Determinants of the New Companies Formation in E.U Member Countries. An Autoregressive ARDL Model Approach

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Abstract

This article searches for influential factors on new companies' formation in a number of 26 EU Member States during the 2009-2019 period basing on available statistical data of this. In such an order data were panel organized and an ARDL (autoregressive distribution lag) model was estimated as the result of unit root tests for stationarity of variables with different level of integration (I_0 ;I_1). The main advantages of such a model used is that we can obtain an image of long run and short run associations between model variables for all countries. In addition, the ARDL model will take into account heterogeneity (differences) among countries by allowing for country specific variables. Significant results for long run association between variables for most countries were obtained, except for: Belgium, Germany, Estonia, Spain, France, Hungary and Austria; short run associations will be presented also individually for each of the 26 countries implied.

Key words: enterprise birth rates, entrepreneurship environment, EU entrepreneurship, determinants of new enterprises formation
J.E.L. classification: C01, C13, C23, M13

1. Introduction

As already mentioned above, the aim of our below study is detecting a correlation, i.e. some causal links between new companies' formation in most of the EU member countries and a list of macroeconomic variables assumed to influence it in the literature. We believe that the significance of this study then deepens on identifying short and long term such links and these between the exogenous like existing entrepreneurship, unemployment rate, GDP, the population's educational attainment level and density of population, on the one hand, and the endogenous that is the enterprise birth rate, on the other. And this will be while limiting to the EU member countries.

Actually, we see this as a challenge and as an attempt to solve it by an *ARDL regressive type model,* given *stationarity* and differences within these above variables' integration degrees. As equally mentioned above, the model will range on a panel data of 26 EU member States and correlations will result and be seen not only on the short and long terms, but equally on both sides, the Union, as a whole, and each member country in part. Reference data come from *Eurostat* for the EU member States, as cross-sections, on the 2009-2019 years interval (11 years).

Besides, a substantial literature treats on the companies' formation issue and here we'll have a 'literature review' paragraph detailing about each variable in context. Positive (+) and significant influences on business formation (i.e. new companies) are here expected from currently existing entrepreneurship, country's economic development attained, density of population and degree of education attained, the last a proxy of *human capital* related to both each country in part and the whole Union. Last, but not least, the unemployment rate is here expected to equally encourage the new business, rather than its alternative option for the unemployment benefits.

2. Literature review of variable selection

According to Eurostat statistics, the enterprise is an unit that produces goods and services and benefits from autonomy in making decision, e.g. its resources allocation. An enterprise (that might be equally called firm or company) is a legal entity everywhere and can do its job in one or more establishments.

Enterprise birth rate (endogenous variable) will be the considered number of newly created enterprises (firms, companies) in year *"t"* over total number of active enterprises at the same year end, in percentages. This is a so called ecological approach (Alexandrova, 2015). An enterprise birth rate so has been computed for each of the EU 28 countries, here excluding Greece and Croatia for no available data.

The enterprise birth rate, as in the *Eurostat* definition, relates to the creation of such production units. And this is understood simply as newly added combinations of production factors in which the existent enterprises aren't involved. This institutional definition so skips new born enterprises through mergers, split-offs, break-ups and/or existent enterprises' component sets restructuring. The same for sub-populations of enterprises that result from changing activity only. Such a new born enterprise is viewed as a new activity from scratch. New born enterprises also create new jobs, while reactivation of dormant enterprises are not supposed to be any new born enterprises.

Existent entrepreneurship, as a first independent variable, equals the number of existent entrepreneurs (i.e. enterprises) and the literature sees it as favourable for new enterprise creation since the existing entrepreneurship actually defining the business environment stability in the economy (Otsuka, 2008, Henderson at all 1995). Here the existing entrepreneurship is the number of legal establishments accounted in each country each year. The higher the number of companies and offices, the more the available capital. The whole rest of resources and factors, here including intelligence, talent and opportunities sees itself boosted in context (Ciccone and Hall, 1996).

But to be equally mentioned that a positive relationship between existing and new born entrepreneurship does not make unanimity in the literature, i.e. while the previous opinion sees business opportunities multiplying, the last (opposite) view sees rather competition strengthening in the area. Other opinions see the entrepreneurial climate as either positive for the individual decisions to become entrepreneur (Armington and Acs,2002; Delfmann et all, 2014), or already settled in its past (Fotopoulos, 2014).

