Czech University of Life Sciences Prague

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Bachelor Thesis

Statistical analysis of world happiness

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Stastical analysis of world happiness

Objectives of thesis

The main focus of the thesis is to determine the real impact of each independent variable on the happiness level, behaviour between independent variables and to test the accuracy of the model using 5 years of Annual World Happiness Report database collected among 156 countries by Gallup, Inc.

Methodology

To achieve the aim of the thesis, several statistical methods such as VIF (variance inflation factor), testing multicollinearity, calculation of correlation between 7 independent variables, regression model and descriptive analysis are used. Microsoft Excel 2016 is used as an analysis tool.

The proposed extentof the thesis

40-60 pages

Keywords
Big data analysis, world happiness report, database, predictive modelling

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FARBER, E. – LARSON, R. *Elementary statistics : picturing the world.* Boston: Pearson Prentice Hall, 2015. ISBN 9780321693624.

OTT, L. – LONGNECKER, M. An introduction to statistical methods & data analysis. Australia: Cengage Learning, 2016. ISBN 9781305269477.

SULLIVAN, M. Fundamentals of Statistics, Pearson Prentice Hall, 2008. ISBN 978-0-13-156987-2.

World happiness report 2015 by Sustainable Development Solutions Network

World happiness report 2019 by Sustainable Development Solutions Network

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Prague on 20. 03. 2020

Declaration

I declare that I have worked on my bachelor thesis titled "Statistical analysis of world happiness" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the bachelor thesis, I declare that the thesis does not break copyrights of any their person.

In Prague on 23.03.2020 _____

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Statistical analysis of world happiness

Abstract

The main aim of this work is to analyze the key factors of World Happiness using last 5 years data of approximately 156 countries. In the theoretical part, happiness in scientifical way, core happiness factors‘ and approaches to reach the determining the behaviour of independent variables are described as well. Factors that affect world happiness are mentioned as well. Based on the theoretical part, practical part is executed as planned. The obtained data was formed in simple grading tables and processed by MS Excel 2016.

Keywords: Big data analysis, world happiness report, database, predictive modelling, happiness, time series analysis

Title of Bachelor Thesis in Czech

Abstrakt

Hlavním cílem této práce je analyzovat klíčové faktory světového štěstí pomocí údajů za posledních 5 let přibližně 156 zemí.
V teoretické části jsou také popsány štěstí vědeckým způsobem, základní faktory štěstí ‘a přístupy k dosažení určování chování nezávislých proměnných.
Rovněž jsou zmíněny faktory, které ovlivňují štěstí na světě.
Na základě teoretické části je praktická část provedena podle plánu.
Získaná data byla vytvořena v jednoduchých klasifikačních tabulkách a zpracována v MS Excel 2016.

Klíčová slova: Velký data, zpráva o světové štěstí, databáze, prediktivní model, štěstí, analýza časové řády

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GWP- Gallup World Poll
VIF- Variance Inflation Factor

1. Introduction

In the 1950s, a famous broadcast journalist, Edward R. Murrow was doing an hour long interview with the founder of Gallup World Poll Dr.George Gallup and asked "Dr.Gallup, of all the things that you've studied what is it that interests you the most?". He answered "*HAPPINESS*".

Happiness needs to be measured if it's going to be taken seriously by people. Using public data and World happiness report from Gallup will be the great exercise for leaders who are looking around and see in which countries in fact, people do regard themselves as very happy and then ask why and apply it in the country.

Gallup conducts surveys in approximately 156 countries and asks people how they are doing in their lives. The data are then compiled by the United Nations Sustainable Development Solutions Network into a global report known as the *World Happiness Report*, which announces the happiest country in the world and explains what makes its people so happy. (Jon Clifton , 2019)

Since 2015, Gallup has been publishing World happiness report without access restriction to public. The aim of the report is to provide uniform comparable basis across the world, a measure of how people value their own lives and that's the single important statistics in the world to understand what makes a great life. Because if we can understand what makes a great life then we can better inform leaders as to activities that they need to do in order to improve people's lives.

