School of Business and Economics
United International University

Macroeconomic, governance and environmental factors on happiness: A cross country analysis

Submitted To

Dr. Md. Mohan Uddin
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Submitted By

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Date of submission: 12 February, 2024

Letter of Authorization

December 23, 2023

Subject: Permission for preparing report.

To whom it may concern:

I **Md. Mohan Uddin**, am writing this letter to authorize that the following student- "Hasan Mahmud Hemal' to prepare a report on "**Macroeconomic, governance and environmental factors on happiness: A cross country analysis**". To complete this paper, the author does not use any unauthorized things and fairly complete this paper with my proper guidelines. I would like to state that, the sources are used in this paper are fully referenced as per the guidelines to confirm the use of external sources.

Thank you for your assistance on this matter.

Sincerely,

…………………...
Dr. Md. Mohan Uddin
Professor
School of Business and Economics
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Letter of Transmittal

10 February, 2024

To,

Dr. Md. Mohan Uddin
Professor
School of Business & Economics (BBA)
United International University (UIU)
United City, Madani Ave, Dhaka 1212

Subject: Report on "Macroeconomic, governance and environmental factors on happiness: A cross country analysis"

Dear Sir,

I am delighted to inform you that, I have completed the formal report on "Macroeconomic, governance and environmental factors on happiness: A cross country analysis". I am grateful to you for assigning me in this report as I have gathered a tremendous amount of knowledge of the different Articles regarding the happiness while completing the report. This report has been very constructive for me as it helped me to summarize and implement the learnings that I have gathered throughout project period and will also help me in future endeavors.

I express my special gratitude to you for dedicating your valuable time, expert guidance, and support while assigning me the report. I have attempted my best to finish it as precisely as possible. I will be pleased to answer any sort of query you may have regarding the report. I hope with great anticipation that you would find it valuable.

Sincerely Yours,

Hasan Mahmud Hemal
ID- 111 201 119
School of Business and Economics
United International University

Acknowledgements

With the help of the most merciful Almighty Allah, it has been possible for me to perform the report on **"Macroeconomic, governance and environmental factors on happiness: A cross country analysis".**

The successful accomplishment of this report is the outcome of the contribution and involvement of a number of people, especially those who give the time to share their thoughtful guidance and suggestions to improve the report. It's difficult for me to thank all of those people who have contributed to this report. There are some special people who cannot go without mention.

First of all, I would like to thank my honorable teacher **Dr. Md. Mohan Uddin,** Professor, United International University. I am thankful to him for his continuous support and supervision, suggestions and providing me with valuable information that was very much needed for the completion of this report.

Finally, my sincere gratitude goes to my family members who helped me mentally and also in giving ideas about the study whenever we needed. I am also grateful to my friends and well-wishers who helped me preparing this report by their valuable assistance, support and information. Thanks to all and I apologize for any unintentional errors.

Abstract

The Happiness Index is extensive survey instrument that measures happiness from different areas of a person's life which is also known as comprehensive measure of wellbeing. In another words, it generally indicates the satisfaction level and happiness of different countries. This research study was conducted to analyze the relationship among the World Happiness Index (WHI) and four selected variables including inflation (INF), corruption (COR), employment (EMP), air pollution(AIP). A comprehensive dataset comprising information from 218 countries was largely collected from the world happiness report and world bank database. The dataset spans from 2012 to 2019. The data that the author collected were in different forms. For this reason, the dataset has to be changed in the standardized from to do the analysis. In this research, the author utilized the correlational method to see the relationship among the five variables where two statistics software have been used (IBM SPSS and gretl). These test were utilized to establish significant relationships among the identified variables using a 5% level of significance. By analyzing the result, the author has concluded that there is a weak negative relationship between inflation and the WHI, a weak positive relationship between corruption and the WHI, a moderate positive relationship between employment and the WHI, and a weak negative relationship between air pollution and the WHI. In conclusion, the study claimed that, "the subjective well-being or Happiness" depends on the performance of countries based on the given socio-economic and environmental factors like inflation, corruption, employment, and air pollution.

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List of Abbreviation

WHI: World Happiness Index.

GDP: Gross Domestic Product.

GNI: Gross National Product.

HDI: Human Development Index.

DESI: Digital Economy and Society Index.

INF: Inflation.

COR: Corruption.

EMP: Employment.

AIP: Air pollution .

Chapter 1: Introduction

1.1 Background

1.1.1 The main concept of happiness index

The Happiness Index assesses a person's feeling of happiness, satisfaction with life, and other happiness domains: psychological well-being, physical health, time balance, community, social support, Lifelong Learning arts and culture, environment, governance, Standard of Living, and work.

Happiness Index is used to define income dissimilarity, trust in government, and sense of community and other aspects of wellbeing within specific demographics of a population for specific countries. It helps to promote social change and provides necessary data to the researchers and policy makers to plan for the well-being and happiness of the citizens (Musikanski et al., 2017). Most importantly the idea of calculating the happiness index is gaining in importance each time, and in recent years its use has been aimed at defining a global indicator to assess the quality of life, which serves as a more objective indicator and universal than such economic indicators as inflation or the gross domestic product indicator (Omarova & Kenzhakimova, 2023).

1.1.2 Definition

The Happiness index is extensive survey instrument that measures happiness from different areas of a person's life which is also known as comprehensive measure of wellbeing. The collective happiness of a nation can be analyzed through this developmental philosophy. Happiness index or "life ladder" can be measured using parameters or key variables such as income, freedom, trust, healthy life expectancy, social support and generosity. The answers hence obtained are averaged out to a single quantifiable value, which further contributes towards World Happiness Report (WHR) (Ahtesham, 2020).

1.1.3 History of happiness index

Global Happiness Council, a group of independent happiness specialists who created the happiness index. The whole concept was emanated from the Bhutanese Gross National Happiness Index.

The kingdom of Bhutan who developed the idea of Gross national happiness in response to pressures to use Gross National Product as the primary goal and metric for the government (Tideman, 2011). From 1972 the people of Bhutan started considering mental well-being, physical health, youth literacy other factors such as wealth, comfort and economic growth. Based on that, they made indexation for measuring happiness based on several factors and ever since, they tried to kept track of this index. In Bhutan, Gross national happiness (GNH) is measured by using the GNHI (Gross National Happiness Index) (Correa, 2017). The UN General Assembly adopted the resolution Happiness: Towards a Holistic Definition of Development in July 2011. From then, they invite people from different countries to assesses the happiness of their people and to use the data to guide public policy. The first UN high level meeting called Wellbeing and Happiness: defining a New Economic Paradigm, chaired by the then UN Secretary General Ban Ki-moon and Bhutan's Prime Minister happened in April 2012. Also, Bhutan had adopted Gross National Happiness (GNH) instead of Gross Domestic Product (GDP) as their main development indicator (Sithey et al., 2015). In April 1, 2012, The first world Happiness report was released that outlined the state of world happiness, causes of happiness and misery and policy implications. Since 2016, the report is launched around 20th March to coincide with UN's International Day of Happiness (Helliwell et al., 2023).

1.1.4 Top 10 happiest countries in the world 2023

World Happiness Report 2023 says that, Researchers analyzed comprehensive Gallup polling data from 137 countries for the past three years (2020-2022) and measured it in the scale of 10. From the finding, the top 10 countries are (Helliwell et al., 2023):

1. Finland (with the score of 7.804)

2. Denmark (with the score of 7.586)

3. Iceland (with the score of 7.530)

4. Israel (with the score of 7.473)

5. Netherlands (with the score of 7.403)

6. Sweden (with the score of 7.395)

7. Norway (with the score of 7.315)

8. Switzerland (with the score of 7.240)

9. Luxemburg (with the score of 7.228)

10. New Zealand (with the score of 7.123)

1.1.5 Domains of happiness

There are 9 domains, clearly demonstrate that from the perspective of GNH (Gross national Happiness), many inter-related factors are important in creating the conditions for happiness. The first three domains are very well known from a human development perspective like - living standards (such as income, assets, housing, rent), health, and education. The next three are a bit modern like - good governance, the use of time (and time poverty), and ecological resilience. And the last are the more innovative which is - psychological wellbeing (includes overall happiness, but also emotions and spirituality), community vitality and cultural diversity and resilience (Ura et al., 2012). Let's explain it briefly.

