

Article

Entrepreneurship Recovery in Romania after the Great Recession. A Dynamic Spatial Panel Approach

Zizi Goschin ^{1,2,*} , Mihai Antonia ¹ and Horia Tigau ¹

¹ Faculty of Economic Cybernetics, Statistics and Informatics, Bucharest University of Economic Studies, 010552 Bucharest, Romania; antoniamihai20@stud.ase.ro (M.A.); horia.tigau@csie.ase.ro (H.T.)

² Institute of National Economy, 050711 Bucharest, Romania

* Correspondence: zizi.goschin@csie.ase.ro

Abstract: Entrepreneurship plays a key role in transforming the economy and society by stimulating economic development, testing innovative ideas, creating new jobs, and by enriching the quality of life and human existence. Entrepreneurship dynamics depend upon a series of local and national economic factors, but are also affected by the international environment, such as the current COVID-19 pandemic. Statistical data show that new businesses are created at a slower rate during an economic crisis, when the economic climate is harsh, and business opportunities are scarce. Nevertheless, there are local differences in the reaction to crises, and new business formation tends to decline with variable intensity from one region to another, even in the same country. The crises are acting as a trigger for some opportunity-driven entrepreneurs, and resilient regions can thrive even in times of crisis or recover faster after a depression. To capture spatial interactions, as well as spatial short- and long-term effects, the method employed in our analysis relies on the estimation of dynamic spatial panel models. We tested the potential impact of a large variety of social and economic indicators on the creation of new firms and found that the most consequential factors of influence are the economic crisis (expressed through a binary variable), GDP per capita, FDI per capita, inflation, unemployment, and education. Our results convey a powerful policy message for both national and regional decision makers. We believe that, while putting entrepreneurial initiative to the test, the current COVID-19 crisis might act as a catalyst that leads to innovation and reshapes the economy and society.

Keywords: economic crisis; entrepreneurship; new firms; resilience; spatial panel data model



Citation: Goschin, Z.; Antonia, M.; Tigau, H. Entrepreneurship Recovery in Romania after the Great Recession. A Dynamic Spatial Panel Approach. *Sustainability* **2021**, *13*, 10702. <https://doi.org/10.3390/su131910702>

Academic Editor: Sajid Anwar

Received: 8 September 2021

Accepted: 23 September 2021

Published: 26 September 2021

Publisher's Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright: © 2021 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

1. Introduction

Entrepreneurship is an essential ingredient for regional development and competitiveness, and understanding its underlying factors is a matter of high interest for scholars and policy makers alike. A wealth of economic literature has studied entrepreneurship in relation to economic crises [1–3], as well as including locational factors of influence. The territorial distribution of entrepreneurial activity in any country is largely shaped by the specific local economic, social, and political climates in which these firms perform their activity. Economic shocks might exert a powerful, yet territorially uneven influence on the birth of new firms and the survival of existing ones. Some regions can be more resilient than others to economic shocks, therefore the entrepreneurial initiative is less affected by the economic crises [4]. However, all regions are impacted to a certain degree when a major recession occurs, such as the one triggered by the 2007–2009 global economic crisis.

During economic crises, new firms, which are generally smaller and more vulnerable, are less likely to survive and thrive. Their survival rate is influenced not only by the size and sector of activity, but also by the location [5,6]. In this context, an important factor in understanding the regional differences in the recovery from a crisis is the spatial dependence that exists among neighboring regions. Spatial dependence is represented by similar characteristics of neighboring regions from a geographic point of view. It implies that neighboring regions tend to be alike, i.e., their characteristics are usually positively

correlated. Given the scarcity of studies that acknowledge spatial dependence while modelling entrepreneurship activity (e.g., [4,5,7]), we aim to fill a gap in the literature by analyzing entrepreneurship recovery and dynamics after a crisis from a spatial perspective, using appropriate spatial econometrics tools.

Starting from the previous considerations, this paper addresses several research questions: how did entrepreneurship recover after the Great Recession that occurred between 2007 and 2009? What are the main regional factors of influence? Does location matter and are there spatial spillover effects between regions? We answer these questions by applying up-to-date spatial econometrics tools on relevant regional data, using Romania as a case study. Romania is one of the largest ex-socialist countries in Central and Eastern Europe and benefited greatly from the transition to the market economy. Entrepreneurship, virtually nonexistent prior to the collapse of the communist regime in 1989, flourished and became a driver for the general economic growth of the country. Sharing many similarities with the other former socialist countries in the region, Romania can be a relevant example for the progress of entrepreneurship and recovery after a major economic crisis in a post-communist economy.

The crises act as a trigger for some opportunity-driven entrepreneurs, and resilient regions can thrive even in these conditions or recover faster after the depression. Given the scarcity of regional statistical data regarding the economic effects of the COVID-19 pandemic, we draw lessons from the previous major crisis, namely the 2007–2009 Great Recession, for assessing the likely economic effects of the current crisis on the birth of new firm. We focus on the interval between 2008 and 2020, aiming to investigate the impact of a major economic crisis on new business formation in Romania, and to determine if the response to crises is shaped by location. This research extends the empirical debate in [8] on the determinants of new business formation in Romania.