Gross domestic product at market prices - in volume terms specific to the year 2010 as per capita Euro – here is the second independent variable. It is calculated as the ratio of real GDP to the average population of a specific year in the 2010 prices. GDP measures the amount of total final output of goods and services produced by the economy within a certain period of time. It includes goods and services with their own specific market segments done (or able to do as such) and products which are produced by general government and non-profit institutions. It is a measure of economic activity and is also used as a proxy for the development in a country's material living standards. Studies have shown that the relationship between entrepreneurship and per capita GDP is highly significant in the economic development context (Audretsch, 2007; Baumol & Strom, 2007). Opinions in the literature stays divided on the per capita growth's influence on new born business: Armington and Acs (2002) see it quite positive, Lee et al (2004) not too much influence (about zero) and Sutaria and Hicks (2004) even the contrary effect.

Unemployment rate – the one of 15-64 years of age unemployed individuals in total population of these same ages (%) – is the third independent variable and a problem to be permanently fought by political authorities and also a reason for the citizens to become self-employed (Deveci and Seikkula-Lein,2018). It is here seen as a natural labour resource for newly created enterprises. Unemployment can be considered a *push factor* as it turns self-employment into a necessity. Storey (1991) and Lindh and Ohlsson (1996) here see some positive association with creation of new businesses, while other cross-sectional studies indicate rather the opposite (Giannetti and Simonov,2004). According to Audretsch and Thurik (2002) a low level of unemployment can stimulate entrepreneurship by opportunities here given. At the macro level a high rate of unemployment might also negatively impact the level of entrepreneurship by lowering availability of business opportunities when depressed economy (Audretsch at all, 2002 and Almus and al.,

1999). Johnson and Parker (1996) also found a negative effect of unemployment on entrepreneurship.

The *population's educational attainment level* (i.e. tertiary/%). This is the fourth independent variable of this model and sees the tertiary education population of 15-64 years of age in total population of these ages. The literature sees it as the most influential factor upon entrepreneurship. "University education makes them ready for *the tough market game"* (Robinson & Sexton, 1994), while Bilić I. and all (2011) cite studies in Croatia that find as high as 67% of Croatian students with serious and strong entrepreneurial intentions (see also Bakotić & Kružić 2010). The same for studies previously made in France to conclude on the importance of young and highly skilled people, here including graduates of local universities, for current business (Guesnier,1994).

The *population density* – i.e. the demographic balance, as population on square kilometer –is the fifth variable considered, here seen as important for entrepreneurship through measuring the production factors' crowding in the area. The growth of population might keep its effects on the self employment level in a country (Verhoeven, 1995). Countries with rapidly expanding population, here including labour force, see also growth in the self-employed people's share in total population; the opposite for countries of low growths of total population. Brüderl & Preisendörfer (1998), mentioned by Audretsch et all (2002), argue for the up pressure on the entrepreneurial activity from higher population density, the urbanization factor and so the specific infrastructure proximity. Reynolds et al. (1994) and Storey (1994) similarly express that the population's important density in the urban areas clears the way for new small business opportunities.

3. Data and methodology

The macro-level determinants of entrepreneurship are resulting from the relationships between human capital, level of development, and institutions (Arin et al, 2014). Human capital, as a production factor, but equally an influencing factor for entrepreneurship, will be analysed below as related to population's density, to education and unemployment rates as well. As in context population density is here considered a measure of population agglomeration in a country, tertiary education is a measure of the educated part of 15-64 years old population as a percent in total population of this age group and unemployment rate, actually in each of the EU member States, is the unemployed people's percentage of given labour force.

The *Eurostat* database that includes the entrepreneurship statistics for 26 countries (less Greece and Croatia, just for missing data) as EU member States will be here used. Each country development level, here as an influential factor of new firms' creation and of the existent entrepreneurship's strengthening, will be seen below with the help of per capita GDP in Euro referred to the 2010 year basis (the 2010 volume = 100 for next following years' numbers in chain). Data will be panel ranged for their analysis through the *ARDL (autoregressive distributed lag)* type model due to their integration degree difference – I(0), versus I(1) -, as according to Pesaran (1999). In a ARDL model type, each of variable of interest is considered to be a function of the it's past values (auto-regressive) and the present and past values of other variables (distributed lag). The Eviews programme will help for model estimations.