2. Objectives and Methodology

2.1 Objectives

Investigate the behaviour of each variable
To forecast the ranking of world happiness in 2020 using tome series analysis
The main focus of the thesis is to determine the real impact of each independent variable on the happiness level, behaviour between independent variables and to test the accuracy of the model using 5 years of Annual World Happiness Report database collected among 156 countries by Gallup, Inc.

2.2 Methodology

To achieve the aim of the thesis, several statistical methods such as VIF (variance inflation factor), testing multicollinearity, calculation of correlation between 7 independent variables, regression model and descriptive analysis are used. Microsoft Excel 2016 is used as an analysis tool.

3. Theoretical Part

3.1 What is Happiness?

The term of happiness is very well understood in every country and very broad and complex to explain it in few words. Happiness can be explained from many angles such as philosophy, economy, social science and psychology. Although, there are many researches to define and measure happiness, all meet at one certain point that different things to different people.

The idea that happiness is central to the point of the human experience goes back to the ancient time. The Greek philosopher Aristippus argued in fourth century BC that the goal of life is to maximize the totality of one's pleasures. (Nettle, 2005)
Aristotle defined happiness as activities in pursuit of excellence. If you concentrate on doing your work at a high level of excellence, this will certainly result in enjoying your job. (Ed Diener, 2011)

Also, happiness moves to the centre of the political and economic decisions. If maximizing happiness is point of individual lives, then point of systems of government and economy should be to maximize collective or aggregate of happiness. (Nettle, 2005)

3.2 Data collection

A sample size of 2,000 to 3,000 is large enough to give a fairly good estimate at the national level. The typical annual sample is 1,000 people. So, if a country had surveys in each year, then the sample size would be 3,000 people (for only sample size of the World Happiness Report 2015 as it consists of data 2012-2014). However, there are many countries that have not had annual surveys, and some of the 2014 surveys were not available when we began analysis on December 31, 2014. (Network S. D., 2015)

3.2Variables in World happiness Report 2015-19

3.2.1 Happiness score and ranking

Rankings are accompanied by the latest attempts to show how key variables contribute to explaining the full sample of national annual average scores. (Network S. D., 2019).
On the other hand, happiness score is the dependent variable of the thesis topic which is explained by explanatory variables such as GDP per capita, healthy life expectancy, social support, freedom to make life choices, perceptions of corruption (trust to government) and generosity.

3.2.2 GDP per capita

GDP per capita is in terms of Purchasing Power Parity (PPP) adjusted to constant 2011 international dollars, taken from the World Development Indicators (WDI) released by the World Bank. The equation uses the natural log of GDP per capita, as this form fits the data significantly better than GDP per capita. (Network S. D., 2019)

3.2.3 Healthy Life expectancy

The time series of healthy life expectancy at birth are constructed based on data from the World Health Organization (WHO) and the World Development Indicators (WDI). The WHO publishes the data on healthy life expectancy for each year. The time series of life expectancies, with no adjustment for health, are available in the WDI. Researchers adopt the following strategy to construct the time series of healthy life expectancy at birth: first they generate the ratios of healthy life expectancy to life expectancy in each year for countries with both data. They then apply the country-specific ratios to other years to generate the healthy life expectancy data. (Network S. D., 2019)

3.2.4 Social support

Social support (or having someone to count on in times of trouble) is the national average of the binary responses (either 0 or 1) to the Gallup World Poll (GWP) question “If you

were in trouble, do you have relatives or friends you can count on to help you whenever you need them, or not?" (Network S. D., 2015)

3.2.5 Freedom to make life choices (Freedom)

Freedom to make life choices is the national average of binary responses to the GWP question "Are you satisfied or dissatisfied with your freedom to choose what you do with your life?" (Network S. D., 2019)

3.2.6 Perceptions of corruption (Trust)

Perceptions of corruption are the average of binary answers to two GWP questions: "Is corruption widespread throughout the government or not?" and "Is corruption widespread within businesses or not?" Where data for government corruption are missing, the perception of business corruption is used as the overall corruption-perception measure. (Network S. D., 2019)

3.2.7 Generosity

Generosity is the residual of regressing the national average of GWP responses to the question "Have you donated money to a charity in the past month?" on GDP per capita. (Network S. D., 2019)

