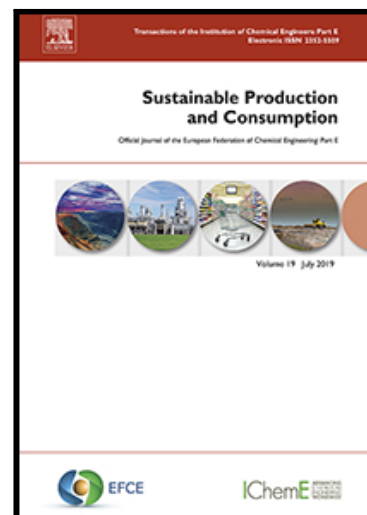


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ENTREPRENEURSHIP AND NATURAL RESOURCE RENTS: EVIDENCE FROM EXCESSIVE
ENTREPRENEURIAL ACTIVITY

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Abstract: This study investigates the impact of excessive entrepreneurial activity on natural resource rents. We employ the ecological perspective to argue that while

entrepreneurship is usually associated with innovation and improved efficiency, and thus reduced natural resource rents, excessive entrepreneurial activity may increase natural resource rents and harm the environment. Investigating a global sample of 70 countries over 11 years (2006–2016) using advanced techniques to address econometric issues, we find initial evidence supporting the natural resource rents of excessive entrepreneurship. We also find heterogeneity between high-income economies (HIEs) and low and middle-income economies (LMEs) as well as between four vital natural resources: coal, gas, forest, and minerals. The findings in this study contribute to the growing literature examining sustainable entrepreneurial ecosystems.

Keywords: Entrepreneurship; excessive start-up; natural resources rents; environment.

JEL code: L26, M13, O13, Q23, N50.

1. Introduction

Entrepreneurship is essential for economic growth (Baumol, 1968, Schumpeter, 1965). This well-established statement, which originated from neo-classical economic theory, implies that more entrepreneurial activity is always better for any economy (Nguyen, 2019, Nguyen et al.). Also, entrepreneurial activity is often found to have strong links with innovation (Fuentelsaz et al., 2018), which plays an important role in securing the long-term survival of the economy by constraining overconsumption and mitigating climate change. However, too much entrepreneurial activity may not be positive, particularly when the number of entrepreneurs exceeds a certain optimal level; Prieger et al. (2016) propose the existence of an optimal level of entrepreneurship in each economy. Entrepreneurial activity, if it exceeds the optimal level, may negatively influence economic growth.

Meanwhile, in another strand of study, the link between economic growth and natural resources has been examined mainly under the “resource curse” hypothesis, which states that nations endowed with abundant natural resources are usually cursed with stagnant economic development (e.g., Africa) (Canh and Thong, 2020). Ben-Salha et al. (2019) provide a model with four explanations for this paradox: (1) the long-term fall of primary product prices; (2) the volatility of commodities price; (3) “Dutch disease”; and (4) institutional weaknesses. This framework helps us understand why excessive natural resources (resource boom) may not always be beneficial to economic growth.

In this respect, recent studies regard opportunistic entrepreneurs (in contrast to social entrepreneurs and sustainable entrepreneurs) as agents that determine the rent-seeking of natural resources (Canh et al., 2020). For example, Torvik (2002) shows that natural resources move productive entrepreneurs into rent-seeking activity, lowering national income and welfare. Murphy et al. (1993), Robinson (1994), and Acemoglu (1995) suggest that initial rent-seeking activity reinforces itself by crowding out productive entrepreneurship from the market. An increase in the number of rent-seekers lowers the returns from both rent-seeking and productive entrepreneurship; however, the effect is greater on the returns from productive entrepreneurship. Baland and Francois (2000)

argue that an increase in natural resources enhances domestic rent-seeking when the initial proportion of agents engaged in rent-seeking is large.

Building on these two strands of literature, our study investigates whether excessive entrepreneurial activity above the optimal level has a negative impact on natural resource rents. The study provides a mechanism through which economic growth from the ecological perspective may be harmed by the presence of too many opportunistic entrepreneurs. The study underscores the point that ecological constraints are a significant problem for economic growth, leading to the need to reconsider the long-held view that the more entrepreneurial activity, the better (Barbier, 2005, Potts et al., 2010).

Specifically, we propose a positive relationship between excessive entrepreneurship and natural resource rents. We acknowledge that entrepreneurship is typically associated with innovation and improved efficiency, and thus contributes to economic growth (Audretsch and Keilbach, 2004). When there are too many small entrepreneurs; however, technological progress stemming from large-scale R&D and scale economies may suffer; this lowers economic efficiency (Prieger et al., 2016). Severe competition requires economic agents, both newcomers and incumbent firms, to secure every opportunity for survival and growth; this makes entrepreneurs more opportunistic, and they pursue higher natural resource rents as a result.

