Entrepreneurship and the Shadow (Informal) Economy

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Abstract

In this paper, we investigate the empirical relationship between entrepreneurship and the shadow economy size. To this end, we use cross-country data and most-frequently-used measure of the entrepreneurial activity, i.e., Global Entrepreneurship Index (GEI), as well as its subindices, and calculate correlations of these indices with the size of the informal sector and its major determinants. Our analysis indicates that there are significant correlations between the variables involved.

Keywords: Entrepreneurship, shadow economy, cross-country data

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I. Introduction

In this paper, we investigate the relationship between the size of the shadow economy and entrepreneurship. We use statistical measures of both variables as well as of different determinants of the shadow economy size, including corruption control, GDP per-capita, and bureaucratic quality. Our correlation analysis shows that there are significant correlations between the variables involved.

There is a vast literature documenting or theorizing the possible relationship between entrepreneurship and informal sector size. In one such study, according to Estrin and Mickiewicz. (2012), there is a positive correlation between the size of the informal economy and the ease of entry to entrepreneurial activity. There is no linear relationship observed between the effect of shadow economy on entrepreneurial entry. Moreover, there is a U-shaped correlation which suggests that likelihood of entrepreneurial entry is at its lowest when the informal economy is approximately a quarter of GDP.

In the existing literature, some studies investigate the relationship between shadow economy and entrepreneurial entry regionally. The article “Entrepreneurship In the Shadow Economy: The Case Study of Russia and Ukraine” by Markina, Sharkova et al. (2018) mentions that informal economy influences significant factors prior to specific and particular regions. For example, while the average index of the shadow economy is 18% for OECD countries, it is 37% for transition economies. Shadow economy sizes increase as a result of high levels of taxes, regulations, and corruption. Moreover, socio-political factors also have an effect on the informal economy. Another regional study was done by Mroz (2012). The article “Entrepreneurship in the shadow: faces and variations of Poland’s informal economy” states that Poland's market

economy and entrepreneurial entry rose towards the close of the last century. However, these initiatives transferred to the informal economic sector from public virtue by the new unregistered income-earning structure and unofficial labor market. This study reveals the latest findings for the growing shadow economy in Poland. In the article "Entrepreneurship, corruption, and the size of US underground economies," Wiseman (2015) introduces the correlation between informal economic activity and entrepreneurial entry in the United States. By using data on productive and unproductive entrepreneurship, shadow economy size, and public corruption. Results from OLS regressions display that informal economy size is strongly negatively associated with productive entrepreneurship. Moreover, findings suggest corruption is an essential measurement for the size of the shadow economy.

Other than existing literature on informality and entrepreneurship, "Evaluating entrepreneurs in the shadow economy: economic or social entrepreneurship?" an article by Williams and Nadin (2011a) brings up the social entrepreneurship concept. The study reports that unofficial and off-the-books entrepreneurial activity is growing and expanding its size in the economy. The reasons behind entrepreneurs engaging in the shadow economy are based on two distinctive factors. A substantial portion of entrepreneurs pursues profit or social logic. In this regard, this paper concentrates on the understanding of the profound logic of shadow entrepreneurs. The article "Innovation and Underground Entrepreneurship" by Goel, Zhang et al. (2015) states the effect of innovation on informal entrepreneurship and the overall shadow economy. Measures innovative activity based on patent applications and suggests that it supports the informal economy. However, any significant relationship between the impacts of innovation and the shadow economy could not be found. The study indicates that government initiatives such as wages or

taxes are ineffective in preventing the underground sector. The article “Theorising the hidden enterprise culture: the nature of entrepreneurship in the shadow economy” by Williams and Nadin (2011b) represents theories that are different models for entrepreneurship in the informal economy are modernization theory, structuralist theory, neo-liberal theory, post-structuralist theory. The results of 861 face-to-face interviews in England demonstrate that none of the models are universally valid. Instead, all models are applicable in the forms of complex and particular structures of the shadow economy.

Building upon this literature, we believe that an empirical study on the relationship between different measures of entrepreneurship and informal sector size and its determinants is very much needed.

The rest of the paper is organized as follows: The following section introduces the data and the empirical method we are using. In section 3, we present the results of our correlation analysis. Finally, the last section provides some concluding remarks.

