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RELATIONSHIP BETWEEN ENTREPRENEURSHIP AND UNEMPLOYMENT IN TURKEY: A DYNAMIC ANALYSIS

Some recent researches have found that unemployment stimulates entrepreneurial activity. However, there are also some studies showing that higher levels of entrepreneurship reduce unemployment. Besides these basic views, some researchers claim that there is no relationship between unemployment and entrepreneurship, and they also asserted that increase in unemployment reduces the entrepreneurship. In this theoretical context, this study investigates the interrelations between entrepreneurship (self-employment) and unemployment rates in Turkey in the period of 1985-2009. In the analysis made by FMOLS and DOLS methods, it was concluded that increase in unemployment reduces the entrepreneurship activities.

Keywords: *entrepreneurship; unemployment; Turkey.*

JEL Classification: *L26, E24.*

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ЗАЛЕЖНІСТЬ МІЖ ПІДПРИЄМНИЦТВОМ І БЕЗРОБІТТЯМ В ТУРЕЧЧИНІ: ДИНАМІЧНИЙ АНАЛІЗ

У статті показано, що деякі нещодавні дослідження довели, яким чином безробіття стимулює підприємницьку діяльність. Проте є також інші дослідження, які показують, що вищий рівень підприємництва знижує рівень безробіття. Окрім цих основних поглядів, деякі дослідники доводять, що немає жодного зв'язку між безробіттям і підприємництвом, а також стверджують, що зростання безробіття знижує рівень підприємництва. У такому теоретичному контексті ця робота вивчає взаємозв'язок між підприємницькою діяльністю (самозайнятістю) і рівнем безробіття в Туреччині в період 1985-2009 р.р. В ході аналізу з використанням FMOLS і DOLS-методів було зроблено висновок, що зростання безробіття знижує підприємницьку активність.

Ключові слова: *підприємництво; безробіття; Туреччина.*

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ЗАВИСИМОСТЬ МЕЖДУ ПРЕДПРИНИМАТЕЛЬСТВОМ И БЕЗРАБОТИЦЕЙ В ТУРЦИИ: ДИНАМИЧЕСКИЙ АНАЛИЗ

В статье показано, что некоторые недавние исследования доказали, каким образом безработица стимулирует предпринимательскую деятельность. Тем не менее, есть также некоторые исследования, показывающие, что более высокий уровень предпринимательства снижает уровень безработицы. Помимо этих основных взглядов, некоторые исследователи доказывают, что нет никакой связи между безработицей и предпринимательством, а также утверждают, что рост безработицы снижает уровень предпринимательства. В таком теоретическом контексте данная работа изучает взаимосвязь между предпринимательской деятельностью (самозанятостью) и уровнем безработицы в Турции в период 1985-2009 г.г. В ходе анализа с использованием FMOLS и

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DOLS-методов был сделан вывод, что рост безработицы снижает предпринимательскую активность.

Ключевые слова: *предпринимательство; безработица; Турция.*

I. Introduction. There is a close relationship between unemployment and entrepreneurship (Prachowny, 1993). However, the methods or ways in which this interaction can be determined are still discussed by many scientists. In recent studies, it can be observed that there are several different approaches and findings about the interaction of these phenomena (Audretsch et al., 2005). The ambiguities found in these studies reflect two conflicting mainstreams. On one hand, entrepreneurship may lead to a decrease in unemployment; on the other hand unemployment may lead to an increase in entrepreneurship. While the first effect has been defined as Schumpeter entrepreneurial effect, the second effect has been referred to as refugee or desperation effect. The Schumpeter effect suggests a negative relation between unemployment and entrepreneurship, and that higher levels of entrepreneurship lead to lower levels of unemployment (Garofoloi, 1994; Audretsch and Fritsch, 1994; Audretsch and Thurik, 2000). In other words, higher levels of start-up activities result in employment increase. Contrary to the Schumpeter effect, the refugee effect claims a positive link between entrepreneurship and unemployment, and thus an increase in unemployment rate leads to higher levels of start-up activities (Blau, 1987; Evans and Leighton, 1990; Evans and Jovanovic, 1989; Blanchflower and Meyer, 1994). In recent years, empirical studies have been conducted in order to analyze if there is an interaction between effects of Schumpeter and refugee. In the studies carried out in 23 OECD countries, Audretsch and Thurik found out that an increase in entrepreneurship rate leads to a decrease in unemployment rate (Wennekers and Thurik, 1999). The apparent results of the Schumpeter effect can also be seen in Japan. However, in countries such as Portugal, Spain and the United Kingdom, the interaction between entrepreneurship and unemployment could not be definitely assessed by the chosen mathematical models. For instance, the Schumpeter effect is strongly observed in higher income regions in Spain while the refugee effect is found in lower income regions of the country. Moreover, Wong et al. (2005) state that the refugee effect occurs in the countries with less developed social security systems.

