemployment, ARDL Method, Turkey.

JEL Codes : C51, E24, L26, O31.

I. Introduction

One of the main aims of economic policies is to ensure the full employment of the total labor force in the economy and thus to reduce the unemployment rate to zero or to the lowest possible level. The total labor force in an economy is divided into two groups: those who are employed and unemployed. Unemployed persons are those who do not work in a paid job. The employed people are regular employees, unpaid family workers, employers and self-employed persons. Among them, the sum of employers and self-employed can be defined as the entrepreneur (Koellinger and Thurik, 2012). It is clear that changes in entrepreneurship, as a component of total employment will have an impact on employment and therefore unemployment. In other words, the existence of a relationship between entrepreneurship and unemployment can be pointed out easily.

In the literature, there are two main views on the relationship between entrepreneurship and unemployment. The first of these is the view called "Schumpeter Effect" which suggests that unemployment will decrease as entrepreneurship increases (Garofoli, 1994; Audretsch and Fritsch, 1994; Audretsch, et al. 2001). The second one is the "Refugee Effect". According to this view, the increase in unemployment encourages entrepreneurship (Blau, 1987, Evans and Leighton, 1990, Evans and Jovanovic, 1989, Blanchflower and Meyer, 1994). In relation to the issue, a number of empirical studies have been conducted on various countries in recent years and different findings have been found (Prachowny, 1993; Audretsch, et al., 2005). Nevertheless, studies on the Turkish economy have been quite limited. Therefore, in this study the relationship between entrepreneurship and unemployment in Turkey are discussed and analyzed with the Autoregressive Distributed Lag (ARDL) model. The quarterly data of

Turkish Economy included 2000-2016 periods have been used in the empirical model. The study differs from other studies related to the subject in terms of data, modeling method and/or the result obtained and has the potential to make an important contribution to the literature in this respect.

II. Theoretical and Empirical Literature

Cantillon first described entrepreneurship as an "economic actor" at the beginning of the 18th century, and the concept has been the subject of theoretical debates. Over time, wide ranges of definitions have been made about the concept and entrepreneurship has been assessed in 12 different ways and in three basic traditions: German, Austrian and Neoclassical traditions (Herbert and Link, 1989: 41; Wennekers and Thurik, 1999: 31-34). However, in all definitions, the effects on the economic functioning of entrepreneurship have been neglected and generally defined as a 'person' or 'firm'. In fact, entrepreneurship can be a very dynamic concept influencing the economy, given the creation and acquisition of new economic opportunities and their competitive aspects. As a matter of fact, Wennekers and Thurik (1999: 46-47) treat entrepreneurship mainly as behavioral characteristics of persons and describe them in company and industry as well as national dimensions. According to this, entrepreneurship is about taking decisions on all matters related to the use of resources and institutions in the face of uncertainties and similar obstacles in the market, either on their own or as a team, inside or outside the organization; shows the ability and willingness to create and acquire new economic opportunities such as new products, new production methods, new corporate schemes and new product-market combinations. This allows entrepreneurship to be established and new entrants to the market, and to be associated with macro variables (Wong, et al., 2005: 339).

The effects of entrepreneurship on the economy are discussed both theoretically and empirically, as well as how they will be identified and addressed. In this framework, the effects of the entrepreneurship on the economic growth, cyclical fluctuations and unemployment are the most researched and debated topics in the last period. At this point, especially the relations between entrepreneurship and unemployment are remarkable. Two different views on this subject are competing with each other. As mentioned earlier, according to the Schumpeter Effect, there is an inverse proportional relationship between the two variables: as entrepreneurship increases, unemployment decreases. The important point here is that causality is towards from entrepreneurship to unemployment. On the contrary, according to Refugee Effect, there is a positive relationship between unemployment and entrepreneurship, and the increase in the unemployment rate encourages entrepreneurship. Causality is towards from unemployment to entrepreneurship. On the other hand, empirical studies reveal that there is a negative relationship between unemployment and entrepreneurship, which means that entrepreneurship, will decrease when unemployment increases. Unemployed people do not have the adequate knowledge and capital to build a business and therefore do not seek entrepreneurship (Johansson, 2000, Hurst and Lusardi, 2004). This phenomenon is explained by unstable economic growth in some studies (Audretsch, et al., 2005). Finally, there are studies suggesting that there is no relationship between entrepreneurship and unemployment and even that the interaction is bi-directional (Carree, 2002).

