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Geography, institutions, and entrepreneurship

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Abstract

The geographic spread of nations would pose logistics challenges in production, distribution and servicing, impacting costs, with implications for entrepreneurship. Using panel data from 62 countries spanning the years 2006 to 2021, we find that of the different oceanic geographic dimensions considered, the number of islands undermines entrepreneurship. Thus, the geographic scatter of a nation, in terms of the number of islands, does not foster entrepreneurship. The length of the coastline or being an island itself seem to not matter significantly in this regard. This main finding holds across different modeling variations. As expected, better institutional quality encourages entrepreneurship. The mediation analysis, to dissect the direct and indirect effects (through institutions) of geography reveals that the impact of the number of islands can work through institutional quality (as well as directly) to undermine entrepreneurship. Besides the considering of the number of islands, the spillovers of oceanic geography through institutions on entrepreneurship form the novel contributions of this work. However, the mediation analysis highlights a critical insight: geographic fragmentation, particularly in countries with numerous islands, weakens the positive impact of institutions. This is likely due to institutional fragmentation failing to align with geographic fragmentation. Some implications for policy are discussed.

Keywords: entrepreneurship; geography; institutions; islands; coastline; latitude; economic freedom; mediation analysis

JEL classification: L26; P48; O17

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1. Introduction

Fostering entrepreneurship remains an active goal of policymakers worldwide as nations try to bolster economic growth and attract foreign talent and investments. The role of entrepreneurship is central to understanding economic growth within different theoretical frameworks. For instance, the Solow model (1956) attributes growth to economies of scale achieved through the creation of larger production facilities. In contrast, the Romer model (1990) highlights the expansion of innovative firms as the primary driver, facilitated by the diffusion of knowledge. Acs et al. (2009) further argue that investments in research and development generate knowledge spillovers, which entrepreneurs can capitalize on to create new opportunities. The establishment of new businesses, often seen as a measure of entrepreneurial activity, has been linked to a variety of positive outcomes: enhanced economic growth and productivity (Black and Strahan (2002), Djankov et al. (2002), Hausse and Du Rietz (1984)), increased job creation (Birch (1979, 1987)), greater technological advancements (Acs and Audretsch (1990)), and improved educational outcomes (Dias and McDermott (2006)).

Previous studies have considered numerous factors to determine their relative efficacy in increasing entrepreneurial activity (Hall and Lawson (2014)). Among these, the role of institutions is central (Henrekson and Sanandaji (2011), Hwang and Powell (2005), Stephen et al. (2005)). Good/effective institutions provide social capital that provide useful positive externalities, lowering costs and fostering entrepreneurship. Good institutions ensure the smooth working of markets, via, among other aspects, protection of property rights, workings of the financial markets, and consistent honoring of contractual obligations.¹ However, empirically, it is not always easy to quantify or accurately measure institutional quality (especially, via measures that are readily comparable across jurisdictions), see Voigt (2013).² For instance similar institutions (e.g., economic freedom or government effectiveness) might in practice work, or be perceived, very differently across developed-underdeveloped, and large-small nations.

In this spectrum of work, the role of fixed or set factors such as a nation's geographic location that might crucially impact entrepreneurship, directly or indirectly, is slowly being recognized (Bosker and Garretsen (2009), Ferreira et al. (2024), Mack (2016), Rasvanis and Tselios (2023), Sternberg (2022)). Geography can impact the size, scope, prevalence, and ultimately the effectiveness of institutions. While geographic attributes of nation's are many and hard to consider in a single study, we focus in this paper on nations' oceanic geography – whether a nation is an island, the number islands a nation has, and the length of its coastline (see Booth et al. (2020), Cowling et al. (2024), Khodarinova et al. (2023)).³ In addition, we also consider the physical location of a nation by accounting for its latitude. These are different aspects with qualitatively different implications for entrepreneurship – for instance, nations that are not themselves islands might have many islands (e.g., Germany, India). On average, in our sample of more than sixty nations, each nation had about 2 islands, and a little more than half the nations were island nations (Table 3).

The effect of geography on entrepreneurship can be mixed. On one side, geographic attributes (such as being an island country or having a large numbers of islands) can aid entrepreneurship when geographically diverse/separate regions of nations provide captive/unique opportunities to entrepreneurs. Examples include nations with scenic islands/mountains and religious/historical places that present

¹ The quality of institutions has also been shown to mitigate the negative effects of dependence on natural resource rents, particularly oil, on new business formation (Farzanegan (2014)).

² Furthermore, given the variations in institutions, we shall also consider alternative institutions as a robustness check.

³ Obviously, the broad geographic diversity can include many more dimensions. Our choice here is somewhat driven by relatively comparable attributes – e.g., island country, number of islands, coastline.

unique local tourism opportunities, and regions with local minerals that provide local entrepreneurship opportunities for excavation and commerce. Geographic isolation, from islands or otherwise, can foster entrepreneurship via greater networking and cooperation among incumbents (intra-island spillovers). Furthermore, the length of a nation's coastline can provide greater entrepreneurship opportunities (e.g., Croatia), compared to nations that have very limited coastline, but not are completely landlocked (e.g., Slovenia).

Key questions addressed in this work are:

- How does a nation's oceanic geographic profile influence entrepreneurship?
- Does geography exert significant influences on entrepreneurship via its indirect effects on institutional quality?

On the other side, government infrastructure might be unequally distributed across diverse regions, leading to challenges for entrepreneurs in regions that are lagging. These regional disparities might relate to transportation bottlenecks, health or education services differences, or governance differences. Furthermore, spillovers from bordering nations and threat from unauthorized/underground competitors might be greater in certain regions, again undermining the effectiveness of institutions (Goel and Saunoris (2022)). In other words, geographic location can indirectly impact entrepreneurship via its impact on institutions. See Figure 1. Geographic variations can significantly impinge upon the spread of institutions, leading to inequalities in the quality of accompanying social capital across regions. Table 1 summarizes arguments for both positive and negative effects of geographical attributes on entrepreneurship (for more details see Rai Sharma (2023), Freitas (2024), UNCTAD (2014)).

Beyond government institutions, social networks, with implications for entrepreneurship, might develop differently in geographically diverse nations (Sorenson (2018)). Beyond networking, the spatial spillovers of knowledge are also impacted by geography, with firms in different locations differently benefitting from the research of others (Jaffe (1989), Jaffe et al. (1993)). These would influence the attractiveness of different locations to entrepreneurs (Malecki (2009), Stam and Welter (2020)).⁴

The geographic spread of nations would also pose logistics challenges in production, distribution and servicing, impacting costs, with implications for entrepreneurship. Small population/area of a land mass poses challenges for attaining scale economies. Conversely, islands potentially offer the lure of captive markets to budding entrepreneurs.