4. Model description and results

Previously to regression analysis done descriptive statistics were deployed for information about normal distribution, versus outliers in data, for measuring the central tendency (mean, median, maximum, minimum,), the same for dispersion (standard deviation) and the same for normality: *kurtosis* (measuring the sharpness degree) and *skewness* (measuring the degree of symmetry). The sample here comprises those 26 EU member countries, with data for the 2009–2019 year interval provided by *Eurostat* 2020 statistics (see Table no.1)

Table no. 1. Variables descriptive statistic, Sample: 1-286

	New Companies	Entrepreneurship	GDP/capita	Density	Tertiary	Unemployment
Mean	2.29	12.99	9.96	4.70	3.22	2.10
Median	2.30	13.10	10.04	4.68	3.31	2.06
Maximum	3.21	15.20	11.33	7.31	3.70	3.26
Minimum	1.11	10.19	8.51	2.75	2.41	0.83
Std. Dev.	0.33	1.40	0.64	0.96	0.31	0.41
Skewness	-0.03	-0.23	-0.19	0.29	-0.61	0.23
Kurtosis	3.60	2.15	2.38	3.44	2.34	3.034
Jarque-Bera	4.06	9.97	5.85	5.81	21.12	2.47
Probability	0.13	0.006	0.053	0.054	0.000026	0.28
Sum	595.64	3379.18	2592.03	1224.02	839.79	546.74
Sum Sq. Dev.	28.77	507.72	106.73	243.06	25.04	45.14
Observations	260	260	260	260	260	260

Source: author's own calculations with Eviews, based on Eurostat data

The skewness between -1 and -0.5 (negatively skewed) means that data are moderate level skewed (the case of "tertiary education" variable). The unemployment variable shows a normal distribution with a *kurtosis* of 3 *(mesokurtic)*. Entrepreneurship, per capita GDP and tertiary education reveal kurtosis of less than 3, meaning a flat distributions (*platykurtic*) relative to the normal. New companies and density variables are *leptokurtic* (with a kurtosis of more than three). The *Jarque-Bera* statistic here measures the difference of the *skewness* and *kurtosis* of the series with those from the normal distribution. The association's probability (the null hypothesis of a normal distribution) reveals that two of variables are not normally distributed – but the rest of them are.

Further on, the model's estimation needs *stationary* and *co-integration* specific tests. Inclusion of non stationary panels in the estimation might lead to spurious regressions (Baltagi, 2013; Gujarati & Porter, 2009). Then, when we don't find any unit root in the data of each series means that the series are stationary. Co-integration is tested for a long run relationship between two or more non-stationary series. Various unit root tests for panel data were then performed – e.g. common tests as Levin, Lin, and Chu (2002), Breitung and Candelon (2005), Im, Pesaran, and Shin (2003) and individual root tests as Augmented Dickey and Fuller-Fisher and Phillips and Perron-Fisher test, in Eviews programme. We also used the Schwartz info criterion for selection of lag order. These tests have null hypothesis $H_{0,}$ when all variables have unit root and alternative hypothesis H_1, when all variables are stationary for a significance level accepted as $\alpha = 5\%$.

More precisely: $Y_t = Y_{t-1} + \varepsilon_t$, where Y_t is the endogenous variable at time t and ε_t is a the error term.

Due to these mixed orders of integration, *the PMG/ARDL (pooled mean group/auto-regressive distributed lag model)* panel approach here proves more appropriate than the traditional panel co-integration test. The option for ARDL was for the 0 versus 1 integration degrees announced. The endogenous here is stationary at level, i.e. at I(0) integration degree. On the contrary, the independent variables are I(1) integration degree, i.e. at the first difference. According to Johansen (1995); Philipps and Hansen (1990), the long-run relationships is present only if a exist a co-integration among variables with the same order of integration. Contrary Pesaran and Shin (1999) argue that the ARDL panel could be equally used with variables of different integration levels, i.e. I(0), and I(1).

Concomitantly, the PMG/ARDL type model Eviews estimated here makes clear the yes or no short and long term association's existence between variables. Moreover, the short run association between variables will be possible for each EU member country in part, together with country specificities to be made distinct. As already mentioned above, the ARDL model estimation for panel data takes into account heterogeneity (i.e. differences) among countries by allowing for country specific variables. This data panel contains a combination of cross section (N=26 countries,

as EU member States) and time series (T=11 years) observations, i.e. a short panel with large N and smaller T. The model sees itself applied on an unbalanced panel for missing data cases either.