Regarding the subject, one of the few studies on Turkish Economy is Kum and Karacaoğlu (2012). In the study, annual data of Turkish Economy included a period of 1985 to 2009 have

been used and FMOLS (Fully Modified Ordinary Least Squares) and DOLS (Dynamic Ordinary Least Squares) methods have been adopted. In the paper, the share of self-employed in total employment was accepted as the entrepreneurial rate, and as a result, the increase in the unemployment rate was found to reduce entrepreneurial activities. Accordingly, there is a negative relationship between the two variables, and the causality is towards from unemployment to entrepreneurship.

In another study by carried out Halıcıoğlu ve Yolaç (2015) have been investigated Refugee Effect in the OECD countries and Turkey. In the study using ARDL (Auto Regressive Distributed Lag) method, 1986-2013 period data of the countries were used. In this framework, it was tested whether the increase in unemployment rate increases entrepreneurship. As a result of the analysis, the increase in unemployment rates in Belgium, Canada, Sweden and the United Kingdom has been increased entrepreneurship but has been found to reduce in Greece, Luxembourg, and Portugal. In Turkey and the other countries, a long-term relationship between unemployment and entrepreneurship could not be found.

According to Özerkek and Doğruel (2015), entrepreneurship and unemployment are negatively related in the long term and the increases in entrepreneurship have being reduced unemployment. This result has been obtained using the Vector Error Correction Model (VECM) and Turkey's annual data for the 1970-2013 periods.

III. Empirical Method and Data

In this study, the relations between entrepreneurship and unemployment is analyzed with Autoregressive Distributed Lag (ARDL) model which developed Pesaran and Shin (1999) and Pesaran, et al. (2001). The main reasons for choosing this method are that short and long run coefficients can be estimated at the same time; long-run relationships between variables can be determined independently of the degree of stationary; each variable in the model can be given a different lag length; can be applied to small samples (Pesaran and Pesaran, 1997: 302-303; Narayan, 2005).

Two models are defined in the study to determine the relationships between entrepreneurship and unemployment. The first model is arranged to reflect the Schumpeter effect and the second model reflect the Refugee effect. In other words, unemployment is considered as a dependent variable in the first model whereas entrepreneurship is considered as a dependent variable in the second model. Thus, it will be possible to evaluate the subject discussed in the literature in both dimensions. Models can be formatted as follows:

$$unemp_t = a_0 + a_1 entrep_t + \varepsilon_t \qquad (1)$$

$$entrep_t = b_0 + b_1 unemp_t + \varepsilon_t \qquad (2)$$

$unemp_t$ and $entrep_t$ represent respectively unemployment rates and entrepreneurship rates with the subscript *t* indexes time period and ε_t is classical error term.

In the analysis, the entrepreneurship rate has been broadly defined as entrepreneurship. According to this, within the total employment, self-employed persons (employers) as entrepreneurs in the enterprises having legal personality and self-employed persons (self-employed persons) as entrepreneurs in the enterprises which do not have legal personality were taken as entrepreneurs. Therefore, the share of employers and self-employed in the total labor force was used as the entrepreneur rate as agreed by Koellinger and Thurik (2012). The

share of the unemployed in the total labor force was also taken as the unemployment rate. In analysis was used quarterly data and all data is provided on the Turkish Statistical Institute (TSI) official website. On the other hand, the variables were seasonally adjusted with the Census X-12 method and Hodrick-Prescott (HP) filter was used to obtain the cyclical components. In other words, unemployment and entrepreneurship data are subject to cyclical analysis. The reason for this is that the relationship between unemployment and entrepreneurship can be made clearer in the recession phases of the conjuncture. Finally, in order to cover the effects of the 2001 and 2008 Crisis, a dummy variable with values of 1 for 2001: Q4 and 2009: Q1 and 0 for other periods were included in the analysis.