The consideration of these direct and indirect impacts of geographic dimensions on entrepreneurial activity across nations forms a key focus of the present research. Besides adding to the literature, the policy implications of this study involve how government policies towards entrepreneurship might be tailored/alterd keeping in mind a nation's geography. Significance of the given geographic dimensions would argue against uniform policy recommendations across all nations.

Using panel data from 62 countries spanning the years 2006 to 2021, we find that of the different oceanic geographic dimensions considered, the number of islands undermines entrepreneurship. Thus, the geographic scatter of a nation, in terms of the number of islands, does not foster entrepreneurship. The length of the coastline or being an island itself seem to not matter significantly in this regard. This main finding holds across different modeling variations. As expected, better institutional quality encourages entrepreneurship. The mediation analysis, to dissect the direct and indirect effects (through institutions)

⁴ See Letaifa and Rabeau (2013) for an alternative view.

of geography reveals that the impact of the number of islands can work through institutional quality (as well as directly) to undermine entrepreneurship. Besides considering of the number of islands, the spillovers of oceanic geography through institutions on entrepreneurship form the novel contributions of this work. Some implications for policy are discussed.

The remainder of the paper is organized as follows: the next section presents the background and the model, followed by the data and estimation methodology. This is succeeded by a discussion of the results, and the paper concludes with final remarks and implications.

2. Background and model

2.1 Background

Geographic spread of land mass could mean different endowments of natural resources and physical (terrain) attributes within a nation. For instance, different islands would likely have different natural abilities to build ports, different exposure to climate change, etc. Besides other things, the ability of governments to provide infrastructure (e.g., airstrips, ports, etc.) is affected, given the underlying physical differences. These differences directly impact the types of new ventures that potential entrepreneurs can engage in, besides impacting the operating costs of those ventures when they are operational.

There is a relatively small body of literature that considers the relation between geography and entrepreneurship. In his review, Sternberg (2022) noted the interdependence between geography and entrepreneurship, and suggests avenues for future research. Thurik et al. (2024) have also noted the synergy between entrepreneurship research across different academic fields. Cowling et al. (2024) focus on start-ups in remote island entrepreneurial ecosystems (EEs) and consider the differences between these entrepreneurs compared to their mainland Scottish and UK counterparts. They find that island new start-up entrepreneurs tend to be older, less well educated, more likely to be female, and less likely to be from an ethnic minority.

In another related piece, Booth et al. (2020) consider tourism and hospitality entrepreneurship in islands (THEI). The authors used the Scopus database and the PRISMA technique, summarizing 132 articles through bibliometric and thematic content analyses. The authors note that opportunities exist to investigate the characteristics and behaviors of island entrepreneurs in the context of THEI.

Finally, Freitas (2024), considering the case of Madeira, posits that entrepreneurship in remote islands might be qualitatively different, favoring necessity-driven entrepreneurs.

Along another dimension, the theoretical foundations of this work relate to how fragmentation or decentralization of governments and institutions impacts their ability to provide services (functions). On the one hand, decentralized institutions are better able to detect, and hence cater to, local needs (in the context of this paper, the needs of local entrepreneurs).

On the other hand, decentralized institutions might be more susceptible to capture, for example via bribery and corruption. Exogenously, the geographic diversity of a nation could force such nations to offer more government decentralized services than otherwise. This aspect, although not widely recognized, seems pertinent in the context of the present research. Based on data from U.S. states, Goel and Nelson (2011) study whether the structure of local governments affects corruption. Their findings show that government decentralization does not necessarily reduce corruption—the type of decentralization matters.

In particular, more general-purpose governments contribute to corruption, but the effect of special-purpose governments is mixed.⁵

The spatial dimensions of entrepreneurship are well-documented, with Backman and Lööf (2015) synthesizing nine studies that link agglomeration economies and regional heterogeneity to innovation and new firm formation (also see Duran (2023), Stam (2010), Trettin and Welter (2011)). Their findings underscore how dense, diverse regions enhance entrepreneurial outcomes, yet our study extends this by examining how geographic fragmentation, such as in island nations, directly constrains business creation and weakens institutional effectiveness—a dynamic less explored in prior work.

Based upon the above discussion, we formulate the following hypotheses that we will empirically test using panel data across numerous countries (see Section 3.1 for details on the data employed).

H1: Higher-quality institutions positively influence entrepreneurship, *ceteris paribus*.

H2a. Geographic diversity enhances entrepreneurship when its positive direct and indirect effects outweigh its negative effects, *ceteris paribus*.

H2b. Geographic diversity hinders entrepreneurship when its negative direct and indirect effects outweigh its positive effects, *ceteris paribus*.

These hypotheses will be tested via the model and data discussed next.

2.2 The model

The goal of the empirical methodology is to estimate and compare the effects of different dimensions of oceanic geography on entrepreneurship. The different dimensions of geography that we consider have not been previously considered in the literature, although all of them seem quite prevalent across nations.

Another significant exercise is to determine the direct and indirect effects of geography on entrepreneurship, which may be mediated through governance and economic freedom institutions (Grandori (2024)), as illustrated in Figure 1. To achieve this, we employ formal mediation analysis (Baron and Kenny (1986), Preacher (2015), VanderWeele (2016)). Mediation analysis, following Baron and Kenny (1986), is conducted in three steps, as described below. Each equation is estimated using pooled OLS. Based on the diagnostic tests reported at the bottom of Table 4, we find that the residuals exhibit heteroskedasticity and serial correlation. Consequently, we correct the standard errors using cluster-robust standard errors, clustered at the country level.

Equation (1) is used to estimate the total effect of geography on entrepreneurship:

$$Entrepreneurship_{it} = \alpha_0 + \alpha_1 Geography_{it}^k + X'_{it}\alpha_2 + \varepsilon_{it}^1 \quad (1)$$

Here, *i* indexes a country and *t* indexes a year. The outcome variable is entrepreneurship, measured by new business density from the World Bank. The treatment variable captures different measures of geography and is indexed by *k*, where *k* represents either Island, Number of Islands, Number of Inhabited Islands, or Coastline—see Table 2 for variable details. Note that many nations, such as Finland, Sweden, that are not themselves islands, have many islands.

⁵ Note, however, that both decentralization and institutions are multidimensional, which can be variously measured, albeit not always easily (Goel et al. (2017), Voigt (2013)).