3.2.8 Dystopia

Dystopia is an imaginary country that has the world's least-happy people. The purpose in establishing Dystopia is to have a benchmark against which all countries can be favourably compared (no country performs more poorly than Dystopia) in terms of each of the six key variables, thus allowing each sub-bar to be of positive width. The lowest scores observed for the six key variables, therefore, characterize Dystopia. Since life would be very unpleasant in a country with the world's lowest incomes, lowest life expectancy,

lowest generosity, most corruption, least freedom and least social support, it is referred to as “Dystopia,” in contrast to Utopia. (World Happiness report 2015 FAQ, 2015)

3.3 Correlation coefficient

A correlation is a relationship between two variables. The data can be represented by the ordered pairs where x is the independent (or explanatory) variable and y is the dependent (or response) variable and correlation coefficient measures the strength and the direction of a linear relationship between two variables. The symbol r represents the sample correlation coefficient. A formula for r is

$$r = \frac{n\Sigma xy - (\Sigma x)(\Sigma y)}{\sqrt{n\Sigma x^2 - (\Sigma x)^2}\sqrt{n\Sigma y^2 - (\Sigma y)^2}}$$

Equation 1 Correlation coeffiecient

where n is the number of pairs of data. (Larson & Farber, 2015)

The range of the correlation coefficient is to 1, inclusive. If x and y have a strong positive linear correlation, r is close to 1. If x and y have a strong negative linear correlation, r is close to -1. If x and y have perfect positive linear correlation or perfect negative linear correlation, r is equal to 1 or -1, respectively. If there is no linear correlation or a weak linear correlation,r is close to 0. It is important to remember that if r is close to 0, it does not mean that there is no relation between x and y, just that there is no linear relation. (Larson & Farber, 2015)

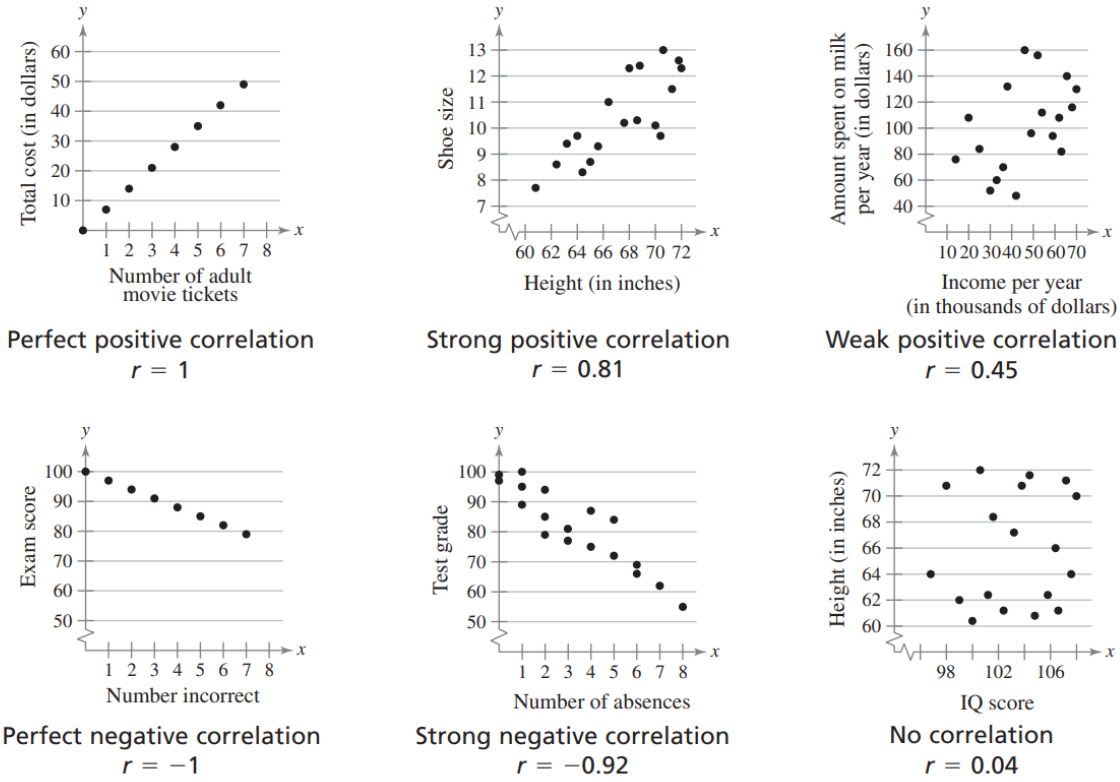

Figure 1: Examples of correlation types

Variance Inflation Factor (VIF)

