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Sustainable competitiveness and happiness at global level

Name: Tanya Dwivedi

Supervisor: PhD Candidate, Natalia Pertiwi Ginting

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Sustainable Competitiveness and Happiness at Global Level

Tanya Dwivedi

India

Supervisor: PhD Candidate, Natalia Pertiwi Ginting

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Summary

Depending on the concerns of time, definition of development has taken various forms - economic development, environmental friendly development, inclusive growth, sustainable development etc. After economic recession experienced worldwide and slow economic growth becoming a norm (Schwab et al. 2015), many countries around the world are preparing policies to enhance national competitiveness. Competitiveness relates to productivity of an economy and factors of production at national level – infrastructure, labour, institutions, R & D etc. This concept, though to target slow economic growth, lacks a sustainable approach. Sustainable development, which concerns the social and environmental factors, has been part of the ongoing development debate since publication of the Brundtland Commission report – Our Common Future in 1987 and proposal of Sustainable Development Goals, more recently. Concept of sustainable competitiveness combines the concept of sustainable development with that of national competitiveness. Countries, must thus, strive to be competitive but not at the cost of environment or society.

A new addition to the development debate relates to well-being, which has been accepted by philosophers as well as some academicians as the ultimate goal in life. Till now, very few countries apart from Bhutan have actually implemented policies for improving people's well-being. Few authors like Kerekes (1995), Aiginger (2006) and Huggins and Thompson (2012) have linked happiness level in a country to its competitiveness level. While some other like Zidansek (2007), have proved a link between sustainable development and happiness. Thus to achieve well-being centric progress, countries can propose competitiveness or sustainable development policies.

This study tries to address three prominent issues - slow economic growth, sustainable development and lack of well-being centric approaches by establishing a link between sustainable competitiveness and happiness. This can give a more holistic and comprehensive way to measure progress and define our development path. This study aims to understand the links between competitiveness and happiness and sustainable competitiveness and happiness. In addition to presence of a link, this study tries to explain variations in the relationship by geographical regions and income level of countries, and identify the factors of sustainability, which influence either positively or negatively the level of happiness at a country level.

This study makes use of three main data – Global Competitiveness Index (GCI) scores (to measure competitiveness), Sustainability adjusted-Global Competitiveness Index (SGCI) scores (to measure sustainable competitiveness) and Cantril ladder (to measure self-reported level of happiness). The research uses panel data for years 2012 and 2014 in Random effects and Fixed effects regression to understand change in happiness scores influenced by change in GCI and SGCI scores.

Results of regression show a significant and positive relationship between competitiveness and happiness and also sustainable competitiveness and happiness. The most significant components of competitiveness for happiness are infrastructure and health and primary education. When compared, variation in competitiveness scores could explain variation in happiness score better than sustainable competitiveness scores. Similar pattern was observed when geographical regions and classification of countries by income was included in the model. A major underlying reason for this was level of GDP. It was concluded that to be happier, countries need to focus on being competitive and sustainable but also earn higher GDP so as to invest in enhancing the competiveness as well as sustainability at country level. This

finds support in (Lapinskiene 2011), who marks growth in GDP as a prerequisite to sustainable development. However, importance of GDP is short-term and mainly for countries in transition (Hagerty and Veenhoven 2003; Clark and Senik 2011). Among the components of sustainability, most significant for happiness at country level were found to be inclusive growth and good governance.

In the past, the approach to development has been lop-sided towards economic growth, but with results from this research, it is proved that sustainable competitiveness can actually lead to happiness at country level. Policy makers should most importantly focus improving infrastructure, health and primary education, inclusive growth and good governance as these lead to improved level of sustainable competitiveness as well as happiness. Improvement of financial markets as well as R & D sector is important and should now be part of development policy. Governments which aim to achieve this holistic development approach, relating to economic growth, sustainability and well-being, should invest more in strengthening the society and basic infrastructure. Technology and innovation should be encouraged, not only for improving competitiveness but also happiness.

Keywords
Competitiveness, Sustainable Competitiveness, Happiness, Beyond GDP, Sustainable Development

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Abbreviations

Abbreviation	Full-form
ASEAN	Association of Southeast Asian Nations
CPI	Consumer Price Index
EU	European Union
FDI	Foreign Direct Investment
GCI	Global Competitiveness Index (by World Economic Form)
GDP	Gross Domestic Product
GHG	Green House Gas
GNH	Gross National Happiness
GNI	Gross National Income
GSCI	Global Sustainable Competitiveness Index (by SolAbility)
GWP	Gallup World Poll
ICT	Information and Communication Technologies
OECD	Organization for Economic Co-operation and Development
R & D	Research and Development
SD	Sustainable Development
SGCI	Sustainability-adjusted Global Competitiveness Index (by Author, 2016)
UN	United Nations
WEF	World Economic Forum
WIPO	World Intellectual Property Organization

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Chapter 1: Introduction

This chapter introduces the premise as well as the need for conducting the research. It focuses on need for shift in development policies as discussed in the problem statement which leads to the primary research question and sub-questions. Reasons for usage of the study is highlighted under 'significance of study'. Scope of the research is defined and limitations while conducting the research are presented to define the problem as well as the approach towards its solution.

1.1.Background

Development per se, according to Chambers (2005), has evolved over the years to be synonymous with economic development and ultimately economic growth. As a result, it focuses on production, trade and Gross Domestic Product (GDP) among other monetary things. However, academicians all over the world are now questioning this economic growth led development as a true measure of progress. This sentiment was resonated in World Economic Forum (WEF) meeting in Davos in January, 2016, where 'Beyond GDP' was an agenda in focus and many contributors asserted that our focus should shift more towards well-being related measurement of progress.

The concept of 'competitiveness' has been widely used to define primarily economic-growth led development. WEF has been a forerunner in assessing the competitiveness of countries around the globe. Since 2005, the WEF has assessed the level of competitiveness of countries using a comprehensive index – Global Competitiveness Index (GCI), which consists of twelve pillars to measure competitiveness at macro as well as micro economic levels. The GCI also identifies the key drivers of economies at various stages of growth. For example, economies at a lower stage of development should focus on improving the basic requirements like infrastructure, institutions etc. while countries at higher levels of development should focus on innovation and business sophistication (Schwab and Sala-i-martin 2011).

With growing concern over sustainability, WEF has introduced environmental and social dimensions into its measurement of competitiveness since 2011. This was influenced by the work of Stiglitz-Sen-Fitoussi commission which urged for moving beyond market activity to measure progress (Schwab and Sala-i-martin, 2011). Hence the concept of 'Sustainable Competitiveness' was used as an active measure for measuring progress, even as authors like Lapinskiene, (2011) and Balkyte and Tvaronavičienė (2010) used it as an academic concept for measuring progress. WEF in its Global Competitiveness Reports measures 'Sustainable Competitiveness' through 'Sustainability-adjusted Global Competitiveness Index (SGCI)'.

Another approach to measuring progress, especially social progress, which is gaining prominence, is measuring happiness (Helliwell et al. 2012). Happiness along with other similar and related terms like well-being, life satisfaction etc. are being included in regular policy debates and various measures like Gross National Happiness, Life Satisfaction survey etc. highlight the growing concern for progress beyond money. However similar to wealth disparity across the globe, wellbeing disparity is evident across the globe and is presented in the World Happiness Reports by United Nations Sustainable Development Solutions Network. A few countries (for example those forming part of the OECD and EU) have started to include questions about general life satisfaction or life evaluation in regular data collection so as to plan for well-being centric policies.

Three concepts of measuring progress are highlighted above – competitiveness, sustainable competitiveness and happiness. With the publication of Brundtland Commission report – 'Our Common Future' in 1987, environment and social factors have come into view of general development debates. Sustainable Development, which aims for a balanced development both in terms of environmental and social factors is being reflected in many of the international agreements and protocols (example: Sustainable Development Goals). In fact, World Happiness Report consider concepts of happiness and wellbeing of nations being a guide to achieve sustainable development goals (Helliwell et al. 2012). Thus, an exploration of relationship between these three concepts is relevant.

1.2. Problem Statement

The concept of 'Competitiveness', which is an indication of productivity of labour and capital in a country (Michael E Porter 1990), is seen as an indicator of growth in this globalized and de-industrialized world. However, after the financial crisis of 2008, low growth has become the norm for many countries (Schwab et al. 2014). Policies for development, thus, should focus on increasing competitiveness of nations. However, these policies are purely economic growth-centric in many parts of the world and do not consider links of competitiveness with well-being of citizens. Aiginger (2006) emphasises that competitiveness should be (re) defined as the ability to create welfare. This highlights the importance of human development in true sense, especially in a world where prominence is given to economic development. The shifting focus of academics towards well-being as a measure of progress, which resonated in the Davos meeting of WEF in January 2016, has been preceded by works of authors like Kerekes (2011), Aiginger (2006) and Huggins and Thompson (2012). However, according to Easterlin (1995), people with higher income, on an average, are happier but at a national level, average level of happiness does not coincide with increase in GDP. There seems to be a mismatch in relationship when it's played out at individual and national level. Thus, there is a need to check if the productivity of a nation, indicated by competitiveness, has any relationship with well-being of a nation.

Development, focussing solely on economic growth is often precarious, especially for the natural-resource-led economies (Costantini and Monni 2008). These economies where environment exploitation is a norm, often fall into low growth, as predicted by the Resource Curse Hypothesis (Costantini and Monni 2008). Many authors (Weiss 1993; Dos Santos and Brandi 2014) link environment with productivity of a nation and thus there is need to adopt sustainability in development, its definition as well as a measure of progress. Sustainable competitiveness, is one such concept, which merges together competitiveness (relating to economic growth) and sustainable development (especially its components of social and economic wellbeing). In this globalizing and connected world, sustainable competitiveness presents an "appropriate context" (Dos Santos and Brandi 2014), as we get more aware about environment and start appreciating our social networks. It is important that countries around the world focus on improving 'sustainable competitiveness' rather than just economic growth related competitiveness. With the world experiencing inequalities and disparities in economic growth, sustainability efforts and even average level of happiness, the question remains whether 'sustainable competitiveness' will be the umbrella concept for the right kind of growth. It is, thus, pertinent to test whether sustainable competitiveness can lead to well-being in a country. Happy individuals are also more productive, as per some studies, which can influence the overall productivity (or competitiveness) of a nation in a cyclical manner. A relation between sustainable competitiveness and well-being can, thus, lead to more productive and resilient societies.

Inequality in various forms persist around the world, be it income, happiness or human development. There seems to be a global North-South divide especially with respect to GDP. Regarding happiness, the North-South divide exists, such as between Europe and Africa but also exceptions in the form of South and Central America. As income and happiness are correlated in the short term, only countries with similar economic development status should be compared with each other with respect to happiness. Certain geographic regions form groups like ASEAN, EU etc. and implement various kinds of policies including sustainable development policies on its member nations. This leads to similar policy background in all member nations regardless of their economic status. One such policy is by EU, with an agenda to enhance competitiveness, which might not have been put forward in other non-EU countries. Countries in the EU will thus have more proposals and plans in place to meet this agenda than other countries. It is, thus, valid to check if geographical regions play any role in influencing relationship between sustainable competitiveness and well-being.

Competitiveness along with sustainable competitiveness are complex concepts with various sub-concepts. Countries aiming at increasing competitiveness or well-being however, should understand their components to be able to propose for policy changes. It is thus relevant to understand which components of both competitiveness and sustainable competitiveness influence well-being in a positive or negative way. This shall help the countries to encourage components of competitiveness and sustainable competitiveness in order to aim for well-being.

It is in this context, that, this research shall be executed to establish whether taking sustainable competitiveness approach to development can lead to happiness at a country level. But first, it shall establish whether there is a link between competitiveness and happiness so as to see the effect of introducing sustainability as a means to achieve happiness. The research shall check if the relationship between sustainable competitiveness and happiness vary by geographical region. To give more insight into this relationship, the research shall also establish which of the aspects of sustainable competitiveness significantly affect happiness.

1.3. Research Objectives

The aim of this research is to test relationship between sustainable competitiveness and happiness.

The research intends to achieve the following objectives –

- To test relation between competitiveness scores with self-reported level of happiness at country level
- To test sustainable competitiveness scores with self-reported level of happiness at country level
- To test sustainable competitiveness scores with self-reported level of happiness at country level based on geographical regions and income level
- To assess factors of sustainable competitiveness significantly influencing happiness

1.4. Provisional Research Question

The research aims to answer the following main question –

Does sustainable competitiveness lead to happiness?

The main research question can be divided into the following sub-questions so as to gain more in-depth answers -

- To what extent does competitiveness alone lead to happiness at country level?
- To what extent sustainable competitiveness lead to happiness at country level?
- Does the relationship between sustainable competitiveness and happiness gets influenced by geographic region or income level of a country?
- What factors significantly affect the relationship between sustainable competitiveness and happiness?

1.5. Significance of study

Development of countries as well as cities, has been measured primarily by economic growth, despite its evident shortfalls (Seaford 2013). With importance of individuals and their happiness gaining prominence in academics as well as urban development, it is pertinent to alter the predominantly economic growth-oriented policies to well-being–oriented policies. This combined with the low-economic growth levels around the world highlight the need for a combined 'wealth and well-being' approach to development. One of the key steps shall be to identify conditions of 'right kind of competitiveness'. As argued in above paragraphs, with emerging realization of importance of environment and social dimensions, competitiveness has evolved into sustainable competitiveness. Aiming for sustainability and competitiveness together, is not only better for the environment but also economy (Wysokinska, 2003; Wade-Benzoni, 1999 in (Balkyte and Tvaronavičienė, 2010).

This study shall help in connecting the two concepts of sustainable competitiveness and happiness, establishing relation between them and identifying factors required for a comprehensive growth. The results of the research can be used in framing policies as well as justifying well-being led policies in the national or urban context. It shall, thus, contribute to the ongoing policy discourse about progress (example WEF's Davos Summit in January 2016). Establishing a relationship between sustainable competitiveness and happiness at national level can open avenues for research at region or city level. Acknowledging the need for a combined wealth and well-being approach to development shall be the first step towards establishing this relationship and working for its enhancement.

1.6. Scope and Limitations

The research aims to work at country level. It makes use of three main data streams – Global Competitiveness Index scores (to measure competiveness), sustainability adjusted GCI (to measure sustainable competitiveness) and Gallup's happiness survey (to measure happiness) for the years 2012 and 2014. Due to difference in number of countries for which the data is available, the research shall only be done for 151 countries, for which data is available for maximum indicators. As per the requirement of the sub-questions, the research also uses individual components of the concepts of competitiveness as well as sustainable competitiveness for understanding their relation with happiness. Under this, the concept of competitiveness is divided into 12 pillars (or components) as per the definition given and used

by WEF, while the concept of sustainable competitiveness is divided into 5 components, 4 of which form the sustainability coefficient while the 5th component is GCI itself. The 4 components of the sustainability coefficient are – inclusive growth, environmental management, disaster risk and governance. As the research uses a lot of indicators to define each concept, unavailability of data for some countries for some indicators pose a limitation to the study.

For geographic regional analysis, countries are divided in 19 geographical regions namely – Australia & New Zealand, Caribbean, Central America, Central Asia, Eastern Africa, Eastern Asia, Eastern Europe, Middle Africa, Northern Africa, Northern America, Northern Europe, South America, South-eastern Asia, Southern Africa, Southern Asia, Southern Europe, Western Africa, Western Asia and Western Europe and is based on UN's division of geographic regions. This helps in defining the premise for sub-question 3 of the research.

Chapter 1 defines the problem within its context and points towards various sub-questions which help in answering the primary research question. However, the next chapter defines the problem in its academic context. In the succeeding chapter of Literature Review, the concepts of competitiveness, sustainable competitiveness and happiness are explained in detail. This shall help in gaining more insight to the problem defined in this chapter.

Chapter 2: Literature review

This chapter presents state of the art theories for the defined problem as per Chapter 1. It presents an overview of the three main concepts used in the research – competitiveness, sustainable competitiveness and happiness. Link between the three concepts is explored based on other available literature. Finally, a conceptual framework is drawn up to use the knowledge gained by understanding the state of art theories in solving the problem posed in chapter 1.

2.1. Measurement of development: An evolution

Indicators that measure development or progress often reflect the pressing concerns of that age. After World War II and the Great Depression in Europe, Gross Domestic Product, an economic indicator started being used to adjudge the progress of a nation (Monni and Spaventa 2013). However, it was soon realized that National Income alone cannot guarantee welfare of any nation, with the creator of GDP, Kuznets (1934) cautioning against just focussing on economic growth (Monni and Spaventa 2013). Late 80s and early 90s witnessed introduction of many new concepts in the discourse of development policy focussing on environment, human development and economy. Each of these concepts was measured by a specific indicator to judge progress of a country based on the particular concept.

Realizing the value of environment and finite resources, Brundtland Commission's Report published in 1987, introduced the concept of 'Sustainable development', which was defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs"(Brundtland 1987) p 40. This concept led to call for attaining goals under 'Agenda 21' in 1992. Policies for development around the world are highly influenced by Agenda 21 and indicators of sustainable development enlisted under it.

Another concept which gained prominence in the 90s was of human development, which was measured by Human Development Index and tried to go beyond the GDP in measuring the development of nations. Concepts of sustainability and human development contributed in preparation of Millennium Development Goals and Sustainable Development Goals which aimed to improve the quality of human life on earth in broad sense. These goals influenced policies and development strategies in many countries and continue to do so.

Concept of competitiveness, which primarily is the measure of economic conditions, market efficiency and productivity of a nation has gained prominence in the past decades as a development approach at urban, regional and national level. This concept has also led to policies, one of which is the European Union (EU)'s Lisbon agenda, with the focus of "competitiveness on growth and jobs for intra-EU social cohesion" (Bailey et al. 2006) p 562. In continuation, concept of sustainable competitiveness has influenced EU's strategy of 'Europe 2020' which focuses on "smart, sustainable and inclusive growth" (Balkyte and Tvaronavičienė 2010) p 357.

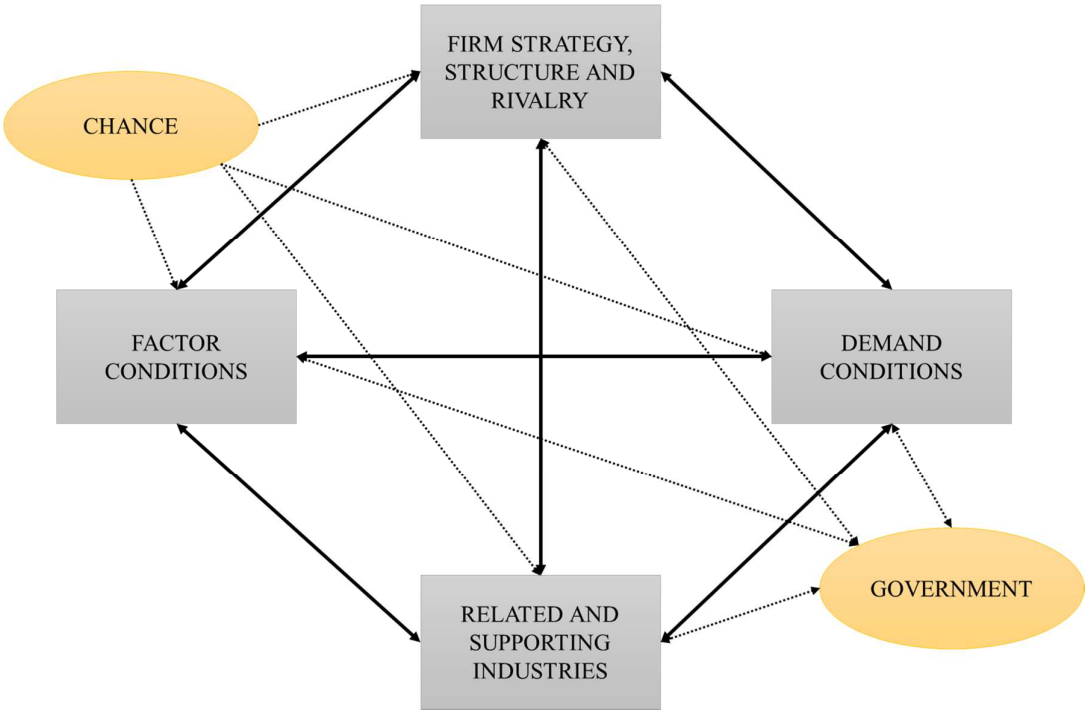
Current policy discourse for development is influenced by a variety of concepts, which primarily underline the need of the time – sustained economic growth, environmental conservation and climate change, human development and well-being. As per Balkyte and Tvaronavičienė (2010), "globalization, economic dynamism and social progress, sustainability and competitiveness go hand-in-hand. The different sets of competitive advantages interact and reinforce each other" p 359. Discussed below are the concepts of competitiveness, sustainable competitiveness and happiness, as they represent the paradigm of 'development' in the world

today. Relationship between these concepts can lead countries to a path of comprehensive development, which links economic growth of countries with sustainability and happiness of people.

2.2. Concept of competitiveness

The concept of competitiveness is not new, but an evolving concept. It has been used to define behaviours of firms, but also countries and cities in the globalized world. The beginning of the concept can be attributed to the work of Ricardo in 1817, where he ascribed the increase in total world output on unrestricted exchange between nations. Scott and Lodge (1985) define competitiveness in business terms, focussing on country's ability to trade in the international markets (Tomáš 2011). Michael E Porter (1990) linked firms and government in his famous Diamond diagram as shown below in Figure 1 to explain competitiveness. According to Porter (1990), competiveness of a firm is related to other factors, shown in his diamond diagram, where all the factors relate to each other and cannot function in isolation. A firm needs factor conditions like human resources, infrastructure, knowledge etc. and a demand (often to innovate) for its product. It should have clear goals and objectives and be located in a cluster of similar or supporting industries. He also attributes conducive government policies and even chance for a firm's competitiveness. Thus, competitiveness is not only about the productivity but also the setup and government policies. Szentes (2011) adds to this by arguing that firms have an inherent role in influencing national competitiveness and vice versa and thus both the firms and government functions in a symbiotic relationship.

Figure 1 Porter's National Diamond (for Competitiveness)



Source: Redrawn by Author, 2016 from (Michael E. Porter, 1990) p 5

Krugman (1994) however, point out that competitiveness is much more than business, in the true sense, but it is "the capability to produce internationally competitive goods and services,

and the capability to ensure a satisfactory and growing standard of living" (Carayannis and Grigoroudis, 2014) p.4. The term 'competitiveness', as generally agreed, is used in a multitude of ways and past studies link it to its outcome ranging from "high standard of living and economic growth" to job creation (Delgado et al. 2012) p 6.

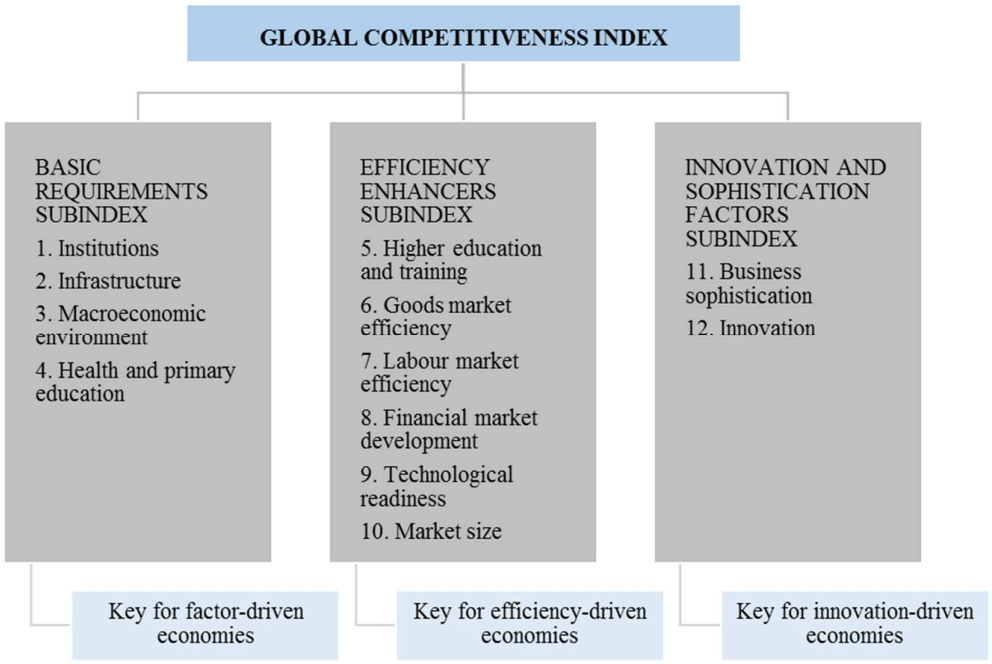
At national level, a lot of factors contribute to the level of competitiveness, as shown in the studies by (Thompson 2004; Szentes 2011; Lee and Peterson 2000; Fagerberg et al. 2007; Delgado et al. 2012). Delgado et al. (2012), continuing with relation between firms and governments shown in Porter (1990), attributes level of competitiveness in a country to mainly two factors – macroeconomic and microeconomic. Macroeconomic factors relate to all those which help boost the productivity of economy and mainly relates to labour, institutional framework, investments and policy outlook (Delgado et al. 2012). Microeconomic factors relate to "efficiency of firms" including their innovativeness, technological advancements in the given regulatory environment (Delgado et al. 2012) p 18. Study by Thompson (2004) for competitiveness of Hong Kong proved that competitiveness is more related to efficiency of institutions facilitating domestic market. He stressed that institutional arrangement in the country should be in sync with the business needs of the time including international trade and this shall contribute to improvement of national business environment and productivity and hence, competitiveness. While Szentes (2011) supports that labour (human resources) and other macroeconomic conditions are necessary for competitiveness, he adds that "socio-psychological attitude of people" also influences the level of competitiveness (p 17). This argument about attitude of people is also supported by (Lee and Peterson 2000) p 415, which attribute entrepreneurship, a cultural trait, to competitiveness. According to them, some communities or people groups increase their entrepreneurship potential due to "autonomy, proactiveness, competitive aggressiveness, risk taking and innovativeness" in the given macroeconomic conditions, especially when they are favourable.

Competitiveness has also been dealt by international organizations such as World Economic Forum, which prepare Global Competitiveness Report annually and thus measure and compare competitiveness across the globe based on their Global Competitiveness Index (GCI) since 2005. WEF, which defines competitiveness as "the set of institutions, policies, and factors that determine the level of productivity of an economy, which in turn sets the level of prosperity that the country can earn" (Schwab et al., 2014) p 4, focuses on not only business, production and economic growth but also infrastructure and governance. However, measuring competitiveness of all nations with the same yardstick is difficult as they are competing with each other in a non-zero sum game in an unlevelled playing field. Differences in starting points for the countries can be attributed to factor endowments, history or policy framework, but, it also relates to costs of production within the country which , if not in sync with level of outputs, affect investment potential and hence, economic growth (Delgado et al. 2012). Hence, any measure of competitiveness must take into account different starting points and paths of development for different nations. As competitiveness of nations, not only relate to economic dimension, but also non-economic dimension (eg. Culture, education, social infrastructure etc.) (Szentes 2011), any measure of competitiveness must include both economic and non-economic fields.

The GCI, based on '12 pillars of competitiveness', compares economies around the world. GCI is influenced by the theory of stages of development (Sala-i-Martín and Artadi 2005) and assumes that countries in different stages of development show different characteristics for competitiveness as well as require different factors for being competitive. The 12 pillars of competitiveness as shown in Figure 2 are restructured into 3 clusters corresponding to three

stages of development for economies - 'Factor-driven', 'Efficiency-driven' and 'Innovation-driven'. The 12 pillars are divided into these three stages and correspond to the specific factors required at each stage to be competitive. For example, for a developing country to be competitive, it really needs to be dependent on its natural resources and should have strong institutions and necessary infrastructure for their efficient allocation. However, as the country develops, its requirements for enhancing competitiveness changes. For the next stage of development, so as to sustain competitiveness, it needs to invest in training of workforce and increase the efficiency of its labour and goods. Similarly, to enhance competitiveness further, when the country can no longer be competitive while producing the same goods, it needs to bring in innovation. Thus, the 12 pillars of competitiveness provide a holistic approach to competing economies at a global scale keeping in view their respective stages of development. Each pillars of competitiveness find validity in past studies. Delgado et al (2012) supports macroeconomic conditions such as education, skills and health of labour, government policies for fiscal development and government debt as well as microeconomic condition such as openness and regulations in market, innovation and technological advancements. Thompson (2004) supports role of institutions for competitiveness. Szentes (2011) supports role of labour, state policy, R &D and infrastructure, both physical and social. Study by Fagerberg et al. (2007) also support education, financial market and governance, exports and labour cost and hence market efficiency – both goods and labour.