Contrary to above mentioned views, it is suggested that there is a negative relation between entrepreneurship and unemployment, and an increase in unemployment rate leads to a decrease in start-ups (Garofoli, 1994; Audretsch and Fritsch, 1994; Johansson, 2000; Hurst and Lusardi, 2004). However, Carree (2002) found no statistically substantial relationship.

Literature widely analyses and emphasizes the existing interrelationship between entrepreneurship and unemployment. In Turkey, however, there is no study concerning these relationships. The studies in Turkey mostly dealed with policy-making on reducing unemployment by encouraging start-up activities. This study deals with these two terms with an interdisciplinary approach. Furthermore, there is no study in international literature which analyses these two variables using FMOLS and DOLS methods. Therefore, this article may make a significant contribution to the literature. This study is organized as follows. In the next part, we will introduce the methods and findings, and in the final section we will present the results and the suggestions.

2. Data and method. In this research, time series were used to annual unemployment rate and self-employed data by TurkStat (TUIK, Turkish Statistical Institute) in the period between 1985 and 2009. As an indication of entrepreneurship, we used the rate of self-employed in total employment as a generally accepted variable in literature (Blanchflower and Oswald, 1998; Audretsch et al., 2001; Thurik et al., 2007; Baptista and Thurik, 2007). The main reason why the period after 1980 was preferred is that entrepreneurial activities have expanded and free market economy has been adopted since then. Moreover, the entrepreneurship in Turkey has been encouraged by legal regulations since 1980.

This research is designed to answer the question "What kind of relationship is there between entrepreneurship and unemployment?" Considering this research question, the alternative hypotheses are developed as follows:

H1: An increase in unemployment increases entrepreneurship activities.

H2: An increase in unemployment reduces entrepreneurship activities.

H3: An increase in entrepreneurship activities reduces the rate of unemployment.

H4: There is no relation between entrepreneurship and unemployment.

2.1. Unit Root Tests. In the analysis with time series, the stability of the series has great importance. The variance and the average must be stable in due course. Besides, the lag covariances of variables in two time slots do not depend on the time, however, depend on the time lag between the variables. If the average and the covariance of a time series do not change in due course and the covariance between two period bases on distance between two periods of time rather than the period that the covariance is calculated, it does not contain unit root, in other words, it is stable (Gujarati, 1999). If an analysis is made using unstable time series, it is possible to confront with a spurious regression problem (Granger and Newbold, 1974). In that case, the results obtained via regression analysis do not reflect the real relation. Extended Dickey-Fuller and Phillips-Perron unit root tests are widely used in examining the stability of time series.

To confirm for stationarity of the variable, augmented Dickey-Fuller (1979) and Phillips-Perron (1988) unit root tests are utilized. The ADF and PP unit root tests for levels and first differences are summarized in Tables 1 and 2. In no case can we find evidence against the null hypothesis that the series contain unit roots in levels. However, we reject the null hypothesis for first differences.

As the results of the unit root tests are presented in Table 1 and reported intercept and with a trend, all the variables are tested both in levels and in first differences. It can be inferred from the table that the unit root hypothesis cannot be rejected when the variables are taken in levels. However, when the first differences are used, the hypothesis of unit root non-stationary is rejected at the 5% significance level.

2.2. Empirical Evidence. Most of previous methods used to estimate the coefficients in the regression equations are biased because they contain the results of interiority and autocorrelation.

Therefore, in recent years, it's recommended that the parameter estimation should be done by using FMOLS and OLS methods developed by Pedroni (1996), Stock and Watson (1993) and Kao and Chiang (2000).

Also in the literature it has been proved, according to the Monte Carlo simulations of a low number of observations, DOLS results are stronger. Kao and Chiang

(2000) showed that DOLS results are stronger than FMOLS results for particularly small size sample observations.