The VIF is a useful indicator of the overall impact of collinearity in estimating the coefficient of an independent variable. The higher the VIF number, the more serious the impact of collinearity on the accuracy of a slope estimate. (Ott & Longnecker, 2010)

It is possible to calculate VIF by software, as part of regression analysis. But can be calculated by hand using 2 types of formulas as well.

VIF range is following:

- Less than 1- not correlated
- Between 1 and 5- moderately correlated
- Above 5 highly correlated.
- Maximum level is equal to 10

Fromulas for VIF:

$$VIF = \frac{1}{(1 - R^2)}$$

Equation 2 VIF formula 1

$$VIF_j = \frac{S_{x_j}^2 (n-1) SE_{b_j}^2}{S^2}$$

Equation 3 VIF formula 2

where

S_{xy} - Standard deviation squ

n- Sample size

SE- Standard error

S- residuals

4 Practical Part

4.1 Correlation coefficient calculation as per year

	GDP per capita	*Social support*	*Health*	*Freedom*	*Generosity*	*Trust*	*Dystopia*
GDP per capita	1.000						
Social support	0.645	1.000					
Health	**0.816**	0.531	1.000				
Freedom	0.370	0.442	0.360	1.000			
Generosity	-0.010	0.088	0.108	0.374	1.000		
Trust	0.308	0.206	0.248	0.494	0.276	1.000	
Dystopia	0.040	0.148	0.019	0.063	-0.101	-0.033	1.000

Table 1 Correlation coefficient calculation 2015

	GDP per Capita	*Social support*	*Health*	*Freedom*	*Generosity*	*Trust*	*Dystopia*
GDP per Capita	1.000						
Social support	0.670	1.000					
Health	**0.837**	0.588	1.000				
Freedom	0.362	0.450	0.341	1.000			
Generosity	-0.026	0.090	0.076	0.362	1.000		
Trust	0.294	0.214	0.250	0.502	0.306	1.000	
Dystopia	0.069	0.120	0.101	0.092	-0.133	-0.003	1.000

Table 2 Correlation coefficient calculation 2016

	GDP per capita	*Social support*	*Health*	*Freedom*	*Generosity*	*Trust*	*Dystopia*
GDP per capita	1.000						
Social support	0.688	1.000					
Health	**0.843**	0.612	1.000				
Freedom	0.370	0.425	0.350	1.000			
Generosity	-0.019	0.052	0.063	0.316	1.000		
Trust	0.351	0.232	0.280	0.499	0.294	1.000	
Dystopia	0.024	0.071	0.055	0.082	-0.117	-0.023	1.000

Table 3 Correlation coefficient calculatiom 2017

	GDP per capita	*Social support*	*Health*	*Freedom*	*Generosity*	*Trust*	*Dystopia*
GDP per capita	1.000						
Social support	0.672	1.000					
Health	**0.844**	0.667	1.000				
Freedom	0.332	0.411	0.355	1.000			
Generosity	-0.011	0.018	0.021	0.298	1.000		
Trust	0.329	0.206	0.316	0.452	0.361	1.000	
Dystopia	0.070	0.072	0.054	0.147	-0.002	0.152	1.000

Table 4 Correlation coefficient calculatiom 2018

	GDP per capita	*Social support*	*Health*	*Freedom*	*Generosity*	*Trust*	*Dystopia*
GDP per capita	1.000						
Social support	0.755	1.000					
Health	**0.835**	0.719	1.000				
Freedom	0.379	0.447	0.390	1.000			
Generosity	-0.080	-0.048	-0.030	0.270	1.000		
Trust	0.299	0.182	0.295	0.439	0.327	1.000	
Dystopia	-0.034	0.027	-0.006	0.078	-0.051	-0.008	1.000

Table 5 Correlation coefficient calculatiom 2019

According to correlation coefficient calculation tables as per year, below points are common in each table. Such as:

1. Correlation coefficient between GDP per capita and Healthy life expectancy is over 0.8
2. Correlation coefficient between GDP per capita and Social support is over 0.6
3. Correlation coefficient between Social support and Healthy life expectancy is over 0.5 and growing as time goes.