We test our rent-seeking hypothesis by using a global sample of 70 countries for the period 2006-2016. Our empirical settings allow us to control for all relevant econometric issues and so generate consistent and reliable results. We conduct a set of supplemental analyses on two groups of economies: low and middle-income economies (LMEs) and high-income economies (HIEs). We also analyze four natural resources: coal, gas, forest, and minerals.

Empirically, we find a positive association between excessive entrepreneurial activity and natural resource rents. We also find that the natural rent-seeking of excessive entrepreneurship is stronger in HIEs than in LMEs and that the effects are greater on mineral rents and forest rents than on coal rents and gas rents. Thus, we propose that there

is an optimal level of entrepreneurship that balances economic growth and environmental protection.

Our study contributes to the relevant literature in three principal ways. First, it is one of the first studies to investigate the relationship between excessive entrepreneurship and natural resource rents systematically. We combine the entrepreneurship literature with the literature on ecological economics to explain the natural rent-seeking of excessive entrepreneurship. Our study subscribes to Prieger et al. (2016)'s proposition that entrepreneurial activity above the optimal level reduces economic growth.

Second, findings in this study extend the emerging strand of research highlighting the importance of sustainable entrepreneurial ecosystems. Following Ludeke-Freund (2020), we suggest that economic growth should not be seen as the sole ultimate goal of entrepreneurship. A sustainable entrepreneurial ecosystem may lead to slower growth rates or even de-growth. However, the social and environmental benefits obtained from such an ecosystem may be worth pursuing (van Lunenburg et al., 2020).

Third, we carefully examine the heterogeneity associated with HIEs and LMEs, as well as the four types of natural resources. Thus, our findings provide a broad perspective on the impact of excessive entrepreneurship on natural resource rents. Finally, our study puts forward useful suggestions for policymakers who seek to find a balance between boosting entrepreneurship and protecting the environment.

We organize this study as follows. In section 2, we provide the literature review. In section 3, we present the data and the empirical model. In section 4, we first estimate a proxy of excessive entrepreneurship and use the proxy to estimate its impact on natural resource rents. We then discuss the empirical results. In section 5, we conclude the study.

2. Literature Review

The relationship between natural resources and entrepreneurial activity is a controversial topic in the extant literature. Previous studies mainly focus on testing the resource curse hypothesis, which mainly revolves around the question "are nations with high resource rents cursed with reduced entrepreneurial activity?" The empirical findings

against this hypothesis are, unfortunately, mixed and inclusive. For example, Chambers and Munemo (2019) test the hypothesis on 116 countries in the period 2001–2012 and show that nations with substantial natural resource extraction exhibit limited entrepreneurial activity. On the other hand, Ben-Salha et al. (2019), using a sample of top resource-abundant countries in the period 1970–2013, find evidence that the natural resource blessing hypothesis is valid in the long run.

In an endeavour to synthesize the literature, Baland and Francois (2000) propose a theoretical model which states that the influence of natural resources on entrepreneurial activity depends critically on the nature of the equilibrium that existed in the country when resources started to increase. When the initial proportion of agents engaged in entrepreneurship (innovative activities) is large, an increase in the economy's resources increases domestic entrepreneurship. However, when a large proportion of individuals are already engaged in rent-seeking, a resources boom inclines the economy toward more rent-seeking.

Based on previous studies, we argue that resource rent-seeking may increase when there is an excessive number of entrepreneurs in an economy. In other words, when entrepreneurial activity is held at an appropriate level, entrepreneurs will contribute to economic growth by introducing innovations and improving economic efficiency. However, when entrepreneurial activity exceeds the equilibrium level, the forces of competition (among new firms and between new firms and incumbent firms) may outweigh the innovation effect and incentivize entrepreneurs to seek rents from natural resources to gain competitive advantage.

Before establishing the theoretical mechanisms underpinning the expected non-linear relationship between resource rent and entrepreneurship, we first define natural resources and distinguish natural resource rent from Schumpeterian rent, which are the key concepts of our theoretical framework.

Natural resources are defined by the World Trade Report as “stocks of materials that exist in the natural environment that are both scarce and economically useful in the production or consumption, either in their raw state or after a minimal amount of

processing” (Report, 2010). The notion of rent was developed by Tullok to indicate that an entity seeks to gain added wealth without any reciprocal contribution of productivity (Tulloch, 1967).ⁱ In this study, we use the term natural resource rent or resource rent to indicate the abuse of natural resources by entrepreneurs seeking private gain (e.g., profits, business survival, or growth) without adequately contributing to the economy by introducing innovations and improving efficiency.