- **Psychological Well-Being**: Psychological well-being refers to people's overall mental health and the presence of positive psychological functioning. The specific indicators and measures used to assess Psychological Well-Being are life satisfaction, positive emotions, negative emotions spiritually (Loyola College, Chennai et al., 2014).

- **Health**: The World Health Organization (WHO) defines "health" as "a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity (*Health and Well-Being*, n.d.). It includes factors such as mental health, self-report health status, healthy days, disability etc. The idea is that a population's well-being is not only dependent on economic factors but also on the health of its people. Thus, the Health domain emphasizes the importance of healthcare services and a healthy population as integral components of a happy and balanced society.

- **Time Balance**: Time is precious and a valuable resource to every human being. Time use data can yield a range of important information that provide insight into like enjoyment of life, sense of leisure and feeling rushed, work, sleep etc (Ura et al., 2012).

- **Education:** The education domain encompasses a broad and comprehensive view of learning that goes beyond academic achievements. It emphasizes the importance of cultivating not just knowledgeable individuals but also compassionate, ethical, and socially responsible citizens. The factors that should be considered in this domain are Literacy, schooling, knowledge, value etc.

- **Cultural Diversity and resilience**: The diversity of the culture is manifested in forms of language, traditional arts and crafts, festivals, events, ceremonies, drama, music, dress and etiquette and more importantly the spiritual values that people share. To assess the strength of various aspects of culture, four indicators have been considered: language, artisan skills, cultural participation (Verma, 2017).

- **Good Governance**: This domain directly addresses the importance of governance itself. A transparent, accountable, and participatory government fosters trust among citizens. Ensuring the rule of law, combating corruption, and respecting human rights are essential elements of good governance.

- **Community vitality**: Community vitality is a great concern towards the well-being of people in the rural areas. The ability of a community is to sustain itself into the future as well as provide opportunities for its people to pursue their own life goals and the ability to experience positive life outcomes and realize positive social economic, and environmental outcomes. Where Donations (time and money), community relationship, family, safety etc. are some significant factors that have to be considered.

- **Ecological Diversity and resilience**: Environmental sustainability is a critical aspect of good governance. Policies that promote the conservation of natural resources, sustainable development, and resilience to environmental challenges contribute to the happiness of current and future generations. The most important factors are ecological issues, responsibility towards environment, wildlife damage (rural), Urbanization issues (Sangha et al., 2019).

- **Living Standard**: The living standards domain refers to the material wellbeing of a countries people. It ensures the completeness of basic material needs for a happy living

where assets, housing, household per capita income etc. are the most important factors (Gupta & Agrawal, 2017).

1.1.6 Measurement of happiness index

According to the world happiness report 2023, The World Happiness Index is calculated by a simple arithmetic addition of 7 sub-indicators. Which are GDP per capita, Social support, Healthy life expectancy, Freedom to make life choices, Generosity, Corruption perceptions, Dystopia Residual (Helliwell et al., 2023). 'Dystopia' appears to be the most important sub-indicator, which reflects the countries own perception of doing better or worse than the hypothetical country Dystopia (Carlsen, 2018). Let's explain it briefly:

- **GDP per capita**: The gross domestic product per capita of a particular country is a measure of its economic output per person which is calculated by dividing the Gross Domestic Product (GDP) of a country by its population. While not a direct measure of happiness, GDP per capita is used as an economic indicator to assess the standard of living in a country which also indicate that higher GDP per capita is often associated with a higher standard of living (*World Bank Open Data*, n.d.).

- **Social support**: This factor or variable measures the presence of social networks and supportive relationships also it reflects the extent to which individuals feel they have family, friends, and other social networks that they can rely on during times of need (Moeini et al., 2018).

- **Healthy life expectancy**: Healthy Life Expectancy is a component or factor of the overall assessment of a particular country's well-being and happiness. This indicator measures the average number of years a person can expect to live in good health, taking into account both mortality and the impact of illness or disability on the quality of life (Radkevich & Radkevich, 2018).

- **Freedom to make life choices**: This factor measure the degree of autonomy and freedom individuals have to make life choices, such as choosing their occupation, where to live, and how to spend their time (Koohborfardhaghighi et al., 2022).

- **Generosity**: Generosity effects the willingness of individuals within a society of a country to contribute to the well-being of others and engage in prosocial behaviors (Park et al., 2017).

This measures charitable giving, volunteering, and other forms of generosity within a country (Reena Basu et al., 2018).

- **Corruption perceptions**: The level of perceived corruption in a country is considered, as corruption can undermine social trust and contribute to dissatisfaction to a society which will eventually effect countries happiness (Li & An, 2020).

- **Dystopia**: Dystopia is a factor that refers to an imaginary society characterized by extreme suffering, oppression, and often a lack of individual freedoms (Helliwell et al., 2023). When considering the relationship between dystopia and the happiness index, it becomes obvious that the two are inversely related. In a dystopian society, the conditions are so unfavorable and oppressive that the overall well-being and happiness of individuals are severely compromised. variables such as restricted personal freedoms, constant observation, economic inequality, and a lack of social justice contribute to a decline in the happiness and satisfaction of the population in a country (Carlsen, 2020).

1.2 Objective of the Study

The research paper aims to investigate the relationship between the world happiness index and four selected socio-economic and environmental factors like inflation, corruption, employment, and air pollution. For this study, the author has used 218 countries data from 2012 to 2019.

Chapter 2: Literature Review

2.1 Review of the Papers

Over the years, lots of scientists have worked to understand what makes people happy and how to determine that. In this segment, we provide an overview of the research related to the world happiness index and its determinants.

Oswald (1997) concludes in their study that The economic factors like income levels, employment status, gross domestic product (GDP) per capita are related to the happiness. There is an intricate connection between subjective well-being and economic performance. The author stated in his study that there exists a significant correlation between happiness levels and economic performance, with higher levels of GDP per capita and lower unemployment rates being associated with greater subjective well-being among individuals within a society.

Tavits (2008) stated in their study the effect of corruption and representation on people's subjective well-being where they used cross national data from 68 countries survey data from 16 European democracies. In their paper they wanted to see the government performance on people's subjective well-being. The author found that citizens in countries with higher levels of corruption tend to report lower levels of subjective well-being, highlighting the detrimental impact of corrupt practices on individuals' overall satisfaction with life.

Altindag & Xu (2017) examined in their study the effect of economic growth on subjective well-being. In this paper the authors provided evidence that the difference of preference of government impacts more in subjective well-being over economic growth and institutional factors.

Intelisano et al. (2020) concludes in their study that measuring happiness, life satisfaction, and overall well-being requires a comprehensive evaluation of various factors. This assessment encompasses political elements such as GDP growth, economic conditions including financial well-being and the extent of social support available. The author also concludes in the paper that

Cultural considerations, environmental factors like air pollution and the ability to manage environmental disasters, as well as social variables including freedom of choice and the level of social support, should also be taken into consideration.

Garces et al. (2019) stated in their research paper the relationship related to the economic development indicators consisting of the variables of life expectancy (LE), expected years in schooling (EY), gross national income per capita (GNI) and the corruption perception index (CPI) of selected countries with the world happiness index (WHI). They have analyzed the data for 78 countries. In this paper the authors conclude that the Quality of life depends on the performance of countries based on the given economic ideas.

Jannani et al. (2023) concludes in their study the relationship between objective and subjective quality of life indicators and reveal the key factors affecting happiness at the international level based on the Human Development Index and the World Happiness Index. In this paper the authors found a positive relationship with the HDI (Human development index), GDP per capita, life expectancy, social support, GDP and personal income.

Artekin (2021) examined their study on what makes the changes the happiness of the people of turkey. In this paper they wanted to see the relationship of relative variables like income, employment, health, and social status with the happiness. And they found positive relationship with all the relative variables except unemployment and inflation.

Marton & Mojsejová (2022) concludes in their paper the role of direct and indirect factors like GDP, inflation, government size and expenditure, corruption, property rights, poverty, life expectancy which could have influenced subjective well-being (SWB) in European countries at national level. The authors found in this paper a positive relationship of GDP, income, property with WHI and a negative relationship of poverty, unemployment with WHI.