4.2 Variance inflation index

To calculate the accurate VIF for each year's data table below formula is used.

$$VIF = \frac{1}{(1 - R^2)}$$

Explanatory variables	VIF
GDP per capita	4.09
Social support	1.94
Health	3.16
Freedom	1.60
Generosity	1.29
Trust	1.42
Dystopia	1.05

Table 6 VIF 2015

Table 6, normal correlation between explanatory variables.

Explanatory variables	VIF
GDP per capita	4.39
Social support	2.05
Health	3.50
Freedom	1.75
Generosity	1.32
Trust	1.44
Dystopia	1.06

Table 7 VIF 2016

Table 7, normal correlation between explanatory variables.

Explanatory variables	VIF
GDP per capita	1.90
Social support	2.08
Health	3.60
Freedom	1.65
Generosity	1.24
Trust	1.50
Dystopia	1.04

Table 8 VIF 2017

Table 8, normal correlation between explanatory variables.

Explanatory variables	VIF
GDP per capita	3.88
Social support	2.12
Health	3.76
Freedom	1.53
Generosity	1.23
Trust	1.50
Dystopia	1.04

Table 9 VIF 2018

Table 9, normal correlation between explanatory variables.

Explanatory variables	VIF
GDP per capita	4.15
Social support	2.74
Health	3.57
Freedom	1.59
Generosity	1.23
Trust	1.43
Dystopia	1.02

Table 10 VIF 2019

Table 10, normal correlation between explanatory variables.

According to results are in the table of VIF, there is no highly correlated variables.

4.3 Forecast

Based on the correlation coefficient calculation and VIF between explanatory variables, model can be tested for the forecast of Happiness rank 2020. To forecast the Happiness rank for 2020, little adjustments are made. Because annual World Happiness report database usually consists of approximately 156 countries but can differ by 2 or 3 countries than previous year. So, few countries such as Somalia, Namibia, Gambia, Swaziland, Tobago and Central African Republic are excluded from the forecast list because they were missing at least 1 year's whole data.

Next adjustment was with variable forecast. To have accurate forecast as much as possible, better way was to use FORECAST function in MS Excel 2016 as per variable. Like scoring each variable for each country. But mentioned previously, Happiness score should be between 1 to 10 and there should be no negative score. As forecast was done, some variables showed negative numbers in some countries forecast and corrected to 0.

Country	2015	2016	2017	2018	2019	2020	correction
Afghanistan	0.2341	0.1643	0.1062	0.0850	0.0000	-0.0464	0.0
Haiti	0.2443	0.1207	0.0304	0.0250	0.0260	-0.0704	0.0

Table 11 Correction for Freedom to make life choices

Country	2015	2016	2017	2018	2019	2020	correction
Greece	0.0000	0.0413	0.0000	0.0000	0.0000	-0.0041	0.0

Table 12 Correction for Generosity

Country	2015	2016	2017	2018	2019	2020	correction
Afghanistan	0.0972	0.3127	0.0612	0.0360	0.0250	-0.0199	0.0
Bosnia and Herzegovina	0.0023	0.2989	0.0000	0.0000	0.0060	-0.0260	0.0
Bulgaria	0.0087	0.1279	0.0111	0.0090	0.0040	-0.0064	0.0
Indonesia	0.0000	0.5652	0.0153	0.0180	0.0280	-0.0221	0.0
Kosovo	0.0474	0.2799	0.0575	0.0230	0.0060	-0.0192	0.0
Kyrgyzstan	0.0423	0.3843	0.0394	0.0350	0.0230	-0.0116	0.0
Malaysia	0.1050	0.4147	0.0656	0.0590	0.0240	-0.0217	0.0
Moldova	0.0162	0.2000	0.0101	0.0000	0.0000	-0.0244	0.0
Romania	0.0065	0.1289	0.0044	0.0010	0.0050	-0.0101	0.0
Slovakia	0.0343	0.1384	0.0242	0.0140	0.0140	-0.0045	0.0
Sri Lanka	0.0918	0.4698	0.0737	0.0500	0.0470	-0.0064	0.0
Thailand	0.0319	0.5870	0.0316	0.0290	0.0280	-0.0282	0.0
Turkmenistan	0.3084	0.2257	0.2593	0.0370	0.0280	-0.0532	0.0
Ukraine	0.0296	0.2036	0.0230	0.0110	0.0100	-0.0141	0.0