Figure 2 Components of Global Competitiveness Index (WEF)



Source: Redrawn by Author, 2016 from (Schwab and Sala-i-martin, 2011) p 9

GCI is an improvement on the indexes used previously by Global Competitive Reports which separated the microeconomic and macroeconomic characteristics of an economy. The previous indexes suffered various shortcomings wherein many of the indicators were suited for advanced economies as highlighted by Lall (2001). However, by using different weights for different indicators in the improved GCI, this problem has been addressed. To differentiate between importance of factors of competitiveness among countries in different stages of

development, different weights are assigned for each of the clusters. The twelve pillars are categorized into – basic requirements, efficiency enhancers and innovation and sophistication factors. Basic requirements – institutions, infrastructure etc. are given more weightage for economies which are factor-driven, while the second cluster of economies are given more weightage for factors influencing the efficiency, like labour and goods market efficiency. The third cluster of economies are given more weightage in factors of business sophistication and innovation, as these are more important for enhancing their competitiveness than basic factors of production. The weights for the 12 pillars of competitiveness for each of the 3 clusters of economies is shown in Table 1.

Table 1 Weights for each sub-index in GCI for stages of economies based on GDP

	Stage 1: Factor-driven	Transition from Stage 1 to Stage 2	Stage 2: Efficiency-driven	Transition from Stage 2 to Stage 3	Stage 3: Innovation-driven
GDP per capita (US$)	<2,000	2,000 – 2,999	3,000 – 8,999	9,000 – 17,000	>17,000
Weight for basic requirements	60%	40-60%	40%	20-40%	20%
Weight for efficiency enhancers	35%	35-50%	50%	50%	50%
Weight for innovation and sophistication factors	5%	5-10%	20%	10-30%	30%

Source: Redrawn by Author, 2016 from (Schwab et al., 2015) p 38

Each pillar of competitiveness is detailed by indicators, for which data is collected by secondary research as well as primary research (Executive Opinion Survey) for each of the countries. The following table elaborates each of the pillars of competitiveness with their definitions, indicators and weights used for each category of countries.

Table 2 12 Pillars of Global Competitiveness and their indicators (Schwab et al., 2015)

Pillars and Indicators	Weight (%) within immediate parent category	Remarks
"BASIC REQUIREMENTS	**20-60%**	
1st pillar: Institutions	**25%**	Refers to "the legal and administrative framework within which individuals, firms, and governments interact to generate wealth"
A. Public institutions	75%	
1. Property rights	20%	
1.01 Property rights		
1.02 Intellectual property protection½		

Pillars and Indicators	Weight (%) within immediate parent category	Remarks
2. Ethics and corruption	20%	(Schwab et al. 2014) p 4. Institutional framework often influences status of inequality and wealth distribution as well as utilization of public funds. A strong and efficient institutional framework also increases the trustworthiness and judicial delivery. Institutional also relate to business ethics and accountability for private sector, which shows the role of an efficient and trustworthy private sector for the growth of economy.
1.03 Diversion of public funds		
1.04 Public trust in politicians		
1.05 Irregular payments and bribes		
3. Undue influence	20%	
1.06 Judicial independence		
1.07 Favoritism in decisions of government officials		
4. Public-sector performance	20%	
1.08 Wastefulness of government spending		
1.09 Burden of government regulation		
1.10 Efficiency of legal framework in settling disputes		
1.11 Efficiency of legal framework in challenging regulations		
1.12 Transparency of government policymaking		
5. Security	20%	
1.13 Business costs of terrorism		
1.14 Business costs of crime and violence		
1.15 Organized crime		
1.16 Reliability of police services		
B. Private institutions	25%	
1. Corporate ethics	50%	
1.17 Ethical behavior of firms		
2. Accountability	50%	
1.18 Strength of auditing and reporting standards		
1.19 Efficacy of corporate boards		
1.20 Protection of minority shareholders' interests		
1.21 Strength of investor protection*		
2nd pillar: Infrastructure	**25%**	Refers to transport, electricity and telecommunication infrastructure which play an important role in movement of goods, labour and information necessary for the productivity of government as well as firms. In addition to economic growth, these factors help integrate weak communities and backward regions to distribute growth spatially as well as socially.
A. Transport infrastructure	50%	
2.01 Quality of overall infrastructure		
2.02 Quality of roads		
2.03 Quality of railroad infrastructure		
2.04 Quality of port infrastructure		
2.05 Quality of air transport infrastructure		
2.06 Available airline seat kilometers*		
B. Electricity and telephony infrastructure	50%	
2.07 Quality of electricity supply		

Pillars and Indicators	Weight (%) within immediate parent category	Remarks
2.08 Mobile telephone subscriptions* ½		
2.09 Fixed telephone lines* ½		
3rd pillar: Macroeconomic environment	**25%**	Although, it may not directly influence the productivity, but stability of macroeconomic environment creates conditions for firms and government to work efficiently. This was especially seen in the measures taken by economies hit hard by economic recession.
3.01 Government budget balance*		
3.02 Gross national savings*		
3.03 Inflation*		
3.04 Government debt*		
3.05 Country credit rating*		
4th pillar: Health and primary education	**25%**	This refers to the health and education of the workforce. Healthy and educated workforce can contribute positively to the economy.
A. Health	50%	
4.01 Business impact of malaria		
4.02 Malaria incidence*		
4.03 Business impact of tuberculosis		
4.04 Tuberculosis incidence*		
4.05 Business impact of HIV/AIDS		
4.06 HIV prevalence*		
4.07 Infant mortality*		
4.08 Life expectancy*		
B. Primary education	50%	
4.09 Quality of primary education		
4.10 Primary education enrollment rate*		
EFFICIENCY ENHANCERS	**35-50%**	
5th pillar: Higher education and training	**17%**	This refers to the quality and quantity of workforce especially in regard to the changing economies around the world. Economies now are aiming more towards expansion of secondary and tertiary sector, which requires workforce with matching skill-set.
A. Quantity of education	33%	
5.01 Secondary education enrollment rate*		
5.02 Tertiary education enrollment rate*		
B. Quality of education	33%	
5.03 Quality of the educational system		
5.04 Quality of math and science education		
5.05 Quality of management schools		
5.06 Internet access in schools		
C. On-the-job training	33%	
5.07 Local availability of specialized research and training		
services		
5.08 Extent of staff training		

Pillars and Indicators	Weight (%) within immediate parent category	Remarks
6th pillar: Goods market efficiency	**17%**	Refers to the conditions required to make domestic as well as foreign trade effective. These help to decide the goods that are to be traded based on consumer preferences, but also encourage the goods that shall be beneficial for the economy. Governments can encourage effective and efficient trade by lowering of incumbent taxes, opening up the economy and proposing pro-business policies.
A. Competition	67%	
1. Domestic competition		
6.01 Intensity of local competition		
6.02 Extent of market dominance		
6.03 Effectiveness of anti-monopoly policy		
6.04 Effect of taxation on incentives to invest		
6.05 Total tax rate*		
6.06 Number of procedures required to start a business*		
6.07 Time required to start a business*		
6.08 Agricultural policy costs		
2. Foreign competition variable		
6.09 Prevalence of trade barriers		
6.10 Trade tariffs*		
6.11 Prevalence of foreign ownership		
6.12 Business impact of rules on FDI		
6.13 Burden of customs procedures		
6.14 Imports as a percentage of GDP*		
B. Quality of demand conditions	33%	
6.15 Degree of customer orientation		
6.16 Buyer sophistication		
7th pillar: Labor market efficiency	**17%**	Refers to utilization of labour in the most economically efficient way. An economy based on meritocracy provides incentives to labour when they perform best, promotes equity and thus attract talent and is able to retain talent which boosts the productivity.
A. Flexibility	50%	
7.01 Cooperation in labor-employer relations		
7.02 Flexibility of wage determination		
7.03 Hiring and firing practices		
7.04 Redundancy costs*		
7.05 Effect of taxation on incentives to work		
B. Efficient use of talent	50%	
7.06 Pay and productivity		
7.07 Reliance on professional management½		
7.08 Country capacity to retain talent		
7.09 Country capacity to attract talent		
7.10 Female participation in labor force*		
8th pillar: Financial market development	**17%**	Like goods and labour market efficiency, this pillar refers to the effective and efficient utilization of resources, mainly
A. Efficiency	50%	
8.01 Availability of financial services		

Pillars and Indicators	Weight (%) within immediate parent category	Remarks
8.02 Affordability of financial services		financial in an economy. It should boost conditions for investments with minimal risks. Apart from that, a sound financial market should be transparent so as to gain trust of the consumers.
8.03 Financing through local equity market		
8.04 Ease of access to loans		
8.05 Venture capital availability		
B. Trustworthiness and confidence	50%	
8.06 Soundness of banks		
8.07 Regulation of securities exchanges		
8.08 Legal rights index*		
9th pillar: Technological readiness	**17%**	Refers to the country's access to latest technology and its adaptation in existing businesses. Ability to use ICT is especially advantageous in today's globalized world.
A. Technological adoption	50%	
9.01 Availability of latest technologies		
9.02 Firm-level technology absorption		
9.03 FDI and technology transfer		
B. ICT use	50%	
9.04 Internet users*		
9.05 Broadband Internet subscriptions*		
9.06 Internet bandwidth*		
9.07 Mobile broadband subscriptions*		
2.08 Mobile telephone subscriptions* ½		
2.09 Fixed telephone lines* ½		
10th pillar: Market size	**17%**	With globalization, countries can make use of trade openness to increase the size of their markets to achieve economies of scale.
A. Domestic market size	75%	
10.01 Domestic market size index*		
B. Foreign market size	25%	
10.02 Foreign market size index*		
INNOVATION AND SOPHISTICATION FACTORS	**5-30%**	
11th pillar: Business sophistication	**50%**	This refers to the quality and quantity of business networks of firms and economies as those located in clusters, mainly geographical, are more efficient with respect to innovation. Other aspects which especially makes a firm more efficient are procedures followed within the firm which lead to a more sophisticated economy as a whole.
11.01 Local supplier quantity		
11.02 Local supplier quality		
11.03 State of cluster development		
11.04 Nature of competitive advantage		
11.05 Value chain breadth		
11.06 Control of international distribution		
11.07 Production process sophistication		
11.08 Extent of marketing		

Pillars and Indicators	Weight (%) within immediate parent category	Remarks
11.09 Willingness to delegate authority		
7.07 Reliance on professional management½		
12th pillar: R&D Innovation	**50%**	Technological innovation and its subsequent innovation has historically been the driving force of growth. Even now, it contributes to improve quality of goods and services and standard of living, in general.
12.01 Capacity for innovation		
12.02 Quality of scientific research institutions		
12.03 Company spending on R&D		
12.04 University-industry collaboration in R&D		
12.05 Government procurement of advanced technology products		
12.06 Availability of scientists and engineers		
12.07 PCT patent applications*		
1.02 Intellectual property protection½"		

Source: (Schwab et al., 2015) p 39-40

*Note: The indicators marked with * are not collected through Executive Opinion Survey.*

Each pillar of competitiveness relies heavily on results of the 'Executive Opinion Survey' which are based on opinions of a number of persons in 160 partner institutions of the WEF. Hence, the results must be interpreted keeping this in mind. The first pillar – Institutions deals with the working of both public and private sector institutions. For public institutions, "property rights, ethics and corruption, undue influence, performance and security" are assessed while for firms, "corporate ethics and accountability are assessed". Some of the indicators like public trust, diversion of public funds, favouritism help to assess the working of the public sector and its efficiency while some factors like property rights might be confusing with respect to competitiveness. Accountability, which is part of assessment for private sector, if included ofr public sector as well could have helped to indicate realization of government policies. This is especially relevant in developing countries, where policies for the betterment often take more time to get implemented. Second pillar covers most aspects of physical infrastructure required for country's growth but in this day and age of internet and globalization, using fixed telephone lines as an indicator of infrastructure quality seems redundant. In its place more focus should be given on infrastructure related to internet, eg. Coverage per unit population and speed. Pillar 3 and 4 are again very comprehensive and consist of mainly quantitative indicators. However, use of indicator for 'dropout rate at primary or secondary level' may be a better indicator than 'enrolment rate' to assess quality of primary education. It is again especially true in case of developing countries, eg. India, where many students drop out after primary schools due to various reasons. Pillar 5 looks at quantity and quality of higher education as well as training for skills. It focusses rightly on quality of math and science education, which form the backbone of technological advancement and innovation but doesn't include its quantitative assessment. Indicators related to presence of such institutions, their access as well as capacity. Pillar 6 and 7 assess efficiency of goods and labour markets quite comprehensively. A point to note in pillar 7 is treatment of gender equality. Although rate of participation of females is included but it doesn't give an actual picture. Women, especially in developing countries, working in informal sector or working unpaid work can be left out while assessing the participation rate.

Furthermore, rate of female participation does not give an actual presentation of access to job market for women in terms of regressive policies or gender pay gap. Elborgh-woytek et al. (2013) is among many studies which highlight potential improvement in productivity and economic growth if women are more integrated in the labour force as well as education. Pillar 8 provides assessment of soundness of financial market which is necessitated especially after global recession of 2008 and its after effects experienced worldwide. Pillar 9 which assess the technological readiness is an important input for competitiveness but depends especially on Pillar 3 and 4 dealing with primary and higher education. It incorporates assessment of ICT which were missing in Pillar 2 – Infrastructure. Pillar 10, which assess a country's potential to exploit economies of scale directly relates to competitiveness. By incorporating both domestic and foreign markets it tries to prevent favouring smaller nations with higher income. Pillar 11 and 12, although focussing on more advance economies and their requirements than less developed or developing economies, indicate the path to be taken for development in the 21st century. R & D especially for enhancing standard of living coupled with technological readiness among other factors should be the aim of world economies.

The division of countries as per the latest GCI measurements in shown in Appendix 1. This model of 12 pillars of competitiveness is widely used in researches relating to competitiveness (Example Yeganeh (2013), Samanta and Sanyal (2010) and Apsalone and Šumilo(2015)). Competitiveness has also been associated with expenditure on R & D (Tomáš, 2011), cultural and religious factors (Yeganeh, 2013) and corruption (Samanta and Sanyal, 2010). GCI also tries to incorporate the above factors; 12th pillar competitiveness – innovation comprises of indicators related to R & D in the country. However, the concept of competitiveness, as measured by WEF as well as other authors in the academia like Weiss (1993), lacks a sustainable approach. Lapinskiene (2011) and Dos Santos and Brandi (2014) agree that sustainable development approach should be taken for harmonious development of countries.

GCI, though aiming for comprehensiveness by including both macro and micro economic factors as well as taking into consideration different paths and starting points of different nations, falls short on many level. It fails to incorporate role of international policies and politics, which according to Szentes (2011) cannot be ignored in our globalized world. It doesn't include any indication to measure inherent entrepreneurial potential, which according to Lee and Peterson (2000) can influence to increase or decrease competitiveness of a nation. Another aspect of the index, which is inherent in its design, collection of some data from an Executive Opinion Survey, might present strong bias in the data.

2.3. Concept of sustainable development

The Brundtland Report – Our Common Future in 1987, is by far, the most well-known work on sustainable development. As the report was presented in an international forum, the concept of sustainability as well as its dire need as an approach to development was highlighted in the global arena. It was defined, in quite a vague manner, as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland, 1987) p 40. After about thirty years of this definition, the exact definition of the concept remains a topic of debate. However, the society must change to incorporate element of sustainability, even if some authors support status quo of balanced development without much changes while others argue for purely focussing on environment (Hopwood et al., 2005). The definitions and approaches to sustainable development might be different, but, in general, it tries to create a balance among "three aspects of our living, the environment, economy and society" (Evans et al., 2015) p 292.

Haughton (1999) summarizes five aspects of sustainable development in terms of equity – "futurity – inter-generational equity; social justice – intra-generational equity; trans-frontier responsibility – geographical equity; procedural equity – people treated openly and fairly; inter-species equity – importance of biodiversity"(Hopwood et al., 2005) p 40. Plachciak, (2009) argues that sustainable development is actually a way forward for a 'just world' as it focusses on 'intergenerational justice' as well as 'intragenerational justice' by focussing on the environment as well as the poor. Sustainable development tries to trade-off and balance the three concepts - economic, social and environmental sustainability (Milaszewicz, 2014).

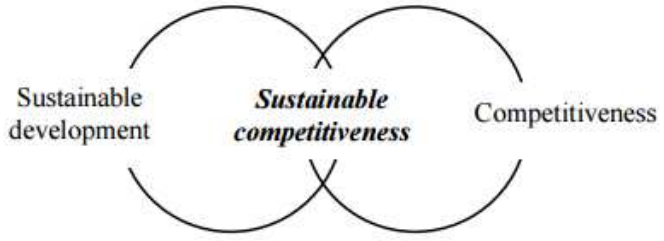
With introduction of Millennium Development Goals in year 2000 and then Sustainable Development Goals subsequently in year 2015, sustainable development has been in the limelight of development around the globe, with international agencies like United Nations, World Bank and others issuing guidelines for it. Many countries have taken steps to introduce elements of sustainability, but due to vast differences in the existing levels of development and access to knowledge, a vast divide is seen between countries. This divide in implementation of sustainable development policies is quite evident in developed and developing countries. The neo-liberal orientation of development policies especially in developing countries might still affect the prospects of sustainable development in these countries (Kumi et al., 2014). Thus, economic outlook needs to be remoulded depending on the requirement of the country so as to be sustainable on the path to development.

2.4. Concept of sustainable competitiveness

Global shift in ideologies has resulted in emergence of sustainable development policies around the world. Herciu and Ogrean (2014) show, from various sources, that traditional perspectives for competitiveness based on GDP per capita and employment are slowly changing and new perspectives are being appreciated, few of which focus not only on social and ecological dimension but also few 'beyond- GDP' concepts like work life balance and happiness.

The WEF also introduced a component of sustainability, since 2011, in its assessment of national competitiveness. Lapinskiene (2011) sees this merging of two different and mostly diverging phenomenon (Milaszewicz, 2014) necessary for 'harmonious development' of countries. Balkyte and Peleckis (2010) give insight to the concept of 'Sustainable Competitiveness', which they describe as a merging of concepts of sustainable development and competitiveness as shown in Figure 3, especially when the world is globalizing and challenge of climate change influence the competitiveness.

Figure 3 Definition of Sustainable Competitiveness (Balkyte & Peleckis, 2010)



Source: (Balkyte and Peleckis, 2010) p 632

Defining the combined concept of sustainable competitiveness is not easy, as "there is still not enough evidence of the existence of certain functional relation between these parameters"(Cvetanovic et al., 2014) p 769. However, the most prominent ways to measure sustainable competitiveness at country-level are devised by WEF and Solability, as explained in the succeeding paragraphs. Many authors like Herciu and Ogrean (2014), Cvetanovic et al. (2014) and Filipovic and Despotovic (2014) use these measures for further research into the topic.

The concepts of sustainable development and competitiveness, though different, are correlated as shown in study by Fonseca and Lima (2015), which proves a high correlation among competitiveness, sustainable competitiveness and innovation by using GCI, sustainability adjusted GCI (by WEF) and Global Innovation index (by Cornell University, INSEAD Business school and WIPO). Filipovic and Despotovic (2014) have proven that being socially and environmentally sustainable is beneficial for economic progress of the country in their study of 79 European countries in 2013. However, the existence of such relationship at global level needs to be seen. Lapinskiene (2011) in his study of European countries prove that there is strong correlation between competitiveness and sustainable development, but for countries with lower economic growth (expressed in GDP/ capita), higher GDP growth rate is to be ensured to lead to more sustainable development. While, higher GDP growth cannot be ensured after a level is reached for both competitiveness and sustainable development (p 442). Thus, in the scenario between competitiveness and sustainable development, economic progress and its sustenance must not be ignored.

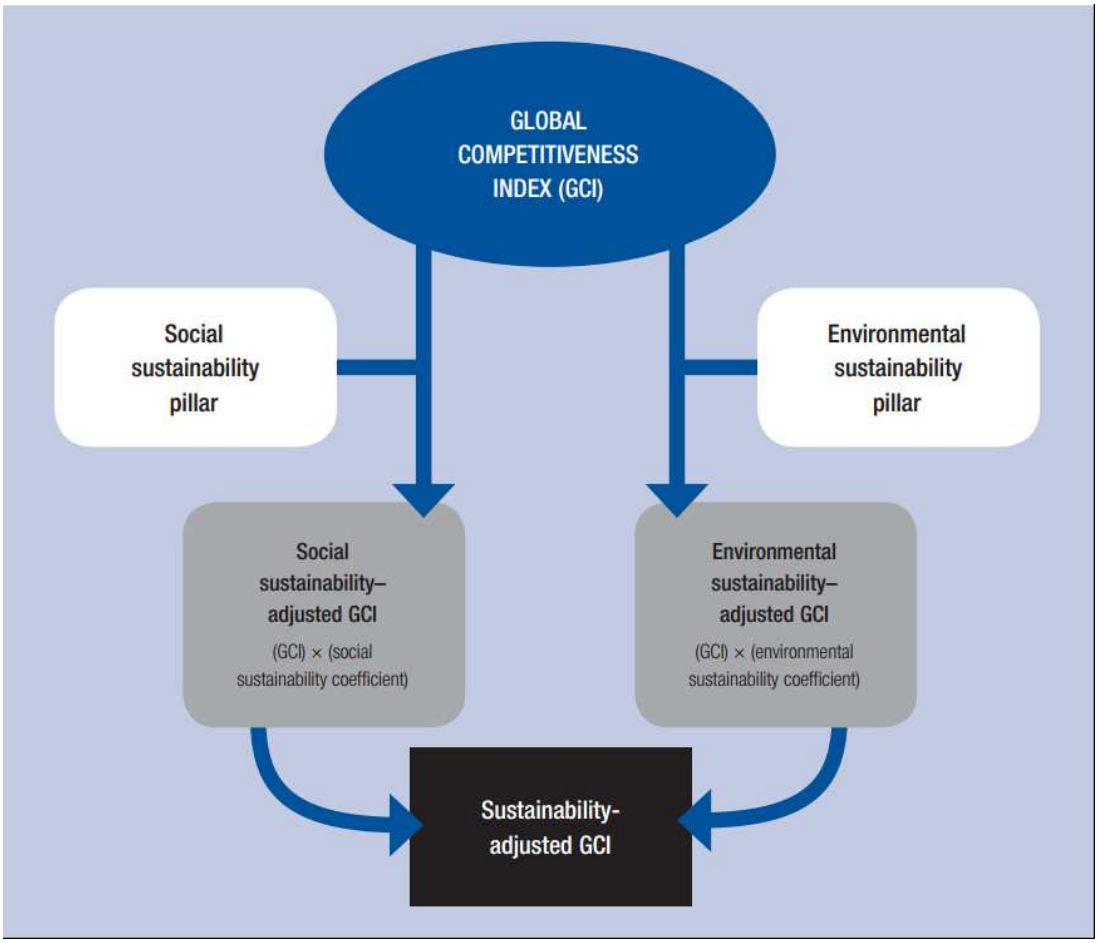
2.5. Measures of Sustainable Competitiveness

A comprehensive and measurable definition of sustainable competitiveness is given by the WEF in their Global Competitiveness Report as

"the set of institutions, policies, and factors that make a nation productive over the longer term while ensuring social and environmental sustainability" (Schwab et al., 2014) p 55.

Approach to measure sustainable competitiveness given by WEF is shown in Figure 4. The approach is to adjust the Global Competitiveness score of a country based on sustainability level in the country. This is to ascertain the level of true progress which is inclusive and environment friendly. WEF's approach uses two coefficients to adjust the GCI score for countries. These are – an environmental sustainability coefficient with indicators focussing on environmental policy, use of renewable resources and degradation of the environment and a social sustainability coefficient with indicators focussing on access to basic necessities, vulnerability to shocks and social cohesion (Schwab et al., 2012). The total sustainability dimension is a result of combination of the two coefficients (i.e. environmental sustainability coefficient and social sustainability coefficient) when multiplied with the GCI.

Figure 4 Components of sustainability adjusted Global Competitiveness Index (WEF, 2012)



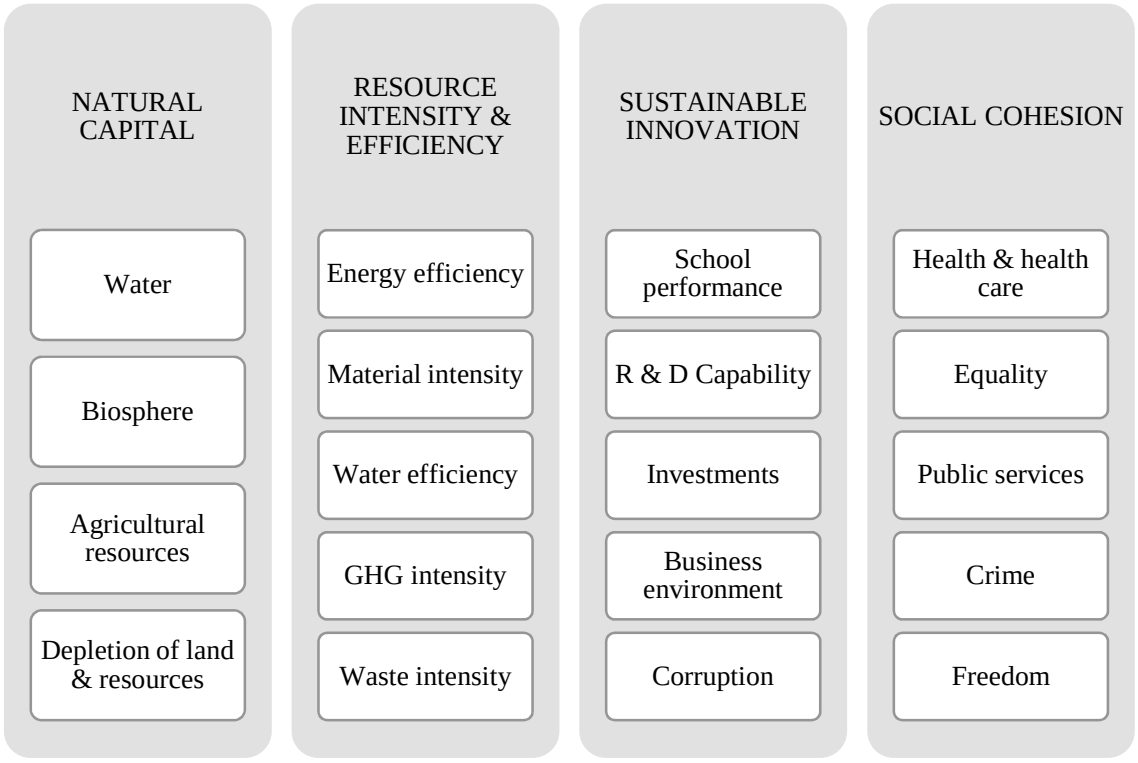
Source: (Schwab et al., 2012) p52

In the above figure, environmental sustainability pillar is defined as "the institutions, policies, and factors that ensure an efficient management of resources to enable prosperity for present and future generations" (Schwab et al., 2012) p 52, while social sustainability pillar is defined as "the institutions, policies, and factors that enable all members of society to experience the best possible health, participation, and security; and that maximize their potential to contribute to and benefit from the economic prosperity of the country in which they live" (Schwab et al., 2012) p 52. To explain further, Schwab et al. (2012) details the pillar of environmental sustainability by using different indicators for each of its variables - environmental policy, use of renewable resources and degradation of the environment. Environmental policy is measured by " stringency and enforcement of environmental regulations, number of ratified international environmental treaties and terrestrial biome protection" (Schwab et al., 2012) p 54. Use of renewable resources is measured by "agricultural water intensity, change in forest cover and forest loss, and fish stock's overexploitation" while degradation of environment is measured by "level of particulate matter concentration, CO2 intensity and quality of natural environment" (Schwab et al., 2012) p 54. Similarly, pillar of social sustainability is detailed by three variables – "Access to basic necessities, vulnerability to shocks and social cohesion" (Schwab et al., 2012) p 55. Access to basic necessities is measured by "access to sanitation, access to improved

drinking water, access to healthcare", vulnerability to shocks is measured by "vulnerable employment, extent of informal economy and social safety net protection", while social cohesion is measured by "income Gini index, social mobility and youth unemployment" (Schwab et al., 2012) p 55. The data for these indicators is collected through secondary research as well as an international 'Executive Opinion Survey' conducted by the WEF to gain qualitative data about the variables.