Su & Muhammad (2023) examined in their study the effect of contributing perimeters concerning life satisfaction and happiness. In this paper the author found that there are 9 independent variables which are related with the life satisfaction. The findings revealed some complex dynamics, suggesting that while economic stability continued to be a significant contributor to life satisfaction, the post-COVID era witnessed a heightened influence of social parameters on happiness

Ionescu-Feleagă et al. (2022) stated in their research paper the relationship between digitalization and happiness offering valuable insights from a European perspective before and during the covid 19. In this paper the author found that there is a positive and significant relationship between digitalization and happiness. The researchers also identify several factors, such as the extent of digital integration, individual attitudes towards technology, and socio-economic considerations, as influential variables shaping the connection between digitalization and happiness.

Carlsen (2020) also examined in their study the impact of the 7 indicators on Happiness and well-being. In this paper the author wanted to find out the importance of each individual indicators. The findings indicate a noteworthy examination of Denmark's exceptional position in the happiness index, which indicates the unique elements that contribute to the country's high happiness rankings. Where Dystopia, generosity and the gross domestic product are the most important elements.

Carlsen (2018) concludes in their paper the relationship between happiness and sustainability. The study employs a posetic-based data analysis, offering a unique perspective on the World Happiness Index. Author explores the notion of happiness not merely as an individual or societal metric but as a key factor in achieving sustainability goals.

2.2 Summary of the Reviews

The World Happiness Index (WHI) is a comprehensive measure that seeks to assess the overall well-being and happiness which incorporates a variety of factors that can be broadly categorized into economic, social, and environmental dimensions (Su & Muhammad, 2023). The dependent variables or factors in the context of the World Happiness Index are some indicators used to quantify and represent the well-being of individuals within a given society. Here are some variables or factors that are directly or indirectly related with WHI.

Table 2.1. Variables related with WHI.

Factor	Positive	Negative	Context
GNI Per Capita	Garces et al. (2019; Oswald (1997)		Positive: Philippines, USA
Employment	Oswald (1997)		Positive: USA
Unemployment		Artekin (2021); Marton & Mojsejová (2022); Oswald (1997)	Negative: USA, Turkey, Slovakia
Gross Domestic Product (GDP)	Artekin (2021); Carlsen (2018), (2020); Jannani et al. (2023); Marton & Mojsejová (2022); Oswald (1997); Su & Muhammad (2023)		Positive: Morocco, USA, Turkey, Slovakia, Malaysia, Denmark
Job satisfaction		Oswald (1997)	Negative: USA
Corruption	Garces et al. (2019)	Akkaya (2022); Carlsen (2018); Marton & Mojsejová (2022); Tavits (2008)	Positive: Philippines; Negative: Columbia, Slovakia, Turkey, Denmark
Generosity	Carlsen (2018), (2020)		Positive: Denmark
Life Expectancy	Carlsen (2018); Garces et al. (2019); Jannani et al. (2023); Marton & Mojsejová (2022)		Positive: Morocco, Philippines, Slovakia, Denmark
Expected Years of Schooling	Garces et al. (2019)		Positive: Philippines
HDI (Human Development Index)	Jannani et al. (2023)		Positive: Morocco
Social Support	Carlsen (2018); Jannani et al. (2023)		Positive: Morocco, Denmark

Personal Income	Artekin (2021)		Positive: Turkey
Inflation		(Artekin, 2021; Marton & Mojsejová, 2022)	Negative: Turkey, Slovakia
Sociodemographic Factors	Artekin (2021)		Positive: Turkey
Democracy	Artekin (2021)		Positive: Turkey
Poverty		Marton & Mojsejová (2022)	Negative: Slovakia
leisure activities		Marton & Mojsejová (2022)	Negative: Slovakia
Property	Marton & Mojsejová (2022)		Positive: Slovakia
Environmental factors: air pollution and inadequate resources		Marton & Mojsejová (2022); Su & Muhammad (2023)	Negative: Malaysia, Slovakia
The economic factor|: Income levels, employment status, social class, and being raised in a single-parent family.	Su & Muhammad (2023)		Positive: Malaysia
Social factors: life satisfaction	Carlsen (2018); Su & Muhammad (2023)		Positive: Malaysia, Denmark
Green innovation and environmental factors	Su & Muhammad (2023)		Positive: Malaysia
Economic policies	Su & Muhammad (2023)		Positive: Malaysia
Digital Economy and Society Index (DESI)	Ionescu-Feleagă et al. (2022)		Positive: Switzerland

GNI Per Capita: Gross National Income (GNI) per capita is a measure used to evaluate and compare the average economic performance and standard of living of individuals within a country. Garces et al. (2019); Oswald (1997) said in their study that there is a positive relationship with subjective well-being.

Employment: Employment is the exchange of services for compensation between an individual and an organization. Oswald (1997) said in his study that there is a positive relationship between employment and happiness.

Unemployment: Unemployment refers to a situation where individuals who are willing and able to work cannot find suitable employment opportunities. Artekin (2021); Marton & Mojsejová (2022); Oswald (1997) concludes in their study that there is a negative relationship with happiness.

Gross Domestic Product (GDP): Gross Domestic Product (GDP) is a measure used to gauge the economic performance of a country. It represents the total value of all goods and services produced within the borders of a country during a specific period, typically a year or a quarter. Essentially, GDP reflects the economic output generated by the labor and capital within a nation. Artekin (2021); Carlsen (2018), (2020); Jannani et al. (2023); Marton & Mojsejová (2022); Oswald (1997); Su & Muhammad (2023) stated in their study that there is a positive relationship with subjective well-being.

Job satisfaction: Job satisfaction is the contentment and fulfillment an individual experience in their work environment. Oswald (1997) concludes in his study that there is a negative relationship with Happiness.

Corruption: Corruption is like a cancer that eats away at the fabric of society. It's when individuals in positions of power or influence abuse their authority for personal gain or advantage. Akkaya (2022); Carlsen (2018); Marton & Mojsejová (2022); Tavits (2008) stated in their study that there is a negative relationship with subjective well-being but Garces et al. (2019) concludes that there is a positive relationship with happiness. For this reason, there is an uncertain decision regarding this factor.

Generosity: Generosity is the genuine act of giving without expecting anything in return. It's the selfless inclination to share one's resources, time, or talents with others in need. Carlsen (2018), (2020) concludes that there is a positive relationship with happiness.

Life Expectancy: Life expectancy refers to the average number of years a person is expected to live based on various factors such as their birth year, current age, gender, health conditions, and socioeconomic status. Carlsen (2018); Garces et al. (2019); Jannani et al. (2023); Marton & Mojsejová (2022) stated in their study that there is a positive relationship with subjective well-being.

Expected Years of Schooling: Expected years of schooling refers to the average number of years a child is expected to spend in formal education based on current enrollment rates and educational policies within a particular country or region. Garces et al. (2019) stated in their study that there is a positive relationship with happiness.

HDI (Human Development Index): The Human Development Index (HDI) is a measure used to assess the well-being and development of a country's population. Jannani et al. (2023) said in their study that there is a positive relationship with happiness.

Social Support: Social support refers to the network of relationships and resources available to individuals that provide them with emotional, informational, or instrumental assistance during times of need. Carlsen (2018); Jannani et al. (2023) concludes in their study that there is a positive relationship with happiness.

Inflation: Inflation is like a sneaky thief that quietly steals the purchasing power of your money over time. Artekin (2021); Marton & Mojsejová (2022) stated in their study that there is a negative relationship with subjective well-being.

Sociodemographic Factors: Sociodemographic factors refer to the various characteristics of a population or a group of people that are used to understand their social and economic status, as well as their behavior and attitudes. Artekin (2021) concludes in their study that there is a positive relationship with happiness.

Democracy: Democracy is a system of governance where power resides in the hands of the people. Artekin (2021) concludes in their study that there is a positive relationship subjective well-being.

Poverty: Poverty is more than just a lack of material possessions; it's a pervasive condition that deprives individuals and communities of basic necessities and opportunities. Marton & Mojsejová (2022) concludes in their study that there is a negative relationship with happiness.

leisure activities: Leisure activities encompass a wide array of pursuits and pastimes that individuals engage in during their free time, outside of work or obligations. Marton & Mojsejová (2022) stated in their study that there is a negative relationship with happiness.

Environmental factors: Environmental factors refer to all the elements and conditions in the natural world like air pollution and inadequate resources that can influence living organisms,

ecosystems, and human activities. Marton & Mojsejová (2022; Su & Muhammad (2023) concludes in their study that there is a negative relationship with happiness.