The vector X includes control variables such as the log of real GDP per capita lagged one period (GDP), gross secondary enrollment (Education), and the absolute latitude of the country (Latitude). Economic prosperity (GDP) captures the economic climate, and the prospects of future profits, both of which are likely to encourage entrepreneurship. Further, education is capturing labor quality, while Latitude refers to a country's location relative to the equator. Countries farther from the equator, in more temperate climates, have generally been shown to experience positive benefits (Brown (2014)). We also include a dummy variable for each continent with Europe serving as the reference continent. This consideration accounts for factors not otherwise accounted for in the set of controls we consider. Finally, ε represents the random error term, which satisfies the usual properties.

The parameter α_1 measures the total effect of a country's geography on the prevalence of entrepreneurship. The total effect is an amalgam of the direct effect and the indirect effect that is mediated through institutional quality—see Figure 1. To disentangle the total effect into the direct and indirect effect, we proceed to estimate equations (2) and (3).

Equation (2) is used to estimate the effect of geography on the mediator variable institutional quality:

$$Institutional\ Quality_{it} = \beta_0 + \beta_1 Geography_{it}^k + X'_{it}\beta_2 + \varepsilon_{it}^2 \quad (2)$$

Where the dependent variable is a measure of institutional quality.⁶ Evidence of mediation is confirmed when the coefficient on Geography (β_1) is statistically significant, which would imply that geographic attributes (e.g., number of islands, island country, etc.) affect institutional quality.

Finally, Equation (3) is used to estimate average direct effect (ADE) and mediation effect of geography:

$$Entrepreneurship_{it} = \gamma_0 + \gamma_1 Geography_{it}^k + \gamma_2 Institutional\ Quality + X'_{it}\gamma_3 + \varepsilon_{it}^3 \quad (3)$$

The ADE of geography on entrepreneurship is given by the coefficient γ_1 , while the coefficient γ_2 measures the direct effect of institutional quality on entrepreneurship. Note that, in the absence of mediation, the total effect is equal to the direct effect: $\alpha_1 = \gamma_1$. Furthermore, evidence of full mediation is when Geography is statistically insignificant once we control for Institutional Quality, while partial mediation is found when Geography is statistically significant with $|\alpha_1| > |\gamma_1|$.

The average causal mediation effect (ACME) is calculated as the difference between the total effect and the average direct effect: $\alpha_1 - \gamma_1$. This effect measures the indirect effect of geography on entrepreneurship that is mediated through institutional quality.

In sum, the total effect estimated by equation (1) provides only a partial understanding of the relationship between geography and entrepreneurship. Mediation analysis allows us to decompose this total effect into two effects: the direct effect of geography on entrepreneurship and the indirect effect, where geography influences entrepreneurship indirectly through its impact on institutional quality. This approach provides deeper insight into the mechanisms underlying the relationship between geography and entrepreneurship,

⁶ Note that we are considering a broad aspect of institutional quality, including different dimensions such as Voice and Accountability, Political Stability and Absence of Violence/Terrorism, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption (Table 2).

enabling us to assess not only the overall importance of geography but also how much of its influence operates through changes in institutional quality. By identifying and quantifying these pathways, mediation analysis offers a more nuanced understanding of how geography impacts entrepreneurial outcomes.

3. Data

The data used in the forthcoming empirical analysis is a panel dataset comprising 62 countries from 2006 to 2021. The list of countries included in the analysis is provided in Table 1A in the appendix, variable definitions are given in Table 2, and Table 3 presents the summary statistics. The size of the sample is restricted by the availability of comparable data across all nations.

The outcome variable is new business density, which is a commonly used measure of entrepreneurship from the World Bank. New business density is measured as the total number of newly registered limited liability corporations as a proportion of 1,000 working-age population aged 15 to 64. It provides a unique source of comparable, cross-country data on new business registrations. The units of measurement are private, formal sector companies under limited liability (or its equivalent). Over the time period 2006 to 2021 the overall trend has been positive showing a new business density of 0.40 (8,868 number of new businesses) in 2006 to 0.61 (16,926 number of new businesses) in 2021.⁷ The World Bank provides two key justifications for this unit of measurement: “First, private limited liability companies are the most common business structure in many countries globally. Second, this aligns with the Doing Business project’s focus on fostering entrepreneurship: investors are more likely to start businesses when their potential losses are limited to their capital investment” (Doing Business, 2020: 21). Elitcha (2021) and Munemo (2022) highlight several characteristics of this dataset that are also relevant to our study. Firstly, it captures “actual” entrepreneurship rather than merely representing “potential” entrepreneurship. Additionally, the World Bank’s approach emphasizes business creation over occupational status. Secondly, the dataset relies on official business registry data, avoiding survey-based data. This makes it an objective measure of entrepreneurship rather than a subjective one. Numerous studies, including Klapper and Love (2011), Farzanegan (2014), Nica (2021), Ajide and Osinubi (2022), and Farzanegan and Badreldin (2024), have used this objective indicator in their analyses.

For the treatment variables, we include several measures that capture different aspects of a country’s geography. First, we use a dummy variable equal to one if the country is an island (Island). Second, we consider the total number of islands (Number of Islands) in a country, as well as the number of inhabited islands (Number of Inhabited Islands). Lastly, we examine the length of the coastline for each country (Coastline). These measures uniquely capture the degree of a country’s physical fragmentation, its contiguity with other countries, and its access to or connectivity via waterways.

The two potential mediators we consider are composite indexes that capture the quality of governance and economic freedom. The governance index is based on perceptions of governance quality within a country and is calculated as the unweighted average of six World Governance Indicators: Voice and Accountability, Political Stability and Absence of Violence/Terrorism, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption. Each dimension is measured on a scale from approximately -2.5 to +2.5, with higher values indicating better governance quality.

⁷ <https://www.worldbank.org/en/programs/entrepreneurship>

The Economic Freedom Index, sourced from the Fraser Institute, is calculated as the unweighted average of five dimensions of economic freedom: Size of Government, Legal System & Property Rights, Sound Money, Freedom to Trade Internationally, and Regulation. This index ranges from 0 to 100, with higher values representing greater economic freedom.

We also include several control variables to isolate the effects of institutions on entrepreneurship. First, we account for the effect of economic prosperity (log of real GDP per capita) lagged by one period to mitigate simultaneity and control for differences in the level of development across countries. Second, recognizing the importance of human capital for starting new businesses, we include gross secondary enrollment (Education). Finally, given that a country's distance from the equator has been shown to influence economic growth and development, we include the absolute value of a country's latitude (Latitude).

4. Results

We first estimate baseline models to consider the effects of geography on entrepreneurship, and institutions on entrepreneurship before turning to other modeling considerations and mediation effects to discern the direct and indirect channels of influence.

