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Analyzing the Effects of Economic Factors on the Relationship between GDP per capita and Entrepreneurship Level

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Abstract: This research aims to evaluate the effect of GDP (Gross Domestic Product) per capita on entrepreneurship, considering economic factors. The paper begins by exploring the concept of entrepreneurship and views GDP per capita as an international performance indicator. The study then analyzes entrepreneurship in developing and developed countries, viewing previous studies. Finally, the paper considers social factors as controls and economic factors as moderators, considering the above relationship, which translates to the hypothesis formation. The regression analysis will test the hypothesis and conclude the direction of the relationship with and without economic moderators for comparison purposes.

Introduction:

The concept of entrepreneurship is prevalent at various stages of observation such as a person, firm, region or industry. Three scholars, Schumpeter, Kirzner, and Knight have shaped the literature on entrepreneurship in the 20th century. The methodology of explaining this phenomenon has been constructed on disciplines like economics, sociology, and psychology (Freytag & Thurik, 2007). Freytag & Thurik (2007) also claim that there is a U-shaped relationship between the level of business ownership and per capita income. This paper aims to use this concept by studying the association between entrepreneurship level and GDP per capita while considering economic factors and applying social controls. The study uses a sample of 20 countries, considering the period 2015-2010.

After the Second World War, entrepreneurship was on the sidelines of economic theory and this lack of interest at the time was due to the belief that entrepreneurship would become more outdated as capitalism developed. Large firms were seen to be increasingly vital in developed countries, however, this trend shifted since 1973, with start-ups increasing in numbers and significance. This shift was more evident due to the political and economic events at the start of the 21st century (Brouwer, 2002). However, the importance of entrepreneurs was first fully recognized by Schumpeter who described the entrepreneurial process of initiating radical structural change and growth through creative destruction. The absence of entrepreneurship would reduce growth, as, without entrepreneurs, the factors of production would be lacking the mechanism to instigate economic development (Cumming et al., 2012). Entrepreneurs may affect economic development by engaging in innovation and creating new products and processes. They may also increase competition and enhance technical and customer knowledge by introducing variations in the product. Entrepreneurs may also be inclined to work efficiently with longer hours as their income is linked to the effort applied (Van Stel et al., 2005). To make progress, entrepreneurs experiment with different variations of output as described above to test which combination improves economic life.

Furthermore, entrepreneurship is the factor that creates wealth by combining existing production factors in new ways (Stam & Van Stel, 2011). Recent studies look at entrepreneurship as a driver of economic development and some authors even include entrepreneurship as a fourth production factor in the macroeconomic production function (Audretsch and Keilbach, 2004).

Economic growth in itself is probably one of the most important targets for development policies. Traditionally, the economic output of a country is seen based on a production function of the sum of labor, capital inputs and technological knowledge (Stam & Van Stel, 2011). Economic growth can also be defined as a sustained increase in the welfare of a nation, combined with prevailing changes in the economy's literacy, public health, industrial structure, demography and distribution of income. Praag & Versloot (2007) described productivity and growth as one of the main indicators of economic outcomes when analyzing previous studies regarding entrepreneurship. According to them, this is measured by a firm/region's contribution to a country's GDP or GDP growth. Hence, the authors included studies that measure a firm's or region's value-added labor productivity. This means the contribution of GDP per worker or total factor productivity. Studies which measure the value and/or growth of any of these indicators of productivity and growth are considered relevant (Praag & Versloot, 2007). GDP per worker can be translated to GDP per capita as this study considers an international analysis and uses this as a performance indicator for comparison purposes in the research. GDP per capita or income per capita is income divided by the population in the appropriate geographic unit which yields a convenient first measure on the state of economic well-being (Rahman & Ulubaşoğlu, 2015).