The general form of ARDL (p,q…q) model is specified as :

$$Y_{it} = \Sigma^{p}_{J=1}\alpha_i y_{i,t-j} + \Sigma^{q}_{J=1}\beta_{ij} x_{i,t-j} + \mu_{i+} e_{it} \quad (1)$$

in which:

Y_{it} is the endogenous variable;
X_{it} is a vector of exogenous and could be I(0) or I(1) or co-integrated
α_{ij} is the coefficient of the lagged exogenous variable
β_{ij} are coefficient vectors
μ is the country (specific fixed effects)
I=1,2…..6 ; t =1, 2,…..11; p, q are the lag orders; e_{it} is the error term.
P represent the lag of the endogenous variable, and q, the lag of exogenous variables

The re-parameterized ARDL(p,q,..q)error correction model is specified as :

$$\Delta Yit = \theta^{*}[y_{i,t-1} - Z_i X_{i,t}] + \Sigma^{P-1}_{J=1} h_{ij} \Delta X_{i,t-j} + \Sigma^{q-1}_{J=0} \beta'_{ij} \Delta X_{i,t-j} + \mu_{i+} e_{it} \quad (2)$$

in which:

$\theta_i = -(1-\alpha_i)$ - country specific speed of adjustment coefficient (expected $\theta i<0$)
$Z_i =$ vector of long run relationships
$ECT = [y_{i,t-1} - Z_i X_{i,t}]$ = error correction term
$h_i, \beta'_i =$ short run dynamic coefficients

The ARDL model then finds a long-run equilibrium between similar variables across the 26 countries in the sample, except for a sub-set of these. The short run adjustment, in its turn, might be country specific, i.e. different impacts of unemployment, tertiary education attainment and/or GDP on either entrepreneurial environment or companies' creation. The coefficient of the error-correction term is negative and not lower than -2 (Samargandi et all, 2013) for the existence of a long-run relationship among the variables of interest. Data limitation here imposes the lag structure. This last is rather likely to be imposed across countries when the time dimension is not long enough to force lags extension (see Loayza and Ranciere, 2006; Demetriades and Law,2006).

Based on the Akaike criterion the following lag structure (1,1,1,1,1,1) for the all variables in the model was estimated.

The long run coefficient is here estimated as *common coefficient* which keeps both negative sign and lower than 1% significant level (probability of 0.0005 ≤ 0,01). Value of *-0.601719* represents the long run association between variables or speed of adjustment. Long run association is estimated also through individual coefficients for each variable, but it stays common to all countries. The 1% increase of existing entrepreneurship leads to the 0.08% increase of new companies' creation in the long run. The coefficient has positive sign, as expected.

The per capita GDP coefficient is also positive and the 1% increase of per capita GDP level leads to the 0.16% increase of new companies' formation in the long run, as well. Increase of unemployment rate by 1% can also conduct to an increase of new companies' formation of 0.07% in the same long run actually, unemployment could be a labour resource needed for the new enterprises.

Density's coefficient sign is negative, namely contrary, as expected. The 1% increase of density of population would lead to a 0.143% decrease in new companies' formation – actually, population crowding might rather discourage entrepreneurship in the long run.

Tertiary education, as a common coefficient for all countries, is not significant in the long run (significance probability is 0.2418>0.05 % significance level).

In the short run, only existing entrepreneurship and GDP are significant and positive signs, as expected. Tertiary education, unemployment rate and density of population have no influence on new companies' information in the short run (see Table 3)

As equally already mentioned, the ARDL model keeps also the advantage that short run and long run coefficients can be estimated for each country in part. See the table below with the individual results as such. Here there are significant long run associations between variables for a majority of countries, i.e. except for: Belgium, Germany, Estonia, Spain, France, Hungary and

Austria, due alternatively to their probability of more than significance probability level of 0.05% , or to non negative sign of long run coefficient .

