

Property rights and entrepreneurship

Leonel A Regalado Cardoso 

Free Market Institute, Texas Tech
University, Texas, USA

Correspondence

Email: lregalad@ttu.edu

Abstract

This article examines the relationship between the quality of property rights institutions and entrepreneurial activity, using panel data from 90 countries between 2004 and 2018. The results provide evidence of a U-shaped association: at low levels of property rights enforcement, entrepreneurship rates are elevated because of necessity-driven activity; as institutions improve moderately, total entrepreneurship initially declines but, at higher levels of property rights protection, opportunity-driven entrepreneurship rises, increasing overall entrepreneurial activity.

KEYWORDS

Economic Freedom of the World Index, entrepreneurship, Global Entrepreneurship Monitor, property rights, rule of law

JEL CLASSIFICATION

L26, P14

1 | INTRODUCTION

Entrepreneurship plays a fundamental role in driving innovation, economic growth, and job creation. Understanding what fosters or harms entrepreneurial activity remains a central question in development economics. Among the many factors that influence entrepreneurship, institutions (especially property rights) have emerged as particularly important. The security and predictability of property rights shape the incentives entrepreneurs face when deciding whether to invest time, effort, and capital in new ventures.

A growing body of empirical research supports the idea that stronger property rights are associated with higher levels of ‘opportunity-driven’ entrepreneurship, while weaker property rights tend to increase ‘necessity’ entrepreneurship. Angulo-Guerrero et al. (2017) studied OECD countries using panel data and the Generalized Method of Moments. The property rights part of the index was statistically significant when used as a regressor in both



opportunity and necessity entrepreneurship. Fuentelsaz et al. (2015) performed a similar analysis using panel data between 2005 and 2012 and a random effects regression, showing that property rights negatively impacted necessity entrepreneurship and opportunity entrepreneurship positively.

McMullen et al. (2008) also studied the effects of economic freedom on opportunity and necessity entrepreneurship, putting all economic freedom components in the same regression. The only one that showed a significant impact was property rights, and it was so only for opportunity-based entrepreneurship. Aidis et al. (2007, p. 29) use a logistic regression to find variables that determine the probability of a person becoming an entrepreneur, finding that property rights “dominate all other institutional variables”.

Most of this literature has assumed a linear relationship between institutional quality and entrepreneurship, which has made the necessity and opportunity subdivisions the main focus. In this article I challenge that assumption by proposing and empirically testing a U-shaped relationship between property rights and total entrepreneurial activity. The logic is simple but powerful. At very low levels of property rights, individuals often turn to entrepreneurship out of necessity, compensating for the lack of formal employment options. As institutions improve slightly, formal job opportunities increase and necessity entrepreneurship declines, reducing total rates. But beyond a certain threshold, stronger property rights increase confidence in long-term returns and reduce investment risk, favouring opportunity-driven entrepreneurship. This rebound creates the upward slope of the U-shape.

By focusing on total early-stage entrepreneurial activity, this study captures the joint effect of both necessity and opportunity motivations, offering a more integrated understanding of how institutions shape entrepreneurship across development levels.¹ The article adds to the literature by uncovering a non-linear dynamic that had previously been assumed linear. The following sections present the theoretical framework guiding this analysis, describe the methodology and variables used, and provide the data analysis and regression results, followed by a discussion of the main conclusions and robustness checks.

2 | THEORETICAL FRAMEWORK

The importance of formal and informal institutions (North, 1990) has taken a leading role within many economic science subdivisions. The ‘rules of the game’ are essential in entrepreneurial studies. When performing the ‘entrepreneurial function’, understood variously as judgment (Klein, 2010; Knight, 1921; von Mises, 1951, p. 10), alertness (Kirzner, 1973), innovation (Schumpeter, 1934), or classified as productive, unproductive, or destructive entrepreneurship (Baumol, 1990), a consistent argument emerges: entrepreneurs must make decisions based on available information. They perform an economic calculation based on present facts and expectations about the future (von Mises, 1949). Entrepreneurship is one of the main reasons a country’s well-being improves: entrepreneurs address needs in the market stimulating economic growth under the right institutional conditions (Georgiou, 2009; Kirzner, 1973; Klein, 2010).

