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Opportunity or necessity? An investigation into the institutional and development factors that impact a country's level of social entrepreneurship.

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Abstract

Social entrepreneurship has become a recognised way in which society can create positive solutions to some of the world's most pressing issues. This research aims to add to the growing literature in the field of social entrepreneurship by addressing the relationship between economic development and social entrepreneurship. Aggregate and individual-level data is obtained from the 2015 Global Entrepreneurship Monitor study in order to conduct cross-country comparisons of the level of social entrepreneurship. Different functional forms of the relationship between economic development and nascent social and commercial entrepreneurship is tested in several linear regressions. Moreover, a logistic regression is performed on the individual-level data to assess whether economic development changes the likelihood of an entrepreneur choosing to enter a social or commercial path. This is replicated in a linear probability model to include interaction terms in order to test if economic development is a moderating variable. The results of these analyses find that social entrepreneurship exhibits a U-shaped relationship with economic development, which supports the concept of necessity and opportunity-driven entrepreneurship. Furthermore, formal institutional factors like rule of law and regulation quality impact the level of social entrepreneurship, but not commercial entrepreneurship. Moreover, the results show that economic development decreases the likelihood of an individual entering social entrepreneurship and moderates the impact of factors such as gender and education on the probability of an entrepreneur being a social entrepreneur.

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Introduction

"A little bit of good can turn into a whole lot of good when fuelled by the commitment of a social entrepreneur." – Jeff Skoll.

Social entrepreneurship is on the rise and has been recognised as a way of solving some of the world's most pressing issues, while simultaneously generating revenue through an innovative business model. The social sector in Italy accounts for about 15% of their national gross domestic product (GDP), which is more than their wine industry (Gregory & Holbrook, 2015). The same report shows that in Kenya, this figure amounts to 45% of their GDP. Although there is a growing amount of empirical literature surrounding social entrepreneurship, most literature focuses on specific case studies and are thus very narrow in their scope. However, literature does show that social entrepreneurship is becoming an increasingly popular subject of investigation and is also gaining more attention at a government level (Defourny & Nyssens, 2008). Thus, this makes social entrepreneurship a very prevalent and interesting field of study.

A social enterprise is commonly defined as an "undertaking whose primary objective is to achieve social impact rather than generating profit for owners and shareholders" (European Commission, 2016). A method to measure the level of social entrepreneurship was derived by Lepoutre et al. (2013), who used the Global Entrepreneurship Monitor survey in 2009 to report and define a broad-based measure of nascent as well as operational social entrepreneurship. Country-level measures of social entrepreneurship allow us to analyse the fundamental determinants of social entrepreneurial activity, which is the focus of this research. The main determinant in question is economic development, which is particularly interesting as one might believe that social entrepreneurship will be more prevalent in underdeveloped economies as they have a higher need for non-governmental solutions to issues like poverty, pollution and gender inequality (Nissan et al., 2012). However, evidence also shows that underdeveloped countries exhibit higher levels of necessity entrepreneurship (Bosma & Levie, 2010). This could imply that the level of social entrepreneurship would be lower, as entrepreneurs in these countries prioritise profits over the creation of social wealth (Estrin et al., 2013). Therefore, this paper will investigate whether the economic development of a country has an impact on its level of social entrepreneurship.

Furthermore, research shows that formal and informal institutions influence the level of entrepreneurship, venture capital funding as well as economic development in a country

(Li & Zahra, 2012; Williamson, 2009). Formal institutions are a collection of political and economic rules that shape the way humans interact, whereas informal institutions are the social norms and code of conduct that arise from a country's culture (North, 1989). Knowing that these institutions impact the level of entrepreneurship, there is a lack of research into whether these institutions will have similar effects on the level of social entrepreneurship. Thus, this leads to the research question:

Do underdeveloped countries exhibit lower levels of social entrepreneurship? How do institutional and development factors play a role in determining a country's level of social entrepreneurship?

The research undertaken in this paper is important for the following reasons: firstly, it can help policymakers determine which macro-factors promote social entrepreneurship. This is of great importance in society as an increasing number of governments are embracing the free market ideology and decreasing funding for government-run social initiatives (Hoogendoorn, 2016). Thus, countries can aim to solve some of their most pressing development issues by aiding social entrepreneurship. Moreover, this research will investigate how certain macro-factors influence the level of social and commercial entrepreneurship, providing evidence on how they differ from one another and adding more empirical analysis to existing literature.

Section one of this paper delves into the history of entrepreneurship and social entrepreneurship in order to understand the findings of relevant literature. The disagreements and gaps in the literature allows for hypotheses to be formulated. The research question will be addressed by running two analyses. The data for the first analysis is based on aggregate data for 59 countries whereas the data for the second is based on individual-level data. Section two of this paper summarises the data and outlines the regression models. The results of these models are illustrated in section three. Finally, section four, which is the discussion section, elaborates more on the results, showing how they are interrelated to each other as well as to current literature. Additionally, the hypotheses are analysed with close inspection of the results, and a critical attitude is employed before drawing conclusions. Finally, the research question is answered in section five, with suggestions for further research as well as an outline of the limitations and implications of this research.

1. Theoretical Framework

1.1 The meaning of entrepreneurship

The definition of an entrepreneur has varied throughout history. Richard Cantillon identified entrepreneurs as being a central agent in the economic ecosystem who exercise business engagements in the face of uncertainty (Murphy, 1989). Since then, many economists have built upon this basic knowledge to formulate their own perspectives. According to Hébert and Link (1989), the intellectual history of entrepreneurship can be condensed into three distinct traditions. The first major tradition is that of Schumpeter (1934), who suggests that an entrepreneur is central to the economy as a source of creative destruction, thus illustrating what he describes as the "innovating entrepreneur". Furthermore, the second tradition, brought about by Schultz and Knight, details that an entrepreneur is an agent who has the "ability to deal with disequilibria" (Schultz, 1975) and make profits (or losses) in the face of uncertainty (Knight, 1921). Lastly, the Austrian tradition stipulates that an entrepreneur restores equilibrium by combining resources after an exogenous shock (Kirzner, 1979). Although these definitions vary, they all encompass the idea that entrepreneurship has to do with individuals and their actions. This lead Wennekers and Thurik (1999) to combine and synthesise the definition of entrepreneurship as the "*manifest ability and willingness of individuals, on their own, in teams, within and outside existing organizations, to perceive and create new economic opportunities and to introduce their ideas in the market, in the face of uncertainty and other obstacles, by making decisions on location, form and the use of resources and institutions".* Throughout this paper, this definition of broad entrepreneurship will be adopted.

1.2 Defining and measuring social entrepreneurship

Like the definition of entrepreneurship, there has been much debate over the definition of social entrepreneurship. Despite the lack of consensus, most definitions encapsulate the idea that a social enterprise's primary objective is to create social value and pursue a social mission, rather than to generate profit (Hoogendoorn, 2016). Zahra et al. (2009) have combined a comprehensive series of definitions to formulate the following definition: *"Social entrepreneurship encompasses the activities and processes undertaken to discover, define, and exploit opportunities in order to enhance social wealth by creating new ventures or managing existing organizations in an innovative manner".* This definition of social entrepreneurship will be applied throughout this paper. The individuals who undergo the above definition of social entrepreneurship will be classed as social entrepreneurs, and

their ventures will be labelled as social enterprises. These terms will be used interchangeably throughout this paper.

A method to measure the level of social entrepreneurship was pioneered by Lepoutre et al. (2013). They complemented the existing Adult Population Survey (APS) administered by the Global Entrepreneurship Monitor (GEM) in 2009 to include open-ended questions relating to the social orientation of entrepreneurs. The GEM is well-known for creating a framework that allows for cross-national harmonised datasets on entrepreneurship (Reynolds et al., 2005) and is thus a vital tool in this research. In their work, Lepoutre et al. (2013) devise a framework in which they determine which businesses can be labelled as social enterprises. They analyse a company on three attributes, that being their social mission, revenue model and innovativeness. In the realm of measuring social entrepreneurship, there has also been much debate about whether non-governmental organisation (NGOs) should be included in the measure of social entrepreneurship or not. Many argue that in order for a company to be classed as a social enterprise, their earned revenue or profits should be reinvested into the company in order to fulfil their social mission (Boschee & McClurg, 2003). On the other hand, others argue that the innovative approach of the business is more important than the revenue model in establishing a social enterprise (Dees, 1998). Thus, Lepoutre et al. (2013) make a distinction between two types of NGOs: those that pursue an innovative approach to achieve their social missions and those who use existing traditional measures. The more innovative NGOs are included in the measure of broad-based social entrepreneurship. For more information about this distinction, and to observe how the level of social entrepreneurship is measured, see Figure 1 in the Appendix.

1.3 The stages of economic development

As mentioned, Schumpeter is known for pioneering the idea of the importance of creative destruction. He theorised that this is what ultimately furthers the growth and development of economies (Schumpeter, 1934). Similarly, Porter, (1990) theorises that an economy can grow and develop, but that their development is contingent on their capacity to innovate and upgrade. Ultimately, economic development has been defined as the long-term increase in the capacity to supply an economy with diverse economic goods by advancing technology and adjusting both the ideological and institutional capacities (Kuznets, 1973). A more modern definition also describes it as a series of structural changes from a resource to knowledge-based economy, which economists typically class into three main categories (Porter, 1990). Schwab (2014) categorises each country into

three categories and two transition states. The first category is the *factor-driven* stage, whereby countries in this stage are identified by their reliance on factor endowments as their source of competitive advantage. This includes unskilled labour and natural resources. As the economy progresses, it is expected that productivity and wages will rise, leading into the *efficiency-driven* economy. This economy is characterised by the drive for more efficient production processes with the aim to keep costs down. Lastly, economies transition to the *innovation-driven* stage as their wages remain high and need to compete by innovating their production processes. These economies have a high-income status and are actively engaged in the process of social learning (Porter et al., 2002).