In contrast, Schumpeterian rent, defined as “the additional value that results from a new combination of resources (including new modes of organization) that an entrepreneur may have undertaken” (Sautet, 2013). Schumpeterian rent can be seen as abnormal profits that entrepreneurs earn from their venture activities and is the driving force behind the process of creative destruction (Danneels, 2012). Nonetheless, Schumpeterian rent is transient by nature, in the sense that it arises only in situations of disequilibrium when the economy shifts from the old modes to new modes. Once the market settles into a new equilibrium, these rents disappear (Sautet, 2013).

Entrepreneurs who aim to acquire Schumpeterian rent will try to push the economy out of its current equilibrium by introducing new products to replace older ones. This process of creative destruction is usually associated with innovation, new business models, and improved efficiency, which lead to reduced natural resource rent (Stephan et al., 2015). However, it is noteworthy that, according to ecological economics, production and consumption are fundamentally a linear function of raw material (Chambers and Munemo, 2019, Barbier, 2005)¹ As such, economic activities will ultimately induce amplified resource rents, i.e., an increase in the contributions (in the absolute values) of coal, mineral, gas, and forest in GDP (Behrens et al., 2007). This amplified resource rent effect may outweigh the creative destruction effect, especially when there is an excessive number of entrepreneurs in an economy, for the following reasons.

First, facing severe competition, entrepreneurs may become more opportunistic and driven by rent-seeking to secure survival and growth opportunities for their business ventures (Prieger et al., 2016). Baumol (2004) emphasizes that entrepreneurship should

¹ Along with other neoclassical factors, such as labour and capital.

not be equated to virtuous behaviour: “because we recognize that entrepreneurship can bring innovation and growth, we are misled into thinking that it must always contribute to economic abundance and expansion.” In fact, the ultimate goal of entrepreneurs is the acquisition and accumulation of wealth, power, and prestige, with innovation used as a primary weapon (Lafuente et al., 2018).

When there are excessive numbers of entrepreneurs, severe competition may significantly increase the marginal costs of capital and labour, leading to reduced profit margins (Prieger et al., 2016, Lafuente et al., 2018). Entrepreneurs are thus incentivized to extract more natural resources (either directly or indirectly), whose marginal cost may increase at a slower pace compared to capital and labour. An example of indirect natural resource-seeking behaviour is that in highly competitive environments, entrepreneurs may seek lower-priced inputs and materials. In response to this pressure, their suppliers may adopt natural rent-seeking strategies to meet the requirements of their clients. The reason for the relatively low marginal cost of natural resources is primarily due to government policies aimed at keeping resources accessible to domestic producers at affordable prices to secure nations’ economic health and boost economic development (Haas, 2011).

In such circumstances, entrepreneurs may come up with business models that rely less on high-skilled human capital (the cost of hiring employees increases in severe competition) or on low value-added technology (the cost of funding R&D investments increases in severe competition), and employ lower-priced, easy-accessed natural resources to make profits (Cressy, 1992, Chell, 2000). Thus, seeking rent from natural resources could be regarded as a feasible strategy under situations of acute competition.

The second reason is that excessive entrepreneurship not only affects newcomers but also influences the behaviour of incumbent firms (Bretschger, 2005). With severe competition and a large number of newly-established firms whose operations are more flexible and efficient, incumbent firms may become more opportunistic in resource rent-seeking behaviour to secure their market positions (Buenstorf, 2016). Specifically, Prieger et al. (2016) investigating a global sample show that when there are too many small businesses, competition in the economy will suffer, with an attendant loss of efficiency in

the sense that technological progress stemming from large-scale R&D will become stagnant. Since R&D takes time and is associated with substantial opportunity costs, incumbent firms may decide to direct their investments toward short-term, low-cost but resource-consuming technology as a “quick and easy” competition strategy (Wennekers and Thurik, 1999). Thus, following Torvik (2002), we argue that the effects of excessive competition may outweigh the direct positive effects of improved efficiency and innovation.

Third, entrepreneurship is a (novel) production process that needs natural inputs. Excessive entrepreneurial activity will, therefore, lead to the increased usage of natural resources in the economy. Potts et al. (2010) hold an optimistic viewpoint that increasing environmental damage or the onset of an impending ecological collapse may present entrepreneurial opportunities. We, however, argue that negative externalities (e.g., resource rents) cannot be removed entirely by entrepreneurial actions, especially in situations of severe competition (Schumpeter, 1965, Torvik, 2002). The reason is that entrepreneurs, at the individual level, have no incentive to consider the “big picture” of the natural resource extraction in the economy; their ultimate objective is to maximize Schumpeterian rents and leave the issue of negative externalities to their government (McMullen et al., 2008). Also, Estapé-Dubreuil et al. (2016) find that firms focusing too closely on environmental issues (at the same time as social issues) are significantly inferior in attracting financial investors. Thus, entrepreneurs facing fierce competition have a strong motivation to seek natural resource rents. This undesirable behaviour may overshadow their contribution to the economy.

