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How economic freedom affects opportunity and necessity entrepreneurship in the OECD countries

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ABSTRACT

This research addresses the extent to which economic freedom, understood as market economy-oriented institutions and policies, matters for opportunity entrepreneurship and necessity entrepreneurship. To this end, we carry out a panel data dynamic analysis in the OECD countries during the period 2001–2012 by using the system Generalized Method of Moments estimator. We examine the relationship between the Fraser Institute's economic freedom index and its five areas, and both indicators from the Global Entrepreneurship Monitor on opportunity entrepreneurship and necessity entrepreneurship. We find that economic liberalization tends to encourage opportunity entrepreneurship and to discourage necessity entrepreneurship. In particular, opportunity entrepreneurship seems to benefit from improvements in legal structure and security of property rights and in regulation of credit, labor, and business, while both aspects and more freedom to trade internationally seem to damage necessity entrepreneurship.

1. Introduction

Entrepreneurship is a driver of economic development. Numerous studies highlight that business activity is a powerful source of economic growth and job creation and that productive entrepreneurship is crucial in terms of economic welfare (Zacharakis, Bygrave, & Shepherd, 2000; van Stel, Carree, & Thurik, 2005; Acs, Audretsch, Braunerhjelm, & Carlsson, 2012; Naudé, 2013). Thus, it is not surprising that many policy makers explicitly pursue policies that are aimed at increasing the amount of entrepreneurship, although there is no consensus on policy interventions that are more likely to affect entrepreneurship in a positive way, not only in terms of amount but also as regards characteristics of entrepreneurship (see Acs, Åstebro, Audretsch, & Robinson, 2016).

Nowadays entrepreneurship is predominantly considered as a comprehensive concept. From this perspective, the Global Entrepreneurship Monitor (GEM) approach is widely used by academics and practitioners. GEM defines entrepreneurship as any attempt at new business or new venture creation, such as self-employment, a new business organization, or the expansion of an existing business, by an individual, a team of individuals, or an established business (Reynolds, Hay, & Camp, 1999). In this context, GEM analyzes the motivation to become an entrepreneur, differentiating between two different types of entrepreneurship, namely opportunity and necessity entrepreneurship (Reynolds, Bygrave, Autio, Cox, & Hay, 2002). On the one hand, opportunity entrepreneurs are those who start a business in order to pursue an opportunity, not being a forced choice. They usually start the business because they want either to earn more money or to be more independent. On the other hand, in entrepreneurship by necessity individuals feel obliged to start their own businesses because of involuntary job loss and the scarcity of vacancies. Consequently, the decision to become involved in an entrepreneurial activity is a forced choice, given that all other employment options are either absent or unsatisfactory. Thereby, whereas opportunity entrepreneurship tends to involve innovative attempts to exploit new market niches, necessity entrepreneurship is more consistent with imitative ventures. In recent years numerous authors have argued that the two types of entrepreneurship usually differ in human capital endowment, venture success, survival rates, job satisfaction, or impact on economic development, stressing the desirability of prioritizing opportunity entrepreneurship (see, for instance, Acs & Varga, 2005; Bergmann & Sternberg, 2007; Kautonen & Palmroos, 2010; Block, Kohn, Miller, & Ullrich, 2015).

The literature on entrepreneurship has primarily focused on individual-level characteristics of entrepreneurs and has tended to underestimate the institutional and policy environment. Nevertheless, in the

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last few decades some authors have underlined the role of institutions and policies for entrepreneurship. The pioneering works of North and Baumol provide important theoretical insights into entrepreneurial development in differing institutional environments. North (1990) refers to institutions as the norms and rules that guide society, conditioning and leading the framework of relations that occur within it, and which can be classified as informal institutions (ideas, beliefs, attitudes and values of the people) and formal institutions (political and legal rules, economic norms and contracts). He underlines that entrepreneurs are the main agents of change and that organizations, such as firms set up by entrepreneurs, adapt their activities and strategies to fit the opportunities and limitations provided through formal and informal institutional frameworks. Baumol (1990) hypothesizes that entrepreneurial individuals channel their efforts in different directions depending on the quality of prevailing economic, political, and legal institutions. He states that entrepreneurship can manifest itself in productive, unproductive, and destructive form. His contribution is significant because it suggests that the policy focus should be on how to improve the quality of institutions to encourage entrepreneurs to redirect their activities towards productive activities that create economic welfare for society. In this line, Sobel (2008) confirms Baumol's theory and asserts that better institutions have both more productive entrepreneurship and also less unproductive entrepreneurship. He stresses that the best path to foster entrepreneurship is through institutional reforms that constrain or minimize the role of government.

In this context, economic freedom, understood as market economy-oriented institutions and policies, may be seen as a significant aspect for entrepreneurial activity. In fact, the different dimensions of economic freedom, such as size of government, legal structure and security of property rights, sound money, freedom to trade internationally, or regulation of credit, labor, and business may constitute key context conditions determining the characteristics of entrepreneurship. Thus, some dimensions of economic freedom may particularly affect opportunity and necessity entrepreneurship (see Bjørnskov & Foss, 2008; McMullen, Bagby, & Palich, 2008; Díaz-Casero, Díaz-Aunión, Sánchez-Escobedo, Coduras, & Hernández-Mogollón, 2012; Fuentelsaz, González, Maícas, & Montero, 2015). Opportunity entrepreneurship is related to the identification of an attractive business opportunity, while necessity entrepreneurship usually builds on a more difficult environment with limited opportunities. From a rational point of view, it can be argued that greater economic freedom gives greater flexibility and higher rewards and new business may be created in response to economic opportunities, whereas if there is little economic freedom one might be forced to be self-employed and to create a sole proprietorship. Increases in economic freedom may become conceptually equivalent to reductions in entrepreneurial action-inhibiting transaction costs, fostering a dynamic economy in which a large amount of business trial and error can take place. Thus, market economy-oriented institutions and policies that provide an appropriate legal and regulatory framework may facilitate predictable and rational decision-making and favor the recognition and exploitation of entrepreneurial opportunities (Johansson, 2001; Berggren, 2003; Powell & Weber, 2013).