II. Data and Methods

In our statistical analysis, we use several different variables. As for measures of entrepreneurship, we use the most frequently used measure in the literature and its subindices. The main index, GEI, is an economic activity measure that quantifies the quality of the entrepreneurship ecosystem in each country in terms of 14 different indicators. The first one of these, the Opportunity Perception, demonstrates the existing possibilities and potentials for entrepreneurial activities. Next, Startup Skills evaluates the capabilities necessary for the

foundation of startups. Risk acceptance combines the measurement of a fear of failure for entrepreneurial actions in a population along with existing risks. Networking illustrates the ability of communication and mobilization for entrepreneurial opportunities. Cultural Support shows the perspective and view of a given country's citizens to entrepreneurship in general. Opportunity Startup is interested in measuring the level of attempts and desires to achieve a better entrepreneurial ecosystem. Technology absorption captures the prevalence of technology in existing and potential startups as well as the development of technological operations. Human Capital calculates the quality of entrepreneurs in terms of their secondary education and the labor market situation. Competition assesses the market power of businesses along with the differentiation of companies to produce unique products. Product Innovation focuses on companies' willingness to produce new products by the use of technology. High Growth captures the intention of high-growth businesses to employ at least 10 employees as well as planning to grow 50% at least in 5 years. Internationalization analyzes the globalization of entrepreneurs along with their internationalized economic activities. As a final subindex, Risk Capital combines the informal investment made in the foundation of startups and the availability of risks in the capital market. All these indices are obtained for all years between 2006 and 2016 from the Global Entrepreneurship and Development Institute based in the USA.

As for the measure of informality, we rely on the method developed by Elgin and Oztunali (2012). Again, we obtain data for which we have data for GEI and its subindices. Finally, as for the determinants of informality, we use the corruption control, bureaucratic quality, and law and order indices which were obtained from the PRS Groups International Country Risk Guide. Finally, GDP per-capita is obtained from Penn World Tables 10.0.

Table 1. Descriptive Summary Statistics

Variable	Mean	Median	Standard Deviation	Minimum	Maximum
Informal sector size (% GDP) in 2016	0.270	0.268	0.117	0.079	0.637
Corruption Control	2.924864	2.5	1.1871619	1	6
Bureaucratic Quality	2.578025	2.5	0.9622381	0	4
Law and Order	3.929158	4	1.2690311	1	6
GDP per-capita	26376.57	22536.62	17697.35	725.73	120860.07
1. Opportunity Perception	0.471	0.403	0.255	0.057	1.000
2. Startup Skills	0.473	0.437	0.270	0.012	1.000
3. Risk Acceptance	0.473	0.440	0.306	0.014	1.000
4. Networking	0.470	0.433	0.225	0.036	1.000
5. Cultural Support	0.471	0.374	0.265	0.054	1.000
6. Opportunity Startup	0.472	0.390	0.275	0.028	1.000
7. Technology Absorption	0.472	0.439	0.284	0.004	1.000
8.Human Capital	0.472	0.428	0.251	0.022	1.000
9. Competition	0.471	0.383	0.253	0.055	1.000
10. Product Innovation	0.470	0.450	0.272	0.001	1.000
11. Process Innovation	0.470	0.430	0.288	0.024	1.000
12. High Growth	0.471	0.446	0.250	0.021	1.000
13. Internationalization	0.472	0.466	0.286	0.004	1.000
14. Risk Capital	0.472	0.437	0.285	0.029	1.000
GEI	42.395	37.363	19.171	11.621	90.231

Table 1 provides descriptive summary statistics of all variables used in the analysis. Accordingly, all variables exhibit significant standard deviation that would make them fit to be included in a statistical analysis.

Our statistical analysis is based on simple correlation analysis. In the next section, we provide both correlations as well as several scatter plots between different variables.

III. Results

In this section, we present results of our correlation analysis.