1.4 The relationship between economic development and entrepreneurship

1.4.1 Evidence for an inverse relationship

The relationship between economic development and entrepreneurship is a field that has been thoroughly studied. On the one hand, various studies stipulate that economic development is associated with a decrease in the self-employment rate. This is due to the occupational choice that individuals make. An individual will typically observe and compare the costs and benefits of an occupation to another and choose the one that would maximise their utility. According to the Lucas model, the rising real wages associated with economic development will make wage-work a more attractive option than self-employment (Lucas, 1978). Thus, marginal entrepreneurs forego self-employment and instead opt for wage-work. Evidence from Acs et al. (1994) supports this theory, as they empirically tested this relationship over time and found that self-employment rates decline as income per capita increases. The authors explain that it is due to the same logic expressed by Lucas, namely that as an economy becomes more capital intensive, there is a decrease in the average returns to entrepreneurship relative to wage work in incumbent firms.

However, it is also stipulated that low levels of development may induce an environment that is not suited for self-employment, such as one whereby there are limited market opportunities and low household income, which would make it difficult for an individual to start and sustain their own business (Verheul et al., 2002). Given the opposing arguments above, the first hypothesis aims to test the relationship between the level of social entrepreneurship and the level of economic development of a country. There is a gap in economic literature in providing any empirical evidence to directly and reliably predict this relationship. However, when observing the need for social enterprises at

varying levels of economic development, there is evidence to suggest that stronger economies have higher welfare and have less need for non-for profit organisations (Nissan et al., 2012). Thus, the first hypothesis is formulated as follows:

H1: The level of nascent social entrepreneurship is negatively associated to the level of economic development of a country.

1.4.2 Evidence for a U-shaped relationship

Further research into the relationship between economic development and the level of business ownership in OECD countries has stipulated the existence of a U-shaped relationship between these two factors (Carree et al., 2002). This relationship was also tested with early-stage entrepreneurial activity[1]. It was concluded that this U-shape relationship is a better model fit for the relationship between entrepreneurship and economic development than a linear or L-shaped model (Sternberg & Wennekers, 2005). The U-shape relationship is explained by the idea that there exists a "natural rate" of entrepreneurship that initially decreases when an economy moves from factor-driven to efficiency driven, but then increases once again when an economy transitions to an innovation-driven economy. It is explained by the existence of opportunity and necessity entrepreneurship. Evidence shows that at low levels of economic development, there are less opportunities for individuals to go into wage-work, thus they are more inclined to enter self-employment out of necessity (Bosma & Levie, 2010). On the other hand, as an economy develops and shifts into an innovation-driven economy, there is a higher need for new technologies, knowledge and learning, which creates a favourable environment for opportunity entrepreneurship (Fairlie & Fossen, 2019). This explains why one might expect the relationship to be U-shaped.

Despite the empirical evidence supporting this U-shaped function between economic growth and entrepreneurship, many economists also point out that this model has many limitations. In a revised version of their original work, Carree et al. (2007) expanded their analysis to include a longer time series and found no evidence that the U-shape relationship is statistically superior to the L-shape form. Thus, given the uncertainty of the relationship between economic development and entrepreneurship, the next two hypotheses are expressed as follows:

[1] This is known to be a better indication of total entrepreneurial activity as it does not exclude businesses that are not yet formally registered.

H2: Nascent social entrepreneurship will exhibit a U-shaped relationship with a country's level of economic development.

H3: Nascent social entrepreneurship will exhibit the same relationship with economic development as nascent commercial entrepreneurship.

1.5 Other determinants of entrepreneurship

Besides the level of economic development, there are also a multitude of other factors that affect the demand and supply side of entrepreneurship. Wennekers et al. (2002) have constructed an eclectic framework of factors that influence the supply and demand of entrepreneurship in countries, and they reveal that it narrows down to technological, economic, demographic, cultural and institutional factors[2].

Institutions are defined as the "*humanly devised constraints that structure political, economic and social interaction*" (North, 1991). They are made up of both formal and informal constraints. Formal institutions are a collection of political and economic rules that shape the way humans interact, whereas informal institutions (cultural factors) are the social norms and code of conduct that arise from a country's culture (North, 1989). It is proven that both of these formal and informal constraints have an impact on the supply of entrepreneurship as it changes the "rules of the game" that surround an individual's occupational choice towards entrepreneurship (Baumol, 1996). Additionally, literature tends to agree that certain aggregate conditions, like a strong rule of law and access to finance, promote individuals to undertake commercial entrepreneurship (Aidis et al., 2012; Hwang & Powell, 2005; Li & Zahra, 2012; McMullen et al., 2008; Williamson, 2009). Well known for his research into cultures and behaviours, Hofstede (2001) theorises that invisible cultural differences are vital factors in determining the success of aggregate policies. Knowing that these institutions impact the level of entrepreneurship, there is limited research into whether these institutions will have similar effects on the level of social entrepreneurship. Thus, the following hypothesis is formulated:

H4: The institutions (both formal and informal) that promote entrepreneurship will be favourable towards social entrepreneurship.

Some of the most pressing evidence to dispute this hypothesis comes in the form of the institutional void theory, which suggests that when governments are small, there will be

[2] In the theoretical framework, more detail goes into the cultural and institutional factors. However, the other demographic, technological and economic factors are included as control variables in the methodology.

a higher need for social enterprises due to the lack of provision of social goods (Dacin et al., 2010; Mair & Marti, 2009). Thus, the deficiency of social goods, for example at low levels of economic development, will increase the demand of social entrepreneurial activity. A small government will, however, discourage commercial entrepreneurship due to the lack of property rights (Foss & Klein, 2005). Thus, the hypothesis stated above will assist literature in understanding how certain institutional factors impact social and commercial entrepreneurship.

1.6 The social orientation of entrepreneurs

The occupational choice made by an individual to become an entrepreneur is done by weighting the costs and benefits of wage work versus self-employment. Once they have decided to enter the entrepreneurial pathway, another interesting perspective to investigate is the factors that drive an individual to choose to become a social rather than commercial entrepreneur. There has been much research on the attributes and characteristics of the individuals that make them more socially inclined. In this framework, characteristics such as age, gender and education have been identified (Marín et al., 2019). Focussing on age, there is evidence to suggest that there are two dominant types of people that engage in social entrepreneurship. The first are young idealistic individuals, where the other are older individuals who enter social entrepreneurship after experience in paid employment (Hoogendoorn et al., 2011). Thus, middle-aged individuals are the least likely to become social entrepreneurs. Moreover, it has been found that more men are involved in social entrepreneurship than women, however the gender gap is not as large in social entrepreneurship as it is in commercial entrepreneurship. Evidence shows that women are more likely to emphasise an environmental or social value in their businesses, thus supporting the idea that women tend to be more socially oriented than men (Hechavarria et al., 2012). Lastly, there is literature to support the view that a higher level of education will increase the chances of an individual becoming a social entrepreneur, as it increases their chances of perceiving social problems as business opportunities (Bosma & Levie, 2010; Lepoutre et al., 2013).

As discussed previously, it is theorised that the level of economic development plays a major role in determining the level of social entrepreneurship. One the one hand, there is a higher need for social goods in less developed countries (Dacin et al., 2010; Nissan et al., 2012). One the other hand, people in these countries are more concerned about survival and receiving an income (Bosma & Levie, 2010). These two factors explain why there is a higher prevalence of for-profit social enterprises in less developed economies. Social

entrepreneurs in these countries will create ventures that will generate social value, while ensuring that they are creating financial value to sustain themselves and their families. For this reason, the fifth hypothesis is explained as:

H5: The likelihood of an entrepreneur choosing to pursue social over commercial entrepreneurship decreases with the level of economic development.

Given that there is substantial evidence to understand how the above factors impact the social orientation of entrepreneurs, there is a lack of research to understand how these factors interact with the economic development of the country in order to determine the social orientation of entrepreneurs. Economic development might impact these factors in a multitude of ways, for example, a more developed economy with an emphasis on innovation and learning will have higher education quality overall. Countries in this stage of development might also have an ageing population or promote more gender equality. Therefore, the relationship between economic development and the social orientation of entrepreneurs can be extended to include these factors. The last hypothesis is stated as follows:

H6: A country's level of economic development moderates the impact of age, gender and education on an entrepreneur's social orientation.

2. Data and Methodology

In order to address the research question, this section will be split into two methodologies, each with a unique dataset. The first methodology aims to address hypotheses one to four, and thus is more focussed on observing aggregate levels of nascent social and commercial entrepreneurship. The second methodology addresses hypothesis five and six, and is more concerned with the individual social orientation of entrepreneurs.

2.1 Analysis one: aggregate investigation

2.1.1 Data

Firstly, national data from the Adult Population Survey (APS) constructed by the Global Entrepreneur Monitor study of 2015 reports the level of early-stage entrepreneurial activity in 60 countries[3]. This is constructed from individual level data whereby a sample of at least 2,000 people in each country are asked a series of survey questions that pertain to the aspirations and activities of entrepreneurs. Everyone is given a weight in order to standardise the results according to the population census of the United States, so that the country-level results can be compared to each other. In order to measure an individual's involvement in entrepreneurship, they are asked the following question: "*Are you alone or with others, currently trying to start a new business or owning and managing a company, including any self-employment or selling any goods or services to others?*". The 2015 version of the GEM survey also asked special questions surrounding the topic of social entrepreneurship. Examples of these questions can be found in Table 2 in the Appendix. This allowed them to measure the country-level rate of nascent social entrepreneurship (*NSE*), operational social entrepreneurship (*OSE*), and early stage social entrepreneurship (*SEA*) in 59 countries[4]. These rates are reported as a percentage of the total working population of the respective country. Data about a country's level of development in 2015, measured as the GNI per capita at purchasing power parity (PPP) and in thousands of US Dollars (USD 1000), is taken from the United Nations statistics database. Moreover, in the 2015 special social entrepreneurship report of the GEM, the countries in their sample are already identified as being factor-driven, efficiency-driven, or innovation-driven economies (Bosma et al., 2016).

[3] A comprehensive list of the countries included in the 2015 GEM study can be found in Table 1 in the Appendix.
[4] Canada was the only country, out of the 60 mentioned above, that did not participate in the social entrepreneurship special topic and therefore, does not have a measure of NSE, OSE or SEA.