In this paper, we address the extent to which economic freedom matters for both types of entrepreneurship under the hypothesis that economic liberalization boosts opportunity entrepreneurship at the expense of necessity entrepreneurship. We carry out a dynamic panel data analysis during the period 2001–2012 in the OECD countries by using the system GMM estimator developed by Arellano and Bover (1995) and Blundell and Bond (1998). To this end, we use both indicators provided by GEM (2015) on opportunity entrepreneurship and necessity entrepreneurship. As indicators of economic freedom, we consider the economic freedom index (EFI) provided by the Fraser Institute, as well as its five areas or dimensions (Fraser Institute, 2015). Our contribution in this paper is twofold. First, we add some empirical evidence on the discussion of how economic liberalization affects opportunity entrepreneurship and necessity entrepreneurship through a dynamic panel data analysis. We conclude that institutional and policy environment plays a remarkable role in determining both types of entrepreneurship motivation. Second, we examine the effects of the specific areas of economic freedom (size of government, legal system and property rights, sound money, freedom to trade internationally, and regulation of credit, labor, and business) on both types of entrepreneurship in order to provide policy recommendations to encourage a favorable policy and institutional framework for high-quality entrepreneurship in the OECD countries.

The remainder of the paper is as follows: Section 2 reviews the literature on the relationship between economic freedom and both types of entrepreneurship. The next section describes data and methodology. Section 4 presents the results. Lastly, some summarizing and concluding remarks are offered.

2. Literature review

In recent years the effects of economic freedom on entrepreneurship has been researched in a number of studies with diverse conclusions. First, focusing on international studies using entrepreneurship indicators provided by GEM, Sobel, Clark, and Lee (2007) conduct a cross-sectional study for 22 OECD countries in 2002 by using the EFI provided by the Fraser Institute. They find that there is a positive and statistically significant relationship between the level of economic freedom and total entrepreneurial activity. Furthermore, they point out that the size of government and regulation are the most important areas of economic freedom for determining rates of entrepreneurship. In the same way, Powell and Rodet (2012) examine the impact that economic freedom (EFI) and societal approval of entrepreneurs have on rates of total entrepreneurial activity. They find that both cultural legitimation of entrepreneurs and economic freedom, specifically the area of economic freedom related to size of government, are associated with increased rates of entrepreneurship in a cross section of 21 quite diverse countries from different continents. They highlight the existence of some empirical evidence in support of Baumol's argument that both quality of institutions and social approval of entrepreneurs affect the prevalence of productive entrepreneurship.

Beyond total entrepreneurial activity, some authors tackle the relationship between economic freedom and entrepreneurship motivation, taking into account the classification that categorizes the types of entrepreneurship, distinguishing between opportunity and necessity entrepreneurship in accordance with the GEM framework.

Bjørnskov and Foss (2008) consider the five dimensions of economic freedom suggested by the Fraser Institute to carry out a cross-sectional study for a small sample of 29 countries worldwide for the year 2001. They find that size of government is negatively associated with total entrepreneurial activity, opportunity entrepreneurship and necessity entrepreneurship, whereas access to sound money is positively related. Considering the economic freedom index from the Heritage Foundation, McMullen et al. (2008), in a cross-sectional analysis examining 37 worldwide countries for the year 2002, argue that the relationship between economic freedom and entrepreneurial activity differs depending on whether the entrepreneurial activity is motivated by necessity or opportunity. They find that entrepreneurial activity by opportunity is positively related to the areas of labor freedom and property rights, while necessity entrepreneurial activity is positively related to labor freedom, fiscal freedom and monetary freedom. These conclusions differ considerably from Díaz-Casero et al. (2012), who carry out a cross-sectional analysis (from 2002 to 2009) and a pooled data analysis (2004–2009) for a sample of 29 countries worldwide grouped by development level. Their results suggest that overall total entrepreneurial activity, opportunity entrepreneurship and necessity entrepreneurship decrease as economic freedom increases, and just smaller government size and fiscal freedom appear to foster the emergence of new entrepreneurs, irrespective of their motivation. They also find that total entrepreneurial activity and entrepreneurship by opportunity increase as

most areas of economic freedom grow in the group of innovation-driven economies.

In a somewhat different line of work, Fuentelsaz et al. (2015) examine the role played by formal institutions on opportunity and necessity entrepreneurship with panel data for 63 countries between 2005 and 2012. Among other institutions, they analyze property rights, business freedom, and labor freedom, and find that opportunity entrepreneurship benefits from an improvement of these institutions, while more economic freedom in these areas reduces necessity entrepreneurship. They use random effects estimation, arguing that institutional dimensions tend to be stable over time and some of them do not show any time variation, even though they not address the potential problems of endogeneity in the relationship between institutions and both types of entrepreneurship.

Our paper empirically explores the links between economic freedom and opportunity and necessity entrepreneurship, analyzing the extent to which the various areas of economic freedom provided by the Fraser Institute are related to both types of entrepreneurship motivation in the OECD countries. To the best of our knowledge, this is the first contribution in the literature studying these relationships with the GEM data by using a dynamic panel data analysis to avoid endogeneity problems, taking into consideration that economic freedom can affect opportunity and necessity entrepreneurship and that both types of entrepreneurship can generate a better environment to encourage or discourage economic freedom.

3. Data and methodology

3.1. Data

This paper uses an unbalanced panel for OECD countries between 2001 and 2012 with statistical information on entrepreneurial activity, economic freedom and a number of control variables. The sample of countries includes 33 OECD countries, all except Luxembourg, although several countries only participated in the GEM project some years of the period examined and our dynamic analysis (dependent variable lagged one year) reduces the number of countries considered to 29 and 30 when studying opportunity and necessity entrepreneurship, respectively.

