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INVESTIGATION OF THE IMPACT OF ENTREPRENEURSHIP AND BUSINESS FREEDOM ON ECONOMIC GROWTH USING PANEL DATA ANALYSIS

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ABSTRACT

The question of which variables determine economic growth has been considered to be one of the most important research questions since Solow's first works in 1950s by many economists. In this study, the relationship among business freedom, entrepreneurship and economic growth nexus in selected 20 high-income OECD countries over the period 2001-2011 was surveyed. One way fixed effects model was estimated to explore the relationship among the variables selected. The empirical part of the paper uses data on business freedom, Total early-stage Entrepreneurial Activity for male and female working age population separately as measurements of entrepreneurship. The study proposes that entrepreneurial activity significantly affects economic growth.

Key Words: Entrepreneurship, business freedom, economic growth, panel data analysis, fixed effect model, entrepreneurial activity.

GİRİŞİMCİLİK VE İŞ ÖZGÜRLÜĞÜNÜN EKONOMİK BÜYÜME ÜZERİNE ETKİSİNİN PANEL VERİ ANALİZİ İLE İNCELENMESİ

ÖZ

Ekonomik büyümenin belirleyicilerinin hangi değişkenler olduğuna dair sorulan soruların cevapları, Solow'un ilk çalışmalarını ortaya koyduğu 1950 yılından buyana birçok iktisatçı tarafından araştırılmaktadır. Bu çalışmada iş özgürlüğü, girişimcilik ve ekonomik büyüme ilişkisi 20 yüksek gelirli OECD ülkesi için 2001–2011 dönemi verileri kullanılarak analiz edilmiştir. Tek yönlü sabit etki modeli seçilmiş değişkenler arasındaki ilişki incelemektedir. Çalışmanın ampirik kısmı iş özgürlüğü, erkek ve kadın çalışma çağındaki nüfusun toplam erken dönem girişimsel aktivite oranını ayrı ayrı girişimcilik ölçütü olarak kullanmaktadır. Elde edilen ampirik bulgulara göre girişimsel aktivitenin ekonomik büyümeyi önemli ölçüde pozitif (olumlu) yönde etkilediğini ortaya koymaktadır.

Anahtar Kelimeler: Girişimcilik, iş özgürlüğü, ekonomik büyüme, panel data analizi, sabit etki modeli, girişimsel aktivite.

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1. INTRODUCTION

Entrepreneurs play a determinant role on the societal, economic and cultural environment of a country. However, they are directly affected by socio-economic, cultural and political environment of a given country as well. By taking into consideration that entrepreneurs are an important influence over a given country's economic success, it is clearly desirable to know what sorts of social institution provide a favourable climate for developing qualities of entrepreneurship (Casson, 1982: 12). Entrepreneurs need a barrier-free business environment to foster an economy.

Business freedom is discussed under economic freedoms in the literature and it is possible to acquire quantitative data on a specific country's business environment where entrepreneurs are active. The economic freedom index to measure this data was created by Heritage Foundation and Wall Street Journal in 1995. There is also another economic freedom index created by Cato Institute, USA and the Fraser Institute, Canada (Lau and Lam, 2002: 664). For the purposes of the study Heritage Foundation and The Wall Street Journal's economic freedom index has been taken into consideration. The Index is one of the oldest commonly known global indexes. It includes data in 10 freedom categories–business, trade, fiscal, monetary, investment, financial, labor, corruption, government size and property rights, corruption and freedom. The data as far as 1995 is accessible (Acs and Szerb, 2009: 20).

The study consists of several parts. Firstly, the concepts of entrepreneurship and business freedom have been discussed. Secondly, effects of entrepreneurship and business freedom on economic growth have been put forward. Following the literature review about the past studies in this research area; data, model and econometric methodology have been included in the study. Lastly, findings of the research and concluding remarks have been proposed.

2. CONCEPTUALIZATION OF ENTREPRENEURSHIP, TOTAL EARLY STAGE ENTREPRENEURIAL ACTIVITY AND BUSINESS FREEDOM

Wennekers and Thurik (1999) stress that entrepreneurship is the clear ability and desire of individuals, on their own, in teams, within and outside existing organizations for the purpose of interpreting and creating new economic opportunities, and introducing their ideas in the market, in the face of uncertainty and other obstacles, by making decisions on location,

form and the use of resources and institutions (Wennekers and Thurik, 1999: 46-47). Thus entrepreneurship is regarded as the participation of individuals in the activities of entrepreneurship. These activities of individuals statistically find meaning in the rate of new establishment rates or business ownership status of individuals. These records can be stated as measures to assess the level of entrepreneurship activities of a given country. This type of demographic classification was introduced by Global Entrepreneurship Monitor (GEM) Consortium.