This future state of affairs is uncertain, and the level of uncertainty is affected by multiple factors (Knight, 1921, p. 265), one of which is the entrepreneur’s “power to control the course of events”. Institutions act to lower uncertainty; they provide a ground to stand on when making decisions (North, 1990). Therefore, entrepreneurs face less uncertainty when formal institutions are understood, stable, and easily preserved: fewer changing variables are out of their control.



Strong institutions allow more accurate economic calculation and reduce the perceived risk of investment.

The effect of property rights and surrounding institutions on entrepreneurial rates is complex, and two main cases could be considered. Using the Kirzner (1973, p. 33) approach to entrepreneurship, an entrepreneur discovers “unexploited profit opportunities”, requiring a certain degree of alertness. Institutions’ structure and degree of enforcement can severely change or distort the market, so entrepreneurs in various settings will find different profit opportunities; institutions heavily influence choices and outcomes (North, 1990). With no clear property rights, entrepreneurs (and overall firm owners) would have fewer incentives to pursue profit opportunities in response to the price structure (Alchian, 2006, p. 474). There is an unknown but possible cost of losing their property in the future, which discourages entrepreneurs from risking their capital and their work. In this way, worse property rights enforcement would decrease the rates of entrepreneurship.

On the other hand, high uncertainty surrounding institutions also causes people to be ‘forced’ into finding profit opportunities since job opportunities might be lacking, and entrepreneurship is the last resort to try to make a living. Even though the future profits of their activity are not secured, these individuals have no other option. This course of action is a type of entrepreneurship that arises out of necessity. As Reynolds et al. (2002, p. 16) state: “they [entrepreneurs] feel compelled to start their own business because all other options for work are either absent or unsatisfactory”; these entrepreneurs start using their ‘alertness’ as a last resort. In this case, worse property rights enforcement has the opposite effect on rates of entrepreneurship.

This dual effect, necessity-driven entrepreneurship under weak institutions and opportunity-driven entrepreneurship under strong ones, gives rise to a U-shaped relationship between property rights and total entrepreneurial activity. At very low levels of property rights, high necessity entrepreneurship inflates total rates. As institutions marginally improve, formal job opportunities absorb some of this necessity-driven activity, causing a decline in overall entrepreneurship. But beyond a certain institutional threshold, improved enforcement of property rights increases confidence in future returns, lowers transaction costs, and incentivises individuals to pursue entrepreneurial ventures based on opportunity. As opportunity-driven activity grows, total entrepreneurship increases again – explaining the upward slope of the curve. The interplay of these two mechanisms – decreasing necessity entrepreneurship followed by increasing opportunity entrepreneurship – is what drives the U-shaped relationship between entrepreneurial rates and the quality of property rights.

Although the previous paragraphs refer to opportunity and necessity entrepreneurship, these are best understood as differing motivators for the same action: the alert discovery of profit opportunities. After the methodological change in the Global Entrepreneurship Monitor in 2019, disaggregated data on these two subtypes have changed. This study seeks to recover insight into their joint dynamics through the analysis of total entrepreneurial activity and its non-linear relationship with institutional quality, particularly property rights.

3 | METHODOLOGY

The model I employ consists of regressing total entrepreneurial rates on property rights and its quadratic transformation, adding control variables:

$$\text{Entrepreneurial activity}_{it} = \beta_1 + \beta_2 \cdot \text{property rights}_{it} + \beta_3 \cdot \text{property rights}_{it}^2 + X_{it} \cdot \beta + u_i + e_{it}$$

where the matrix X_{it} refers to the control variables and their coefficients, and u_i are random effects.

3.1 | Sample

The study spans from 2004 to 2018. The sample consists of 822 observations, divided into 90 countries, using data from the Fraser Institute's Economic Freedom of the World Index and the Global Entrepreneurship Monitor (GEM). Each country has a minimum number of observations of three: countries that had only one or two observations were removed from the dataset. Notable studies have used GEM data, and have even related them to economic freedom of the world subindexes (Aidis et al., 2007; Amorós et al., 2016; Angulo-Guerrero et al., 2017; Brieger et al., 2021; Dvouletý & Orel, 2020; Estrin et al., 2009; Fuentelsaz et al., 2015; Loukil, 2020; McMullen et al., 2008; Qin, 2021).

