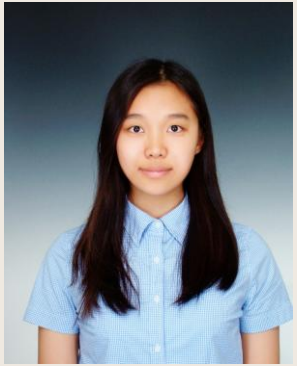
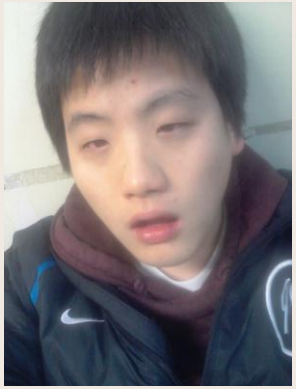



Cultural Diversity

Factors and Results of Cultural Diversity

Variety

Eun-A Jung, Soonbin Hong, Hyebong Kim, Seachang Jeon

Contents

Introduction

Introduction

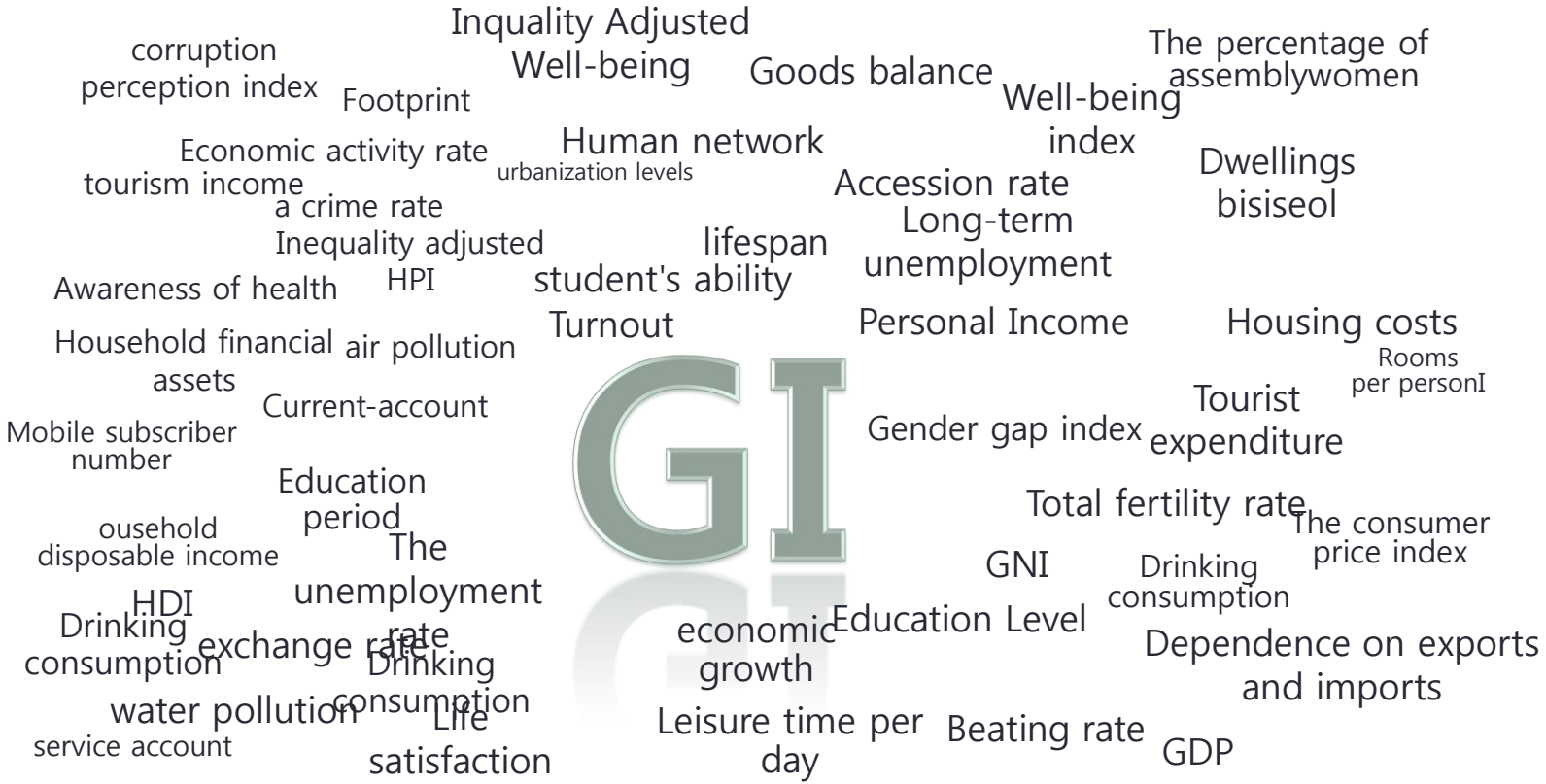
GDP?