Table 1. **Augmented Dickey-Fuller (ADF) Test Results for Unit Roots**

Variable		Without trend	With trend
UNEMP	Level	-1.049825	-1.735885
		[-2.991]	[-3.612]
	First Difference	-4.606001*	-4.591196*
		[-2.998]	[-3.622]
SELFEMP	Level	-0.242239	-2.943364
		[-2.998]	[-3.658]
	First Difference	-9.154650*	-8.930684*
		[-2.998]	[-3.622]

Notes: Critical values are in the parentheses. * denotes statistical significance at the 5% level.

Table 2. **Phillips-Perron (PP) Test Results for Unit Roots**

Variable		Without trend	With trend
UNEMP	Level	-1.290994	-2.080694
		[-2.991]	[-3.612]
	First Difference	-4.606612*	-4.591196*
		[-2.998]	[-3.622]
SELFEMP	Level	-1.583043	-5.415606
		[-2.991]	[-3.612]
	First Difference	-9.154650*	-10.87880*
		[-2.998]	[-3.622]

Notes: Critical values are in the parentheses. * denotes statistical significance at the 5% level.

Our models are based on the regression such as suggested in Pedroni (2001):

$$SELFEMP_{it}=\alpha_i+\beta_i UNEMP_{it}+\mu_{it} \quad i=1,2,..,N \quad t=1,2,..,T \text{ (Model 1)}, \qquad (1)$$

$$UNEMP_{it}=\alpha_i+SELFEMP_{it}+\mu_{it} \quad i=1,2,..,N \quad t=1,2,..,T \text{ (Model 2)}, \qquad (2)$$

where $SELFEMP_{it}$ is the log of *SELFEMP*, $UNEMP_{it}$ is the log of *UNEMP* and $SELFEMP_{it}$ and $UNEMP_{it}$ are cointegrated with slopes β_i, which may or may not be homogeneous across *i*.

$$SELFEMP_{it}=\alpha_i+\beta_i UNEMP_{it}+\sum_{k=-Ki}^{Ki}\gamma_{ik}\Delta UNEMP_{it-k}+u_{it} \quad i=1,2,..,N \quad t=1,2,..,T \quad (3)$$

$$UNEMP_{it}=\alpha_i+\beta_i SELFEMP_{it}+\sum_{k=-Ki}^{Ki}\gamma_{ik}\Delta SELFEMP_{it-k}+u_{it} \quad i=1,2,..,N \quad t=1,2,..,T \quad (4)$$

Following from equation, let $\xi_{it}=(\hat{u}_{it},\Delta UNEMP_{it})$ be a stationary vector including the estimated residuals and differences in *P*.

Also let, $\Omega_{it}=\lim_{T\to\infty}E\left[T^{-1}(\sum_{t=1}^{T}\xi_{iT})(\sum_{t=1}^{T}\xi_{iT})'\right]$ be the long-run covariance for this vector process which can be decomposed into $\Omega_i=\Omega_i^0+\Gamma_i+\Gamma_i'$, where Ω_i^0 is the contemporaneous covariance and Γ_i is the weighted sum of autocovariances.

FMOLS and *DOLS* test results are reported in Tables 3 and 4.

Table 3. **FMOLS (Fully Modified Ordinary Least Squares) Test Results**

Variable	Coefficient	Standard Error	Prob
UNEMP (β_1)	-0.696863* [-2.674]	0.260582	0.0139
β_0	30.43567* [12.940]	2.351934	0.0000

Notes: Number of lags was selected using the SIC-Schwarz information criteria. t-statistics values are in the parentheses.

According to *FMOLS* results for Model 1 in which *UNEMP* is considered as independent variable, is statistically significant. Accordingly, *UNEMP* increasing reduces the *SELFEMP*.

According to the Model 2 results, change in *SELFEMP* has no effect on *UNEMPL* variable.

Table 4. **DOLS (Dynamic Ordinary Least Squares) Test Results**

Variable	Coefficient	Standard Error	Prob
UNEMP (β_1)	-1.098298* [-2.923]	0.375707	0.0222
β_0	33.21530* [11.033]	3.010501	0.0000

Notes: Number of lags and leads are 4 and 3 respectively was selected using the SIC-Schwarz information criteria. t-statistics values are in the parentheses.

According to the *DOLS* analysis, decrease in *UNEMP* and increase in *SELFEMP* have a negative and strong relationship in the long term. One of the advantages provided by the *DOLS* analysis is to estimate the parameters.

Accordingly, 1% increasing in *UNEMP*, 1.098% (approx. 1.1%) reduces *SELFEMP*. Change in *SELFEMP* has no effect on *UNEMPL* variable.