2. Literature Review

Previous research indicated that besides their contribution to economic growth, new firms are also able to enhance economic resilience to crises [2,3]. Some studies showed that regions with a high level of entrepreneurship are more flexible and more resilient to exogenous shocks due to increased economic diversification and the entrepreneurs' ability to perceive and exploit potential opportunities even in times of crisis [9]. Recent academic debates on new firm formation during the last economic crisis showed that regions with high entrepreneurial initiative are better at withstanding crises and can adapt faster to new economic conditions [10]. Resilience to economic crises is frequently linked to entrepreneurship in the literature, and the findings reveal that entrepreneurship contributes to urban resilience [11], wage cuts may relatively influence entrepreneurial initiative [12], and the "spatial stickiness" of the "entrepreneurial regimes" promote resilience and the ability to adapt to economic shocks [10].

Entrepreneurial initiative, embodied in new firm formation, represents an important driver of economic development, which has captured the interest of many researchers trying to better understand its determinants. Numerous studies that empirically investigated the factors that influence new firm formation [10,13–24] obtained different results, depending on the period or the geographic localization of the study. Previous research revealed many regional factors affecting the dynamics of entrepreneurial activity, such as population growth, demographic characteristics, economic growth, wages, unemployment, and entrepreneurial density [14,20,25,26].

2.1. Economic Growth

There is a growing body of literature identifying the determinants of new business formation on a regional basis [14,21,23,27]. Choosing the location for a new firm depends on the presence of agglomeration economies, especially in cities where population and firm density can influence the search costs for workforce and suppliers [28].

A common determinant of new firm creation in literature is economic growth. A positive relation between GDP per capita and entrepreneurship was found in several studies [29,30], while others indicated negative correlations in the case of poor countries [31]. There are also studies arguing that GDP per capita is not significant for new firm creation [25].

Increases in wages trigger greater demand for goods, which positively influences the creation of new firms [28]. High wages, associated with a high level of skills, can stimulate the creation of new firms, since new entrepreneurs are usually better skilled than the average population [21].

2.2. Unemployment

Higher rates of unemployment in a region could lead to more people starting their own businesses, due to difficulties in finding a job [8]. Many studies investigating unemployment and its relationship with new business formation seem to be contradictory and dependent on time or geographical factors [8,18]. In the short term, the relationship is negative—an increase in unemployment predicts, for instance, a decrease in entrepreneurial activity in the following months, explained by difficulties at the level of the national economy and social aid for the unemployed. In the long term, the relationship is positive, with an increase in unemployment predicting higher entrepreneurial activity, which may be explained by the “push effect”. Higher rates of unemployment could lead to new firm formation, as a negative change in labor market conditions, and the limited availability of waged employment, may push individuals into entrepreneurial activity.

2.3. Education

Education as a factor of influence on entrepreneurship, is explained in the literature based on human capital theory: people invest in themselves through education because they expect a higher income [32] or they want to acquire the necessary skills to validate profitable business opportunities [10]. Higher education positively influences labor productivity, which ensures entrepreneurial success. As a determinant of new firm formation, education (especially tertiary education), was found to be statistically significant in numerous empirical studies [20,33,34]. Since the results depend on location and time, there are also studies that did not find education to be statistically significant for the birth of new enterprises [13,16].

2.4. Demographic Characteristics

Among other factors of influence, demographic characteristics, such as the age distribution of the population, were found to be surprisingly significant for the creation of new enterprises. It is common knowledge that the working population in the 35–50 age range is more likely to start a business [16,35]. A study in The Netherlands [35] showed that the impact of population changes on the birth rates of new firms depended on the regional context: it is negative in urban areas and positive in rural ones.

2.5. Inflation

Start-ups are often financed with entrepreneurs' own savings, which, in an inflationist economic environment, puts the entrepreneurs at higher risks, due to the increased difficulty of recovering the initial investments [36] and the disruptions in business plans. Studies have found a negative correlation between inflation and entrepreneurship [37], confirming that unpredictability discourages long-term involvement in a business.

3. Econometric Model, Variables, and Data

An economic crisis hitting a region will likely influence the economic performance in neighboring regions as well. It implies that spatial dependence, which exists among neighboring regions, needs to be accounted for in the econometric model [38–41]. Consequently,

our study uses spatial econometrics to describe both spatial and temporal dependencies on entrepreneurship data, more precisely on the entrepreneurial initiative in Romania.

Aiming to investigate all possible autocorrelations in our data, the investigation starts with a general nesting spatial model [42–44]:

$$Y_{it} = \rho \sum_j W_{ij} Y_{it} + \sum_k X_{itk} \beta_k + \sum_k \sum_j W_{ij} X_{itk} \theta_k + \mu_i + \gamma_t + \varepsilon_{it} \quad (1)$$

with $\varepsilon_{it} = \lambda \sum_j W_{ij} \varepsilon_{jit} + v_{it}$

where in our case, Y_{it} is the number of new firms created in county i at time t , X_{itk} are the regressors, k is for the explanatory variables, W is a binary contiguity queen-type matrix that describes spatial relations among counties, ρ denotes the response parameter of the dependent variable lagged in space, $W_{ij} X_{itk}$ stands for the explanatory variables k lagged in space, and $W_{ij} Y_{it}$ is the dependent variable lagged in space. Finally, μ_i is a vector of spatially fixed effects, γ_t is time fixed effects. β and θ represent response parameters of the exogenous explanatory variables, ε_{it} represents the spatial errors, λ is the spatial autocorrelation coefficient, and v_{it} are the spatially uncorrelated errors.

Starting from the general nesting spatial model described above, we can reduce it to some several more restrictive models [45] as presented in the following, Table 1:

Table 1. Typology of spatial models.