Global Peace?

Well-being?

GNI?

Introduction

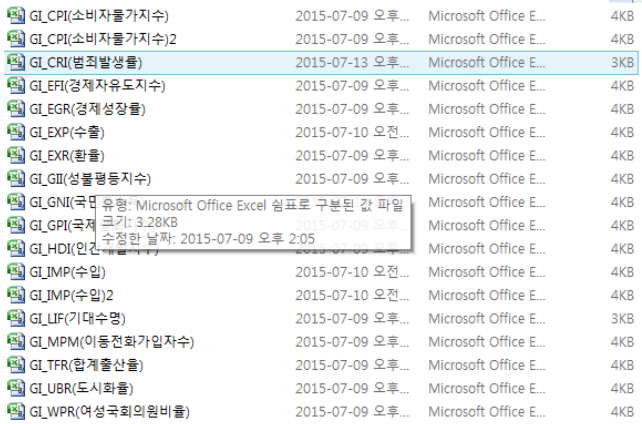


Methods

1) Gathering and Filtering Data

Datasets

Consumer Price, Crime Rate, Economic Freedom, Gender Inequality, Global Peace,
GNI/person, Human Development, Life Expectancy, Total Fertility Rate, Urbanization Rate,
Happy Planet Index, Wellbeing, Economic Participation Rate, World Corruption

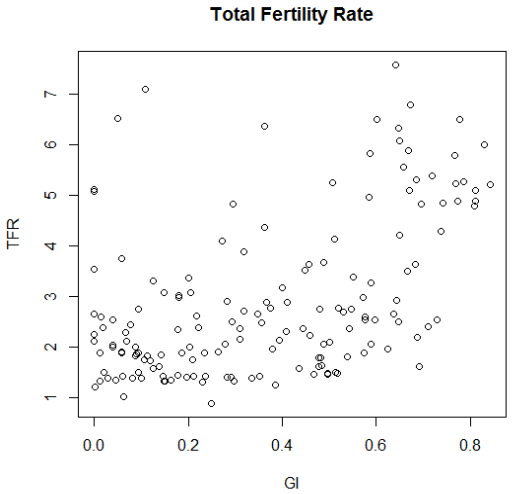


2) Correlation Analysis

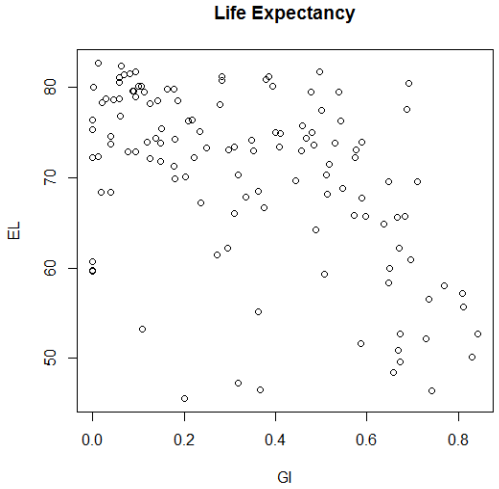
```
> cor.test(GI,TFR)

        Pearson's product-moment correlation

data:  GI and TFR
t = 7.2353, df = 159, p-value = 1.859e-11
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
 0.3716194 0.6057328
sample estimates:
      cor
0.4976871
```

Result

2) Correlation Analysis



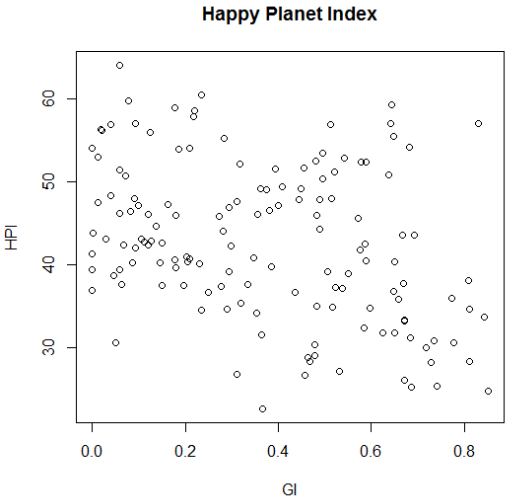

```
> cor.test(GI,TFR)

        Pearson's product-moment correlation

data:  GI and TFR
t = 7.2353, df = 159, p-value = 1.859e-11
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
 0.3716194 0.6057328
sample estimates:
      cor
0.4976871
```