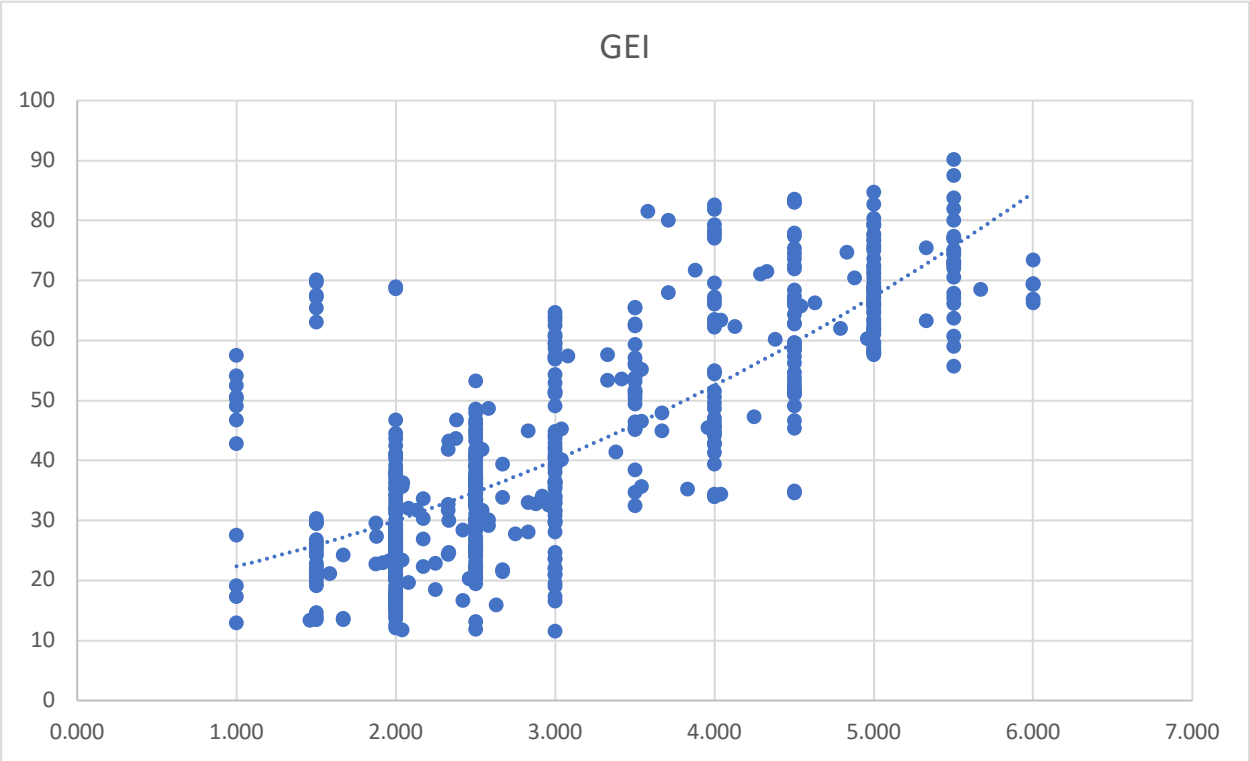
Table 2: Table of Correlations

Variable	Informal Sector Size	Corruption Control	Bureaucratic Quality	Law and Order	GDP per-capita
1. Opportunity Perception	-0.372	0.551	0.755	0.603	0.516
2. Startup Skills	-0.414	0.400	0.476	0.487	0.537
3. Risk Acceptance	-0.586	0.686	0.660	0.627	0.692
4. Networking	-0.381	0.511	0.580	0.418	0.503
5. Cultural Support	-0.536	0.688	0.830	0.673	0.696
6. Opportunity Startup	-0.647	0.811	0.794	0.774	0.838
7. Technology Absorption	-0.574	0.636	0.624	0.635	0.685
8.Human Capital	-0.486	0.651	0.445	0.535	0.591
9. Competition	-0.584	0.656	0.715	0.706	0.633
10. Product Innovation	-0.503	0.535	0.494	0.435	0.499
11. Process Innovation	-0.677	0.635	0.617	0.624	0.743
12. High Growth	-0.516	0.587	0.481	0.448	0.533
13. Internationalization	-0.561	0.618	0.528	0.583	0.644
14. Risk Capital	-0.671	0.743	0.564	0.597	0.739
GEI	-0.677	0.776	0.789	0.751	0.817

Table 2 presents correlations of all the 15 entrepreneurship-related variables (GEI and subindices) with informal sector size and its determinants. As one can see from the table, all correlations are significant. Moreover, it is also accordingly evident from the second column that a larger informal sector is associated with less entrepreneurial activity in all dimensions. Finally, as for the determinants of informality, it appears that a higher level of corruption control,