According to the above results, 3 hypotheses (H_1, H_3, and H_4) were rejected; hypothesis (H_2) that the increase in the unemployment rate reduces entrepreneurial activity was adopted.

3. Results and discussion. In this study, the relationship between unemployment and entrepreneurship in the years 1985-2009 is estimated by means of FMOLS and DOLS methods. It is concluded that the increase in unemployment rate reduce the entrepreneurship during the mentioned period. According to the results of the analysis, 1% increase in the unemployment rate reduce the self-employed at the rate of 1,1%. It is considered that the findings of the related studies with the features of Turkish entrepreneurs and the development of entrepreneurship in Turkey may explain the reason for this result.

Although Karadeniz and Ozdemir (2009) underline that Turkey has a rapid developing market and people in Turkey have a positive attitude to entrepreneurship, they mention that the most important obstacles encountered by entrepreneurs in Turkey is the lack of financial support provided by government and private sector, also there are inadequate government programs on the intellectual property rights and on providing knowledge/technology and tax practices (Karadeniz and Ozdemir, 2009: 30). Benzing et al. (2009) state the inadequacies on the sustainability and reality of accounting records; complicated tax structure and weak and instable economic structure are the

most important obstacles for entrepreneurship in Turkey. (Benzing et al., 2009: 58). Turkish people do not want to set up a new business due to negative circumstances. Within these negative circumstances, investors prefer profiting from high interest rates instead of investing, and legal transactions for investors are some of the reasons of the undeveloped entrepreneurship. In Turkey, the entrepreneurship could not be developed in view of the inefficient education at universities and as a result of this, students have a lack of knowledge on how a business plan can be created, a business can be set up and how finance can be obtained for an enterprise. Due to this and similar reasons, the entrepreneurship could not be developed in spite of the increasing unemployment rate.

Becoming an entrepreneur by starting up a business is not an easy task since an entrepreneur needs help and expertise in a number of fields. Turkish entrepreneurs indicate the following expertise/information as a need at their start-up: market and demand research, technological support, qualified human resources, marketing and advertising. However, the number of organizations from which assistance is sought is very few. The reason behind might be the lack of awareness of the formal sources and types of help available to entrepreneurs.

It is observed that entrepreneurship activity has no effect on the decrease of unemployment rate, or the increase in the unemployment rate has no effect on the entrepreneurship activities. In developed countries, entrepreneurship activity is one of the engines of economic growth and has an effect called the Schumpeter effect on decreasing the unemployment rate, and within this context it is suggested that the unemployment rate may be decreased by means of the support of private and public sectors for entrepreneurship activities. At this point, in order to stabilize economic development and decreasing the unemployment rate, there have been several studies for developing and expanding the youth and women entrepreneurship mentality. Though, the findings of these studies and increasing unemployment rate show there is no positive feedback for the precautions.

In further studies on Turkey the mentioned relationship varying by sex or region can be analyzed, and the relationship between non-agricultural unemployment rate and entrepreneurship may be examined and by this means it is possible to make a contribution to the developing of literature. Besides, a contribution to the international literature can be made by comparing the results related to Turkey with the studies on other countries.

References:

Abe, M. and Ohta, S. (2001). Fluctuations in unemployment and industry labor markets, Journal of the Japanese and International Economies 15 (4), 437-464.

Acs, Z.J. and Audretsch, D.B. (1993). Conclusion, in: Z.J. Acs and D.B. Audretsch (eds.), Small Firms and Entrepreneurship: An East-West Perspective, Cambridge University Press, Cambridge, UK.

Aoki, M. (1990). Toward an economic model of the Japanese firm, Journal of Economic Literature 18 (1), 1-27.

Audretsch, D. B., Carree M.A. and A.R. Thurik, A.R. (2001). Does entrepreneurship reduce unemployment?. Tinbergen Institute discussion paper TI01-074/3. Erasmus University Rotterdam.

Audretsch, D.B. and Fritsch, M. (1994). The geography of firm births in Germany, Regional Studies 28, 359-365.

Audretsch, D.B., Carree, M.A., Stel, A.J. and Thurik, A.R. (2005). Does self-employment reduce unemployment?, Papers on Entrepreneurship, Growth and Public Policy #07/2005, Jena, Germany: Max Planck Institute of Economics.

Baptista, R. and Thurik, A.R. (2007). The relationship between entrepreneurship and unemployment: is Portugal an outlier?, Technological Forecasting & Social Change, 74, 75-89.