Social factors: Social factors refer to the various elements within a society like life satisfaction that influence individuals' behaviors, beliefs, and interactions. Carlsen (2018); Su & Muhammad (2023) stated in their study that there is a positive relationship with subjective well-being.

Green innovation and environmental factors: Green innovation refers to the development and implementation of new ideas, technologies, and practices that aim to minimize negative impacts on the environment while promoting sustainability. Su & Muhammad (2023) concludes in their study that there is a positive relationship with happiness.

Economic policies: Economic policies are strategies and actions implemented by governments or monetary authorities to influence the overall functioning and performance of an economy. Su & Muhammad (2023) stated in their study that there is a positive relationship with happiness.

Digital Economy and Society Index (DESI): Digital Economy and Society Index (DESI) is a comprehensive tool designed to measure the digital performance and progress of European countries. Ionescu-Feleagă et al. (2022) concludes in their study that there is a positive relationship with Digital Economy and Society Index (DESI) and subjective well-being.

Chapter 3: Data and Methodology

For completing this research paper, the researcher performed an analysis to see the relationship among inflation, corruption, employment, air pollution, and world happiness index. For doing that a comprehensive analysis of the data is conducted using statistical techniques by which the researcher can identify the correlation among inflation, corruption, employment, environment factor like: air pollution, and world happiness index.

3.1 Sample

For this research project, most of the data (inflation, corruption, employment, air pollution) were retrieved from world data bank (*DataBank | The World Bank*, n.d.) an organization which is formed by the governments of member nations and happiness index data were collected from world happiness report (*World Happiness Report*, 2023) which is published by the Sustainable Development Solutions Network division of the UN. A comprehensive dataset comprising information from 218 countries was largely collected from the World Data Bank were the researcher considered 4 selective variables. The dataset spans from 2012 to 2019 for both world bank data and world happiness data which is providing a robust temporal dimension to this analysis.

3.2 Data

In this research paper, the author used secondary data to analyses the findings and give it a conclusion. Pre-existing data that has been gathered by others for objectives other than the current research goal is referred to as secondary data. Basically this is not the first hand data. These kind of data were used by someone else for other purpose. In this research paper the author used 5 kind of variables to see the relationship among the variables. Those are:

- World happiness index (WHI): The world happiness data were collected from the world happiness report (*World Happiness Report*, 2023). Every year the united nation publishes this report. From 2012 they have started this. Based on the data worlds happiest counties were chosen by the UN.

- Inflation (INF): The inflation data were collected from the world data bank (*World Development Indicators | DataBank*, n.d.-a). In the world data bank this data is given in

the name of "Inflation customer prices (annual %)". The author has taken the data from 2012 to 2019.

- Corruption (COR): The corruption data were collected from the world data bank (*World Development Indicators | DataBank*, n.d.-b). In the world data bank, the data in given in the name of "CPIA transparency accountability and corruption in the public sector rating 1=low to 6=high". The author has taken the data from 2012 to 2019.

- Employment (EMP): The employment data were collected from the world data bank (*World Development Indicators | DataBank*, n.d.-c). In the world data bank the data was given in the name of "employers total (% of total employments) (modeled ILO estimate)". The author has taken the data from 2012 to 2019.

- Air pollution (AIP): The employment data were collected from the world data bank (*World Development Indicators | DataBank*, n.d.-d). In the world data bank the data is given in the name of "PM2.5 air pollution mean annual exposure (micrograms per cubic meters)". The author has taken the data from 2012 to 2019.

3.3 Data Analysis

The data that the author collected were in different forms. For this reason, the dataset has to be change in the standardize from. Standardizing data is a process used in statistics and data analysis to transform variables to have a mean of 0 and a standard deviation of 1. The formula for standardizing a dataset is: $Z = (x-\mu)/\sigma$ where z is the standardized value, x is the original data point, μ is the mean of the dataset, σ is the standard deviation of the dataset (Elen & Avuçlu, 2021). This transformation ensures that all variables are on the same scale, which facilitates comparison and interpretation. To do this standardization the author has used the "Microsoft excel where he used a formula called "=STANDARDIZE(x, mean, standard_dev)".

The study utilized the correlational method to see the relationship among the 5 variables. The correlational method is a research technique used to examine the relationship between two or more variables without manipulating them (Godfrey, 1980). These test were utilized to establish significant relationships among the identified variables using a 5% level of significance. To do this correlation analysis the author has used a software called "Gretl" which can assist in correlation analysis by facilitating the extraction, transformation, and loading of data from various sources into a central repository for analysis.

Chapter 4: Results and Discussions

4.1 Results

4.1.1 Descriptive statistics

In this part of the study the author has showed the descriptive analysis of inflation, corruption, employment, air pollution, and world happiness index. Where minimum value, maximum value, mean value and standard deviation of each debarments has been calculated. To complete this process, the author has used a statistics software named (IBM SPSS).

Table 4.1. Descriptive statistics of inflation, corruption, employment, air pollution, happiness index

Variables	N	Minimum	Maximum	Mean	Std. Deviation
inflation	324	-4.294	379.999	8.772	28.210
corruption	324	1.5	4.5	2.753	.5789
employment	324	.0489	12.7809	2.299	2.436
air_pollution	324	13.388	91.492	43.401	17.779
happiness_index	324	2.838	7.499	4.515	.810
Valid N (listwise)	324				

From the descriptive analysis it has been seen that, inflation has a total 324 variables where the minimum value is -4.294, maximum value is 379.99, Mean value is 8.772 and std. deviation is 28.2104. For corruption the author has used 324 variables where the minimum value is 1.5, maximum value is 4.5, mean value is 2.753 and std. deviation is .5789. Talking about the employment there are 324 variables are used where the minimum value is .0489, maximum value is 12.7809, mean value is 2.299 and std. deviation is 2.436. After that, there is environmental factor: air pollution where the author has used 324 variables. Here the minimum value is 13.388, maximum value is 91.492, mean value is 43.401 and std. deviation is 17.779. Lastly there is

Happiness index. Here the no of total variables is 324. The minimum value is 2.838, maximum value is 7.499, mean value is 4.515 and std. deviation is .8104.

4.1.2 Distribution of the world happiness index (WHI)

By seeing the distribution of the World Happiness Index (WHI) people can tell about how happy people are around the world. Here the author has shown a visual representation of the World happiness index (WHI).
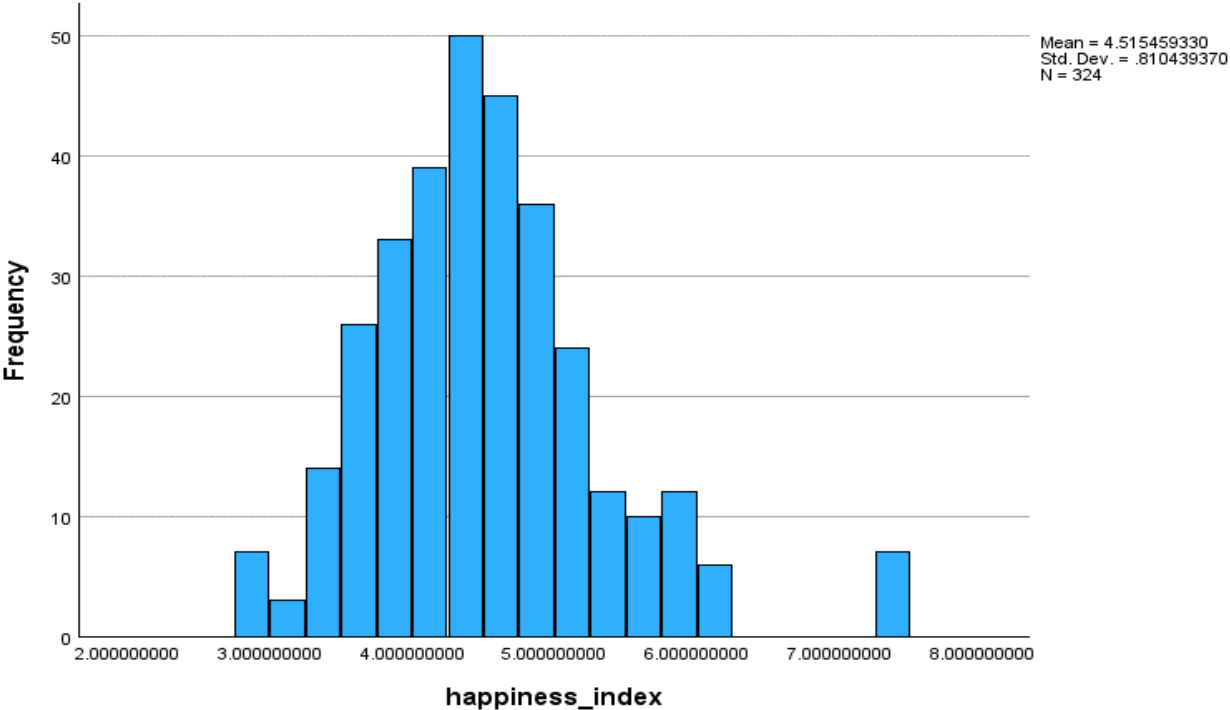
Figure 4.1. Visual representation of World Happiness index (WHI).