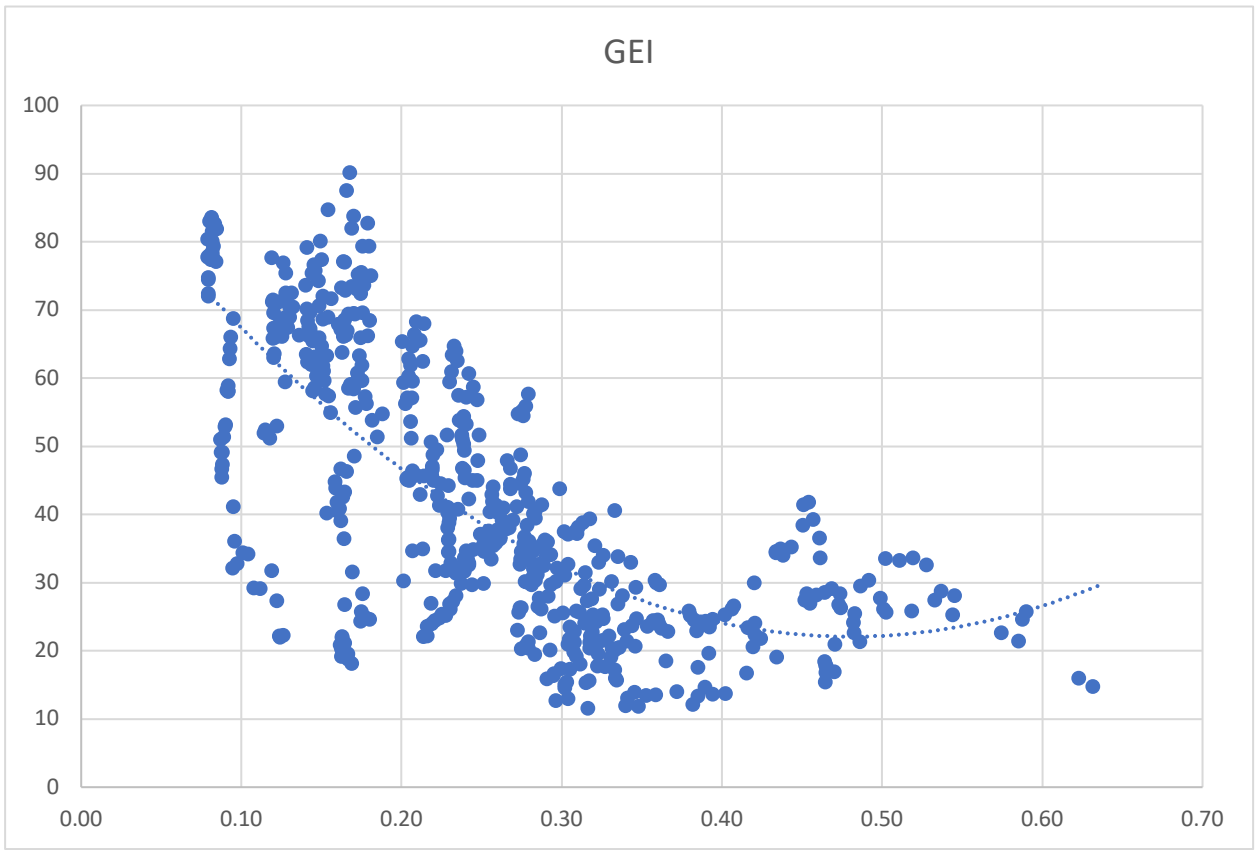
bureaucratic quality, law and order, and GDP per-capita are all associated with a higher index level of entrepreneurial activity.

Figure 1. GEI vs. Corruption Control Index



Next, we also illustrate these significant correlations between the GEI and informal sector size/determinants of informality in different scatter plot diagrams. The first of these, Figure 1, illustrates the correlation between the corruption control index and GEI. Accordingly, there is a strong positive correlation between GEI and the Corruption Control Index with 0.776. The ease of entrepreneurial activity rises with the increasing prevention of corruption.