GEM aims to investigate differences at national levels and types of entrepreneurship and to link these to job creation and economic growth. However, unlike other national economic characteristics, like GDP, or inflation, national entrepreneurship can be referred to as the net result of individual decisions to realize entrepreneurial initiatives. In this individual perspective and in light of the GEM objectives, every person engaged in any behavior related to new business creation, no matter how modest, is relevant to the national level of activity. GEM refers to people who are entrepreneurially active as adults in the process of setting up a business they will (partly) own and or currently owning and managing an operating young business. This definition is basically similar to the most appropriate focus of entrepreneurial research (Reynolds et al., 2005: 208-209).

Total early-stage Entrepreneurial Activity (TEA) is a term that is used to refer to percentage of 18-64 population who are either a nascent entrepreneur or owner-manager of a new business in the GEM studies. Besides, TEA can be divided into two groups based on the gender of entrepreneurs as total early-stage entrepreneurial activity for male working age population and total early-stage entrepreneurial activity for female working age population (GEM, 2013).

Entrepreneurship needs an environment where their activities are not limited. The level of freedom of a business environment can be expressed by the concept of ‘business freedom’.

Business freedom, a component of economic freedom index, is a quantitative measure of the ability to commence, operate, and end a business in a given country that represents the overall burden of regulation as well as the efficiency of government in the regulatory process (Heritage Foundation, 2011: 447).

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3. EFFECTS OF ENTREPRENEURSHIP AND BUSINESS FREEDOM ON ECONOMIC GROWTH

The theory of economic growth strongly implies the significant role of entrepreneurial activity in the economy (Baumol, 1968: 65). Entrepreneurs in a given economy attempt to shape it by taking available economic activities. Yet, the level to which entrepreneurs enjoy the possible economic opportunities depends on the degree to which entrepreneurs function without restrictions. In order to obtain economic growth a barrier free business environment for entrepreneurs should be designed by the policy makers.

Today entrepreneurship has become increasingly important to developed countries as a source of economic growth and employment creation (Thurik et al., 2008: 673). Entrepreneurship activities are one of the primary determinants of economic change and the dynamics that move society to a greater economic height. Business start-ups to exploit a perceived business opportunity would lead to economic growth, but it is also possible that obligatory entrepreneurship may not lead to economic development. Being pushed into entrepreneurship (self-employment) because all other options for work are either absent or unsatisfactory can even lead to under development (Griffith, 2012: 1). On the contrary, if the existing environment is not suitable for entrepreneurship activities the economy would be affected negatively.

4. LITERATURE REVIEW

Among studies that examine the relationship between entrepreneurship and economic growth, studies at the nation-state are limited (Van Stel et al., 2005: 311-321). Barro (1991) showed that entrepreneurs are the most important factors in explaining the differences in growth across economies.

Van Stel (2005) et al. investigated whether TEA influences GDP growth for a sample of 36 countries. They tested whether the influence depended on the level of economic development measured as GDP per capita. The study put forward that entrepreneurial activity by nascent entrepreneurs and owner/managers of young businesses affected economic growth, but that this effect depended upon the level of per capita income. The result suggested that entrepreneurship played a different role in countries in different stages of economic development.

Salgado-Banda (2005) used different two measures as proxy variables of productive entrepreneurship in order to explore the linkage between productive entrepreneurship and economic growth in 22 OECD countries over the period of 1975-1998. These measures are patent applications and self-employment or business ownership. According to Salgado-Banda (2005) entrepreneurship, measured by patent applications, had both statistical and economic relevance on economic growth. The empirical results showed that self-employment or business ownership appeared to be negatively associated with economic growth. This meant that self-employment could be associated with rent-seeking activities or other non-innovative areas instead of productive entrepreneurship by Salgado-Banda (2005).