4A. Considering average institutional quality to denote different institutions

4A.1 Baseline models – institutional quality

The results of estimating equation (1) for each measure of geography are presented in Table 4. The adjusted R-squared indicates that approximately 30% of the variation in entrepreneurship is explained by the model. Among the treatment variables, we find that the Number of Islands is negative and statistically significant at the 5% level. In terms of magnitude, an increase of 100 islands in a country reduces entrepreneurship by 0.002 new businesses per 1,000 working-age population, *ceteris paribus*. More islands entail smaller pockets of markets that increase costs via a failure to realize minimum efficient scales. These costs are also increased via transportation and logistical bottlenecks. All these likely make entrepreneurship more challenging and less attractive. The remaining geography variables are statistically insignificant.

While case studies, such as Freitas (2024), highlight the challenges of new business formation within island states, this study provides the first cross-country empirical evidence of the overall impact of geographical fragmentation on entrepreneurship.

Regarding the control variables, we find that GDP is positively and significantly associated with entrepreneurship. This is consistent with the notion that greater economic prosperity promotes positive economic outlook that facilitates entrepreneurship. However, the other control variables lack statistical significance.

The results of estimating equation (2) are presented in Table 5. The adjusted R-squared indicates that approximately 70% of the variation in institutional quality is explained by the model. Notably, we find that Island and the Number of Islands are both positive and statistically significant, while the other two geographic variables are statistically insignificant. On average, island countries have an institutional quality score that is 0.245 points higher (approximately one-third of a standard deviation), *ceteris paribus*.

Further, we find that a 1% increase in the number of islands a country has is associated with an approximately 0.08% increase in institutional quality.

For the control variables, the results show that GDP and education are positively and significantly associated with institutional quality, while latitude is statistically insignificant. Furthermore, the coefficient for the Africa & Oceania continent dummy variable is positive and statistically significant.

Table 6 presents the results from estimating equation (3). The adjusted R-squared values range from 0.26 to 0.43. The coefficient on institutional quality is positive and statistically significant across all four models, ranging from a low of 3.87 to a high of 5.02. This finding reinforces the positive association between strong institutions and entrepreneurship, and supports Hypothesis 1. Good institutions ensure the smooth functioning of markets, while also protecting intellectual property. Both these factors instill confidence in current and budding entrepreneurs.

Furthermore, we observe that the coefficient on the Number of Islands is larger (in absolute value) and more statistically significant compared to the results in Table 4 after accounting for institutional quality.

4A.2 Additional consideration: Considering interaction terms with institutional quality

When we consider the interaction terms of the four geographic dimensions (Island, Number of Islands, Number of Inhabited Islands, and Coastline) with Institutional Quality, the results in Table 4a show that only the coefficients on the Number of Inhabited Islands and its interaction term are negative and significant. All other geographic dimensions fail to achieve statistical significance. This implies that as a greater number of a nation's islands are inhabited, the overall entrepreneurship goes down. This could be due to the inability of the social capital via institutions to keep up, or the production/supply costs and logistics with geographic spread making entrepreneurship unattractive.

Again, the positive effect of Institutional Quality on entrepreneurship remains robust.

4A.3 Robustness check: Controlling for the role of outliers A

As robustness check, we control for the influence of outliers, where the dependent and the geographic control variables are winsorized. In Table 4b, the negative effect of the number of islands on entrepreneurship is significant, as in Table 4a, while the other geographic dimensions fail to attain statistical significance.

From a policy perspective, while the recognition of good institutions for entrepreneurship promotion is not a new revelation, nations with many islands need to consider the negative spillovers on entrepreneurship and thus would have to design policies somewhat differently.

4A.4 Extension: Using mediation analysis to separate the direct and indirect effects of geography on entrepreneurship

4.1.1 Mediation analysis with institutional quality as the mediator

Turning to the mediation analysis, the results are presented in Table 5. The consideration of mediation elaborates on the premise of Lowe and Feldman (2017) who argue that entrepreneurs in different regions

over time shape the institutions they deal with. In our analysis, as shown in Figure 1, different geographic dimensions impact entrepreneurship directly, and indirectly (through institutions).

Based on the findings in Table 5, only Island and Number of Islands exhibited evidence of potential mediation. Model 5.1 in Table 5 shows no statistical support for a direct effect of Island on Entrepreneurship. However, the positive and statistically significant Average Causal Mediation Effect (ACME) suggests that the majority of the impact of Island on Entrepreneurship is mediated through institutional quality. The ACME estimate indicates that island nations, compared to non-island nations, indirectly increase the number of new businesses per 1,000 working-age population by 0.95 through their effect on improving institutional quality. Furthermore, the proportion mediated confirms that approximately 64% of the total effect is transmitted through institutions.

Model 5.2 in Table 5 reveals that the direct effect of the Number of Islands is negative and statistically significant, while the ACME is positive and statistically significant. In this case, the mediated effect increases entrepreneurship, whereas the direct effect reduces it. Moreover, the direct effect outweighs the indirect effect, resulting in a negative total effect (-0.206). The ACME estimate suggests that an increase of 100 islands in a nation indirectly increases the number of new businesses per 1,000 working-age population by 0.001 through its positive influence on institutional quality. The proportion mediated indicates that the mediator (institutional quality) mitigates 58.9% of the negative total effect. The negative proportion mediated reflects that the indirect channel provides a positive offset to the strongly negative direct effect.

4B. Considering economic freedom as an alternative indicator of institutions

4B.1 Baseline models – economic freedom

Given that institutional quality can take many forms, we consider an alternative dimension in the form of economic freedom to represent institutions. Greater economic freedom implies less intrusive government and thus would foster entrepreneurship. The literature has devoted quite a bit of attention to the nexus between economic freedom and entrepreneurship, although the intermediate context of geography has been mostly ignored (Bjørnskov and Foss (2008), Goel et al. (2015), Hall and Lawson (2014), Kuckertz et al. (2016), Nyström (2008)).

Table 6 presents the results for estimating equation (3) with Economic Freedom replacing broader institutional quality. This alternative consideration of institutions also addresses the debate surrounding how best to measure institutions (Voigt (2013)). The adjusted R-squared indicates that approximately 50% of the variation in entrepreneurship is explained by the model. The coefficient on Economic Freedom is positive and highly statistically significant across all four models, suggesting that economic freedom is directly and positively associated with entrepreneurship. Interestingly, the coefficient on the Number of Inhabited Islands is statistically insignificant, as are the coefficients on Island and Coastline. However, the coefficient on the Number of Islands is negative and statistically significant, indicating a direct negative association with entrepreneurship.

Regarding the control variables, the coefficient on Area is negative and statistically significant, while the remaining control variables lack statistical significance.