Benzing, C, Hung C. M. and Kara, O. (2009). Entrepreneurs in Turkey: a factor analysis of motivations, success factors, and problems, Journal of Small Business Management, 47(1), 58-64.

Blanchflower, D. and Meyer, B. (1994). A longitudinal analysis of young entrepreneurs in Australia and The United States, Small Business Economics, 6(1), 1-20.

Blanchflower, D. G. and Oswald, A. J. (1998). What makes an entrepreneur?, Journal of Labour Economics,16(1), 26-60.

Blau, D. M. (1987). A Time series analysis of self employment in the United States, Journal of Political Economy, 95(3), 445-467.

Carree, M. (2002). Does unemployment affect the number of establishments? A regional analysis for U.S. states, Regional Studies, 36, 389-398.

Dickey, D. and Fuller, W. A. (1979). Distribution of the estimators for autoregressive time series with a unit root, Journal of American Statistical Association, 74, 427-431.

Dickey, D. and Fuller, W. A. (1981). Likelihood ratio statistics for autoregressive time series with a unit root, Econometrica, 49(4), 1057-1072.

Evans, D. and Leighton, L. (1990). Small business formation by unemployed and employed workers, Small Business Economics 2, 319-330.

Evans, D. S. and Jovanovic, B. (1989). Estimates of a model of entrepreneurial choice under liquidity constraints, Journal of Political Economy, 97(3), 657-674.

Garofoloi, G. (1994). New firm formation and regional development: The Italian case, Regional Studies 28, 381-394.

Golpe, A. and van Stel, A. (2007). Self-employment and unemployment in Spanish regions in the period 1979-2001, Jena Economic Research Papers, 2007-021.

Gonzalo, J. (1994). Five alternative methods of estimating long-run equilibrium relationships, Journal of Econometrics, 60, 203-234.

Granger, C.W.J. and Newbold, P. (1974). Spurious regressions in econometrics, Journal of Econometrics, 2(2), 111-120.

Gujarati, D.N. (1999). Temel Ekonometri, Cev. U. Senesen ve G.G. Senesen, Literatur Yayinlari, Istanbul.

Hurst, E. and Lusardi, A. (2004). Liqudity constraints, household wealth and entrepreneurship, Journal of Political Economy, 112 (2), 319-347.

Johansson, E. (2000). Self-employment and liquidity constraints: Evidence from Finland, Scandinavian Journal of Economics, 102, 123-134.

Kao, C. and M.-H Chiang, M.-H (2000). On the estimation and inference of a cointegrated regression in panel data, in: Baltagi B. H. (ed.), Advances in Econometrics: Non-stationary Panels, Panel Cointegration and Dynamic Panels, 15, 179-222.

Karadeniz, E and Ozdemir, O. (2009). Entrepreneurship in Turkey and developing countries: a comparison of activities, characterstics, motivation and environment for entrepreneurship, MIBES Transactions, Vol. 3, Issue 1, 30.

Pedroni, P. (1996). Fully Modified OLS for Heterogeneous Cointegrated Panels and the Case of Purchasing Power Parity, Indiana University Working Papers In Economics, No. 96-020, June.

Pedroni, P. (2001). Purchasing power parity tests in cointegrated panels, The Review of Economics and Statistics, 83(4), 727-731.

Phillips, P. C. B. and Peron, P. (1988). Testing for a unit root in time series regression, Biometrika, 75(2), 336-346.

Prachowny, M.F.J. (1993). Okun's Law: Theoretical foundations and revised estimates, Review of Economics and Statistics, 75, 331-336.

Stock, J. H. and Watson, M. (1993). A simple estimator of cointegrating vectors in higher order integrated systems, Econometrica, 61, 783-820.

Taylor, M . (1996). Earnings, independence or unemployment: Why become self-employed? Oxford Bulletin of Economics and Statistics, 58 (2), 253-265.

Thurik, A.R., Carree, M.A. , van Stel, A., Audretsech, D.B. (2007). Does self-employment reduce unemployment, Discussion Papers on Entrepreneursihp, Growth and Public Policy.

Wennekers, A. and Thurik, A.R. (1999). Linking entrepreneurship and economic growth, Small Business Economics,13(1), 27-55.

Wong, P.K., Ho, Y.P. and Autio, E. (2005). Entrepreneurship, innovation and economic growth: Evidence from GEM data, Small Business Economics, 24, 335-350.

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