Wong et al. (2005) used cross-sectional data on 37 countries in order to explore the relationship between the measures of entrepreneurial activities and economic growth. Authors tested four types of TEA which were high-growth total entrepreneurial activity, opportunity total entrepreneurial activity, necessity total entrepreneurial activity, and overall total entrepreneurial activity. They found that only high-growth potential TEA had a significant impact on economic growth as one of the four types of TEA,

Nyström (2008) investigated the relationship between economic freedom and entrepreneurship, measured by self-employment, in 23 OECD countries for the period 1972-2002. The empirical results showed that a smaller government sector, better legal structure and security of property rights and less regulation of credit, labour and business caused to increase entrepreneurship activity.

Braunerhjelm (2010) found that there existed a positive relationship between entrepreneurship and economic growth in 20 OECD countries over the period 1981-2002 (Braunerhjelm, 2010: 1-82).

Valliere and Peterson (2009) tested the impacts of three types of TEA, namely high-expectation entrepreneurship activity (HEA), opportunity entrepreneurial activity (OEA) and necessity entrepreneurial activity (NEA) on GDP growth rates in 24 developed (these countries have per capita GDP more than US$ 20.000) and 20 emerging countries (these countries had per capita GDP less than US$ 20.000) for years 2004 and 2005. According to the empirical results of the authors, HEA entrepreneurs seemed to positively contribute growth in the case of developed countries, but other two entrepreneurs did not. The sign of NEA was positive, but NEA was not statistically significant variable. OEAs were negatively

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associated with growth in developed countries. The case of emerging countries was different to the case of developed countries. Hence, the specific entrepreneurship terms had no significant effects on economic growth.

Vázquez-Rozas et al. (2010) analyzed the effect of entrepreneurial capital on GDP growth in Spanish and Portuguese regions from 2000 to 2008. They used the ratio of companies created in each region as a proxy variable of entrepreneurial capital. They found that the effect of the entrepreneurship capital on GDP growth was positive and significant.

Klarl (2011) found that entrepreneurial activity positively affected growth rate of ideas on the balanced growth path. Hence, according to Klarl (2011), the existence of lead entrepreneurship contributed significantly to technological change.

5. DATA MODEL AND ECONOMETRIC METHODOLOGY

5.1. Data and model

In order o empirically investigate the impact of entrepreneurship on economic growth, this paper estimate for the available time period, 2001-2011, among 20 high-income OECD countries: Australia, Belgium, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Netherlands, Norway, Spain, Sweden, Switzerland, United Kingdom, United States[4]. Some countries are excluded from the sample, although they are high-income OECD member, since these countries have no available data in selected period. Missing data are a part of almost all research. In order to overcome the missing data problem, we have taken the mean values of the series because the Ordinary Least Squares estimator we preferred used the deviations from the mean.

The question of which variables determine economic growth has been considered to be one of the most important research questions since Solow's first works in 1950s by many economists. We have focused on the relationship between economic growth and the entrepreneurial activity from entrepreneurship indicators. In this study, the economic growth models which will be estimated are as follows:

$$\ln gdp\_ppp_{it} = a_{0i} + a_{1i}.bus\_free_{it} + a_{2i}.overall\_TEA_{it} + \varepsilon_{it} \quad (1)$$

[4] According to World Bank's list of economies issued in 18 July 2011, high-income OECD countries have got gross national income (GNI) per capita exceeding $ 12,276 per year.

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$$\ln gdp\_ppp_{it} = \beta_{0i} + \beta_{1i}.bus\_free_{it} + \beta_{2i}.TEA\_m_{it} + u_{it} \quad (2)$$

$$\ln gdp\_ppp_{it} = \delta_{0i} + \delta_{1i}.bus\_free_{it} + \delta_{2i}.TEA\_f_{it} + \upsilon_{it} \quad (3)$$

A description of the variables used this study and their data sources follows:

(1) Member countries' business freedom index (bus_free) is taken from the Heritage Foundation (2012).

(2) GDP per capita based on purchasing power parity (lngdp_ppp) is measured by the logarithm of GDP per capita, ppp index (2005=100). The data on GDP are obtained from World Bank's World Development Indicators (2012).

(3) Total early-stage Entrepreneurial Activity (overall_TEA) is used to measure entrepreneurship. Overall_TEA means the percentage of 18-64 population who are either a nascent entrepreneur or owner-manager of a new business. This data obtained from Global Entrepreneurship Monitor (GEM).

(4) Total early-stage Entrepreneurial Activity for male working age population (TEA_m) and Total early-stage Entrepreneurial Activity for female working age population (TEA_f) for male and female separately is used as well as overall_TEA, which is used to measure Entrepreneurial activity. The data on TEA are taken from GEM.