In sum, we expect entrepreneurial activity to exert a non-linear (U-shaped) effect on a nation’s natural resource rents. Specifically, there is an optimal level of entrepreneurship in an economy; entrepreneurial activity exceeding this threshold may incentivize economic agents (both new and incumbent) to seek rents from natural resources to secure the survival and growth of their business.

3. Data and Empirical Model

Empirical Model

Since the aim of this study is to examine the effects of excessive entrepreneurship on natural resources rents, we adopt a baseline empirical model of natural resource rents as follows:

$$[1]$$

where R , Y , Inv , U and FDI represent natural resource rents, national income, new investments, urbanization and foreign direct investment, respectively.

The baseline model includes economic development (Y) and its vitality (Inv) to account for natural resource rents because economic development is one of the main drivers and economic activities consume natural resources (e.g., Abdulahi et al. (2019)). In terms of social factors, urbanization represents a change in living standards and social structure. Urbanization requires heavy use of natural resources, such as cement, steel, aluminium, and coal, thereby increasing natural resource rents (Shen et al., 2005). Urbanization is usually associated with industrialization processes, which lead to a higher demand for natural resources (Mudakkar et al., 2013). Meanwhile, trade openness and FDI inflows are a proxy for economic integration (Hajzler, 2014, Ndikumana and Sarr, 2019, Phuc Nguyen et al., 2019), which may exert either a negative or positive impact on natural resource rents through the pollution haven or pollution halo hypotheses (Phuc Nguyen et al., 2019). Finally, the square term of the income level is added into the model to control for the environmental Kuznets curve (EKC) hypothesis, which proposes a non-linear relationship between economic development and environmental degradation.

To investigate the influence of excessive entrepreneurial activity on natural resources rents, we add a set of dummy variables (DUM) representing excessive entrepreneurship to the baseline model. The empirical model is as follows:

[2]

Data

We collect the new business density (new registrations per 1,000 people ages 15-64) from World Development Indicators (WDIs – World Bank) and take logarithms as a proxy for entrepreneurial activity. This entrepreneurship rate is employed in the next paragraph to estimate the level of excessive entrepreneurship, which is the level of entrepreneurial activity that exceeds the optimal level of entrepreneurship in an economy. We should, in principle, identify the optimal level of entrepreneurship for every economy. Although there is no consensus in the literature on what is the optimal level of entrepreneurship, Prieger et al. (2016) completed one of the most critical studies on this topic, proposing that a country will suffer a “growth penalty” when entrepreneurship deviates from its optimal level. Prieger et al. (2016) put forward the following equation:

$$\ln y_{it} = \alpha + \beta \ln y_{it}^* + \gamma TEA_{it} + \delta TEA_{it}^* + \epsilon_i + \eta_{it} \quad [3]$$

in which i and t denote country i in year t , respectively; y is national output and y^* is national output at optimal entrepreneurship; TEA is total entrepreneurship rate and TEA^* is the optimal level of entrepreneurship rate; ϵ_i is a country-specific term, and η_{it} is the residual term. From the equation, we can extrapolate the optimal level of entrepreneurship as follows:

$$\ln y_{it}^* = \frac{\ln y_{it} - \alpha - \gamma TEA_{it} - \delta TEA_{it}^* - \epsilon_i - \eta_{it}}{\beta} \quad [4]$$

in which $(\ln y_{it} - \alpha - \gamma TEA_{it} - \delta TEA_{it}^* - \epsilon_i - \eta_{it})$ represents the output gap in the economic literature (Orphanides and Norden, 2002). To limit the feedback effect from entrepreneurship on economic growth (Galindo and Méndez, 2014), which would lead to the problem of endogeneity, the study further transforms Eq. [4] by using a one-year lag of output gap in empirical estimation:

$$\ln y_{it}^* = \frac{\ln y_{it-1} - \alpha - \gamma TEA_{it-1} - \delta TEA_{it-1}^* - \epsilon_i - \eta_{it-1}}{\beta} \quad [5]$$

Table5. Excessive entrepreneurship and natural resources ~~in~~ and middle income economies (LMEs)