Model	Restrictions	Spatial Lag
Spatial autoregressive model with autoregressive errors (SAC)	$\theta = 0$	WY, Wu
Spatial Durbin model (SDM)	$\lambda = 0$	WY, WX
Spatial autoregressive model (SAR)	$\theta = 0$ and $\lambda = 0$	WY
Spatial error model (SEM)	$\theta = 0$ and $\rho = 0$	Wu

Furthermore, we can upgrade the spatial model to a dynamic space-time model that incorporates dependence in both time and space. Dynamics are embodied in the model through the inclusion of a time lagged dependent variable Y_{it-1} among the regressors [45].

The model that can best describe the space and time variation of entrepreneurial activity is the dynamic spatial Durbin panel data model [45] which reads as follows:

$$Y_{it} = \tau Y_{it-1} + \rho \sum_j W_{ij} Y_{it} + \eta \sum_j W_{ij} Y_{it-1} + \sum_k X_{itk} \beta_k + \sum_k \sum_j W_{ij} X_{itk} \theta_k + \mu_i + \gamma_t + \varepsilon_{it} \quad (2)$$

where Y_{it} is the number of new firms created in county i at time t , X_{itk} are the regressors, k is for the explanatory variables, W is a binary contiguity queen-type matrix that describes spatial relations among counties, τ , ρ , and η denote the response parameters of the dependent variable lagged in time, space, and both space and time. Y_{it-1} is the time-lagged dependent variable. $W_{ij} Y_{it}$ is the dependent variable lagged in space, $W_{ij} Y_{it-1}$ is the dependent variable lagged in both time and space, μ_i is a vector of spatially or fixed effects. γ_t represents time fixed effects, and ε_{it} are the spatial uncorrelated errors.

In order to answer the research questions by means of the dynamic SDM, our study uses a panel of the 41 Romanian counties and the Bucharest municipality for the period 2008–2020, which includes the 2007–2009 global economic crisis.

The dependent variable in our model is the total number of new firms, an indicator already used in the literature to express the entrepreneurial initiative [14,18,22,24,46,47], while variation in the number of firms reflects resilience to crises [48].

Our variable of interest is a custom-made indicator of economic crisis recorded at the county level. It is built as a binary economic variable that identifies the recession time span for each county according to its annual GDP dynamics, as follows: GDP decline is coded 1, and GDP growth is coded 0 [4].

Based on previous studies, we have also chosen a set of explanatory variables that capture factors that might influence new business formation (Table 2). Gross domestic product per inhabitant reflects the amount of wealth available in a region and is expected to have a positive influence on the birth of new enterprises [29–31]. Starting a business offers a creative way to avoid unemployment, therefore the unemployment rate is also included in the model [18]. It is often seen as an effective path to reduce inequalities [49] and can be a poverty escape route. Education—in our case, the number of students in tertiary education—leads to better human capital resources, and, with the expectation of higher earnings, to a higher propensity of involvement in entrepreneurial activity, as empirical studies have already found [20]. The number of employees in the research and development sector reflects the potential for innovation, a likely determinant of business growth, as well as economic recovery [50]. We also included some demographic characteristics in the model: population density (people per square kilometer) and the average age of the population [20]. Foreign direct investments per inhabitant [29] generates growth in demand, which may lead to the creation of new firms. Inflation can ruin a business plan due to increased costs—the impossibility of transferring them to customers leads to lower investments or even bankruptcy.

Table 2. The variables.

Variable	Description	Source	Expected Effect
GDP/capita	Gross domestic product per capita (RON, constant prices)	National Institute of Statistics (NIS)	+
Unemployment	Ratio between the number of employed persons (registered at employment agencies) and the active civilian population	NIS	+ / −
Education	Total number of students in tertiary education	NIS	+
Inflation	Inflation rate	NIS	-
Employees in research and development sector	Total number of employees in the research and development sector in the county's economy	NIS	+
Population density	Population size per square km	NIS and own Computation	+
Age	Average age of total population (years)	NIS	+ / −
FDI/capita	Foreign direct investments per inhabitant, at the end of the year [euro, constant prices]	NIS	+
Crisis	A binary economic crisis variable, according to annual GDP dynamics (GDP decline = 1, otherwise = 0)	NIS and own Computation	-

Data for all the explanatory variables came from the Romanian National Institute of Statistics, and from the Romanian Business Register. The authors own all computations.

4. Results

Investigation starts with the SDM as a general specification [51,52] then the nested models SAR or SEM are excluded based on the results of the LR tests. We have used a Bayesian comparison approach [53,54] of model specifications for comparison between SAC and SDM, as successfully applied in previous studies [55]. In this scenario we are looking for the maximum Bayesian information and model probabilities and minimum Akaike's information for both spatial and dynamic model selection.

All statistics in Table 3 point to the dynamic spatial Durbin panel data model (DSDM) as the best fit for our data. The main results from estimating the dynamic spatial Durbin panel data model specification are displayed in Table 4.

Table 3. Model selection.

Model		SDM	SAC	DSDM
R-sq:	within	0.0529	0.2019	0.4197
	between	0.8372	0.8165	0.7709
	overall	0.7952	0.7866	0.7288
Log-pseudolikelihood		−4023.616	−3996.843	−3464.385
AIC		8069.231	8025.68	6962.769
BIC		8115.679	8093.24	7033.074

Table 4. The results from the dynamic spatial Durbin panel data model.