A framework of factors that impact the level of entrepreneurship in a country has been identified in the work from Wennekers et al. (2002), who reveal that technological, economic, demographic, cultural and institutional factors impact the overall level of entrepreneurship. This makes up the basis of the variables chosen as control variables in this analysis. An overview of all control variables, with their definition and source can be found in Table 3 in the Appendix. The choice of control variables for the economic, demographic and technological factors was largely inspired by work from Wennekers et al. (2005), whereas the choice of informal and formal institutional variables was inspired by Puumalainen et al. (2015). Unfortunately, the level of education was not included in this investigation as it was not possible to find comprehensive data on the education level of many of the countries included in the analysis. Table 4 shows the descriptive statistics of all the above-mentioned variables.

TABLE 4

Summary and Descriptive Statistics, Analysis 1

	Obs	Mean	St. Dev.	Min	Max
1a. Nascent Social Entre.	59	3.30	2.64	0.25	10.09
1b. Nascent Commercial Entre.	60	7.87	5.76	0.76	25.89
2. GNI per capita (USD 1000)	58	24.17	15.81	1.55	66.58
3. Power distance	55	59.33	21.77	0	100
4. Uncertainty avoidance	55	65.04	22.55	0	100
5. Masculinity vs. femininity	55	47.84	19.70	0	100
6. Individualism vs. collectivism	55	43.35	24.95	0	91
7. Government effectiveness	60	0.60	0.80	-0.78	2.00
8. Regulation quality	60	0.58	0.85	-1.31	1.85
9. Rule of law	60	0.49	0.94	-1.03	2.06
10. Economic growth 2014	59	3.01	2.15	-2.51	8.56
11. Economic growth 2015	59	3.14	3.66	-3.55	25.16
12. Unemployment rate 2015	59	8.42	5.63	0.60	26.07
13. Population growth 2009-2015	60	5.72	6.95	-6.86	35.73
14a. Population share aged 20-24	60	4.42	1.48	4.90	10
14b. Population share aged 25-29	60	7.55	1.16	5.40	11
14c. Population share aged 29-34	60	7.38	0.85	6	10.50
14d. Population share aged 35-39	60	7.11	0.89	4.90	8.80
14e. Population share aged 40-44	60	6.76	1.03	3.40	8.80
14f. Population share aged 45-49	60	6.45	1.27	2.90	8.90
14g. Population share aged 50-54	60	6.07	1.44	2.40	8.60
14h. Population share aged 55-59	60	5.50	1.53	2	7.70
14i. Population share aged 60-64	60	4.75	1.60	1.60	7.30
15. % of internet users	59	63.58	21.68	14	98.81

Obs = Number of observations; **St. Dev.** = Standard Deviation; **Min** = Minimum value; **Max** = Maximum value; **USD 1000** = value in thousands of US Dollars.

From this table, it is apparent that there is a large difference between the rate of nascent social entrepreneurship between the countries in the sample, with a maximum of 10.09% in Peru and a minimum of 0.25% in South Korea. The mean rate of nascent commercial entrepreneurship (7.87%) is also higher than the mean rate of nascent social entrepreneurship (3.30%), which shows that on average, commercial entrepreneurship is a more popular form of entrepreneurship than its social counterpart.

2.1.2 Methodology

Firstly, three regression tests will be performed with nascent social entrepreneurship (*NSE*) as the dependent variable and GNI per capita (USD 1000) as the independent variable in order to test the functional relationship between the two variables. A linear, inverse (L-shape) and quadratic (U-shape) relationship is tested in these regressions. These regressions can be tested against all the countries that participated in the special survey of the GEM, except for Canada as the level of *NSE* is missing. This process is also repeated using the GEM's measure for the nascent entrepreneurial activity of commercial entrepreneurship (*NCE*) in order to see if the two measures have the same functional relationship with economic development. This time, however, Canada is included in the analysis as their level of NCE is reported, and thus maximising the amount of observations will allow for a better model to be estimated. Each functional relationship (Linear, U-shaped, L-shaped) is approximated using the following series of regressions:

(1) $NSE;\ NCE = \beta_0 + \beta_1 GNI + \varepsilon$ *(Linear);*

(2) $NSE;\ NCE = \beta_0 + \beta_1 GNI + \beta_2 GNI^2 + \varepsilon$ *(Quadratic/U-Shape);*

(3) $NSE;\ NCE = \beta_0 + \beta_1 (1/GNI) + \varepsilon$ *(Inverse/L-Shape);*

where *NSE* is the level of nascent social entrepreneurship and *NCE* is the level of nascent commercial entrepreneurship. Regressions (1) and (2) can be compared using a likelihood ratio test. However, in order to compare regressions (1) and (2) with (3), the statistically superior specification will be deduced by observing the adjusted R^2, as done in research by Wennekers et al. (2005). Moreover, the Akaike's and Schwarz's Bayesian information criteria (AIC and BIC) of the regressions will be computed and compared.

The above regression models, however, do not explain much of the variance in the level of nascent social and commercial entrepreneurship as there are omitted variables. Therefore, control variables need to be considered in order to increase the explanatory power of the models. Moreover, adding the control variables for the formal and informal institutions will also aid in addressing hypothesis four.

2.1.3 Methodology with control variables

The analysis will now be performed with the chosen set of control variables (see Table 3 in the Appendix). The regression models are as follows:

(4) $NSE; NCE = \beta_0 + \beta_1 GNI + \varphi Z + \varepsilon$ *(Linear);*

(5) $NSE; NCE = \beta_0 + \beta_1 GNI + \beta_2 GNI^2 + \varphi Z + \varepsilon$ *(Quadratic/U-shape) ;*

(6) $NSE; NCE = \beta_0 + \beta_1 (1/GNI) + \varphi Z + \varepsilon$ *(Inverse/L-shape);*

whereby $Z = \beta_A Formal + \beta_B Powerdistance + \beta_C Uncertainty + \beta_D Individualism + \beta_E Masculinity + \beta_F Populationgrowth + \beta_G Agedistribution + \beta_H Economicgrowth2014 + \beta_I Economicgrowth2015 + \beta_J Unemployment$.

Table 5 in the Appendix shows the correlation matrix between the dependant and independent variables in this analysis. Only the population share of age group 40-44 (variable nr. 14e) is represented as it has the strongest negative correlation to the level of nascent social entrepreneurship.

In order to perform a multiple linear regression analysis, the underlying assumptions of a linear regression model need to be investigated. Firstly, the regressions exhibit a linear or curvilinear relationship and do not show any significant outliers. Secondly, the regressions all have normally distributed errors. Evidence of these assumptions can be found in Figure 2, Figure 3 and Figure 4 in the Appendix. Thirdly, the model should have constant variance. This is tested by plotting the error terms against the residuals as well as using the Breusch-Pagan test for homoskedasticity. All the regressions with nascent commercial entrepreneurship as the dependant variable exhibited heteroscedasticity, as well as regression 4 with nascent social entrepreneurship. These regressions were performed with the *robust* command in STATA in order to correct the standard errors for heteroscedasticity. An example of the residuals plotted against the fitted values can be found in Figure 5 in the Appendix. Lastly, the model should not contain any multicollinearity. Multicollinearity is not an issue in models (1), (2) and (3) as GNI per capita is the only explanatory variable. However, it is apparent that there is multicollinearity in the multiple linear regression analysis as many of the control variables are strongly correlated to each other. By testing for multicollinearity using Variance Inflation Factors (VIF), it is revealed that the variables measuring the quality of formal institutions, being *government effectiveness, regulation quality* and *rule of law* fall within in the range of high multicollinearity (>5). Therefore, these variables were combined using a Principle Components Analysis to form a new variable called *formal.*

The age groups also exhibited high multicollinearity with one another, thus only the age group 40-44 (variable nr. 14e) is included in the regression analysis, once again because it has the strongest negative correlation to the level of nascent social entrepreneurship. Moreover, *internet* also scored in the range of high multicollinearity, therefore it was omitted from the regression analysis. After adjusting for and removing the multicollinearity, the mean VIF score of all the regressions remain below the threshold (<5).

The multiple linear regression analysis is performed only on the sample of countries with no missing data; thus, 7 countries were removed from the sample[5]. Finally, the adjusted R^2, AIC and BIC are calculated in order to compare the strength of the models.

2.2 Analysis two: individual investigation

2.2.1 Data

The focus now turns to the individual level data collected by the GEM in 2015, which has data on 181 281 individuals. In order to determine an individual's involvement in entrepreneurship, the sample was narrowed down to the people who are either starting or are owner-managers of a business and further narrowed down to people in the countries who participated in the special social entrepreneurship topic. This brought the sample size to 21 610 individual entrepreneurs. The individuals' involvement in social entrepreneurship was measured by their reply to the following question: *"Are you, alone or with others, currently trying to start or currently leading any kind of activity that has a social, environmental or community objective?"*. Each entrepreneur would indicate their answer with one of four category variables, which were 1 = "Yes, currently trying to start", 2 = "Yes, currently leading", 3 = "Yes, trying to start AND leading" and 4 = "No". For simplicity, their involvement in social entrepreneurship is made into a dummy variable, which takes on the value of 0 if they answered 4 = "No" and 1 if they answered 1,2 or 3 = "Yes". These individuals also report their age, gender and highest education level. Age is reported as a continuous variable whereas gender is reported as a dummy variable with value 1 for women and value 0 for men. The education level is reported as 0 = "None", 1 = "Some Secondary", 2 = "Secondary Degree", 3 = "Post-Secondary" and 4 = "Graduate".

Table 6 shows the correlation matrix between the variables used in this investigation. Gender and the variable showing an efficiency-driven economy are negatively and

[5] The following countries were excluded from the sample: Cameroon, Canada, Barbados, Botswana, Macedonia, Puerto Rico, Taiwan and Tunisia.

significantly correlated to the variable showing an individual's involvement in social entrepreneurship.