4.1.3 Correlation and results

In this research paper, the author has used the correlation matrix to calculate the relation among inflation, corruption, employment, air pollution, and world happiness index. The correlation analysis among inflation, corruption, employment, air pollution, and world happiness index. in Table 4.2 and Figure 4.2.

Correlation coefficients, using the observations 1 - 324
5% critical value (two-tailed) = 0.1090 for n = 324

Table 4.2. Correlations among inflation, corruption, employment, air pollution, and world happiness index.

INF	COR	EMP	AIP	WHI	
1.0000	-0.2191***	0.0116*	-0.0557*	-0.1074*	INF
	1.0000	-0.1214**	0.1397**	0.1054*	COR
		1.0000	-0.1050*	0.2864***	EMP
			1.0000	-0.0927*	AIP
				1.0000	WHI

Note: INF referred as inflation, **COR** referred as corruption, **EMP** referred as employment, **AIP** referred as air pollution and **WHI** referred as World happiness index. *, **, *** referred as 10%,5%,1% significance level.
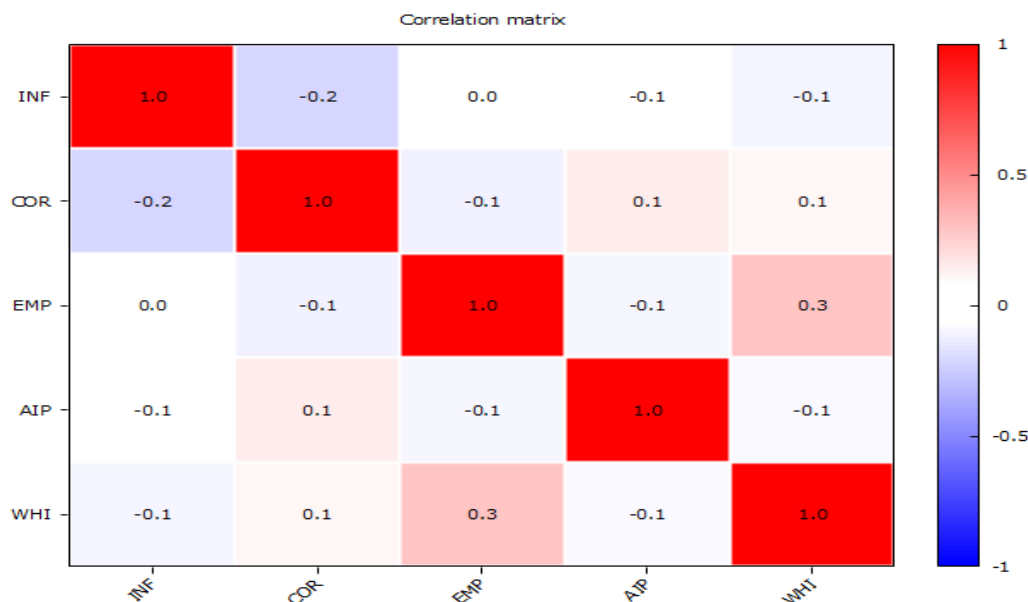
Figure 4.2. Visual representation of Correlations among inflation, corruption, employment, air pollution, and world happiness index.

By analyzing the result, it has been seen that, all the variables are significantly related with happiness index. The author did the correlation analysis with 10%, 5% and 1% significant level. The correlation coefficient of -0.1074 is a very weak negative relationship between inflation and the World Happiness Index. This means that as inflation increases, there is a slight tendency for the happiness index to decrease, though the correlation is not strong enough to imply a significant impact on happiness levels. After that, with a correlation coefficient of 0.1054, there's again a very weak positive relationship between corruption and the World Happiness Index. This indicates that as corruption levels increase, there's a slight tendency for the happiness index to also increase, but again, the correlation is quite weak and may not have a substantial impact on overall happiness. Thirdly, the correlation coefficient of 0.2864 signifies a moderate positive relationship between employment and the World Happiness Index. This variable is the most significant variable with world happiness index. The result suggests that, as employment rates rise, there's a notable tendency for the happiness index to increase as well. This correlation indicates that employment status may have a more significant impact on happiness levels compared to inflation or corruption. Finally, the correlation coefficient of -0.0927 implies a very weak negative relationship between air pollution and the World Happiness Index. This indicates that as air pollution levels increase, there's a slight tendency for the happiness index to decrease, but similar to the other factors, the correlation is quite weak and may not strongly influence overall happiness levels.

4.2 Discussions

Many Individuals from different country believe that, they are satisfied and happy in their life. But it changes their perception when researcher comes with different outputs. There are so many variables that impact people's satisfaction and happiness that people don't know. In this research paper the researcher has analyzed that how happiness is correlated with inflation, corruption, employment, air pollution. Talking about the inflation Artekin (2021); Marton & Mojsejová (2022) stated in their study that inflation has a negative relationship with happiness. This research paper found the same result and agree with their conclusion. But when it comes to the corruption Akkaya (2022); Carlsen (2018); Marton & Mojsejová (2022); Tavits (2008) found in their research paper that there is a negative relationship with happiness. But Garces et al. (2019) concludes in his study corruption has a positive relation with happiness. This research paper has also found corruption has a positive relationship with happiness. After that, Oswald (1997) found in their study that

employment has a positive relationship with happiness. In this research paper the author also found the employment has positive relationship with happiness index. The author also found that there is a negative relationship with environmental factor: air pollution and happiness index. Simultaneously Marton & Mojsejová (2022); Su & Muhammad (2023) agreed with the same result in their study.

Chapter 5: Conclusion

A central question that all over the people wants to ask, "What does the happiness depends on?" To know this answer, the author did an analysis to see the relationship among happiness and some selected socio-economic and environmental factors: inflation, corruption, employment, and air pollution. Through thorough correlation analysis, intriguing patterns emerged. The author observed a modest negative correlation between happiness and inflation, implying that as inflation rises, happiness tends to slightly decrease. Conversely, a slight positive correlation was noted between happiness and corruption, suggesting that in contexts where corruption is more prevalent, happiness levels might see a marginal uptick. Moreover, a more notable positive correlation surfaced between happiness and employment, indicating that as employment rates rise, so does overall happiness. However, a concerning negative correlation was evident between happiness and air pollution, implying that as air quality worsens, happiness tends to decline. These findings underscore the complex interplay between societal factors and happiness levels, emphasizing the multifaceted nature of well-being. While the correlations the author identified may seem subtle, but these findings show the potential areas for policy intervention and societal improvement. For instance, efforts to curb inflation and reduce air pollution could yield positive effects on happiness levels within communities. Additionally, addressing corruption and fostering employment opportunities may contribute to enhanced well-being on a broader scale. Ultimately, this research underscores the importance of considering various socio-economic factors when striving to understand and improve societal happiness. As people navigate the complexities of their modern world, acknowledging these correlations offers valuable insights for promoting greater happiness and prosperity for all.

