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Economic freedom and formal entrepreneurial activity: A longitudinal analysis between the period 2013 -2018

Libertad económica y actividad emprendedora formal: Un análisis longitudinal entre el periodo 2013 - 2018

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Abstract. Given the lack of empirical consensus on the relationship between formal market-oriented institution and entrepreneurial activity, our research aimed to explore the relationship between formal entrepreneurship and overall economic freedom. To do so, we have generated balanced panel data based on the intersection of available information from the Fraser Institute Freedom Index, The World Bank entrepreneurship survey, and The World Bank macroeconomic indicators. The final sample included information of 107 countries over six years, 2013 to 2018. We modelled the data with a fixed effect and panel-corrected standard errors method with country dummy variables. Our results suggest a negative and significant relationship between (first difference) formal entrepreneurial activity and (lagged) overall economic freedom. Besides, we found that (first difference) unemployment rate, (first difference and log) total population and (first difference) working-age population had a negative and statistically significant relationship with (first difference) formal entrepreneurial activity. Based on these results, we provided an analysis considering the nature of the entrepreneurial endeavours and suggested further research avenues.

Keywords: Formal Institutions, Market-oriented institution, Economic Freedom, Formal Entrepreneurs, Business Establishment

Resumen. Dada la falta de consenso empírico sobre la relación entre instituciones formales orientadas al mercado y la actividad empresarial, esta investigación tiene por objetivo explorar la relación entre el emprendimiento formal y la libertad económica. Se utilizan datos provenientes del Instituto Fraser y el Banco Mundial para generar un panel de datos equilibrados. La muestra incluye información de 107 países en el periodo 2013-2018 sobre el Índice de Libertad Económica, Actividad Emprendedora e indicadores macroeconómicos. Se utiliza un método de panel con efectos fijos y errores estándar corregidos con variables dummy de país. Los resultados muestran una relación negativa y significativa entre la actividad emprendedora formal (en primera diferencia) y la libertad económica (rezagada). además, la tasa de empleo (en primera diferencia), la población total (primera diferencia y log), junto a la población en edad de trabajar (primera diferencia) tienen una relación negativa y estadísticamente significativa con la actividad emprendedora formal (primera diferencia). Se proporciona un análisis de los resultados y se sugieren nuevas vías de investigación

Palabras Clave: Instituciones formales, institución orientada al mercado, libertad económica, emprendedores formales, creación de empresas

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INTRODUCTION

The economic literature suggests that institutional variation seems to be one of the main determinants of the differences among international entrepreneurial activity (Díaz-Casero et al., 2013; Fritsch et al., 2021; Nyström, 2008). From a theoretical point of view, institutional economic theory (North, 1990) has been widely used to understand the sources of these divergences. The theory posits that agents' economic behaviour and aggregated outcomes are shaped by a set of formal and informal institutional characteristics (Baumol & Strom, 2011; North, 1990; Sobel, 2008). Economic freedom, a formal market-oriented institution, has been widely used as a measure of formal institutional quality in a country (Ajide, 2021; Ghosh, 2017; McMullen et al., 2008; Özkul, 2020; Popov et al., 2018; Saunoris & Sajny, 2017).

The relationship between entrepreneurship and economic freedom is still relatively unexplored in the empirical literature (Bennett, 2021a; Nyström, 2008). Empirical research has not provided conclusive results on this relationship, mainly due to the cross-sectional nature of the examinations (Hall et al., 2016; Kosi & Bojnec, 2013; Sweidan, 2021) and the extensive focus on developed economies (Angulo-Guerrero et al., 2017; Barnatchez & Lester, 2017; Bennett, 2021b; Deskins & Ross, 2018; Goetz & Rupasingha, 2014; Nyström, 2008; Rodrigues Brás & Soukiazis, 2018; Sobel, 2008). Therefore, researchers have suggested for a further empirical analysis of this relationship (Fuentelsaz et al., 2015a).

The influence of economic freedom on the entrepreneurial activity in economies has attracted the interest of academics and policymakers (Fuentelsaz et al., 2015a; Kuckertz et al., 2016), because it is associated with a higher level of innovation, competition, and economic growth (Anokhin & Schulze, 2009; Díaz-Casero et al., 2013). It has motivated recent economic policies focused on generating a proper environment for specific entrepreneurial endeavours (Angulo-Guerrero et al., 2017; Solomon et al., 2021). Our chapter aims to provide novel empirical evidence about the relationship between formal entrepreneurial activity and overall economic freedom. To do so, we have generated a robust econometric analysis using a fixed-effect method and a panel-corrected standard errors method with a balanced panel of 107 countries from 2013 to 2018.

Our research makes two main contributions to advance the empirical discussion. First, we provided a complete overview of the literature regarding economic freedom and different type of entrepreneurial endeavour (e.g., self-employment, necessity-driven, opportunity-driven, and establishment of formal business). Second, we provide novel empirical insights into the relationship between pro-market institutions and formal entrepreneurial activity.

The structure of this chapter is as follows. First, we provide an overview of our theoretical framework and describe the main findings of the relationship between economic freedom and entrepreneurship through an extensive literature review. Second, we describe the data and methods used for the econometric model. Third, we summarize the empirical results. Lastly, we discuss the results considering the extant research and conclude the chapter by providing further research avenues.