Data on entrepreneurial activity are from GEM (2015), focusing on the variables opportunity entrepreneurship (TEAOPP) and necessity entrepreneurship (TEANEC). Let us recall that GEM pays attention to differences in motivations for starting a business, providing separate measures of opportunity entrepreneurship and necessity entrepreneurship. Whereas TEAOPP is the percentage of population that claims to be involved in some kind of entrepreneurship that does not exceed 42 months of activity due to exploitation of a business opportunity, TEANEC is the percentage of population that claims to be involved in some kind of entrepreneurship that does not exceed 42 months of activity due to necessity.

Nowadays the GEM data set is internationally recognized as an invaluable source of information for entrepreneurship and widely used in the literature. Unlike other databases that are limited to measuring newly registered businesses, GEM takes a broad view and studies the behavior of individuals with respect to starting and managing a business (Bosma, 2013). Since 1999 this research consortium collects cross-national data on numerous aspects of entrepreneurship aggregated at the country level, providing 20 indicators on entrepreneurial activity, attitudes and aspirations.

Concerning economic freedom, we primarily consider as an overall measure the Economic Freedom of the World Index (EFI) reported annually by the Fraser Institute since 2000 in *Economic Freedom of the World* (EFW) (Fraser Institute, 2015), the most extensively used reference in academic contexts in the recent years. The EFW data set provides a comprehensive measure of the degree to which countries rely on markets rather than political decision-making to allocate resources. In particular, the EFI measures the degree to which country institutions and policies are supportive of economic freedom. It is a composite index that weighs five dimensions of economic freedom, EFI1-EFI5, which are in turn based on several components and sub-components: i. Size of government (EFI1); ii. Legal structure and property rights (EFI2); iii. Sound money (EFI3); iv. Freedom to trade internationally (EFI4); and v. Regulation of credit, labor, and business (EFI5). These five dimensions or major areas of the EFI, as well as their components and sub-components, are specified in Table A1 of the Appendix A.

The composite index and the other indicators range from 0 to 10, 0 indicating the lowest and 10 the greatest economic freedom. When sub-components are present, the sub-component ratings are averaged to derive the component rating. The component ratings within each area are then averaged to derive ratings for each of the five areas. In turn, the five area ratings are averaged to derive the summary rating for each country. The composite EFI and their dimensions exist in a chain-linked version, suitable for analysis over time, which we use in our study as explanatory variables.

We control our baseline model for the log of GDP per capita (GDPpc) in PPP, as well as a number of other socioeconomic variables for sensitivity analysis, from the World Development Indicators. In particular, in accordance with the literature we consider the following variables: percentage of secondary education (Secondary_education), percentage of tertiary education (Tertiary_education), percentage of unemployment (Unemployment), percentage of long-term unemployment (Long_unemployment), percentage of employment in agriculture (Emp_agriculture), percentage of employment in industry (Emp_industry), percentage of employment in services (Emp_services), money and quasi money (M2), foreign direct investment (FDI), market capitalization (Market_cap), population between ages of 15–64 (Population_15–64), and female population (Female). We also carry out an additional robustness test including as control variables the respective GEM entrepreneurial aspiration and attitude indicators (11 variables). See Table 1 for descriptive statistics of all variables used in the study and Table A2 of the Appendix A for their definitions and sources.

3.2. Methodology

We formulate the following panel data model to analyze the effect of economic freedom on opportunity and necessity entrepreneurship, where countries are represented by i and time by t:

$$E_{it} = \beta_0 + \beta_1 ef_{it} + \beta_2 x_{it} + \zeta_i + \omega_{it} \quad (1)$$

where E_{it} is the dependent variable of opportunity and necessity entrepreneurship (TEAOPP, TEANEC), ef_{it} is the respective index of economic freedom (EFI and its five major areas, EFI1-EFI5), x_{it} are the control variables, ζ_i is the time-constant intercept term for each country that captures individual-specific effects that are constant over time, and ω_{it} is a normally distributed error term.

To begin with, the null hypothesis of no country effects is rejected in all estimations, implying that a pooled regression model is inappropriate, as estimates made with pooled OLS would be biased (Breusch & Pagan, 1980). Therefore, we must use panel data models, as they permit controlling for individual effects not controlled by the explanatory variables introduced in the models.

Nevertheless, due to potential problems of endogeneity between economic freedom and both types of entrepreneurship, we employ a dynamic panel data model, which includes a lagged level of the dependent variable as regressor, E_{it-1}:

$$E_{it} = \beta_0 + \beta_1 ef_{it} + \beta_2 x_{it} + \beta_3 E_{it-1} + \zeta_i + \omega_{it} \quad (2)$$

Since the lag of the dependent variable is necessarily correlated with the idiosyncratic error, traditional static panel data model estimators, such as the fixed effects and random effect estimators, are inconsistent.

Table 1
Descriptive statistics.
Source: GEM (2015), Fraser Institute (2015), World Development Indicators (2015).