In order to process the study E views 7.0, Gauss 6.0, and Rats 7.0 are used. Adding Total early-stage Entrepreneurial Activity for male and female working age population separately to the model and using the recent period have differentiated this study from the other studies subjected the relationship between entrepreneurship and economic growth. In order to estimate these regressions, we preferred the analysis of panel data. The analysis of panel or longitudinal data is the subject of one of the most active and innovative bodies of the economic growth literature, because panel data provide such a rich environment for the development of estimation techniques and theoretical results (Greene, 2008: 54-66).

Table 1 presents the descriptive statistics and correlation matrix of the variables used in the study. According to correlation matrix, all explanatory variables is positively correlated with GDP per capita and the intensity of this correlation ranged from twenty one to thirty five percent.

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Table 1. Descriptive Statistics and Correlation Matrix of the Variables

	gdp_ppp	overall_TEA	TEA_m	TEA_f	bus_free
Mean	31866.38	6.390909	8.386727	4.391955	81.59864
Median	31950.22	5.800000	7.600000	3.850000	85.00000
Maximum	49175.28	36.40000	41.80000	26.20000	100.0000
Minimum	14213.73	0.900000	1.400000	0.300000	66.10000
Std. Dev.	6509.484	3.261619	4.025492	2.523583	9.979218
Correlation Matrix	**gdp_ppp**	**overall_TEA**	**TEA_m**	**TEA_f**	**bus_free**
gdp_ppp	1.000000	0.241912	0.267388	0.212965	0.353003
overall_TEA	0.241912	1.000000	0.976547	0.950926	0.131650
TEA_m	0.267388	0.976547	1.000000	0.876067	0.113498
TEA_f	0.212965	0.950926	0.876067	1.000000	0.177512
bus_free	0.353003	0.131650	0.113498	0.177512	1.000000

5.2. Econometric Methods and Findings

Panel unit root tests

In order to get unbiased estimations, firstly we investigate the existence of unit root in the series. Several different panel unit root tests are available. The stationarity properties of the variables are tested by the panel unit root tests of Levin et al. (2002) (LLC), Im et al. (2003) (IPS), and. LLC (2002) assume that the coefficients of lagged dependent variable to be homogenous across all cross sections, while IPS (2003) allow the coefficients of lagged dependent variables to be heterogeneous and for residual serial correlation. Other test Maddala and Wu (1999) consider deficiency of both the LLC and IPS frameworks and offer an alternative testing strategy (Barbieri, 2006: 5-16). MW is based on a combination of the p-values of the test statistics for a unit root in each cross-sectional unit.

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Table 2. Results of Panel Unit Root Test

Variable	LLC		IPS		PP-Fisher	
gdp_ppp	**Constant**	**Constant Trend**	**Constant**	**Constant Trend**	**Constant**	**Constant Trend**
	-3.85	64.13	-0.41	13.17	41.48	11.90
	[0.00]***	[1.00]	[0.33]	[1.00]	[0.40]	[1.00]
lngdp_ppp	-4.52	-1.91	-0.85	1.23	45.48	11.97
	[0.00]***	[0.02]**	[0.19]	[0.89]	[0.25]	[1.00]
Δlngdp_ppp	-6.97	-8.23	-2.30	-0.98	65.52	66.08
	[0.00]***	[0.00]***	[0.01]**	[0.16]	[0.00]***	[0.00]***
overall_TEA	3.67	-3.23	-1.37	-1.44	120.34	148.84
	[0.99]	[0.00]***	[0.08]*	[0.07]*	[0.00]***	[0.00]***
TEA_m	-6.30	-12.97	-4.42	-2.19	139.45	151.7
	[0.00]***	[0.00]***	[0.00]***	[0.01]**	[0.00]***	[0.00]***
TEA_f	-10.45	-2.77	-4.41	-0.02	116.29	118.46
	[0.00]***	[0.00]***	[0.00]***	[0.49]	[0.00]***	[0.00]***
bus_free	-1.18	1.19	-0.26	0.81	48.6	32.37
	[0.11]	[0.88]	[0.39]	[0.79]	[0.16]	[0.79]
lnbus_free	-0.77	1.78	-0.16	0.75	52.66	55.74
	[0.21]	[0.96]	[0.43]	[0.77]	[0.08]*	[0.05]**
Δlnbus_free	-15.02	-11.10	-7.22	-2.34	155.49	128.76
	[0.00]***	[0.00]***	[0.00]***	[0.00]***	[0.00]***	[0.00]***

Numbers in brackets are p-values. *, ** and *** indicates the statistical significance at 10, 5, and 1% levels respectively. The max lag lengths were set to 3 and Schwarz Bayesian Criterion was used to determine the optimal lag length.