Another definition of sustainable competitiveness is given by Solability (2015) which follows the same lines as the definition of sustainable development given by Brundtland Report and focuses on intergenerational equity. It is defined as "the ability to generate and sustain inclusive wealth without diminishing future capability of achieving and sustaining current wealth levels" (Solability, 2015) p 7. Like the Global Competitiveness Index, Solability also uses pillars to measure 'sustainable competitiveness' by an index. Their approach is not to adjust a measure of competitiveness (GCI) by sustainability like WEF, but to measure sustainable competitiveness, as a whole, in terms of four pillars. Natural capital, links to the availability of natural resources in the country and their level of depletion; Resource intensity pillar refers to efficiency of use of the available resources in the country; Social cohesion pillar indicates stability of business environment as the population can work without interruption; Sustainable innovation pillar refers to economy being driven by innovation; and finally governance pillar refers to government framework for business (Solability, 2015). These pillars combine aspects for environment, society, economic growth and competitiveness and thus represent measure for sustainable competitiveness.

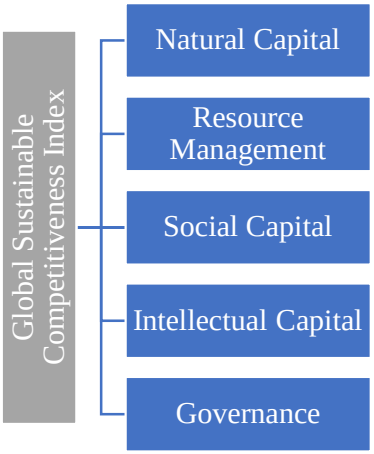
Figure 5 Components of Global Sustainable Competitiveness Index - 2013 (Solability)



Source: Solability, 2013 in (Herciu and Ogrean, 2014)

The organization, Solability, has since then strengthened their 'Global Sustainable Competitiveness Index' (GSCI) by adding another dimension – Governance Capability, which makes it comparable to the Sustainability adjusted GCI prepared by WEF. The improved format of GSCI is presented in Figure 6. The improved Global Sustainable Competitiveness Index depends on five pillars, which relate to a country's ability to prosper in an environmentally sensitive and inclusive way without compromising its future potential. These are – "natural capital availability, resource efficiency, social cohesion, government-led development direction, and innovation and business capabilities"(Solability, 2015) p 7.

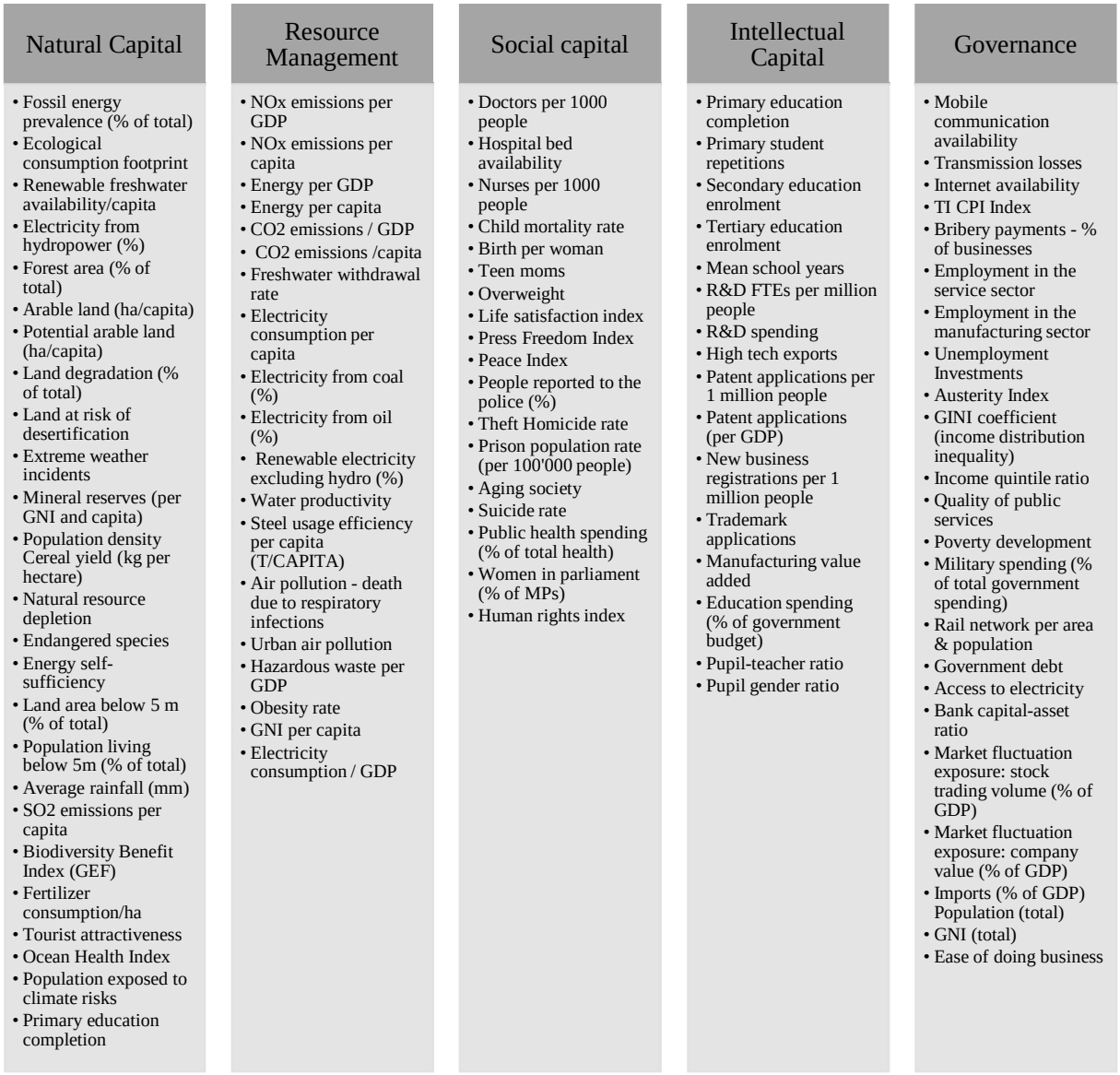
Figure 6 Components of Global Sustainable Competitiveness Index - 2015 (Solability)



Source: Author, 2016 based on (Solability, 2015)

The following figure details the indicators used to measure GSCI based on the five pillars shown in Figure 7.

Figure 7 Global Sustainable Competitiveness Index and its indicators (Solability, 2015)



Source : Author, 2016 based on (Solability, 2015)

The five components of GSCI together provide information on aspects of environmental management, resource utilization, social capital, social infrastructure and governance. It does not have a well-defined competitiveness component. Based on the indicators, it relies heavily on the sustainable part of sustainable competitiveness. Some of the indicators are used twice in similar form (eg GNI per capita and GNI and electricity consumption per capita and electricity consumption per GDP). When compared to the 12 pillars of competitiveness by WEF, it is observed that GSCI includes indicators relevant to pillars of institutions (Government debt, CPI index, Bribery payments etc.), infrastructure (Rail network per area, Access to electricity, mobile communication availability), health and primary education (primary education enrolment, public health spending etc.), macroeconomic environment (ease of doing business,

market fluctuation exposure etc.) and R & D (patents, , R & D spending etc). However, it leaves out indicators to assess the market condition, related to goods and labour. This is an important component for defining competitiveness, as it essentially measures productivity of a nation. GSCI also uses certain indicators (eg. Obesity rate, Teen moms, extreme weather conditions, overweight, suicide rate etc.) which might not relate directly to sustainable competitiveness. As the main aim of ranking countries according to sustainable competitiveness is to identify gaps in development approach and prepare strategies to certain issues identified by the indicators to achieve better sustainable competitiveness. However, GSCI does not present a very clear picture of identifying potentials or problems in a country's approach for competitiveness and specifically sustainable competitiveness. In spite of all the shortcomings of the index, GSCI gives thorough insight into defining environmental sustainability as the indicators used are very detailed covering aspects of natural resource use and deletion, biodiversity, pollution, renewable energy, disaster-prone land etc. It also includes an indicator of well-being – 'overall life satisfaction' as part of social capital.

The sustainability adjusted GCI, does not cover factors like "incidence of political violence and civil war, market imbalances, natural disasters, environmental damage and resource depletion, measures of food security, non-communicable diseases and worker protection" (Schwab et al., 2012) p 61-62. GSCI prepared by Solability, on the other hand relies heavily on sustainability aspect and lacks in indicators to measure competitiveness in a detailed manner as done by WEF in Global Competitiveness Reports. These are not the only approaches to measure 'sustainability' dimension of competitiveness. Lapinskiene (2011) uses social factors, such as "resource productivity, poverty with respect to gender, employment rate of older people and healthy life year at birth and environmental indicators, such as GHG emissions, share of renewables in energy consumption and energy consumption of transport (sector) relative to GDP" to define sustainability. In addition, he adds the concept of development assistance relative to the national income as a dimension of sustainable development. He compares countries in both competitiveness and sustainability rankings and shows that "high competitiveness creates the conditions to improve quality of life" in addition maintaining "environmental-friendly development" p 6. Apsalone and Šumilo (2015), in their study of 37 countries to understand relationship between socio-cultural factors and competitiveness have highlighted six factors which are significant. 'Collectivism and Hierarchy', which indicates level of inequality and inefficient power structure in society is negatively linked to competitiveness. Countries with more equal societies as well as direct communication as societal values, such as Anglo-Saxon, Germanic and Scandinavian countries, score better in competitiveness. Other five factors are positively linked to competitiveness. These are – 'Future, Cooperation and Performance Orientation', which indicates focus of society as a whole on its future to achieve which the society coorperates and performs; 'Self-expression' indicates individuality; 'Monochronism and Rationality' indicates attitude of people to prioritize important tasks based on rationality instead of multitasking, 'Economic Orientation' indicates focus of society on economic growth and 'Social structure' refers to "universal or particular attitudes" p 286.

To add dimension of sustainability to the concept of competitiveness, the world should be seen as a mesh of interdependent economies especially due to globalization trends. It is thus important to be sustainable through international cooperation and development, social welfare and security including initiatives to reduce inequality and "guaranteeing human rights, improving quality of life and protecting natural environment" (Szentes 2005)p 17.

Zaremba-Warnke (2015) uses three types of indicators – ecological, economic and social-cultural to assess sustainability of products and processes in enterprise. However, these criteria are also well-suited for country level. the ecological criteria include indicators relating to climate change, urbanization, biodiversity, non-renewable energy usage and toxic emissions. Socio-cultural factors include indicators relating to participation, human rights freedom, poverty, existing social structures, safety, quality of life and health. These factors can also be used to assess sustainability at national level.

2.5.1. Sustainability-adjusted GCI as a measure of sustainable competitiveness

Many studies use GCI and sustainability indicators as proposed by WEF in their Global Competitiveness Reports, as they give a holistic view of inputs to competitiveness at both macro and micro level. Thore and Tarverdyan (2016) uses GCI to represent measure of competitiveness, while using different indicators for its sustainability part – Gini coefficient, Youth unemployment, access to sanitation and improved drinking water for social sustainability and agricultural water conservation, CO2 release limitation and forest cover conservation for environmental sustainability. P110.

Measurement of sustainable competitiveness is an evolving field and the existing indexes are, but an effort to measure the simple yet complex concept of sustainable competitiveness. Taking into account the earlier definition and the scope of this research, sustainable competitiveness for this study is defined as –

"***set of institutions, policies and factors leading to a productive economy with a sustained and inclusive growth, efficient management of resources, capacity of disaster resilience and good governance"***

For this study, sustainable competitiveness is measured by preparing a coefficient of sustainability (similar to the sustainability-adjusted GCI by WEF), which when multiplied by the GCI (by WEF) shall lead to an adjusted GCI indicating level of sustainable competitiveness for each country. Concept of sustainable development as per this research, can be divided into four main concepts as shown in Figure 8.

Figure 8 Components of Sustainability coefficient for sustainable competitiveness

Source: Author, 2016

This definition combines concepts of sustainable development –environment, economy and society as per Evans et al. (2015) with the concept of competitiveness. In addition, it includes concept of good governance. It has been proven by Samanta and Sanyal (2010) that corruption in indirectly related to competitiveness. Hence, good governance is required for enhancement of competitiveness. Indicators to measure each of the variables shall be taken from the existing indices of sustainability adjusted GCI by WEF and GSCI by Solability.

The sustainability coefficient used in this research consists of 4 components, each of which comprises of several indicators. Component 1 – inclusive growth relates to that growth whose benefits are shared by all sections of society, regardless of their income or gender. Thus, to indicate inclusive growth, equality is used. Income inequality, measured by Gini coefficient indicates an exclusive growth in the country. Gender inequality is endangers inclusive growth as highlighted by Niimi (2009) as it is an indication of inclusion of almost half of the country's workforce. WEF uses Gini coefficient as a measure to depict social sustainability. Another factor for inclusive growth is initiatives taken by government to reduce prevalent inequality in the society, which can be indicated by percentage of total budget allocated or spent for pro-poor programmes. Policies to address youth unemployment gets included in many of the inclusive growth programmes such as Europe 2020 by EU (Lahusen et al. 2013). Thus, to assess inclusive growth, the indicators should relate to inequality in income, government's initiatives to address that inequality, inequality related to gender and youth unemployment.

Component 2 – Environmental management signifies the performance of a country with respect to risk to and protection of natural resources. A country which endangers its environmental resources cannot be termed sustainable. Thus, to assess environmental management, indicators that relate to pollution, biodiversity, forests, GHG emissions etc. should be measured. Environmental Performance Index, prepared by Yale Centre for Environmental Law and Policy (YCELP) and the Centre for International Earth Science Information Network (CIESIN) at Columbia University, in collaboration with the Samuel Family Foundation and the World

Economic Forum, "ranks how well countries perform on high-priority environmental issues in two broad policy areas: protection of human health from environmental harm and protection of ecosystems" (Hsu et al. 2014). It indicates performance of countries with respect to pollution, water and sanitation, climate and energy, biodiversity and habitat, agriculture, water resources and fisheries. It manages to cover most aspects to be considered under environment management. Importance of energy efficiency is shown by Tvaronavičienė et al. (2015) according to which using innovative and clean technology affects long-term competitiveness and sustainable development in a positive manner. As per their study, energy was intensively used in industries like iron and steel and wood and wood production. Innovative technologies in such energy intensive industries can decrease the energy demand.

Component 3 – Disaster Risk is important in sustainable development as natural hazards are negatively related to sustainability (Rose 2011). However, each country is not affected by the same disasters equally and the indicators to measure the effect of disasters should take that into consideration. Also, approach to disaster resilience differs by country. Indicators related to population affected by disasters and the government's approach in terms of programmes and budget can assess Disaster Risk of a country.

Component 4 – Governance has a strong link with competitiveness as indicated by Porter, 1990 but also sustainability. Governance structures existing in any country influences policy proposals and its implementation (Atkinson and Klausen 2016). Thus, for achieving sustainability, good governance indicators should be in place. These relate to corruption levels, freedom of press, political stability and absence of violence. Although good governance gets included in the 1st pillar of GCI – Institutions (diversion of public funds, irregular payments and bribes), the two factors used to describe SGCI - corruption index and political stability and violence helps to expand the narrative of good governance and its importance for sustainability. The indicators of Political Stability and Absence of Violence and Government Effectiveness are also used by Dragičević et al. (2011) in their study comparing competitiveness of Croatia and Slovenia. They used the above indicators to measure good governance and positively related it to competitiveness growth.

Sustainability-adjusted GCI used for this research tries to address shortcomings in the past approaches of measuring sustainable competitiveness.

2.5.2. Future of sustainable competitiveness

Linking competitiveness to only productivity can be a dangerous assumption. Productivity doesn't truly highlight the progress of a country as it can be higher even if unemployment is rampant and natural resources are exploited, while it can be lower even if income is equitably distributed in the society (Aiginger 2006). Thus, competitiveness must also include components of sustainability. Miłaszewicz (2014) shows that sustainability has a positive influence on competitiveness in only developed countries and calls for a world-wide approach to sustainable development and competitiveness rather than making it an inter-country rivalry, for the benefit of future generations.

Since there has been concerns of the validity of national competitiveness as a concept (eg. (Krugman 1994) (Szentes 2011), (Aiginger and Vogel 2015) call for inclusion of "Beyond GDP as a benchmark of national performance" p 498. This proposed outcome of competitiveness covers social equality as well as ecological sustainability and adds to the traditional outcomes expected of competitiveness – GDP growth and employment. Concepts of competitiveness and sustainability together can complement each other as, economic growth

is required to drive welfare (Aiginger 2006) while competitiveness alone cannot guarantee sustenance for future generations.

Lapinskiene (2011) has established that competitiveness ranking of countries get reflected in their sustainability rankings and forerunners in this trend are countries like Denmark, Finland and Norway. As per Aiginger (2006), the time has come when the aim of competitiveness should be to create welfare. Huggins and Thompson (2012) also assert that sometimes policies aimed at achieving competitiveness sometimes neglect their outcomes especially with regard to well-being of people. Thus, it is pertinent to study conditions under which competitiveness does not compromise on the well-being of people. For this, concept of well-being and happiness shall be discussed in the following paragraphs.

2.6. Concept of happiness and well-being

Happiness is generally seen as an umbrella term which can be used to describe a human emotion as well as life, in general, of that individual. Veenhoven (2013) suggests that 'happiness' is often used interchangeably with related terms such as wellbeing, quality of life, life satisfaction etc. However, happiness can be seen as all of these things and much more depending on its definition. The definition of happiness is somewhat flexible and the concept might be seen as 'elusive' (Veenhoven 2004). However, Plato seemed to agree, while Jeremy Bentham (1789) proposed (Veenhoven 2004) as well as Veenhoven (2013) agree that happiness is the main goal in life.

The concept of happiness has come a long way from the times of Plato and is still evolving. In the past, happiness was seen more as a philosophical subject, however now, a "new science of happiness" is emerging (Ballas, 2013) p S43. John Stuart Mill's (1863) notion of happiness related to it being some form of it being "intended pleasure and absence of pain" (Cloutier et. al., 2013) p 2. Diener (2008) also echoes on the same principles of life satisfaction being having more positive than negative emotions, while Cloutier (2013) adds to it a viewpoint of communities (Cloutier et. al., 2013) p2.

Veenhoven (2013) differentiates happiness from different qualities of life and explains that "subjective wellbeing" or "life satisfaction", which relate to subjective enjoyment of life, are more closely related to happiness than life-ability, live-ability and even purpose of life. He further divides life satisfaction into 4 dominant satisfactions – Instant satisfaction, which relate to instant mood improvements; Domain satisfaction, which relates to different spheres of social life – work, family etc.; Top-experience, which relates to a fleeting moment of intense satisfaction; and Overall Satisfaction, which is the most comprehensive way to describe happiness as a whole. Similar to Veenhoven (2013), this research focusses on 'Overall Life Satisfaction' and interchangeably uses the term happiness to indicate it. The term is also used interchangeably with 'well-being' which presents the idea of being in a satisfied place in life.

Veenhoven (2004) shows that 'goodness of life' can be understood by understanding the four main characteristics – "livability of environment, life-ability of person, utility of life and satisfaction with life" p 4. Livability of environment refers to the conditions for good living in the surrounding environment; life-ability of person refers to capability of person to lead a good life for herself; utility of life refers to aim and meaning of the particular life, mainly in doing good in the world; and satisfaction with life refers to "appreciation of life, commonly referred to by terms such as 'subjective well-being', 'life-satisfaction' and 'happiness' in a limited sense of word" (Veenhoven 2004) p 5. This satisfaction with life is again divided into four parts to clarify different facets of life, in general. These are - Pleasure, which relate to instant mood

improvements; Domain satisfaction, which relates to different spheres of social life – work, family etc.; Top-experience, which relates to a fleeting moment of intense satisfaction; and Overall Satisfaction, which is the most comprehensive way to describe happiness as a whole (Veenhoven 2013; Veenhoven 2004)

The term 'Happiness' has multiple and often contextual meanings which leads to its interpretation as per many perspectives and viewpoints. Frey and Stutzer (2002) acknowledge that best way to measure life satisfaction is to ask people directly how satisfied with their lives they are. Thus, in context of the above viewpoints, for this study, definition of happiness is taken from Veenhoven (2011)-

"an individual's subjective satisfaction with his/her life as a whole"

2.7. Happiness and public policy

Happiness of people has been studied by various branches of science as well as social science, where in the branch of 'Happiness Economics', which until twentieth century was assumed to be non-empirical (Van Praag and Ferrer-i-Carbonell, 2010), is emerging. It relates to studying of individual behaviours about the decisions they make or the surrounding environment which result into happiness or unhappiness. It can be measured directly by measuring satisfaction with life as a whole or indirectly by assessing the factors leading to happiness in life.

Many countries in the world as well as supra-national organizations like EuroStat and OECD are starting to measure well-being. Some of these initiative to bring well-being in focus are publishing of World Happiness Report by United Nations since 2012, which ranks countries of the world as per their average happiness level. EuroStat along with other countries like United Kingdom collect data on well-being through regular surveys. Bhutan, which uses a Gross National Happiness Index to measure progress in addition to other measures, is one of the first countries to prepare and use a national level well-being indicator (Stucke 2013). The GNH in Bhutan is part of the constitution and the policies utilizing GNH concept relate to environment, energy, culture, education, health, FDI and small and medium industries (Musikanski 2014). In order to define indicators to assess well-being, EU started the "project BRAINPOoL (Bringing Alternative Indicators Into Policy"(Musikanski 2014) p 57.

Concept of happiness is not only utilized as a cause but also as an outcome for policy planning. Policies aiming at employment generation and social security positively influence happiness as shown by Easterlin (2013) in a study of Ultra-welfare (Denmark, Sweden and Finland) and Semi-welfare states (France, Germany, Austria and U.K) while only economic growth might not lead to happiness, as shown by example of China. He also suggested that economic growth in itself should not be forsaken but utilized to improve employment opportunities and safety net policies.

As seen above, happiness is a multifaceted concept, where each facet deals with a different aspect of life. Goal of governments, while proposing policies for enhancement of well-being of its citizens should focus on the facet of Life Satisfaction, which is the "overall appreciation of one's life-as-a-whole" (Veenhoven 2004) p 6. Veenhoven (2004) also argues that happiness can be enhanced, albeit systematically, and can be treated as analogous to improvement in health care. With right policies and programmes, it can be achieved.

Various studies have found a positive correlation between wealth and happiness, but the causal relationship is ambiguous - Whether wealthy people are happy or happy people are

wealthy?(Van Praag and Ferrer-i-Carbonell, 2010). Frijters et al. (2004), Pischke (2010) and Powdthavee (2010) prove that income has a causal effect on happiness (Van Praag and Ferrer-i-Carbonell, 2010). In fact, according to a study done for a British data set by Van Praag and Ferrer-i-Carbonell (2008b) suggests that out of all domain satisfactions (job, financial, housing, health, leisure-use, leisure-amount, marriage and social life) for general life satisfaction, job-satisfaction contributes the maximum (Van Praag and Ferrer-i-Carbonell, 2010). Other studies like that done by Graham (2009) also validates that happiness is strongly related to employment, health, income. However, he also finds a parabolic age effect on happiness, which essentially means that children and old people are relatively happier than those in the middle ages.

Countries in Western Europe, well-known for scoring high on almost all 'Happiness Indices', are also 'wealthy'. Taking a cue from these, other countries must come up with policies and plans "to enable all members of the society to experience the best possible health, participation, and security; and maximize their potential to contribute to and benefit from the economic prosperity of the country in which they live" (Sala-I-Martín, Bilbao-Osorio, et al., 2014) p 6 so as to sustain competitiveness. Inclusion of all potential labour in the economy shall contribute to economic development (Sala-I-Martín, Bilbao-Osorio, et al., 2014) as well life satisfaction of people, as job satisfaction is major contributor to general life satisfaction (Praag and Ferrer-i-Carbonell, 2010). The social benefits in many Scandinavian, Benelux and French cities and London, which influence the happiness levels of their residents, are only possible due to availability of wealth in the economy and strong welfare and redistributive policies of the government. Thus, wealth and happiness are positively linked at a city scale, provided presence of strong institutions, policies and infrastructure. Policies based on both the approaches can prove to be complementary, however the causal relationship between emerging form of competitiveness and happiness should be researched.

2.8. Sustainable competitiveness and happiness

World Happiness Report (2016) uses bivariate regression to understand the relationship between happiness, represented by Cantril Ladder and sustainability, represented by SDG Index, competitiveness, represented by GCI and economic freedom, represented by IEF for 119 countries. SDG Index presents the progress of a country as per the 17 SD goals. GCI measures the competitiveness of a country with 114 indicators under 12 pillars which are treated as input or necessary conditions to achieve competitiveness. IEF assesses freedom of individuals to utilize their resources, both labour and finance with minimum restrictions and consists of 10 sub-indices related to "rule of law, government size, regulatory efficiency and market openness" p 61. The regressions also include measures of economic performance, represented by GDP per capita and employment, represented by unemployment rate, as past studies have been conducted that relate these to happiness. The results of these regression show that both economic competitiveness and sustainable development are linked to happiness at country level. When taken together, economic performance combined with employment contribute most significantly to explain variations in happiness. However, SDG Index is also significant in the same regression, indicating that apart from economic growth and employment, environmental and social factors are also important for happiness at country level. (Helliwell et al. 2016). This is also supported by Zidansek, which concludes that sustainable development and well-being are linked at country level. However, some studies (Huggins and Thompson (2012) and Rogerson (1999) also show positive links between competitiveness and well-being. It is thus required to understand the relationship between competitiveness, sustainable development and happiness.

With arguments in the preceding paragraphs about competitiveness, sustainable competitiveness and happiness and their relevance to development of society, it is relevant to search for links between the concepts. Authors like Aiginger (2006) and Lapinskiene (2011) draw our attention towards a more comprehensive economic growth which leads to well-being of society. Thus, the following paragraphs shall try to establish links among competitiveness, sustainable competitiveness and happiness.

Competitiveness is much more than economic growth as shown by Martin and Simmie (2008) p 4, who define it as:

"the ability of cities to continually upgrade their business environment, skill base, and physical, social and cultural infrastructures, so as to attract and retain high-growth, innovative and profitable firms, and an educated, creative and entrepreneurial workforce, to thereby enable it achieve a high rate of productivity, high employment rate, high wages, high GDP per capita, and low levels of income inequality and social exclusion"

This definition takes into account and shows that 'competitiveness' is in fact a multifaceted approach. It not only deals with economic growth but also equality, both in terms of income distribution and societal structure. This is also supported by other authors, like Kerekes (2011) who believes that economic growth through markets might not be the only thing required for happiness of people and highlights the words of 19th century British scientist, Ruskin – "that country is the richest which nourishes the greatest number of noble, and happy human beings"(Kerekes, 2011) p 6. Thus, in crude terms, all the growth and development boils down to happiness of people.

Stiglitz et al. (2010) highlighted the fallacy in our approach towards development by saying - ''what we measure affects what we do. If we have the wrong metrics, we will strive for the wrong things''. It is supported by Seaford (2013) who recognizes that the predominant economic- growth and free market driven approach to development has shortfalls. He argues for a case of using subjective well-being indicators to guide policy for a more comprehensive approach towards development. Huggins et al. (2013) indicate presence of a relationship between local competitiveness and level of well-being, but given the 'new approach' to competitiveness, it is pertinent to establish relation between 'sustainable competitiveness' and subjective well-being.