1.1. Institutional Theory

Our research builds on the North' (1990) institutional economic theory. From this theoretical perspective, economic institutions are defined as the taken-for-granted norms and rules that influence the economic incentive structure. It can act as implicit guidelines for individuals' actions (Popov et al., 2018). Institutions can be classified into two types (North, 1990): (a) formal, which includes political rules, economic norms, and contracts; and (b) informal, which comprises the individual ideals, beliefs, attitudes, and values of the economic actors.

The literature suggests that national institutions determine the type of organizations that establish and survive (Díaz-Casero et al., 2013; Fuentelsaz et al., 2015b; Kuckertz et al., 2016). Institutions' quality is relevant for economic growth as it reduces market uncertainty and promotes efficiency by reducing transaction costs (Ajide, 2021; McMullen et al., 2008; Nyström, 2008). In this sense, the institutional environment constrains entrepreneurs and organizations as it fosters or hinders the exploration, discovery, and exploitation of new business opportunities (Díaz-Casero et al., 2013; Kirzner, 1997; Kuckertz et al., 2016; Rodrigues Brás & Soukiazis, 2018).

1.2.Economic freedom and entrepreneurship

Economic freedom, a formal market-oriented institution, includes all liberties and rights of production, distribution, and consumption (Díaz-Casero et al., 2012). In an economically free society individuals will be allowed to work, produce, and consume (Díaz-Casero et al., 2012; Díaz-Casero & Mogollón, 2015). Empirical research suggests that societies with a high degree of economic freedom produce a greater level of growth, improve economic value creation, enhance the social quality of life, and generate a favourable environment for voluntary exchange (Ajide, 2021; Díaz-Casero & Mogollón, 2015; McMullen et al., 2008),

Economic freedom influence the individual entrepreneur's choice between formal and informal entrepreneurship (Angulo-Guerrero et al., 2017; Baumol & Strom, 2011; Nyström, 2008). Economic freedom is believed to enhance allocating resources to a productive effort based on the relative socioeconomic costs and benefits (McMullen et al., 2008; Saunoris & Sajny, 2017). An increase in economic freedom is conceptually equivalent to reducing entrepreneurial action-inhibiting transaction costs (Kier & McMullen, 2020). Therefore, individuals could have greater flexibility to start a new business in response to economic opportunities (Angulo-Guerrero et al., 2017). Besides, a deterioration in economic freedom could reduce entrepreneurial actions. Thus, it motivates the effort's reallocation into different economical activities (Saunoris & Sajny, 2017).

Empirical research has not provided conclusive results on the effect of economic freedom on entrepreneurial activities. Scholars have analysed the role of formal institutions in different entrepreneurial types as opportunity-driven (Angulo-Guerrero et al., 2017; Bárcena-Martín et al., 2021; Díaz-Casero et al., 2012; Raza et al., 2019), necessity-driven (Goel & Saunoris, 2020; Kuckertz et al., 2016; McMullen et al., 2008), self-employed (Goetz & Rupasingha, 2014; Nyström, 2008; Özkul, 2020), and the establishment of formal business (Ajide, 2021; Barnatchez & Lester, 2017; Bennett, 2021a; Hall et al., 2016; Kosi & Bojnec, 2013; Raza et al., 2019; Sweidan, 2021). Table 1 summarizes the main empirical and theoretical findings on this topic.

Table 1. Literature Review Economic Freedom and Entrepreneurship

Author	Research question/aim	Theory	Sample	Main results
(Nyström, 2008)	What is the relationship between entrepreneurship and the institutions of economic freedom?	Institutional Theory (North, 1999)	23 Countries 1972-2002	(a) Regulation of credit, labor, and business has the most significant effect on self-employment.
(McMullen et al., 2008)	To investigate differences in levels of entrepreneurship among countries by gauging the existence of a relationship between government-related variables and the motivation to become an entrepreneur	Institutional Theory (North, 1999)	37 Countries 2002	(a) Significant negative relationship between Gross Domestic Product Per Capita (Log) and Opportunity Motivated Entrepreneurship. (b) Necessity Motivated Entrepreneurship is positively associated with increasing economic freedom in terms of fiscal freedom, monetary freedom, and labor freedom (c) Opportunity Motivated Entrepreneurship is positively associated with increasing economic freedom regarding property rights and labor freedom.
(Sobel, 2008)	What is the impact of institutional quality on both productive and unproductive entrepreneurship levels?	Theory of productive and unproductive entrepreneurship (Baumol, 1990)	48 States	(a) Better institutional quality results in a higher level of productive entrepreneurial activity. (b) Institutional quality is highly correlated with net entrepreneurial productivity.