Results for the panel unit root tests are shown in Table 2. As can be readily seen from Table 2, most of the tests (with the exception of the LLC test) fail to reject the unit root null for gdp_ppp and lngdp_ppp in both constant and constant plus time trend, but the tests (with the exception of the IPS test in one case) do reject the null of a unit root for lngdp_ppp in difference form. Similarly we are able to strongly reject the unit root null hypothesis for all indicators of entrepreneurship activity. We are unable to reject the unit root null hypothesis at the 5 percent level significance in all of the tests for bus_free, but we are able to reject the null of a unit root for lnbus_free in difference form.

From these findings, we conclude that lngdp_ppp and lnbus_free are integrated of order one, or I(1). In addition, all indicators of entrepreneurship activity are integrated of order zero, or I(0). At this stage, it is necessary to turn to panel cointegration techniques in order to determine whether a long-run equilibrium relationship exists among the non-stationary variables in level form.

Panel Cointegration Tests

After the order of stationarity has been determined, our next step is to apply panel cointegration methodology. We perform panel cointegration tests for three models

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(lngdp_ppp, lnbus_free, overall_TEA), (lngdp_ppp, lnbus_free, TEA_f), and (lngdp_ppp, lnbus_free, TEA_m). These tests are developed by Pedroni (1999, 2004). Pedroni (1999) allows for heterogeneous slope coefficients across individuals. This test consists of within-dimension and between-dimension, which comprise totally seven component test statistics. To analyze the existence of the long-run equilibrium relationship among the variables, the results of Pedroni panel cointegration tests we conduct are reported in Table 3 for the three models.

Table 3. Pedroni Panel Cointegration Tests

For Eq.1

Within-Dimension		Between-Dimension	
	Statistic		**Statistic**
Panel v-stat	-2.66 (0.99)	**Group rho-Statistic**	5.51 (1.00)
Panel-rho stat	4.23 (1.00)	**Group PP-Statistic**	2.22 (0.98)
Panel-PP stat	3.17 (0.99)	**Group ADF-Statistic**	5.18 (1.00)
Panel ADF-stat	5.79 (1.00)		

Numbers in parenthesis are p-values. The max lag lengths were set to 4 by Schwarz Bayesian Criterion with the assumption of the deterministic trend and constant.

For Eq.2

Within-Dimension		Between-Dimension	
	Statistic		**Statistic**
Panel v-stat	-2.62 (0.99)	**Group rho-Statistic**	5.70 (1.00)
Panel-rho stat	4.32 (1.00)	**Group PP-Statistic**	2.56 (0.99)
Panel-PP stat	3.25 (0.99)	**Group ADF-Statistic**	2.63 (0.99)
Panel ADF-stat	6.93 (1.00)		

Numbers in parenthesis are p-values. The max lag lengths were set to 4 by Schwarz Bayesian Criterion with the assumption of the deterministic trend and constant.

For Eq.3

Within-Dimension		Between-Dimension	
	Statistic		**Statistic**
Panel v-stat	-2.65 (0.99)	**Group rho-Statistic**	5.02 (1.00)
Panel-rho stat	3.84 (0.99)	**Group PP-Statistic**	0.23 (0.59)
Panel-PP stat	1.94 (0.97)	**Group ADF-Statistic**	-0.00 (0.49)
Panel ADF-stat	4.41 (1.00)		

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Numbers in parenthesis are p-values. The max lag lengths were set to 4 by Schwarz Bayesian Criterion with the assumption of the deterministic trend and constant.

As it is seen from Table 3, the results of Pedroni panel cointegration test statistics for the three models strongly fail to reject the null hypothesis of no cointegration, hence there is no evidence of long-run cointegration relationships among variables. Thus, we conduct panel OLS estimator in this study.

Table 4. Test of Cross-section Effects

Effects Test	Statistic Eq.1	Statistic Eq.2	Statistic Eq.3
Cross-section F	288.35 (0.00)***	281.16 (0.00)***	297.13 (0.00)***
Cross-section Chi-square	654.33 (0.00)***	649.82 (0.00)***	659.70 (0.00)***

Numbers in parenthesis are p-values. *** indicates the statistical significance at 10 level.