3.2 | Dependent variables

Entrepreneurial variables are taken from the GEM dataset (Global Entrepreneurship Monitor, n.d.). Entrepreneurship is defined from an occupational-structural perspective (Klein, 2010). In this case, entrepreneurship is an occupational decision (self-employment) operating in one stage of the firm's life cycle. GEM considers entrepreneurs as such from the moment they decide to set up a business until they are running an established company (3.5 years or older) or go out of business.²

The primary dependent variable for this study is Total Early-Stage Entrepreneurial Activity, which measures the "Percentage of 18–64 population who are either a nascent entrepreneur or owner-manager of a new business".³ However, two other study variables are incorporated in different regressions: opportunity and necessity entrepreneurship. Total Opportunity-Driven Early-Stage Entrepreneurial Activity is the percentage of the 18–64-year-old entrepreneurs that engage in entrepreneurial activity because of opportunities in the market, and Total Necessity-Driven Early-Stage Entrepreneurial Activity is the percentage of the 18–64-year-old entrepreneurs that engage in entrepreneurial activity because of necessity, such as the lack of job opportunities.

The importance of the secondary regressions arises from two sources: first, to check whether the effect of property rights on these entrepreneurial rates follows the framework established in a former section; and second, to showcase that the results provided by previous literature hold in the database used to estimate the primary regression. These would look like this:

$$\text{Opportunity}_{it} = \beta_1 + \beta_2 \cdot \text{property rights}_{it} + X_{it} \cdot \beta + u_i + e_{it}$$

$$\text{Necessity}_{it} = \beta_1 + \beta_2 \cdot \text{property rights}_{it} + X_{it} \cdot \beta + u_i + e_{it}$$

GEM obtains its data by surveying people, asking them to rank on a Likert scale how much they identify with one statement or, in some cases, how much they identify with one statement

or the other. Even though the surveys are carefully designed to try to grasp information precisely, there are some measurement errors in these, as the questions are, to some degree, open to interpretation by the surveyed individuals. For Total Entrepreneurial Activity, the questions are the following:

- Are you, alone or with others, currently trying to start a new business, including any self-employment or selling any goods or services to others?
- Are you, alone or with others, currently trying to start a new business or a new venture for your employer as part of your normal work?⁴

To obtain data about opportunity and necessity entrepreneurship, the questions are:

- Are you involved in this start-up to take advantage of a business opportunity or because you have no better choices for work?
- Which one of the following, do you feel, is the most important motive for pursuing this opportunity?⁵

3.3 | Independent variable: Legal System and Property Rights score

Choices and outcomes in society are defined not only by formal institutions but by “a mixture of informal norms, rules, and enforcement characteristics together” (North, 1990, p. 53). The study proposes using the Legal System and Property Rights sub-index within the Fraser Institute's Economic Freedom of the World Index (EFW) from Gwartney et al. (2021) as a proxy for this mixture.⁶ The sub-index is chosen, as it has commonly been used to study these relationships, and given the reputation of Fraser Institute's index.

In general, better property rights incentivise entrepreneurs to take profit opportunities so that a better score would lead to greater entrepreneurial activity. However, worse property rights push people into entrepreneurship, as it is their last resort to fulfil their basic needs. Therefore, the expected result is a U-shaped relationship between property rights and entrepreneurial rates using property rights and its squared transformation – if the effects on opportunity and necessity entrepreneurship do not cancel each other out. Concerning opportunity and necessity entrepreneurship, the proposed effect is that as property rights have a better definition and protection opportunity entrepreneurship grows, and necessity entrepreneurship decreases.

3.4 | Control variables

Control variables are chosen as they may affect entrepreneurial activity and its subdivisions. The first one is Real Per Capita GDP, adjusted to Purchasing Power Parity, which controls for the wealth level in each country, following the regressions used in Angulo-Guerrero et al. (2017). The other three control variables are based on the regressions that Fuentelsaz et al. (2015) performed, and these are Real GDP Growth, Unemployment, and Population Growth (Table 1). They are used to control changes in wealth, population, and in labour markets. Finally, year dummies show the model's trend over time; entrepreneurial rates tend to grow. Year dummies are included based on other studies mentioned by Wooldridge (2009, p. 492).

TABLE 1 Variable description.