Table 13 Correction for Perceptions of corruption

Country	2015	2016	2017	2018	2019	2020	correction
Botswana	1.4618	0.9674	0.3779	0.3830	0.1840	-0.2672	0.0

Table 14 Dystopia

After adjustments are done, Happiness scoring for 2020 was done as table 14 for available countries.

Country	HAPPINESS SCORE 2020	HAPPINESS RANK 2020
Finland	8.0178	1
Denmark	7.8025	2
Norway	7.7590	3
Netherlands	7.6486	4
Switzerland	7.6192	5
Iceland	7.5379	6
New Zealand	7.5170	7
Sweden	7.5050	8
Canada	7.3840	9
Australia	7.3813	10
Austria	7.2877	11
United Kingdom	7.2026	12
Germany	7.2011	13
Luxembourg	7.1944	14
Ireland	7.1869	15
Costa Rica	7.1369	16
Israel	7.0591	17
Belgium	7.0322	18
Czech Republic	6.9142	19
Malta	6.9009	20
United States	6.8634	21
United Arab Emirates	6.7587	22
France	6.6166	23
Guatemala	6.5846	24
Taiwan	6.5436	25
Chile	6.4157	26
Saudi Arabia	6.4154	27
Romania	6.4015	28
Spain	6.3881	29
Qatar	6.3646	30
Uruguay	6.3437	31
Poland	6.3339	32

Singapore	6.3310	33
Mexico	6.3303	34
Latvia	6.3266	35
Uzbekistan	6.3111	36
Nicaragua	6.3023	37
Bahrain	6.2850	38
Slovakia	6.2701	39
El Salvador	6.2686	40
Panama	6.2090	41
Italy	6.2081	42
Lithuania	6.1642	43
Brazil	6.1323	44
Slovenia	6.1297	45
Argentina	6.1149	46
Honduras	6.1109	47
Ecuador	6.0828	48
Colombia	6.0821	49
Estonia	6.0701	50
Hungary	6.0579	51
Mauritius	6.0511	52
Cyprus	6.0294	53
Kosovo	6.0219	54
Kuwait	5.9905	55
Thailand	5.9407	56
Japan	5.9383	57
Jamaica	5.9001	58
South Korea	5.8697	59
Philippines	5.8481	60
Kazakhstan	5.8325	61
Malaysia	5.7914	62
Pakistan	5.7780	63
Russia	5.7566	64
Portugal	5.7540	65
Bolivia	5.7527	66
Serbia	5.7150	67
Paraguay	5.6654	68
Peru	5.6452	69
Dominican Republic	5.6206	70
Montenegro	5.5868	71
Tajikistan	5.5842	72
Hong Kong	5.5634	73
Greece	5.5339	74
Turkey	5.5225	75
Libya	5.5187	76

Lebanon	5.5010	77
Moldova	5.4898	78
Turkmenistan	5.4667	79
Bosnia and Herzegovina	5.4400	80
Mongolia	5.3571	81
Morocco	5.3570	82
Cameroon	5.3311	83
Ivory Coast	5.3247	84
Bulgaria	5.3198	85
China	5.3011	86
Azerbaijan	5.2877	87
Belarus	5.2855	88
Croatia	5.2320	89
Nigeria	5.2256	90
Algeria	5.1809	91
Kyrgyzstan	5.1711	92
GABON	5.1666	93
Nepal	5.1167	94
Vietnam	5.0956	95
Indonesia	5.0927	96
Bhutan	5.0735	97
Benin	5.0574	98
Jordan	5.0323	99
Senegal	5.0249	100
Congo (Brazzaville)	5.0066	101
Burkina Faso	4.9433	102
Cambodia	4.9242	103
Ghana	4.8828	104
South Africa	4.8306	105
Mozambique	4.7818	106
Palestinian Territories	4.7599	107
Niger	4.7169	108
Iran	4.6392	109
Georgia	4.6060	110
Chad	4.6046	111
Mali	4.5963	112
Albania	4.5638	113
Togo	4.5511	114
Kenya	4.5469	115
Guinea	4.5344	116
Armenia	4.5209	117
Sri Lanka	4.4978	118
Sierra Leone	4.4867	119
Mauritania	4.4806	120