Variable		Dynamic SDM	
		Coef	$p > z $
Main	New firms t-1	0.555	[0.000] ***
	W New firms t-1	−0.246	[0.001] ***
	GDP/capita	−0.034	[0.034] *
	Unemployment	−89.66	[0.003] **
	Education	0.005	[0.033] *
	Inflation	−7237.48	[0.000] ***
	Employees in research and development sector	0.006	[0.934]
	Population density	−8.60	[0.003] **
	Age	−276.41	[0.020] *
	FDI/capita	0.148	[0.001] ***
	Crisis	−570.93	[0.001] ***
	GDP/capita	0.086	[0.009] **
	Unemployment	−68.51	[0.193]
	Education	−0.018	[0.012] **
	Inflation	1310.02	[0.587]
Wx	Employees in research and development sector	−0.154	[0.342]
	Population density	−9.31	[0.246]
	Age	−9.96	[0.948]
	FDI/capita	−0.419	[0.000] ***
	Crisis	123.62	[0.285]
Spatial [rho] ρ		0.425	[0.000] ***
Variance [sigma ² _e] ϕ		195328	[0.000] ***

* statistically significant at 10%; ** statistically significant at 5%; *** statistically significant at 1%.

The dynamic spatial models allow us to empirically investigate the time and space-time effects for both the short term (Table 5a) and long term (Table 5b). The impact of a variable is measured both in the region of reference (direct effect) and in the neighboring regions (indirect effect).

Our main hypothesis is confirmed, since an economic crisis has a strong negative influence on the birth of new firms, as indicated by the high and significant estimated coefficient. There are not only negative short-term effects of the economic crisis (Table 5a), but they persist and worsen in the postcrisis environment. The time lag in the dependent variable suggests that there is a statistically significant increase in new firm formation as each year passes, while the cross-parameter with both a time and a space lag is significantly negative.

The coefficient of gross domestic product per inhabitant is negative and statistically significant. The direct short- and long-term effects of GDP/capita have a low statistical significance (about 10%) and indicate a negative influence on the birth of new firms in Romania.

Table 5. (a) Short term effects. (b) Long term effects.

Variable	SR_Direct		SR_Indirect		SR_Total	
	Coef	$p > z $	Coef	$p > z $	Coef	$p > z $
(a)						
GDP/capita	−0.027	0.116	0.115	0.029 *	0.0887	0.143
Unemployment	−101.51	0.001 ***	−173.61	0.025 *	−275.13	0.001 ***
Education	0.003	0.174	−0.025	0.033 *	−0.021	0.110
Inflation	−7433.74	0.000 ***	−2876.10	0.010 **	−10309.85	0.000 ***
Employees in research and development sector	−0.010	0.895	−0.247	0.367	−0.258	0.423
Population density	−10.04	0.004 **	−21.12	0.136	−31.14	0.061 *
Age	−290.57	0.009 **	−207.53	0.261	−498.11	0.001 ***
FDI/capita	0.109	0.015 **	−0.580	0.000 ***	−0.471	0.000 ***
Crisis	−584.16	0.000 **	−193.86	0.280	−778.03	0.000 ***
(b)						
GDP/capita	−0.062	0.106	0.254	0.035*	0.192	0.159
Unemployment	−226.10	0.001 ***	−369.09	0.056	−595.19	0.005 **
Education	0.009	0.141	−0.056	0.030*	−0.046	0.106
Inflation	−16664.6	0.000 ***	−5638.81	0.396	−22303.42	0.019 **
Employees in research and development sector	−0.021	0.907	−0.538	0.382	−0.559	0.439
Population density	−22.33	0.004 **	−45.10	0.185	−67.44	0.086
Age	−650.36	0.012 **	−427.20	0.362	−1077.57	0.009 **
FDI/capita	0.251	0.019 **	−1.27	0.000 **	−1.02	0.009 **
Crisis	−1309.90	0.000 ***	−373.21	0.493	−1683.12	0.005 **

* statistically significant at 10%; ** statistically significant at 5%; *** statistically significant at 1%.

Unemployment rate is highly significant (at 1% level) and has a strong negative influence in new business creation in Romania. Its negative effects are quite persistent both long and short term, and as a direct and indirect impact.

The number of people in tertiary education has a positive overall influence on entrepreneurial initiative.

Inflation shows a strong negative relation with the formation of new firms, for both the long term and the short term.

Contrary to what was expected, the number of employees in the research and development sector does not play a significant role in explaining the variation of new firm formation in any perspective.

Average age was found to be statistically significant and has short- and long-term direct effects, but the estimated coefficient holds a negative sign. There are two possible explanations for this. Firstly, entrepreneurship is a riskier career choice than being just an employee. Even if it comes along with work experience and some of the necessary skills to start a business, aging negatively influences the propensity towards starting a business in Romania. Secondly, there is a lack of entrepreneurial education programs for adults.

Population density is statistically significant (at 5%) and has a strong negative influence on the births of new enterprises.

Foreign direct investments per inhabitant is highly significant (at 1%) and has a strong overall and direct positive influence in the emergence of new businesses.

The spatial lag parameter (ρ) is positive and highly significant, indicating that the density of new firms in a region is correlated with firms in the surrounding regions.

The results show that the dynamic spatial panel model specification provided a superior fit for our data. Apart from spillover effects, the dynamic model allowed us to empirically investigate the time and space-time effects both for the short and long term, improving in this way the understanding of economic phenomena.