Type	Variable	Definition	Source
Dependent variables	Total	Percentage of 18–64 population who are either a nascent entrepreneurs or owner-managers of a new business	Global Entrepreneurship Monitor (n.d.)
	Entrepreneurial Activity		
	Opportunity Entrepreneurship	Opportunity-driven entrepreneurial activity, as percentage of total entrepreneurial activity	
	Necessity Entrepreneurship	Necessity-driven entrepreneurial activity, as percentage of total entrepreneurial activity	
Independent variables	Property Rights	Legal System and Property Rights score in Economic Freedom of the World index; observations can take values from 0 to 10.	Gwartney et al. (2021)
	GDP Per Capita (PPP)	Per capita GDP (constant 2017 Dollars) at purchasing power parity	World Bank (n.d.)
	Real GDP Growth		
	Unemployment		
	Population		
	Growth		

3.5 | Type of model: Random effects

The study uses a random-effects model regression because the data is “from a series of studies that have been performed by researchers operating independently” and “it would be unlikely that all the studies were functionally equivalent” (Borenstein et al., [2013](#), p. 83). Furthermore, different surveyors in countries with different cultural factors and languages collected all the data from GEM and the Economic Freedom of the World Index, which may affect how people answer some questions, even within the same databases. The Hausman test did not reject the null hypothesis, indicating that the random-effects estimator is consistent and suitable for this specification, assuming uncorrelated individual effects.

4 | DATA ANALYSIS

Entrepreneurial activity has a median of 9.06, which, with a mean more than two points above, and a maximum value of 41.16 (more than four times higher), indicates that most observations are concentrated on the lower bound of the values (Table 2). This can be seen in Figure 1. For Opportunity Entrepreneurship, there is a maximum value of 1.88, meaning that 18 per cent of the entrepreneurial activity in a country started a business because of an opportunity. This would not make sense, but the nature of the Adult Population Survey (APS) (where GEM gets its entrepreneurship data) does not solve this discrepancy, as people answer on a ‘how much they identify with the statement’ basis. In general, the average country in the dataset’s entrepreneurial activity is composed of 65.83 per cent opportunity entrepreneurship and 38.44 per cent necessity entrepreneurship.

TABLE 2 Central tendency measures.

	Variable	Mean	Median	Std. dev.	Min	Max
Dependent variables	Total Entrepreneurial Activity	11.247	9.06	7.443	1.48	41.46
	Opportunity Entrepreneurship	0.658	0.702	0.234	0.026	1.887
	Necessity Entrepreneurship	0.384	0.302	0.255	0.032	0.961
Independent variables	Property Rights	6.343	6.231	1.495	2.813	8.998
	GDP Per Capita (PPP)	30,977.0	27,242.49	19,691.25	1,397.798	116,283.7
	Real GDP Growth	2.924	2.876	3.384	−14.248	25.176
	Unemployment	8.055	7.945	5.249	0.11	33.93
	Population Growth	0.851	0.783	1.278	−4.533	15.177

Source: Global Entrepreneurship Monitor (n.d.), Gwartney et al. (2021), World Bank (n.d.)

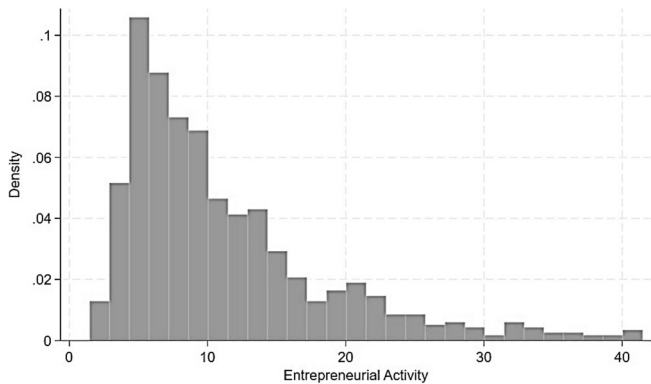


FIGURE 1 Total entrepreneurial activity histogram.

Concerning the main independent variable, property rights have a mean at a score of 6.34, with a similar median. This mean and the median are closer to the maximum value of the variable, and, upon plotting the observations in a histogram in Figure 2, there are fewer countries with extremely low scores than countries with extremely high scores.