Myanmar	4.4776	121
Bangladesh	4.4665	122
Tunisia	4.4574	123
Egypt	4.4289	124
Iraq	4.3961	125
Uganda	4.3322	126
Ethiopia	4.3131	127
Congo (Kinshasa)	4.3049	128
South Sudan	4.2974	129
Ukraine	4.0511	130
India	3.9502	131
Madagascar	3.9448	132
Venezuela	3.9121	133
Zambia	3.8867	134
Lesotho	3.8042	135
Laos	3.7973	136
Syria	3.7556	137
Burundi	3.6391	138
Rwanda	3.5498	139
Botswana	3.5217	140
Liberia	3.4583	141
Afghanistan	3.4556	142
Zimbabwe	3.3377	143
Haiti	3.3017	144
Malawi	3.2228	145
Yemen	3.1291	146
Central African Republic	3.0944	147
Tanzania	3.0757	148

Table 15 World Happiness Forecast for 2020

5 Results

5.1 Movements between 2020 forecast and 2019 actual report.

Table 15 shows the movement of countries ranking between 2020 forecast and 2019 actual report.

Yellow arrow- no change in forecast

Red arrow- ranked below in forecast

Green arrow- ranked above in forecast

Country	HAPPINESS RANK 2020	HAPPINESS RANK 2019	CHANGE IN THE RANK
Finland	1	1	0
Denmark	2	2	0
Norway	3	3	0
Netherlands	4	5	1
Switzerland	5	6	1
Iceland	6	4	-2
New Zealand	7	8	1
Sweden	8	7	-1
Canada	9	9	0
Australia	10	11	1
Austria	11	10	-1
United Kingdom	12	15	3
Germany	13	17	4
Luxembourg	14	14	0
Ireland	15	16	1
Costa Rica	16	12	-4
Israel	17	13	-4
Belgium	18	18	0
Czech Republic	19	20	1
Malta	20	22	2
United States	21	19	-2
United Arab Emirates	22	21	-1
France	23	24	1
Guatemala	24	27	3
Taiwan	25	25	0
Chile	26	26	0
Saudi Arabia	27	28	1
Romania	28	48	20
Spain	29	30	1

Qatar	30	29	🔻	-1
Uruguay	31	33	🔺	2
Poland	32	40	🔺	8
Singapore	33	34	🔺	1
Mexico	34	23	🔻	-11
Latvia	35	53	🔺	18
Uzbekistan	36	41	🔺	5
Nicaragua	37	45	🔺	8
Bahrain	38	37	🔻	-1
Slovakia	39	38	🔻	-1
El Salvador	40	35	🔻	-5
Panama	41	31	🔻	-10
Italy	42	36	🔻	-6
Lithuania	43	42	🔻	-1
Brazil	44	32	🔻	-12
Slovenia	45	44	🔻	-1
Argentina	46	47	🔺	1
Honduras	47	59	🔺	12
Ecuador	48	50	🔺	2
Colombia	49	43	🔻	-6
Estonia	50	55	🔺	5
Hungary	51	62	🔺	11
Mauritius	52	57	🔺	5
Cyprus	53	49	🔻	-4
Kosovo	54	46	🔻	-8
Kuwait	55	51	🔻	-4
Thailand	56	52	🔻	-4
Japan	57	58	🔺	1
Jamaica	58	56	🔻	-2
South Korea	59	54	🔻	-5
Philippines	60	69	🔺	9
Kazakhstan	61	60	🔻	-1
Malaysia	62	80	🔺	18
Pakistan	63	67	🔺	4
Russia	64	68	🔺	4
Portugal	65	66	🔺	1
Bolivia	66	61	🔻	-5
Serbia	67	70	🔺	3
Paraguay	68	63	🔻	-5
Peru	69	65	🔻	-4
Dominican Republic	70	77	🔺	7
Montenegro	71	73	🔺	2
Tajikistan	72	74	🔺	2
Hong Kong	73	76	🔺	3
Greece	74	82	🔺	8
Turkey	75	79	🔺	4
Libya	76	72	🔻	-4
Lebanon	77	91	🔺	14
Moldova	78	71	🔻	-7
Turkmenistan	79	87	🔺	8
Bosnia and Herzegovina	80	78	🔻	-2
Mongolia	81	83	🔺	2