Table 4 shows the results of test of cross section fixed effects for the three models. We estimate the relationship among economic growth, business freedom, and entrepreneurship using one-way fixed effects estimator. Employing the one-way fixed effects model will give reliable results since the probability values of both cross section F and cross-section Chi-square statistics are smaller than 0.01 at significance level.

Table 5. The Results for One-way Fixed Effects Model

For eq. 1. Dependent Variable: Δlngdp_ppp

Panel OLS	β	t-ratio	std.error	prob.
Overall_TEA	0.0037	0.002	1.6699	0.096*
Δlnbus_free	0.0722	0.042	1.6978	0.091*
C@trend	9.9622 0.0089	0.180 0.001	55.138 6.7207	0.000*** 0.000***

*, ** and *** indicates the statistical significance at 10, 5, and 1% levels respectively.

For eq. 2. Dependent Variable: Δlngdp_ppp

Panel OLS	β	t-ratio	std.error	prob.
TEA_m	0.0014	0.001	1.9000	0.369
Δlnbus_free	0.0768	0.042	1.7991	0.073*
C@trend	9.9533 0.0090	0.181 0.001	54.765 6.700	0.000*** 0.000***

*, ** and *** indicates the statistical significance at 10, 5, and 1% levels respectively.

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For eq. 3. Dependent Variable: Δlngdp_ppp

Panel OLS	β	t-ratio	std.error	prob.
TEA_f	0.004	0.002	1.863	0.0642*
Δlnbus_free	0.071	0.042	1.681	0.094*
C@trend	9.969 0.008	0.180 0.001	55.258 6.489	0.000*** 0.000***

*, ** and *** indicates the statistical significance at 10, 5, and 1% levels respectively.

The results obtained from the one-way fixed effects are shown in table 5. According to Table 5, business freedom index has statistically significant and positively effect on economic growth for all three models as expected from the literature.

Interestingly, even though TEA_m has no significantly impact on economic growth, the both the coefficients of overall_TEA and TEA_f, which are used as the indicators of entrepreneurial activity are significant and positive in all three models. Hence, we can say that business freedom and especially Total early-stage Entrepreneurial Activity for female working age population are important determinants in promoting economic growth.

6. CONCLUSION

This paper contributes to the empirical literature on the determinants of economic growth across countries. In this study, the relationship among business freedom, entrepreneurship and economic growth nexus in selected 20 high-income OECD countries over the period 2001-2011 was surveyed. After reviewing the theoretical principles and experimental studies, the model and estimation was introduced.

The empirical part of the paper uses data on business freedom and Total early-stage Entrepreneurial Activity for male and female working age population separately as a measure of entrepreneurship from a database including 20 OECD countries covering the period 2001 to 2011.

We also hope our findings will be of interest to public policy makers. Adding Total early-stage Entrepreneurial Activity for male and female working age population separately to the model and using the recent period have differentiated this study from the other studies subjected the relationship between entrepreneurship and economic growth. In order to estimate these regressions, we preferred the analysis of panel data.

Women's entrepreneurship has been recognized during the last decade as an important untapped source of economic growth and the studies with the topic of women in

entrepreneurship has been largely neglected in the social sciences. However, a number of women who are involved in businesses have increased. In addition The World Bank's World Development Report 2011 suggests that productivity could increase by as much as 25% in some countries if discriminatory barriers against women were removed. Removing these barriers, such as discriminatory property and inheritance laws, cultural practices, lack of access to formal financial institutions, and time constraints due to family and household responsibilities, will create greater opportunities for sustainable enterprises run by women. This in turn will contribute to women's economic empowerment and gender equality as well as helping to generate sustainable growth and jobs (ILO, 2012). From this point of view, we focused on women's entrepreneurship in addition to total entrepreneurship.

According to the obtained empirical findings, business freedom index has statistically significant and positively effect on economic growth for all three models as expected from the literature. Interestingly, even though TEA_m has no significantly impact on economic growth, the both the coefficients of overall_TEA and TEA_f, which are used as the measurements of entrepreneurship are significant and positive in all three models. Hence, we can say that business freedom and Total early-stage Entrepreneurial Activity for female working age population are important determinants in promoting economic growth. Consequently female entrepreneurship contributes to countries' economic growth using unique skills, resources and practices. In particular, there is a high correlation of economic growth and entrepreneurial activity among high income OECD countries

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