In the literature analysis, this paper finds out that there are not many studies that evaluate the effect of GDP/GDP per capita on entrepreneurship. Evaluation of the inverse relationship is more common like in the papers of Cumming et al. (2012), Hafer (2013) and Valliere & Peterson (2009). Papers which look into the association between these variables are usually studying the relationship between entrepreneurship and economic growth. Furthermore, GDP/GDP per capita is considered in terms of relative change in most previous related papers such as in the studies of Hessels & Van Stel (2009), Van Stel et al. (2005) and Zoltan et al. (2012). This paper aims to move away from this standard and uses absolute GDP per capita to further enrich the analysis of entrepreneurship and economic growth. Finally, there are not many studies that analyze economic and social variables together on the relationship between entrepreneurship and GDP per capita.

The significance given to an entrepreneur and the policy interest in his/her activities has increased in recent years. Hence, the understanding of the broad connection between entrepreneurship, economic level and institutions is critical if one wants to analyze entrepreneurial levels within or across countries (Hessels et al., 2008). Economic factors can increase entrepreneurship, leading to wealth creation as

described by Stam & Van Stel (2011). In this study, we investigate if economic factors such as private investment, government expenditure, and innovation amplify the relationship between GDP per capita and entrepreneurship level. This is done by using these economic factors as moderators of the association between the main variables of the study. If this relationship is amplified, these factors may be a more efficient and cheaper tool to increase entrepreneurship level in a country and policy makers can target these economic factors specifically. Hence, the results of this study can provide valuable insights into government policymaking which is related to enhance entrepreneurship in a region. This increase in entrepreneurship can increase the welfare and standard of living in a society by wealth creation as described above and also improve the employment level in an economy. Hence, this leads to the following research question:

Research Question: *What is the effect of economic factors on the relationship between GDP per capita and entrepreneurship level?*

The following section provides the literature review which describes the variables of this study and the concepts behind them, which lead to the hypothesis formation. The section after that is the empirical analysis which studies the data and the regression analysis and is followed by the results and conclusion.

Literature Review:

Entrepreneurship:

There have been many obstacles in defining entrepreneurship as it depends on the different environments, organizations and situations considered (Scherer et al., 1989). However, Carsrud et al. (1986) define entrepreneurship as "an individual who is willing and able to engage in personal risk-taking and responsibility, while at the same time combining the means of production and credit in the expectation of realizing profit and/or other specific objectives such as power and prestige." Another view of entrepreneurship can be seen in the paper of Dejardin (2000) which describes it 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". Entrepreneurship can be split into two parts, necessity and opportunity. Necessity entrepreneurship is becoming an entrepreneur when you do not have a better alternative while opportunity entrepreneurship is an active choice to start a new enterprise, believing that an unexploited opportunity exists (Zoltan, 2006).

Multiple indicators have been used in previous studies to measure entrepreneurship. Zoltan et al. (2011) measure this concept by simply using the number of people self-employed as a percentage of total employment, excluding the agricultural sector. Hafer (2013) uses the Kauffman Foundation's index of entrepreneurial activity (KIEA) which uses current population surveys. Valliere & Peterson (2009) used an aggregate of High-expectation Entrepreneurship Activity (HEA), Opportunity Entrepreneurship Activity (OEA) and Necessity Entrepreneurship Activity (NEA) to measure entrepreneurship. The difference between HEA and OEA is that opportunity entrepreneurs have lower growth expectations. A more common indicator is the Total early-stage entrepreneurial activity (TEA) which is defined as that percentage of adult population (18–64 years old) that is either actively involved in starting a new venture or is the owner/manager of a business that is less than 42 months old (Reynolds et al., 2002). TEA is used in the papers of Simón-Moya et al. (2014), Martin et al. (2010) and Hessels & Van Stel (2009) hence, it is a measure for entrepreneurship level in this study.

GDP per capita:

Besides GDP per capita, there are other performance indicators to evaluate economic development. Rahman & Ulubaşoğlu (2015) looked at different indicators for economic growth measurement in their study such as the accumulation of physical capital or investment which is based on the neoclassical theory. This theory views investment as a critical driver for economic growth. The total output follows a production function that increases with the value of physical capital and labor with technology added as an extra dimension. Another indicator described by Rahman & Ulubaşoğlu (2015) is knowledge input which consists of scientists, R&D, patents, knowledge spillovers and ideas which can give rise to economic growth. These spillovers can occur across countries, leading to worldwide economic growth or there can be country-specific knowledge accumulation which can explain each country's economic growth. The above study also views the difficulty faced in comparing cross-country income report data and recommends to use the official exchange rates to convert national currency figures into one single currency or using a purchasing power parity (PPP). Finally, Rahman & Ulubaşoğlu (2015) talk about national income or GDP as a significant economic indicator which is measured by the sum of all expenditures in a country in a given year. It can also be defined as the addition of all income earnings or value-added of all goods in a year.