(Díaz-Casero et al., 2012)	To examine whether economic freedom affects entrepreneurial activity in three groups of countries.	Institutional Theory (North, 1999)	34 Countries 2004-2009	(a) TEA rates, opportunity-TEA rates, and necessity-TEA rates decrease when a country increases economic freedom. (b) In Innovation-Driven Economies opportunity-TEA rates increase as the economic freedom index grows.
(Díaz-Casero et al., 2013)	To analyze the impact of institutions on entrepreneurship in groups of countries classified according to their economic development.	Institutional Theory (North, 1999)	42 Countries 2006-2007	(a) In the factor-driven stage, the scant institutional development negatively relates to the business initiative and institutional quality. (b) In the efficiency stage, institutional improvement decreases the number of new ventures because the incentives' structure changes. (c) The structure encourages and engenders entrepreneurs in the innovation-driven stage.
(Kosi & Bojnec, 2013)	To examine the impact of freedom from regulation in different institutional areas on business entry rate.		10 Countries 1995-2007	(a) A positive impact of product market freedom. (b) There is no evidence of the significant impact of the financial, labor market, and fiscal freedom on the business entry rate. (c) Corruption is shown to have a modest negative impact on business creation.
(Goetz & Rupasingha, 2014)	What variables motivate self-employment growth?	New Growth Theory	1 Country 1969-2011	(a) Differences between urban and rural types of policies interventions. (b) Population density plays a role only in large urban counties. (c) Self-employed respond rationally to economic signals.
(Díaz-Casero et al., 2012)	To analyze the impact of the size of government in entrepreneurial activity for countries with different levels of economic development.	Institutional Theory (North, 1999)	55 Countries 2000-2011	(a) Government Size has a positive correlation with entrepreneurial measures.
(Fuente Isaz et al., 2015b)	To analyze and to compare the influence that the formal institutions of a country have on the different types of enterprise and their relative presence	Institutional Theory (North, 1999)	63 Countries 2005-2012	(a) Increased development of formal institutions positively affects both opportunity entrepreneurship and its relative presence. (b) Lower taxation increases the rate of venture initiatives that only launch small businesses, with the sole purpose of ensuring the subsistence of their partners.
(Kuckertz et al., 2016)	How policymakers might design specific components of economic freedom to encourage high levels of entrepreneurial activity (EA)	Institutional Theory (North, 1999)	63 Countries	(a) EF has greater explanatory power for economies in the earlier stages of development than for innovation-driven economies. (b) EF is more apt to explain the occurrence of Necessity Driven than Opportunity driven entrepreneurs.
(Erkut, 2016)	Whether subjective and objective data can capture the same tendencies on entrepreneurship, innovation, and economic freedom		53 Countries 2010	(a) The effective enforcement of intellectual property rights legislation and quick access to utilities are the two variables with the most informational content.
(Hall et al., 2016)	To analyze the relationship between freedom and entrepreneurship		1 Country 2009	(a) None of the parameters in the study have significant average direct, average indirect, or average total effects along with the spatial autoregressive term.

(Saunoris & Sajny, 2017)	To provide a robust analysis of the relationship between formal and informal entrepreneurship and economic freedom	Institutional Theory (North, 1999)	61 Countries 2001-2010	(a) Economic freedom is positively correlated with formal entrepreneurship and negatively associated with informal entrepreneurship. (b) Economic freedom is positive and significant across all quantiles when Formal Entrepreneurship is the dependent variable. (c) Economic Freedom is only significant at higher quantiles of informal entrepreneurship.
(Angulo-Guerrero et al., 2017)	To wis economic freedom associated with entrepreneurial activity in the OECD countries during 2002–2012.	Institutional Theory (North, 1999)	33 Countries 2001-2012	(a) Economic freedom is positively and significantly associated with opportunity entrepreneurship. (b) Significant negative relationship between the composite index of economic freedom and entrepreneurship by necessity. (c) Perceived opportunities and media attention for entrepreneurship are entrepreneurial attitude indicators positively and significantly associated with opportunity entrepreneurship
(Barnatchez & Lester, 2017)	To analyze the consequences of economic freedom on economic dynamism across U.S. states and over Time.	Economic Freedom and Economic Outcomes	1 Country 1981-2013	(a) Establishment entry and exit are positively correlated with Economic Freedom. (b) The freedom index is associated with an increase in the net entry rate of new establishments and an increase in the net job creation rate.
(Dempster & Isaacs, 2017)	how, and to what extent, the impact of corruption on entrepreneurship may depend on other factors, such as the quality of existing institutions.	Theory of productive and unproductive entrepreneurs (Baumol, 1990)	47 Countries 2001-2011	(a) Size of Government and Trade Freedom have a direct relationship with productive entrepreneurship. (d) Corruption is positive and statistically significant. (c) Legal structure interacted with Corruption has the most explanatory power. (d) Political development as a positive influence on productive entrepreneurship.
(Ghosh, 2017)	To identify whether institutional qualities act as roadblocks towards channeling the unemployed population, within developing countries, towards entrepreneurship.		79 Countries 2001-2016	(a) Legal system and freedom to trade have statistically significant effects on entrepreneurial intention. (b) Lower credit market regulations are associated with higher entrepreneurial intentions. (c) Flexible labor regulation is associated with lower latent entrepreneurship. (d) Freedom to trade internationally negatively affects entrepreneurial intention.
(Deskins & Ross, 2018)	To investigate the relationship between economic freedom and black versus white entrepreneurship rates	State-level public policies and Entrepreneurs hip	1 Country 1996-2012	(a) More economically free labor market reduces black entrepreneurship but does not affect white entrepreneurship.
(Popov et al., 2018)	The modeling of the influence of the formal institutional environment in developed countries.	Institutional Theory (North, 1999)	28 Countries	(a) Regulatory institutions play a less critical role in social entrepreneurship development.
(Raza et al., 2019)	To clarify the relationship between entrepreneurial readiness and entrepreneurial behaviors across countries and	Social cognitive theory and institutional theory	51 Countries 2001-2008	(a) The individuals with a high level of entrepreneurial readiness and high political democracy significantly affects the likelihood of entrepreneurial entry. (b) The entrepreneurial entry thrives with high entrepreneurial readiness and Political Democracy countries.