5. Discussions

Negative effects of the economic crisis are visible in the long run, new firm formation is below the bankruptcy rate in most of the counties in Romania, which indicates a slow and incomplete process of economic recovery after the crisis [56]. Few regions achieved complete recovery—this accomplishment is due to stronger and stable economic conditions that are likely to lead to higher levels of entrepreneurial activity rather than weak or

weakening economic conditions. In these regions, the crisis acts as a trigger for some opportunity-driven entrepreneurs [8].

However, the entrepreneurial phenomenon is growing in Romania; we discovered that more new firms are created each year compared to the previous year. There is also competitiveness between counties, as the time-spatial lag in firm formation suggests counties perform worse when neighboring counties had more company registrations in the previous year.

The correlation between the dependent variable and GDP per capita is partially explained in the literature by the U-shaped relationship between the level of economic development and the rate of entrepreneurship: studies showed that entrepreneurial activity has a positive effect on economic growth in highly developed countries, but a negative effect in developing ones [57,58]. Since the results suggest that GDP per capita, overall, negatively influences new business formation in Romania, we must search for alternative explanations. One possible explanation may be temporary work migration abroad. Another possible explanation is that economic growth comes along with a higher level of competition, thus discouraging new start-ups. Still, economic performance has an indirect positive influence in both the short and long term, explained by an increase in demands of goods and services that came from the neighboring regions.

Regions with negative labor market conditions are likely to feel a dampening effect on purchasing power because of lower levels of disposable income, reducing the overall demand and therefore the need for new businesses [9]. This might explain why there is a strong negative correlation between unemployment and new firm creation. Moreover, this result also suggests that Romanian entrepreneurs are more opportunity-driven than necessity-driven, as more firms are born when there is less unemployment, and hence we can deduce that these firms are not created by the people in need of a job. Contrary to this, a larger workforce also represents a larger customer base for the aspiring entrepreneurs' target market.

Education plays a significant role in the development of new businesses. Our results may indicate that a greater degree of knowledge boosts the ability to perceive profitable opportunities for start-ups [20]. However, it has significant indirect negative effects in both the long and short term that indicate a strong competition between counties.

Inflation can be a determining factor for entrepreneurs to halt the process of starting a business, as a higher inflation rate might suggest economic instability and higher estimated costs that drive businesses to increase prices, which can reduce sales, and, soon enough, lead to bankruptcy, as the cash flow decreases to below-operational levels. This might be why our results show a significant negative relation between inflation and business formation rate.

The nonsignificant result regarding the research and development sector could suggest that Romanian new businesses do not focus on innovation, but rather on the desire to fill a gap in the market, offering products or services that might not be present in the current supply.

A higher population density decreases the natural endowment per capita and that generates a decrease in demand that is negatively correlated with new business formation. Population density is strongly associated with urbanization rate. Latest studies suggest that the benefits of GDP growth, which come along with urbanization, are unequally distributed [59].

Results indicate that more start-ups are created in counties where the average age is lower. Our findings are consistent with another study about entrepreneurship in Romania [60]. There are two possible explanations. Firstly, entrepreneurship is a riskier career choice than just being an employee, even if it comes with work experience and some of the necessary skills to start a business. Secondly, there is a lack of entrepreneurship education programs for adults. Entrepreneurship matters differently in developed and developing countries, based on the impact that it has on GDP [58]. We believe that in

Romania entrepreneurship is still in its early stages, since the transition did not happen as quickly as in other ex-communist European countries [61].

FDI generate a rise in demand; foreign companies also need local services or materials, a fact which leads to new business opportunities in local markets. Another point of view that complements the previous one is that foreign firms introduce informational capital on the local market [62], acting as templates of organization, management and sales techniques for new entrepreneurs to replicate in their own small businesses. However, significant indirect negative spatial effects, in both the short and long term, suggest an uneven distribution of FDI in Romania. FDI generate negative externalities for the neighbors' economies through competition with surrounding regions.

Finally, by analyzing the model's spatial parameter, it is suggested that vicinity counts not only for the economic resilience of regions [63], but it also matters for business performance [39] and, as our results indicate, for new firm creation.

6. Conclusions

Entrepreneurship is viewed as an essential ingredient for achieving the economic goals of the EU's agenda and an important driver of postcrisis recovery. In our paper, we empirically investigated the determinants of new firm formation in an ex-socialist country, focusing on the impact of the global economic crisis in a dynamic context, while accounting for spatial spillovers. Our main contribution to the literature stems from investigating the dynamic linkage between entrepreneurial initiative and resilience to crises, by considering spatial spillovers over space and time based on a dynamic spatial panel data model. In comparison, previous studies have investigated the determinants of new business formation using a spatial panel data framework without the dynamic component [4,8].

The results from the dynamic spatial Durbin model indicate that the creation of new firms in a region is positively correlated with the new firm formation in the same region in the previous year, suggesting long-term stability and reinforcement of the factors that favor the "birth" of new firms, despite economic hardships such as crises. Contrary to this, the creation of new firms in a region is negatively correlated with new firm formation in surrounding regions in the previous year, suggesting that the competition between firms in different regions is stronger than the competition within a certain region. It implies that the specific factors that shape the economic climate of each region (and differentiate from other regions) are key to enabling new firms' births. Consequently, it is essential to design adequate, custom-made regional policies to support the emergence of new businesses that are able to compete for economic resources with the ones in the surrounding regions.

All spatial parameters in the model are highly significant, indicating that location really matters, and entrepreneurial activity is governed by spatial correlation among neighboring regions. Our results suggest that a dynamic spatial panel model specification is a good fit for our data. Apart from identifying spillover effects, the dynamic model allows us to empirically investigate the time and space-time effects in both the short and long term, improving in this way our understanding of the entrepreneurial phenomenon.