In previous recent papers that analyze the relationship between economic growth and entrepreneurship, GDP/GDP per capita is used as a key performance indicator as seen in the papers of Hessels & Van Stel (2009) and Van Stel et al. (2005). Simón-Moya et al (2014) studied the effects of cultural, institutional and economic drivers on entrepreneurship and used GPD per capita as one of the main economic indicators. Cumming et al. (2012) analyzed the economic impact of entrepreneurship by using GDP per

capita as one of the main dependent variables of the study. Some of the studies described here have used an international comparison to evaluate entrepreneurship like the study by Van Stel et al. (2005) which showed that TEA rates have a negative effect on GDP growth in relatively poor countries, while it has a positive effect on relatively rich countries. The paper also claims that countries which are on similar stages of economic development can differ in rates of entrepreneurial activity. Hessels & Van Stel (2011) find a positive relationship between entrepreneurship and economic growth, however, an additional effect of export-oriented early-stage entrepreneurship is observed in higher-income countries. A similar result was found in the study by Valliere & Peterson (2009) when analyzing entrepreneurship and economic growth of emerging and developed countries. However, there are entrepreneurial studies like of Martin et al. (2010) and Galindo & Mendez (2013) which use international data sets, not for comparing countries but to make the sample more representative. This method will also be the focus of this study. The above literature analysis shows a positive relationship between entrepreneurship and economic growth with GDP per capita is the key performance indicator. This leads to the following hypothesis:

H1: There is a positive relationship between GDP per capita and entrepreneurship level.

From Schumpeter's perspective, an entrepreneur is profit-seeking and needs an adequate social environment to develop the activity (Martin et al., 2010). Castano et al. (2015) claim that the structure and social development of a country is an important factor, furthermore, a suitable social climate enhances entrepreneurial activity by stimulating economic growth and job creation. His study looks at the effect of economic, social and cultural factors on entrepreneurship. The study finds a positive relationship between entrepreneurship and social factors, which is evaluated using a single regression equation to analyze all the factors (economic, social and cultural). Hence, this study considers the following social variables for further analysis.

Social Controls:

The study by Bonte et al. (2009) finds an inverse U-shaped relationship between an individual's age and his or her decision to start a business, which is in line with previous findings. The study above also found a causal relationship between the regional age structure and regional start-up activity. To account for age, the percentage of the total population which is aged between 18 and 64 is taken into consideration. This is to include only the working population which is more likely to engage in entrepreneurship and is used in the study of Hafer (2013) which studies entrepreneurship and growth using state analysis.

The study by Matthews and Moser (1995) found that females had less interest in business ownership than males. Furthermore, Reynolds (1995) claimed that nascent or newly emerging entrepreneurship was more common for males than females. The study by Wilson et al. (2007) looks at the relationship between

gender, entrepreneurial self-efficacy, and entrepreneurial intentions by studying from the sample groups of middle/high school children and adult MBA students. The study found that men reported a higher level of entrepreneurial self-efficacy and intentions than women. Furthermore, the study by Zhao et al. (2005) also found women reporting lower intentions to become an entrepreneur than men. Hence, gender is taken into consideration by adding the percentage of males from the total population as the second control.