TABLE 6
Correlation Matrix: Analysis 2

	1	2	3	4	5	6
1. Involved in social entre.	1.00					
2. Age	0.01	1.00				
3. Gender	-0.04**	0.01	1.00			
4. Education	0.00	-0.04**	-0.06**	1.00		
5. Efficiency-driven econ.	-0.11**	-0.03**	0.02*	0.05**	1.00	
6. Innovation-driven econ.	0.00	0.13**	-0.06**	0.28**	-0.64**	1.00

**p<0.05, **p<0.01.*

Moreover, the summary statistics in Table 7 show that the average age of respondents is 37 years old and that the mean involvement in social entrepreneurship of all the individuals in the sample is 0.16. Thus, on average, 16% of all the entrepreneurial individuals surveyed by the GEM are social entrepreneurs. The number of observations for the age and education are smaller than the total number of observations for the rest of the variables as some individuals decided not to disclose this personal information. Thus, these individuals will not be included in the analysis. Moreover, the individuals which were over 64 years old were excluded from the sample, as they do not represent the working population. Altogether, this brings the total number of testable observations down to 20,926 individuals.

TABLE 7
Summary and Descriptive Statistics, Analysis 2

	Obs	Mean	St. Dev.	Min	Max
1. Involved in social entre.[a]	21,062	0.16	0.38	0	1
2. Gender[a]	21,610	0.43	0.50	0	1
3. Age[c]	21,610	37.28	11.50	18	64
4. Education[b]	21,442	2.00	1.12	0	4
5. Efficiency-driven economy[a]	21,610	0.51	0.50	0	1
6. Innovation-driven economy[a]	21,610	0.28	0.45	0	1

a = Dummy variable; **b** = Categorical variable; **c** = Continuous variable; **Obs** = Number of observations; **St. Dev.** = Standard Deviation; **Min** = Minimum value; **Max** = Maximum value.

Table 8 shows the variance analysis and means comparison between the three stages of economic development. In order to derive the F statistic, a one-way ANOVA test was performed. This tests the variance between groups and uses this variance to detect differences among means. All the variables resulted in having a significant F statistic

($p<0.01$), hence implying that the means across the stages of economic development significantly differ from one another. Furthermore, a Scheffe's mean comparison test was performed for every variable under the three stages of development.

TABLE 8

Variance and mean comparison across development stages, Analysis 2

	A. Factor driven	B. Efficiency driven	C. Innovation driven	F stat.	Means Comparison		
					B-A.	C-A.	C-B.
Involved in social entrepreneurship	0.26 (0.44)	0.12 (0.33)	0.16 (0.37)	245.68**	**	**	**
Gender	0.47 (0.50)	0.44 (0.50)	0.38 (0.49)	43.58**	**	**	**
Age	34.98 (11.12)	36.96 (11.47)	39.58 (11.30)	209.17**	**	**	**
Education	1.45 (1.25)	1.96 (1.05)	2.50 (0.91)	1,214.97**	**	**	**
Observations	4,464	10,956	5,506				

*$p<0.05$, **$p<0.01$.

From this table, it is noted that the probability of an entrepreneur being involved in social entrepreneurship is highest in the factor-driven economies (with a mean of 0.26). On average, entrepreneurs in innovation-driven countries are older (39.58 years) than in the other two stages. Moreover, entrepreneurs in the innovation-driven countries tend to be more educated. The difference in the average education level between innovation-driven (2.50) and the factor-driven countries (1.45) highlights the disparities in education between countries at different levels of economic development.

2.2.2 Methodology

As the individuals' involvement in social entrepreneurship is determined by a dichotomous variable (1= "Yes", 0 = "No"), the dependant variable is binary, and thus, a logistic regression analysis must be performed on the individual level data. The general model for a logistic regression looks as follows:

(7) $Logit(\pi_i) = Logit\left(\frac{\pi_i}{1-\pi_i}\right) = \beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + v_i$

In this research, π_i = probability of being a social entrepreneur and $1 - \pi_i$ = probability of being a commercial entrepreneur. In the above model, x_{i1} and x_{i2} represent two independent variables. In this investigation, the independent variables are the age, gender and education of the entrepreneurs, as well as their country's stage of economic

development. Introducing these variables to the general model illustrated in (7) gives the following:

(8) $$Logit\left(\frac{P(Social\ Entre.)}{P(Commer.Entre.)}\right) = \beta_0 + \beta_1 Gender_i + \beta_2 Age_i + \beta_3 Education\ (Secondary)_i + \beta_4 Education\ (Tertiary)_i + \beta_5 Development\ (Efficiency)_i + \beta_6 Development\ (Innovation)_i + v_i$$

Age is a continuous variable whereas gender is reported as a dummy variable with value 1 for women and value 0 for men. The education level is recoded into three categorical variables to represent 1 = "Primary", 2 = "Secondary" and 3 = "Tertiary". In order to test whether the economic development of a country has an impact on an individual's decision to engage in social entrepreneurship, the level of development is added as a categorical variable which takes on the value 1 if it is a factor-driven economy, 2 for an efficiency-driven economy, and 3 for an innovation-driven economy. The variable representing primary education as well as the variable indicating a factor-driven economy are not included in the regression as they are used as base variables.

The coefficients ($\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ and β_6) are calculated using Maximum Likelihood Estimation (MLE). For ease of interpretation, the coefficients, represented below as $\hat{\beta}$, will be transformed into an odds ratio through the following formula:

$$Odds\ ratio = e^{\hat{\beta}}$$

These coefficients will reflect the net or adjusted effects in a three and four-factor additive model. The additive model assumes that the effect of each factor is the same for all categories of the others (Kleinbaum, 1994). This means that, for example, the net effect of tertiary education will represent an average effect across both females and males as well as across all age groups and may not be representative of the effect at any particular age or gender.

After adding the level of development to the model, a likelihood ratio-test will be performed in order to test whether adding the development variables added any statistically significant predictive power to the model. The null hypothesis tests if the coefficients of the additional development variables equal to 0. If the test statistic is large, then the null hypothesis is rejected to show that the saturated model is statistically stronger than the nested model.

In order to test the moderation effect stated in hypothesis six, a linear probability model will be employed. Despite the binary nature of an entrepreneur's involvement in social entrepreneurship, a linear regression model will avoid the difficulties surrounding the

estimation of interaction effects in non-linear models and thus, make the interpretation of the coefficient more straightforward. The regression for this is modelled as followed:

(9) $$P(Social\ Entrepreneur)_i = \alpha + \beta_1 Age_i + \beta_2 Gender_i + \beta_3 Education(Secondary)_i + \beta_4 Education(Tertiary)_i + \beta_5 Efficiencydriven_i + \beta_6 Innovationdriven_i + \beta_7 Age_i * Efficiencydriven_i + \beta_8 Age_i * Innovationdriven_i + \beta_9 Gender_i * Efficiencydriven_i + \beta_{10} Gender_i * Innovationdriven_i + \beta_{11} Education(Secondary)_i * Efficiencydriven_i + \beta_{12} Education(Secondary)_i * Innovationdriven_i + \beta_{13} Education(Tertiary)_i * Efficiencydriven_i + \beta_{14} Education(Tertiary)_i * Innovationdriven_i + \varepsilon_i$$

In order to examine the effects of the interactions, the variables are entered in a two-step process. At first, the interactions are not included, thus forming the nested model. The interactions are then added to form the saturated model. Once again, the variable representing primary education as well as the variable indicating a factor-driven economy are not included in the regression as they are used as base variables. The interaction effect between the stage of economic growth with the age, gender and education of the entrepreneur is observed in order determine if there is a moderating effect. A moderation effect is described by the change in the casual relation between two variables as a function of the moderator variable (Baron & Kenny, 1986). For this, two conditions need to be met to support the moderating effect. Firstly, the interaction effect of the moderator variable with the other independent variables should be significant and add explanatory power to the model. Moreover, the moderator variable must function itself as an independent variable (Frazier et al., 2004). These assumptions will be tested in order to confirm whether the economic development of a country moderates the impact of age, gender and education on an entrepreneur's involvement in social entrepreneurship.

The coefficients in this linear probability model are estimated using Ordinary Least Squares (OLS). Robust standard errors are employed in this research as linear probability models exhibit heteroscedasticity. Moreover, multicollinearity is reduced in this model by standardising the continuous variable *age*. The variable is centered by subtracting the mean value from every observation. By doing so, the mean VIF of this model is reduced from 11.25 to 5.77. Although the upper threshold for multicollinearity is at 5, literature tends to suggest that a mean VIF between 5 and 10 is still acceptable (Hair et al., 2013). An analysis of the residuals proves that this sample complies with the assumptions of linearity, independence and normality.

3. Results

3.1 Analysis one: aggregate investigation

3.1.1 Without control variables

Table 9 reports the results of the three regression tests performed with nascent social entrepreneurship (*NSE*) and nascent commercial entrepreneurship (*NCE*) as the dependent variables and GNI per capita (USD 1000) as the independent variable with different functional forms. From this table, it is clear to see that the level of economic development of a country has a small but significant impact on the level of NCE. In the linear form, an increase in the level of GNI per capita by one thousand USD is associated with a decrease in the level of NCE by 0.14%. All the models with NCE as the independent variable have significant F-statistics, therefore adding some form of economic development to the model creates a better fit than the intercept-only model.

In terms of NSE, only the L-shaped model is statistically significant, and the coefficient between NSE and the inverse of GNI is statistically significant as well with a value of $\hat{\beta}_1$= 9.42. Thus, the linear and U-shaped functional form are rejected for NSE. Observing the adjusted R^2 values, the L-shape explains more of the variance in the model with both NSE and NCE as the dependant variables. The L-shape also has the lowest BIC and AIC values; therefore, it is the statistically superior functional form in this sample for both NSE and NCE. This hints towards the idea that NSE and NCE exhibit the same relationship with economic development, which is in support of hypothesis three. A full overview of the BIC and AIC values for regression models 1-6 can be found in Table 10 in the Appendix.

TABLE 9

Results of testing the functional relationship between GNI per capita (USD 1000) and nascent social and commercial entrepreneurship in 2015

	NSE			NCE		
	Linear	U-shape	L-shape	Linear	U-shape	L-shape
GNI per capita	-0.01	-0.13		-0.14***	-0.40***	
GNI per capita^2		0.00			0.00*	
1/GNI per capita			9.42***			27.55***
Constant	3.68***	4.92***	2.63***	11.36***	14.19***	5.85***
F statistic	0.34	1.30	7.79***	9.48***	6.36***	15.60***
R^2	0.01	0.05	0.12	0.14	0.19	0.22
Adjusted R^2	-0.01	0.01	0.11	0.13	0.16	0.20
Observations	57	57	57	58	58	58

** p<0.10, **p<0.05, ***p<0.01.*

3.1.2 With control variables

Table 11 shows the same three regression tests as before, but this time with the control variables included in the regression. All the models are at least statistically significant at a 1% level and adding the control variables has also increased the adjusted R^2 of each model, therefore adding explanatory power to the models.