The results of our research paper suggest that the economic crisis had a strong negative influence on new firm formation in Romania with both short- and long-term effects. The recovery was slow and incomplete after the crisis. However, some regions were more resilient and recovered faster and were able to profit from the opportunities that the post-crisis recovery revealed. We found that the determinants of new business creation in Romania can be divided into two categories, positive and negative. The main factors that positively influence new firm formation are FDI and education. FDI has a strong positive and direct influence, with significant time effects, both short and long term. We also found that entrepreneurs might benefit from GDP/capita spillover effects from the neighboring regions and take advantage of their economic performance. This effect persists in the long run as well. The rest of the factors investigated in our study seem to negatively influence the entrepreneurial initiative, such as: GDP/capita, unemployment, inflation, population

density, and average age. Moreover, we find that education has a negative spillover effect in both the short and long term, suggesting a strong competition for human resources among regions. The most significant negative impact is generated by inflation. Inflation can ruin a business plan due to increasing costs and the impossibility of transferring them to customers, leading to lower investments or even bankruptcy.

Our findings may help the decision makers in Romania to reach a better understanding of the determinants of new business formation in order to create a more efficient economic environment for entrepreneurs. There are some practical implications of our findings, such as: offering financial support to new firms that need to recover from the negative effects of crises; promoting and subsidizing programs on entrepreneurship, firm management and financial literacy for adults, in order to counteract old patterns that remained at the societal level from the previous Communist regime (other countries with a similar background have managed to overcome such issues and could be used as examples of good practice); increasing the support for tertiary education, especially in less-developed counties, as education was shown to be a significant determinant in new firm formation; creating a platform for foreign investors and local entrepreneurs to cooperate, so that foreign firms can benefit from local services and products, and local providers can become more specialized in supplying and developing their products, at the standards of their more experienced partners.

Limitations of our research mainly came from a relatively short time span of only 12 years. When more data becomes available, future research should test the robustness of these results.

Author Contributions: Conceptualization, Z.G., M.A. and H.T.; methodology, Z.G., M.A. and H.T.; software, M.A.; validation, Z.G. and M.A.; writing—Z.G., M.A. and H.T. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: On demand.

Acknowledgments: This work was partially supported by a grant from the Romanian Ministry of Research and Innovation, CNCS—UEFISCDI, project number PN-III-P4-ID-PCCF-2016-0166: “ReGrowEU—Advancing ground-breaking research in regional growth and development theories, through a resilience approach: towards a convergent, balanced and sustainable European Union”. An earlier version of this paper was presented at the 13th World Congress of Regional Science Association International “Smart regions. Opportunities for sustainable development in the digital era”, 25–28 May 2021.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Martin, R. Regional economic resilience, Hysteresis and Recessionary Shocks. *J. Econ. Geogr.* **2012**, *12*, 1–32. [\[CrossRef\]](#)
2. Martin, L.R.; Sunley, P. On the notion of regional economic resilience: Conceptualization and explanation. *J. Econ. Geogr.* **2015**, *15*, 1–42. [\[CrossRef\]](#)
3. Williams, N.; Vorley, T. Economic Resilience and Entrepreneurship: Lessons from the Sheffield City Region. *Entrep. Reg. Dev.* **2014**, *26*, 257–281. [\[CrossRef\]](#)
4. Goschin, Z. What makes new firms resilient? A spatial analysis for Romania. *Reg. Sci. Policy Pract.* **2020**, *12*, 913–930. [\[CrossRef\]](#)
5. Littunen, H. Networks and Local Environmental Characteristics in the Survival of New Firms. *Small Bus. Econ.* **2000**, *15*, 59–71. [\[CrossRef\]](#)
6. Brixy, U.; Grotz, R. Regional patterns and determinants of birth and survival of new firms in Western Germany. *Entrep. Reg. Dev.* **2007**, *19*, 293–312. [\[CrossRef\]](#)
7. Ebert, T.; Brenner, T.; Brixy, U. New firm survival: The interdependence between regional externalities and innovativeness. *Small Bus. Econ.* **2018**, *53*, 287–309. [\[CrossRef\]](#)