Variable	Min.	Max.	Mean	Standard deviation
TEAOPP	22.0	82.0	55.2	11.9
TEANEC	2.0	48.0	17.7	9.8
EFI	5.2	8.6	7.5	0.5
EFI1	2.8	8.3	5.5	1.2
EFI2	3.6	9.5	7.6	1.3
EFI3	3.6	9.9	9.3	0.7
EFI4	6.3	9.4	8.1	0.7
EFI5	4.3	8.6	7.1	0.8
GDPpc	12,166.2	64,954.1	33,915.4	11,137.5
School secondary	71.5	159.1	104.7	13.7
School tertiary	20.1	114.0	64.2	16.5
Unemployment	2.1	25.0	7.4	3.7
Long-term unemployment	0.0	73.1	30.3	17.3
Emp. agriculture	1.1	37.6	6.4	5.7
Emp. industry	15.3	40.5	26.0	5.6
Emp. services	39.7	81.2	67.2	8.0
M2	25.8	241.3	84.1	36.9
FDI	-16.2	88.1	4.7	8.0
Market capitalization	4.7	282.5	65.1	46.4
Population 15–64	61.3	72.9	67.1	2.2
Female	49.7	53.9	51.0	0.7
TEAyyjg5	3.0	61.0	26.9	9.0
TEAyynwp	13.0	90.0	45.3	12.3
TEAyyint	1.0	60.0	18.3	8.0
Futsupno	0.7	46.0	9.9	6.7
Nbgoodyy	25.0	87.0	58.5	12.6
Frfailop	10.0	61.0	33.4	7.9
Nbstatyy	34.0	90.0	68.3	9.7
Knoentyy	13.0	88.0	37.6	9.7
Nbmediyy	19.0	85.0	54.4	13.7
Suskilyy	9.0	67.0	43.3	11.2
Opportyy	3.0	71.0	33.9	15.0

We apply the system GMM estimator developed by Arellano and Bover (1995) and Blundell and Bond (1998). In particular, we use the one-step system GMM estimator with robust standard errors. It estimates a system of equations in both first-differences and levels, in which the instruments in the level equations are lagged first differences of the variables.

This dynamic approach allows including lagged values of TEAOPP and TEANEC as explanatory variables, which controls for omitted variables that change over time, in contrast with other estimations that control for country characteristics that are constant over time. It also takes into consideration the potential endogenous nature of economic freedom. In this sense, consideration could be given to the possibility of a two-way causality that may run from TEAOPP and TEANEC to economic freedom as well. We can also relax the strict exogeneity assumption for the control variables, which can be considered as predetermined, allowing for feedback from lagged TEAOPP and TEANEC values to the current value for the respective control variables.

In this way, our dynamic panel data models treat the lagged information on TEAOPP and TEANEC and the different economic freedom measures as endogenous, while the control variables are considered predetermined rather than strictly exogenous.

Our baseline model includes as control variable the log of GDP per capita in PPP.[1] The level of economic development, proxied by GDP per capita, is a control variable widely used in this field. According to Singer, Amorós, and Moska (2015), total early-stage entrepreneurial activity decreases through the development phases, so that it tends to be the highest among factor-driven economies and the lowest in innovation-driven economies. That is, it tends to decline in economies with higher GDP per capita (see, for instance, Bjørnskov & Foss, 2008; and Nyström, 2008). In less developed territories, where fewer high-paying jobs working for someone else exist, many people turn to entrepreneurship to earn a living. We may consider that rising economic development allows for more lucrative employment opportunities than running one's own business and, at the same time, a lower level of entrepreneurship by necessity can be expected in economically advanced countries as compared to less developed economies, where the lack of options to work may push more people to become entrepreneurs.[2]

To test the robustness of our results, in accordance with prior studies we estimate other model specifications considering the set of additional socioeconomic control variables described above, as well as the respective GEM entrepreneurial aspiration and attitude indicators.

4. Results

The baseline results of the one-step system GMM estimation with robust standard errors are presented in Table 2. The Sargant test of overidentifying restrictions suggests that the instruments are valid, while the Arellano-Bond test for second-order autocorrelation reveals that there is no significant serial correlation, so the estimator should be consistent. We include one lag of TEAOPP and TEANEC respectively, and the estimates highlight that the lagged dependent variable is highly significant. In this regard, lagged TEAOPP and TEANEC seem to capture a lot of information on unobserved effects that influence opportunity entrepreneurship and necessity entrepreneurship over time, including diverse structural features of the OECD countries.

In accordance with the literature, we observe a different behavior in the relationship between economic freedom and both types of entrepreneurship motivation. First, our results highlight that economic freedom is positively and significantly associated with opportunity entrepreneurship. In line with results revealed by McMullen et al. (2008) or Fuentelsaz et al. (2015), this relationship appears to be driven by EFI2 (Legal system and property rights) and EFI5 (Regulation of credit, labor, and business). EFI2 essentially includes judicial independence, integrity of legal system, and the protection of intellectual property, while EFI5 takes into account credit market regulations (e.g., ownership and competition in the banking sector), labor market regulation (e.g., the ease of hiring and firing workers, minimum wage and the extent of unemployment benefits), and business regulation measures (e.g., the ease of starting a business and the bureaucracy and cost associated with running a business). Therefore, a better legal structure and security of property rights and more lenient regulation of credit, labor and business tend to favor entrepreneurship by opportunity. By contrast, although previous studies show diverse results, our findings clearly reveal a significant negative relationship between the composite index of economic freedom and entrepreneurship by necessity. It seems to be induced by EFI2 (Legal system and property rights), EFI5 (Regulation of credit, labor, and business) and also EFI4 (Freedom to trade internationally). EFI4 basically refers to measures of tariffs on international trade, regulatory trade barriers, and international capital market controls. These findings are consistent with the fact that necessity entrepreneurship usually builds on a more difficult environment with limited opportunities, so that little economic freedom might force some people to be self-employed and to create a sole proprietorship.

Regarding control variables, as expected, the level of economic development seems to be positively associated with TEAOPP and negatively with TEANEC in the baseline models, so that development seems to involve the strengthening of opportunity entrepreneurship at the expense of necessity entrepreneurship.

[1] The GDP per capita variable is used in its logarithmic form in order to reduce problems with non-normality.

[2] Some authors, such as Acs (2006), underline that all countries have some level of both opportunity and necessity entrepreneurship and suggest that the ratio of opportunity-to-necessity entrepreneurship should be a useful indicator of economic development: The higher the ratio of opportunity-to-necessity entrepreneurship, the higher the level of economic development. In fact, he demonstrates a strong positive relationship between this ratio and GDP per capita.