Table no. 2. Long run coefficients and associated probability

Country	Long run coefficient	Probability
Belgium	0.121	0.002
Bulgaria*	-1.057	0.000
Czech*	-0.196	0.014
Denmark*	-1.019	0.000
Germany	0.268	0.000
Estonia	-0.185	0.114
Ireland*	-0.170	0.091
Spain	0.686	0.001
France	0.109	0.000
Italy*	-0.104	0.000
Cyprus*	-0.468	0.000
Latvia*	-0.886	0.000
Lithuania*	-0.299	0.000
Luxembourg*	-0.821	0.002
Hungary	-0.202	0.518
Malta*	-1.348	0.000
Netherlands*	-0.334	0.003
Austria	0.105	0.001
Poland*	-1.953	0.000
Portugal*	-0.313	0.003
Romania*	-0.990	0.000
Slovenia*	-1.158	0.000
Slovakia*	-1.381	0.000
Finland*	-0.118	0.000
Sweden*	-0.406	0.005
UK*	-3.525	0.003

Source: own representation; calculation performed in Eviews
* significant values of long run coefficient

In the short run, the PMG/ARDL model here offers the capability of detecting the exogenous on endogenous influence both in each country included and through individual coefficients of each variable. So, the *existing entrepreneurship* variable seems to be significant and has positive influence on new companies' formation in the short run for: Czech Republic, Denmark, France, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Poland, Romania, Slovenia, Slovakia, Finland, Sweden and the UK.

Table no. 3. Short run individual coefficients and estimated probability

Country	Variable	Coefficient	Std. Error	t-Statistic	Prob. *
Belgium	Unemployment	-0.17319	0.048661	-3.559126	0.038
Bulgaria	Unemployment	0.082359	0.017931	4.593107	0.019
Czech Republic	Entrepreneurs	2.897227	0.812672	3.565064	0.038
	Tertiary	-1.412156	0.458467	-3.080167	0.054
Denmark	Unemployment	-0.288956	0.011024	-26.2125	0.000
	Tertiary	2.238893	0.873569	2.562927	0.083
	Entrepreneurs	4.520834	0.255037	17.72622	0.000
Germany	Unemployment	1.428391	0.234009	6.103996	0.009
	Tertiary	4.125799	0.303166	13.60906	0.001
	Entrepreneurs	-6.822536	0.652576	-10.45478	0.002
	GDP	7.240134	1.215	5.958959	0.010
Estonia	GDP	2.734118	0.960622	2.846197	0.065
Ireland	No short run				
Spain	Unemployment	1.283108	0.351835	3.646905	0.036
France	Unemployment	-2.479571	0.417958	-5.932583	0.010
	Entrepreneurs	2.315106	0.247769	9.343793	0.003
Italy	Unemployment	-0.747742	0.018246	-40.98065	0.000
	Entrepreneurs	8.299672	3.377853	2.457085	0.091
	GDP	-5.724641	0.625611	-9.150485	0.003
Cyprus	Unemployment	-0.44	0.069793	-6.304341	0.008
	Entrepreneurs	1.048907	0.33982	3.086656	0.054
Latvia	Unemployment	-0.134948	0.013252	-10.18307	0.002
	Entrepreneurs	3.434655	0.065688	52.28725	0.000
	GDP	-0.4466	0.152739	-2.923935	0.061
	Density	-13.80091	2.331024	-5.920536	0.010
Lithuania	Unemployment	1.257044	0.018126	69.35169	0.000
	Entrepreneurs	1.67055	0.10445	15.99378	0.001
Luxembourg	Unemployment	0.07509	0.007594	9.888247	0.002
	Tertiary	0.291937	0.008996	32.45175	0.000
	Entrepreneurs	1.991177	0.539003	3.694188	0.034
Hungary	Unemployment	0.544813	0.1674	3.254549	0.047
Malta	No short run				
Netherland	No short run				
Austria	Unemployment	-0.271576	0.104701	-2.593833	0.081
	Tertiary	0.107605	0.013207	8.147817	0.004
Poland	Unemployment	0.51449	0.003914	131.4487	0.000
	Tertiary	0.605172	0.144591	4.185414	0.025
	Entrepreneurs	-1.380677	0.023427	-58.93634	0.000
	GDP	6.885972	0.316716	21.74178	0.000
Portugal	Unemployment	0.298333	0.097232	3.068249	0.055
Romania	Unemployment	2.514109	0.44675	5.627551	0.011
	Entrepreneurs	0.672526	0.143557	4.684719	0.018

Slovenia	Unemployment	0.341512	0.041863	8.157762	0.004
	Entrepreneurs	4.513914	0.793606	5.68785	0.011
Slovakia	Unemployment	0.700498	0.01765	39.68816	0.000
	Tertiary	-4.964376	0.484511	-10.24617	0.002
	Entrepreneurs	3.579412	0.36575	9.786509	0.002
Finland	Unemployment	0.908135	0.070461	12.88841	0.001
	Entrepreneurs	9.658762	2.489922	3.879142	0.030
Sweden	Unemployment	-1.208964	0.196462	-6.153693	0.009
	GDP	2.870433	0.729381	3.935436	0.029
	Entrepreneurs	-1.515428	0.486341	-3.115977	0.053
UK	Unemployment	-3.181572	0.84714	-3.755663	0.033
	Entrepreneurs	1.527259	0.306469	4.983402	0.016