5 | RESULTS

Table 3 presents the results for the proposed regressions. In regression (1) property rights and its quadratic transformation are significant at the 1 per cent and 5 per cent levels respectively. The property rights coefficient being negative and its transformation being positive means that better property rights lower entrepreneurial activity, but the overall effect becomes more positive as property rights improve. A convex U-shaped relationship exists between property rights and entrepreneurial activity.

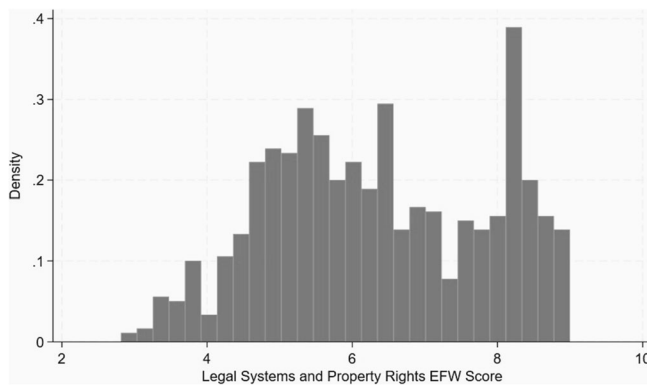


FIGURE 2 Property rights sub-index histogram.

Then, there is evidence that property rights have a statistically significant, increasing negative effect on total entrepreneurial rates. On regression (2), the quadratic transformation is removed, and although property rights remain significant with similar levels, a Wald test confirms that the coefficient of squared property rights in regression (1) is significantly different from zero ($p\text{-val} = 0.0011$). Regression (3) excludes GDP Per Capita from the set of controls to assess the robustness of the U-shaped relationship, considering that economic prosperity may act as a potential transmission channel. The results remain consistent in direction and significance, further supporting the presence of a nonlinear association between property rights and entrepreneurship.

The fourth and fifth regressions use the same variables as the main regression (minus property rights squared). Property rights have a significant effect, with the expected direction: better property rights increase opportunity entrepreneurship and decrease necessity entrepreneurship. In this way, the study replicates past results found by other researchers and builds its main discovery on this. Furthermore, the magnitudes of the effects are different: each additional point in the property rights score increases opportunity entrepreneurship more than three times the amount it decreases necessity entrepreneurship, as a percentage of total entrepreneurial activity.

One concern about these results is their economic significance: given any value of property rights, the effect on entrepreneurial activity does not amount to even one standard deviation of the Total Entrepreneurial Activity variable. In other words, property rights affect economic activity, but to a relatively small magnitude. This is taken further in Figure 3, where the predicted values of entrepreneurial activity (holding all the other variables constant at their mean) do not vary as much as the actual values of entrepreneurial activity. The difference between the maximum and minimum predicted values of entrepreneurship is 6.272 per cent of the population; this amounts to 0.843 of a standard deviation in entrepreneurial activity, but this change happens at the same time as property rights moves from 2.81 (comparable to Cameroon in 2016) to 6.686 (comparable to Chile in 2018) (Gwartney et al., 2021), which is a big variation amounting to 2.59 standard deviations in the explanatory variable. This comparison is shown in Table 4, where these differences can be seen in absolute terms and in terms of standard deviations.

TABLE 3 Regression results.

Variables	(1) Total Entrepreneurial Activity	(2) Total Entrepreneurial Activity	(3) Total Entrepreneurial Activity	(4) Opportunity Entrepreneurship	(5) Necessity Entrepreneurship
Property Rights	−5.590*** (2.024)	−0.506 (0.379)	−5.745*** (2.116)	0.0432*** (0.0109)	−0.0142*** (0.00477)
Property Rights squared	0.418** (0.163)		0.331* (0.171)		
GDP Per Capita	−0.000159*** (2.85e−05)	−0.000154*** (2.84e−05)		−1.13e−06 (7.82e−07)	−4.42e−07 (3.49e−07)
GDP Growth	0.00586 (0.0480)	0.00294 (0.0482)	−0.00834 (0.0483)	−0.000560 (0.00254)	0.00228 (0.00139)
Unemployment	−0.173*** (0.0505)	−0.177*** (0.0506)	−0.107** (0.0503)	−0.00382** (0.00181)	0.00271*** (0.000810)
Population Growth	0.677*** (0.178)	0.711*** (0.179)	0.392** (0.174)	−0.00383 (0.00780)	−0.00616 (0.00383)
Constant	33.44*** (6.092)	18.89*** (2.168)	33.81*** (6.366)	−0.00952 (0.0707)	0.825*** (0.0341)
Year dummies	Yes	Yes	Yes	Yes	Yes
Observations	804	804	804	796	796
Number of countries	87	87	87	87	87
R-Squared	0.448	0.4169	0.3453	0.332	0.817