Table 2
Opportunity and necessity entrepreneurship and economic freedom. Baseline models.

	TEAOPP						TEANEC					
Constant	−133.469*	49.104	−104.604	−75.183	−75.447	−41.483	60.049	26.820	82.689*	89.534*	113.536**	108.177**
	[79.997]	[103.544]	[63.868]	[74.462]	[80.334]	[98.450]	[47.478]	[40.610]	[43.273]	[47.151]	[45.769]	[47.803]
EFI1	1.723						−1.240					
	[1.244]						[0.943]					
EFI2		6.739**						−2.412*				
		[2.626]						[1.406]				
EFI3			−1.040						0.158			
			[1.633]						[1.031]			
EFI4				−0.913						−2.488**		
				[3.080]						[1.193]		
EFI5					6.749***						−1.891**	
					[1.995]						[0.802]	
EFI						9.197**						−5.024**
						[4.113]						[1.996]
Log GDPpc	15.531*	−5.258	14.862**	11.389	6.881	1.579	−4.108	0.179	−7.127*	−5.634	−8.528*	−5.687
	[7.998]	[11.755]	[6.908]	[7.221]	[8.012]	[10.034]	[4.716]	[4.212]	[3.720]	[4.403]	[4.540]	[4.672]
Lagged TEAOPP (t-1)	0.305**	0.179	0.258**	0.337***	0.202	0.208*						
	[0.130]	[0.127]	[0.126]	[0.124]	[0.134]	[0.126]						
Lagged TEANEC (t-1)							0.388***	0.409***	0.431***	0.380***	0.373***	0.377***
							[0.095]	[0.085]	[0.085]	[0.083]	[0.081]	[0.086]
Number of countries	29	29	29	29	29	29	30	30	30	30	30	30
Observations	146	146	146	146	146	146	227	227	227	227	227	227
Sargan test	0.1404	0.1420	0.0381	0.0535	0.0623	0.0184	0.1698	0.1589	0.1043	0.1412	0.0859	0.1025
Arellano-Bond test	0.0763	0.0786	0.0629	0.0572	0.0274	0.0650	0.7064	0.7493	0.6990	0.6965	0.7296	0.6938

*** Significant at 1% level.
** Significant at 5% level.
* Significant at 10% level.

In order to assess the robustness of the baseline models, we introduce several variations in the baseline specifications by including some additional socioeconomic control variables, in accordance with the literature. Table 3 summarizes the results and corroborates that the foregoing findings remain in most model specifications.

As an additional robustness test, we also control for entrepreneurial aspirations and attitudes in the baseline specifications. To this end, we introduce the entrepreneurial aspiration and attitude indicators provided by GEM (2015). Entrepreneurial aspirations reflect the qualitative nature of entrepreneurial activity, so that, for instance, entrepreneurs

Table 3
Variations on baseline specifications including other socioeconomic variables.

	TEAOPP						TEANEC					
	EFI1	EFI2	EFI3	EFI4	EFI5	EFI	EFI1	EFI2	EFI3	EFI4	EFI5	EFI
Baseline	1.723	6.739**	−1.040	−0.913	6.749***	9.197**	−1.240	−2.412*	0.158	−2.488**	−1.891**	−5.024**
	[1.244]	[2.626]	[1.633]	[3.080]	[1.995]	[4.113]	[0.943]	[1.406]	[1.031]	[1.193]	[0.802]	[1.996]
Including school secondary	1.551	4.449**	−0.370	−2.144	1.317	5.020*	−0.649	−1.921	0.773	−2.372	−0.995	−3.953**
	[1.090]	[2.178]	[1.381]	[2.753]	[1.867]	[2.569]	[0.740]	[1.202]	[1.279]	[1.445]	[0.989]	[1.727]
Including school tertiary	0.820	5.097*	−0.501	−1.493	2.594	0.391	−0.089	−2.012*	0.365	−2.326**	−0.810	−2.734**
	[1.028]	[2.965]	[1.884]	[2.746]	[2.121]	[2.691]	[0.605]	[1.036]	[1.035]	[1.134]	[1.145]	[1.352]
Including unemployment	−0.311	3.053	1.737	−1.842	0.730	−0.245	−0.413	−1.672	0.255	−2.251**	−1.216	−3.904*
	[1.145]	[2.189]	[1.359]	[2.792]	[1.786]	[2.542]	[0.556]	[1.127]	[0.985]	[1.028]	[0.797]	[2.011]
Including long-term unemployment	0.742	5.445**	0.856	−0.837	4.869***	9.297***	−1.066	−2.080**	−0.842	−2.237*	−1.821*	−5.341**
	[0.716]	[2.210]	[1.156]	[3.126]	[1.671]	[3.417]	[0.751]	[1.061]	[1.017]	[1.145]	[1.023]	[2.102]
Including emp. agriculture	−0.488	7.755***	−0.133	2.990	4.397	4.893	0.241	−2.960**	−0.170	−2.840*	−2.093*	−3.797*
	[1.188]	[1.991]	[2.010]	[3.517]	[2.874]	[3.032]	[0.791]	[1.354]	[1.108]	[1.530]	[1.074]	[2.173]
Including emp. industry	0.950	5.757**	−1.327	1.899	4.114*	6.029*	−0.508	−1.949**	1.637	−2.419**	−1.011	−2.670*
	[1.211]	[2.246]	[2.114]	[3.249]	[2.136]	[3.354]	[0.725]	[0.981]	[1.394]	[1.222]	[0.755]	[1.583]
Including emp. services	−0.163	7.487***	1.348	3.392	4.198*	6.640	0.308	−2.716***	−0.570	−2.976**	−1.217	−4.320**
	[1.311]	[2.299]	[1.730]	[3.448]	[2.257]	[4.318]	[0.706]	[1.003]	[1.351]	[1.228]	[0.814]	[1.837]
Including private credit	2.152*	3.094	−2.536*	−3.323*	4.459**	5.273	−1.091	−2.726**	0.955	−1.701	−2.199***	−4.250***
	[1.179]	[1.991]	[1.336]	[1.993]	[1.768]	[3.370]	[0.798]	[1.207]	[1.133]	[1.185]	[0.720]	[1.590]
Including M3	4.723*	0.040	−3.379	0.084	8.942***	4.000	−5.969**	−2.296	5.262***	−2.268	−7.386**	−6.864
	[2.579]	[1.471]	[3.311]	[2.504]	[3.132]	[3.121]	[2.835]	[2.076]	[1.817]	[2.167]	[3.033]	[5.046]
Including M2	1.764	3.991**	−0.759	−1.195	5.334***	8.468**	−0.403	−2.155*	0.047	−2.057	−1.268	−3.432
	[1.116]	[1.696]	[1.217]	[2.517]	[1.993]	[3.826]	[0.638]	[1.192]	[1.089]	[1.441]	[0.986]	[0.000]
Including FDI	1.287	7.052***	−1.862	−1.630	4.134*	7.413**	−0.698	−2.398**	−0.075	−2.101	−1.717**	−4.033**
	[1.098]	[2.658]	[1.687]	[3.021]	[2.488]	[3.610]	[0.710]	[1.159]	[1.036]	[1.322]	[0.767]	[1.799]
Including market capitalization	0.836	5.298**	−2.280	−3.700	4.543*	6.880	−0.626	−2.616**	0.452	−2.394**	−2.402**	−5.844**
	[1.372]	[2.223]	[1.815]	[2.524]	[2.603]	[4.902]	[0.989]	[1.315]	[0.992]	[1.148]	[0.958]	[2.534]
Including population 15–64	2.327*	3.187*	−0.671	−0.902	5.539***	8.485**	−1.125	−1.476	1.210	−2.435**	−1.650*	−4.785**
	[1.336]	[1.841]	[2.287]	[3.135]	[1.811]	[4.221]	[0.888]	[1.187]	[1.290]	[1.169]	[0.930]	[2.241]
Including female	1.821	3.955**	−1.477	−2.809	3.983*	3.587	−0.544	−1.673	−0.359	−2.324*	−1.586	−3.618*
	[1.717]	[1.714]	[2.125]	[2.739]	[2.414]	[3.627]	[0.812]	[1.383]	[1.209]	[1.190]	[1.022]	[1.853]