	determine whether formal institutions moderate this relationship.			(c) Government Regulations are positively associated with individuals' entrepreneurial readiness and entrepreneurial behavior. (d) Entrepreneurial entry thrives with high entrepreneurial readiness and high levels of Financial Capital Availability.
(Boudreaux et al., 2019)	(a) Is it possible that a reinforcing effect exists such that individuals with similar socio-cognitive traits are more likely to pursue entrepreneurship depending on the institutional context?	Social cognitive theory and institutional theory	45 Countries 2002-2012	(a) Pro-market institutions positively affect opportunity entrepreneurship. (b) Strong enforcement of property rights, impartial courts, protection of property rights, judicial independence, low business, credit, and labor market regulations are most likely driving the main findings.
(Boudreaux & Nikolaev, 2019)	How economic institutions affect the relationship between capital and opportunity-motivated entrepreneurship.	Institutional Theory (Williamson, 2000)	45 Countries 2002-2012	(a) Human and financial capitals are shown to be important determinants of entrepreneurship in countries with lower-quality institutional environments. (b) The effect decreases as the quality of the institutional environment increases.
(Rodriguez Brás & Soukiazis, 2018)	To analyze the impact of various factors on the total entrepreneurial activity rate (TEA).	Institutional Theory (North, 1999)	26 Countries 2004-2011	(a) A quadratic relationship was found between the Total Entrepreneurial Activity (TEA) and the GDP per capita (PPP terms). (b) Monetary Freedom has a positive impact on entrepreneurship. (c) Investment Freedom has a positive impact on entrepreneurship. (d) Chow test suggested that the entrepreneurial rate was the same after and before the financial crisis.
(Goel & Saunoris, 2020)	Does more significant income disparity in a nation's population impact entrepreneurial activity?	Determinants of Entrepreneurship	96 Countries 2006-2015	(a) Greater economic freedom and greater democracy promote entrepreneurship. (b) The impact of economic prosperity is positive and significant. (c) Greater income inequality has a motivating effect in promoting entrepreneurship. (d) The inequality effect switches from a sanding effect at a low prevalence of entrepreneurship (q25) to a greasing effect at a high prevalence (q75 and q90).
(Özkul, 2020)	To analyze the effect of economic freedom on entrepreneurship in Islamic countries consisting of mostly underdeveloped and developing countries		56 Countries 1995-2019	(a) GDP per capita, import, and inflation negatively affect entrepreneurship. (b) Money supply variable positively affects entrepreneurship. (c) The level of entrepreneurial activities increases as the economic freedom increases
(Brieger et al., 2021)	To explore the relationship between entrepreneurs' age and their social value creation goals by examining cross-sectional age differences in entrepreneurs' choice to create social value	Lifespan Theory	50 Countries 2009	(a) U-shaped relationship between entrepreneurs' age and their willingness to contribute to the welfare of their communities and societies. (b) Economic and Social goals display different age patterns across entrepreneurs' lifespans. (c) Institutional environment moderates the relationship between age and entrepreneurial value creation goals.

	through their ventures			
(Bennett, 2021a)	(a) Does local economic freedom facilitate the creation and destruction of businesses. (b) Does local economic freedom facilitate the creation and destruction of jobs,	Institutional Theory (North, 1999)	1 Country 1977-2012	(a) Economic freedom is positively associated with the firm and job creation rates but does not affect the firm and job destruction rates.
(Ajide, 2021)	To examine the impact of economic freedom on entrepreneurship in Africa.	Institutional Theory (North, 1999)	18 Countries 2007-2018	(a) Secured property rights, relaxed tax burden, monetary freedom, trade freedom, freedom from corruption, investment freedom, financial freedom, business freedom, and labor freedom positively impact African entrepreneurship.
(Bennett, 2021b)	How do each economic freedom component influence firm entry and firm exit?	Economic Freedom and Economic Outcomes	1 Country 1972-2012	(a) Less retirement and insurance payments, lower property taxation, lower minimum wage may be external enablers of firm entry. (b) Income taxation and government employees may be associated with lower firm entry rates. (c) Transfer payments, unionized labor is associated with lower exit rates.
(Darnihamedani & Terjesen, 2020)	How do labor market institutions shape female and male entrepreneurs' employment growth ambitions?	Determinants of Entrepreneurship	68 Countries 2006-2013	(a) Institutions may have diverging effects on subgroups of entrepreneurs (ambitious versus less ambitious entrepreneurs, men versus women entrepreneurs). (b) With high levels of business freedom, there is little to no significant gender gap in entrepreneurs' employment growth ambitions. (c) Labor freedom positively influences entrepreneurs' employment growth ambitions, particularly males. (d) Monetary freedom positively contributes to employment growth ambitions, particularly for male
(Bárceña-Martín et al., 2021)	How business, labor, and credit regulations contribute differently to both the overall prevalence of opportunity-driven entrepreneurship (ODE) and its gender gap in high-income and emerging economies		41 Countries 2005-2016	(a) Higher credit market liberalization is significantly associated with more entrepreneurship by opportunity. (b) Business and labor market freedom seem to exert an equalizing effect on the divide in entrepreneurship by opportunity.
(Sweidan, 2021)	Explores the ability of the state-level economic institutions to justify the movements of entrepreneurship rate after the Great Recession.		1 Country 2008-2017	(a) Economic freedom, economic development, and firms' death rate statistically affect entrepreneurship activities. (b) Unemployment rate and tax regulations have a statistically significant negative effect. (c) The economic freedom's components are significant and positive, except the result of tax regulations.