Reduction in social stress would encourage entrepreneurs to increase their activity and measuring this is primarily important. This is measured by income distribution (Galindo & Mendez, 2013). This concept is also seen in the paper of Martin et al. (2010) which says income inequality reduction would lower social stress as mentioned above, along with opposition to innovation. The paper by Frid et al. (2016) studies US nascent entrepreneurs, actively attempting to start a new business venture. The results showed that low wealth and moderately wealthy nascent entrepreneurs are more likely to discontinue the startup process during the development phase as they face liquidity constraints. Hence, this study uses income inequality as an additional control variable, measured by the GINI index. GINI index measures income distribution among individuals in an economy and how much it deviates from a perfectly equal distribution. A Gini index of 0 represents perfect equality, while an index of 100 implies perfect inequality (World Bank, 2018).

Sluis, Praag & Vijverberg (2008) claim that the more years of education have been acquired, the higher are the chances of a good performance due to increased earnings, higher growth and better chances of survival. One of the ways of incorporating differences in human capital is the percent of the adult population with a bachelor's degree (Hafer, 2013). Individuals place greater trust in their abilities to commence an economic activity when they have a higher level of education (De Clercq & Arenius, 2006). This is also seen in the paper by Ertuna & Gurel (2011) which looks at the university students in Turkey that study business and engineering. The study finds that students with higher education have a greater intention of becoming entrepreneurs. Hence the population with at least some secondary education based on the percentage of ages 25 and older is the final control variable (United Nations).

Each of the social factors that this paper looks into affects the entrepreneurship level, as seen above. However, social factors are not the focus of this study and hence, these variables are added as controls to test the direction of the relationship between entrepreneurship level and GDP per capita with and without the economic moderators. To study the effect of economic factors on the above relationship, this study considers the following moderators.

Economic Moderators:

The role of financial institutions is important in profit enhancing. Entrepreneurs need financial resources to carry out their activities and invest in innovation. Hence, a policy designed to increase savings is necessary to facilitate the credit process (Galindo & Mendez, 2013). These savings can, in turn, increase the level of private investment in the economy to stimulate entrepreneurship. Furthermore, new models of economic growth view investments as a necessary complement to entrepreneurship/innovation. Hence, private investment is the first economic moderator in the analysis and is measured by the gross fixed capital formation in US Dollars. This includes plant, machinery and equipment purchases; construction of roads, railways, schools, hospitals, private and industrial buildings (World Bank, 2018).

Government aid to entrepreneurship is based on correcting market failures due to external costs, external benefits or public goods. The government hence has multiple paths to inspire entrepreneurship through public spending. These include tax incentives, governmental purchasing programs, public contracts, and the provision of capital risk funds or specific support from governmental agencies (Castano et al., 2015). Li (2002) studied entrepreneurship and government subsidies and found that a more effective way to improve entrepreneurial activity and total output is to provide income subsidy programs that specifically target poor and capable entrepreneurs. Public spending is, therefore, the second economic moderator which is measured by the general government final consumption expenditure in US Dollars. This includes government expenditure on goods and services, national defense and security but excludes government military expenditures (World Bank, 2018).

Schumpeter, along with other economists stresses the important role of entrepreneurship and innovation in economic growth (Galindo & Mendez, 2013). An entrepreneur's innovation can lead to other individuals undertaking an entrepreneurial career (Castano et al., 2015). According to Martin et al. (2010), innovation plays a role in the improvement of a product which lets the entrepreneur be in a better position to increase profits. These high profits can lead to more people engaging in the development of the product hence, innovation is the last economic moderator in consideration, measured by the number of patent applications for residents which is similar to the paper by Galindo & Mendez (2013). Patents provide exclusive rights for an invention, product or process and protection for the owner which lasts for generally 20 years (World Bank, 2018). These economic factors lead to the following hypothesis:

H2: Economic factors such as private investment, government spending, and innovation moderate and amplify the relationship between GDP per capita and entrepreneurship level.

Empirical analysis:

To analyze these economic and social factors, this study will consider the data from 2010 until 2015. Originally, the data from 2013 till 2018 was considered however, the figures for the GINI index and

education were not available for this timeline. The dependent variable in this study is the entrepreneurial level, measured by the TEA while GDP per capita is the independent variable. The papers by Martin et al. (2010) and Galindo & Mendez (2013) serve as a basis for the country selection of the sample as these papers use a similar regression equation which we consider for their analysis. The final country sample consists of the aggregate of the countries used in these papers, except for New Zealand and Iceland as TEA data was not available for them. The final sample contains 20 countries which include Argentina, Australia, Belgium, Brazil, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Netherlands, Norway, Singapore, South Africa, Spain, Sweden, United States, and the United Kingdom.