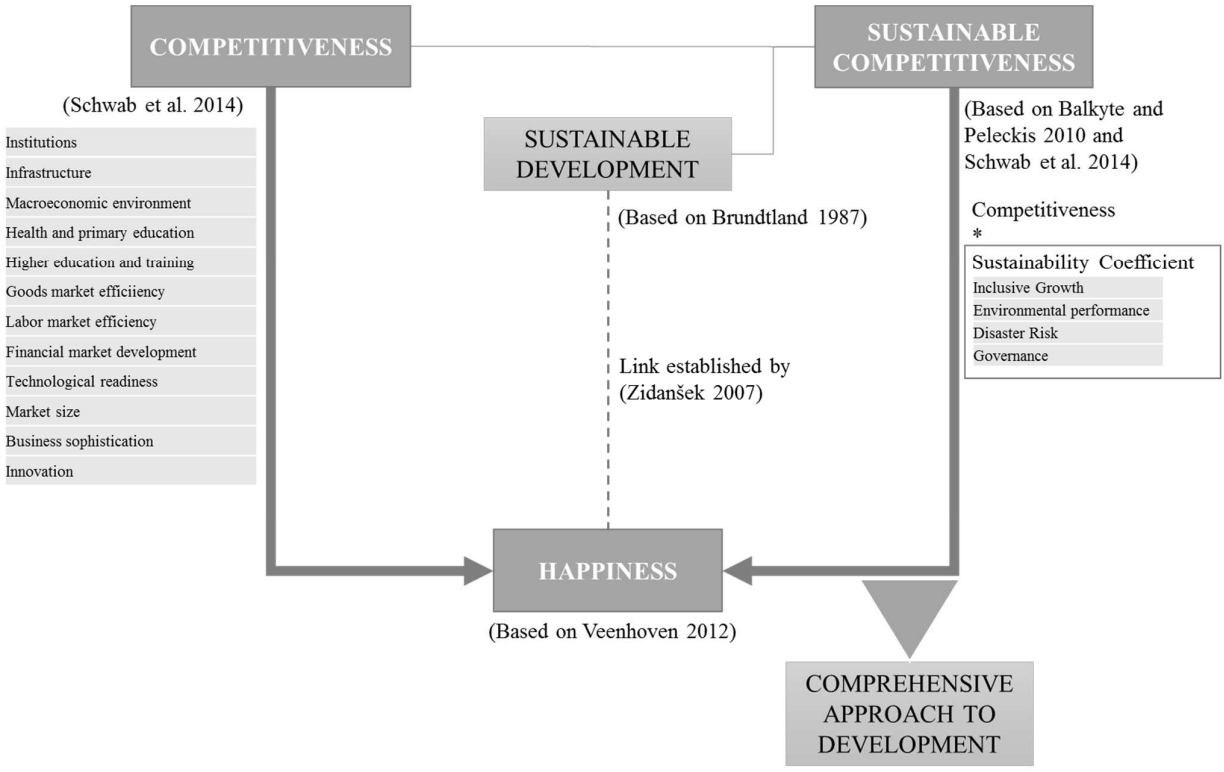
Balkyte and Tvaronavičienė (2010) stress the link between economic growth and social progress and in their opinion, "continued competitiveness and economic growth are essential to supporting living standards and wellbeing" p 358. Providing environment with high levels of well-being, cities and countries are attracting world-class workers and increasing their competitiveness. This is leading to competitiveness and well-being becoming mutually supportive (Balkyte and Tvaronavičienė, 2010). Lapinskiene (2011) has already established high correlation between levels of competitiveness and conditions to improve quality of life without endangering the environment based on his study of European countries. It is, thus, important to study the link particularly between sustainable competitiveness of nations and happiness of people residing in all countries especially when Stucke (2013) has shown competitiveness can be more successful for leading to well-being if it caters also to economic, social and democratic dimensions of society.

2.9. Conceptual Framework

As per the relationships established by the literature review in the preceding section, the conceptual framework of the thesis is shown in Figure 9. The research tries to link competitiveness and its more sustainable form – 'sustainable competitiveness' to happiness to be able to provide guidance for a more comprehensive approach to development. Competitiveness, as defined by Schwab et al. (2014) based on 12 pillars of competitiveness is to be tested with self-reported subjective well-being of people at country level. Sustainable development is found to be related positively to happiness at country level, as established by Zidanšek (2007). As Balkyte and Peleckis (2010) show that sustainable competitiveness is a product of the concepts - sustainable development and competitiveness, where sustainable development already has a link to happiness, the link between sustainable competitiveness and happiness is further explored at country level. Establishing a relationship between sustainable competitiveness and happiness can help to argue in favour of more comprehensive approach to development. It can help to create policies which are not only beneficial for economic growth and environment but also people's well-being.

In the figure below, explaining the conceptual framework for this research, two concepts are seen as the independent variables – competitiveness, which is measured by GCI and is detailed by 12 pillars of competitiveness – institutions, infrastructure, macroeconomic environment, health and primary education, higher education and training, goods market efficiency, labour market efficiency, financial market development, technological readiness, market size, business sophistication and innovation, and sustainable competitiveness, which is a product of competiveness (GCI) and a sustainability coefficient, detailed by 4 components – inclusive growth, environmental management, disaster risk and good governance. Both these concepts are to be tested with happiness, measured by self-reported level of life satisfaction, acting as a dependent variable. The conceptual framework also points that a link between sustainable development and happiness is already established and hints that as a result, sustainable competitiveness might also be related with happiness. The figure also shows the outcome of this research which is to plan for a comprehensive approach to development, which leads to competitiveness, sustainability and well-being.

Figure 9 Conceptual framework



Source : Author, 2016

The design of the research as per the conceptual framework and the definitions of the concepts used are detailed in the next chapter. It also includes operationalization, which details each of the concept as well as the variable shown in the figure above.

Chapter 3: Research Design and Methods

This chapter translates the academic concepts to measurable indicators in order to address the problems identified in Chapter 1. This is done by identifying measurable indicators of each concept in the conceptual framework guided by theories learnt in Chapter 2. This chapter provides information on the process of data collection and their analysis methods.

3.1. Revised Research Question

The main question that the research tries to answer is:

Does sustainable competitiveness lead to happiness at country level?

However, to answer this question, the following sub-research questions need to be answered.

i. To what extent does competitiveness alone lead to happiness at country level?
ii. To what extent sustainable competitiveness lead to happiness at country level?
iii. Does the relationship between sustainable competitiveness and happiness gets influenced by geographic region or income level of a country?
iv. What factors significantly affect the relationship between sustainable competitiveness and happiness?

As population, GDP and even geographical area of a country can influence level of competitiveness, it is pertinent to compare countries with similar population, GDP and geographical area.

The first sub-research question explores relationship between economic growth indicated by competitiveness but without giving due concern for environment and social factors and happiness of people. The second sub-question however, tries to test this relationship by including dimensions of sustainable development. The difference between the first two sub-questions actually indicates whether aiming for sustainable competitiveness would make any difference for the well-being of people. The third sub-question on the other hand, explores if geographical regions and income category of a country influence the relationship between sustainable competitiveness and happiness, while the fourth sub-question tries to find out the components of sustainable competitiveness which are important in influencing happiness at country level.

3.2. Operationalization: Variables, Indicators

Operationalization is a process of transition from theory to empirical research (Van Thiel, 2007). The theoretical concepts are unbundled into clearly defined and measurable variables and indicators. According to Van Thiel (2007), the process of operationalization has three stages –

- Defining the central variables
- Identifying indicators to measure those variables, and
- Providing a scale (of values) for measurement of the indicators.

There are three central concepts under research in this study as mentioned in the preceding chapters – Competitiveness, Sustainable Competitiveness and Happiness. The concept of Happiness is detailed as the variable – 'Life Satisfaction' based on the definition given by

Veenhoven (2013). It is measured by the indicator of 'Self-reported happiness', data for which is collected by Gallup's World Survey and is available at country level for different years (2005-2014).

The concept of Competitiveness is detailed by the 12 variables, all of which relate to National Competitiveness. These 12 variables are aggregated into one indicator - Global Competitiveness Index (GCI), data for which is published annually by WEF. As explained in Chapter 2, GCI provides a comprehensive aggregate of factors affecting 'National Competitiveness', both at a macro-economic and micro-economic level. It does so by measuring GCI based on twelve components, each consisting of sub-components collected quantitatively as well as qualitatively. Some components are more relevant to specific countries based on their level of development. For example, a developing country must strengthen its infrastructure and institutions to increase competitiveness, while a developed country must focus on sophistication of business and innovation for enhancing competitiveness. To cater to this, GCI divides countries into three clusters, also explained in Chapter 2, and gives different weights to the 12 components of GCI for each of the cluster. Thus, developing countries in the first cluster, marked as 'Factor-driven economies', have more weights assigned to components of Institutions, Infrastructure and Health and Primary education than Business sophistication. In this way, GCI not only provides a comprehensive approach to measure national competitiveness, but also identifies factors particularly required to be strengthened in different economies.

The concept of Sustainable Competitiveness is measured by sustainability adjusted GCI (SGCI). This is done to provide a component of sustainability in measurement of competitiveness. As a result, competitiveness is not only about macro and micro economic characteristics but also environmental, governance, inclusivity of growth and disaster resilience. Based on literature in Chapter 2, these components were earlier missing in the attempts to define competitiveness in a sustainable manner. By adjusting the economic dimensions of competitiveness (measured by GCI) through sustainability variables, sustainable competitiveness can be measured. This approach of measuring 'Sustainability-adjusted GCI', is similar to the one taken by WEF in preparing Global Competitiveness Reports. However, this sustainability coefficient has four components – inclusive growth, environmental management, disaster risk and good governance. These components are based on the literature in Chapter 2. This coefficient tries to adjust competitiveness by sustainability, so as to improve from the earlier attempts.

The following table presents the concepts, their constituent variables and indicators.

Table 3 Operationalization Table

Concept	Definition & source	Variable	Indicator	Potential Source	Remarks
Competitiveness	"set of institutions, policies, and factors that determine the level of productivity of an economy" (Schwab et al., 2014)	Institutions	Global Competitiveness Index	Global Competitiveness Report	Global Competitiveness Index (GCI) is used to measure 12 pillars of competitiveness which can be compared across nations. It is widely used by other authors as a measure
		Infrastructure			
		Macroeconomic environment			
		Health and primary education			
		Higher education and training			

Concept	Definition & source	Variable	Indicator	Potential Source	Remarks
		Goods market efficiency			of national competitiveness.
		Labor market efficiency			
		Financial market development			
		Technological readiness			
		Market size			
		Business sophistication			
		Innovation			
Sustainable competitiveness	"set of institutions, policies and factors leading to a productive economy with a sustained and inclusive growth, efficient management of resources, capacity of disaster resilience and good governance" Based on (Schwab et al. 2014) and (Balkyte and Peleckis 2010)	Inclusive Growth	Gini Coefficient	World Bank	The indicators form part of a 'coefficient' to be multiplied with GCI scores by the WEF to adjust them as per sustainability. This is to be done similarly to the sustainability-adjusted GCI scores prepared by WEF, but also includes the dimensions of disaster resilience and governance which it lacks.
			Human Rights Index	United Nations	
			Youth unemployment	World Bank	
			Percentage of budget spent on pro-poor programs / social programs	World Bank	
			Gender Inequality Index	UNDP	
		Environmental management	Environmental Performance Index	Environmental Performance Index Reports by Yale University	
		Disaster Risk	Percentage of population affected by disasters	International Disaster Database	
		Good Governance	Corruption Perception Index	Transparency International	
			Freedom of Press Index	Freedom House	
			Political Stability and absence of Violence	Worldwide Governance Indicators (World Bank)	
			Government Effectiveness	Worldwide Governance Indicators (World Bank)	
Happiness	“an individual’s subjective satisfaction with his/her life as a whole” (Veenhoven, 2011)	Life Satisfaction	Self-reported level of happiness	Gallup's World Poll	Happiness, in this research is used interchangeably with terms such as subjective well-being and life-satisfaction, which based on Veenhoven (2013) are assumed to be same things.

Source: Compiled by Author, 2016

3.3. Research strategy

The research which utilises existing data sources is called 'Desk Research' (Van Thiel, 2007). This thesis uses 'Desk Research' as its research strategy for various reasons as explained in the following paragraphs.

Sustainable competitiveness and happiness, both broad concepts, can be translated to various levels from firm and individual to country and even global level. However, this research aims to test the relationship, primarily, between sustainable competitiveness and happiness at country level. The broad scope of research necessitates the use of secondary or existing data for analysis. The concept of sustainable competitiveness is a complex one as it combines two complex concepts which are open to interpretations – 'Sustainable Development' and 'Competitiveness'. It is thus pertinent to use commonly used definitions for a comparison on global level. As this research does not aim to delve deep into the concepts of sustainable competitiveness and happiness but is concerned about the existence of such a relationship and its variation by geographic region, desk research is most suitable as a research strategy. Another reason for using desk research is availability of abundant data on the various indicators from reliable sources such as World Bank, United Nations, World Economic Forum etc. and thus using primary data wouldn't contribute fruitfully to the research.

For this thesis, desk research is used to collect data for three major concepts – Competitiveness, Sustainable Competitiveness and Happiness for couple of years so as to also understand the trend. Competitiveness is measured by an index prepared by World Economic Forum and hence has reliability of data. The index, however, constitutes a large number of indicators which have been collected in both quantitative and qualitative manner over many years. This presents an opportunity to research on trends of the relationship between competitiveness and happiness and sustainable competitiveness and happiness. Due to availability of open data from reliable sources, the results can also be easily replicated in future.

The main limitations of using 'Desk Research' as a research strategy for this thesis is in terms of validity and reliability. To increase the validity of the research, wherever possible, measures for the concepts are tailored according to the research. For example, instead of using index for measuring sustainable competitiveness, the best of both the indexes present (prepared by WEF and Solability) is used by preparing a new coefficient of sustainability. Thus, this new coefficient takes the best indicators of the indexes and reduces the validity problem. However, for competitiveness, GCI is used. The availability of existing data for the research can also influence the operationalization as it discourages primary data collection for any missing components due to the broad scope of research.

Regarding reliability of the data, GCI has been prepared by organization of international repute using data available with other international organizations such as World Bank, United Nations etc. and thus is mostly reliable. However, the weightages in the index and its inherent design is out of control of the researcher and reflects the values of the organizations creating it. The index might have some unknown bias in terms of design which cannot be taken out by the researcher. The index comprises of quantitative as well as qualitative data, which might have been influenced during data collection or coding process. As the indices are prepared by different organizations, their scope in terms of countries compared is not consistent. Unavailability of data for some countries and some years might affect the generalization of the findings.

3.4. Data Collection Methods

Three sets of data are used in this research – Competitiveness scores (indicated by Global Competitiveness Index by WEF), Sustainable Competitiveness scores (indicated by sustainability adjusted GCI) and Happiness scores (indicated by self-reported life satisfaction values at country level by Gallup's World Poll). The data for GCI is openly available in forms of report – Global Competitiveness Report published annually. The second data set is to be prepared from the open data available online as indicated under 'potential sources' in the operationalization table. The third data set – Gallup's World Poll of happiness is collected from Urban Competitiveness and Resilience department at Institute of Housing and Urban Development Studies, Rotterdam.

3.5. Data Analysis Methods

As a first step for data analysis, 'Coefficient of sustainability' is prepared for each of the countries as explained in Section 4.1.1. For this, a 'sustainability index' is prepared using p2 distance in R software. The same technique is also used to prepare individual indexes for each of the four components of sustainability coefficient. The index is then converted into a coefficient on a scale of 0 to 1, based on the highest value in the index. This means score of each country is divided by the highest achieved score in sustainability. The resulting score ranging from 0 to 1, indicates how relatively sustainable countries are to one another. The resulting sustainability coefficient is then multiplied with GCI score to adjust it according to sustainability which will result in measurement of sustainable competitiveness of each country.

In this research, the dependent variable (Y) is Happiness and the two independent variables (X1 and X2) are Competitiveness and Sustainable Competitiveness, respectively. The data is analysed by using first by simple OLS regression and then by Panel regression, to test changes in Y (Happiness level) due to changes in X1 (Competitiveness) and, test changes in Y (Happiness level) due to changes in X2 (Sustainable Competitiveness). The relationship between Sustainable Competitiveness (X2) and Happiness level (Y) shall also be tested by geographical regions, for inter-regional comparison. GCI shall also be adjusted according to each of the component of sustainability coefficient to test which of the component is most significantly related to happiness. All the regression models are controlled for population, geographical area and GDP.

This chapter provided measurable indicators for the concepts of competitiveness, sustainable competitiveness and happiness. Data collection and analysis methods were also indicated however, the data for all three concepts as well as control variable is presented in the next chapter.

Chapter 4: Research Findings

This chapter presents the data used for this study. It explains the sources of data as well as their generation. Each variable of the concepts – competitiveness, sustainable competitiveness and happiness are described with regard to general statistics, trends over the years and patterns around the world. Other control variables as well as dummy variables are also similarly described. The chapter includes results of regressions answering the four sub-research question as well as their explanations and lessons learnt.

4.1. Data preparation

To understand the relationship between competitiveness and happiness and sustainable competitiveness and happiness, data for various indicators as shown in Chapter 3 were collected for all available years. In total, twenty-six indicators as shown in Table 4, including dependent and independent variables, were searched for, for all available years and countries.

Table 4 Source of initial indicators

S. No.	Indicators	Source
1	Global Competitiveness Index	Dataset from World Economic Forum website comprising trends and values of GCI scores
2	Gini Coefficient	World Bank dataset
3	Human Rights Treaties signed out of 18 internationally recognized	Data combined by Freedom House
4	Percentage of youth unemployed	World Bank dataset
5	Percentage of budget spent on pro-poor programs / social programs	World Bank dataset
6	Gender Inequality Index	Human Development Reports
7	Ecological footprint	Website of Footprint Network
8	Environment Performance Index	Research done by YALE University for creation of Environmental Performance Index
9	CO^2 intensity (kilograms of CO^2 per kilogram of oil equivalent energy use)	World Bank dataset
10	Percentage of population affected due to Natural disasters	Data created from The International Disasters Database compiled by Center for Research on the Epidemiology of Disasters and Population data from World Bank Dataset
11	Percentage of budget reserved for disaster mitigation activities	Data for some countries available in form of a paper by Chakrabarti, P.G.D at UNISDR website
12	Corruption Perception Index	Index created by Transparency International
13	Freedom of Press Index	Index created by Freedom House
14	Political Stability and absence of Violence	World Governance Indicators compiled by World Bank
15	Government Effectiveness	World Governance Indicators compiled by World Bank
16	Self-reported level of happiness	Gallup's World Poll

Source: Compiled by Author, 2016

As seen in the above table, data for almost half the indicators was sourced from World Bank, while the rest was also sourced from well-known reports like Human Development Report, Environment Performance Reports etc. Data for indicators for corruption and Freedom of Press was sourced from well-known organizations like Transparency International and Freedom House. However, some indicators were dropped before commencing with analysis due to various reasons explained below. The data was also summarized with respect to availability for each country for each year. It was found that data for maximum indicators as well as maximum countries was available for two years – 2012 and 2014.

Indicator measuring number of human rights treaties signed by a country was dropped from the final list of indicators as the data was only available for 1 year – 2015. Due to lack of sufficient data for the two years – 2012 and 2014, indicators showing 'Pro-poor budget allocation'. It was assumed that Gini Coefficient, which measures the disparity of wealth distribution, would be a better indicator for relative poverty in the country. Environmental indicators were also adjusted keeping in mind data availability. Instead of using separate indicators to assess how environmentally sound a country was, a combined indicator – Environmental Performance Index was used. Out of the two indicators proposed for assessing disaster management, sufficient data was only available for indicator showing percentage of population affected by a natural disaster in a country. Freedom of Press Index was dropped as it divided the countries into 3 categories- Free, Not free and Partially free, which wasn't sufficient for the analysis. Thus, after deliberation of indicators, their best possible alternatives and availability of data, total list of indicators was reduced to twelve as shown in Table 5 below.

Table 5 List of indicators used in Data Analysis

Indicator	Full form	Number of countries for which data present		Range	Relation to sustainability
		2012	2014		
1_GCI	Global Competitiveness Index	144	144	0 to 10	Directly proportional
2_Gini	Gini Coefficient	80	80	0 to 1	Inversely proportional
3_GenderIneq	Gender Inequality Index	149	127	0 to 1	Inversely proportional
4_YouthUnemp	Percentage of youth unemployed	150	150	0 to 100	Inversely proportional
5_EPI	Environmental performance Index	124	137	0 to 100	Directly proportional
6_NaturalDis	Percentage of people affected due to Natural disasters as a percent of total population	99	82	0 to 100	Inversely proportional
7_Corruption	Corruption Perception Index	143	143	0 to 100	Directly proportional
8_PolStablity	Political Stability and Absence of Violence	149	149	0 to 100	Directly proportional
9_GovEffec	Government Effectiveness	149	149	0 to 100	Directly proportional
10_Happiness	Self-reported level of happiness	138	106	0 to 10	Directly proportional

Source: Author, 2016

As shown in the table above, each indicator has different range of values as some are indexes while others are percentages. Also, higher values for some indicators are directly proportional

while other indirectly proportional to sustainability level of a country. Sustainability coefficient, that is prepared to adjust GCI scores to assess 'Sustainable Competitiveness' shall take into account this variation in characteristic of each indicator. The indicators which are indirectly proportional to sustainability level are reciprocated to convert them into directly proportional indicators. Another aspect to note, which is also evident in the above table, is the difference in data availability for indicators – 2_Gini and 7_NaturalDis. Both these indicators have data available for less number of countries. However, in case of Gini Coefficient, data unavailability can be attributed to missing values, but, for indicator showing people affected by natural disasters, data unavailability can be attributed to both absence of a natural disaster in that specific country in that year or missing data.

4.1.1. Sustainability coefficient

As stated in the preceding chapters, Sustainable Competitiveness is to be assessed by adjusting competitiveness according to sustainability. This means that competitiveness scores of countries which are less sustainable shall be reduced by relatively higher degrees than the counties which are more sustainable. Similar approach to adjust GCI scores has been taken by World Economic Forum in their Global Competitiveness Reports.

Sustainability coefficient comprises of 4 parts, as explained in Chapter 3 – Inclusive Growth, Environment Performance, Disaster Risk, and Governance. Various indicators used under each part of the sustainability coefficient is shown in Table 6 below.

Table 6 Structure of Sustainability Coefficient

S. No.	Components of Sustainability Coefficient	Indicators	Indicator name
1	Inclusive Growth	Gini Coefficient	2_Gini
		Gender Inequality Index	3_GenderIneq
		Youth Unemployment in %	4_YouthUnemp
2	Environment Performance	Environmental Performance Index	5_EPI
3	Disaster Risk	Share of population affected in Natural disaster	6_NaturalDis
4	Governance	Corruption Performance Index	7_Corruption
		Perception of Voice and accountability	8_PolStablity
		Perception of Government Effectiveness	9_GovEffec

Source: Author, 2016

The computation of the coefficients used the P2 distance index, a synthetic index that combines all of these indicators into a single value (Bonet-garcía et al. 2015). This approach has also been used to build synthetic indicators in other disciplines such as well-being and other social indicators (Bonet-garcía et al. 2015). It allows comparisons between entities (both temporal and spatial) and is considered to be an exhaustive synthetic indicator because it is not based on a reduction of information.

It considers all the valuable information contained in the variables used to build it allowing the inclusion of a large number of variables, since all redundant variance is removed by the process itself, as is the multicollinearity (Montero et al. 2010; Bonet-garcía et al. 2015).

To calculate the P2 distance, we started with a matrix X of order (m, n) in which m is the number of spatial units (countries) and n, the number of variables. Each element of this matrix, xri, is the value of the variable 'i' in the spatial entity 'r'. The P2 distance indicator calculates the distance of each spatial entity with regard to a theoretical spatial entity of reference. Initially, a distance matrix D is calculated as:

dri=|Xri-X*i|

where x*i* is the r-th element of the reference base vector

X*i* = (x*i*1, x*i*2, . . ., x*i*n). For each variable a reference value must be defined to compare different spatial entities (Bonet-garcía et al. 2015).

The resulting index is converted to a coefficient from 0 to 1, based on the highest value on the index. GCI scores for each country is adjusted by this sustainability coefficient. In addition to the sustainability coefficient, coefficient for each of the components is also prepared to answer sub-question 4 about the components of sustainability affecting relationship between sustainable competitiveness and happiness, by the same method.

4.2. Description of data

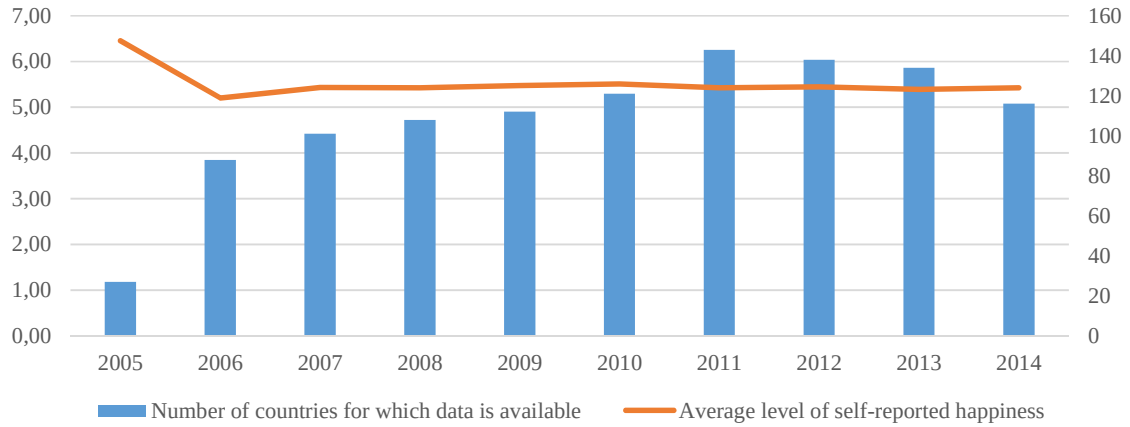
For answering the main as well as sub-research questions posed in Chapter 1, four types of variables are analysed – Dependent, Independent, Dummy and Control variables. Data analysis in this research mainly pertains to assessing the impact of change in dependent variable with change in independent variable(s) subject to certain conditions posed by control variables including dummy variables. Each sub-question entails use of a combination of the following variables.

4.2.1. Dependent Variable (Happiness)

Concept of happiness is indicated by average self-reported happiness level at a country level. This data is captured by Gallup World Poll and is for the duration of 2005-2014. It was conducted in 202 countries with around 1,000 – 3,500 respondents per country per year, who were all above 15 years of age. The respondents were asked the question – "Please imagine ladder, with steps numbered from 0 at the bottom to 10 at the top. The top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time?" This question known as Cantril ladder assesses individual's perception of their own life by comparing current life with what they perceive is best life for them. It thus, measures contentment with one's life. GWP also collects data about mood in previous days and overall life satisfaction (Veenhoven 2011).

The data collected by GWP with the help of this survey shows that the global average of self-reported happiness level is around 5.52, ranging from maximum 6.45 to minimum 5.2. as shown in Figure 10, it has remained almost constant in terms of value. The number of countries where this data is collected, however, varies every year. This indicates a lack of approaches or development strategies to enhance well-being of people around the world.

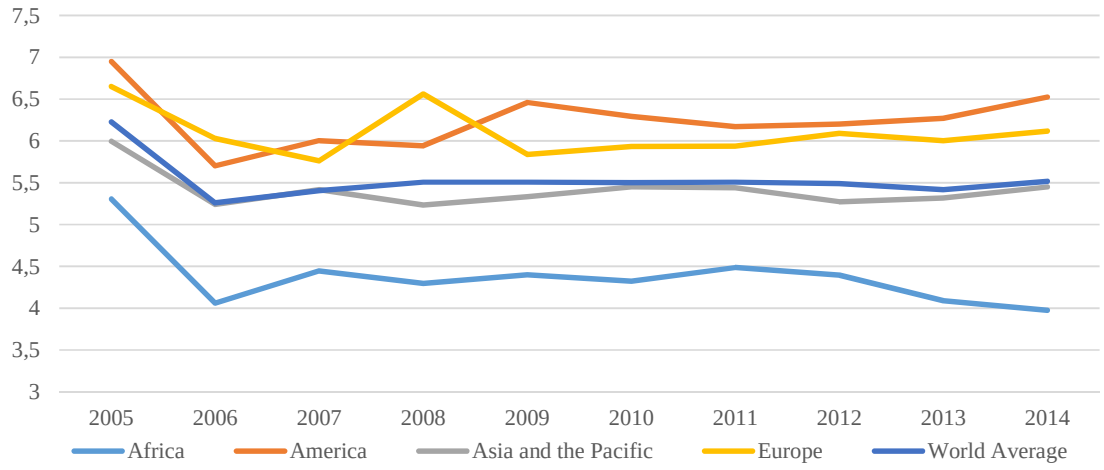
Figure 10 Trend of average self-reported happiness at global level (2005-2014)



Source: Author, 2016 based on Gallup World Poll data, 2005-2014

Average self-reported happiness level, which appears to be constant over the years at a global level, shows variation at a geographic region level. As shown in Figure 11. It is evident that average happiness score for Africa is below the average global level, while Americas and Europe have higher levels. A trend of decreasing happiness level is seen in case of Africa, while the opposite is seen for Europe and Americas since 2011.