Our review suggests that different elements of economic freedom affect each type of entrepreneurial endeavour. First, prior research provides evidence about the positive relationship between self-employment,

business credit, and labour regulations (Nyström, 2008). Besides some macroeconomic factors as the gross domestic product per capita and inflation reduce the emergence of self-employed individuals (Özkul, 2020). Some authors concluded that self-employed respond rationally to macro-economic signals before selecting their occupation (Goetz & Rupasingha, 2014)

Second, the literature suggests that opportunity-driven entrepreneurs are related positively to the overall economic freedom, property rights, labour freedom, and credit market liberalization. Nonetheless, the opportunity cost, measured as the national gross domestic product per capita, reduces the emergence of opportunity entrepreneurs (Angulo-Guerrero et al., 2017; Boudreaux & Nikolaev, 2019; Kier & McMullen, 2020).

Third, researchers have found that necessity-driven is negatively associated to the overall economic freedom (Angulo-Guerrero et al., 2017; Saunoris & Sajny, 2017). Some authors have suggested that economic freedom, as a formal institution, is more apt to explain the occurrence of necessity-driven than opportunity-driven entrepreneurs (Kuckertz et al., 2016).

Lastly, the establishment of formal business is enabled by lower property taxation and pro-market institutions that enable product market freedom. (Ajide, 2021; Barnatchez & Lester, 2017; Bennett, 2021a; Goel & Saunoris, 2020; Kosi & Bojnec, 2013; Sweidan, 2021). Researchers proposed that democracy fosters the new business creation (Goel & Saunoris, 2020). Besides, macro-economic elements as income inequality and the national development stage had a different effect on the formation of new business (Díaz-Casero et al., 2013; Goel & Saunoris, 2020). Although previous scholars have explored this phenomenon, further robust examination in a longitudinal setting is needed to understand the relevance the economic freedom on entrepreneurial endeavours (Ajide, 2021; Díaz-Casero et al., 2013; Dutta & Sobel, 2016).

METHODOLOGY

2.1. Data

To explore the relationship between economic freedom and the establishment of formal business, we have generated panel data based on the intersection of available information from (1) the Fraser Institute Freedom Index (Díaz-Casero et al., 2012; Gwartney et al., 2021; Nyström, 2008), (2) The World Bank entrepreneurship survey (Ajide, 2021; Goel & Saunoris, 2020), and (3) The World Bank indicators (Angulo-Guerrero et al., 2017; Darnihamedani & Terjesen, 2020; Fuentelsaz et al., 2015b; Kosi & Bojnec, 2013; McMullen et al., 2008; Nyström, 2008; Özkul, 2020). The final sample included information of 107 countries over six years, 2013 to 2018.

Our dependent variable is the country's new business density to measure formal entrepreneurial activity. It is obtained from the World Bank entrepreneurship survey. It is defined as the number of newly registered private formal companies with limited liability per 1,000 working-age people (those ages 15–64).

Our independent variable is the yearly economic freedom index from the Fraser Institute. It measures the degree to which the policies and institutions support economic freedom, encourages voluntary transactions, and a market allocation of resources (Angulo-Guerrero et al., 2017; Ghosh, 2017; Nyström, 2008). The index considers five principal components (Gwartney et al., 2021): (a) size of government, (b) legal structure and security of property rights, (c) access to sound money, (d) freedom to trade internationally, (e) regulation of credit, labour, and business. The rating for each component is placed on a scale of 0 (the lower) to 10 (the higher). As prior research suggests (Nyström, 2008), the simple average of these scores builds the overall economic freedom.

We control our baseline model with economic variables: (i) the Gross Domestic Product per capita (purchasing power parity) (Angulo-Guerrero et al., 2017; Boudreaux & Nikolaev, 2019; Brieger et al., 2021; Darnihamedani & Terjesen, 2020; Özkul, 2020), (ii) the foreign direct investment as a percentage of the GDP (Ajide, 2021; Angulo-Guerrero et al., 2017; Dempster & Isaacs, 2017), (iii) the percentage of unemployment (Angulo-Guerrero et al., 2017; Bennett, 2021b; Fuentelsaz et al., 2015b; Hall et al., 2016; Kosi & Bojnec, 2013; Nyström, 2008), and (iv) the share of the workforce employed in the agriculture sector (Angulo-Guerrero et al., 2017; Bennett, 2021a; Ghosh, 2017). Besides, we control the baseline model with societal variables: (i) total population (Bennett, 2021b; Boudreaux et al., 2019; Boudreaux & Nikolaev, 2019), and (ii) working-age population (between the ages 15 to 64) as a percentage of the total population (Angulo-Guerrero et al., 2017).