TABLE 11

Results of testing the functional relationship between GNI per capita (USD 1000) and nascent social and commercial entrepreneurship in 2015 with control variables.

	NSE			NCE		
	Linear	U-shape	L-shape	Linear	U-shape	L-shape
GNI per capita	-0.07	-0.22		-0.07	-0.13	
GNI per capita^2		0.00			0.00	
1/GNI per capita			8.49*			9.35
Formal Institutions	1.41**	1.72**	0.98*	0.45	0.57	-0.00
Power distance	-0.04*	-0.05*	-0.04	-0.07*	-0.07*	-0.07*
Uncertainty avoidance	0.02	0.02	0.02	0.05	0.05	0.05*
Individualism	-0.02	-0.02	-0.02	-0.07	-0.07	-0.07*
Masculinity	0.04*	0.05**	0.05**	0.07	0.07	0.07*
Population growth	0.04	0.01	0.01	0.08	0.07	0.04
Age distribution 4044	-0.78*	-0.61	-0.55	-2.24***	-2.17**	-1.97**
Economic growth 2014	0.18	0.13	0.16	0.16	0.14	0.15
Economic growth 2015	0.06	0.05	0.04	-0.07	-0.07	-0.08
Unemployment	-0.04	-0.04	-0.04	-0.18	-0.17	-0.17
Constant	9.49***	10.79***	5.70	25.98***	26.48***	21.84***
F statistic	2.67***	1.85*	1.92*	2.90***	2.77***	2.92***
R^2	0.34	0.36	0.35	0.46	0.46	0.46
Adjusted R^2	0.16	0.17	0.17	0.31	0.30	0.32
Observations	52	52	52	53	53	53

** p<0.10, **p<0.05, ***p<0.01.*

When analysing the models with NSE as the dependant variable, the variables *formal* and *masculinity* have a positive and significant (at least: *p<0.10*) coefficient in all functional forms of the regression. Thus, this suggests that an increase in quality of the

formal institutions as well as the increase in the level of masculinity in a country is associated with an increase in the level of nascent social entrepreneurship, all else equal. The variable *power distance* is negative and significant at 1% level in the linear and U-shape form for NSE, whereas it is negative and significant at 1% in the U-shape and L-shape form for NCE. This hints that an increase in the power distance is associated with a decrease in the level of nascent social and commercial entrepreneurship. This observation provides some evidence for hypothesis four, which states that the institutions that affect NCE will also have a significant impact on NSE. Furthermore, the coefficient for the variable *age distribution* is consistently negative and significant (at least at a 1% level) when regressed against NCE. Thus, an increase in the % of the population that falls within the 40-44 age category is associated with a decrease in the overall rate of nascent commercial entrepreneurship.

By once again observing the adjusted R^2, AIC and BIC values, the U-shape functional form for NSE has the highest adjusted R^2 and the lowest BIC and AIC values, therefore it is the statistically superior functional form in this sample. This provides evidence for hypothesis two, which stipulates the U-shape relationship between economic development and NSE. In comparison, the L-shape form for NCE remains to be the statistically significant functional form. This gives evidence to oppose hypothesis three, which states that NSE and NCE exhibit the same relationship with economic development.

3.2 Analysis two: individual investigation

Table 12 shows the results of the nested and saturated logistic regression model (8). The first column in each model represents the coefficients of the logistic odds, whereas the second column shows the calculated odds ratios.

The chi-squared test performed on the overall fit of both models is significant at a 1% level, therefore the predictors in this model are statistically superior to the intercept-only model. The Wald test confirms that most of the variables in both models are significantly different from 0 at a 1% level. Age in this case is only significant in the saturated model, whereas the categorical variable for secondary education is only significant in the nested model.

TABLE 12

Results of regression 8 showing the determinants of the probability of an entrepreneur entering social instead of commercial entrepreneurship.

	$Logit\left(\frac{P(Social\ Entre.)}{P(Commer.\ Entre.)}\right)$			
	Nested Model		Saturated Model	
	Coefficient	Odds Ratio	Coefficient	Odds Ratio
Gender	-0.19***	0.82***	-0.21***	0.81***
Age	0.00	1.00	0.01***	1.01***
Education (Primary)	(Base)	(Base)	(Base)	(Base)
Education (Secondary)	-0.18***	0.83***	0.02	1.02
Education (Tertiary)	0.51***	1.67***	0.75***	2.12***
Development (Factor)			(Base)	(Base)
Development (Efficiency)			-1.00***	0.37***
Development (Innovation)			-0.77***	0.47***
Constant	-1.48***	0.23***	-0.99***	0.37***
Log likelihood	-9,183.23	-	-8,952.01	
X^2 statistic	123.37***	-	585.80***	-
Pseudo R^2	0.01	-	0.03	-
Observations	20,926	-	20,926	-

** p<0.10, **p<0.05, ***p<0.01.*

For ease of interpretation, the odds ratios for each coefficient has been computed. The odds ratio for the variable indicating an individual's gender did not change significantly after adding the development indicators to the model, therefore these results are robust. The odds ratio of 0.82 in the regression of the nested model shows that, net of all the other variables, the odds ratio of a female entering social entrepreneurship is 0.82 times the odds ratio of a male entering social entrepreneurship. This corresponds to an 18% decrease in the odds of entering social entrepreneurship when an individual identifies as a female rather than a male. Thus, on average, females are less likely to be social entrepreneurs than males.

The coefficient for age is positive and significant in the saturated model. The odds ratio in the saturated model shows that, net of the other variables, the odds of entering social entrepreneurship with an additional year of age increases the odds of an entrepreneur's involvement in social entrepreneurship by 1%.

The odds of entering social entrepreneurship among individuals who attained tertiary education are around 2 times the corresponding odds among individuals who only

attained primary education (the base category), net of all other variables. Thus, attending some form of tertiary education increases the odds of entering social entrepreneurship over commercial entrepreneurship by 112%.

The coefficients for the efficiency and innovation-driven dummy variables are both negative and significant at a 1% confidence level. The odds ratio of 0.37 for the efficiency-driven economy shows that, on average, the odds of entering social entrepreneurship for individuals who are in countries in this category are 0.37 times the odds of individuals in factor-driven economies. This corresponds to a decrease in the odds of becoming a social entrepreneur by 63%. This implies that individuals are more likely to enter social entrepreneurship if they are in a factor-driven economy rather than an efficiency-driven economy. Likewise, the odds ratio of 0.47 for the innovation-driven economy shows that, on average and net of all other variables, the odds of entering social entrepreneurship over commercial entrepreneurship decreases by 53% if the person is in an innovation-driven country, in comparison to a factor-driven country. Not only does this provide evidence for hypothesis five, but this also proves that the odds of entering social entrepreneurship is higher in innovation-driven countries than in efficiency-driven countries, which hints at hypothesis two (U-shaped relationship).

The increase in the pseudo R^2 between the nested and saturated model, as well as the likelihood ratio test between the two models, which resulted in a large and significant test statistic ($X^2 = 458.13,\ p = 0.00$), proves that the saturated model is statistically superior. Thus, adding the development variables added predictive power to the model.

The results of the linear probability model (9) are shown in Table 13. As observed, both the nested and saturated model are significant at a 1% level. In terms of the independent variables, age is not significant in either of the models, nor is it significant in the interaction terms. The variable indicating secondary education is not significant in the nested model, whereas the variable for tertiary education is insignificant in the saturated model. All other variables and interactions are significant at a 1% level.

TABLE 13

Results of linear probability model 9 testing the moderating effect of development on the probability of an entrepreneur entering social instead of commercial entrepreneurship

	$P(Social\ Entre.)$	
	Nested Model	Saturated Model
Gender	-0.03***	-0.06***
Age	0.00	0.00
Education (Primary)	(Base)	(Base)
Education (Secondary)	0.00	-0.12***
Education (Tertiary)	0.12***	-0.02
Development (Factor)	(Base)	(Base)
Development (Efficiency)	-0.15***	-0.27***
Development (Innovation)	-0.12***	-0.23***
Gender*Efficiency		0.03***
Gender*Innovation		0.07***
Age*Efficiency		0.00
Age*Innovation		-0.00
Secondary*Efficiency		0.19***
Secondary*Innovation		0.15***
Tertiary*Efficiency		0.18***
Tertiary*Innovation		0.16***
Constant	0.27***	0.35***
F statistic	88.26***	54.57***
R^2	0.03	0.04
Adjusted R^2	0.03	0.04
Observations	20,926	20,926

** p<0.10, **p<0.05, ***p<0.01.*

Firstly, the development variables are both significant and negative, implying that on average, an entrepreneur in efficiency and innovation-driven countries are less likely to enter social entrepreneurship than those in factor-driven countries. This hints at the negative association stated in hypothesis one. It also hints towards the U-shaped relationship stated in hypothesis two, as the probability of being a social entrepreneur is higher in innovation than efficiency-driven countries.

Both models hint that gender has a negative partial association with the social orientation of entrepreneurs in the sample. This suggest that men are more likely to enter social entrepreneurship than women. Interestingly, the interaction effect of the innovation-driven countries with gender is positive (0.07) and larger than the main effect of gender in the saturated model (-0.06). This suggests that on average, women are more likely be social entrepreneurs than men in innovation-driven countries.

It is apparent that the interaction effect of economic development with all the variables, other than age, are significant. The increase in the adjusted R^2 between the models and the significant test statistic of the likelihood ratio test ($X^2 = 223.58$, $p = 0.00$), proves that the model with economic development as a moderator variable is statistically superior to the nested model. This confirms the presence of a moderation effect, and thus supports hypothesis six.