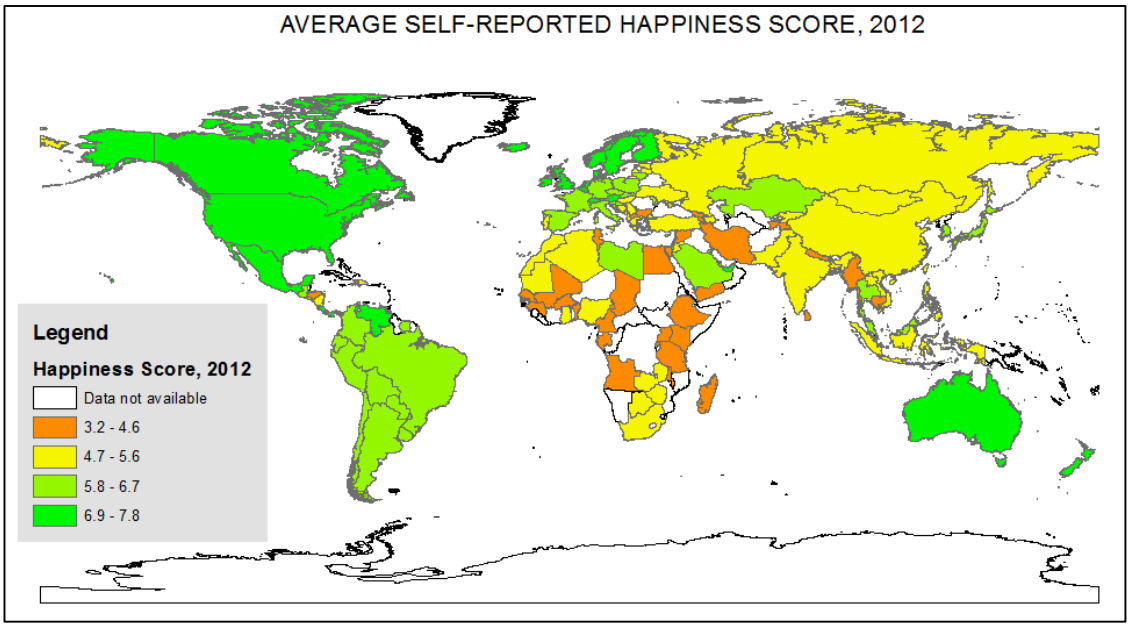
Figure 11 Trend of average self-reported happiness level by geographic region (2005-2014)



Source: Author, 2016 based on Gallup World Poll data, 2005-2014

This research uses data from years 2012 and 2014 which is mapped and shown in Figure 12 and Figure 13. These figures also reiterate the findings of Figure 11, and showcase the vast differences in average happiness scores across geographic regions. Although data unavailability for many countries in these years might affect the consolidated scores, but a pattern of concentration of higher average self-reported scores is evident in developed countries in both the years.

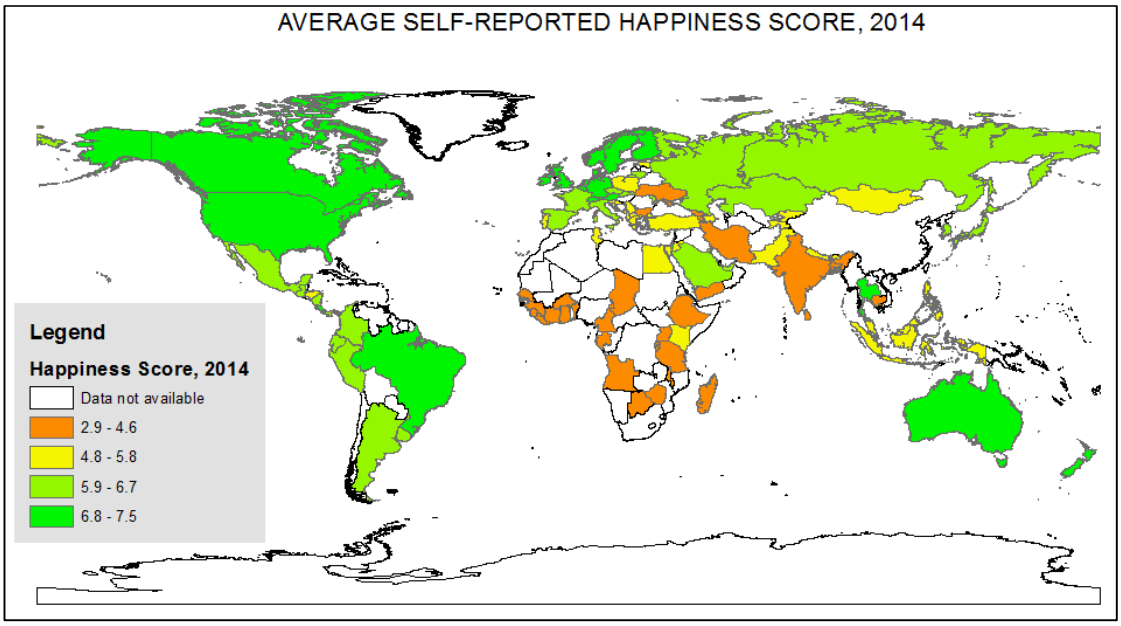
Figure 12 Country-wise average self-reported happiness scores, 2012



Source: Author, 2016 based on Gallup World Poll data (2012) mapped using ArcGIS 10.3.1

The Figure 12 above shows higher values of average happiness in Americas, Australia and New Zealand, Europe and some countries in Asia and Middle East. As seen in the figure, lower happiness values correspond to countries which are yet developing while its opposite might not be true as countries in South America as a whole have higher values of happiness, even though some may be developing.

Figure 13 Country-wise average self-reported happiness scores, 2014

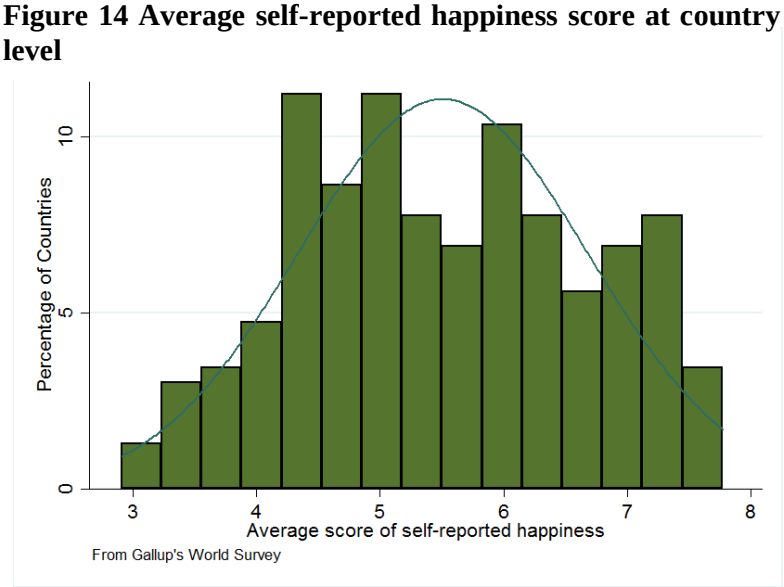


Source: Author, 2016 based on Gallup World Poll data (2014) mapped using ArcGIS 10.3.1

Figure 13 shows the same pattern as Figure 12. However, happiness scores for some countries like Russia, Thailand and Germany have improved while that for countries like India, Mexico, Argentina and Peru have decreased.

Data for Happiness score shows almost Normal distribution as shown in Figure 14, with maximum number of countries having values between 4 to 5 and 6. Few number of countries show extreme values i.e., extremely unhappy or extremely happy, even though, more countries are on the happier side than unhappier side.

Figure 14 Average self-reported happiness score at country level

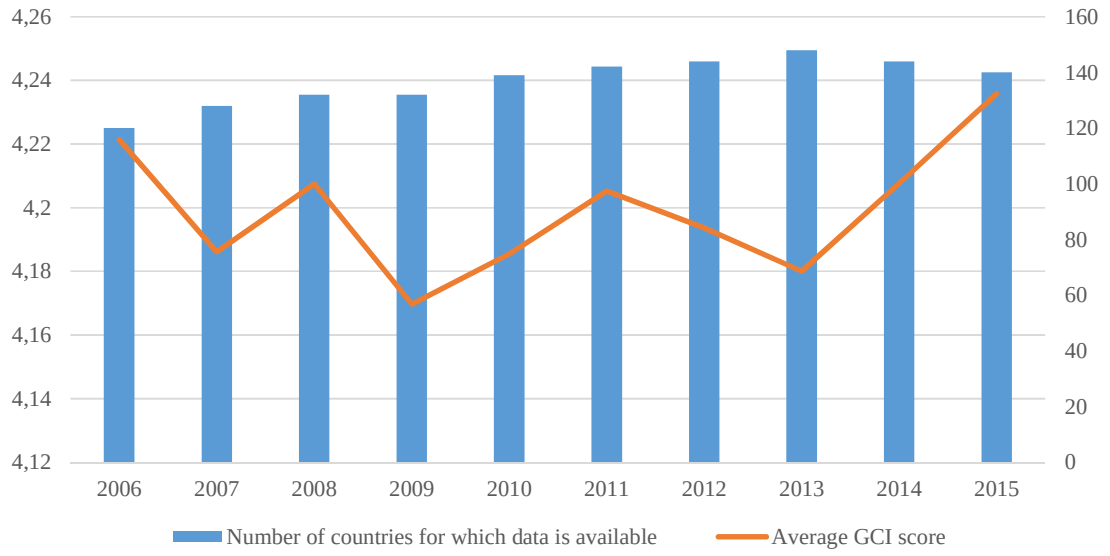


Source: Author, 2016, based on Gallup World Poll data (2012 and 2014) plotted using STATA 14

4.2.2. Independent Variable 1 (Competitiveness)

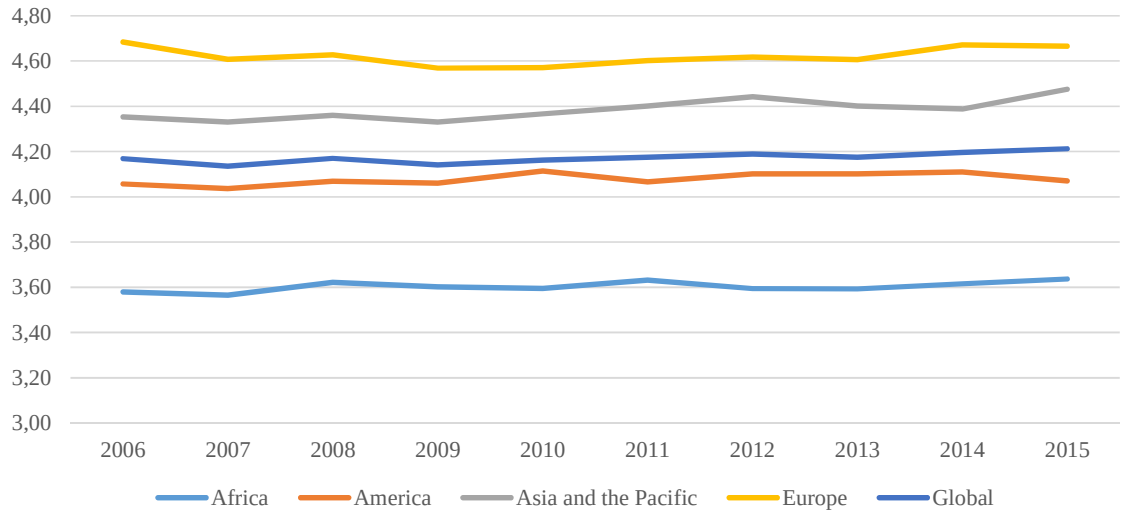
Concept of competitiveness is indicated by the Global Competitiveness Index which is part of the Global Competitiveness Reports published by the World Economic Forum since 2005. It consists of 12 pillars influencing competitiveness of a country and is explained in Chapter 2.

Figure 15 Trend of average GCI scores (2006 - 2015)



Source: Author, 2016 based on Global Competitiveness Index data, 2006-2015

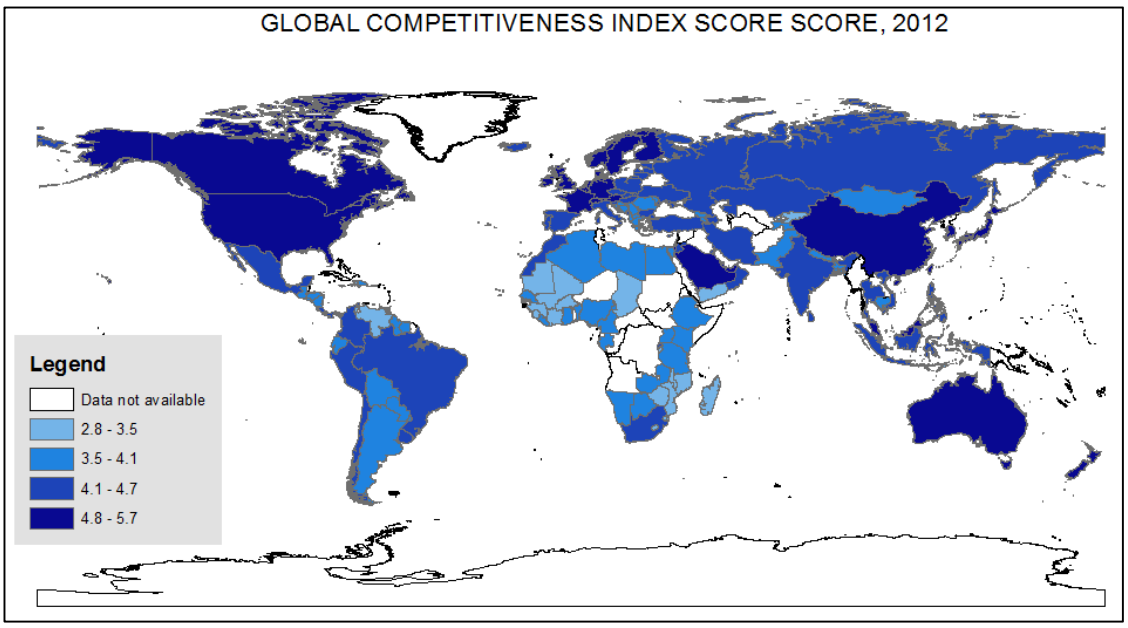
Figure 16 Trend of average GCI scores by geographical region (2006-2015)



Source: Author, 2016 based on Global Competitiveness Index data, 2006-2015

Figure 15 shows that average level of competitiveness around the world has almost remained constant over the last decade, ranging from minimum 4.17 to maximum 4.23. Average GCI according to geographical regions, as shown in Figure 16, is almost constant in the past decades, but a pattern is seen. Countries in Europe and Asia and Pacific have fared very well in terms of competitiveness, when compared to countries in Africa. Countries in Americas as per averages remain close to the Global average.

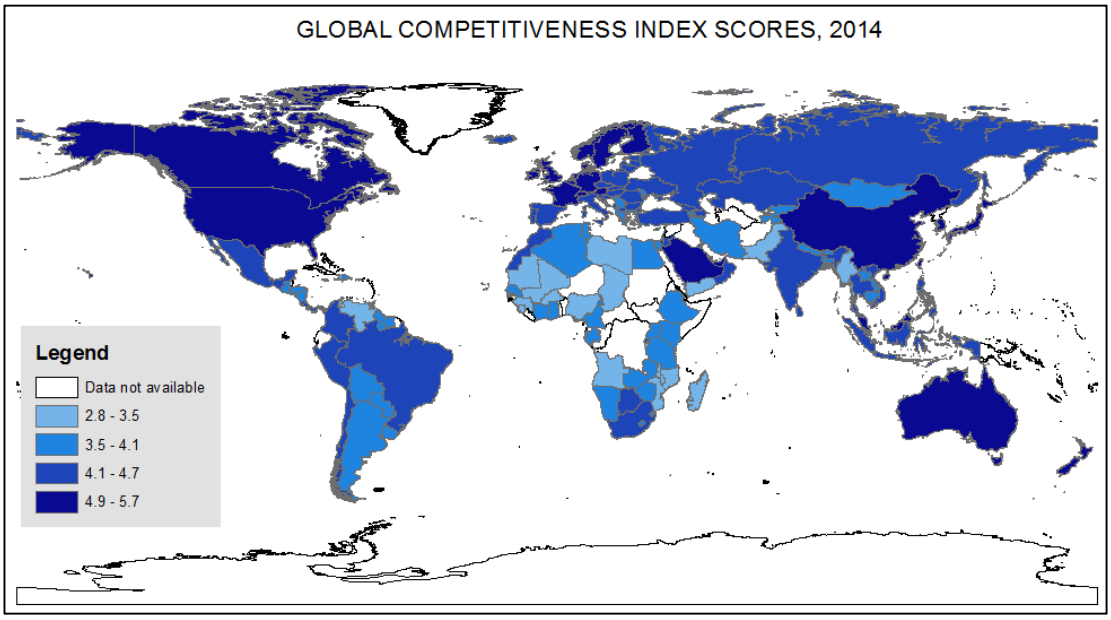
Figure 17 Country-wise GCI scores, 2012



Source: Author, 2016 based on GCI data (2006-2015) by World Economic Forum mapped using ArcGIS 10.3.1

Figure 17 shows that the major players of international trade – countries of the developed world and China and Saudi Arabia also have a high value of competitiveness. Lowest scores can be seen in some countries of Africa like Mauritania, Mali, Zimbabwe and Madagascar, and Venezuela in South America.

Figure 18 Country-wise GCI scores, 2014



Source: Author, 2016 based on GCI data (2006-2015) by World Economic Forum mapped using ArcGIS 10.3.1

Not much difference is observed in the GCI scores at a global level as shown in Figure 17 and Figure 18. However, at country level, higher GCI scores are evidently concentrated in Northern America, Western Europe, China and Australia. Lack of change in GCI over the years, might indicate slow growth of economy.

Data for GCI score shows almost Normal distribution as shown in Figure 19, with maximum number of countries having values around 4. Few number of countries show extreme values i.e., extremely uncompetitive or extremely competitive. Few countries are also concentrated at the higher side of the graph, almost creating a peak between values 5 and 6.

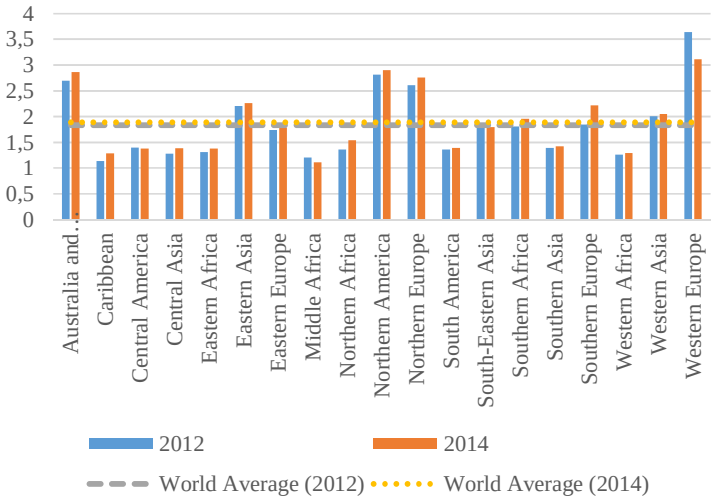
Figure 19 Average Global Competitiveness Index score at country level

Source: Author, 2016, based on GCI data (2012 and 2014) by World Economic Forum plotted using STATA 14

4.2.3. Independent Variable 2 (Sustainable Competitiveness)

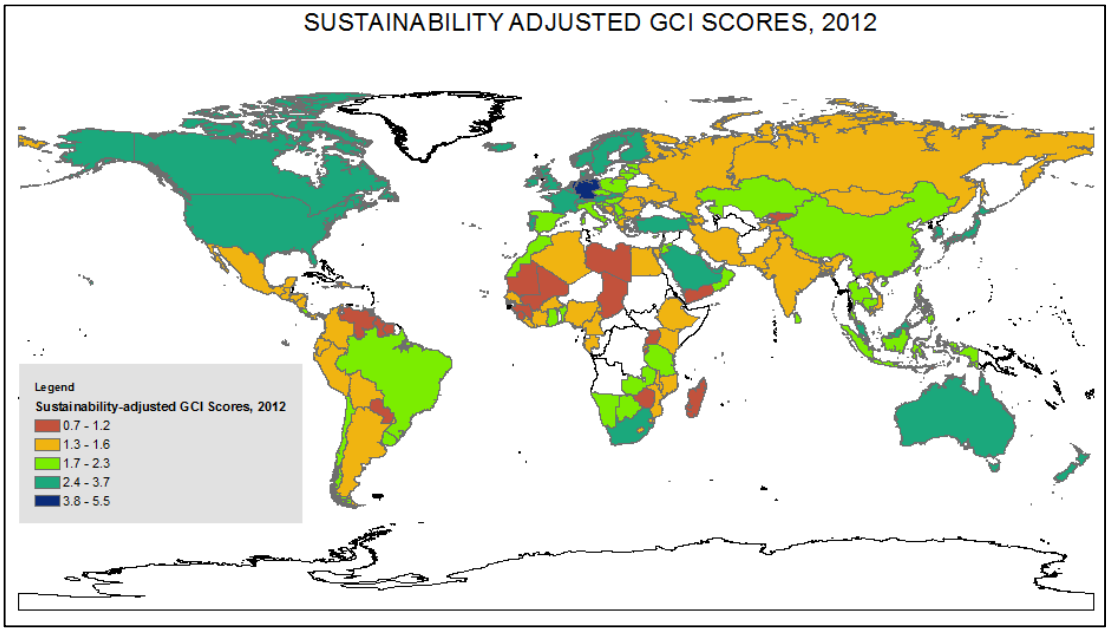
Concept of sustainable competitiveness is indicated by sustainability-adjusted GCI. As explained in in Section 4.1.1, it is a product of 'sustainability' indicators and GCI. It has been calculated for years 2012 and 2014 and ranges from maximum 5.5 (Netherlands) to minimum 0.65 (Chad) in 2012 and maximum 4.31 (Germany) and minimum 0.89 (Angola) in 2014. There has been slight improvement in the overall sustainability-adjusted GCI scores shown in Figure 20. In regions like Central America, Middle Africa, and Western Europe scores for 2014 have been lower than 2012, while for other regions scores have increased from 2012 to 2014. Disparity in GCI scores and happiness scores across geographic regions is also evident in sustainability-adjusted GCI. Only countries in Eastern Asia, Northern America, Northern Europe, Southern Europe, Western Europe and Australia and New Zealand score more than the world average. This disparity can also be seen in Figure 21 and Figure 22.

Figure 20 Trend of Sustainability-adjusted GCI by geographic region (2012, 2014)



Source: Author, 2016 based on Global Competitiveness Index data, 2012 and 2014 and other indicators

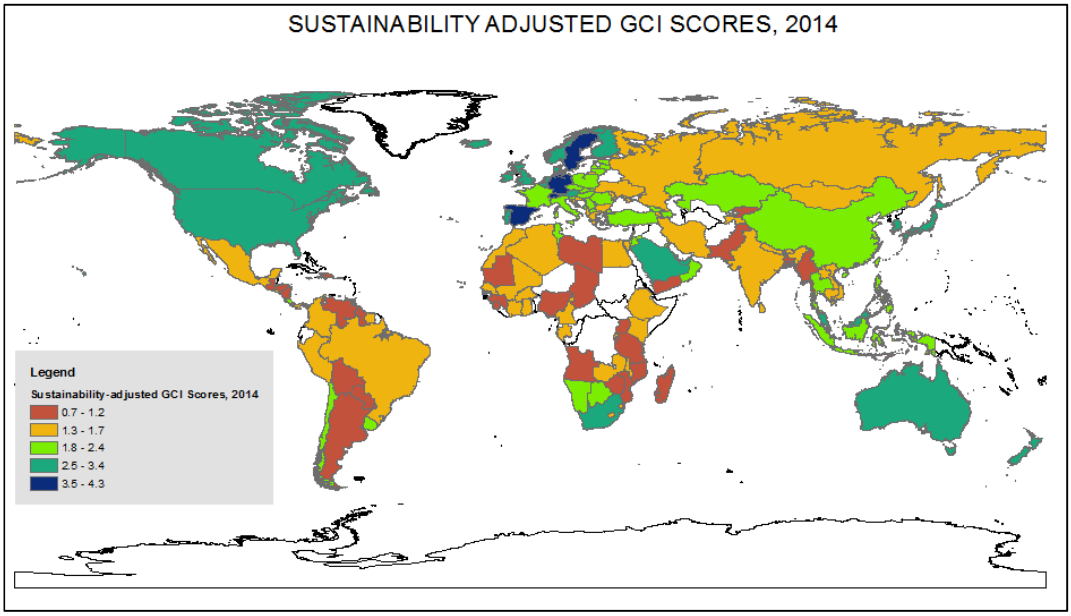
Figure 21 Country-wise sustainability-adjusted GCI scores, 2012



Source: Author, 2016 based on GCI data (2012 & 2014) by World Economic Forum and other indicators mapped using ArcGIS 10.3.1

Highest score for sustainability is for Germany, which shows a very high value relative to other countries in the world. Countries in the next category – Canada, USA, Australia, South Africa, Saudi Arabia apart from countries in Europe also had higher scores in GCI. Disparity in scores between GCI and SGCI is evident in case of China, which had higher relative score in GCI but scores low in SGCI. This indicates use of unsustainable practices to promote competitiveness prevalent in the country.

Figure 22 Country-wise sustainability-adjusted GCI scores, 2014

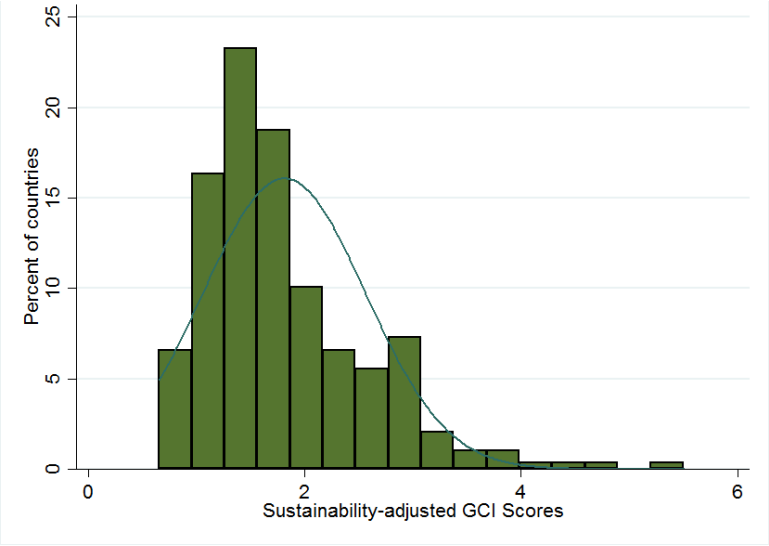


Source: Author, 2016 based on GCI data (2012 & 2014) by World Economic Forum and other indicators mapped using ArcGIS 10.3.1

In two years, sustainability in competitiveness has improved in two more countries – Sweden and Spain while has worsened in mostly all of South America. While comparing the two figures, the change in SGCI values is most striking in case of South America.