2.2. Methodology

Our research employs two panel methodologies to guarantee robustness. These methods are fixed effect (FE)/ random effect (RE) and panel-corrected standard errors (PCSE) method with country dummy variables (Ajide, 2021; Sweidan, 2021). We introduce the general panel formula used along this research:

$$Y_{it} = \beta X_{it} + U_i + E_{it} \quad i = 1, \dots, N \quad t = 1, \dots, T \quad (1)$$

Where Y_{it} is the dependent variable, the subscript i indicates the country and t the year; X_{it} represents the vector of explanatory variables; U_i stands for the country-specific disturbance term, and E_{it} denotes the unique disturbance term for each country at each point in time. The term U_i is assumed to be random and independent of E_{it} . Moreover, the vector of X_{it} is independent of the disturbance terms U_i and E_{it} . We begin our empirical examination by estimating the following panel model

$$NBD_{it} = \beta_0 + \beta_1 EFL_{it} + \beta_2 Lppc_{it} + \beta_3 Fdi_{it} + \beta_4 Unem_{it} + \beta_5 lpop_{it} + \beta_6 Pop15_{it} + \beta_7 Empagr_{it} + U_i + E_{it} \quad (2)$$

EFL_{it} represents the economic freedom index and each of the five components, as instruments. NBD_{it} represents the new business density. We lagged one period the overall index and the five components to reduce the potential reverse causality between EFL_{it} and NBD_{it} (Ajide, 2021; Saunoris & Sajny, 2017), $Lppc_{it}$ represents the GDP per capita in logarithmic form, Fdi_{it} denotes the foreign direct investment as percentage of GDP, $Unem_{it}$ indicates the percentage of unemployment, $lpop_{it}$ denotes the total population in logarithmic form, $Pop15_{it}$ represents the adult population percentage, and $Empagr_{it}$ denotes the share of workforce employed in the agricultural sector.

First, we test our data for stationarity to avoid producing spurious regressions. We employ the Harris-Tzavalis (HT) panel unit root test (Sweidan, 2021). The null hypothesis of the HT test says that the panel contains the unit root, and the alternative hypothesis is that the panel is stationary. We report the results produced by the unit root test in table 2. All variables with unit root were transformed at the first difference.

Second, we estimated the panel model of equation (2) by either FE or RE. We use the Hausman test to select what model fits the data better. The null hypothesis shows that the preferred model is the RE model, examining whether the error term E_{it} are correlated with the independent variables. We compute the value of the χ^2 by Hausman test and report the results in table 5.

Finally, we estimate several diagnostic tests in our FE model (Özkul, 2020; Sweidan, 2021): (i) Pesaran's cross-sectional dependence test, (ii) modified Wald test for GroupWise heteroscedasticity, and (iii) Wooldridge test for autocorrelation. The three tests suggest that the model has: heteroscedasticity, autocorrelation, and cross-sectional dependence. We re-estimate by using the panel-corrected standard errors methods with country dummy variables. The results are detailed in table 7.

RESULTS

Table 2 presents the results of the Harris-Tzavalis (HT) panel unit root test. We found that EFL_{it} and Fdi_{it} are stationary at the level, while NBD_{it} , $Lppc_{it}$, $Unem_{it}$, $lpop_{it}$, and $Pop15_{it}$ are stationary at the first difference. Those five variables will be incorporated into the models using the first difference.

Table 2. Panel Unit Root Test

Variables	HT	P-Value
Panel A: The Level		
EFL_{it}	0,261	0,000
Fdi_{it}	0,396	0,000
Panel B: The First Difference		
NBD_{it}	0,689	0,002
$Lppc_{it}$	0,908	0,000

$Unem_{it}$	0,916	0,000
$lpop_{it}$	0,964	0,000
$Pop15_{it}$	10,645	0,000
$Empagr_{it}$	0,722	0,000

Table 3 presents the descriptive statistics of each variable. The average score of (first difference) new business density and (lagged) economic freedom is 0.119 (SD. .74) and 7.087 (SD. .826), respectively. Moreover, the average (first difference and log) GDP per capita, foreign direct investment, (first difference) unemployment rate, (first difference and log) total population, (first difference) working-age population, and (first difference) workforce employed in the agricultural sector are .019 (SD. .029), 4.438 (SD. 13.429), -.295 (SD. .817), .005 (SD. .005), -.069 (SD. .326), and -.476 (SD. .952).

Table 3. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
NBD_{it}	535	.119	.74	-5.481	3.683
EFL_{it}	535	7.087	.826	4.72	8.82
$Lppc_{it}$	535	.019	.029	-.252	.215
Fdi_{it}	642	4.438	13.429	-40.291	223.428
$Unem_{it}$	525	-.295	.817	-3.08	3.17
$lpop_{it}$	535	.005	.005	-.006	.029
$Pop15_{it}$	530	-.069	.326	-.949	.971
$Empagr_{it}$	525	-.476	.952	-8.31	2.63

Table 4 presents the pairwise correlation with a Bonferroni adjustment by year. Most correlations are insignificant at the conventional level. The correlation is higher for the societal and economic control variables but never above the 0.5 thresholds (Darnihamedani & Terjesen, 2020). Hence, multicollinearity is not presumed.

Table 4. Pairwise Correlation

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) NBD_{it}	1.000							
(2) EFL_{it}	0.061	1.000						
(3) $Lppc_{it}$	0.088	0.134*	1.000					
(4) Fdi_{it}	0.033	0.098	0.077	1.000				
(5) $Unem_{it}$	-0.102	-0.253*	-0.275*	-0.092	1.000			
(6) $lpop_{it}$	-0.031	-0.375*	-0.264*	-0.049	0.401*	1.000		
(7) $Pop15_{it}$	-0.110	-0.319*	-0.136*	-0.049	0.328*	0.474*	1.000	
(8) $Empagr_{it}$	0.030	0.154*	-0.223*	0.028	-0.094	-0.011	-0.022	1.000

Note *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 5 provides the results of the Hausman test. We have tested the baseline model considering the economic freedom index, EFL_{it} , and each of the five components as instruments (Sweidan, 2021): size of government, $EFL1_{it}$, legal structure and security of property rights, $EFL2_{it}$, access to sound money, $EFL3_{it}$, freedom to trade internationally, $EFL4_{it}$, regulation of credit, labour and business, $EFL5_{it}$. The χ^2 for the six equations is statistically significant. Hence, the null hypothesis is rejected, and the fixed-effect model can be used to estimate the model parameters.