4B.2 Additional consideration: Considering interaction terms with economic freedom

When the interaction terms of Economic Freedom are considered with the geographic dimensions in Table 6a, the interaction terms of both the Number of Islands and the Number of Inhabited Islands are negative and significant. Being an island nation or the length of the coastline has no significant impact on entrepreneurship, however. Furthermore, greater economic freedom, as expected, promote entrepreneurship.

4B.3 Robustness check: Controlling for the role of outliers B

The outlier analysis in Table 6b again supports the main findings from Table 6. In particular, both the Number of Islands has a significant negative coefficient, and Economic Freedom has positive and significant coefficient. Further, the effect of the Number of Inhabited Islands is also negative and significant. Thus, the greater potential demand of residents in inhabited entrepreneurship fails to positively attract entrepreneurs.

4B.4 Extension: Using mediation analysis to separate the direct and indirect effects of geography on entrepreneurship

4.2 Robustness check - Mediator: Institutions of economic freedom

This section discusses the results in which Economic Freedom serves as the mediator between geography and entrepreneurship.

4.2.1 Mediation analysis with economic freedom as the mediator

We again employ the mediation analysis, with economic freedom as an indicator of institutional quality, to determine the direct and indirect effects on entrepreneurship. Table 7 presents the resulting mediation results.

Model 7.2 shows a direct effect of the Number of Islands on Entrepreneurship, but no evidence of mediation. This is unlike the corresponding model (Model 5.2) in Table 5, when Institutional Quality was the mediator. Interestingly, Model 7.3 reveals that the Number of Inhabited Islands has a direct negative impact on entrepreneurship and a positive indirect impact mediated through economic freedom. These two effects offset each other, resulting in a total effect of the Number of Inhabited Islands that is negative but statistically insignificant. Again, these findings differ from Model 5.3 in Table 5. Thus, the point is that the same geographic dimension could have different direct and indirect influences on entrepreneurship, depending upon which dimension of institutions is considered. This is a useful input for policy formulation.

Finally, Model 7.4 indicates that Coastline has a positive and statistically significant effect on entrepreneurship, which is almost entirely mediated through its effect on economic freedom. This is confirmed by the estimated proportion mediated, which is 98.2% and statistically significant at the 10% level.

Overall, the results reveal the importance of decomposing the total effect into its direct and indirect components to better understand how geography impacts entrepreneurship, which can inform both theoretical modeling and policy. Furthermore, the findings highlight the multidimensionality of geography, showing that different aspects of geography can have distinct impacts on institutional quality

and entrepreneurship. Similarly, institutions themselves are multidimensional and are influenced in varying ways by geography.

4.5 Additional consideration C: IV regression to control for potential reverse causality

Although the number of islands is fixed for a nation, still one could argue that there could be reverse feedbacks from entrepreneurship to institutional quality/economic freedom. Thus, we perform an IV regression in Table 8, taking institutional quality/economic freedom in Models 4.2 and 6.2, respectively to be endogenous. For this purpose where Institutional Quality is instrumented using Genetic Distance, and Economic Freedom is instrumented using former Colony.

The results show that the effect of the number of islands is negative in both cases, and is statistically significant in Model 8.1 with Institutional Quality. This instills confidence in our earlier findings.

5. Conclusions

This study investigates the direct and indirect effects of geography on entrepreneurship, focusing on the mediating role of institutions. The growing recognition of entrepreneurship research across various academic disciplines (Thurik et al. (2024)) highlights the need for more cross-disciplinary studies to thoroughly examine the interplay among different drivers of entrepreneurship. This research aims to contribute to this understanding, particularly by focusing on the relationship between geography and entrepreneurship.

Using mediation analysis and a panel dataset of 62 countries from 2006 to 2021, we analyze the impact of geographical characteristics—such as being an island nation or the number of islands belonging to a country—on new business formation, a key measure of entrepreneurship. Besides adding to the literature, the consideration of geographic aspects is especially relevant for policymaking, as these are inherent attributes of a nation that policymakers must contend with. In his review, Sternberg (2022) has noted the interdependence between geography and entrepreneurship.

Our findings reveal that the total effect of geography on entrepreneurship is negative, primarily due to the challenges posed by geographic fragmentation. However, this negative impact is partially mitigated by a positive mediating effect: island nations tend to exhibit stronger institutional quality, which positively influences entrepreneurship. Island states with smaller populations and relatively tight-knit communities often benefit from stronger social trust, which can enhance the quality of their institutions. Additionally, island economies tend to rely heavily on external trade, tourism, and international interactions. To attract foreign investment and sustain economic growth, these states often prioritize building robust institutions with more efficient administration. These factors collectively help explain the positive relationship between geographical fragmentation and the quality of governance.

Turning to the questions posed in the Introduction, we can now provide the following answers:

- How does a nation's geographic profile influence entrepreneurship?
Our analysis shows that certain geographic characteristics, particularly the number of islands a nation possesses, tend to hinder entrepreneurship. This can be attributed to factors such as market

segmentation, which limits scale and scope economies, as well as higher transaction costs arising from transportation and logistical challenges.

- Does geography exert significant influences on entrepreneurship via its indirect effects on institutional quality?
Yes, we find that in many instances the indirect effects of geography through institutions on entrepreneurship are significant. The findings are more consistent with Hypothesis H2b listed above.

The results highlight the dual impact of geography, underscoring both its constraints and the potential for institutional strength to mitigate these barriers. Island nations, in particular, can leverage their institutions to promote entrepreneurship by reducing entry barriers, enhancing access to finance, and investing in critical infrastructure. Since nations differ widely in their geographic endowments, our results suggest that policymakers should take account of these given attributes in framing policy and that uniform policies across nations are unlikely to yield similar results. For example, island nations may benefit from initiatives that enhance regional cooperation (e.g., Pacific Islands Forum (PIF)), develop specialized export industries (e.g., Mauritius' textile and apparel industry or Maldives' tourism industry), or improve access to global markets through investments in transportation and digitalization (e.g., Jamaica's logistics hub initiative or Estonia's digital transformation). Furthermore, governments in geographically fragmented countries could prioritize institutional reforms that strengthen transparency, accountability, and public service delivery (e.g., Seychelles' anti-corruption reforms, or Singapore's public service reforms) to offset the business formation challenges linked to their geography.

To summarize, the main insight is that the impact of institutional quality on entrepreneurship is somewhat undermined by geographic fragmentation of nations (Tables 6 and 9). A plausible explanation is that institutional fragmentation (diffusion) likely does not keep up with geographic fragmentation (which lowers the institutional support in different regions to entrepreneurs). Future research can extend this line of inquiry by considering alternative dimensions of entrepreneurship, institutions, and/or geography.