Dep. var: <i>NRR</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Income	-4.994*** [1.506]	-5.405*** [1.562]	-7.521*** [2.039]	-6.236*** [2.096]	-6.073*** [1.834]	-7.234*** [1.618]	-7.078*** [1.631]	-7.081*** [1.631]	-6.599*** [1.739]	-1.626 [2.211]
Income^2	0.335*** [0.096]	0.374*** [0.098]	0.485*** [0.121]	0.408*** [0.125]	0.408*** [0.109]	0.482*** [0.096]	0.473*** [0.096]	0.472*** [0.097]	0.440*** [0.103]	0.105 [0.134]
DUM1	1.341* [0.705]	1.209* [0.645]	1.203* [0.640]	1.206* [0.636]	1.075* [0.627]					
DUM2						0.484 [0.689]				
DUM3							0.475 [0.706]			
DUM4								0.333 [0.588]		
DUM5									0.854 [0.567]	
DUM6										3.739*** [0.386]
Cap		0.000 [0.037]	0.010 [0.037]	0.014 [0.038]	-0.028 [0.038]	-0.025 [0.037]	-0.025 [0.037]	-0.024 [0.037]	-0.026 [0.037]	-0.058 [0.041]
Urban			0.023*** [0.007]	0.021*** [0.007]	0.005 [0.009]	0.006 [0.007]	0.006 [0.007]	0.006 [0.007]	0.007 [0.008]	0.030*** [0.007]
Trade				-0.008** [0.004]	-0.020*** [0.005]	-0.020*** [0.005]	-0.020*** [0.005]	-0.020*** [0.005]	-0.020*** [0.005]	-0.029*** [0.006]
FDI					0.345*** [0.094]	0.348*** [0.094]	0.347*** [0.095]	0.354*** [0.095]	0.345*** [0.093]	0.325*** [0.080]
Cons.	22.768*** [6.003]	23.407*** [6.675]	31.709*** [8.470]	26.993*** [8.655]	27.314*** [7.597]	31.986*** [6.776]	31.339*** [6.836]	31.465*** [6.792]	29.467*** [7.230]	10.158 [8.818]
Observations	396	392	392	392	392	392	392	392	392	392
R-squared	0.020	0.024	0.026	0.028	0.054	0.046	0.046	0.046	0.050	0.145
No. of countries	36	36	36	36	36	36	36	36	36	36

Note: standard errors are in []; *, **, *** are significant levels at 10%, 5%, and 1%, respectively.

Appendix

Table A1. List of countries

34 High income economies (HIEs)				
Australia	Denmark	Israel	New Zealand	Slovenia
Austria	Estonia	Italy	Norway	Spain
Belgium	Finland	Korea, Rep.	Panama	Sweden
Chile	France	Latvia	Poland	Switzerland
Croatia	Germany	Lithuania	Portugal	United Kingdom
Cyprus	Hungary	Luxembourg	Singapore	Uruguay
Czech Republic	Ireland	Netherlands	Slovak Republic	
36 Low and middle income economies (LMEs)				
Albania	India	Mauritius	Pakistan	Senegal
Armenia	Indonesia	Mexico	Paraguay	South Africa
Bolivia	Jamaica	Moldova	Peru	Tajikistan
Botswana	Jordan	Morocco	Philippines	Thailand
Brazil	Kazakhstan	Namibia	Romania	Turkey
Costa Rica	Kyrgyz Republic	Nepal	Russian Federation	Ukraine
Dominican Republic	Malaysia	Nigeria	Rwanda	Zambia
El Salvador				
Mean (Standard deviation) for subsamples				
Variable	High income economies		Low and middle-income economies	
NRR	1.47	(3.36)	5.35	(5.70)
CoalR	0.08	(0.29)	0.29	(0.77)
MineR	0.70	(2.88)	2.09	(3.19)
GasR	0.16	(0.46)	0.48	(0.94)
ForestR	0.20	(0.31)	0.77	(1.26)
Income	10.31	(0.64)	8.16	(0.87)
Cap	23.52	(5.26)	25.30	(6.26)
Urban	75.82	(12.81)	54.85	(17.87)
Trade	116.2	(73.7)	76.21	(32.08)
FDI	8.26	(20.97)	3.83	(2.98)
EnDen	1.42	(0.88)	-0.03	(1.26)

Notes: Number of observations are 374 and 396 for HIEs and LMEs, respectively.