Table 5. The results of the Hausman test

Functions	Chi-Square	P-Value
$NBD_{it} = F(Lppc_{it}, Fdi_{it}, Unem_{it}, lpop_{it}, Pop15_{it}, Empagr_{it}, EFL_{it})$	21,85	0,00
$NBD_{it} = F(Lppc_{it}, Fdi_{it}, Unem_{it}, lpop_{it}, Pop15_{it}, Empagr_{it}, EFL1_{it})$	21,85	0,00
$NBD_{it} = F(Lppc_{it}, Fdi_{it}, Unem_{it}, lpop_{it}, Pop15_{it}, Empagr_{it}, EFL2_{it})$	14,11	0,03
$NBD_{it} = F(Lppc_{it}, Fdi_{it}, Unem_{it}, lpop_{it}, Pop15_{it}, Empagr_{it}, EFL3_{it})$	17,18	0,01
$NBD_{it} = F(Lppc_{it}, Fdi_{it}, Unem_{it}, lpop_{it}, Pop15_{it}, Empagr_{it}, EFL4_{it})$	15,83	0,01
$NBD_{it} = F(Lppc_{it}, Fdi_{it}, Unem_{it}, lpop_{it}, Pop15_{it}, Empagr_{it}, EFL5_{it})$	12,75	0,05

Table 6 report the results produced by the FE with robust standard errors. To assess the robustness of the models, we employed the following tests: (i) Pesaran's cross-sectional dependence -CD- test, (ii) modified Wald test for GroupWise heteroscedasticity, and (iii) Wooldridge test for autocorrelation. Firstly, Pesaran's test rejects the probability of no cross-sectional dependence at the 5% level of significance (CD=-0,568, Probability= 1,43%). Secondly, the Wald test strongly rejects the probability of GroupWise homoscedasticity at the 1% level of significance ($\chi^2 = 5.4E5$, Probability= 0,00%). Finally, the Wooldridge test rejects the probability of no autocorrelation in panel data at the 10% significance level ($F = 3,61$, Probability= 6,02%). Therefore, we re-estimate our model employing a panel-corrected standard errors method to solve the cross-sectional dependence, the GroupWise heteroskedasticity, and the autocorrelation in panel data (Sweidan, 2021).

Table 6. The estimated parameters of the FE model

	(1) FE	(2) FE	(3) FE	(4) FE	(5) FE	(6) FE
EFl_{it}	-0.643** (0.226)					
$EF1_{it}$		-0.229** (0.11)				
$EF2_{it}$			-0.042 (0.123)			
$EF3_{it}$				-0.186** (0.082)		
$EF4_{it}$					-0.162* (0.09)	
$EF5_{it}$						0.073 (0.135)
$Lppc_{it}$	0.287 (1.43)	0.102 (1.448)	0.526 (1.40)	0.283 (1.43)	0.685 (1.40)	0.513 (1.39)
Fdi_{it}	0.005* (0.002)	-0.004** (0.002)	-0.003* (0.002)	-0.005** (0.002)	-0.004* (0.002)	-0.003* (0.002)
$Unem_{it}$	-0.0086** (0.038)	-0.082** (0.038)	-0.079** (0.037)	-0.072* (0.038)	-0.086** (0.037)	-0.077** (0.037)
$lpop_{it}$	-35.406 (28.774)	-40.26 (31.27)	-41.166 (31.768)	-36.993 (28.845)	-38.595 (31.025)	-41.451 (31.708)
$Pop15_{it}$	-0.69* (0.361)	-0.7* (0.368)	-0.597 (0.367)	-0.676* (0.361)	-0.609 (0.367)	-0.617* (0.367)
$Empagr_{it}$	0.006 (0.028)	0.006 (0.027)	0.003 (0.027)	0.005 (0.029)	0.006 (0.028)	0.004 (0.028)
Constant term	4.821*** (1.692)	1.824** (0.777)	0.553 (0.722)	1.88** (0.792)	1.46* (0.742)	-0.218 (1.006)
Development Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	525	525	525	525	525	525
R-squared	0.062	0.054	0.044	0.057	0.049	0.044
Bayesian Crit	917.13	921.486	927.211	919.752	924.139	926.886
Akaike's Crit	883.023	887.378	893.103	885.645	890.031	892.779

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 7 provides the results of the panel-corrected standard errors method. Our estimation suggests a negative and significative relationship between (first difference) new business density NBD_{it} and (lagged) economic freedom EFl_{it} except for the parameters $EF2_{it}$ with a negative but not statistically significative, and $EF5_{it}$, with a positive but not statistically significative relationship. Our results suggest that formal institutions generate a lagged impact in the formal entrepreneurial activity variations. The negative effect of economic freedom on formal entrepreneurship could be generated through changes in the economic incentive's structure, as it is suggested in prior empirical research (Angulo-Guerrero et al., 2017; Díaz-Casero et al., 2013).

The (first difference) unemployment rate, $Unem_{it}$, has a negative and statistically significant impact on (first difference) new business density, NBD_{it} . A high level of $Unem_{it}$ reduce the economic incentives to generate a newly registered private formal company. Based on those macroeconomic signals, entrepreneurial individuals could engage in different entrepreneurial forms instead of formal ventures (Sweidan, 2021). Lastly, the (first difference and log) total population, $lpop_{it}$, and the (first difference) working age population, $Pop15_{it}$, has a negative and statistically significant impact on (first difference) new business density NBD_{it} .