Data Descriptive Statistics:

TEA data is from GEM (Global Entrepreneurship Monitor) and the education component variable is from the United Nations website while the data for all the other variables is from the World Bank's World database Indicators (WDI). This study performs a descriptive statistics analysis to obtain a better understanding of the variables which is shown in the appendix on tables 1 and 2. Table 1 looks at the mean and standard deviation of the main dependent variable TEA and the main independent variable, GDP per capita. This is sorted by country. It is interesting to note that Brazil, being a developing country, has the highest mean TEA rate (17.22). Argentina is a close second while Italy has the lowest mean TEA rate of 3.87. Many developed European western countries such as Belgium, France, Germany, the United Kingdom, and Ireland have a mean TEA below the sample average of 8.28. Furthermore, Argentina has the highest standard deviation and Finland the lowest for TEA. The average GDP per capita of the sample is $43,624, which is a fairly high amount. Although having a TEA rate greater than the average, South Africa has the lowest mean GDP per capita in the sample with Brazil being the second-lowest which had the highest mean TEA. This can provide some evidence against the first hypothesis but cannot be decisive. South Africa also has the lowest standard deviation while Norway, which has the highest mean GDP per capita also has the highest standard deviation for this variable. This means that not many people in Norway enjoy this high per capita income.

Table 2 in the appendix looks at the mean and standard deviation of all the social controls and the economic moderators and aggregates them according to the year. For both private investment and government expenditure, the mean is higher than the standard deviation for each year. This can be due to extremely high private investment and government spending by the United States and Japan. Expenditure on these variables in these countries exceeds a trillion US dollars with the United States spending higher than 3.5 and 2.5 trillion US Dollars on private investment and public expenditure. Not many countries have a value exceeding 500 million US Dollars on these variables which also reflects the high standard deviation. The mean of the private investment tends to increase each year until 2014, after which it

decreases. The average government expenditure also increases until 2014 and decreases afterward. Innovation also has a standard deviation higher than the mean which can be explained by extremely large quantities of patent registrations by technologically developed countries like Germany, Japan, and the United States. In all the economic moderators, there are large differences between the mean and the median which translates to the fact that large extreme values of the data influence the mean. For social controls, the mean of the percentage of the working population stays relatively stable at around 66% and the percentage of the male population at around 49.3%. There are minor fluctuations in the Gini Index while there is a high level of secondary education in the selected countries and stays in the range of 82-85%.

Initial Regression Analysis Equation:

After describing the data, this paper initially considers making two multivariate OLS regression equations that can apply STATA to test the hypothesis and find out the value of the coefficients. These equations which are stated below are based on the regression analysis applied in the study of Martin et al. (2010) and Galindo & Mendez (2013).

$$Ent = \beta0 + \beta1(Y) + \beta2(P) + \beta3(M) + \beta4(Q) + \beta5(E) + \varepsilon \quad (1)$$

$$Ent = \beta6 + \beta7(Y) + \beta8(PV) + \beta9(Y*PV) + \beta10(G) + \beta11(Y*G) + \beta12(IN) + \beta13(Y*IN) + \beta14(P) + \beta15(M) + \beta16(Q) + \beta17(E) + \varepsilon \quad (2)$$

To test the first hypothesis, the study considers equation 1 or the without economic moderators analysis. Ent is the entrepreneurial level which uses TEA. Y is GDP per capita, P is the percentage of the population aged between 18 and 64, M is the percentage of the male population, Q is the Gini index to measure income distribution and E is the percentage of the adult population with at least a secondary education. To test the second hypothesis, the study considers equation 2 or the economic moderators' analysis. PV is private investment, G is government or public expenditure while IN is innovation measured by the number of patent applications.