IV. Econometric Tests and Results

A. Unit Root Tests

Although the ARDL method allows variables with different degrees of stationary to take part in the same model and test long-term relationships, it requires that the variables are not *I(2)* (Narayan and Narayan, 2004). Therefore, as in many time series models, it is a necessity to perform unit root tests. The stationary of the variables was first analyzed using the Augmented Dickey-Fuller (ADF) test and then the Phillips – Perron (PP) (1988) test was applied to compare the results.[1] Test results are reported in Table 1.

Table 1: Unit Root Test Results

ADF Test							
	Level			**First Difference**			
Variables	***Test Format****	***Test Statistics***	***Critical Value*** (%5)***	***Test Format****	***Test Statistics***	***Critical Value*** (%5)***	***Conclusion***
unemp	*(c, t)*	-3.2062	-3.4815	*(c, t)*	-5.5126	-3.4815	***I(1)***
entrep	*(c, t)*	-4.5808	-3.4804	-	-	-	***I(0)***
PP Test							
	Level			**First Difference**			
	Test Format*	***Test Statistics***	***Critical Value**(%5)***	***Test Format****	***Test Statistics***	***Critical Value*** (%5)***	***Conclusion***
unemp	*(c)*	-2.7163	-2.9069	*(c)*	-5.5327	-2.9076	***I(1)***
entrep	*(c, t)*	-4.6079	-3.4804	-	-	-	***I(0)***

∗ Expressions used in parentheses represent constant terms and trends, respectively.

∗∗ denotes the critical values of MacKinnon (1996).

According to Table 1, the unemployment rate has a unit root at the level according to both ADF and PP test. However, when the first difference is applied, the stationary hypothesis is accepted. Thus, the result is that the unemployment rate is *I(1)*. On the other hand, it is observed that the entrepreneurship rate does not include unit root according to both test results. The entrepreneurship rate is stationary at the level and it is *I(0)*. These results show that the relationship between entrepreneurship and unemployment should be analyzed by ARDL model instead of traditional methods.

[1] The tests were conducted under the assumptions of an intercept, intercept and deterministic trend. If the test included only the intercept is stationary, the test including the intercept and trend has been applied. Thus, all deterministic and stochastic properties are taken into account in determining the stationary of the series.

B. ARDL Models

The relationships between variables in ARDL model are analyzed in two stages. First, it is tested whether there is a long-term relationship between variables. If there is a long-term relationship, short and long-term parameters are estimated in the second stage. Before applying the model, an unrestricted error correction model is created. Model 1 and Model 2 to be estimated in the study can be shown as follows:

$$unemp_t = \alpha_0 + \sum_{i=1}^{p} \alpha_{1i} \Delta unemp_{t-i} + \sum_{i=0}^{p} \alpha_{2i} \Delta entrep_{t-i} + \sum_{i=0}^{p} \alpha_{3i} \Delta dummy_{t-i} + \alpha_4 unemp_{t-1} + \alpha_5 entrep_{t-1} + \alpha_6 dummy_{t-1} + u_t \quad (3)$$

$$entrep_t = \beta_0 + \sum_{i=1}^{p} \beta_{1i} \Delta entrep_{t-i} + \sum_{i=0}^{p} \beta_{2i} \Delta unemp_{t-i} + \sum_{i=0}^{p} \beta_{3i} \Delta dummy_{t-i} + \beta_4 entrep_{t-1} + \beta_5 unemp_{t-1} + \beta_6 dummy_{t-1} + u_t \quad (4)$$

In equations (3) and (4) p represents the number of the lag and it is determined by Akaike or Schwarz information criteria and the lag providing the smallest critical value is regarded as the optimal lag length. Lag length test results for Model 1 and Model 2 are presented Table 2. In this test, the maximum lag length was accepted as 8 and the optimal lag length was found as 3 for Model 1 and 4 for Model 2. Thus, by applying for these lag lengths, for equation 3 which shows Model 1, the ARDL (2,3,1) model, and for equation 4 which represents Model 2, the ARDL (1,3,4) model were estimated.