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Table 1. Mixed effects of geography on entrepreneurship

Geographic Attribute	Positive Effects on Entrepreneurship	Negative Effects on Entrepreneurship
Isolation (Island Nations)	- Promotes self-reliance and local innovation to overcome resource limitations.	- Limited market access increases transaction costs and reduces opportunities for business expansion.
Fragmented Landmass (Many Islands)	- Encourages niche market development catering to diverse local communities.	- Higher logistical and transportation challenges for resource and product distribution.
Proximity to Oceans	- Provides opportunities in industries like fisheries, tourism, and maritime trade.	- Dependency on volatile industries (e.g., tourism) makes entrepreneurship vulnerable to external shocks.
Small Population/Market Size	- Stronger community ties foster trust and collaboration, aiding small-scale entrepreneurship.	- Limited demand restricts scalability and profitability of new businesses.
Environmental Vulnerabilities	- Necessity-driven innovation in response to climate challenges can lead to unique entrepreneurial solutions.	- Frequent natural disasters disrupt business continuity and mitigate investment.
Cultural Cohesion	- Tight-knit communities support entrepreneurial networks and cooperative business.	- Social conservatism or lack of diversity may limit innovation and risk-taking behavior.
Geopolitical Importance	- Strategic location boosts trade-related entrepreneurship and attracts foreign investment.	- Political tensions or over-reliance on strategic rents may crowd out local entrepreneurial initiatives.
Natural Resource Availability	- Natural resources offer entrepreneurial opportunities in aquaculture and eco-tourism.	- Scarcity of land-based resources (e.g., arable land) limits agricultural and industrial entrepreneurship.
Institutional Quality	- Geographic constraints may lead to better governance, which supports entrepreneurial ecosystems.	- Poor institutional responses to geographic challenges (e.g., corruption or inefficiency) can undermine entrepreneurship.

Table 2: Variable Definition and Sources

Variable Name	Definition	Source
Entrepreneurship	New business density measured as the number of newly registered corporations (i.e. private limited liability companies. per 1,000 working-age (25-64 years old) population.	World Bank
Institutional Quality	Index of institutional quality calculated as the unweighted average of the six World Governance Indicators including Voice and Accountability, Political Stability and Absence of Violence/Terrorism, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption. Index is measured on a scale from -2.5 to +2.5 with higher numbers meaning greater institutional quality.	World Governance Indicators
Economic Freedom	Economic Freedom Index comprised of five areas of economic freedom: (1) Size of Government (2) Legal System & Property Rights (3) Sound Money (4) Freedom to Trade Internationally and (5) Regulation. The index is on a scale from 0 to 10 with higher numbers denoting more economic freedom.	Fraser Institute
Island	Dummy variable equal to 1 if the country is an island and zero otherwise.	https://worldpopulationreview.com/
Number of Islands	The number of islands in a country scaled by 10,000.	https://worldpopulationreview.com/
Number of Inhabited Islands	The number of inhabited islands in a country scaled by 10,000.	https://worldpopulationreview.com/
Coastline	The length of coastline measured in kilometers scaled by 10,000.	https://www.cia.gov/
GDP (lag)	The natural log of GDP per capita measured in PPP constant 2021 international dollars.	World Bank
Education	Secondary school enrollment measured as the percent of gross.	World Bank
Latitude	Absolute latitude	Gallup et al. (1999)
Area	The natural log of the surface area of a country measured in square kilometers.	World Bank
Note: All data are by country and year, covering the years 2006 to 2021, unless otherwise noted.		

Table 3: Summary statistics

Variable	Mean	St. Dev.	Min	Max
Entrepreneurship	5.56	6.27	0.02	38.20
Institutional Quality	0.58	0.81	-1.18	1.88
Economic Freedom*	7.43	0.77	5.08	9.10
Island	0.53	0.50	0.00	1.00
Number of Islands	1.94	5.98	0.00	26.76
Number of Inhabited Islands	0.03	0.09	0.00	0.60
Coastline	0.77	1.98	0.00	20.21
GDP (lag)	10.06	0.94	7.37	11.69
Education	96.97	22.29	24.39	159.11
Latitude	0.34	0.21	0.01	0.72
Area*	11.43	2.68	5.77	16.65

N = 693

*N = 537

Table 4: Institutional and geographic drivers of entrepreneurship – Baseline models

Dependent variable: Entrepreneurship				
	(4.1)	(4.2)	(4.3)	(4.4)
Institutional Quality	3.873** (1.575)	5.019*** (1.411)	4.114*** (1.379)	3.937*** (1.335)
Island	0.539 (2.104)			
Number of Islands		-0.328*** (0.109)		
Number of Inhabited Islands			-7.411 (5.850)	
Coastline				-0.153 (0.156)
GDP (lag)	1.490 (1.097)	0.929 (0.943)	1.225 (1.076)	1.523 (1.098)
Education	-0.035 (0.035)	-0.031 (0.033)	-0.029 (0.034)	-0.034 (0.036)
Latitude	1.008 (6.008)	4.998 (5.176)	0.233 (5.598)	1.117 (5.893)
Africa_Oceania	1.622 (3.222)	1.985 (2.754)	1.457 (3.132)	2.022 (3.181)
America	-0.772 (2.559)	-0.211 (2.463)	-0.873 (2.592)	-0.392 (2.664)
Asia	0.373 (3.205)	1.355 (3.205)	0.788 (3.401)	0.617 (3.504)
Observations	693	693	693	693
Adjusted R ²	0.356	0.425	0.365	0.357
LM test	549.62*** [0.000]	549.83*** [0.000]	548.54*** [0.000]	548.06*** [0.000]
BP test	91.59*** [0.000]	92.62*** [0.000]	86.98*** [0.000]	87.27*** [0.000]
Residual Std. Error (df = 684)	5.029	4.752	4.994	5.025
F Statistic (df = 8; 684)	48.916***	65.025***	50.803***	49.102***

Notes: See Table 2 for variable details. Each model is estimated using pooled OLS. Constant is included in each model but not reported. Cluster robust standard errors are in parentheses and probability values are in brackets. Asterisks denote significance at the following levels: *** p<0.01, ** p<0.05, * p<0.1.