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Appendix-A

The data of the indicators included in the study are presented below:

Countries	Year's	Inflation	Corruption	Employment	Air_Pollution	Happiness_Index
Afghanistan	2012	6.441213	2	1.054247	54.70023	4.25835
Afghanistan	2013	7.385772	2	1.26199	58.79166	4.04
Afghanistan	2015	-0.66171	2	1.815164	60.59701	3.575
Afghanistan	2016	4.383892	2	2.188389	57.2037	3.36
Afghanistan	2017	4.975952	2	2.619621	53.35536	3.794
Afghanistan	2018	0.626149	2	2.308126	52.80462	3.6315
Afghanistan	2019	2.302373	2	2.019602	52.41704	3.2033
Angola	2012	10.2779	2.5	4.400979	29.11116	4.17838
Angola	2013	8.777814	2.5	4.604081	29.20984	5.589
Armenia	2012	2.55802	3.5	0.537105	40.53562	4.473529
Armenia	2013	5.789668	3.5	0.462205	38.41539	4.316
Bangladesh	2012	6.217504	2.5	0.516007	68.94271	4.807098
Bangladesh	2013	7.530406	2.5	0.78748	66.42738	4.804
Bangladesh	2015	6.19428	2.5	1.815346	68.97034	4.694
Bangladesh	2016	5.513526	2.5	2.731012	67.76736	4.643
Bangladesh	2017	5.70207	2.5	4.464744	62.75318	4.608
Bangladesh	2018	5.543621	2.5	4.846911	63.27546	4.5004
Bangladesh	2019	5.591996	2.5	5.239479	63.42553	4.4558
Benin	2012	6.744683	3.5	1.276098	43.41597	3.492997
Benin	2013	0.428889	3.5	1.299532	39.17881	3.528
Benin	2015	0.218786	3.5	1.319733	49.03491	3.34
Benin	2016	-0.79405	3.5	1.390107	46.48119	3.484
Benin	2017	1.769412	3.5	1.402948	45.03636	3.657
Benin	2018	0.644804	3.5	1.423065	46.24556	4.1414
Benin	2019	-0.70503	3.5	1.436005	46.85846	4.8832
Bhutan	2015	4.548144	4.5	0.083813	44.48292	5.253
Bhutan	2016	3.219887	4.5	0.088883	43.64905	5.196
Bhutan	2017	4.955084	4.5	0.092811	40.16357	5.011
Bhutan	2018	2.723964	4.5	0.096568	40.41256	5.0821
Bhutan	2019	2.72643	4.5	0.101828	40.2986	5.0821
Bolivia	2012	4.515603	3.5	6.764091	27.74732	5.633493
Bolivia	2013	5.7364	3.5	5.576256	26.09199	5.857
Bolivia	2015	4.05961	3	4.517	28.74198	5.89
Burkina Faso	2012	3.818152	3.5	0.703641	54.18097	3.926028
Burkina Faso	2013	0.533739	3.5	0.673831	47.34169	4.259

Burkina Faso	2015	0.724839	3.5	0.647114	60.27252	3.587
Burkina Faso	2016	0.441041	3.5	0.640882	56.22888	3.739
Burkina Faso	2017	1.482999	3.5	0.621811	53.53073	4.032
Burkina Faso	2018	1.955943	3.5	0.644536	53.64968	4.4244
Burkina Faso	2019	-3.23339	3.5	0.609408	53.67034	4.5868
Burundi	2012	18.16105	2	1.174244	37.10546	3.67756
Burundi	2013	7.937958	2	1.144975	35.06836	3.706
Burundi	2015	5.544689	2	1.290628	35.79366	2.905
Burundi	2016	5.55769	2	1.288713	35.48687	2.905
Burundi	2017	16.05254	1.5	1.269212	32.86251	2.905
Burundi	2018	-2.8147	1.5	1.268331	33.76643	2.9045
Burundi	2019	-0.68677	1.5	1.25217	33.27978	3.7753
Cambodia	2012	2.934316	2	0.160966	24.96953	4.100715
Cambodia	2013	2.941625	2	0.162131	28.0675	4.067
Cambodia	2015	1.223932	2	0.101965	24.0552	3.819
Cambodia	2016	3.01914	2	0.074291	24.82503	3.907
Cambodia	2017	2.912636	2	0.128242	22.01765	4.168
Cambodia	2018	2.459085	1.5	0.122316	22.29493	4.4326
Cambodia	2019	1.942575	1.5	0.120606	22.11209	4.6998
Cameroon	2012	2.735297	2.5	2.893248	61.32736	4.375735
Cameroon	2013	2.050347	2.5	2.986449	56.76664	4.42
Cameroon	2015	2.676235	2.5	3.098561	69.51058	4.252
Cameroon	2016	0.87419	2.5	3.106404	65.05643	4.513
Cameroon	2017	0.640409	2.5	3.091591	62.31536	4.695
Cameroon	2018	1.068858	2.5	3.089725	63.831	4.9753
Cameroon	2019	2.452802	2.5	3.079614	64.47088	5.0437
Central African Republic	2012	5.478296	2.5	0.580281	47.17215	7.499089
Central African Republic	2013	6.988793	2.5	0.50095	44.72632	7.477
Central African Republic	2015	1.40297	2.5	0.619853	48.22092	7.427
Central African Republic	2016	4.945433	2.5	0.655415	45.52426	7.404
Central African Republic	2017	4.180723	2.5	0.684208	44.38823	7.316
Central African Republic	2018	1.612157	2.5	0.69688	46.10882	7.3285
Central African Republic	2019	2.685374	2.5	0.866518	46.37675	7.2781
Chad	2012	7.516624	2	0.688853	59.86167	3.919401
Chad	2013	0.222672	2	0.716091	55.79298	4.056
Chad	2015	4.377127	2.5	0.888877	63.96919	3.667
Chad	2016	-0.79244	2.5	0.994442	59.85639	3.763
Chad	2017	-1.5371	2.5	1.084054	59.52256	3.936
Chad	2018	4.274622	2.5	1.167698	59.20017	4.3006

Chad	2019	-0.97194	2.5	1.220916	59.28252	4.3495
Comoros	2013	-4.29487	2.5	1.145022	17.73412	3.851
Congo, Dem. Rep.	2013	0.808223	2	1.992063	38.18559	4.578
Congo, Dem. Rep.	2015	0.744199	2	1.969562	40.27108	4.517
Congo, Dem. Rep.	2016	2.885851	2	2.019575	37.92861	4.272
Congo, Rep.	2012	5.010188	2	1.101954	39.05648	3.819792
Congo, Rep.	2013	4.631616	2	1.096382	41.03303	4.297
Congo, Rep.	2015	3.169098	2	1.121886	41.60346	3.989
Congo, Rep.	2016	3.190562	2	1.132696	40.36513	4.236
Congo, Rep.	2017	0.450064	2	1.090432	38.36896	4.291
Congo, Rep.	2018	1.152779	2	1.042899	39.50959	4.5587
Congo, Rep.	2019	2.206073	2	1.020886	39.30341	4.8115
Cote d'Ivoire	2012	1.304511	2.5	0.938038	56.69823	4.197182
Cote d'Ivoire	2015	1.2515	3	1.501813	63.41108	3.655
Cote d'Ivoire	2016	0.723178	3	1.97798	61.24646	3.916
Cote d'Ivoire	2017	0.685881	3	1.549045	55.04316	4.18
Cote d'Ivoire	2018	0.359409	3	1.627021	55.59822	4.6712
Cote d'Ivoire	2019	-1.10686	3.5	1.648709	55.62337	4.9438
Djibouti	2012	3.73121	2.5	4.837468	47.01195	4.956731
Djibouti	2013	2.706032	2.5	4.514324	46.2603	4.69
Djibouti	2015	-0.84739	2.5	4.446205	44.89785	4.369
Ethiopia	2013	7.464022	3	0.501136	35.36549	4.561
Ethiopia	2015	9.5689	3	0.484455	34.42531	4.512
Ethiopia	2016	6.628133	3	0.447042	33.61503	4.508
Ethiopia	2017	10.68712	3	0.445188	33.94833	4.46
Ethiopia	2018	13.83304	3	0.457854	33.85373	4.3502
Ethiopia	2019	15.80963	3	0.475565	33.78072	4.2858
Gambia, The	2019	7.115676	2.5	1.710504	58.08072	4.5163
Georgia	2012	-0.94366	3.5	1.568473	20.13867	3.892324
Georgia	2013	-0.51206	3.5	1.367935	19.58916	4.187
Ghana	2012	11.18634	4	5.291358	54.52707	4.704951
Ghana	2013	11.66619	4	5.371994	47.78909	5.091
Ghana	2015	17.14997	3.5	5.608618	60.48228	4.633
Ghana	2016	17.45463	3	5.632838	59.66162	4.276
Ghana	2017	12.37192	3.5	5.601113	55.93673	4.12
Ghana	2018	7.808765	3.5	5.614462	54.23686	4.657
Ghana	2019	7.14364	3.5	5.606984	53.98926	4.9963
Guinea	2012	15.22629	2	1.454073	52.85547	5.992826
Guinea	2013	11.88759	2.5	1.279872	45.97257	3.847
Guinea	2015	11.78008	2.5	1.298108	56.2136	3.656
Guinea	2016	8.172681	2.5	1.432879	53.58936	3.607