Table 2: Optimal Lag Length

Model 1 (ARDL (2,3,1))			**Model 2 (ARDL (1,3,4))**	
p	**AIC**	**LM Test**	**AIC**	**LM Test**
1	-7.8968	0,2314	-8.8900	0.7738
2	-7.9421	0,5082	-8.8759	0.7738
3	**-8.1089**	**0,9213**	-9.0192	0.7834
4	-8.0901	0,9213	**-9.1657**	**0.8393**
5	-8.1222	0,0086	-9.1653	0.8393
6	-8.3256	0,8219	-9.1464	0.8393
7	-8.4200	0,8758	-9.1677	0.7565
8	-8.4173	0,8758	-9.1785	0.7565

In order to the determination of the long-run relationships in the ARDL method, the lagged coefficients of the dependent and independent variables in the equations (3) and (4) are equalized to zero ($H_0: \alpha_4 = \alpha_5 = \alpha_6 = 0$ ve $H_0: \beta_4 = \beta_5 = \beta_6 = 0$) and the F test is applied. Then, calculated F statistic values are compared with critical values on Pesaran, et al. (2001). If F statistic value is greater than the upper critical value, it is decided that there is a long-term relationship between variables and that the variables are co-integrated. Bound test results for models are shown in Table 3. According to the results, the calculated F statistic values for both models are greater than the upper critical values in all confidence intervals. Therefore, it is concluded that there is a long-term relationship between variables.

Table 3: Bound Test Results

Model 1 (ARDL (2,3,1))							
***F* Statistic**	***k***	Critical Values					
		%1		%5		%10	
		I(0)	*I*(1)	*I*(0)	*I*(1)	*I*(0)	*I*(1)
10.37600	2	**5.15**	**6.36**	**3.79**	**4.85**	**3.17**	**4.14**
Model 2 (ARDL (1,3,4))							
***F* Statistic**	***k***	Critical Values					
		%1		%5		%10	
		I(0)	*I*(1)	*I*(0)	*I*(1)	*I*(0)	*I*(1)
11.77302	2	**5.15**	**6.36**	**3.79**	**4.85**	**3.17**	**4.14**

k is the number of independent variables. I(0) and I(1) critical values in Pesaran, et al. (2001: 300).

After determining the long-term relationships, parameter estimation was made for both models. The results of ARDL (2,3,1) for Model 1 and ARDL (1,3,4) for Model 2 can be seen in Table 4.

Table 4: Estimation Results of ARDL Models

Model 1: ***ARDL (2,3,1)***

Dependent Variable*: unemp*

Variable	***Coeff,***	***Std. Error***	***t-Statistic***	***Prob.***
unemp (-1)	1.007208	0.129264	7.791848	***0.0000***
unemp (-2)	-0.299220	0.126968	-2.356662	***0.0221***
entrep	0.153902	0.198806	0.774132	0.4422
entrep (-1)	-0.601639	0.205350	-2.929826	***0.0050***
entrep (-2)	0.342637	0.194139	1.764910	0.0832
entrep (-3)	-0.529991	0.180013	-2.944190	***0.0048***
dummy	0.005211	0.002887	1.805114	0.0766
dummy (-1)	0.008498	0.002828	3.004743	***0.0040***
C	-0.000388	0.000535	-0.726302	0.4708

Diagnostic Tests:

R^2 : 0.87, $\bar{R}^2$: 0.85, *F-stat. : 45*.226, Prob. (*F-Stat.*) 0.00, DW : 1.91

Breusch-Godfrey Serial Correlation LM Test:

$\chi_1^2 = 0.095[0.757]$, $\chi_2^2 = 0.198[0.905]$, $\chi_3^2 = 1.562[0.668]$

Heteroskedasticity Test: ARCH-LM

$\chi_1^2 = 0.411[0.521]$, $\chi_2^2 = 1.238\ [0.538]$, $\chi_3^2 = 1.822[0.610]$,

Normality Test: *Skewness: -0.077 , Kurtosis: 3.76 , Jarque-Bera: 1.583 [0.453]*

Stability: Ramsey RESET Test $\chi_1^2 = 0.226[0.821]$

Model 2: ***ARDL (1,3,4)***

Dependent Variable: *entrep*

Variable	***Coeff.***	***Std. Error***	***t-Statistic***	***Prob.***
entrep (-1)	0.458836	0.109266	4.199256	***0.0001***
unemp	0.072316	0.074207	0.974520	0.3344
unemp (-1)	-0.107681	0.103554	-1.039854	0.3033
unemp (-2))	-0.117956	0.112898	-1.044806	0.3010
unemp (-3)	0.213622	0.074804	2.855754	***0.0062***
dummy	0.002009	0.001768	1.136091	0.2612
dummy(-1)	-0.001580	0.001858	-0.850656	0.3989
dummy(-2)	0.001692	0.001703	0.993047	0.3254
dummy(-3)	-0.004304	0.001573	-2.736319	***0.0085***
dummy(-4)	-0.005005	0.001607	-3.114944	***0.0030***
C	0.000321	0.000333	0.965393	0.3389

Diagnostic Tests:

R^2 : 0.61, $\bar{R}^2$: 0.53, *F-stat. : 7*.980, Prob. (*F-Stat.*) 0.00, DW : 2.05

Breusch-Godfrey Serial Correliation LM Test:

$\chi_1^2 = 0.177[0.673]$, $\chi_2^2 = 0.441[0.801]$, $\chi_3^2 = 0.929[0.818]$, $\chi_4^2 = 3.121[0.537]$

Heteroskedasticity Test: ARCH-LM

$\chi_1^2 = 0.096[0.756]$, $\chi_2^2 = 0.098[0.951]$, $\chi_3^2 = 0.9295[0.818]$, $\chi_4^2 = 3.945[0.4133]$

Normality Test: *Skewness: 0.910 , Kurtosis: 5.120 , Jarque-Bera: 20.195 [0.00004]*

Stability: Ramsey RESET Test $\chi_1^2 = 0.2630[0.793]$

The results of the diagnostic test show no problems in the Model 1. According to Breusch-Godfrey LM and the ARCH-LM tests, Model 1 has no autocorrelation and heteroscedasticity problems. In addition, Jarque-Bera test statistic points out that the residuals have the normal distribution. Finally, the Ramsey RESET test shows that the model is set up correctly and the coefficients are stable. However, diagnostic test results indicate that there is a problem in

Model 2. Although all the other test results are at acceptable intervals, the Jarque-Bera statistic value shows that the residuals have no normal distribution. Similar problems can also be seen in other results related to Model 2.

Table 5: Long-Run Coefficients of ARDL Models

Model 1: ***ARDL(2,3,1)***				
Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.*
entrep	-2.174873	0.708683	-3.068896	***0.0034***
dummy	0.046945	0.017130	2.740510	***0.0083***
Model 2: ***ARDL(1,3,4)***				
Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.*
unemp	0.111430	0.087030	1.280365	0.2062
dummy	-0.013285	0.007020	-1.892415	0.0641

Long-term coefficients for models are summarized in Table 5. According to the Model 1, there is an inverse relationship between unemployment and entrepreneurship and causality is from entrepreneurship to unemployment. Thus, 1 percent increase in the rate of entrepreneurship reduces the unemployment rate by more than 2 percent. However, there is a positive relationship between the variables according to Model 2, in which entrepreneurship is taken as a dependent variable, but this relationship is not meaningful.