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

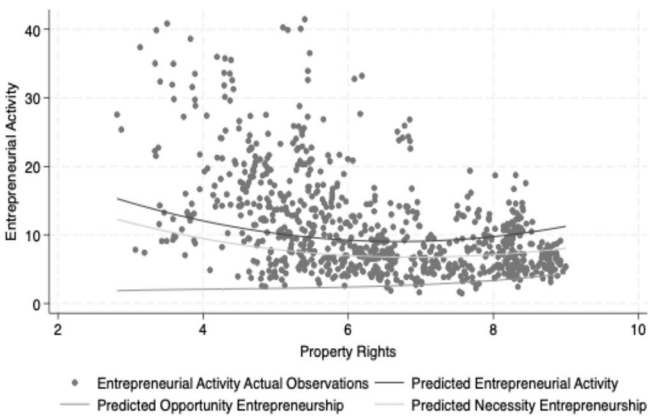


FIGURE 3 Predicted values for entrepreneurial activity, opportunity entrepreneurship, and necessity entrepreneurship (lines), and actual values for entrepreneurial activity plotted against property rights (scatter).

TABLE 4 Comparison of estimated values.

	Entrepreneurial Activity	Property Rights
Max predicted value (Total Entrepreneurial Activity)	15.297	2.813
Min predicted value (Total Entrepreneurial Activity)	9.025	6.686
Difference	−6.272	3.873
Difference (in Std dev)	−0.843	2.591

Sources: Own predicted values, Gwartney et al. (2021).

6 | CONCLUSION

Researchers have recognised the importance of institutions on a broad basis for decades. A proper legal system and well-established property rights are part of the institutions needed to spur economic growth among nations. Entrepreneurs are a crucial part of this wealth-creating process. Studying entrepreneurship and how it reacts to distinct factors has been the aim of a growing body of literature. The GEM project is an important part of this, as it has data records that now go at least a couple of decades back, allowing statistical analysis for several countries and years.

This study finds robust evidence of a U-shaped relationship between property rights and total early-stage entrepreneurial activity. At low levels of property rights, entrepreneurship is primarily driven by necessity, as individuals turn to self-employment in the absence of secure job alternatives. However, as property rights strengthen, the incentive structure shifts, and greater institutional certainty creates confidence in long-term returns, encouraging opportunity-driven ventures and ultimately increasing overall entrepreneurial activity.

These findings emphasise the importance of institutional quality in shaping entrepreneurial dynamics. Strengthening property rights does not merely protect existing economic agents, it also creates the conditions for new entrepreneurial initiatives to emerge. While the effect size may be modest relative to the total variation in entrepreneurship across countries, the direction and significance of the relationship point to a meaningful role for institutions in influencing this important aspect of economic behaviour.

ORCID

Leonel A Regalado Cardoso  <https://orcid.org/0009-0008-3915-8995>

ENDNOTES

- ¹ In 2019, the Global Entrepreneurship Monitor (GEM) modified its survey instrument, replacing the opportunity/necessity distinction with broader motivational categories (Bosma et al., 2020). While this limits direct comparisons with earlier studies, the total early-stage entrepreneurship rate remains a useful proxy for capturing changes driven by both forms of entrepreneurship.
- ² <https://www.gemconsortium.org/wiki/1149> (accessed 7 July 2025).
- ³ <https://www.gemconsortium.org/wiki/1154> (accessed 7 July 2025).
- ⁴ <https://www.gemconsortium.org/wiki/1181> (accessed 7 July 2025).
- ⁵ <https://www.gemconsortium.org/wiki/1177> (accessed 7 July 2025).
- ⁶ The Legal Systems and Property Rights sub-index has eight different components (Gwartney et al., 2021, pp. 253–5). Taken from the World Economic Forum's *Global Competitiveness Report*: (i) judicial independence, (ii) impartial courts, (iii) protection of property rights, and (iv) reliability of police measures confidence in law-enforcing activities. From PRS Group's *International Country Risk Guide*: (v) military interference in the rule of law and politics and (vi) integrity of the legal system. From World Bank's *Doing Business* project: (vii) regulatory costs of selling real property and (viii) legal enforcement of contracts averaged with Business Environment Risk Intelligence's *Historical Ratings Research Package* Enforcement of Contracts score.