4. Discussion

Firstly, the first hypothesis is tested, which states that the level of nascent social entrepreneurship (*NSE*) is negatively associated to the level of economic development of a country. The linear regression results presented in column 2 of Table 9 shows that there is indeed a negative coefficient when GNI per capita is regressed against nascent social entrepreneurship, however this coefficient is not significant ($p=0.581>0.05$). Moreover, the correlation matrix in Table 5 also shows a negative correlation between the two variables, however this correlation, once again, is not significant. Thus, there is no evidence to support the first hypothesis, and it is therefore rejected.

Further, it was hypothesised in the second hypothesis that nascent social entrepreneurship will exhibit a U-shaped relationship with a country's level of economic development. This was tested by regressing GNI per capita against nascent social entrepreneurship in different functional forms, one such being the quadratic specification. As seen in column 3 of Table 9, the quadratic specification without the added control variables explained very little variance in the level of nascent social entrepreneurship ($R^2 = 0.05$). In Table 9, the L-shape was found to be the model with the most explanatory power. However, when the control variables are added to the regression, as seen in Table 11, the U-shape function becomes the statistically superior functional form. This is because it has the highest adjusted R^2 as well as the lowest AIC and BIC values. Therefore, there is enough evidence to suggest that once controls are added to add predictive power to the model, the U-shape is indeed the most statistically sound model

of economic development and nascent social entrepreneurship. Therefore, the second hypothesis cannot be rejected. However, it must be noted that the established U-shaped relationship might not be robust to different control variables. In order to conclude that the U-shaped relationship is the best functional form for regressing nascent social entrepreneurship and economic development, further regressions with different control variables could be used, which goes beyond the scope of this research.

The third hypothesis stated that the level of nascent social entrepreneurship will exhibit the same relationship with economic development as nascent commercial entrepreneurship. Without the control variables, the L-shaped form was the statistically superior model for both nascent and commercial entrepreneurship. However, once the control variables were added, the U-shape form became the superior functional form for nascent social entrepreneurship. The control variables added significant explanatory power to the models, as seen by the increase in adjusted R^2 as well decrease in the AIC and BIC values. For this reason, there is evidence to support that the U-shaped form is the best model fit for nascent social entrepreneurship, whereas the L-shaped form is the best for nascent commercial entrepreneurship, and the third hypothesis is rejected. Despite previously finding substantial evidence for the U-shaped form, Carree et al. (2007) since revised their methodology to include a time-series and also found evidence that the L-shaped functional form is the most statistically significant in predicting the relationship between nascent commercial entrepreneurship and economic growth. Thus, the findings of this paper are in line with current literature.

Moreover, the fourth hypothesis, which stated that the institutions (both formal and informal) that promote entrepreneurship will be favourable towards social entrepreneurship, was tested in regression models (4), (5) and (6). The quality of formal institutions, expressed as the variable *formal*, has a positive and significant (at least: $p<0.10$) coefficient in all functional forms of the regression with nascent social entrepreneurship as the dependant variable. This implies that an improvement in the level of government effectiveness, rule of law and regulation quality creates a more favourable environment for social entrepreneurship. However, *formal* did not show any significant relationship with nascent commercial relationship in any of the functional forms. Current literature tends to agree with these findings, as it has been found that social start-ups benefit more from constitutional level institutions than commercial start-ups (Estrin et al., 2013; Hoogendoorn, 2016). When analysing the informal institutions, *power distance* and *masculinity* exhibited significant coefficients with nascent social and

commercial entrepreneurship in some of the functional forms. Specifically, *power distance* exhibited a negative and significant relationship with both nascent social and commercial entrepreneurship in the U-shaped functional form. Thus, as the level of power distance in a country increases by one arbitrary unit, there is evidence to prove that the level of nascent social and commercial entrepreneurship tends to decrease by 0.05% and 0.07% respectively. This negative relationship between power distance and social entrepreneurship was also uncovered by Puumalainen et al, (2015). However, they did not find a significant relationship for any of the other cultural dimensions used in this analysis, whereas the findings in this paper show that *masculinity* exhibited a positive and significant relationship with both nascent social and commercial entrepreneurship in the L-shaped functional form. As the measure of masculinity in a country increases by one arbitrary unit, the level of nascent social and commercial entrepreneurship increases by 0.05% and 0.07% respectively. An increase in the level of masculinity of a country implies a larger focus on wealth building, which could be an incentive for individuals to enter social and commercial entrepreneurship. Ultimately, there is evidence to suggest that some formal and informal institutions impact the level of nascent social and commercial entrepreneurship in similar ways. However, the effects of these institutions are not robust to changes in the functional form of economic development in the regressions, therefore the fourth hypothesis is rejected.

The fifth hypothesis, which stated that the likelihood of an entrepreneur choosing to pursue social over commercial entrepreneurship is negatively impacted by economic development, was tested in analysis two (see Table 12). The coefficients for the efficiency and innovation-driven dummy variables are both negative and significant at a 1% confidence level. An interpretation of the results highlights that, on average, being in an efficiency driven economy instead of a factor-driven economy decreases the odds of an individual entering social entrepreneurship by 63%. Likewise, the odds ratio of 0.47 for the innovation-driven economy shows that, on average and net of all other variables, the odds of entering social entrepreneurship over commercial entrepreneurship decreases by 53% if the person is in an innovation-driven country, in comparison to a factor-driven country. This implies that overall, the probability of an individual entering social entrepreneurship is the highest in factor-driven economies and lowest in efficiency driven economies. Evidence for this is also seen in the linear probability model in Table 13, which shows that being in an efficiency and innovation-driven country, as compared to a factor-driven country, decreases the probability of being a social entrepreneur by 15% and 12% respectively. This is also supported by the mean comparisons in Table 8, whereby 26% of

the entrepreneurs in factor-driven economies identified as social entrepreneurs, compared to 16% in innovation-driven countries and a mere 12% in efficiency-driven economies. Therefore, the fifth hypothesis cannot be rejected, however it must be noted that there is enough evidence to reject the hypothesis if the country develops to an innovation-driven economy from an efficiency-driven economy. These findings provide further evidence to support the second hypothesis that nascent social entrepreneurship will exhibit a U-shaped relationship with a country's level of economic development.

Lastly, the sixth hypothesis stated that a countries' level of economic development will moderate the impact of age, gender and education on the probability of an entrepreneur entering social entrepreneurship. The interaction terms of economic development with education and gender, shown in Table 13, are significant whereas the interaction term with age is not significant. Moreover, the increase in the adjusted R^2 between the models and the significant test statistic of the likelihood ratio test ($X^2 = 223.58$, $p = 0.00$), proves that the model with economic development as a moderator variable is statistically superior to the nested model. Although the interaction with age is not significant, there is enough evidence to confirm the presence of a moderation effect for gender and education, and thus the sixth hypothesis cannot be rejected.

5. Conclusion

In this paper, research was undertaken using both aggregate and individual-level data in order to answer the central research question:

Do underdeveloped countries exhibit lower levels of social entrepreneurship? How do institutional and development factors play a role in determining a country's level of social entrepreneurship?

To summarise, the findings of this paper highlight that the rate of entry of social entrepreneurship is best modelled by a U-shaped function with the level of economic development, whereas the corresponding measure for commercial entrepreneurship is best modelled by a L-shaped function. This suggests that macro-factors do not have the same effect on these two types of entrepreneurial entry. Strong formal institutions that are embedded in the law and governance of a country tend to have a positive effect on the level of nascent social entrepreneurship. Cultural factors, such as a country's overall level of risk-taking and desire for wealth, is observed to have a positive impact on both types of entrepreneurship. A higher proportion of individuals choose to enter social over commercial entrepreneurship in underdeveloped countries. Finally, a country's level of

economic development has a moderating effect on the influence of gender and education on an entrepreneur's social orientation.

Thus, the research question can be answered: Underdeveloped countries tend to exhibit higher levels of social entrepreneurship, which research accredits to necessity-driven entrepreneurship as well as the need to solve societal problems that are not addressed by the public policies of underdeveloped countries. Moreover, the level of social entrepreneurship also tends to increase in innovation-driven countries, which confirms the presence of opportunity-driven social entrepreneurship. Institutional aspects, such as the effectiveness and regulatory quality of the government, as well as cultural values such as power distance, are important in determining aggregate levels of social entrepreneurship.

The limitations of the research in this paper are multi-fold. Firstly, hypotheses one to four were tested using the aggregate data from 60 countries that participated in the GEM study and 59 countries that participated in the special social entrepreneurship topic. This is a considerably small sample size, and thus does not allow us to make estimations and inferences about all other countries in the world. This also means that there is a large uncertainty in the size estimation of the coefficients. Moreover, the chosen independent variable to reflect economic development in this study was the level of GNI per capita (USD 1000). Many economists argue that this is not the best measure of economic development. Wennekers et al. (2005) propose that innovativeness capacity is a more suited measure. There is also much speculation regarding the usefulness of the early stage GEM entrepreneurial indicators, as they do not consider the emergence of formally registered business ventures. Virgill, (2009) has created their own framework, using the start-up rate as the measure of entrepreneurial activity, which is seen to have an increasing linear relationship with economic development. Therefore, the results and conclusions in this paper are not robust to any alternative measurements of social entrepreneurial activity or economic development. Lastly, the logistic regression model that was used to test hypothesis five assumes that the effect of each factor is the same for all categories of the others. However, the effect of an individual's education on whether they enter social entrepreneurship may fluctuate depending on their gender or age. Although one can make general comments on the net effects shown by the regression, a full picture of how the level of economic development affects different individual's perceptions about social entrepreneurship cannot be determined.

In the scope of this research, the level of nascent social entrepreneurship was regressed with independent variables that are known to affect the level of nascent commercial entrepreneurship. As a suggestion for further research, it would be interesting to assess a completely new set of control variables that are more tailored towards the social orientation of entrepreneurs, in order to devise an eclectic framework of factors focussed on social entrepreneurship. Moreover, by including the transitionary states between the levels of economic development, and by investigating the levels of entrepreneurship in efficiency-driven economies more thoroughly, a clearer image of how social entrepreneurship changes as an economy develops could be formulated. This could also be done by introducing a time-series analysis of entrepreneurship in countries that developed economically over time. Instead of using the GEM survey database, one could also use the World Bank Group Entrepreneurship Survey to conduct research with formal business registration as the measure of entrepreneurial activity. Not only does it contain information on more countries[6], it is also argued to more accurately represent the actual rate of entrepreneurship, whereas the GEM captures the "*potential supply*" of entrepreneurs (Acs et al., 2008).