8. Tigau, H.; Antonia, M. Evidence that Romanian entrepreneurs are opportunity-driven, rather than necessity-driven: A macroeconomic spatial analysis. In Proceedings of the 36th International Business Information Management Association [IBIMA], Granada, Spain, 4–5 November 2020.
9. Goschin, Z.; Druică, E.; Vălsan, C. Shaped by location? A spatial panel analysis of Romanian family businesses. *Reg. Sci. Policy Pract.* **2020**, *12*, 893–911. [\[CrossRef\]](#)
10. Bishop, P.; Shilcof, D. The spatial dynamics of new firm births during an economic crisis: The case of Great Britain, 2004–2012. *Entrep. Reg. Dev.* **2016**, *29*, 215–237. [\[CrossRef\]](#)
11. Williams, N.; Vorley, T.; Ketikidis, P.H. Economic resilience and entrepreneurship: A case study of the Thessaloniki City Region. *Local Econ.* **2013**, *28*, 399–415. [\[CrossRef\]](#)
12. Glaeser, E.L.; Ponzetto, G.A.; Tobio, K. Cities, Skills and Regional Change. *Reg. Stud.* **2014**, *48*, 7–43. [\[CrossRef\]](#)
13. Fritsch, M.; Schroeter, A. Why does the effect of new business formation differ across region. *Small Bus. Econ.* **2011**, *36*, 383–400. [\[CrossRef\]](#)
14. Audretsch, D.B.; Fritsch, M. The Geography of Firm Births in Germany. *Reg. Stud.* **1994**, *28*, 359–365. [\[CrossRef\]](#)
15. Stam, E. Entrepreneurship and Innovation Policy. *Jena Econ. Res. Pap.* **2008**, *2008*. [\[CrossRef\]](#)
16. Piacentino, D.; Bono, F.; Cracolici, M.F.; Giuliani, D. A spatial analysis of new business formation: Replicative vs innovative behaviour. *Spat. Stat.* **2017**, *21*, 390–405. [\[CrossRef\]](#)
17. Fritsch, M.; Changoluisa, J. New business formation and the productivity of manufacturing incumbents: Effects and mechanisms. *J. Bus. Ventur.* **2017**, *32*, 237–259. [\[CrossRef\]](#)
18. Ross, A.; Adams, J.; Crossan, K. Entrepreneurship and the spatial context: A panel data study into regional determinants of small growing firms in Scotland. *Local Econ.* **2015**, *30*, 672–688. [\[CrossRef\]](#)
19. Stam, E.; van Stel, A. *Types of Entrepreneurship and Economic Growth. Entrepreneurship, Innovation, and Economic Development*; Oxford Scholarship Online: Oxford, UK, 2011.
20. Tamásy, C. Determinants of regional entrepreneurship dynamics in contemporary Germany: A conceptual and empirical analysis. *Reg. Stud.* **2006**, *40*, 365–384. [\[CrossRef\]](#)
21. Fritsch, M. Regional differences in new firm formation. Evidence from West German. *Reg. Stud.* **1992**, *26*, 233–241. [\[CrossRef\]](#)
22. Ghani, E.; Kerr, W.; O'Connell, S. Spatial Determinants of Entrepreneurship in India. *Reg. Stud.* **2014**, *48*, 1071–1089. [\[CrossRef\]](#)
23. Reynolds, P.D.; Storey, D.J. *Explaining Regional Variations in New Firm Formation Rates: An International Comparative Study*; Warwick University: Warwick, UK, 1992.
24. Tamasy, C.; Le Heron, R. The Geography of Firm Formation in New Zealand. *Tijdschr. Econ. Soc. Geogr.* **2008**, *99*, 37–52. [\[CrossRef\]](#)
25. Keeble, D.; Walker, S. New firms, small firms and dead firms: Spatial patterns and determinants in United Kingdom. *Reg. Stud.* **1994**, *28*, 411–427. [\[CrossRef\]](#)
26. Armington, C.; Acs, Z.J. The determinants of regional variation in new firm formation. *Reg. Stud.* **2002**, *36*, 33–45. [\[CrossRef\]](#)
27. Audretsch, D.B.; Fritsch, M. *Market Dynamics and Regional Development in the Federal Republic of Germany*; Discussion Paper FS IV 92-6; Wissenschaftszentrum Berlin für Sozialforschung: Berlin, Germany, 1992.
28. Reynolds, P.D.; Storey, D.J.; Westhead, P. Cross-National Comparisons of the Variation in New Firm Formation Rates. *Reg. Stud.* **1994**, *41*, 123–136. [\[CrossRef\]](#)
29. Audretsch, D. Entrepreneurship capital and economic growth. *Oxf. Rev. Econ. Policy* **2007**, *23*, 63–78. [\[CrossRef\]](#)
30. Baumol, W.J.; Strom, R.J. Entrepreneurship and economic growth. *Strateg. Entrep. J.* **2007**, *1*, 233–237. [\[CrossRef\]](#)
31. Amorós, J.E.; Bosma, N. *Global Entrepreneurship Monitor 2013 Global Report*; GEM Consortium: Zurich, Switzerland, 2014.
32. Schultz, T.W. Investment in Entrepreneurial Ability. *Scand. J. Econ.* **1980**, *82*, 437–448. [\[CrossRef\]](#)
33. Audretsch, D.B.; Link, A.N. *Universities and the Entrepreneurial Ecosystem*; Edward Elgar Publishing: Northampton, MA, USA, 2017.
34. Fritsch, M.; Kristalova, M.; Wyrwich, M. One transition story does not fit them all: Initial regional conditions and new business formation after communism. *Post-Communist Stud.* **2021**, 1–28. [\[CrossRef\]](#)
35. Delfmann, H.; Koster, S.; McCann, P.; Van Dijk, J. Population Change and New Firm Formation in Urban and Rural Regions. *Reg. Stud.* **2014**, *48*, 1034–1050. [\[CrossRef\]](#)
36. Parker, S.C. *The Economics of Entrepreneurship*; Cambridge University Press: Cambridge, UK, 2009.
37. Arin, K.P.; Huang, V.Z.; Minniti, M.; Nandialath, A.M.; Reich, O.F. Revisiting the Determinants of Entrepreneurship: A Bayesian Approach. *J. Manag.* **2015**, *41*, 607–631. [\[CrossRef\]](#)
38. Gleave, W.; Mitra, J. The spatial determinants of entrepreneurship in the regions of England, 2000–2004. *Int. J. Entrep. Small Bus.* **2010**, *9*, 143. [\[CrossRef\]](#)
39. Pijnenburg, K.; Kholodilin, K. Do Regions with Entrepreneurial Neighbours Perform Better? A Spatial Econometric Approach for German Regions. *Reg. Stud.* **2012**, *48*, 866–882. [\[CrossRef\]](#)
40. Cravo, T.A.; Becker, B.; Gourlay, A. Regional Growth and SMEs in Brazil: A Spatial Panel Approach. *Reg. Stud.* **2014**, *49*, 1995–2016. [\[CrossRef\]](#)
41. Goschin, Z.; Grigore, A.M.; Druică, E. Exploring SMEs Distribution in Romania. A Spatial Clustering Perspective. *Manag. Strateg.* **2017**, *1*, 683–693.
42. Anselin, L.; Le Gallo, J.; Jayet, H. Spatial Panel Econometrics. In *The Econometrics of Panel Data—Fundamentals and Recent Developments in Theory and Practice*; Matyas, L., Sevestre, P., Eds.; Springer: Berlin/Heidelberg, Germany, 2008; pp. 624–660.