Figure 2. GEI vs. Shadow Economy Size



Next, Figure 2 presents the correlation between informal sector size and GEI. Here, a strong negative correlation has been observed in GEI vs. Shadow Economy size index with -0.677. Unreported informal activities inversely affect the promotion of entrepreneurship, and its resources. However, as indicated by the fitted polynomial curve, there might also be some non-linearities involved here.

Figure 3. GEI vs. GDP per-capita

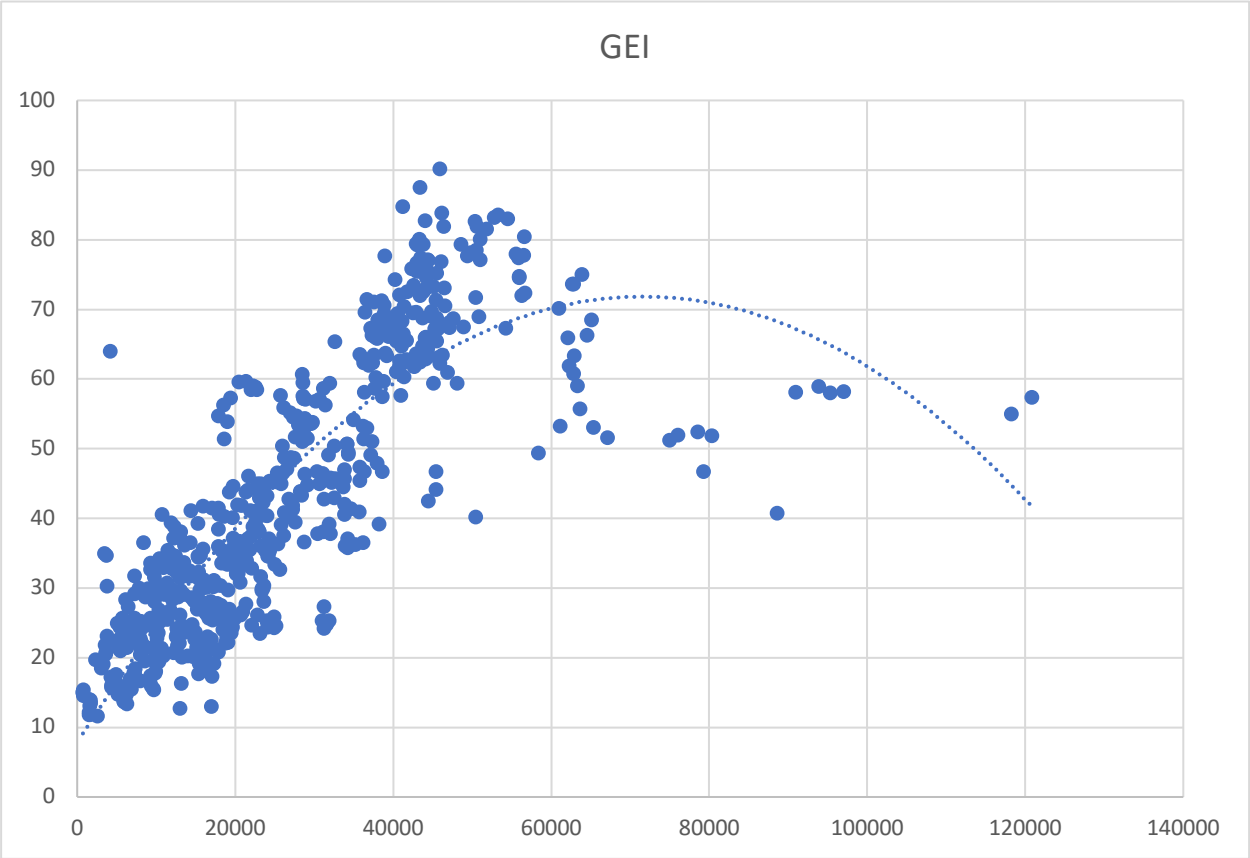
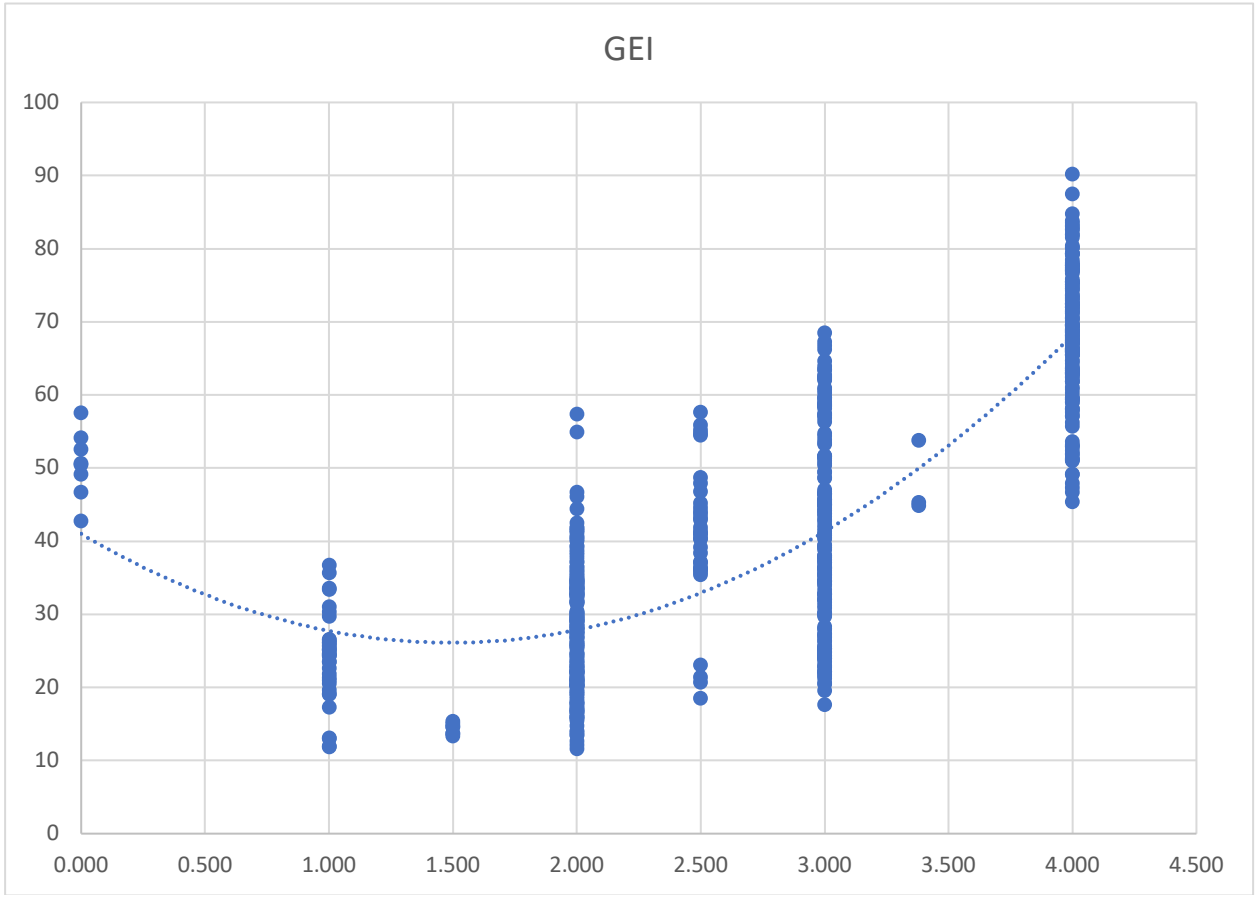