This research has varying theoretical and practical implications. Firstly, this paper identifies and further explores the aggregate determinants and drivers of entrepreneurship and takes a deeper look at which factors drive diversity within a country's entrepreneurial sphere. It was determined that favourable formal institutions exert a significant influence on the rate of social start-up entry, thus a country wishing to expand its level of social entrepreneurship should ensure that aspects such as property rights are embedded within their aggregate policies. Moreover, this paper contributes to current literature by providing empirical evidence of the determinants of social entrepreneurship, as well as highlighting the differences between social and commercial entrepreneurship. Nevertheless, the area of social entrepreneurship is both a dynamic and interesting field of study with many unanswered aspects, thus it should be continuously investigated in the future.

[6] To date, the World Bank Group Entrepreneurship Survey has cross-country, time-series data on the number of total and newly registered businesses for 84 countries.

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Appendix

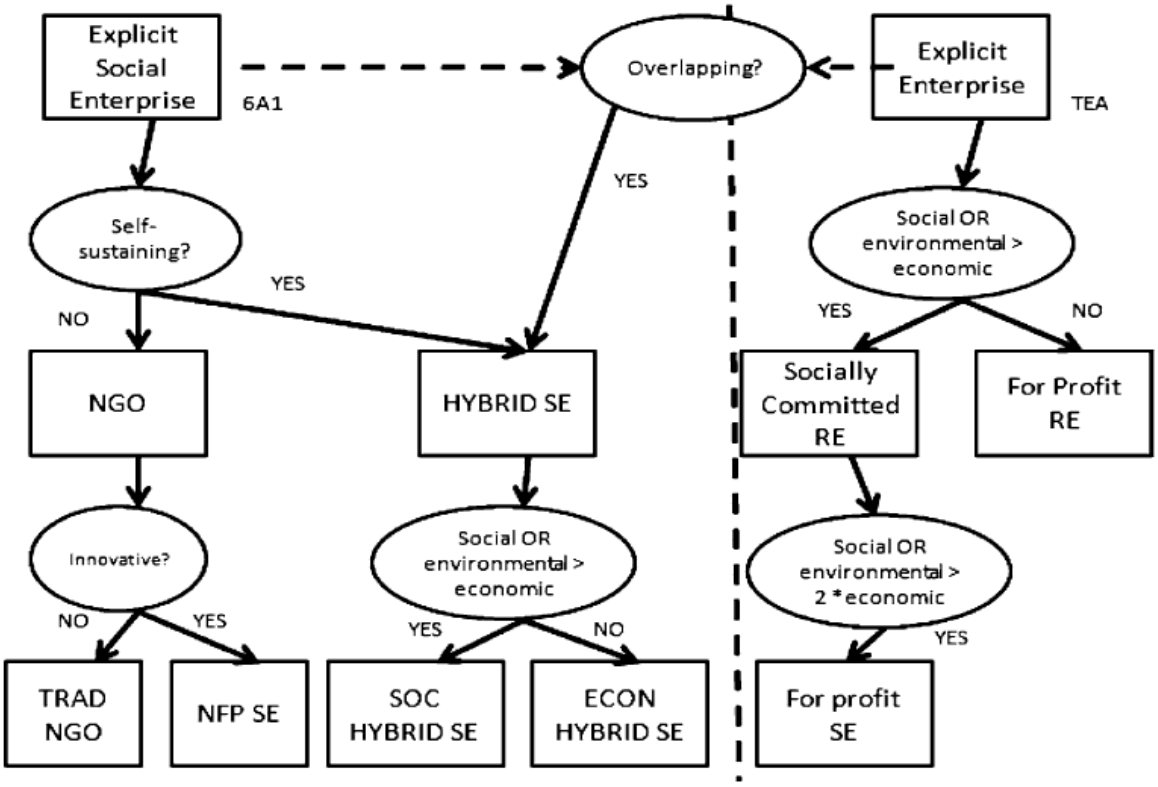

FIGURE 1: *The social entrepreneurship spectrum devised by Lepoutre et al. (2013) which shows the steps taken to distinguish between the different types of social enterprises (for profit, non-profit and hybrid enterprises). It also shows that traditional non-government organisations (NGO's) that do not have innovative business models are not classified as social enterprises.*

TABLE 1

List of countries included in the GEM 2015 study

Factor-driven	Efficiency-driven	Innovation-Driven
Botswana	Argentina	Australia
Burkina Faso	Barbados	Belgium
Cameroon	Brazil	Canada
India	Bulgaria	Estonia
Iran	Chile	Finland
Kazakhstan	China	Germany
Philippines	Colombia	Greece
Senegal	Croatia	Ireland
Vietnam	Ecuador	Israel
	Egypt	Italy
	Guatemala	Korea
	Hungary	Luxembourg
	Indonesia	Netherlands
	Latvia	Norway
	Lebanon	Portugal
	Macedonia	Puerto Rico
	Malaysia	Slovakia
	Mexico	Slovenia
	Morocco	Spain
	Panama	Sweden
	Peru	Switzerland
	Poland	Taiwan
	Romania	United Kingdom
	South Africa	United States
	Thailand	
	Tunisia	
	Uruguay	

TABLE 2

Questions asked in the special social entrepreneurship topic survey of the GEM in 2015

Question ID	Question
sestart	Are you, alone or with others, currently trying to start or currently leading any kind of activity that has a social, environmental or community objective?
sestact	Over the past twelve months have you done anything to help start this activity, organization or initiative?
sestdif	Can I check, is this activity, organization or initiative the same one that you described in detail earlier, or is it a different one?
se3mn	Has the activity, organization or initiative provided services to others, or received external funding for more than three months?
sestyr	What was the first year the activity, organization or initiative provided services to others, or received external funding?
senowjob	Including the owners, how many people are currently working for this activity, organization or initiative?
senowjvt	How many volunteers are currently working for this activity, organization or initiative?
seyr5job	Not counting owners, how many people, including present and future employees, will be working for this activity, organization or initiative five years from now?
sestmontot	How much money, in total, is required to start this activity, organization or initiative?
sestmonown	How much of your own money, in total, will you provide to this activity, organization or initiative?
sestfrma	Family members (Received or expect to receive money from...?)
sestfrmb	Friends or neighbors (Received or expect to receive money from...?)
sestfrmc	Employer or work colleagues (Received or expect to receive money from...?)
sestfrmd	Banks or other financial institutions (Received or expect to receive money from...?)
sestfrme	Private investors or venture capital (Received or expect to receive money from...?)
sestfrmf	Government programs, donations or grants (Received or expect to receive money from...?)
sestfrmg	Online crowdfunding (Received or expect to receive money from...?)
seommontot	How much money, in total, was required to start this activity, organization or initiative?
seommonown	How much of your own money, in total, did you provide to this activity, organization or initiative?

seomfrma	Family members (Received money from...?)
seomfrmb	Friends or neighbors (Received money from...?)
seomfrmc	Employer or work colleagues (Received money from...?)
seomfrmd	Banks or other financial institutions (Received money from...?)
seomfrme	Private investors or venture capital (Received money from...?)
seomfrmf	Government programs, donations or grants (Received money from...?)
seomfrmg	Online crowdfunding (Received money from...?)
seecon	My organization, generating value to society and the environment is more important than generating financial value for the company.
sesocial	My organization puts more emphasis on social value than on environmental value.
semarket	My organization operates in the market by producing goods and services.
seinprod	My organization offers products or services that are new to the market.
seinproc	My organization offers a new way of producing a product or service.
seprofit	Profits will be reinvested to serve the social or environmental purpose of my organization.
seimpact	My organizations puts substantial effort in measuring its social or environmental impact.

TABLE 3

An overview of the control variables used in regressions 4-6, Analysis 1

Category	Variable	Definition	Source and notes
Informal (cultural) institutions	Power distance	The extent to which the lower levels of a hierarchical organisation can have an influence on higher levels. A lower power distance equates more equality and more flat structures.	Hofstede Insights database (Hofstede, 2001) These variables are measured on a scale from 0 to 100.
	Uncertainty avoidance index	Measures how uncertainty and ambiguity are tolerated. A high avoidance indicates low tolerance for risk-taking and uncertainty.	
	Masculinity versus femininity	Indicates how a society views achievement and their attitudes towards equality. A more masculine society are more assertive and concentrate on wealth building. A more feminine society is nurturing and focuses on the quality of life.	
	Individualism versus collectivism	Individualism shows that people are more driven to achieve their personal goals whereas collectivism indicates a preference to maximise well-being of a group.	
Formal institutions	Government effectiveness	This measures the perceived quality of public services, quality and implementation of public policy and civil services.	World Governance Indicators database These variables are estimated by a score between -2.5 to 2.5.
	Regulation quality	The perceived quality of the government's ability to implement policies that effectively promote the private sector and its development.	
	Rule of Law	Captures the perceptions of how well citizens abide to the rules of society, the quality of contract enforcement on property rights, the likelihood of criminal activities as well as the legal system in place.	
Economic Factors	Economic Growth	Annual percentage growth rate of gross domestic product (GDP) at market prices based on constant local currency and based on constant 2010 USD.	World Development Indicators database
	Unemployment	Defined as the percentage of the labour force that is without work but available for and seeking employment.	
Demographic factors	Population Growth in last 6 years	Calculated as the percentage change in total population between 2009 and 2015.	
	Age Distribution	The percentage of the total population that fall within the following categories: 20-24; 25-29; 30-34; 35-39; 40-44; 45-49; 50-54; 55-59; 60-64.	OECD Stat.
	Educational Attainment	Government expenditure on education as a % of GDP.	World Development Indicators database
Technological factors	Internet Users	% of people in the population of that country that have access to and use the internet.	