Source: own representation; calculation performed in Eviews

Negative, but significant coefficients were obtained for Germany, where the entrepreneurial environment seems to discourage the entrepreneurs. *Tertiary education v*ariable is significant and positive in the short run only for Denmark, Germany, Luxembourg and Austria, and keeps negative signs for Slovakia and Czech Republic. For the rest of countries tertiary education has no influence on new companies' formation in the short run. *GDP* variable is significant and positive in the short run just for Germany, Estonia, Poland, Sweden and negative, but significant for Italy and Latvia. For the rest of the countries it is not about any association between GDP and new companies formation in the short run. *Unemployment rate* is significant and positive in the short run for Bulgaria, Germany, Spain, Lithuania, Luxembourg, Hungary, Romania, Slovenia, Slovakia, Finland, i.e. the unemployment rate rise might be presumed as a self-employment strengthening factor. On the contrary, this is negative for Belgium, Denmark, France, Italy, Cyprus, Latvia, Austria, Sweden and UK, i.e. countries in which unemployment rather impedes on new business.

Density of population looks significant, but has a negative influence on new companies' formation just for Latvia and is not significant for the rest of countries – i.e. it seems that density of population isn't here too much able to influence the new companies' formation.

Lastly, there are three countries of the total of 26 analysed, for which there is rather no evidence for short run associations between variables in the model, but just for those of long run: Ireland, Netherlands and Malta (all the results of interdependencies between variables are expected in a longer number of years)

5. Conclusions

It is the *PMG/ARDL* type model of Pesaran and Shin (1999) helping this above finding of influential factors on the new companies' formation in both the whole EU area and each EU member country. And so our analysis could focus on panel data developed on 26 individual countries along an 11 years period that finally makes a total of 286 observations.

First, based on the above results' estimation of *long run common coefficients* proper to all the EU member countries prove that there are real influences in this long run from existing entrepreneurship, GDP, unemployment and density of population on new companies' formation in European (EU) member countries. As presumed, *a quality entrepreneurial climate* is supposed to stimulate the people's decision to become entrepreneurs as a lot of studies support such an idea (see also Armington and Acs 2002; Delfmann et all, 2014)..

Per *capita GDP,* as a predictor of new firm formation is found to have a positive effect in a long run by similar studies (Armington, and Acs, 2002). – i.e. it is, of course, the economic development level and its rising that positively influences either the business environment, or the companies' creation, that is here included.

Unemployment rate can be considered here a push factor as it turns self-employment into a necessity. We obtained positive and significant results in line with other studies regarding positive association with creation of new businesses. Storey (1991) and Lindh and Ohlsson (1996). in their turn, argue in such a sense about the common scenario in which, first, employed people are licensed – i.e. their wage/salary income turns into the lower one of employment benefit --, then they prefer the self-employment alternative – i.e. that might provide the entrepreneur specific profit of course higher than the unemployment benefit and sometimes higher even than the same people's former wage/salary (see also Harrison and Hart, 1983).

As for *density of population*, we can conclude that in the long run a higher population density discourages the entrepreneurship, rather than supporting it. *Tertiary education,* in its turn, is not a significant exogenous in the long run according to this model developed. It seems that a high level of education does not quite lead to entrepreneurship option – i.e. different/lower education levels here proves more appropriate, e.g. the professional, secondary and vocational ones.

In the *short run* there are significant common coefficients just for existing entrepreneurship, and GDP in their relationship with new company formation. In the short run *tertiary education, unemployment rate and density of population* prove no influence in new companies' formation. Using this ARDL model also individual coefficients were estimated, as already showed above, in the previous parts of this paper. Just for three countries Ireland, Malta and Netherlands there aren't short run association between variables, but just long run ones.

There is to be mentioned in the end of our study that the above results get in line with previous ones in this area, although with some limitations regarding the data missing for business European statistics before 2009 and also total data missing for the 2009-2019 decade interval for Croatia and Greece – so, these countries could be excluded from our above analysis. However, enlarging this study on future is intended both provided corresponding data available and more variables considering.

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