Table A2. Excessive entrepreneurship and coal rents, mineral rents

Model:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dep. Var:	<i>CoalR</i>						<i>MineR</i>					
Income	0.646*** [0.063]	0.647*** [0.063]	0.646*** [0.064]	0.646*** [0.064]	0.647*** [0.063]	0.626*** [0.057]	-1.009*** [0.351]	-1.003*** [0.343]	-1.032*** [0.361]	-1.034*** [0.362]	-1.054*** [0.358]	-1.267*** [0.382]
Income^2	-0.035*** [0.004]	-0.035*** [0.004]	-0.035*** [0.004]	-0.035*** [0.004]	-0.035*** [0.004]	-0.034*** [0.003]	-0.002 [0.017]	-0.001 [0.017]	-0.001 [0.018]	-0.001 [0.018]	0.001 [0.018]	0.012 [0.019]
DUM1	-0.011 [0.036]						0.523*** [0.150]					
DUM2		-0.008 [0.041]						0.578*** [0.167]				
DUM3			-0.025 [0.039]						0.487*** [0.153]			
DUM4				-0.019 [0.033]						0.525*** [0.152]		
DUM5					-0.019 [0.035]						0.517*** [0.154]	
DUM6						0.083*** [0.018]						0.769*** [0.185]
Cap	0.012*** [0.002]	0.012*** [0.002]	0.012*** [0.002]	0.012*** [0.002]	0.012*** [0.002]	0.011*** [0.002]	0.074*** [0.016]	0.071*** [0.016]	0.073*** [0.016]	0.074*** [0.016]	0.074*** [0.016]	0.075*** [0.016]
Urban	-0.002*** [0.000]	-0.002*** [0.000]	-0.002*** [0.000]	-0.002*** [0.000]	-0.002*** [0.000]	-0.002*** [0.000]	0.060*** [0.004]	0.059*** [0.004]	0.060*** [0.004]	0.060*** [0.004]	0.060*** [0.004]	0.062*** [0.004]
Trade	-0.001*** [0.000]	-0.001*** [0.000]	-0.001*** [0.000]	-0.001*** [0.000]	-0.001*** [0.000]	-0.001*** [0.000]	-0.006*** [0.001]	-0.006*** [0.001]	-0.006*** [0.001]	-0.006*** [0.001]	-0.006*** [0.001]	-0.006*** [0.001]
FDI	0.001 [0.001]	0.001 [0.001]	0.001 [0.001]	0.001 [0.001]	0.001 [0.001]	0.001 [0.001]	0.011** [0.005]	0.011** [0.005]	0.011** [0.005]	0.011** [0.005]	0.011** [0.005]	0.010** [0.005]
Cons.	-2.726*** [0.259]	-2.729*** [0.259]	-2.719*** [0.263]	-2.724*** [0.259]	-2.727*** [0.258]	-2.681*** [0.231]	5.295*** [1.545]	5.304*** [1.514]	5.388*** [1.584]	5.403*** [1.588]	5.482*** [1.569]	6.187*** [1.567]
Observations	766	766	766	766	766	766	766	766	766	766	766	766
R-squared	0.047	0.046	0.047	0.047	0.047	0.051	0.151	0.152	0.149	0.151	0.150	0.160
No. of countries	70	70	70	70	70	70	70	70	70	70	70	70

Note: standard errors are in []; *, **, *** are significant levels at 10%, 5%, and 1%, respectively.

Table A3. Excessive entrepreneurship and natural gas rents, forest rents

Model:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dep. Var:	<i>GasR</i>						<i>ForestR</i>					
Income	-0.283*** [0.081]	-0.281*** [0.082]	-0.282*** [0.082]	-0.285*** [0.081]	-0.285*** [0.081]	-0.359*** [0.091]	-2.004*** [0.076]	-2.005*** [0.074]	-2.008*** [0.074]	-2.006*** [0.076]	-2.008*** [0.075]	-2.075*** [0.077]
Income^2	0.010** [0.004]	0.010** [0.004]	0.010** [0.004]	0.010** [0.004]	0.010** [0.004]	0.014*** [0.005]	0.095*** [0.004]	0.095*** [0.004]	0.095*** [0.004]	0.095*** [0.004]	0.095*** [0.004]	0.099*** [0.004]
DUM1	0.021 [0.057]						0.049 [0.056]					
DUM2		0.034 [0.055]						0.040 [0.056]				
DUM3			0.049 [0.049]						0.019 [0.051]			
DUM4				-0.003 [0.052]						0.049 [0.056]		
DUM5					-0.001 [0.051]						0.042 [0.056]	
DUM6						0.284*** [0.047]						0.251*** [0.031]
Cap	-0.015*** [0.003]	-0.016*** [0.003]	-0.016*** [0.004]	-0.015*** [0.003]	-0.015*** [0.003]	-0.016*** [0.004]	-0.018*** [0.005]	-0.018*** [0.005]	-0.018*** [0.005]	-0.018*** [0.005]	-0.018*** [0.005]	-0.018*** [0.005]
Urban	0.007*** [0.001]	0.007*** [0.001]	0.007*** [0.001]	0.007*** [0.001]	0.007*** [0.001]	0.008*** [0.001]	-0.002*** [0.000]	-0.002*** [0.000]	-0.001*** [0.000]	-0.002*** [0.000]	-0.002*** [0.000]	-0.001** [0.000]
Trade	-0.001*** [0.000]	-0.001*** [0.000]	-0.001*** [0.000]	-0.001*** [0.000]	-0.001*** [0.000]	-0.001*** [0.000]	-0.000*** [0.000]	-0.000*** [0.000]	-0.000*** [0.000]	-0.000*** [0.000]	-0.000*** [0.000]	-0.000*** [0.000]
FDI	-0.000 [0.001]	-0.000 [0.001]	-0.000 [0.001]	-0.000 [0.001]	-0.000 [0.001]	-0.001 [0.001]	-0.002** [0.001]	-0.002** [0.001]	-0.002** [0.001]	-0.002** [0.001]	-0.002** [0.001]	-0.002** [0.001]
Cons.	2.108*** [0.421]	2.100*** [0.423]	2.093*** [0.421]	2.125*** [0.420]	2.123*** [0.419]	2.307*** [0.437]	11.284*** [0.373]	11.294*** [0.365]	11.309*** [0.367]	11.294*** [0.375]	11.304*** [0.372]	11.483*** [0.365]
Observations	766	766	766	766	766	766	766	766	766	766	766	766
R-squared	0.040	0.041	0.041	0.040	0.040	0.074	0.222	0.222	0.222	0.222	0.222	0.239
No. of countries	70	70	70	70	70	70	70	70	70	70	70	70