Morocco	82	89	↑	7
Cameroon	83	96	↑	13
Ivory Coast	84	99	↑	15
Bulgaria	85	97	↑	12
China	86	93	↑	7
Azerbaijan	87	90	↑	3
Belarus	88	81	↓	-7
Croatia	89	75	↓	-14
Nigeria	90	85	↓	-5
Algeria	91	88	↓	-3
Kyrgyzstan	92	86	↓	-6
GABON	93	104	↑	11
Nepal	94	100	↑	6
Vietnam	95	94	↓	-1
Indonesia	96	92	↓	-4
Bhutan	97	95	↓	-2
Benin	98	102	↑	4
Jordan	99	101	↑	2
Senegal	100	111	↑	11
Congo (Brazzaville)	101	103	↑	2
Burkina Faso	102	115	↑	13
Cambodia	103	109	↑	6
Ghana	104	98	↓	-6
South Africa	105	106	↑	1
Mozambique	106	123	↑	17
Palestinian Territories	107	110	↑	3
Niger	108	114	↑	6
Iran	109	117	↑	8
Georgia	110	119	↑	9
Chad	111	132	↑	21
Mali	112	128	↑	16
Albania	113	107	↓	-6
Togo	114	139	↑	25
Kenya	115	121	↑	6
Guinea	116	118	↑	2
Armenia	117	116	↓	-1
Sri Lanka	118	130	↑	12
Sierra Leone	119	129	↑	10
Mauritania	120	122	↑	2
Myanmar	121	131	↑	10
Bangladesh	122	125	↑	3
Tunisia	123	124	↑	1
Egypt	124	137	↑	13
Iraq	125	126	↑	1
Uganda	126	136	↑	10
Ethiopia	127	134	↑	7
Congo (Kinshasa)	128	127	↓	-1
South Sudan	129	156	↑	27

Ukraine	130	133	↑	3
India	131	140	↑	9
Madagascar	132	143	↑	11
Venezuela	133	108	↓	-25
Zambia	134	138	↑	4
Lesotho	135	144	↑	9
Laos	136	105	↓	-31
Syria	137	149	↑	12
Burundi	138	145	↑	7
Rwanda	139	152	↑	13
Botswana	140	148	↑	8
Liberia	141	141	→	0
Afghanistan	142	154	↑	12
Zimbabwe	143	146	↑	3
Haiti	144	147	↑	3
Malawi	145	150	↑	5
Yemen	146	151	↑	5
Central African Republic	147	155	↑	8
Tanzania	148	153	↑	5

Table 15 Ranking movement between 2019 actual report and 2020 forecast

5.2 Highlight countries

As my current residence is Czech Republic and my mother is Mongolia, it was interesting to see happiness level is going higher than previous years. Main escalated variables were GDP and social support.

5.2.1 Czech Republic

Year	Ranking
2015	31
2016	27
2017	23
2018	21
2019	20
2020	20

Table 17 Happiness level change for Czech Republic

5.2.2 Mongolia

Year	Ranking
2015	100
2016	101
2017	100
2018	94
2019	83
2020	83

Table 18 Happiness level change for Mongolia

6 Conclusion

If I say it is possible to measure and forecast happiness 50 years ago most of the people would not believe because idea of being happy is very emotional and different in every country. For example, in my mother country Mongolia If you ask somebody how happy they are over the dinner table it would lead to very philosophical discussion. But in English, if you ask somebody if she or he is happy, most probably they would just answer yes. My point is if researcher could determine the very basic factors which influence the happiness it is very possible to measure and forecast the happiness level in every country. Furthermore, every earth citizen can have the certain understanding about happiness. Also, happiness level score can help leaders to compare their own countries situation to another and can be aware to improvement on certain points.

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