Data for Sustainability-adjusted GCI score shows almost Normal distribution but is skewed to the left Figure 23, which creates problems while checking for model specification error. Hence, the variable is converted by using Natural

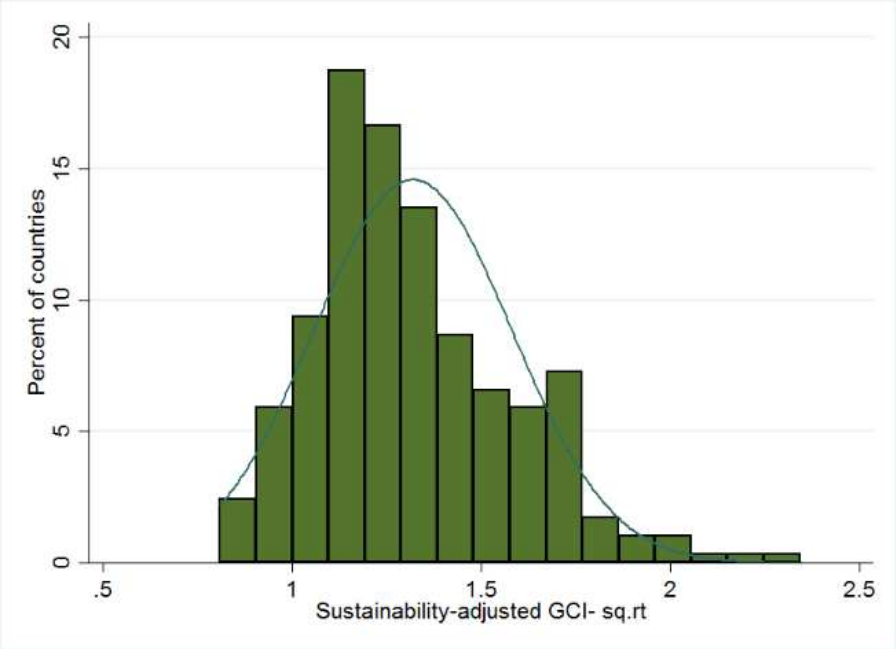
Figure 23 Sustainability-adjusted GCI scores at country level (Normal)



Source: Author, 2016, calculated based on GCI data (2012 and 2014) by World Economic Forum and other indicators plotted using STATA 14

Log as well as square root. Both the converted variables are checked during analysis and the Square root version of Sustainability adjusted GCI is accepted for further regressions. Figure 24 shows histogram of the square root values of sustainability-adjusted GCI.

Figure 24 Sustainability-adjusted GCI scores at country level (Square root)

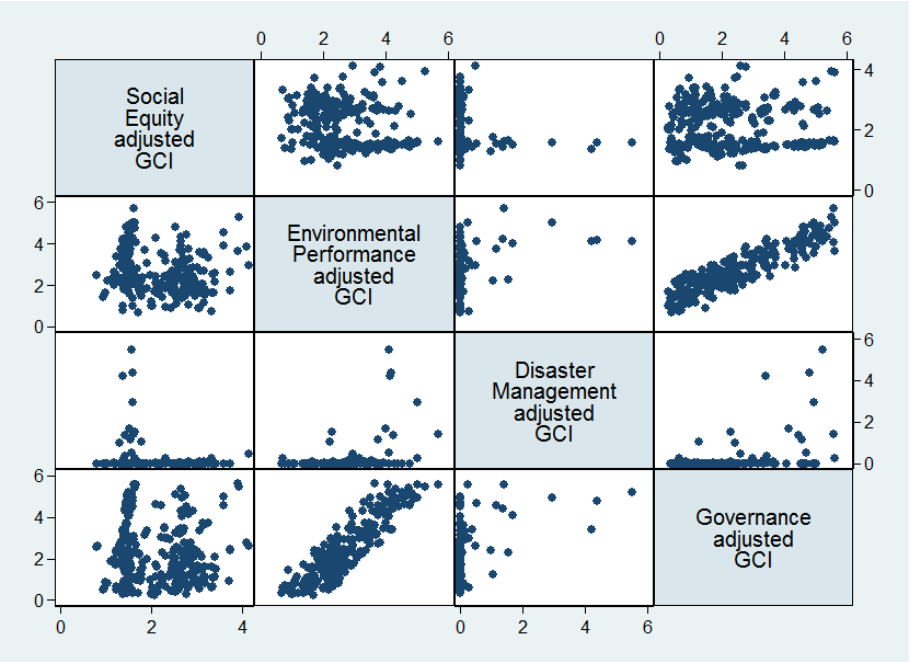


Source: Author, 2016, calculated based on GCI data (2012 and 2014) by World Economic Forum and other indicators plotted using STATA 14

Unbundling of Sustainability coefficient

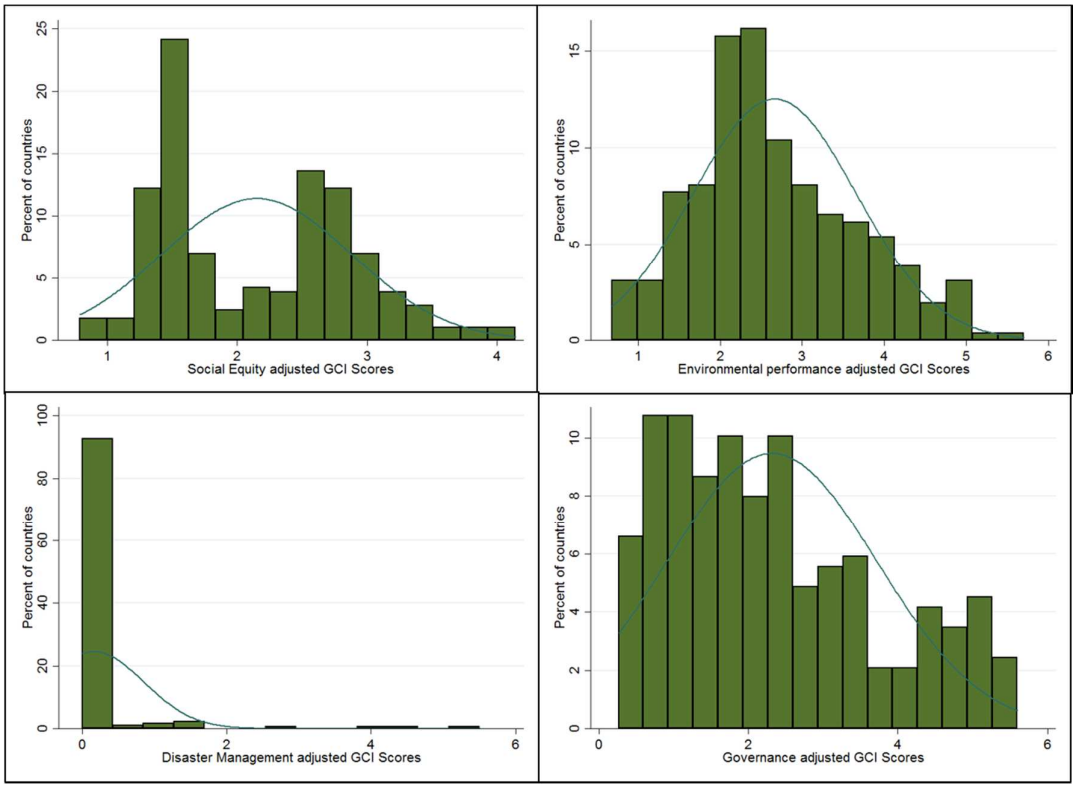
For answering sub-question 4, which tries to find out which component of sustainability actually affects relationship of sustainable competitiveness and happiness, the sustainability coefficient is unbundled into its components – Inclusive Growth, Environmental Performance, Disaster Management and Governance. The GCI is then multiplied by each of the sub-coefficients to generate four new independent variables – Inclusive Growth adjusted GCI, Environmental Performance adjusted GCI, Disaster Management adjusted GCI and Governance adjusted GCI. Scatter plot for these independent variables is shown in Figure 25. It is evident that Disaster management adjusted GCI has a lot of outliers. Histograms for these variables show the same.

Figure 25 Scatterplot for unbundled 'sustainability coefficient'



Source: Author, 2016 plotted using STATA 14

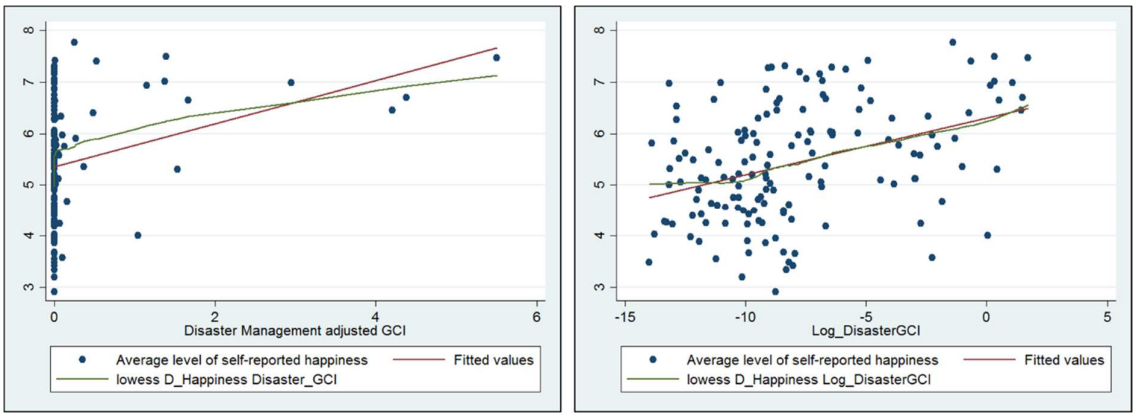
Figure 26 Histograms for 4 variables under sustainability-adjusted GCI



Source: Author, 2016 plotted using STATA 14

In addition to outliers and non-normality, linearity was also observed in variable – Disaster Management adjusted GCI. A new variable was generated, taking a log of this variable. As shown in Figure 27, using natural log improved the linearty of the variable.

Figure 27 Two-way plot for linearity of Disaster adjusted GCI (normal and natural log)

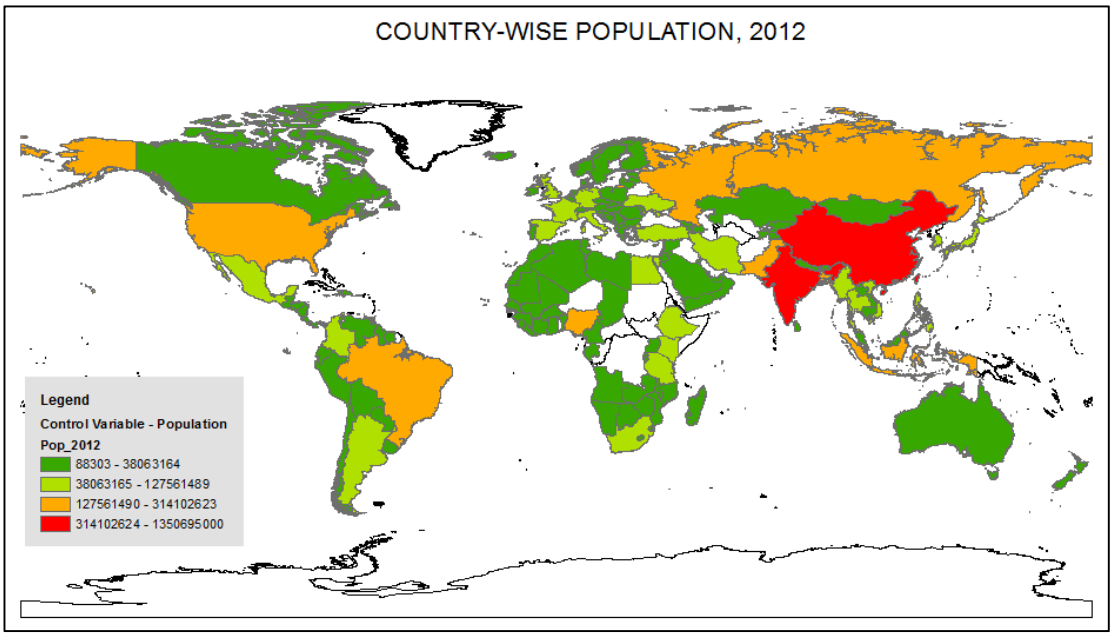


Source: Author, 2016 plotted using STATA 14

4.2.4. Control Variables

Three type of control variables are used in the research, so that similar countries are compared with each other and results are more credible. These control variables are population, land area (in sq.km) and GDP (in US Dollars at 2011 prices). Following figures show the data mapped on a world map.

Figure 28 Control Variable 1 - Population, 2012

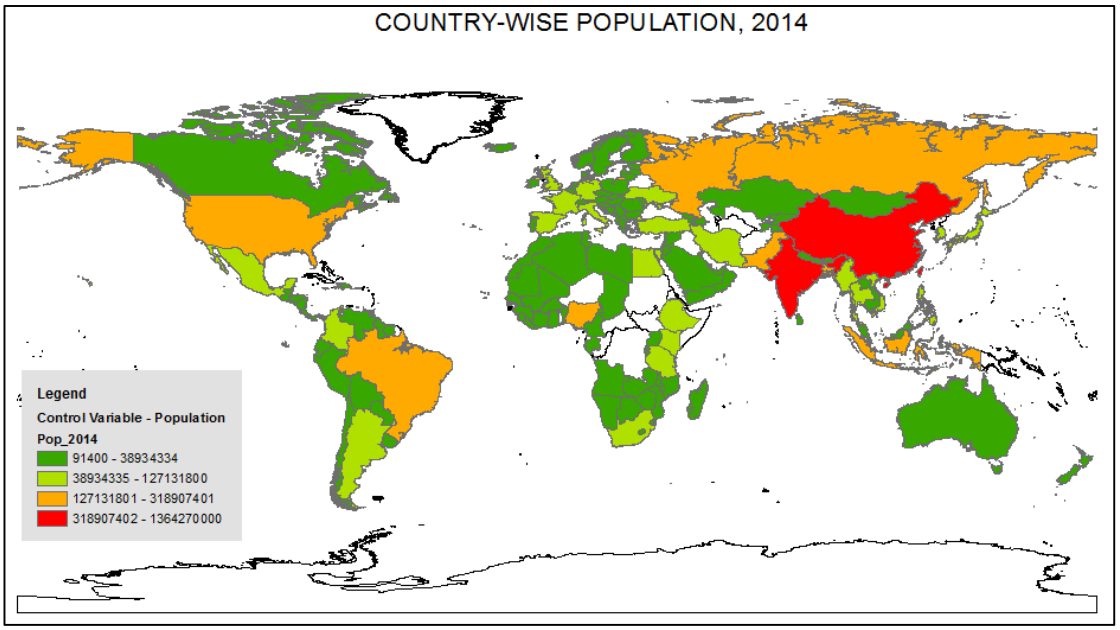


Source: Author, 2016 based on World Bank dataset, mapped using ArcGIS 10.3.1

The Figure 28 above shows distribution of world population spatially. India and China stand out to be the most populous countries in the world. Other countries with relatively higher

population are USA in North America, Brazil in South America, Nigeria in Africa, Russia (categorized as part of Eastern Europe), Pakistan in South Asia and Indonesia in South East Asia. Population in most developed countries except USA are relatively smaller.

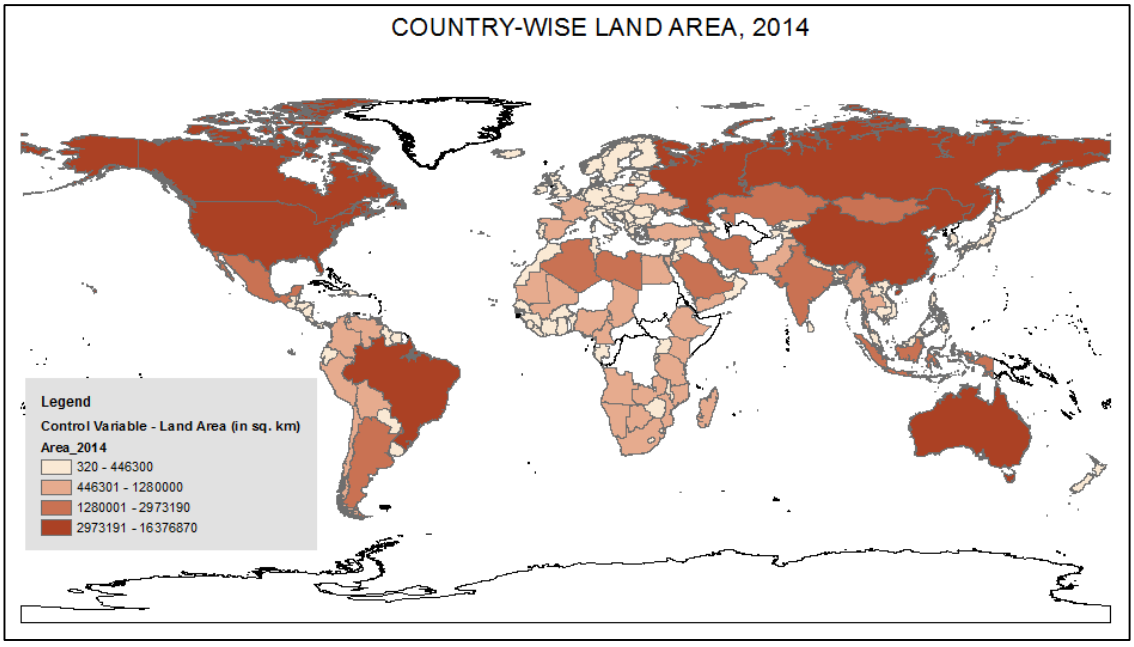
Figure 29 Control Variable 1 - Population, 2014



Source: Author, 2016 based on World Bank dataset, mapped using ArcGIS 10.3.1

Figure 29 is similar to earlier figure as population patterns are not expected to change within two years. However, classes in the map legend indicates total population growth when compared to population classes in 2012 map.

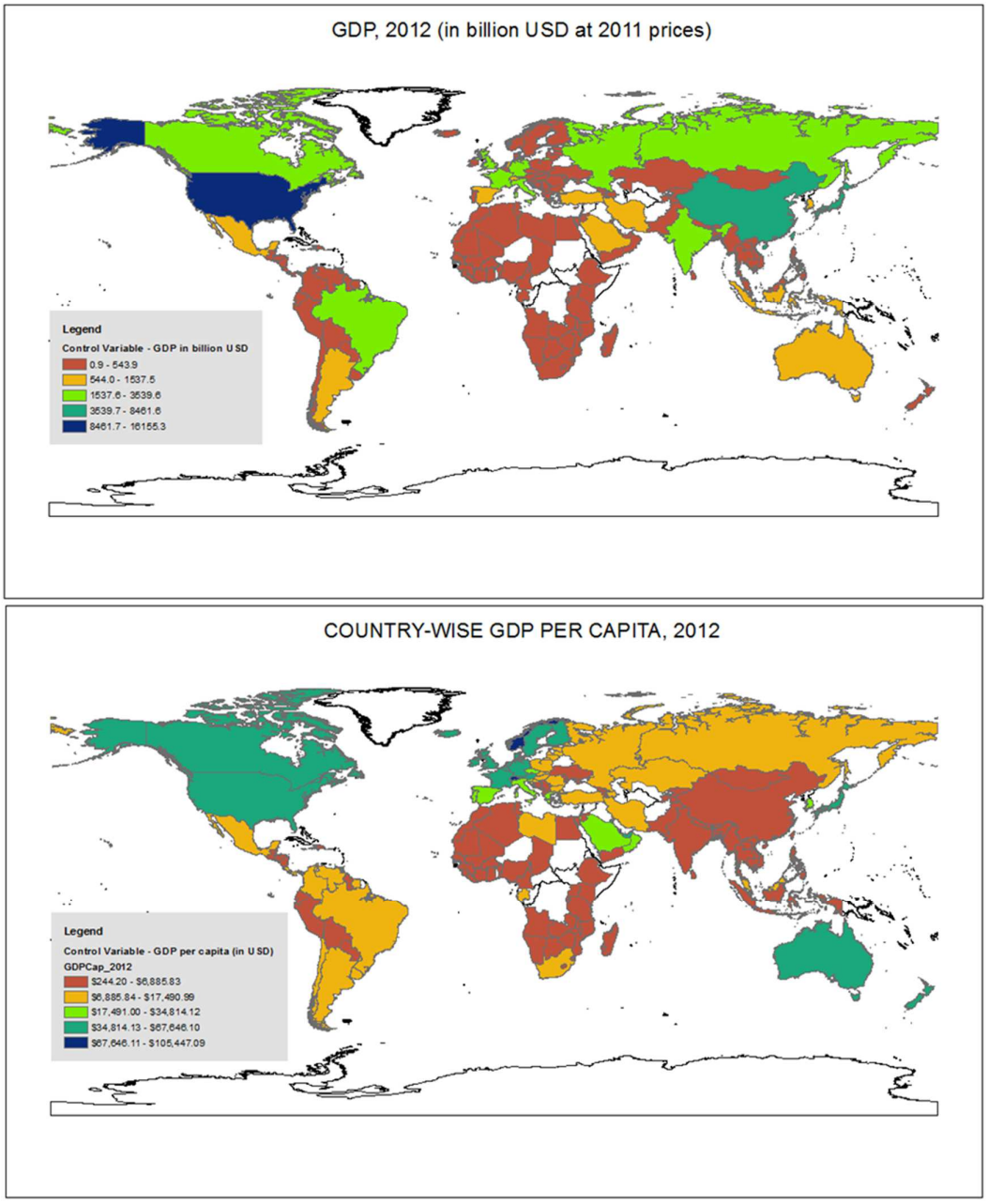
Figure 30 Control Variable 2 - Land Area



Source: Author, 2016 based on World Bank dataset, mapped using ArcGIS 10.3.1

Figure 30 above shows some of the biggest countries in the world – Russia, USA, Canada, China, Australia and Brazil. Population values shown in Figure 28 and Figure 29 correspond with the land area. However, there are two exceptions. India is a relatively big country but has one of the largest population, whereas Australia is one of the biggest country by land area but has a relatively smaller population.

Figure 31 Control Variable 3 – GDP and GDP per capita, 2012

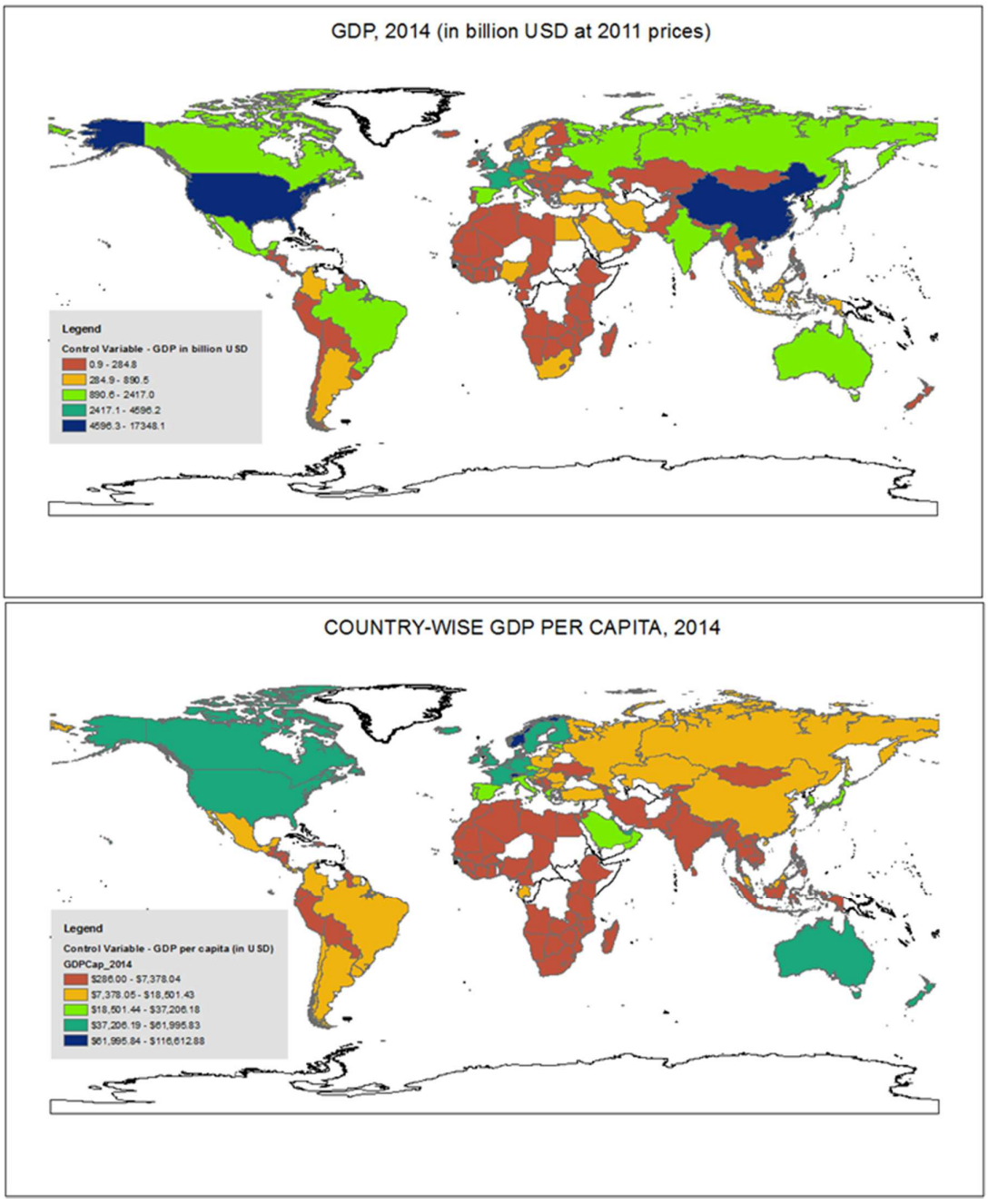


Source: Author, 2016 based on World Bank dataset, mapped using ArcGIS 10.3.1

Figure 31shows GDP and GDP per capita of each country for 2012. While countries like USA< Canada, Brazil, India, Russia and countries in Western Europe have some of the highet GDP in the world but when adjusting it according to population, it can be seen that, GDP per capita

is the highest for developed countries like USA, Canada, Australia and countries in Northern and Western Europe. In spite of having large population and large land area, India and China have relatively lowest GDP per Capita. USA, which has relatively large population as well as land area also has higher GDP per capita. This indicates robustness of its economy. The maps above show higher per capita GDP in countries of the developed world, example, Australia, USA, Canada while countries in Southern Asia and Africa show the least amount of per capita GDP, even though southern Asia is home to India, which is the second most populous country in the world.

Figure 32 Control Variable 3 – GDP and GDP per capita, 2014



Source: Author, 2016 based on World Bank dataset, mapped using ArcGIS 10.3.1

Figure 32 above shows GDP and GDP per capita for year 2014 and follows the same pattern as the figure for 2012, except two observations. Within two years, China has enhanced its GDP as well as GDP per capita relative to other countries from 2012. Countries in Africa have lowed GDP per capita relative to other countries, even though the absolute numbers may have improved.

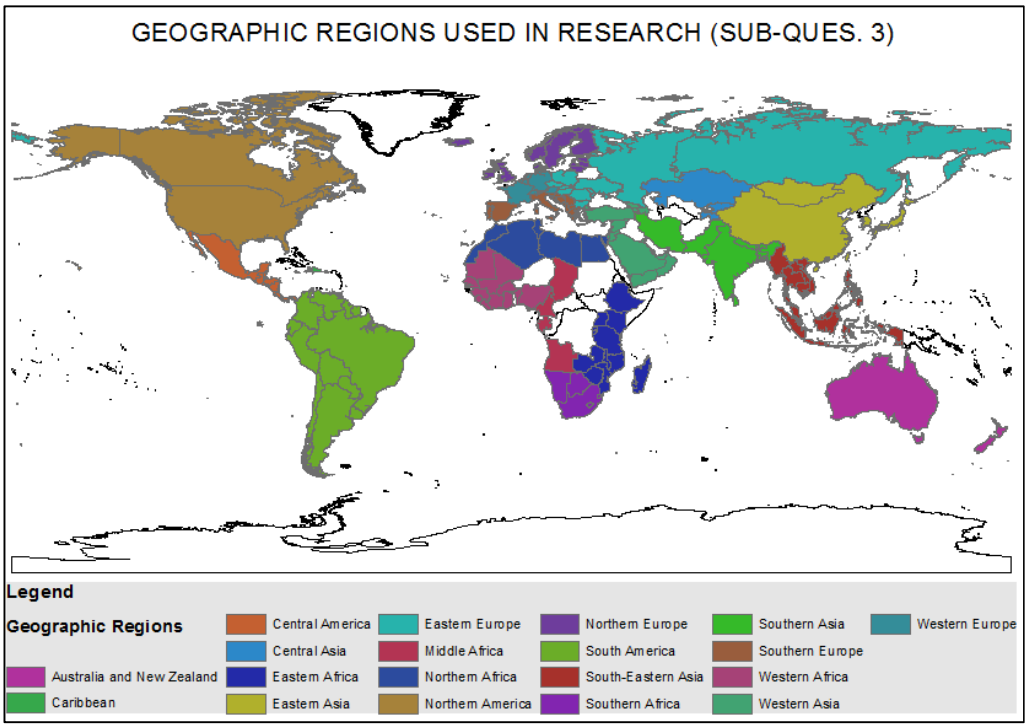
Control variable for population shows concentration of maximum population Asia including India, China, Pakistan and Russia while the second control variable shows the largest countries in the world. Control variable for GDP is created by multiplying GDP per capita with population. Comparing maps for years 2012 and 2014 for all control variables, no apparent timely pattern can be identified however, spatial patterns can be seen.