Note: standard errors are in []; *, **, *** are significant levels at 10%, 5%, and 1%, respectively.

Table A4. Excessive entrepreneurship and oil rents in full sample

Dep. var: <i>NRR</i>	(1)	(2)	(3)	(4)	(5)	(6)
Income	6.314*** [0.601]	6.307*** [0.604]	6.346*** [0.560]	6.321*** [0.607]	6.322*** [0.609]	4.961*** [0.542]
Income^2	-0.345*** [0.033]	-0.345*** [0.033]	-0.347*** [0.031]	-0.346*** [0.033]	-0.346*** [0.034]	-0.271*** [0.030]
DUM1	0.072 [0.279]					

DUM2		0.094				
		[0.294]				
DUM3			0.251			
			[0.288]			
DUM4				0.032		
				[0.292]		
DUM5					0.019	
					[0.283]	
DUM6						1.580***
						[0.326]
Cap	-0.023	-0.023	-0.024	-0.023	-0.022	-0.029*
	[0.017]	[0.017]	[0.017]	[0.017]	[0.017]	[0.017]
Urban	-0.033***	-0.034***	-0.034***	-0.033***	-0.033***	-0.032***
	[0.004]	[0.004]	[0.004]	[0.004]	[0.004]	[0.004]
Trade	-0.019***	-0.019***	-0.019***	-0.019***	-0.019***	-0.019***
	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]
FDI	0.033***	0.032***	0.031***	0.033***	0.033***	0.023***
	[0.010]	[0.010]	[0.011]	[0.010]	[0.010]	[0.009]
Cons.	-22.494***	-22.463***	-22.689***	-22.508***	-22.511***	-17.219***
	[2.108]	[2.134]	[1.932]	[2.127]	[2.130]	[2.190]
Observations	495	495	495	495	495	495
R-squared	0.065	0.065	0.066	0.065	0.065	0.115
No. of countries	45	45	45	45	45	45

Note: standard errors are in []; *, **, *** are significant levels at 10%, 5%, and 1%, respectively.

Supplementary materials

Table S1. Excessive entrepreneurship and natural resources rents robustness check with institutional quality as control variable

Dep. var: <i>NRR</i>	(1)	(2)	(3)	(4)	(5)	(6)
Income	-1.684***	-1.686***	-1.712***	-1.727***	-1.761***	-2.434***
	[0.484]	[0.482]	[0.505]	[0.492]	[0.488]	[0.564]
Income ²	0.117***	0.120***	0.119***	0.120***	0.122***	0.158***
	[0.025]	[0.026]	[0.027]	[0.026]	[0.026]	[0.034]
DUM1	0.811**					
	[0.342]					
DUM2		0.898**				
		[0.384]				
DUM3			0.827**			
			[0.362]			
DUM4				0.727**		
				[0.333]		

DUM5					0.734**	
					[0.327]	
DUM6						2.564***
						[0.370]
Cap	0.053**	0.048*	0.051*	0.053**	0.053**	0.048*
	[0.026]	[0.026]	[0.026]	[0.026]	[0.026]	[0.027]
Urban	0.050***	0.048***	0.050***	0.050***	0.049***	0.055***
	[0.003]	[0.004]	[0.003]	[0.003]	[0.003]	[0.003]
Trade	-0.013***	-0.013***	-0.013***	-0.013***	-0.013***	-0.013***
	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]
FDI	0.010**	0.010*	0.010*	0.010**	0.010**	0.006
	[0.005]	[0.005]	[0.005]	[0.005]	[0.005]	[0.005]
Inst	-3.119***	-3.139***	-3.115***	-3.117***	-3.127***	-3.110***
	[0.356]	[0.354]	[0.353]	[0.358]	[0.357]	[0.367]
Cons.	6.274***	6.291***	6.374***	6.489***	6.592***	8.543***
	[2.217]	[2.166]	[2.291]	[2.236]	[2.214]	[2.052]
Observations	766	766	766	766	766	766
R-squared	0.179	0.18	0.179	0.178	0.178	0.238
No. of countries	70	70	70	70	70	70

Note: standard errors are in []; *, **, *** are significant levels at 10%, 5%, and 1%, respectively.