Guinea	2017	8.914359	2.5	1.521994	53.48752	3.507
Guinea	2018	9.827617	2.5	1.52954	52.44233	3.9641
Guinea	2019	9.47001	2.5	1.543808	52.51253	4.5344
Haiti	2013	4.765024	2.5	0.724371	18.71625	4.341
Haiti	2015	6.731841	2.5	0.718949	19.88015	4.518
Haiti	2016	11.50291	2.5	0.721472	19.1493	4.028
Haiti	2017	10.68009	2.5	0.724253	19.12975	3.603
Haiti	2018	12.48141	2.5	0.724375	19.14097	3.582
Haiti	2019	18.70378	2.5	0.715496	19.03231	3.5969
Honduras	2012	5.196186	3	11.61365	25.51904	5.564011
Honduras	2013	5.161899	3	12.78095	28.04344	5.142
Honduras	2015	3.157831	3	9.666144	26.72227	4.788
Honduras	2016	2.724612	3	10.9993	24.75522	4.871
Honduras	2017	3.934361	3	11.58656	22.74897	5.181
Honduras	2018	4.347349	3	9.966967	23.36239	5.504
Honduras	2019	4.365872	2.5	10.16824	22.87512	5.8604
India	2012	9.478997	3.5	1.527804	86.38168	4.974501
India	2013	10.01788	3.5	1.588043	89.45226	4.772
Kenya	2012	9.377767	3	1.727031	29.07805	4.180273
Kenya	2013	5.717494	3	1.708041	28.08814	4.403
Kenya	2015	6.582174	3	1.663589	28.08947	4.419
Kenya	2016	6.297158	3	1.628801	26.88968	4.356
Kenya	2017	8.005723	3	1.607276	25.06404	4.553
Kenya	2018	4.68982	3	1.589135	23.28569	4.4097
Kenya	2019	5.23586	3	1.568019	21.61459	4.5086
Kyrgyz Republic	2012	2.768442	3	0.818174	27.65706	4.828298
Kyrgyz Republic	2013	6.613752	3	1.372262	28.7751	5.042
Kyrgyz Republic	2015	6.503318	3	1.831656	25.33994	5.286
Kyrgyz Republic	2016	0.388838	3	2.531308	24.71004	5.185
Kyrgyz Republic	2017	3.17531	3	1.595312	24.0967	5.004
Kyrgyz Republic	2018	1.542661	3	2.026614	24.22386	5.1308
Kyrgyz Republic	2019	1.133623	3	2.006108	24.07289	5.2607
Lao PDR	2012	4.255127	2.5	0.519377	22.9931	5.161074
Lao PDR	2013	6.371427	2.5	0.543006	24.6697	4.787
Lao PDR	2015	1.277354	2.5	0.55085	20.7819	4.876
Lao PDR	2016	1.596912	2.5	0.55309	23.40354	4.876
Lao PDR	2018	2.040393	2.5	0.561733	20.50575	4.6231
Lao PDR	2019	3.322559	2.5	0.561202	20.54734	4.7963
Lesotho	2013	4.865119	3.5	3.12165	31.82818	4.898

Lesotho	2015	3.218445	3	3.026482	32.06283	4.898
Lesotho	2017	4.447699	3	3.059531	29.79041	3.808
Lesotho	2018	4.751803	3	3.022076	28.73518	3.8082
Lesotho	2019	5.187084	3	3.003403	27.52281	3.8019
Liberia	2012	6.831787	3	1.820724	49.167	4.039651
Liberia	2013	7.577307	3	1.554487	44.14587	4.196
Liberia	2015	7.748697	3	1.564144	55.99663	4.571
Liberia	2016	8.834249	3	1.507559	54.71187	3.622
Liberia	2017	12.41963	3	1.516504	48.31233	3.533
Liberia	2018	23.56351	2.5	1.52045	50.40175	3.4954
Liberia	2019		2.5	1.420779	50.59974	3.9753
Mali	2012	5.323128	3	0.544961	63.43016	3.966874
Mali	2013	-0.60674	3	0.536455	52.78017	4.247
Mali	2015	1.450691	3	0.568661	65.82961	3.995
Mali	2016	-1.79965	3	0.962386	60.6151	4.073
Mali	2017	1.759857	3	0.802503	61.60379	4.19
Mali	2018	0.299547	3	0.594537	60.53458	4.447
Mali	2019	-1.65827	3	0.603851	60.62414	4.3904
Mauritania	2012	4.902427	2.5	2.663645	70.24165	4.64289
Mauritania	2013	4.129102	2.5	2.875531	60.78226	4.758
Mauritania	2015	3.254727	3	3.433015	71.46707	4.436
Mauritania	2016	1.47171	3	3.67886	66.48828	4.201
Mauritania	2017	2.254277	3	3.975628	69.63359	4.292
Mauritania	2018	3.06736	3	4.0245	66.65394	4.3555
Mauritania	2019	2.300093	3	4.040474	66.81178	4.4903
Moldova	2012	4.546334	3.5	0.554774	17.99706	5.3054
Moldova	2013	4.597879	3.5	0.728149	17.57367	5.791
Moldova	2015	9.67624	2.5	0.508688	16.12818	5.889
Moldova	2016	6.359309	2.5	0.576076	14.73766	5.897
Moldova	2017	6.57023	2.5	0.340712	13.38884	5.838
Moldova	2018	3.045054	2.5	0.352872	13.90585	5.6397
Moldova	2019	4.837784	2.5	0.410385	13.7474	5.5285
Mongolia	2012	14.33033	3.5	0.871502	40.4659	4.562082
Mongolia	2013	10.49066	3.5	1.147987	37.88969	4.834
Mongolia	2015	5.735683	3.5	1.341225	37.1555	4.874
Mongolia	2016	0.733272	3.5	1.483068	39.37772	4.907
Mongolia	2017	4.301431	3.5	0.982089	35.95617	4.955
Mongolia	2018	6.824248	3	1.472646	37.47249	5.1246
Mongolia	2019	7.30107	3	1.434051	38.05757	5.2854
Mozambique	2012	2.602455	3	2.970573	23.59782	4.692764
Mozambique	2013	4.261353	3	2.702502	23.70516	4.971
Mozambique	2015	3.55076	2.5	2.370148	24.01223	4.971
Mozambique	2017	15.11321	2.5	2.491371	22.1397	4.55