Table 4a: Institutional and geographic drivers of entrepreneurship – Considering interaction terms

Dependent variable: Entrepreneurship				
	(4a.1)	(4a.2)	(4a.3)	(4a.4)
Institutional Quality	3.311*	5.015***	4.562***	4.232***
	(1.833)	(1.404)	(1.385)	(1.387)
Island	-0.939			
	(1.464)			
Number of Islands		-0.710		
		(1.042)		
Number of Inhabited Islands			-8.285*	
			(4.843)	
Coastline				0.097
				(0.201)
Institutional Quality*Island	2.212			
	(1.462)			
Institutional Quality*Number of Islands		0.223		
		(0.591)		
Institutional Quality*Number of Inhabited Islands			-21.630**	
			(8.585)	
Institutional Quality* Coastline				-0.238
				(0.207)
GDP (lag)	1.057	0.902	1.231	1.591
	(1.104)	(0.950)	(0.992)	(1.078)
Education	-0.029	-0.030	-0.033	-0.039
	(0.035)	(0.032)	(0.033)	(0.036)
Latitude	-0.204	5.014	4.050	1.899
	(5.683)	(5.199)	(5.776)	(6.293)
Africa_Oceania	1.064	1.981	2.559	2.555
	(3.032)	(2.758)	(2.993)	(3.460)
America	-1.282	-0.155	0.609	0.218
	(2.493)	(2.480)	(2.755)	(3.029)
Asia	-0.024	1.517	1.918	0.917
	(3.244)	(3.287)	(3.449)	(3.685)
Observations	693	693	693	693
Adjusted R ²	0.374	0.425	0.399	0.360
Residual Std. Error (df = 684)	4.961	4.751	4.860	5.016
F Statistic (df = 8; 684)	46.867***	57.938***	52.008***	44.173***

Notes: See Table 4.

Table 4b: Institutional and geographic drivers of entrepreneurship – Controlling for outliers

Dependent variable: Entrepreneurship*				
	(4b.1)	(4b.2)	(4b.3)	(4b.4)
Institutional Quality*	2.824*** (0.904)	3.836*** (0.785)	3.202*** (0.829)	3.029*** (0.800)
Island	0.982 (1.269)			
Number of Islands*		-0.00005*** (0.00001)		
Number of Inhabited Islands*			-0.001 (0.001)	
Coastline*				-0.00000 (0.0001)
GDP (lag)	1.046 (0.770)	0.613 (0.654)	0.783 (0.781)	1.041 (0.785)
Education	-0.010 (0.023)	-0.005 (0.020)	-0.004 (0.023)	-0.009 (0.023)
Latitude	2.862 (3.860)	5.920* (3.512)	2.063 (3.683)	1.532 (3.767)
Africa_Oceania	1.507 (2.110)	2.248 (1.848)	1.635 (2.128)	1.733 (2.082)
America	-0.445 (1.727)	0.401 (1.703)	-0.285 (1.833)	-0.403 (1.789)
Asia	-0.263 (2.039)	0.898 (1.934)	0.236 (2.113)	-0.360 (2.070)
Observations	693	693	693	693
Adjusted R ²	0.459	0.529	0.466	0.452
Residual Std. Error (df = 684)	3.461	3.227	3.438	3.482
F Statistic (df = 8; 684)	74.331***	98.344***	76.433***	72.364***

*Winsorized variables based on 5th and 95th percentile

Notes: Notes: See Table 4.

Table 5: Institutional and geographic drivers of entrepreneurship – Direct and indirect effects of geography
(mediator variable: Institutional Quality)

Measure	Model 5.1	Model 5.2	Model 5.3	Model 5.4
Average Causal Mediation Effect	0.950*** [0.000]	0.122*** [0.000]	2.226*** [0.000]	-0.061** [0.044]
Average Direct Effect	0.539 [0.308]	-0.328*** [0.000]	-7.411*** [0.000]	-0.153** [0.016]
Total Effect	1.490** [0.016]	-0.206*** [0.000]	-5.185*** [0.000]	-0.214*** [0.000]
Proportion Mediated	0.638** [0.016]	0.589*** [0.000]	0.429*** [0.000]	0.285*** [0.044]

Notes: These models correspond to Table 4 and use mediation analysis in R (also see Figure 1).

P-values based on 500 Monte Carlo draws for nonparametric bootstrap are in brackets. Asterisks denote significance at the following levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 6: Economic freedom and geographic drivers of entrepreneurship – Baseline models

Dependent variable: Entrepreneurship				
	(6.1)	(6.2)	(6.3)	(6.4)
Economic Freedom	5.329*** (1.472)	5.382*** (1.357)	5.555*** (1.449)	5.326*** (1.427)
Island	-0.027 (2.147)			
Number of Islands		-0.179** (0.081)		
Number of Inhabited Islands			-6.746 (5.582)	
Coastline				0.003 (0.152)
GDP (lag)	-0.647 (1.106)	-0.534 (1.009)	-0.845 (1.094)	-0.648 (1.081)
Education	-0.013 (0.037)	-0.008 (0.035)	-0.009 (0.035)	-0.013 (0.036)
Latitude	8.451 (5.404)	11.119** (5.667)	7.768 (5.754)	8.463 (5.883)
Area	-0.521* (0.309)	-0.463* (0.238)	-0.439* (0.249)	-0.520** (0.252)
Africa_Oceania	3.190 (3.201)	3.580 (2.762)	2.880 (2.885)	3.178 (2.983)
America	-1.885 (2.607)	-1.381 (2.603)	-2.113 (2.676)	-1.891 (2.719)
Asia	0.600 (3.179)	1.126 (3.159)	0.868 (3.135)	0.597 (3.251)
Observations	537	537	537	537
Adjusted R ²	0.484	0.508	0.493	0.484
LM test	403.41*** [0.000]	401.78*** [0.000]	402.80*** [0.000]	403.48*** [0.000]
BP test	48.80*** [0.000]	49.14*** [0.000]	43.33*** [0.000]	45.86*** [0.000]
Residual Std. Error (df = 528)	4.748	4.636	4.709	4.748
F Statistic (df = 8; 528)	56.855***	62.482***	58.803***	56.855***

Notes: See Table 2 for variable details. Each model is estimated using pooled OLS. Constant is included in each model but not reported. Cluster robust standard errors are in parentheses and probability values are in brackets. Asterisks denote significance at the following levels: *** p<0.01, ** p<0.05, * p<0.1.