REFERENCES

- Aidis, R., Estrin, S., & Mickiewicz, T. (2007). *Entrepreneurship, Institutions and the Level of Development*. TIGER Working Paper Series No. 103. Transformation, Integration and Globalization Economic Research (TIGER).
- Alchian, A. (2006). *Property Rights and Economic Behavior*. Volume 2 of *The Collected Works of Armen A. Alchian*. Liberty Fund.
- Amorós, J., Borraz, F., & Veiga, L. (2016). Entrepreneurship and socioeconomic indicators in Latin America. *Latin American Research Review*, 51(4), 186–201. <https://doi.org/10.1353/lar.2016.0055>
- Angulo-Guerrero, M., Pérez-Moreno, S., & Abad-Guerrero, I. (2017). How economic freedom affects opportunity and necessity entrepreneurship in the OECD countries. *Journal of Business Research*, 73, 30–37. <https://doi.org/10.1016/j.jbusres.2016.11.017>
- Baumol, W. (1990). Entrepreneurship: Productive, unproductive, and destructive. *Journal of Political Economy*, 98(5), 893–921. <https://doi.org/10.1086/261712>
- Borenstein, M., Hedges, L., Higgins, J., & Rothstein, H. (2013). *Introduction to Meta-analysis*. Wiley.
- Bosma, N., Hill, S., Ionescu-Somers, A., Kelley, D., Levie, J., & Tarnawa, A. (2020). *GEM Global Report 2019/2020*. Global Entrepreneurship Monitor.
- Brieger, S., Bairo, A., Criaco, G., & Terjesen, S. (2021). Entrepreneurs' age, institutions, and social value creation goals: A multi-country study. *Small Business Economics*, 57(1), 425–453. <https://doi.org/10.1007/s11187-020-00317-z>
- Dvouletý, O., & Orel, M. (2020). Individual determinants of entrepreneurship in Visegrád countries: Reflection on GEM data from the Czech Republic, Hungary, Poland, and Slovakia. *Entrepreneurial Business and Economics Review*, 8(4), 123–137. <https://doi.org/10.15678/EBER.2020.080407>
- Estrin, S., Korosteleva, J., & Mickiewicz, T. (2009). *Better Means More: Property Rights and High-growth Aspiration Entrepreneurship*. IZA Discussion Paper No. 4396. IZA Institute of Labor Economics.
- Fuentelsaz, L., González, C., Maicas, J. P., & Montero, J. (2015). How different formal institutions affect opportunity and necessity entrepreneurship. *BRQ Business Research Quarterly*, 18(4), 246–258. <https://doi.org/10.1016/j.brq.2015.02.001>
- Georgiou, M. (2009). *Entrepreneurship Causes Economic Growth: An Empirical Analysis for Western European Countries and the United States, 1990–2004*. Unpublished manuscript. SSRN. <https://doi.org/10.2139/ssrn.1478903>
- Global Entrepreneurship Monitor. (n.d.). *Global Entrepreneurship Monitor data*. GEM. <https://www.gemconsortium.org/data> (accessed December 2023).