The short-term dynamics of the models in the ARDL method are illustrated by the error correction mechanism. The short-term forecast or error correction results of the models can be seen in Table 6. Error correction coefficients calculated for both models are marked negative and meaningful. In other words, according to models, the short-run imbalances are eliminated in the long-run and the system is converging to the long-run equilibrium. However, according to Model 1, only 29% of the short-term imbalances are eliminated every three months, while 54% of the imbalances are eliminated every three months.

It was observed that the short-term coefficients of the models were not in harmony with the long-term results. According to the Model 1, lagged changes in unemployment and entrepreneurship can lead to increased unemployment, but these changes are eliminated in the long-run. Similarly, the results of the Model 2 are not in line with the long-term. This is because there is a negative relationship between two lagged changes in unemployment rate and entrepreneurship in short-run. In other words, short-term increases in unemployment can lead to a decrease in entrepreneurship. However, according to the error correction coefficient, this effect is temporary and disappears in the second period.

Table 6: Short-Term Estimation Results

Model 1: ***ARDL(2, 3, 1)***				
Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.*
C	-0.000388	0.000500	-0.776236	0.4410
Δ *(unemp (-1))*	0.299220	0.098051	3.051688	***0.0035***
Δ *(entrep)*	0.153902	0.173805	0.885485	0.3798
Δ *(entrep (-1))*	0.187354	0.175315	1.068670	0.2900
Δ *(entrep (-2))*	0.529991	0.161872	3.274133	***0.0019***
Δ *(dummy)*	0.005211	0.002046	2.547318	***0.0137***
*CointEq(-1)**	-0.292013	0.051396	-5.681629	***0.0000***
Model: ***ARDL(1, 3, 4)***				
Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.*
C	0.000321	0.000290	1.105947	0.2739
Δ *(unemp)*	0.072316	0.062969	1.148443	0.2561
Δ *(unemp (-1))*	-0.095666	0.069938	-1.367864	0.1774
Δ *(unemp (-2))*	-0.213622	0.065916	-3.240840	***0.0021***
Δ *(dummy)*	0.002009	0.001522	1.319551	0.1929
Δ *(dummy (-1))*	0.007618	0.002447	3.112739	***0.0030***
Δ *(dummy (-2))*	0.009309	0.002250	4.137678	***0.0001***
Δ *(dummy(-3))*	0.005005	0.001534	3.262736	***0.0020***
*CointEq(-1)**	-0.541164	0.089325	-6.058392	***0.0000***

V. Conclusion

The effects of entrepreneurship on the economy have been an important debate issue in the literature for a long time. In addition to its effects on business cycles and economic growth, with the impact of globalization, entrepreneurship has emerged as a subject of intensive research on how it affects employment and unemployment. Because the changes in entrepreneurship, which is an important component of total employment, naturally affect employment and unemployment. However, the main argument is whether entrepreneurship affects unemployment or whether changes in unemployment determine entrepreneurship? Furthermore, the relationship between the two variables is positive or negative way?

In this study, in order to answer these questions, two separate models were established within the framework of the ARDL method using the quarterly data from Turkey's 2000-2016 periods. The unemployment rate in the first model and the entrepreneurship rate in the second model were taken as dependent variables. As a result of these estimations, a negative relationship was found between entrepreneurship and unemployment. In other words, it was concluded that the Schumpeter effect was valid. On the other hand, it is not possible to talk about the effect of refugee. Although the results of the estimation reveal findings in this direction, the results are not statistically significant. Therefore, it is not wrong to say that entrepreneurship does not increase during periods of cyclical unemployment. From this point of view, findings support the idea that the unemployed persons will not tend to entrepreneurship because they do not have sufficient capital, knowledge and equipment.

According to the findings obtained from the study, the increases in entrepreneurship in Turkey reduce unemployment. For this reason, the application and development of policies that encourage entrepreneurship is important in terms of reducing unemployment. However, the fact that struggle with unemployment is based solely on these policies should not be

considered as the only solution. In order to find a permanent solution to the problem, determining the structural reasons of unemployment and producing policies accordingly will be the healthiest way.

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