*** Significant at 1% level.
** Significant at 5% level.
* Significant at 10% level.

may differ in their growth expectations, innovative orientation, or international orientation. Meanwhile, entrepreneurial attitudes express the general feeling of the population towards entrepreneurs and their activity, considering, among others, to what extent individuals perceive good opportunities to start a firm, whether individuals discern entrepreneurship as a desirable career choice, entrepreneurial intention to start a business, or the extent to which fear of failure is an obstacle to set up a business. After controlling for these variables, the significance of the different economic freedom measures remains highly robust (EFI2, EFI5 and EFI for TEAOPP; and EFI2, EFI4, EFI5 and EFI for TEANEC) (see Table 4).

Regarding the significance of the control variables related to entrepreneurial aspirations and attitudes (estimates available upon request), we should highlight that perceived opportunities (Opportyy) and media attention for entrepreneurship (Nbmediyy) are entrepreneurial attitude indicators positively and significantly associated with opportunity entrepreneurship. Unsurprisingly, perceived opportunities is also linked, although negatively, to necessity entrepreneurship. In this sense, it should be noted that the perception of good opportunities to start a firm encourages taking the step towards entrepreneurial activity, favoring opportunity entrepreneurship and damaging necessity entrepreneurship. In a similar way, media attention for entrepreneurship also seems to have a remarkable role in promoting opportunity-driven entrepreneurship.

5. Conclusions

In this paper we examine to what extent economic freedom is associated with entrepreneurial activity in the OECD countries during the period 2002–2012, providing new evidence from a dynamic panel data approach. We find that economic freedom matters for entrepreneurship motivation. The overall index of economic freedom is positively associated with opportunity entrepreneurship, while its relationship with necessity entrepreneurship is negative. Greater economic freedom seems to encourage the emergence of new business opportunities and enable entrepreneurs to take advantage of them. Thus, a market economy-oriented environment seems to favor opportunity entrepreneurship at the expense of necessity entrepreneurship. Let us recall that a priori opportunity entrepreneurship is more desirable, since overall it arises voluntarily and tends to involve innovative initiatives to exploit new market niches, while necessity entrepreneurship is often linked to initiatives that imitate other firms and is usually characterized by limited business quality, lower levels of investment and human capital, and less impact on economic development. In this sense, the aim of governments should not only be to increase entrepreneurship indiscriminately, but to also take into account the types and characteristics of entrepreneurship.

Focusing on the different areas of economic freedom, we find that a better legal system and property rights (EFI2) and a more flexible regulation of credit, labor, and business (EFI5) seem to encourage opportunity entrepreneurship, whereas EFI2, EFI5 and higher freedom to trade internationally (EFI4) appear to discourage necessity entrepreneurship. From the point of view of public policies, as an environment providing quality and integrity of the legal system and protection of property rights tends to promote innovative behaviors and risk-taking (Bjørnskov & Foss, 2013), any government policy in this sense may particularly favor potential opportunity entrepreneurs. In addition, policy reforms that make business regulation more flexible and doing business easier, including the simplification of all the administrative processes that entrepreneurs have to face, seem to strengthen opportunity entrepreneurship in particular, taking into consideration the higher aspirations of potential opportunity entrepreneurs and their higher incentives to comply with regulations (Levie & Autio, 2011). These findings highlight the importance of an appropriate legal and regulatory framework to facilitate high-quality entrepreneurship in the OECD economies.