- Gwartney, J., Lawson, R., Hall, J., & Murphy, R. (2021). *Economic Freedom of the World: 2021 Annual Report*. Fraser Institute.
- Kirzner, I. (1973). *Competition and Entrepreneurship*. University of Chicago Press.
- Klein, P. (2010). Opportunity discovery and entrepreneurial action. In *The Capitalist and the Entrepreneur: Essays on Organizations and Markets* (pp. 93–116). Ludwig von Mises Institute.
- Knight, F. (1921). *Risk, Uncertainty, and Profit*. Hart, Schaffner and Marx.
- Loukil, K. (2020). Intellectual property rights, human capital and types of entrepreneurship in emerging and developing countries. *Theoretical and Applied Economics*, 27(1), 21–40.
- McMullen, J., Bagby, D., & Palich, L. (2008). Economic freedom and the motivation to engage in entrepreneurial action. *Entrepreneurship Theory and Practice*, 32(5), 875–895. <https://doi.org/10.1111/j.1540-6520.2008.00260.x>
- North, D. (1990). *Institutions, Institutional Change and Economic Performance*. Cambridge University Press.
- Qin, S. (2021). Perceptual enablers of global nascent entrepreneurs: A quantitative investigation based on global entrepreneurship monitor data. *International Journal of Entrepreneurial Knowledge*, 9(1), 112–126. <https://doi.org/10.37335/ijek.v9i1.132>
- Reynolds, P., Bygrave, W., Autio, E., Cox, L., & Hay, M. (2002). *GEM Global Entrepreneurship Monitor: 2002 Executive Report*. Ewing Marion Kauffman Foundation. <https://www.gemconsortium.org/report/gem-2002-global-report> (accessed 7 July 2025).
- Schumpeter, J. (1934). *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle*. Harvard University Press.
- von Mises, L. (1949). *Human Action: A Treatise on Economics*. Ludwig von Mises Institute (1998).
- von Mises, L. (1951). *Profit and Loss*. Ludwig von Mises Institute (2008).
- Wooldridge, J. (2009). Métodos avanzados para datos de panel. In *Introducción a la econometría: Un enfoque moderno* (4th ed.) (pp. 481–505). CENGAGE Learning.
- World Bank. (n.d.). *World Development Indicators*. World Bank. <https://databank.worldbank.org/source/world-development-indicators> (accessed December 2023).
- World Bank Group. (2025). Metadata Glossary. DataBank. <https://databank.worldbank.org/metadataglossary/worldwide-governance-indicators/series/RL.ES.T> (accessed 7 July 2020).

How to cite this article: Regalado Cardoso, L. A. (2025). Property rights and entrepreneurship. *Economic Affairs*, 45(3), 509–521. <https://doi.org/10.1111/ecaf.70007>

APPENDIX

Robustness check

As a robustness check, in Table A1 I run the same regressions presented in Table 3 with the World Bank's Rule of Law estimate. This measure is like that of Property Rights from the Economic Freedom of the World Index. According to the World Bank Group (2025), the Rule of Law index “captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence”. This index ranges from minus 2.5 in the lower bound (worse rule of law) to 2.5 in the upper bound (better rule of law).

The results resonate with those where the Property Rights sub-index from EFW was used. A U-shaped relationship holds with this new measure (regression (1)), when the squared transformation is removed there is no significant effect (regression (2)), the quadratic effect remains significant without GDP Per Capita (regression (3)), an increase in rule of law increases opportunity entrepreneurship (regression (4)) and decreases necessity entrepreneurship (regression (5)).

TABLE A1 Robustness check.

Variables	(1) Total Entrepreneurial Activity	(2) Total Entrepreneurial Activity	(3) Total Entrepreneurial Activity	(4) Opportunity Entrepreneurship	(5) Necessity Entrepreneurship
Rule of Law	-2.099*** (0.757)	-1.181* (0.665)	-3.905*** (0.675)	0.0686*** (0.0181)	-0.0312*** (0.00746)
Rule of Law squared	1.204** (0.478)		0.826* (0.490)		
GDP Per Capita	-0.000153*** (3.06e-05)	-0.000143*** (3.04e-05)		-1.23e-06 (8.24e-07)	-6.71e-08 (3.55e-07)
GDP Growth	-0.0125 (0.0489)	-0.0107 (0.0491)	-0.0345 (0.0490)	-0.000341 (0.00258)	0.00232* (0.00141)
Unemployment	-0.186*** (0.0512)	-0.193*** (0.0513)	-0.146*** (0.0516)	-0.00371** (0.00185)	0.00279*** (0.000821)
Population Growth	0.673*** (0.178)	0.660*** (0.178)	0.403** (0.173)	-0.00804 (0.00745)	-0.00590 (0.00359)
Constant	15.72*** (1.127)	16.42*** (1.096)	13.39*** (1.057)	0.226*** (0.0418)	0.744*** (0.0223)
Year dummies	Yes	Yes	Yes	Yes	Yes
Observations	792	792	792	784	784
Number of countries	85	85	85	85	85
R-Squared	0.4566	0.4186	0.3699	0.3328	0.8201

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