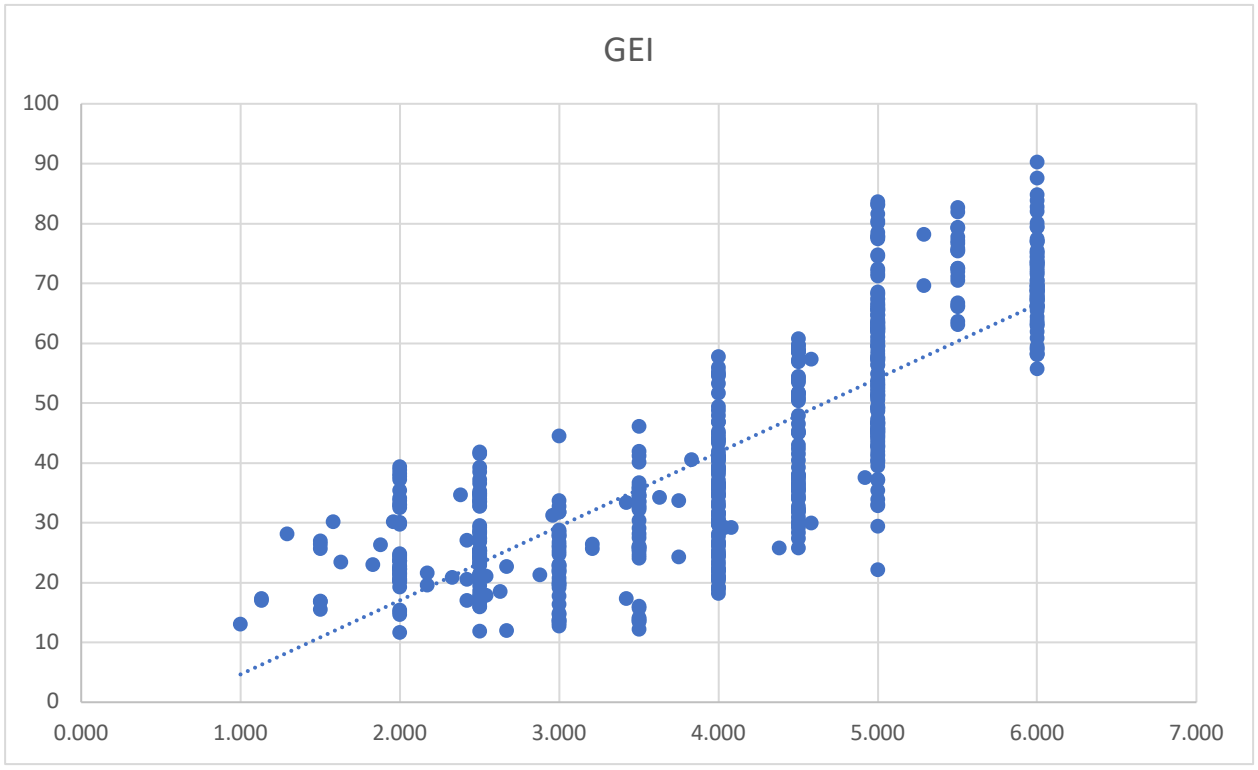
Figure 3 depicts the relationship between the GEI index and GDP per-capita. GDP per capita vs. GEI index exhibits a very positive relationship with a correlation coefficient of 0.81. In a linear relationship as a country's GDP divided by its total population increases, the quality and dynamics of entrepreneurship also rises. However, as the polynomial fit indicates there is also some non-linearity here. Particularly, in very rich countries, we observe the GEI going down compared to somewhat less richer countries.