4.2.5. Dummy Variables

Dummy variable is an artificial variable and generally takes up values of 0 and 1. It helps to improve regression results. In this research, one dummy variable is used to analyse sub question 3. Sub-question 3 tries to assess whether relationship between sustainable competitiveness and happiness is influenced by geographic regions. For this, a dummy variable – d_Region is created with 151 countries being divided into 19 geographical regions. 'd_Region' has values from 1 to 19 each corresponding to a different geographical region. Countries covered under each geographical region is shown in Regression results for sub-question 3, take Eastern Africa as a base region in the first regression while Western Europe as a base region in the second region. The results can be interpreted by comparing the coefficients of each region, with conditions of that of the base region. The two regressions, hence, highlight comparison of other regions with sustainability and competitiveness with that of Eastern Africa in the first instance and that of Western Europe in the second instance.

Figure 33. Regression results for sub-question 3, take Eastern Africa as a base region in the first regression while Western Europe as a base region in the second region. The results can be interpreted by comparing the coefficients of each region, with conditions of that of the base region. The two regressions, hence, highlight comparison of other regions with sustainability and competitiveness with that of Eastern Africa in the first instance and that of Western Europe in the second instance.

Figure 33 Countries under study as per geographic regions



Source: Author, 2016 mapped using ArcGIS 10.3.1

Figure 33 above shows countries of the world divided as per geographic regions. These are – Central, Northern and South America, Eastern, Middle, Northern, Southern and Western Africa, Central, Eastern, South Eastern, Southern and Western Asia, Eastern, Northern, Southern and Western Europe, Caribbean and Australia and New Zealand. Countries in each of the geographical regions is shown in Annexure 2.

4.3. **Data Assumptions**

Regarding data analysis, the first step is to check credibility of data. Most commonly for studies such as this one, it is done by testing the data for multicollinearity, normality, linearity, heteroscedasticity and model specification errors. Normality of data is tested by two methods – graphic and a statistical test. kdensity plot shows the distribution of values in a graphic manner while Shapiro-Wilk test checks the null hypothesis that the sample is from a normal distribution. Homoscedasticity of residuals is tested by Breusch Pagan test, which tests the null hypothesis that residuals are homoscedastic. Multicollinearity is tested by two commands – vif and collin. Vif or 'Variance Inversion Factor' indicates the level of multicollinearity. Any variable with vif>10 should be dropped out of the regression. Collin also measures collinearity and indicates many collinearity diagnostics such as vif, tolerance and conditional number. For data to be not multicollinear the value of conditional number should be less than 15. Linearity is checked by plotting a two-way graph in STATA. The fit of values should be as close as possible to the line of fit. If values are scattered in a two-way graph, log or square root is taken for the variable. Model specification error is checked by ovtest or Omitted Variable Test to check for any omitted variables in the regression. It takes the null hypothesis that the model does not have any omitted variable. A dataset should normally distributed with homoscedastic residuals, should not show multicollinearity but should show linearity and should not have any omitted variable for a credible and robust regression.

4.4. Methodology for data analysis

Data for 151 countries under different variables is prepared for Panel analysis in STATA. In the beginning, credibility of data is established by testing for multicollinearity, normality, linearity, heteroscedasticity and model specification errors. The dependent variable, Happiness, has 233 observations. It has a mean of 5.5, with minimum of 2.9 and maximum of 7.8. A summary of other variables with measures of central tendency is shown in Figure 34.

Figure 34 Summarization of variables

Variable	Obs	Mean	Std. Dev.	Min	Max
id	302	151.5	87.32411	1	302
Year	302	2013	1.00166	2012	2014
ID1_GCI	288	4.203463	.6752883	2.77949	5.721826
D_Happiness	233	5.506382	1.169193	2.904535	7.776209
ID2_Sustai~I	288	1.810519	.7513193	.655587	5.501896
CV1_Popula~n	300	4.54e+07	1.56e+08	88303	1.36e+09
CV2_Geogra~a	300	790424	2056401	320	1.64e+07
CV3_GDP	294	5.07e+11	1.71e+12	8.51e+08	1.73e+13

Source: Author, 2016 calculated using STATA 14

The three main variables are also highly correlated as seen in Table 7.

Table 7 Correlation between dependent and independent variables

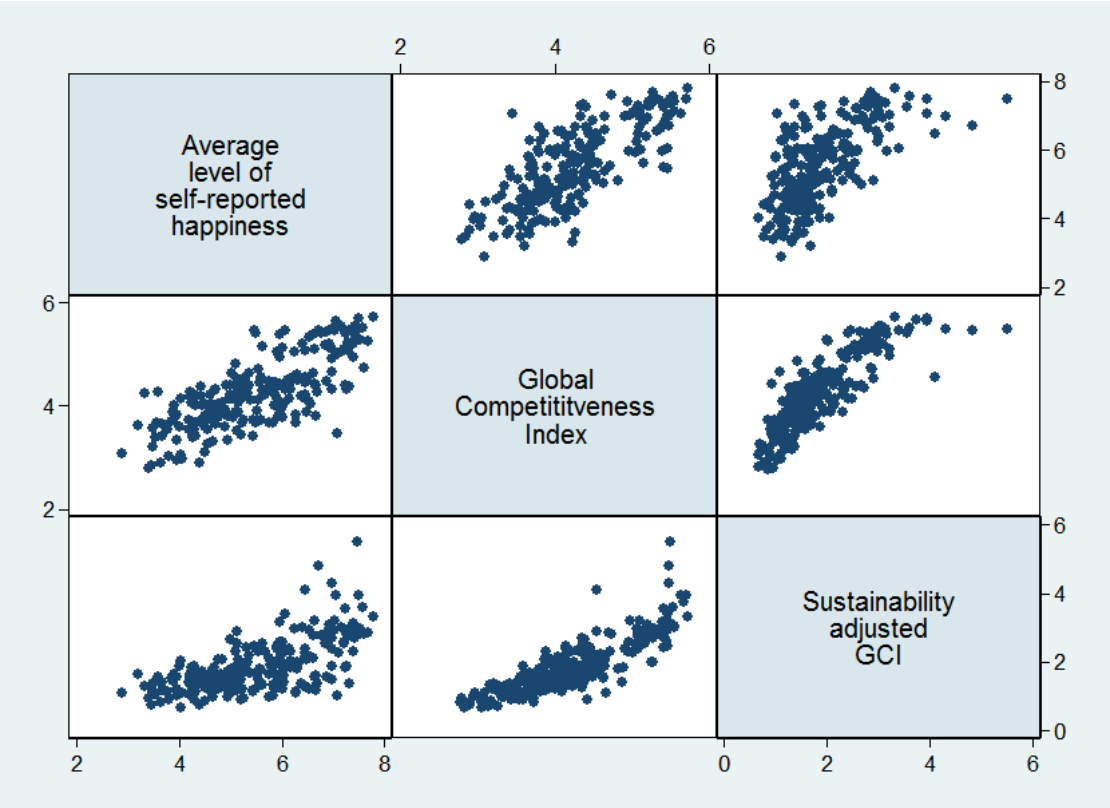
	GCI	Happiness	SGCI
GCI	1.00		
Happiness	0.76	1.00	
SGCI	0.85	0.64	1.00

Source: Author, 2016 calculated using STATA 14

By looking at the correlation values of GCI, SGCI and Happiness, it can be concluded that happiness has better correlation with GCI than SGCI. For this study only 8 indicators were used to depict sustainability but it is a multidimensional and complex concept. Many other facets of sustainability (eg disaster risk reduction activities, pro-poor program implementation, environmental awareness etc.) haven't been included, but can influence the correlation factor.

The three main variables show lack of major outliers as shown in the graph matrix in Figure 35. Dataset created for sustainability-adjusted GCI show some outliers. Influential data could not be checked with Cook's D test as robust is done to remove heteroscedasticity in some cases.

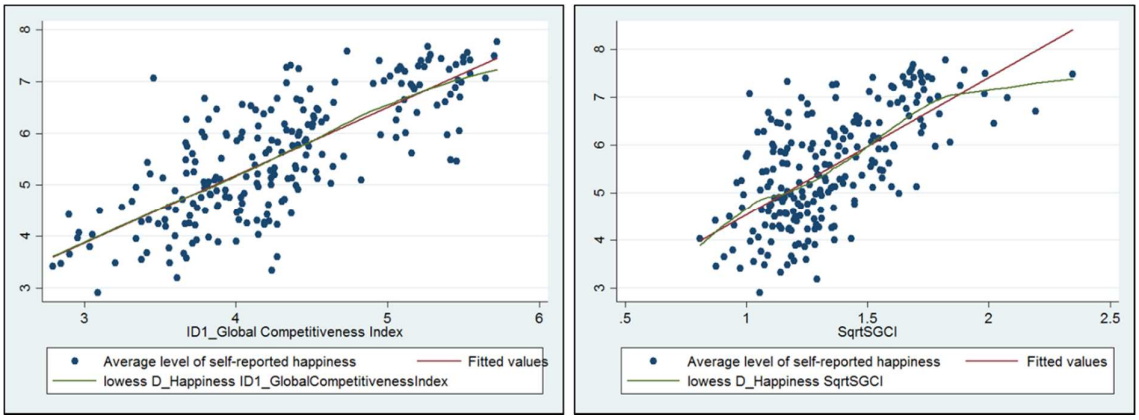
Figure 35 Graph matrix of Dependent Variable and Independent Variables



Source: Author, 2016 plotted using STATA 14

Data was also tested for normality by plotting kdensity graphs as well as Shapiro-Wilk Test. In all sub-questions, data is normal as value of W being insignificant fails to reject the null hypothesis that data is normally distributed. Multicollinearity was tested by using vif command in Stata, which revealed that there was no collinearity in variables. However, Collin command was also used to double-check multicollinearity. Linearity of the dependent and various independent variables is checked by using two-way scatter plots and the results for all the variables show linearity as shown in Figure 36.

Figure 36 Two-way scatter plot for Happiness, GCI and SGCI (sq.rt)



Source: Author, 2016 plotted using STATA 14

Heteroscedasticity of residuals is checked in each sub-question for every model using Breusch Pagan test in Stata. Wherever the p value is significant, i.e. null hypothesis that residuals are homoscedastic, is rejected, robust is used during regressions to distribute the residuals more evenly. It is used in sub-question 1 and 2. Model specification error, i.e. omission of important variable, is checked using ovtest after regression in stata. It is noticed that ovtest in sub-question 1, in regression between happiness score and GCI score, points out at a model specification error. To correct this, one of the control variable which was initially GDP per capita was changed to GDP (in USD at 2011 prices). This corrected the model specification error. Another such problem is seen in sub-question 2 in regression between happiness score and sustainability adjusted GCI scores. It is corrected by converting the 'sustainability adjusted GCI score' to its square root. However, this leads to heteroscedasticity of residuals, for which robust has been used.

Hausman test is done for both models - happiness and competitiveness (Model 1) as well as happiness and sustainable competitiveness (Model 2). For model 1, Hausman test suggests using Random-Effects, which means that the variation across countries is assumed to be random and uncorrelated with dependent or independent variables included in the model. For model 2, Hausman test suggests using Fixed Effects, which means that each country has its own characteristic which may or may not influence the dependent variable.

Table 8 Preliminary regression - happiness, competitiveness and sustainable competitiveness

	(1) Happiness (Competitiveness)	(2) Happiness (Sustainable competitiveness)	(3) Happiness (Sustainable competitiveness-square root)
Global Competitiveness Index	1.33***		
	(0.08)		
Population	-0.00*	-0.00	-0.00
	(0.00)	(0.00)	(0.00)
Geographical area	0.00**	0.00***	0.00***
	(0.00)	(0.00)	(0.00)
GDP in US$(2011 prices)	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)
Sustainability adjusted GCI		0.96***	
		(0.08)	
Sustainability adjusted GCI (square root)			2.84***

	(1) Happiness (Competitiveness)	(2) Happiness (Sustainable competitiveness)	(3) Happiness (Sustainable competitiveness-square root) (0.23)
Constant	-0.16	3.66***	1.65***
	(0.34)	(0.16)	(0.32)
Observations	223	223	223
R^2	0.60	0.45	0.46
Adjusted R^2	0.60	0.44	0.45

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: Author, 2016 calculated using STATA 14

A preliminary regression reveals highly significant positive relationship between happiness and competitiveness as well as happiness and sustainable competitiveness as shown in

Table 8. Results for all regressions are extracted using esttab command in stata which shows most significant results at 99.9% confidence level. Other levels of significance are at confidence intervals of 99% and 95%. Other factors which are significant below these levels are not shown in the results. As per the results, happiness values explain 60% variation in GCI scores and 44% variation in SGCI scores when take separately. Happiness score also explain 46% variation in SGCI when its square root is used for regression. Also, value of constant increases from 0.96 to 2.84 when using square root of SGCI instead of SGCI.

4.5. Interpretation of findings

Data required for answering the research questions has been collected, cleaned and prepared as shown in the previous section. The research questions, answered below, deal with influence of either competitiveness or sustainable competitiveness on increase or decrease in the happiness level of a country. All three main variables – competitiveness, sustainable competitiveness and happiness are complex concepts in themselves, as shown in Chapter 3 and supported by theories in Chapter 2. Collection of data, for this reason, has been done to incorporate most relevant theories. The following section tries to understand influence of competitiveness, with its 12 pillars and sustainable competitiveness, with an additional 4 aspects, with average happiness level of a country. The following findings shall help to identify conditions at country level which can help countries to achieve happiness, while being competitive as well as sustainable.

4.5.1. Sub research question 1

Competitiveness, which for this study has been measured by GCI incorporates mostly the input factors – education, labour market efficiency, health, R &D etc. Although GCI suffers from certain shortcomings (explained in Section 2.2), its prevalent use in many competitiveness studies (eg.(Fonseca and Lima 2015; Dos Santos and Brandi 2014; Yeganeh 2013; Lapinskiene 2011)) raises its credibility. Comparing maps for GCI and Happiness scores, it is observed that developed countries, for the most part, are doing relatively well in both spheres than other countries. Easterlin (1974) shows that an individual's happiness increases with income, however, Clark and Senik (2011) and Hagerty and Veenhoven (2003) show that increase in GDP does not guarantee increase in happiness. Hence the following sub-question tries to understand if competitiveness, which is an indicator of productivity of an economy, instead of solely economic growth, can influence happiness of people.

To what extent does competitiveness alone lead to happiness at country level?

To answer sub-question 1, relationship between GCI and average self-reported happiness level is tested using 'random effects' regression. As per the results, there is very significant positive relationship between happiness and competitiveness as shown in Table 9.

Table 9 Regression result for happiness and competitiveness

	(1) Happiness (Competitiveness)
Global Competitiveness Index	1.24***
	(0.09)
Population	-0.00***
	(0.00)
Geographical area	0.00*
	(0.00)
GDP in USD (2011 prices)	-0.00
	(0.00)

	(1) Happiness (Competitiveness)
Constant	0.24 (0.40)
Observations	223
R^2	0.6175

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: Author, 2016 calculated using STATA 14

Out of a panel of 2 years with 302 observations of 151 countries, this regression used 223 observations. The results show that for 1-unit increase in GCI, Happiness level increases by 1.24 unit. Effect on other variables such as population, GDP and land area, which are actually control variables is significant but miniscule, as shown by their 0.00 coefficients. Also, change in GCI values (competitiveness) explains 61.75% variation in happiness values. This is a high value considering the regression uses panel data. It is important to remember though, that GCI is an aggregate of 12 pillars, some of which are education, health and infrastructure. These components of GCI influence perception of living conditions which Veenhoven (2000) calls - 'liveability of environment' and hence, a link between a component of competitiveness and happiness can be established without any tests. It is interesting to note that this relationship is not influenced by GDP of a country, which was used a control variable.

The relationship between happiness and competitiveness can be presented in the following equation –

Happiness = 0.24 + (1.24) *GCI*

After establishment of the relationship between competitiveness and happiness, it is pertinent to understand which factors mostly influence this relationship. GCI is unbundled into its twelve components and a regression with dependent variable 'Self -reported happiness level' is conducted. Pillars – 5 (Higher education and training), 9 (Technological readiness) and 11 (Business sophistication) are dropped from the final regression due to high vif (signifying multicollinearity).

Table 10 Regression of happiness and components of GCI

	(1) Happiness (Pillars of GCI)
1st pillar: Institutions	-0.00 (0.16)
2nd pillar: Infrastructure	0.32** (0.12)
3rd pillar: Macroeconomic environment	0.08 (0.06)

	(1) Happiness (Pillars of GCI)
4th pillar: Health and primary education	0.28**
	(0.10)
6th pillar: Goods market efficiency	-0.45*
	(0.21)
7th pillar: Labor market efficiency	-0.09
	(0.13)
8th pillar: Financial market development	0.27*
	(0.13)
10th pillar: Market size	0.07
	(0.09)
12th pillar: Innovation	0.36*
	(0.14)
Population	-0.00*
	(0.00)
Geographical area	0.00
	(0.00)
GDP in USD (2011 prices)	-0.00
	(0.00)
Constant	2.10**
	(0.71)
Observations	223
R^2	0.6756
Adjusted R^2	

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: Author, 2016 calculated using STATA 14

From Table 10, it is evident that happiness is very significantly and positively related to infrastructure (Pillar 2) and health and primary education (Pillar 4). Change in GCI values (competitiveness), in this case explains 67.56% variation in happiness values. This is higher value than the previous regression and indicates the significance of particular pillars of GCI for happiness. For every 1-unit increase in infrastructure, the average happiness level increases by 0.32 units, while the increase due to health and primary education level of a country is 0.28 units. Other significant components of GCI for happiness financial market development (Pillar 8) and innovation (Pillar 11). For each 1-unit increase in financial market development, happiness level increases by 0.27 unit, while the increase due to unit increase in innovation is

0.36 units. Happiness is also negatively related to Goods market efficiency. This does not indicate that to increase happiness, market efficiency has to be compromised. A look into the components of this pillar can give an insight for explaining this negative relationship. Pillar of goods market efficiency comprises of indicators related to competition – domestic and foreign, and quality of demand conditions. Some of the indicators under these sub-pillars may be negatively related to happiness.

Lessons learnt

As per the above regressions, happiness and competitiveness have a highly significant positive relationship and within competitiveness, factors affecting happiness significantly are infrastructure, health and primary education, financial market development and innovation. The coefficient for GCI also has a very small standard error, indicating at a smaller range of possible happiness scores for each value of GCI. There is a significant negative relationship with population i.e. higher the population lower the happiness. However, as the coefficient is almost negligible, this relationship is not quantifiable. Relationship with GDP, although not significant, has come out to be negative. This might support the finding by Easterlin (1974) that income is not related to happiness in the long run. Though this study is at country level, it finds support in the study done by Huggins and Thompson (2012) in localities of UK, that proved that competitive is linked to well-being at local level. A productive economy also has an efficient labour market which is accessible to people with different skill set. Unemployment should be reduced in the country, which is beneficial both for happiness Van Praag (2010) as well as competitiveness.

Results from the second regression highlight the importance of infrastructure, both physical, such as transport, telecommunication and electricity, and social, such as health and primary education, for happiness. It is interesting, however, that presence and quality of government framework (pillar 1 – institutions) is negatively related to happiness as is goods market efficiency. However, this goes against findings by Ott (2011) who proves that quality of government is positively linked to happiness and linked to inequality of happiness in a bell-shaped pattern.

4.5.2. Sub research question 2

As sustainable competitiveness is a relatively new term, fewer studies are available on it and studies on its relationship with happiness or well-being are almost negligible. Thus, the following research sub-question tries to explore this relationship and uses components of sustainable development to assess 'sustainable' part of sustainable competitiveness. Even by comparing maps for SGCI and Happiness scores, it is observed that developed countries, for the most part, are doing relatively well than other countries. As supported by Lapinskiene (2011), a minimum level of GDP growth is required to undertake sustainable development. Also, the components of GCI as well as SGCI require a sustained flow of finances as input to perform well. An economy which does not invest in infrastructure, health and education of workforce, R & D etc. cannot be sustain a level of competitiveness for long time.

To what extent sustainable competitiveness lead to happiness at country level?

Answering sub-question 1 helps setting stage for sub-question 2 as the concept of sustainable competitiveness is actually an extension of competitiveness. To understand the relationship between sustainable competitiveness and happiness, it is imperative that relationship between competitiveness and happiness is established. By answering sub-question 1, it is proven that

competitiveness and happiness are significantly and positively related. Sub-question 2 tries to find out the relationship between sustainable competitiveness and happiness, given that link between sustainable development and happiness has been proven by Zidansek (2007).

A panel regression is done for happiness as a dependent variable and sustainability-adjusted GCI as an independent variable with three control variables. The data is checked for multicollinearity, normality, heteroscedasticity, influential data and specification errors. It was found that the data was not collinear. It was normal and the residuals were homoscedastic. However, the independent variable didn't appear to be linear in a two-way scatter plot with dependent variable. Moreover, the model showed specification error on doing ovtest and as a result, square root of sustainability adjusted GCI was generated. This is also explained in Section 4.2.3. Random Effects panel regression was carried out for the model with robust and the results are shown in Table 11.

Table 11 Regression of happiness and sustainability-adjusted GCI

	(1) Happiness (Competitiveness)	(2) Happiness (Sustainable Competitiveness-sq rt)
Global Competitiveness Index	1.24***	
	(0.09)	
Population	-0.00***	-0.00***
	(0.00)	(0.00)
Geographical area	0.00*	0.00*
	(0.00)	(0.00)
GDP in US$ (2011 prices)	-0.00	0.00
	(0.00)	(0.00)
Sustainability adjusted GCI (square root)		1.76***
		(0.31)
Constant	0.24	3.10***
	(0.40)	(0.43)
Observations	223	223
R^2	0.6175	0.4361
Adjusted R^2		

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: Author, 2016 calculated using STATA 14

According to the regression results, for 1-unit increase in square root of sustainability adjusted GCI, happiness score is increased by 1.76 units. The relationship holds between square root values of SGCI and happiness scores. To simplify it further, 1 unit increase in SGCI, increases the happiness level by 3.1 units. It can be presented by the following equation.

Happiness* = 3.10 + 1.76 *(Square root of SGCI)

Change in SGCI values (sustainable competitiveness) explains 43.61% variation in happiness values. The goodness of fit (indicated by value of R-squared) is less than that of 1st regression (61.75%). Even so, this regression presents a very high and positive link between sustainable competitiveness and happiness especially since panel data is used. The coefficient is more than that for competitiveness, without sustainability dimension. However, what really causes this significance of relationship is explored in sub-question 4.

Constants in each of the regression (1 and 2) differ in terms of value as well as significance. Constants in regressions, in general, indicate the y-intercept of the line of fit of data. It refers to the value of y (dependent variable), when x (independent variable) is 0. In the above regressions, value of constants is 0.24 and 3.10 respectively, indicating value of happiness when GCI and square root of SGCI equals 0. Constants in regression models generally don't make sense in the real world. However, in the second regression, the constant is also highly significant (3.10***), which indicates its importance for inclusion in the regression model. For the second regression model to be credible both the coefficient for square root of SGCI (independent variable) as well as the constant (y-intercept) should be included.

Lessons learnt

Countries which are more competitive as well as sustainable are happier than countries which are not competitive and/ or sustainable. These sustainable competitive countries also earn more GDP than other countries. This indicates that to be happier, countries need to focus on being competitive and sustainable but also earn higher GDP so as to invest in enhancing the competiveness as well as sustainability at country level. Establishment of a significant relationship between sustainable competitiveness and happiness at country level is a step towards well-being centric development approach. These results are supported and preceded by study done by Lapinskiene (2011) and Stucke (2013).

4.5.3. Sub research question 3

As explained in sub-research question 2, relationship between SGCI and happiness is observable on their maps to a small extent. Again, higher GDP values correspond with higher values of SGCI and happiness together. The following research sub-question explains how relationship between sustainable competitiveness and happiness changes by geographic regions as well as income level of countries. As explained before, in sub-question 1, increase in GDP does not lead to increase in happiness, but the sub-question below tries to understand and establish if GDP is a pre-requisite for sustainable competitiveness at country level.

Does the relationship between sustainable competitiveness and happiness is influenced by geographical region or GDP?

Part A : By geographical region

Relationship between sustainable competitiveness and happiness was found to be significant and positive. This sub-question seeks to answer whether it holds true for a) every geographic region and b) GDP. For the first part of this sub-question, 151 countries under study are divided into 19 geographic regions. This categorization is based on the UN's categorization of world regions and is explained in Section 4.2.5. Geographic regions are represented by a dummy variable. It seeks to answer change in relationship between sustainable competitiveness and

happiness in different regions, as compared to sustainable competitiveness levels in Eastern Africa and Western Europe, which are taken as base regions in the two models.

Table 12 Regression of happiness and sustainability-adjusted GCI, by geographic region

	(1) Happiness (SGCI by geographic region) Base: Eastern Africa	(2) Happiness (SGCI by geographic region) Base: Western Europe
Sustainability adjusted GCI (square root)	1.29***	1.29***
	(0.29)	(0.29)
Population	-0.00	-0.00
	(0.00)	(0.00)
Geographical area	0.00***	0.00***
	(0.00)	(0.00)
GDP in US$(2011 prices)	0.00	0.00
	(0.00)	(0.00)
Eastern Africa	0.00	-2.09***
	(.)	(0.29)
Middle Africa	-0.07	-2.16***
	(0.21)	(0.26)
Northern Africa	0.87**	-1.22***
	(0.33)	(0.34)
Southern Africa	0.15	-1.94***
	(0.28)	(0.23)
Western Africa	0.06	-2.03***
	(0.30)	(0.33)
Caribbean	0.69***	-1.40***
	(0.20)	(0.27)
Central America	2.12***	0.03
	(0.33)	(0.35)
South America	2.15***	0.06
	(0.22)	(0.24)
Northern America	1.96***	-0.13
	(0.32)	(0.27)
Central Asia	1.12***	-0.97**
	(0.29)	(0.31)

	(1) Happiness (SGCI by geographic region) Base: Eastern Africa	(2) Happiness (SGCI by geographic region) Base: Western Europe
Eastern Asia	0.90***	-1.19***
	(0.24)	(0.21)
Southern Asia	0.56*	-1.53***
	(0.25)	(0.27)
South-Eastern Asia	1.17**	-0.92**
	(0.38)	(0.35)
Western Asia	1.14***	-0.95***
	(0.30)	(0.28)
Eastern Europe	1.02***	-1.07***
	(0.30)	(0.30)
Northern Europe	2.06***	-0.03
	(0.34)	(0.26)
Southern Europe	1.00***	-1.09***
	(0.24)	(0.21)
		0.00
Western Europe	2.09***	
	(0.29)	(.)
Australia and New Zealand	2.28***	0.19
	(0.28)	(0.20)
Constant	2.62***	4.71***
	(0.39)	(0.53)
Observations	223	223
R^2	0.7584	0.7584
Adjusted R^2		

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: Author, 2016 calculated using STATA 14

Change in SGCI values (sustainable competitiveness) explains 75.84% variation in happiness values. This is a very high value considering the regression uses panel data. As per the results of both regressions, it is clear that geographic region influences the relationship between happiness and sustainable competitiveness except in case of Middle Southern and Western Africa, when compared to Eastern Africa and Northern Africa, Caribbean, whole of Asia – central, eastern, southern, south eastern or western in regression (1) and except America (Central, South and Northern),Northern Europe and Australia and New Zealand when compared to Western Europe in regression (2). Each of these exceptions indicate towards specific local characteristics which make these regions different from the base regions in each

case. The result for the first model can be interpreted as follows. A country in any other region apart from the Eastern Africa, example Eastern Asia, having similar sustainable competitiveness level as a country in Eastern Africa, will have a happiness score more than that of the country in Eastern Africa by 0.90 units. Similarly, for the second model, a country in Middle Africa having similar sustainable competitiveness level as a country in Western Europe, will have a happiness score less than the country in Western Europe by 1.07 units. Another observation is regarding exceptions in second regression. Countries in the exception regions (eg Northern America, Australia & New Zealand and Northern Europe) except those in Central and South America are developed countries. This indicates to a local characteristic in Central and South America which makes it an exception to this regression.