Table 7. The estimated parameters of the panel-corrected standard errors method

	(1) PCSE	(2) PCSE	(3) PCSE	(4) PCSE	(5) PCSE	(6) PCSE
$EF1_{it}$	-0.643*** (0.212)					
$EF2_{it}$		-0.229* (0.132)				
$EF3_{it}$			-0.042 (0.083)			
$EF4_{it}$				-0.186*** (0.0709)		
$EF5_{it}$					-0.162** (0.0667)	
$Lppc_{it}$	0.287 (1.491)	0.102 (1.579)	0.526 (1.441)	0.283 (1.411)	0.685 (1.537)	0.513 (1.447)
Fdi_{it}	-0.005 (0.003)	-0.004 (0.003)	-0.003 (0.003)	-0.005 (0.003)	-0.004 (0.003)	-0.003 (0.006)
$Unem_{it}$	-0.086*** (0.031)	-0.082*** (0.028)	-0.079*** (0.030)	-0.072** (0.035)	-0.0860*** (0.030)	-0.077** (0.031)
$lpop_{it}$	-35.41** (17.57)	-40.26** (16.60)	-41.17** (17.55)	-36.99** (16.32)	-38.59** (17.89)	-41.45** (17.40)
$Pop15_{it}$	-0.690** (0.289)	-0.700** (0.299)	-0.597** (0.248)	-0.676** (0.279)	-0.609** (0.256)	-0.617** (0.264)
$Empagr_{it}$	0.006 (0.016)	0.006 (0.016)	0.003 (0.016)	0.005 (0.018)	0.006 (0.017)	0.004 (0.0167)
Constant term	3.660*** (1.145)	1.647* (0.853)	0.480 (0.415)	1.366*** (0.503)	0.962** (0.436)	-0.133 (0.551)
Country Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Development Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	525	525	525	525	525	525
R-squared	0.301	0.296	0.288	0.298	0.292	0.288

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

DISCUSSION

Given the lack of consensus on the effect of formal institutions on entrepreneurial endeavours, this chapter has provided new evidence about the nature of this phenomenon. To do so, we have explored the relationship between economic freedom, a formal market-oriented institution, and formal entrepreneurial activity using a balanced longitudinal panel with 107 countries from 2013 to 2018. Our results suggest a negative and significant relationship between (first difference) formal entrepreneurial activity and (lagged) overall economic freedom. Our results were robust to the use of (lagged) size of government, (lagged) access to sound money, and (lagged) freedom to trade internationally as instruments of the overall index. Besides, we found that (first difference) unemployment rate, (first difference and log) total population and (first difference) working-age population had a negative and statistically significant relationship with (first difference) formal entrepreneurial activity.

We contribute to the discussion about economic freedom twofold. First, the negative relationship found between the (lagged) overall economic freedom index and the (first difference) formal organizations' establishment could suggest that an increase in competition between entrepreneurs given supportive pro-market institutions will reduce the alternatives to exploit business opportunities through new ventures formation (Kirzner, 1997). Therefore, individuals who not generate a new venture will look for alternative entrepreneurial types, e.g. self-employment, to obtain benefits from the market as some researchers denote (Kuckertz et al., 2016; Nyström, 2008).

Second, the negative relationship between the societal and economic indicators with formal entrepreneurship could suggest that individuals respond rationally to changes in their environment as prior research suggests (Goetz & Rupasingha, 2014). Pro-market institutions that raise credit access regulation or promote social expenditure could cause individuals to change their entrepreneurial behaviour due to liquidity constraints or change the opportunity cost (Buera, 2009; Solomon et al., 2021). We theorize that entrepreneurial individuals would size their occupational costs and benefits combined with the market uncertainty and characteristics before formalizing an entrepreneurial endeavour.

Our robustness estimations suggested that policymakers must consider the impact of improving the size and efficiency of the government if their interest is to motivate new formal organizations. Our results hint that

governments with a low level of spending, marginal tax rates, and state ownership of assets could motivate the use of the market, not organizational forms, as a channel for opportunities exploitation. Besides, those countries that reduce tariffs and generate few controls on the movement of physical and human capital could disturb the market's competitive nature. It could cause that external individuals and organizations to have greater flexibility in responding to local economic opportunities, hindering the establishment of new organizations. Therefore, we suggest governments generate effective economic signals to foster formal entrepreneurial activities.

CONCLUSIONS

Our chapter aimed to explore the relationship between formal entrepreneurial activity and overall economic freedom. To do so, we employed a panel-corrected standard errors method with a balanced panel data of 107 countries from 2013 to 2018. Our results suggested a negative and significant relationship between (first difference) formal entrepreneurial activity and (lagged) overall economic freedom.

This chapter is not without limitations. Although we have made a robust analysis based on formal economic institutions, the entrepreneurial phenomenon is also affected by informal institutions (e.g., societal ideals, beliefs, and attitudes). Therefore, our results could not be considered as conclusive. Further research could extend our analysis modelling the different contexts considering the formal and informal environment. Lastly, our empirical examination considered six years due to data availability between the different sources. Further research could explore a more extended period analysing the shaping economic forces that hinder or foster the formal entrepreneurial activity in each country.

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