Correlation Analysis:

The sample of the selected countries consists of both developed and developing nations and there might be large differences in the values of the tested variables. Furthermore, the paper also applies interaction terms in the regression analysis which can lead to the issue of multicollinearity. To reduce this problem, this study standardizes the variables which it will use for regression. Standardization also removes the problem of large outliers in data of the countries. To further examine multicollinearity, this study applies a correlation analysis between the economic moderators for each year separately as seen in the appendix

tables 3A till 3F. This provides some compelling output. The analysis shows an extremely high correlation between all the economic variables with the value going to almost 0.99. This is the case for the year 2015. There is a similar output when we apply this method to other years with the exception being the correlation between innovation and private investment and innovation and government expenditure. In this case, the correlation between these variables reduces in the range 0.84 to 0.88, however, this value is still too high.

After viewing the economic moderators, this study applies the correlation analysis on the social factors as seen in the appendix tables 3G till 3L. For 2015, there is a high correlation between the social controls, with values reaching more than 0.78. It is also noticeable that the correlation results which relate to the percentage of the working population have a lower value as compared to the output which does not contain this variable. This is the case for all the years except in 2015. There is also a high correlation between the Gini Index and the percentage of the population with at least a secondary education.

Final Analysis Equation:

The above analysis shows that both the economic moderators and social controls suffer from the issue of multicollinearity. This means that the variables will not show a significant result. To counter this problem, the study decides to choose only one economic moderator from the list above as each is highly correlated and cancels the effect on each other. Innovation is not selected as it does not share the same units with the main independent variable, GDP per capita. Between the other two economic moderators, private investment is selected as it has a higher correlation with TEA (0.136) as compared to the correlation between TEA and government spending (0.096). Furthermore, as seen above, taking the working population as the only control variable can obtain any meaningful results. This leads us to the final equation:

$$Ent = \beta 18 + \beta 19(Y) + \beta 20(PV) + \beta 21(Y*PV) + \beta 22(T) + \varepsilon \quad (3)$$

This study uses only equation (3) to test and analyze hypotheses 1 and 2 and ignores the first two equations, formed previously due to the multicollinearity problem. Furthermore, it is known that GDP per capita does not stay constant each year and changes with time. To incorporate this, the paper adds an extra dimension of time as an additional control in its equation analysis by including the variable of the year number in the regression model, represented by T.

Results:

The result of the model as described in the empirical analysis is presented in table 4 below. To test the validity of the model and its corresponding variables, this study sets the significance level at less than 5%.

The results show an overall significant model and an R-square of 0.34. There is a negative relationship between TEA and GDP per capita (beta -0.28) and this association is significant. Hence, we reject the first hypothesis. Furthermore, there is a positive significant relationship between the percentage of the working population and the TEA rate. The result is similar when obtaining the association between the year and TEA however, the correlation coefficient is lower. The study also finds that the economic moderator's private investment does not have a significant relationship with TEA. This is also the case for the association between the interaction term of GDP per capita and private investment and the TEA rate. Due to these results and the elimination of factors in the correlation analysis, this research cannot find any moderating relationship of private investment, government spending, and innovation with GDP per capita and entrepreneurship level. Hence, hypothesis two is neither accepted nor rejected.

Table 4: Regression analysis. The results are based on a 5% significance level with 108 total observations. Prob > F equals 0.000 while the R-squared has a value of 0.340.

Dependent Variable (TEA)						
Independent Variables	Coefficient	Standard Error	t	p-value	Confidence Interval (95%)	
GDP per Capita	-0.276	0.129	-2.140	0.034	-0.531	-0.020
Private Investment	0.023	0.136	0.170	0.867	-0.247	0.293
GDP per Capita*Private Investment	0.354	0.269	1.320	0.191	-0.180	0.889
% Working Population	0.380	0.082	4.660	0.000	0.218	0.541
Year	0.189	0.082	2.310	0.023	0.027	0.351
Constant	-0.022	0.082	-0.270	0.789	-0.184	0.140

Conclusion:

Due to the multicollinearity problem within the economic variables, it is difficult to give a definite answer of the research question. The study eliminates two out of the three selected economic factors and hence, if we only consider private investment as a moderator, we can say that there is no effect of economic factors on the relationship between GDP per capita and entrepreneurship level. However, due to the lack of economic variables this statement can be easily challenged. The findings in this paper have a stark contrast to the paper by Cumming et al. (2012) who claims that the establishment of entrepreneurial activity or new business activity is positively related to GDP per capita. Nystrom (2008) defines entrepreneurship as self-employment and studies 23 OECD countries during the period 1972-2002 and finds a negative relationship between entrepreneurship and GDP per capita. Bjornskov & Foss (2008) also find a similar result and claim that such development reduces the need to engage in entrepreneurial activity. The authors also say that although GDP per capita is a vital determinant of average income, this

value decreases with the level of income, which can explain the findings of hypothesis 1. Due to the high correlation between the variables, as seen above, the economic moderating effect could not be established. Hence, for future research, it is recommended to use other economic variables for analysis such as money supply, which is used in the paper of Galindo & Mendez (2013). Another economic moderator which can be considered is R&D expenditure which is used in the study of Castano et al., (2015). The degree of the rule of law and economic freedom can be used as additional or new social factors, which also applied in the study of Castano et al., (2015). To further analyze the effect of social factors, the impact of demographics on entrepreneurship can also be studied as done in the paper by Levesque et al., (2011). Another limitation of this study is that only 20 countries were selected and most of them were developed. Hence, it is further recommended to increase the number of countries by adding more developing regions. Validity can also further be increased by increasing the number of years of the sample. Finally, a further extension of this study can be to find the correlation between GDP per capita and entrepreneurship level by using both economic and social moderators which can provide more insights into this relationship.

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Appendix:

Table 1: Descriptive statistics of the main variables by country.

Country	Number of Observations	TEA		GDP per capita	
		Mean	SD	Mean	SD
Argentina	6	16.99	2.61	$ 12,587	$ 1,176
Australia	4	11.05	2.46	$ 58,450	$ 5,074
Belgium	6	5.19	0.87	$ 45,238	$ 2,711
Brazil	6	17.22	2.13	$ 11,688	$ 1,541
Canada	3	13.31	1.29	$ 28,944	$ 4,793
Denmark	4	4.81	0.76	$ 60,213	$ 2,270
Finland	6	5.91	0.47	$ 47,743	$ 3,086
France	5	5.33	0.50	$ 42,181	$ 1,372
Germany	6	5.01	0.52	$ 44,788	$ 2,808
Ireland	6	7.55	1.40	$ 53,134	$ 4,978
Italy	5	3.87	1.00	$ 34,320	$ 2,349
Japan	5	4.01	0.72	$ 43,969	$ 4,639
Netherlands	6	8.61	1.27	$ 50,895	$ 3,145
Norway	6	6.50	0.80	$ 94,155	$ 11,084
Singapore	4	9.95	2.26	$ 55,992	$ 1,636
South Africa	6	8.68	1.34	$ 6,971	$ 816
Spain	6	5.37	0.56	$ 29,298	$ 2,063
Sweden	6	6.54	1.15	$ 56,570	$ 4,099
United States	6	11.87	2.19	$ 52,483	$ 3,138
United Kingdom	6	7.90	1.60	$ 42,855	$ 2,681
Total / Avg	108	8.28	1.30	$ 43,624	$ 3,273

Table 2: Descriptive statistics of the economic moderators and social controls by year.