Our research has several limitations that may constitute avenues for further research. Given that the results are based on an unbalanced panel data set, our findings should not be interpreted as definitive. Moreover, although GEM methodology is homogeneous across countries, opportunity and necessity entrepreneurship have different connotations in different contexts, and this dichotomy should be interpreted with due caution, especially in international studies. Further research is also needed to better understand the specific links between market economy-oriented institutions and policies and both types of

Table 4
Variations on baseline specification including aspiration and attitude indicators.

	TEAOPP						TEANEC					
	EFI1	EFI2	EFI3	EFI4	EFI5	EFI	EFI1	EFI2	EFI3	EFI4	EFI5	EFI
Baseline	1.723	6.739**	−1.040	−0.913	6.749***	9.197**	−1.240	−2.412*	0.158	−2.488**	−1.891**	−5.024**
	[1.244]	[2.626]	[1.633]	[3.080]	[1.995]	[4.113]	[0.943]	[1.406]	[1.031]	[1.193]	[0.802]	[1.996]
Including TEAyyjg5	1.570	5.187**	−0.469	−2.077	5.772***	7.961**	−0.223	−2.239	−0.113	−2.829**	−1.272	−3.999*
	[1.260]	[2.332]	[1.561]	[2.518]	[2.048]	[3.426]	[0.817]	[1.404]	[1.044]	[1.272]	[1.000]	[2.119]
Including TEAyynwp	1.020	4.594**	−1.960	−0.922	4.227**	4.559	−0.384	−2.725**	0.191	−3.449***	−2.440***	−5.085***
	[1.000]	[1.948]	[1.638]	[2.446]	[1.943]	[3.331]	[0.745]	[1.158]	[0.916]	[1.224]	[0.723]	[1.723]
Including TEAyyint	1.201	5.333**	−0.216	−0.911	5.010**	5.581	−1.384	−2.137*	0.198	−1.934	−1.728**	−4.706**
	[1.174]	[2.715]	[1.698]	[2.901]	[2.224]	[4.258]	[1.061]	[1.258]	[1.026]	[1.246]	[0.791]	[2.026]
Including Futsupno	1.293	4.644**	−0.737	0.786	5.493***	7.121**	−0.860	−1.864	0.312	−3.158***	−1.867**	−5.084***
	[0.881]	[1.910]	[1.627]	[2.442]	[1.865]	[3.036]	[0.918]	[1.324]	[1.152]	[1.153]	[0.859]	[1.817]
Including Nbgoodyy	1.887	5.013**	0.773	0.107	4.742**	7.915**	−1.388	−2.894**	−0.074	−2.858**	−1.822**	−5.242**
	[1.230]	[2.187]	[1.485]	[3.060]	[2.106]	[3.707]	[0.933]	[1.210]	[1.030]	[1.350]	[0.847]	[2.087]
Including Frfailop	1.117	7.606**	−1.026	−0.975	7.516***	9.001**	−0.356	−2.476*	1.280	−2.904**	−1.984**	−4.345**
	[1.259]	[3.018]	[1.456]	[2.701]	[2.004]	[3.760]	[0.692]	[1.331]	[1.381]	[1.245]	[0.771]	[1.997]
Including Nbstatyy	0.901	5.204***	−0.292	0.048	5.678***	8.453**	−1.566	−2.853**	−0.149	−2.915**	−2.264***	−5.518**
	[1.165]	[2.008]	[1.299]	[2.919]	[2.054]	[4.037]	[1.082]	[1.225]	[1.051]	[1.409]	[0.799]	[2.222]
Including Knoentyy	0.783	6.416***	−0.618	−0.689	7.160***	8.221*	−0.759	−2.124	0.835	−2.239	−1.539	−4.092*
	[1.038]	[2.044]	[1.548]	[2.558]	[2.116]	[4.641]	[0.790]	[1.332]	[1.283]	[1.515]	[1.079]	[2.341]
Including Nbmediyy	−0.618	5.229***	3.029*	−1.977	4.656**	6.965*	−1.486	−2.752*	−0.244	−2.839*	−2.009*	−5.798**
	[1.321]	[1.988]	[1.652]	[3.310]	[1.861]	[4.010]	[1.287]	[1.412]	[1.224]	[1.614]	[1.203]	[2.728]
Including Suskilyy	1.011	4.392*	0.396	0.250	4.256*	6.576*	−0.594	−0.994	−0.615	−3.139**	−1.435	−4.618**
	[1.032]	[2.507]	[1.389]	[2.529]	[2.460]	[3.954]	[0.994]	[1.312]	[1.158]	[1.387]	[0.942]	[2.174]
Including Opportyy	0.392	2.779	−0.054	−1.269	2.724	3.340	−0.255	−1.170	−0.034	−3.049**	−0.911	−3.577
	[0.735]	[2.053]	[1.544]	[2.188]	[2.554]	[3.721]	[0.753]	[1.060]	[1.108]	[1.224]	[1.030]	[2.241]

*** Significant at 1% level.
** Significant at 5% level.
* Significant at 10% level.

entrepreneurship, dealing in addition with the diverse components and sub-components of economic freedom, in order to provide more detailed guidance to policy makers.

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Appendix A

Table A1
Areas, components, and sub-components of the EFI.
Source: Gwartney, Lawson, and Hall (2014).