Figure 4. GEI vs. Bureaucratic Quality



Next, Figure 4 presents a relationship of the GEI index with another determinant of informality, i.e., Bureaucratic Quality. Here, both variables are significantly associated with each other, as the calculated correlation coefficient is 0.789. High standards of the bureaucratic system create a more feasible environment for entrepreneurial activity. Nevertheless, again there seems to be some support for the non-linearity of this relationship.

Figure 5. GEI vs. Law and Order Index



Finally, Figure 5 illustrates GEI vs. Law and Order Index, yet another determinant of informality. The figure exhibits a strong positive association with 0.751. Accordingly, proper implication of law and order in a country indicates more opportunities for entrepreneurs and a healthy entrepreneurship ecosystem.

IV. Conclusion

In this paper, we analyzed the relationship between entrepreneurship and the shadow economy size. To this end, we use cross-country data and most-frequently used measure of the entrepreneurial activity, i.e., Global Entrepreneurship Index (GEI), as well as its various subindices, and calculate correlations of these indices with the size of the informal sector and its major determinants. Our analysis indicates that there are significant correlations between the variables involved.

Indeed, our analysis is not exhaustive. One major issue is that our empirical analysis does not include any econometric specifications or estimations but instead relies on correlation analysis. Another extension could be finding specific anecdotes or case studies from different countries or episodes that may give some insights or hints about the relationship between informal economic activity and entrepreneurship. Finally, the data series we used end in 2016, so the analysis can also be revised using the most recent data. These we leave to future research.

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