TABLE 5

Correlation Matrix, Analysis 1

	1a.	1b.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14e.	15.
1a.	1.00															
1b.	0.48**	1.00														
2.	-0.08	-0.38**	1.00													
3.	-0.05	0.14	-0.62**	1.00												
4.	0.01	0.08	-0.12	0.28*	1.00											
5.	0.20	0.10	-0.09	0.29*	0.05	1.00										
6.	0.01	-0.32*	0.70**	-0.55**	-0.15	0.19	1.00									
7.	-0.10	-0.40**	0.89**	-0.58**	-0.13	-0.13	0.69**	1.00								
8.	0.04	-0.33**	0.82**	-0.53**	-0.05	-0.12	0.63**	0.91**	1.00							
9.	-0.04	-0.34**	0.86**	-0.59**	-0.10	-0.17	0.70**	0.96**	0.93**	1.00						
10.	0.27*	0.19	-0.24	0.20	-0.36**	0.15	-0.22	-0.21	-0.22	-0.23	1.00					
11.	0.21	-0.08	0.00	0.06	-0.24	0.16	0.01	0.04	0.07	0.03	0.61**	1.00				
12.	-0.20	-0.17	-0.07	-0.07	0.22	0.09	0.17	-0.03	-0.03	0.01	-0.32*	-0.16	1.00			
13.	0.25	0.41**	-0.24	0.10	-0.23	0.11	-0.18	-0.37**	-0.38**	-0.35**	0.34**	0.05	-0.29*	1.00		
14e.	-0.35**	-0.56**	0.35**	-0.04	0.11	0.06	0.16	0.39**	0.33**	0.29*	-0.18	0.06	0.11	-0.53**	1.00	
15.	-0.18	-0.42**	0.82**	-0.59**	-0.03	-0.12	0.63**	0.84**	0.79**	0.80**	-0.39**	-0.10	0.07	-0.34**	0.47**	1.00

**p<0.05, **p<0.01.*

1a. = Nascent Social Entre.; **1b.** = Nascent Commercial Entre.; **2.** = GNI per capita (USD 1000); **3.** = Power distance; **4.** = Uncertainty avoidance; **5.** = Masculinity vs. femininity; **6.** = Individualism vs. collectivism; **7.** = Government effectiveness; **8.** = Regulation quality; **9.** = Rule of law; **10.** = Economic growth 2014; **11.** = Economic growth 2015; **12.** = Unemployment rate 2015; **13.** = Population growth 2009-2015; **14e.** = Population share aged 40-44; **15.** = % of internet users

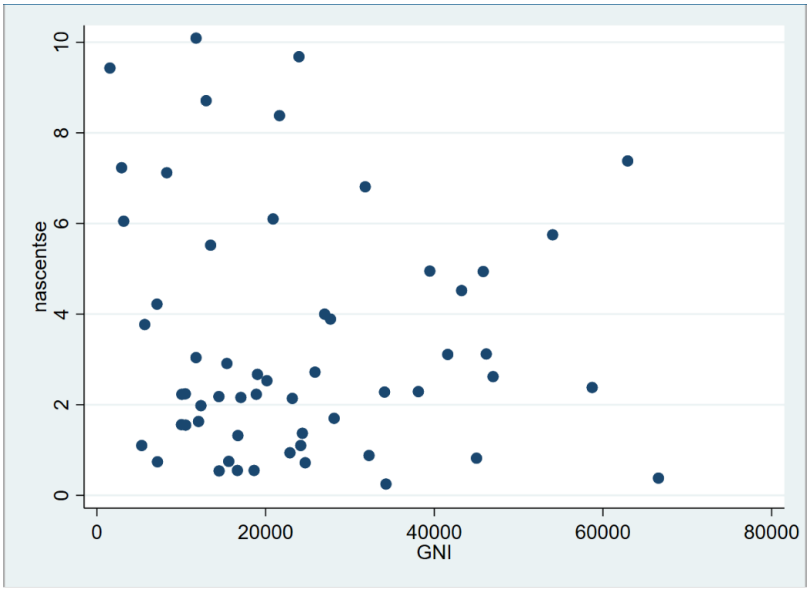

FIGURE 2: *The scatter plot showing the relationship between the level of nascent social entrepreneurship (% of working population) and GNI per capita (USD 1000) for 57 countries in the GEM study.*

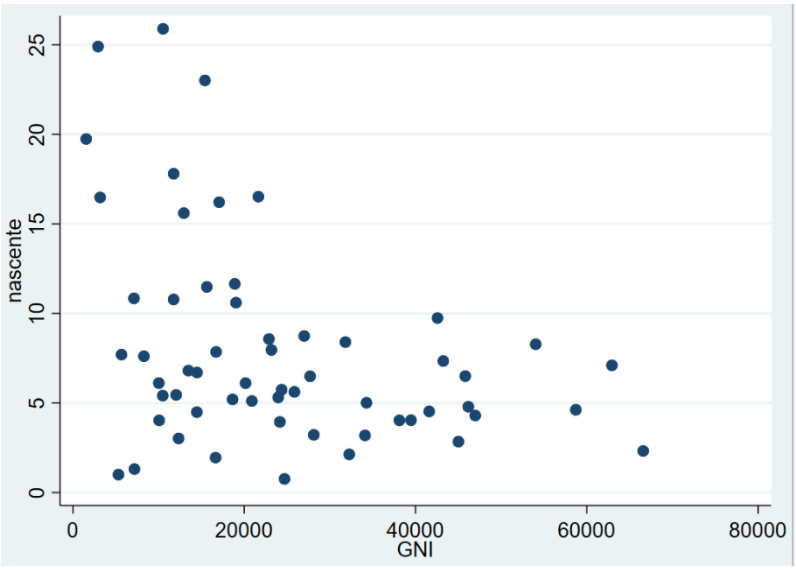

FIGURE 3: *The scatter plot showing the relationship between the level of nascent commercial entrepreneurship (% of working population) and GNI per capita (USD 1000) for 58 countries in the GEM study.*

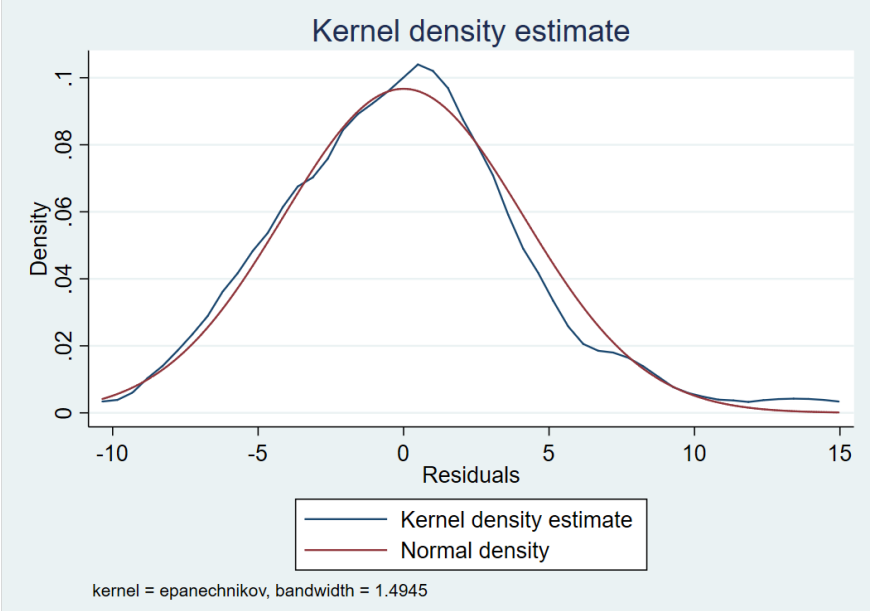

FIGURE 4: *The kernel density plot showing the approximate normal distribution of the residuals in regression model (1) with nascent social entrepreneurship as the dependant variable.*

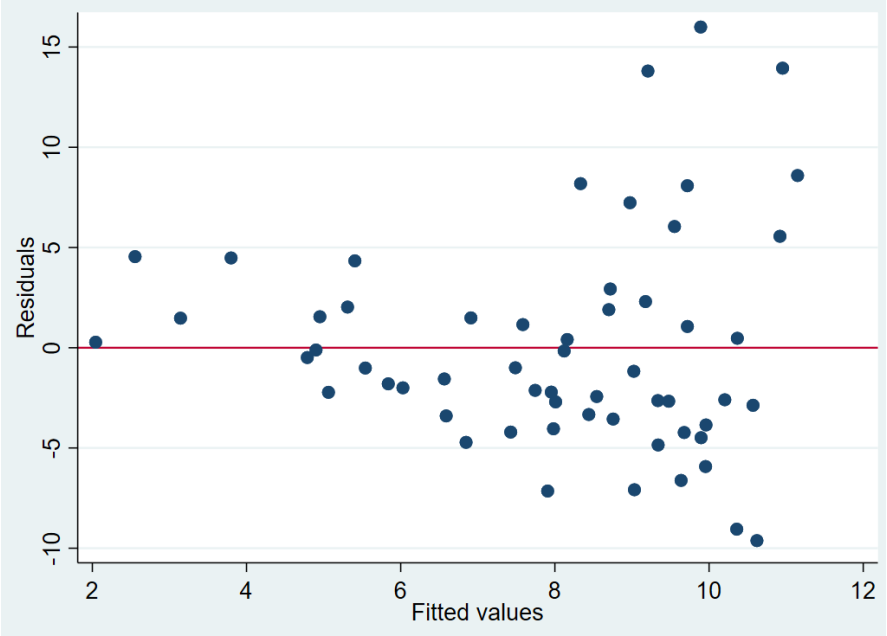

FIGURE 5: *The residuals versus fitted values plot of regression (1) with nascent commercial entrepreneurship as the dependant variable. The shape of this plot suggests the existence of heteroscedasticity in this regression.*

TABLE 10

BIC and AIC results for linear regressions 1-3.

	NSE			NCE		
	Linear	U-shape	L-shape	Linear	U-shape	L-shape
AIC	275.61	272.27	268.41	362.80	361.80	357.61
BIC	279.70	277.36	272.50	366.92	367.98	361.73

BIC and AIC results with the control variables for linear regressions 4-6.

	NSE			NCE		
	Linear	U-shape	L-shape	Linear	U-shape	L-shape
AIC	253.00	251.11	252.41	321.78	323.70	321.52
BIC	276.41	274.53	275.83	345.42	349.31	345.16