1. *Size of government*

A. Government consumption
B. Transfers and subsidies
C. Government enterprises and investment
D. Top marginal tax rate

(i) Top marginal income tax rate
(ii) Top marginal income and payroll tax rate

2. *Legal system and property rights*

A. Judicial independence
B. Impartial courts
C. Protection of property rights
D. Military interference in rule of law and politics
E. Integrity of the legal system
F. Legal enforcement of contracts
G. Regulatory restrictions on the sale of real property
H. Reliability of police
I. Business costs of crime

3. *Sound money*

A. Money growth
B. Standard deviation of inflation
C. Inflation: most recent year
D. Freedom to own foreign currency bank accounts

4. *Freedom to trade internationally*

A. Tariffs
(i) Revenue from trade taxes (% of trade sector)
(ii) Mean tariff rate
(iii) Standard deviation of tariff rates

B. Regulatory trade barriers
(i) Non-tariff trade barriers
(ii) Compliance costs of importing and exporting

C. Black-market exchange rates
D. Controls of the movement of capital and people
(i) Foreign ownership/investment restrictions
(ii) Capital controls
(iii) Freedom of foreigners to visit

5. *Regulation*

A. Credit market regulations
(i) Ownership of banks
(ii) Private sector credit
(iii) Interest rate controls/negative real interest rates

Table A1 (*continued*)

B. Labor market regulations
(i) Hiring regulations and minimum wage
(ii) Hiring and firing regulations
(iii) Centralized collective bargaining
(iv) Hours regulations
(v) Mandated cost of worker dismissal
(vi) Conscription

C. Business regulations
(i) Administrative requirements
(ii) Bureaucracy costs
(iii) Starting a business
(iv) Extra payments/bribes/favoritism
(v) Licensing restrictions
(vi) Cost of tax compliance

Table A2
Definitions and sources of the variables.

Variable	Definition	Source
Opportunity-driven entrepreneurial activity (TEAOPP)	Percentage of those involved in TEA who (i) claim to be driven by opportunity as opposed to finding no other option for work; and (ii) who indicate the main driver for being involved in this opportunity is being independent or increasing their income, rather than just maintaining their income	(1)
Necessity-driven entrepreneurial activity (TEANEC)	Percentage of those involved in TEA who are involved in entrepreneurship because they had no other option for work	(1)
Economic freedom index (EFI)	Composite measure of the degree to which the policies and institutions of countries are supportive of economic freedom	(2)
Size of government (EFI1)	Measures of the government intervenes in the economy through consumption, redistribution through transfer schemes, public investments, and marginal taxation	(2)
Legal system and property rights (EFI2)	Measures of the protection and respect for the rights of people to their own lives and rightfully acquired property	(2)
Sound money (EFI3)	Measures of the consistency of monetary policy by considering the rate and variability of inflation and monetary controls	(2)
Freedom to trade internationally (EFI4)	Measures of the extent of trade and barriers to trade and capital flows, both through actual trade and investment flows and through indicators of tariff and non-tariff barriers to trade and capital	(2)
Regulation (EFI5)	Measure of the freedom from government regulations and controls in the labor market, financial markets, and the price controls in the markets for goods and services	(2)
GDPpc	GDP per capita, PPP (constant 2011 international $)	(3)
School secondary	Gross enrolment ratio. Secondary. All programmes. Total is the total enrollment in secondary education, regardless of age, expressed as a percentage of the population of official secondary education age	(3)
School tertiary	Gross enrolment ratio. Tertiary (ISCED 5 and 6). Total is the total enrollment in tertiary education (ISCED 5 and 6), regardless of age, expressed as a percentage of the total population of	(3)

Table A2 (*continued*)

Variable	Definition	Source
	the five-year age group following on from secondary school leaving	
Unemployment	Percentage of the labor force that is unemployed	(3)
Long-term unemployment	Percentage of the total unemployed with continuous periods of unemployment extending for a year or longer	(3)
Emp. agriculture	Percentage of the labor force in the agriculture sector	(3)
Emp. industry	Percentage of the labor force in the industry sector	(3)
Emp. services	Percentage of the labor force in the service sector	(3)
M2	Money and quasi money (M2) as % of GDP	(3)
FDI	Foreign direct investment, net inflows (% of GDP)	(3)
Market capitalization	Market capitalization of listed companies (% of GDP)	(3)
Population 15–64	Population ages 15–64 (% of total)	(3)
Female	Percentage of the population that is female (%)	(3)
Growth expectation early-stage entrepreneurial activity (TEAyyjg5)	Percentage of TEA who expect to employ at least five employees five years from now	(1)
New product early-stage entrepreneurial activity (TEAyynwp)	Percentage of TEA who indicate that their product or service is new to at least some customers	(1)
International orientation early-stage entrepreneurial activity (TEAyyint)	Percentage of TEA who indicate that at least 25% of the customers come from other countries	(1)
Entrepreneurial intention (Futsupno)	Percentage of 18–64 population (individuals involved in any stage of entrepreneurial activity excluded) who intend to start a business within three years	(1)
Entrepreneurship as desirable career choice (Nbgoodyy)	Percentage of 18–64 population who agree with the statement that in their country, most people consider starting a business as a desirable career choice	(1)
Fear of failure rate (Frfailop)	Percentage of 18–64 population with positive perceived opportunities who indicate that fear of failure would prevent them from setting up a business	(1)
High status successful entrepreneurship (Nbstatyy)	Percentage of 18–64 population who agree with the statement that in their country, successful entrepreneurs receive high status	(1)
Know startup entrepreneur rate (Knoentyy)	Percentage of 18–64 population who personally know someone who started a business in the past two years	(1)
Media attention for entrepreneurship (Nbmediyy)	Percentage of 18–64 population who agree with the statement that in their country, you will often see stories in the public media about successful new businesses	(1)
Perceived capabilities (Suskilyy)	Percentage of 18–64 population who believe to have the required skills and knowledge to start a business	(1)
Perceived opportunities (Opportyy)	Percentage of 18–64 who see good opportunities to start a firm in the area where they live	(1)

Note: (1) GEM (2015), (2) Fraser Institute (2015), (3) World Development Indicators (2015).

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