		2010			2011			2012			2013			2014			2015		
		Mean	SD	Median	Mean	SD	Median	Mean	SD	Median	Mean	SD	Median	Mean	SD	Median	Mean	SD	Median
Economic Moderators	PvtInt	4.4E+11	6.5E+11	2.4E+11	4.6E+11	7E+11	1.6E+11	4.7E+11	4.9E+11	1.4E+11	4.9E+11	7.7E+11	2.1E+11	4.8E+11	7.8E+11	2.1E+11	4.5E+11	8.9E+11	2E+11
	GovExp	4.3E+11	5.9E+11	2.1E+11	4.3E+11	6.1E+11	1.9E+11	4.3E+11	6.1E+11	1.8E+11	4.4E+11	5.9E+11	2.5E+11	4.2E+11	5.7E+11	2.4E+11	3.8E+11	6.2E+11	2.1E+11
	Inn	35575	84966	2468	35294	85536	2193	36738	88475	2332	37125	89013	2679	33163	83642	2141	24928	73848	2207
Social Controls	WorkPop	66.10	1.36	65.88	66.35	2.26	65.82	66.00	2.33	65.36	65.94	2.50	65.60	65.64	2.47	65.53	65.42	1.65	65.45
	MalePop	49.32	0.40	49.19	49.37	0.36	49.29	49.30	0.39	49.20	49.30	0.39	49.21	49.36	0.40	49.22	49.39	0.42	49.25
	Gini	34.15	9.20	33.00	32.64	7.61	30.50	32.80	7.47	32.30	33.89	6.93	33.20	35.18	10.09	32.30	32.66	6.95	31.7
	Edu	82.94	14.52	86.00	83.96	13.98	87.30	82.60	12.74	82.35	83.55	12.46	83.35	84.71	11.55	86.75	84.66	12.68	87.75

Tables 3A-3F show the Pearson correlation between the economic moderators by year (2015-2010).

Correlation 2015	Private Investment	Government Spending	Innovation
Private Investment	1.0000	-	-
Government Spending	0.9949	1.0000	-
Innovation	0.9936	0.9844	1.0000

Correlation 2014	Private Investment	Government Spending	Innovation
Private Investment	1.000	-	-
Government Spending	0.9902	1.0000	-
Innovation	0.8628	0.8567	1.0000

Correlation 2013	Private Investment	Government Spending	Innovation
Private Investment	1.0000	-	-
Government Spending	0.9929	1.0000	-
Innovation	0.8729	0.8667	1.0000

Correlation 2012	Private Investment	Government Spending	Innovation
Private Investment	1.0000	-	-
Government Spending	0.9944	1.0000	-
Innovation	0.8796	0.8835	1.0000

Correlation 2011	Private Investment	Government Spending	Innovation
Private Investment	1.0000	-	-
Government Spending	0.9956	1.0000	-
Innovation	0.8606	0.8620	1.0000

Correlation 2010	Private Investment	Government Spending	Innovation
Private Investment	1.0000	-	-
Government Spending	0.9961	1.0000	-
Innovation	0.8434	0.8335	1.0000

Tables 3G-3L show the Pearson correlation between the social controls by year (2015-2010).

Correlation 2015	Working Population	Male Population	GINI Index	Edu
Working Population	1.0000			
Male Population	-0.0797	1.0000		
GINI Index	0.7847	-0.4094	1.0000	
Education	-0.6748	0.4130	-0.8826	1.0000

Correlation 2014	Working Population	Male Population	GINI Index	Edu
Working Population	1.0000			
Male Population	0.1334	1.0000		
GINI Index	0.4270	-0.4018	1.0000	
Education	-0.3943	0.5900	-0.6938	1.0000

Correlation 2013	Working Population	Male Population	GINI Index	Edu
Working Population	1.0000			
Male Population	0.2449	1.0000		
GINI Index	0.4888	-0.3440	1.0000	
Education	-0.0603	0.4355	-0.6978	1.0000

Correlation 2012	Working Population	Male Population	GINI Index	Edu
Working Population	1.0000			
Male Population	0.2369	1.0000		
GINI Index	0.4528	-0.4409	1.0000	
Education	-0.3154	0.5073	-0.9066	1.0000

Correlation 2011	Working Population	Male Population	GINI Index	Edu
Working Population	1.0000			
Male Population	0.2770	1.0000		
GINI Index	0.3541	-0.4291	1.0000	
Education	-0.2685	0.2836	-0.8413	1.0000

Correlation 2010	Working Population	Male Population	GINI Index	Edu
Working Population	1.0000			
Male Population	0.5523	1.0000		
GINI Index	-0.2835	-0.3334	1.0000	
Education	0.2646	0.3382	-0.4941	1.0000