These results are also supported in theory by (Clark and Senik 2011; Hagerty and Veenhoven 2003), which suggest that GDP only matters for happiness till the economies are in transition. Higher GDP growth does not guarantee higher happiness. As most of the countries in regions like East Africa, South Asia etc. are developing countries, they require a sustained economic growth to invest in sustainable development and hence, score lower in both sustainability and happiness. On the other hand, countries in Northern America, Australia & New Zealand and Northern Europe did not have any significant relationship between sustainable competitiveness and happiness. This again can be attributed to similarity between all these countries – a high GDP and sustained level of growth.

Part B : By GDP

To understand the effects of GDP on relationship between sustainable competitiveness and happiness, a panel regression is done in two ways. Countries are divided into four categories – High-income, Upper middle-income, Lower middle-income and Low-income as per the classification done by (Development Policy and Analysis Division 2013) based on their GNI. In the first type of regression (1 to 4), relationship between sustainable competitiveness and happiness is examined separately for each category of countries, but fail to produce reliable and significant results as observed by their low R-squared and p values. However, in the second type of regression (number 5), category of country as per income was used as a dummy variable, with Low-income countries as the base.

Table 13 Regression of happiness and sustainability-adjusted GCI, by income

	(1)	(2)	(3)	(4)	(5)
	Happiness	Happiness	Happiness	Happiness	Happiness
	(High-income countries)	(Upper-middle-income countries)	(Lower-middle-income countries)	(Low-income countries)	(GDP as dummy)
Sustainability adjusted GCI	0.06		0.11		0.22*
	(0.09)		(0.60)		(0.09)
Population	0.00	-0.00	0.00	0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

	(1)	(2)	(3)	(4)	(5)
	Happiness	Happiness	Happiness	Happiness	Happiness
	(High-income countries)	(Upper-middle-income countries)	(Lower-middle-income countries)	(Low-income countries)	(GDP as dummy)
Geographical area	0.00	0.00*	-0.00	0.00	0.00*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Sustainability adjusted GCI (square root)		0.23		-1.42	
		(0.91)		(1.05)	
High-income countries (dummy)					1.98***
					(0.25)
Upper-middle-income countries (dummy)					1.31***
					(0.23)
Lower-middle-income countries (dummy)					0.76**
					(0.23)
Low-income countries (dummy)					0.00
					(.)
Constant	-129.67	5.17***	4.81***	5.45***	3.85***
	(2346.41)	(1.20)	(0.91)	(1.12)	(0.21)

	(1) Happiness (High-income countries)	(2) Happiness (Upper-middle-income countries)	(3) Happiness (Lower-middle-income countries)	(4) Happiness (Low-income countries)	(5) Happiness (GDP as dummy)
Observations	78	56	44	31	209
R^2	0.0136	0.1085	0.0002	0.1492	0.5791

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: Author, 2016 calculated using STATA 14

Change in SGCI values (sustainable competitiveness) explains 57.91% variation in happiness values. This is a very high value considering the regression uses panel data. As per the results of this regression (5), it is clear that income influences the relationship for all category of countries. The result for the fifth model can be interpreted as follows. A high-income country having similar sustainable competitiveness level as a low-income country, will have a happiness score more than that of the low-income country by 1.98 units. Similarly, a lower-middle income country will have a happiness score more than a low-income country by 0.76 units.

Lessons learnt

Patterns seen in relationship between sustainable competitiveness and happiness, which are influenced by geographic regions cannot be explained by mere location of a country in a specific geographic region. Difference in the coefficients of each region in the two models points towards a pattern which can also be explained by GDP or level of development of economy. However, countries Central and South America have positive coefficients in both cases and hence indicate influence of certain local regional characteristics like culture etc. Countries in certain geographic regions also form economic regions and have access to similar resources and policy initiatives. Influence of geographic regions on the relationship between sustainable competitiveness and happiness might be influenced by economic or cultural region.

Regression of sustainable competitiveness with happiness with income category of a country as a dummy, indicates the importance of national income. It does not prove that increase in income leads to happiness but explains that increase in income creates conditions to support both sustainable competitiveness as well as happiness. Countries with higher income can enhance sustainable competitiveness, for example, by investing in infrastructure, health and primary education, by preparing better for disaster risk, for incorporating environmental friendly technologies and investing in R & D.

4.5.4. Sub research question 4

Coefficient of sustainability comprises of 4 aspects, as defined in this research – inclusive growth, environmental management, disaster risk and governance. Inclusive growth consists of component of youth unemployment. According to (Easterlin 2013; Musikanski 2014), employment has a positive influence on happiness. Niimi (2009) proves that gender inequality,

which is also part of the inclusive growth component, is negatively related to competitiveness. Studies by Ferrer-i-Carbonell and Gowdy (2007) and Welsch (2006) prove that environmental degradation is negatively linked to happiness while Dragičević et al. (2011) in a study of governance in Croatia and Slovenia prove that good governance is a basic tenet of competitiveness. Hence some components of sustainability have already established links with competitiveness or happiness. However, the following sub-research question tries to explain which among all the components of sustainability is most significant for happiness at country level.

What factors most significantly affect the relationship between sustainable competitiveness and happiness?

Sub-question 4 acts as a logical extension of sub-question 2, which tries to understand which factors of sustainable competitiveness most significantly influence happiness. It unbundles the concept of sustainable competitiveness into five parts. The first four components – Inclusive Growth, Environmental Performance, Disaster Risk and Governance make up the sustainability coefficient, while the fifth part is GCI. Each of the sub-component of sustainability coefficient is unbundled into a separate coefficient and multiplied with GCI as explained and described in section 4.2.3. The results of each of the regressions is shown in Table 14.

Table 14 Regression of factors of sustainable competitiveness and happiness

	(1) Happiness (Sustainable Competitiveness)	(2) Happiness (Inclusive Growth)	(3) Happiness (Environmental Performance)	(4) Happiness (Disaster Management)	(5) Happiness (Governance)
Inclusive Growth adjusted GCI	2.04*	-0.38**			
	(0.98)	(0.13)			
Environmental Performance adjusted GCI	-0.05		-0.02		
	(0.11)		(0.07)		
Disaster Risk adjusted GCI (log)	0.02			0.00	
	(0.02)			(0.02)	
Governance adjusted GCI	0.47				0.57***
	(0.34)				(0.05)

	(1) Happiness (Sustainable Competitiveness)	(2) Happiness (Inclusive Growth)	(3) Happiness (Environmental Performance)	(4) Happiness (Disaster Management)	(5) Happiness (Governance)
Population	0.00	-0.00	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Geographical area	0.00	0.00	0.00	-0.00	0.00*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
GDP in US$ (2011 prices)	0.00	0.00**	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Constant	-2014.19	6.26***	-599.74	211.16	4.13***
	(4177.09)	(0.30)	(2925.30)	(4407.57)	(0.13)
Observations	140	223	209	148	223
R^2	0.27	0.5582	0.0021	0.0052	0.5850

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: Author, 2016 calculated using STATA 14

The first model shows results when all the factors of sustainable competitiveness are regressed together with happiness. It shows that Inclusive Growth adjusted GCI is most significantly related to happiness. For every unit increase in Inclusive Growth adjusted GCI, happiness increases by 2.04 units. This is the highest coefficient in all the regressions till now, and shows the importance of inclusive growth for happiness at country level. However, the low value of R-squared indicates omission of other important variables from the model. This result is only valid at a confidence level of 95%.

In separate models, Inclusive Growth adjusted GCI and Governance-adjusted GCI are significantly linked to happiness. The most significant result is for governance adjusted GCI, according to which, for every unit increase in governance adjusted GCI, happiness increases by 0.57 units. Also, variation in governance adjusted GCI explains 58.5% of variation in happiness score. However, in the individual regressions, Inclusive Growth adjusted GCI is significantly but negatively linked to happiness. For every unit increase in Inclusive Growth adjusted GCI, happiness decreases by 0.38 units. This can be explained by missing values in the dataset which are biased. Most of the missing values for Gini coefficient belong to developed countries like Sweden, USA, Austria among others. So the results especially for this

regression (2) is based on countries having generally higher values of Gini coefficients and hence, higher level of income inequality. Taken separately, this component of sustainability might distort the result as when taken with other components of sustainability (regression1), inclusive growth has a positive and significant coefficient. Other two variables of sustainability fail to produce significant results on their own. This is also represented in their small values of R-squared. This is due to lack of enough variables in the regression. Also both components consist of very less number of indicators.

Lessons learnt

Adjusting GCI based on the unbundled components of sustainability coefficient doesn't produce reliable significant results. It indicates lack of important variable in the model. However, the results point out towards importance of inclusive growth and good governance in addition to competitiveness for happier population. Surprisingly, environmental performance is related negatively to happiness, which goes against any of the theories discussed in this research. Criteria used for measuring environmental performance was EPI. It consists of the following - Health impact (of environmental degradation), Air Quality, Water and Sanitation, Water resources, Agriculture, Forests, Fisheries, Biodiversity and habitat and Climate and Energy. It is surprising because other studies like (Alessandrini et al. 2015; Zidanšek 2007) have proved a positive link between sustainable development and happiness. But, as the model doesn't have a good fit and requires more variables, this result can be overlooked. Inclusive growth, with its components gender inequality (Niimi, 2009) as well as youth unemployment (Easterlin 2013; Musikanski 2014), have been proven to be negatively linked to happiness.

It can thus be concluded from answering these four sub-research questions that to achieve happiness in the society, both approaches – competitiveness as well as sustainable competitiveness can be successful. However, sustainable competitiveness approach aligns with the proposed Sustainable Development Goals. It is thus, better for countries to aim for sustainable competitiveness as a way to enhance happiness of its population. Another observation from these results is the importance of development of physical as well social infrastructure in the society, regardless of a country's GDP or development status. These core infrastructure which are proved to be significantly related to happiness are – primary education and health, transportation and communication, employment, gender and income equality, good governance practices and stable and secure environment in the country. All these also influence the perceived satisfaction from surrounding environment (Livability by Veenohoven, 2011). Another important lesson learnt from these results is the importance of higher and sustained GDP for happiness of population in developing countries. It was proven that sustainable competitiveness can lead to happiness, especially in countries with higher GDP, which can invest in R& D, innovation and infrastructure. Although Clark and Senik (2011) and Hagerty and Veenhoven (2003) show that growth in only GDP is not a pre-requisite for happiness, but as shown in the results, sustained GDP is a basic tenet for sustainable competitiveness to lead to happiness.

Chapter 5: Conclusion and recommendation

Ever-changing definition of development can refer to either economic growth, sustainable development or prosperity depending on the issue being addressed. From low-levels to a sustained level of economic growth, from a natural-resource dependent to environment-friendly growth, from inequitable to inclusive growth and from economic perspective to a more humane perspective on growth, priorities of governments around the world as well as those in power to make decisions are shifting. These shifting perspectives, however, should be accompanied by policy changes to make any impact. With low-growth experienced after the economic recession, countries have put into place policies to increase competitiveness but economic growth is not paramount for human development. It is necessary, but as put by Aiginger (2006), it should lead to welfare of the society. Competitiveness, if leading to happiness of people, can lead to a holistic approach to human development. However, sustainable development principles, first highlighted by the Brundtland Report in 1987, should not be left out from this holistic approach. If competitiveness, which is also sustainable, can lead to happiness of people, policies can be proposed to address the three major issues – economic growth, sustainability and prosperity, in a holistic manner. Well-being of people, which has been almost invisible in the global agenda, can finally be addressed without compromising on economic growth and sustainability. It is in this regard that, this research tried to find the link between competitiveness and well-being and sustainable competitiveness and well-being at country level. The relationships were also tested across geographic regions.

5.1. Answer to the main research question

To answer the main research question ***'Does sustainable competitiveness lead to happiness at country level'***, it was divided into four sub-questions which have been explained in Chapter 4. As per the results of these four sub-questions, it is established that sustainable competitiveness can lead to happiness of people. The results however, are subject to certain constraints.

A positive relationship was found between competitiveness and happiness. Countries which are competitive essentially invest in infrastructure, health and education, have better institutional capacity, promote trade by providing conducive macroeconomic environment and efficient goods and labour market, promotes technological advances, business sophistication and innovation. All these factors combined together leads to happiness at a country level. However, within these list of factors, most important factors contributing to increase in happiness are infrastructure, health and primary education. Veenhoven (2013) shows that surrounding environment influences the subjective well-being. Hence, improvement in surrounding environment in terms of better infrastructure and health and primary education can create better living conditions for its citizens and thus create conditions more livable. Other factors that are somewhat important for increasing happiness were found to be related to the financial market, its availability, affordability, transparency and soundness and innovation, mainly related to research and development by both government and universities. Both these factors also lead to making world a better place to live and thus essentially connect to Veenhoven (2013)'s argument of live-ability, which is although different but connected to life-satisfaction.

Sustainable competitiveness which merges together concepts of sustainable development and competitiveness was also found to be positively related to happiness at country level. This means that improving sustainability of a country, which can be related to environment, inclusiveness of growth, disaster risk or governance, can lead to happiness of people. Countries

which are more equitable, protect and work alongside environment, minimize losses due to natural disasters and have good governance in place, apart from being competitive, have happier citizens than other countries which don't fulfill these criteria. Combining the concepts of sustainability and competitiveness benefits both economy and environment Wysokinska, 2003; Wade-Benzoni, 1999 in Balkyte and Tvaronavičienė (2010) as well as well-being of people, as per this research. It also provides support to the argument by Balkyte and Tvaronavičienė (2010) "continued competitiveness and economic growth are essential to supporting living standards and wellbeing" p 358 and addresses the gap in development approach pointed by Kerekes (2011) by including the three concepts – competitiveness, sustainability and well-being.

The relationship between sustainable competitiveness and happiness didn't show a specific pattern but showed how countries in certain geographic regions perform better than other. However, this cannot be attributed to a country's mere location. On closer examination, it was found that sustainable competitiveness had strong and better relationship with happiness in geographic regions having countries with higher GDP. Easterlin (1974) established positive link between individual's income and happiness level but Lapinskienė and Tvaronavičienė (2009) established GDP (income) as a prerequisite for sustainable development in a study of countries of Central and Eastern Europe. Hence, these results prove that being sustainably competitive can lead to improved happiness level but only if the GDP is high enough. Countries in Western or Northern Europe, Australia and New Zealand were more sustainable competitive and happier than countries in Northern Africa, Caribbean, Asia among others. However, countries in two geographic regions were exception to this trend. Countries in Central and South America has happier people with same level of sustainable competiveness as Eastern Africa (Base region), even though their GDP is not at par with countries of the developed world (e.g. Western and Northern Europe, Northern America etc.). For countries in Central and South America, relationship between sustainable competitiveness and happiness holds true regardless of the level of GDP. This highlights the possibility that specific regional factors influence relationship between sustainable competitiveness and happiness in these regions.

Within the concept of sustainable competitiveness, inclusive growth and good governance are most influential factors leading to happiness. Equality in a society is a prerequisite for "benefitting from the economic prosperity of a country" (Sala-I-Martín, Bilbao-Osorio, et al., 2014) p 6 and thus, the importance inclusive growth for happiness support this argument as well as explains the position of Scandinavian, Benelux and French cities and London for both wealth and well-being. Again, components of inclusive growth used in this research relate to income and gender inequality and youth unemployment. Praag and Ferrer-i-Carbonell (2010) have already proven that job satisfaction is an important aspect of overall life satisfaction. Access to jobs with proper pay can thus lead to happiness. Good governance, which relates to transparency, political stability and overall security in this research, is also an important factor for happiness. Countries which are competitive must also have transparency, political stability and overall security to increase happiness of its citizens.

5.2. Lessons learnt and Conclusion

Well-being, which is essentially the goal of development and life, in general, as argued by various academicians and philosophers, can be achieved at a country level by increasing competitiveness and without compromising on sustainability. In the past, the approach to development has been lop-sided, but with results from this research, it is proved that sustainable competitiveness can actually lead to happiness at country level. New policy initiatives, at the

country level should thus focus on improving 'inclusive growth', including income and gender inequality and youth unemployment, 'governance' including corruption, security and political stability, 'infrastructure', including transport, electricity and telecommunication, and 'health and primary' education. In addition to these factors of sustainable competitiveness which lead to increase in happiness, other factors that need to be improved are financial sector as well as research and development. Investing in these sectors for their improvement leads to generation of trust and financial independence in the society. Innovation through research and development contributes to development of society as a whole.

One of the major conclusions from this study was made by understanding relationship between sustainable competitiveness and happiness with respect to different geographical regions and income categories of countries. Countries in regions less developed than Western Europe like Western Asia, Southern Africa etc. had negative coefficients for happiness score when it was regressed with SGCI scores. This happened because none of the countries in these regions had conditions of sustainability or competitiveness matching with that of countries in Western Europe. The difference between the countries also extend to GDP. This was further established as other 'developed countries' in regions like Northern America, Northern Europe, Australia and New Zealand did not have any significant relationship between sustainable development and happiness. This can be attributed to two factors. First is the similarity between development level and income level between countries in these regions with that of Western Europe. Secondly, as Hagerty and Veenhoven (2003) and Clark and Senik (2011) showed, that after a sustained value of GDP growth is achieved, its relationship with increase in happiness becomes negligible. Thus, a sustained GDP growth is a prerequisite to sustainable competitiveness leading to happiness.

The results of the research are encouraging but not without certain constraints. First and the foremost constraint is the lack of inclusion of more indicators to present all facets of sustainability. Factors which couldn't be included in the research due to lack of data were human rights, ecological footprint and renewable energy use, and disaster resilience initiatives in the form of budgets or programmes. Inclusion of these factors could have improved the results as well as enriched the findings. Relationships between competitiveness and happiness and sustainable competitiveness and happiness have been established by using random effects panel regression, and thus its results can be generalized to all countries. However, some countries might have other factors influencing this relationship, as seen in the case of countries in Central and South America. Importance of various components of sustainability, although interpreted with the help of coefficients of regression, cannot be generalized due to smaller R-squared values, which indicate low goodness of fit in the model. Thus, the importance of inclusive growth and good governance for happiness is established but it needs to be tested with inclusion of local factors.

Establishing the link between competitiveness and happiness at country level adds to findings by Huggins et al. (2013), who focus on relationship between local competitiveness and level of well-being. The research also tries to provide an answer to lack of synergy between comprehensive economic growth and well-being, highlights by authors such as Aiginger (2006) and Lapinskiene (2011). It establishes that competitiveness doesn't only mean economic growth but also leads to happiness and hence can replace the GDP-driven approach to development. However, this research tries to add the concept of sustainability to this relationship. In this way it links the three issues of importance in today's context – low economic growth, sustainability in development and lack of well-being and tries to define a new development approach which not only looks at sustained productivity of a country, but

stability of society, management of environment, reducing of disaster risks and also happiness of the people. This research is among the few which explore concept of sustainable competitiveness with happiness. In the coming times, as urgency of adopting sustainability measures is highlighted along with policies concerning well-being of people, this research can help to devise a strategy by identifying the exact determinants of happiness within sustainable competitiveness.

5.3. **Recommendation**

Establishment of relationship between sustainable competitiveness and happiness mainly concerns policy makers, which holds true at country level and comprises many factors. Policies for improving competitiveness especially which is sustainable can be categorized as being aimed at well-being. Policy makers should most importantly focus improving infrastructure, health and primary education, inclusive growth and good governance as these lead to improved level of sustainable competitiveness as well as happiness. Many developing countries already have programmes like these but they suffer from shortcomings (eg. Corruption, lack of political will or even shortage of funds). The governments must not only provide funds for development but also increase accountability. Improvement of financial markets as well as R & D sector is important and should now be part of development policy. Governments which aim to achieve this holistic development approach, relating to economic growth, sustainability and well-being, should invest more in strengthening the society and basic infrastructure. Technology and innovation should be encouraged, not only for improving competitiveness but also happiness.

Due to certain findings as well as constraints, this research presents opportunities for further exploration related to this topic. The first and the foremost research opportunity stemming from this research is of carrying out this research at a city level. While this research established the link between sustainable competitiveness and happiness at national level, a research at city level can lead to interesting results. Urban competitiveness is different than national competitiveness, which was focussed on in this research, and many other factors contribute to it. Also, well-being centric initiatives makes more sense at a local level which is not as abstract as that at country level. Another aspect that needs further research relates to the factors affecting the relationship between sustainable competitiveness and happiness in Central and South America. As per the results of the regressions based on geographic regions, these regions presented interesting results. These regions also have relatively higher happiness score when compared to countries with similar GDP and population, indicating that other factors such as cultural or local might be contributing to this relationship. Another branch of further research can be adding to the sustainability component of sustainable competitiveness. As it consists of only 9 indicators, many of the facets of sustainability is left out. Future research should add more facets of sustainability in the model and explore if it improves the result.

Annexures

Annexure 1

Countries at different stages of development (Global Competitiveness Report 2015)

Stage 1: Factor-driven	Transition from stage 1 to stage 2	Stage 2: Efficiency-driven	Transition from stage 2 to stage 3	Stage 3: Innovation-driven
Bangladesh	Algeria	Albania	Argentina	Australia
Benin	Azerbaijan	Armenia	Brazil	Austria
Burundi	Bhutan	Bolivia	Chile	Bahrain
Cambodia	Botswana	Bosnia and Herzegovina	Costa Rica	Belgium
Cameroon	Gabon	Bulgaria	Croatia	Canada
Chad	Honduras	Cape Verde	Hungary	Cyprus
Cote d'Ivoire	Iran	China	Latvia	Czech Republic
Ethiopia	Kazakhstan	Colombia	Lebanon	Denmark
Gambia	Kuwait	Dominican Republic	Lithuania	Estonia
Ghana	Moldova	Ecuador	Malaysia	Finland
Guinea	Mongolia	Egypt	Mexico	France
Haiti	Nigeria	El Salvador	Oman	Germany
India	Philippines	Georgia	Panama	Greece
Kenya	Saudi Arabia	Guatemala	Poland	Hong Kong SAR
Kyrgyz Republic	Venezuela	Guyana	Romania	Iceland
Lao PDR	Vietnam	Indonesia	Russian Federation	Ireland
Lesotho		Jamaica	Seychelles	Israel
Liberia		Jordan	Turkey	Italy
Madagascar		Macedonia	Uruguay	Japan
malawi		Montenegro		Korea, Reublic
Mali		Morocco		Luxembourg
Mauritania		Namibia		Malta
Mozambique		Paraguay		Netherlands
Myanmar		Peru		New Zealand
Nepal		Serbia		Norway
Nicaragua		South Africa		Portugal
Pakistan		Sri Lanka		Qatar
Rwanda		Swaziland		Singapore
Senegal		Thailand		Slovak Republic
Sierra Leone		Tunisia		Slovenia
Tajikistan		Ukraine		Spain
Tanzania				Sweden
Uganda				Switzerland
Zambia				Taiwan, China
Zimbabwe				Trinidad and Tobago
				United Arab Emirates
				United Kingdom
				United States of America

Annexure 2

Countries as per geographic regions

Geographic region	Country
Australia and New Zealand	Australia
	New Zealand
Caribbean	Barbados
	Dominican Republic
	Haiti
	Jamaica
	Puerto Rico
	Trinidad and Tobago
Central America	Belize
	Costa Rica
	El Salvador
	Guatemala
	Honduras
	Mexico
	Nicaragua
	Panama
Central Asia	Kazakhstan
	Kyrgyz Republic
	Tajikistan
Eastern Africa	Burundi
	Ethiopia
	Kenya
	Madagascar
	Malawi
	Mauritius
	Mozambique
	Rwanda
	Seychelles
	Tanzania
	Uganda
	Zambia
	Zimbabwe
Eastern Asia	China
	Hong Kong SAR
	Japan
	Korea, Rep.
	Mongolia
	Taiwan, China
Eastern Europe	Bulgaria
	Czech Republic
	Hungary
	Moldova
	Poland
	Romania
	Russian Federation
	Slovak Republic
	Ukraine
Middle Africa	Angola
	Cameroon
	Chad
	Gabon
Northern Africa	Algeria

Geographic region	Country
	Egypt
	Libya
	Morocco
	Tunisia
Northern America	Canada
	United States
Northern Europe	Denmark
	Estonia
	Finland
	Iceland
	Ireland
	Latvia
	Lithuania
	Norway
	Sweden
	United Kingdom
South America	Argentina
	Bolivia
	Brazil
	Chile
	Colombia
	Ecuador
	Guyana
	Paraguay
	Peru
	Suriname
	Uruguay
	Venezuela
South-Eastern Asia	Brunei Darussalam
	Cambodia
	Indonesia
	Lao PDR
	Malaysia
	Myanmar
	Philippines
	Singapore
	Thailand
	Timor-Leste
	Vietnam
Southern Africa	Botswana
	Lesotho
	Namibia
	South Africa
	Swaziland
Southern Asia	Bangladesh
	Bhutan
	India
	Iran, Islamic Rep.
	Nepal
	Pakistan
	Sri Lanka
Southern Europe	Albania
	Bosnia and Herzegovina
	Croatia
	Greece
	Italy
	Macedonia, FYR

Geographic region	Country
	Malta
	Montenegro
	Portugal
	Serbia
	Slovenia
	Spain
Western Africa	Benin
	Burkina Faso
	Cape Verde
	Côte d'Ivoire
	Gambia, The
	Ghana
	Guinea
	Liberia
	Mali
	Mauritania
	Nigeria
	Senegal
	Sierra Leone
Western Asia	Armenia
	Azerbaijan
	Bahrain
	Cyprus
	Georgia
	Israel
	Jordan
	Kuwait
	Lebanon
	Oman
	Qatar
	Saudi Arabia
	Syria
	Turkey
	United Arab Emirates
	Yemen
Western Europe	Austria
	Belgium
	France
	Germany
	Luxembourg
	Netherlands
	Switzerland

Annexure 3

Classification of Countries by GDP (World Economic Situation and Prospects, 2011)

High-income	Upper-middle	Lower-middle	Low-income
Australia	Albania	Angola	Bangladesh
Austria	Algeria	Armenia	Benin
Bahrain	Argentina	Bolivia	Burkina Faso
Barbados	Azerbaijan	Cabo Verde	Burundi
Belgium	Belarus	Cameroon	Central African Republic
Brunei Darussalam	Bosnia and Herzegovina	Cote d'Ivoire	Chad
Canada	Botswana	Djibouti	Comoros
Croatia	Brazil	Egypt	Democratic Republic of Congo
Cyprus	Bulgaria	El Salvador	Eritrea
Denmark	Chile	Georgia	Ethiopia
Equatorial Guinea	China	Ghana	Gambia
Estonia	Colombia	Guatemala	Guinea
Finland	Costa Rica	Guyana	Guinea-Bissau
France	Cuba	Honduras	Haiti
Germany	Dominican Republic	India	Kenya
Greece	Ecuador	Indonesia	Kyrgyz Republic
Hong Kong SAR, China	Gabon	Iraq	Liberia
Hungary	Iran	Lesotho	Madagascar
Iceland	Jamaica	Mauritania	Malawi
Ireland	Jordan	Moldova	Mali
Israel	Kazakhstan	Morocco	Mozambique
Italy	Latvia	Nicaragua	Myanmar
Japan	Lebanon	Nigeria	Nepal
Kuwait	Libya	Pakistan	Niger
Luxembourg	Lithuania	Paraguay	Rwanda
Malta	Macedonia	Philippines	Sierra Leone
Montenegro	Malaysia	Republic of Congo	Somalia
Netherlands	Mauritius	Sao Tome and Principe	Tajikistan
New Zealand	Mexico	Senegal	Tanzania
Norway	Namibia	Sri Lanka	Togo
Oman	Panama	Sudan	Uganda
Poland	Papua New Guinea	Syrian Arab Republic	Zimbabwe
Portugal	Peru	Turkmenistan	
Qatar	Romania	Ukraine	
Republic of Korea	Serbia	Vietnam	
Saudi Arabia	South Africa	Yemen	
Singapore	Thailand	Zambia	
Slovak Republic	Tunisia		

High-income	Upper-middle	Lower-middle	Low-income
Slovenia	Uruguay		
Spain	Venezuela		
Sweden			
Switzerland			
Trinidad and Tobago			
United Arab Emirates			
United Kingdom			
United States			

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