Table 6a: Economic freedom and geographic drivers of entrepreneurship – Considering interaction terms

Dependent variable: Entrepreneurship				
	(6a.1)	(6a.2)	(6a.3)	(6a.4)
Economic Freedom	5.132*** (1.885)	5.536*** (1.360)	5.653*** (1.400)	5.446*** (1.455)
Island	-4.648 (12.086)			
Number of Islands		5.483** (2.495)		
Number of Inhabited Islands			154.712** (73.429)	
Coastline				2.556 (2.949)
Economic Freedom*Island	0.613 (1.807)			
Economic Freedom* Number of Islands		-0.727** (0.326)		
Economic Freedom* Number of Inhabited Islands			-22.654** (10.712)	
Economic Freedom* Coastline				-0.329 (0.382)
GDP (lag)	-0.744 (1.062)	-0.606 (1.002)	-0.745 (1.063)	-0.603 (1.068)
Education	-0.010 (0.038)	-0.007 (0.035)	-0.009 (0.034)	-0.013 (0.036)
Latitude	8.384 (5.465)	12.197** (5.810)	10.476* (5.887)	9.525 (6.652)
Area	-0.541** (0.276)	-0.480** (0.238)	-0.466* (0.246)	-0.562** (0.270)
Africa_Oceania	3.018 (3.360)	3.901 (2.783)	3.667 (2.860)	3.734 (3.357)
America	-1.863 (2.586)	-0.978 (2.671)	-0.714 (2.928)	-1.234 (3.197)
Asia	0.552 (3.255)	1.411 (3.183)	1.713 (3.208)	0.928 (3.485)
Observations	537	537	537	537
Adjusted R ²	0.484	0.517	0.510	0.486
Residual Std. Error (df = 528)	4.748	4.595	4.628	4.740

F Statistic (df = 8; 528)	51.261***	58.304***	56.734***	51.619***
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Notes: Notes: See Table 4.

Table 6b: Economic freedom and geographic drivers of entrepreneurship – Controlling for outliers

Dependent variable: Entrepreneurship*				
	(6b.1)	(6b.2)	(6b.3)	(6b.4)
Economic Freedom*	3.266*** (0.853)	3.568*** (0.713)	3.740*** (0.832)	3.195*** (0.816)
Island	0.629 (1.404)			
Number of Islands*		-0.00003** (0.00001)		
Number of Inhabited Islands*			-0.001* (0.001)	
Coastline*				0.0001 (0.0001)
GDP (lag)	-0.068 (0.816)	-0.021 (0.724)	-0.355 (0.786)	-0.156 (0.802)
Education	0.011 (0.025)	0.016 (0.024)	0.016 (0.024)	0.012 (0.025)
Latitude	6.865* (3.935)	9.122** (4.040)	6.609* (3.938)	6.620 (4.082)
Area	-0.397* (0.236)	-0.365* (0.201)	-0.364* (0.208)	-0.552** (0.247)
Africa_Oceania	2.960 (2.000)	3.658** (1.796)	3.057 (1.878)	3.036 (1.882)
America	-1.057 (1.817)	-0.404 (1.885)	-0.968 (1.979)	-0.891 (1.862)
Asia	0.004 (2.054)	0.776 (2.044)	0.607 (2.022)	-0.029 (2.049)
Observations	537	537	537	537
Adjusted R ²	0.540	0.575	0.554	0.541
Residual Std. Error (df = 528)	3.239	3.115	3.188	3.234
F Statistic (df = 8; 528)	70.928***	81.447***	75.094***	71.311***

Notes: Notes: See Table 4.

Table 7: Economic freedom and geographic drivers of entrepreneurship – Direct and indirect effects of geography

(mediator variable: Economic Freedom)

Measure	Model 7.1	Model 7.2	Model 7.3	Model 7.4
Average Causal Mediation Effect	0.424	0.013	5.541***	0.143***
	[0.220]	[0.328]	[0.000]	[0.000]
Average Direct Effect	-0.027	-0.179***	-6.746***	0.003
	[0.976]	[0.000]	[0.000]	[0.860]
Total Effect	0.396	-0.166***	-1.205	0.145*
	[0.620]	[0.000]	[0.396]	[0.072]
Proportion Mediated	1.069	0.077	4.599	0.982*
	[0.496]	[0.328]	[0.396]	[0.072]

Notes: These models correspond to Table 6 and use mediation analysis in R (also see Figure 1).

P-values based on 500 Monte Carlo draws for nonparametric bootstrap are in brackets. Asterisks denote significance at the following levels: *** p<0.01, ** p<0.05, * p<0.1.

The possibility of the proportion being greater than one arises when the direct effect and indirect effect have opposite signs.

Table 8: Institutional and geographic drivers of entrepreneurship – IV regressions to account for potential endogeneity

Dependent variable: Entrepreneurship		
	(8.1)	(8.2)
Institutional Quality	24.089*	
	(13.552)	
Economic Freedom		18.450*
		(11.163)
Number of Islands	-0.790**	-0.218
	(0.331)	(0.152)
GDP (lag)	-9.242	-8.558
	(7.398)	(6.650)
Education	-0.187	-0.065
	(0.120)	(0.091)
Latitude	3.368	22.459**
	(12.773)	(9.321)
Area		0.270
		(0.860)
Africa_Oceania	-7.505	2.954
	(7.338)	(5.303)
America	-4.005	-4.873
	(4.770)	(6.812)
Asia	4.849	3.637
	(5.364)	(3.392)
Observations	693	505

First-stage t statistic	5.102***	4.468***
	[0.000]	[0.000]
Residual Std. Error	9.667 (df = 684)	7.542 (df = 495)

Notes: See Table 2 for variable details. Models 9.1 and 9.2 correspond to Models 4.2 and 6.2, respectively, above. Each model is estimated using instrumental variables where Institutional Quality is instrumented using Genetic Distance and Economic Freedom is instrumented using Ex Colony.

Constant is included in each model but not reported. Cluster robust standard errors are in parentheses and probability values are in brackets. Asterisks denote significance at the following levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 1A: Countries used in the analysis

Algeria	Hong Kong SAR, China	Senegal
Antigua and Barbuda	Iceland	Seychelles
Australia	India	Singapore
Azerbaijan	Indonesia	Solomon Islands
Bahrain	Ireland	Spain
Bangladesh	Italy	Sri Lanka
Barbados	Jamaica	St Kitts and Nevis
Brunei Darussalam	Japan	St Lucia
Cabo Verde	Kiribati	St Vincent and the Grenadines
Canada	Korea, Rep	Sweden
Chile	Madagascar	Thailand
China	Maldives	Timor-Leste
Comoros	Malta	Tonga
Croatia	Mauritius	Trinidad and Tobago
Cyprus	Micronesia, Fed Sts	Tuvalu
Denmark	New Zealand	United Kingdom
Dominica	North Macedonia	Vanuatu
Dominican Republic	Norway	
Estonia	Pakistan	
Fiji	Papua New Guinea	
Finland	Peru	
France	Philippines	
Greece	Russian Federation	
Grenada	Samoa	
Haiti	Sao Tome and Principe	

N = 62

Figure 1: Direct and indirect effects of geography on entrepreneurship