Table S2. Excessive entrepreneurship and natural resources: robustness check with institutional quality as control variable

Dep. var: <i>NRR</i>	(1)	(2)	(3)	(4)	(5)	(6)
Income	-52.671*** [2.742]	-51.702*** [2.613]	-51.934*** [2.450]	-51.935*** [2.619]	-52.196*** [2.442]	-52.015*** [2.537]
Income ²	2.452*** [0.133]	2.406*** [0.127]	2.416*** [0.118]	2.418*** [0.127]	2.428*** [0.118]	2.417*** [0.122]
DUM1	0.823** [0.371]					
DUM2		0.587* [0.305]				
DUM3			0.712** [0.326]			
DUM4				0.798** [0.352]		
DUM5					0.595* [0.339]	
DUM6						0.854*** [0.318]
Cap	0.039*** [0.015]	0.034** [0.014]	0.031** [0.013]	0.035*** [0.013]	0.038*** [0.014]	0.048** [0.019]
Urban	0.050*** [0.005]	0.051*** [0.005]	0.051*** [0.005]	0.050*** [0.005]	0.051*** [0.005]	0.057*** [0.005]
Trade	-0.016*** [0.001]	-0.016*** [0.001]	-0.016*** [0.001]	-0.017*** [0.001]	-0.017*** [0.001]	-0.016*** [0.001]
FDI	0.002 [0.003]	0.002 [0.003]	0.002 [0.003]	0.002 [0.003]	0.002 [0.003]	0.002 [0.003]
Inst	3.433*** [0.234]	3.383*** [0.228]	3.440*** [0.245]	3.419*** [0.242]	3.443*** [0.239]	3.456*** [0.275]
Cons.	275.588*** [13.817]	270.663*** [13.219]	271.933*** [12.394]	271.727*** [13.204]	273.283*** [12.308]	271.702*** [12.561]
Observations	374	374	374	374	374	374
R-squared	0.307	0.300	0.303	0.306	0.300	0.308
No. of countries	34	34	34	34	34	34

Note: standard errors are in []; *, **, *** are significant levels at 10%, 5%, and 1%, respectively.

Table S3. Excessive entrepreneurship and natural resources rents (DUMs as control variables)

Dep. var: <i>NRR</i>	(1)	(2)	(3)	(4)	(5)	(6)
Income	-2.909* [1.705]	-4.016** [1.653]	-3.808** [1.631]	-3.821** [1.621]	-3.376** [1.665]	0.650 [1.983]
Income ²	0.351*** [0.103]	0.423*** [0.100]	0.410*** [0.099]	0.410*** [0.097]	0.380*** [0.101]	0.096 [0.111]
DUM1	1.057* [0.563]					
DUM2		0.678 [0.596]				
DUM3			0.651 [0.584]			
DUM4				0.454 [0.528]		
DUM5					0.892* [0.496]	
DUM6						3.308*** [0.344]
Cap	0.013 [0.036]	0.015 [0.035]	0.016 [0.035]	0.017 [0.035]	0.015 [0.035]	-0.016 [0.040]
Urban	-0.025*** [0.008]	-0.024*** [0.007]	-0.024*** [0.007]	-0.024*** [0.007]	-0.023*** [0.007]	0.000 [0.007]
Trade	-0.002 [0.004]	-0.001 [0.004]	-0.002 [0.004]	-0.002 [0.004]	-0.002 [0.004]	-0.011** [0.005]
FDI	0.343*** [0.092]	0.342*** [0.091]	0.340*** [0.091]	0.350*** [0.094]	0.343*** [0.092]	0.327*** [0.079]
Inst	-5.679*** [0.599]	-5.728*** [0.608]	-5.720*** [0.610]	-5.703*** [0.612]	-5.696*** [0.596]	-5.213*** [0.651]
Cons.	3.055 [7.441]	7.328 [7.226]	6.486 [7.176]	6.733 [7.184]	4.926 [7.277]	-9.647 [8.949]
Observations	392	392	392	392	392	392
R-squared	0.188	0.182	0.182	0.181	0.185	0.256
No. of countries	36	36	36	36	36	36

Note: standard errors are in []; *, **, *** are significant levels at 10%, 5%, and 1%, respectively.

¹ This meaning of rent or rent-seeking should be distinguished from Ricardian rent, which is a surplus earning above the costs necessary to till a scarce and fertile land. Even though being used to indicate inefficiency, Ricardian rent is seen as being "above-normal earnings" that remain even if the

economy is in equilibrium SAUTET, F. 2013. Local and systemic entrepreneurship: solving the puzzle of entrepreneurship and economic development. *Entrepreneurship: Theory and Practice*, 387..

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