43. Baltagi, B.H.; Song, S.H.; Koh, W. Testing panel data regression models with spatial error correlation. *J. Econom.* **2003**, *117*, 123–150. [[CrossRef](#)]
44. Elhorst, J.P. Spatial panel data models. In *Handbook of Applied Spatial Analysis*; Fischer, M.M., Getis, A., Eds.; Springer: Berlin/Heidelberg, Germany, 2010; pp. 377–407.
45. Baltagi, B.H. *Econometric Analysis of Panel Data*, 3rd ed.; John Wiley & Sons Inc.: New York, NY, USA, 2005.
46. Gaygisiz, E.; Koksall, M.Y. Regional Variation in New Firm Formation in Turkey: Cross-Section and Panel Data Evidence. In Proceedings of the 43rd Congress of the European Regional Science Association: Peripheries, Centres, and Spatial Development in the New Europe, Jyväskylä, Finland, 27–30 August 2003.
47. Ross, A. Regional Determinants of Entrepreneurship in a Small Economy: Panel Data Evidence from Scotland. In Proceedings of the 51st Congress of the European Regional Science Association: New Challenges for European Regions and Urban Areas in a Globalised World, Barcelona, Spain, 30 August–3 September 2011.
48. Huggins, R.; Thompson, P. Local Entrepreneurial Resilience and Culture: The Role of Social Values in Fostering Economic Recovery. *Camb. J. Reg. Econ. Soc.* **2015**, *8*, 313–330. [[CrossRef](#)]
49. Lecuna, A. Income inequality and entrepreneurship. *Econ. Res. Ekon. Istraživanja* **2020**, *33*, 2269–2285. [[CrossRef](#)]
50. Szabo, Z.K. The impact of the crisis on the SME sector in Romania—The back-up of innovation and entrepreneurship development. *Rom. J. Econ.* **2011**, *32*, 90–108.
51. LeSage, J.; Pace, R.K. *Introduction to Spatial Econometrics*; CRC/Chapman and Hall: Boca Raton, FL, USA, 2009.
52. Elhorst, J. *Paul. Spatial Econometrics—From Cross-Sectional Data to Spatial Panels*; Springer: Berlin/Heidelberg, Germany, 2014.
53. LeSage, J. Spatial econometric panel data model specification: A Bayesian approach. *Spat. Stat.* **2014**, *9*, 122–145. [[CrossRef](#)]
54. LeSage, J. Software for Bayesian cross section and panel spatial model comparison. *J. Geogr. Syst.* **2015**, *17*, 297–310. [[CrossRef](#)]
55. Firmino Costa da Silva, D.; Elhorst, J.P.; Neto Silveira, R.D.M. Urban and Rural Population Growth in a Spatial Panel of Municipalities. *Reg. Stud.* **2017**, *51*, 894–908. [[CrossRef](#)]
56. Zaman, G.; Georgescu, G.; Antonescu, D.; Goschin, Z.; Popa, F. *Endogenous Economic Development at Regional Level. The Case of Romania*; Expert Publishing House: Bucharest, Romania, 2015. (In Romanian)
57. Sternberg, R.; Wennekers, S. Determinants and Effects of New Business Creation Using Global Entrepreneurship Monitor Data. *Small Bus. Econ.* **2005**, *24*, 193–203. [[CrossRef](#)]
58. Valliere, D.; Peterson, R. Entrepreneurship and economic growth: Evidence from emerging and developed countries. *Entrep. Reg. Dev.* **2009**, *21*, 459–480. [[CrossRef](#)]
59. Heinrich Mora, E.; Heine, C.; Jackson, J.J.; West, G.B.; Yang, V.C.; Kempes, C.P. Scaling of urban income inequality in the USA. *J. R. Soc. Interface* **2021**, *18*, 20210223. [[CrossRef](#)]
60. Nicolau, C.; Foris, T. Human resources crisis: Identifying future entrepreneur’s profile in Romania. *Procedia Soc. Behav. Sci.* **2017**, *238*, 572–581. [[CrossRef](#)]
61. Paul, K. *Régime Transitions and Variation in Post-Communist Europe*; Oxford University Press: Oxford, UK, 2013.
62. Guadalupe, M.; Kuzmina, O.; Thomas, C. Innovation and Foreign Ownership. *Am. Econ. Rev.* **2012**, *102*, 3594–3627. [[CrossRef](#)]
63. ESPON. *Territorial Dynamics in Europe—Economic Crisis and the Resilience of Regions*; Territorial Observation No. 12. ESPON Coordination Unit: Luxembourg, 2014.