Mozambique	2018	3.911334	2.5	2.747589	21.542	4.4166
Mozambique	2019	2.802703	2.5	2.811815	20.77407	4.4662
Myanmar	2013	5.643039	2.5	2.889902	36.13454	4.439
Myanmar	2015	9.454172	3	2.938259	31.18147	4.307
Myanmar	2016	6.928825	3	2.937823	32.41347	4.395
Myanmar	2017	4.572537	2.5	2.941285	29.10399	4.545
Myanmar	2018	6.872329	2.5	4.30106	29.57682	4.3078
Myanmar	2019	8.825067	2.5	2.497746	29.43314	4.3604
Nepal	2012	9.45981	3	0.989585	86.9939	4.474119
Nepal	2013	9.040163	3	0.995989	86.35564	4.156
Nepal	2015	7.868909	3	1.030854	88.68735	4.514
Nepal	2016	8.790343	3	1.033694	91.4927	4.793
Nepal	2017	3.627096	3	1.050866	80.62597	4.962
Nepal	2018	4.061163	3	1.057096	82.68815	4.8804
Nepal	2019	5.568685	3	1.06947	83.10319	4.9127
Nicaragua	2012	7.193551	2.5	4.822211	21.51418	5.114866
Nicaragua	2013	7.135468	3	5.131275	23.46972	5.507
Nicaragua	2015	3.99738	3	5.486397	21.89484	5.828
Nicaragua	2016	3.523173	2.5	5.541097	21.1066	5.992
Nicaragua	2017	3.850672	2.5	5.55178	19.79808	6.071
Nicaragua	2018	4.947237	2.5	5.557948	20.55767	6.141
Nicaragua	2019	5.37629	2.5	5.565716	20.43901	6.105
Niger	2012	0.45509	3	1.027191	78.61511	4.121817
Niger	2013	2.297231	3	0.85396	70.63492	4.152
Niger	2015	-0.57609	3	0.684672	87.52219	3.845
Niger	2016	1.653889	3	0.740159	85.25195	3.856
Niger	2017	2.796373	3	0.719092	78.03894	4.028
Niger	2018	2.967604	3	0.738607	79.91206	4.1655
Niger	2019	-2.48979	3	0.739232	80.10927	4.6275
Nigeria	2012	12.22424	3	2.096617	67.36462	4.855947
Nigeria	2013	8.495518	3	2.105763	59.6854	5.248
Nigeria	2015	9.009435	3	2.090237	76.05337	5.268
Nigeria	2016	15.69681	3	2.073105	69.62588	4.875
Nigeria	2017	16.50227	3	2.04853	69.12075	5.074
Nigeria	2018	12.09511	3	2.055562	69.82257	5.1554
Nigeria	2019	11.39642	3	2.044358	70.39626	5.2646
Pakistan	2012	9.682352	2.5	1.394499	65.41081	5.1487
Pakistan	2013	7.692156	2.5	1.301215	66.84635	5.292
Pakistan	2015	2.529328	3	1.413853	66.92975	5.194
Pakistan	2016	3.765119	3	1.333067	68.71764	5.132
Pakistan	2017	4.085374	3	1.370121	61.75482	5.269
Pakistan	2018	5.078057	3	1.409443	62.39701	5.4725
Pakistan	2019	10.57836	3	1.414077	62.57425	5.653

Rwanda	2012	10.27102	3.5	0.05292	40.28932	4.203909
Rwanda	2013	5.924269	3.5	0.052826	38.04488	3.715
Rwanda	2015	2.528503	3.5	0.051073	38.64242	3.465
Rwanda	2016	7.174343	3.5	0.049359	38.4851	3.515
Rwanda	2017	8.279537	3.5	0.04994	35.57288	3.471
Rwanda	2018	-0.31121	3.5	0.050755	36.66002	3.4081
Rwanda	2019	3.347877	3.5	0.048912	36.18492	3.3338
Senegal	2012	1.418229	3.5	0.816332	64.50906	4.414183
Senegal	2013	0.710245	3.5	0.828233	53.04187	3.959
Senegal	2015	0.135212	3.5	0.844045	65.39362	3.904
Senegal	2016	0.837285	3.5	1.697358	59.47931	4.219
Senegal	2017	1.318153	3.5	1.868641	63.42037	4.535
Senegal	2018	0.460986	3.5	1.848879	60.08271	4.6311
Senegal	2019	1.760112	3.5	1.820395	60.2114	4.6811
Sierra Leone	2012	6.587762	3	2.521166	49.58465	3.585802
Sierra Leone	2013	5.524129	3	2.562352	44.13942	4.318
Sierra Leone	2015	6.689436	3	2.509383	55.08583	4.507
Sierra Leone	2016	10.88606	3	2.412564	53.91337	4.635
Sierra Leone	2017	18.22151	3	2.6356	50.18179	4.709
Sierra Leone	2018	16.02954	3	2.794484	50.86842	4.5706
Sierra Leone	2019	14.805	3	2.916665	51.09607	4.3742
South Sudan	2016	379.9996	1.5	1.910915	37.94147	3.832
South Sudan	2017	187.8516	1.5	1.773452	38.6629	3.591
South Sudan	2018	83.50153	1.5	1.709975	37.97706	3.2542
South Sudan	2019	87.24136	1.5	1.533241	37.55278	2.8526
Sri Lanka	2012	7.542914	3	2.842858	22.42415	4.25961
Sri Lanka	2013	6.90845	3	3.018877	22.99524	4.151
Sri Lanka	2015	3.768368	3	3.103	18.97034	4.271
Sri Lanka	2019	3.528394	3	2.770096	19.9644	4.3659
Sudan	2013	36.52234	1.5	4.969572	52.48658	4.401
Sudan	2015	16.90957	1.5	4.973264	52.80307	4.55
Sudan	2016	17.75025	1.5	5.101022	51.51146	4.139
Sudan	2017	32.35163	1.5	5.051312	53.48836	4.139
Sudan	2018	63.29251	1.5	5.311079	53.77109	4.1387
Tajikistan	2012	5.831166	2.5	3.510955	41.23015	4.613789
Tajikistan	2013	5.009646	2.5	3.528062	42.28232	4.38
Tajikistan	2015	5.714559	2.5	3.497519	38.97319	4.786
Tajikistan	2016	6.004581	2.5	3.506444	38.1368	4.996
Tanzania	2012	16.00109	3	1.95659	28.91643	3.800163
Tanzania	2013	7.870724	3	2.296714	27.8469	3.77
Tanzania	2015	5.58817	3	2.683237	28.36615	3.781
Tanzania	2016	5.174766	3	2.789575	27.819	3.666
Tanzania	2017	5.318716	3	2.871263	25.32633	3.349

Tanzania	2018	3.494458	2.5	2.932508	25.50348	3.3035
Tanzania	2019	3.464281	3	2.991301	24.74048	3.2307
Togo	2012	2.577182	2.5	1.49877	45.21821	3.007487
Togo	2013	1.825395	2.5	1.511121	40.29246	2.936
Togo	2015	2.585004	2.5	1.379343	51.06406	2.839
Togo	2016	1.285448	2.5	1.558388	48.26087	3.303
Togo	2017	-0.98189	3	1.599411	46.51135	3.495
Togo	2018	0.927755	3	1.504116	46.39462	3.9985
Togo	2019	0.674653	3	1.564997	46.21038	4.0849
Uganda	2012	12.67904	2	3.302055	42.79372	4.313321
Uganda	2013	4.905209	2	3.54506	42.01385	4.443
Uganda	2015	5.589686	2	3.702679	43.15615	3.931
Uganda	2016	5.706375	2	4.002894	41.73859	3.739
Uganda	2017	5.209717	2	4.028664	38.525	4.081
Uganda	2018	2.616012	2.5	4.026551	37.19901	4.1608
Uganda	2019	2.867588	2.5	4.057516	35.21823	4.1894
Uzbekistan	2012	13.2088	2	11.62437	39.0213	5.224832
Uzbekistan	2013	11.84143	2	11.73634	39.48459	5.623
Uzbekistan	2015	8.751882	2	11.82748	35.48587	6.003
Uzbekistan	2016	8.130887	2	11.87766	35.11678	5.987
Uzbekistan	2017	13.87574	2	11.87113	35.06871	5.971
Uzbekistan	2018	17.52418	2.5	11.89546	34.78487	6.0961
Uzbekistan	2019	14.52574	2.5	12.06978	34.7861	6.1741
Viet Nam	2012	9.094703	3	2.69666	23.62616	5.425293
Viet Nam	2013	6.592675	3	2.490119	25.23779	5.533
Viet Nam	2015	0.631201	3	2.900794	21.82366	5.36
Yemen, Rep.	2013	10.96844	2	7.005606	51.40473	4.054
Zambia	2012	6.5759	3	0.280404	28.36062	4.704553
Zambia	2013	6.977676	3	0.282048	27.28505	5.006
Zambia	2015	10.11059	3	0.288921	28.26274	5.129
Zambia	2016	17.86973	3	0.292241	27.40906	4.795
Zambia	2017	6.577312	3	0.287531	26.18112	4.514
Zambia	2018	7.494572	2.5	0.285663	26.3477	4.3771
Zambia	2019	9.150316	2.5	0.296436	25.92546	4.1066
Zimbabwe	2012	3.725327	1.5	0.487752	26.28825	3.978434
Zimbabwe	2013	1.63495	1.5	0.502924	25.51129	4.827
Zimbabwe	2015	-2.43097	2	0.490489	25.92896	4.61
Zimbabwe	2016	-1.54367	2	0.507806	25.3274	4.193
Zimbabwe	2017	0.893962	2	0.483991	22.58245	3.875
Zimbabwe	2018	10.61887	2.5	0.56149	22.08556	3.6923
Zimbabwe	2019	255.305	2.5	0.283079	20.8347	3.6632