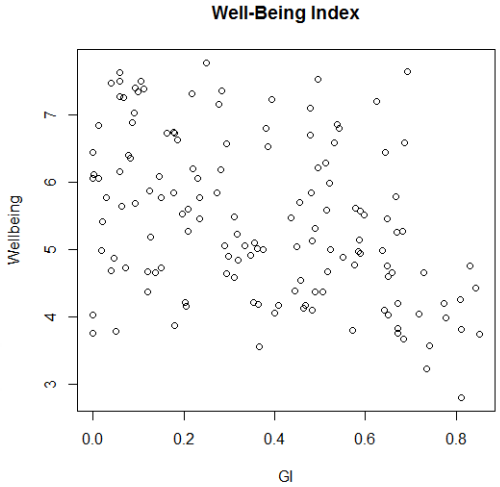

```
> cor.test(GI,EL)

        Pearson's product-moment correlation

data:  GI and EL
t = -6.5014, df = 124, p-value = 1.754e-09
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
 -0.6240726 -0.3611433
sample estimates:
       cor
-0.5042016
```

Result

2) Correlation Analysis



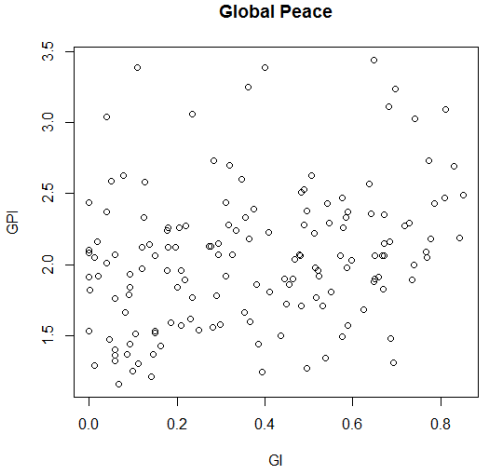

```
> cor.test(GI,HPI)

        Pearson's product-moment correlation

data:  GI and HPI
t = -4.4691, df = 142, p-value = 1.594e-05
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
 -0.4867684 -0.1990076
sample estimates:
       cor
-0.3511525
```

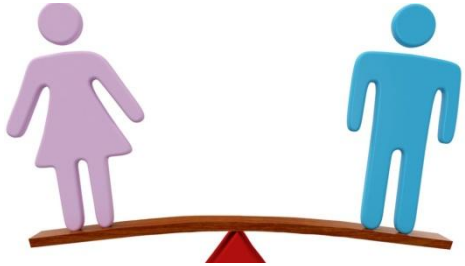



```
> cor.test(GI,Wellbeing)

        Pearson's product-moment correlation

data:  GI and Wellbeing
t = -5.195, df = 142, p-value = 6.972e-07
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
 -0.5286496 -0.2525659
sample estimates:
       cor
-0.3996316
```

Result

2) Correlation Analysis





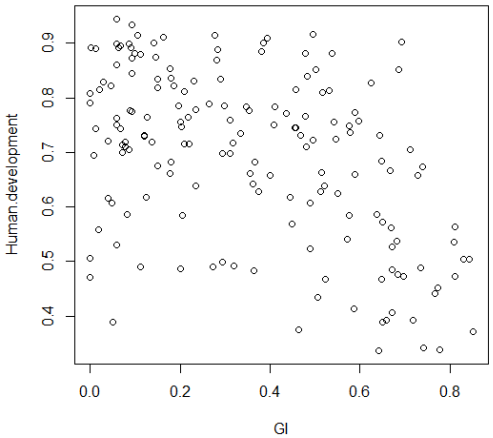
```
> cor.test(GI,GPI)

        Pearson's product-moment correlation

data:  GI and GPI
t = 3.5653, df = 151, p-value = 0.0004871
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
 0.1255193 0.4188080
sample estimates:
      cor
0.2786476
```

```
> cor.test(GI,GII)

        Pearson's product-moment correlation

data:  GI and GII
t = 7.1868, df = 145, p-value = 3.23e-11
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
 0.3823210 0.6227201
sample estimates:
      cor
0.5124934
```

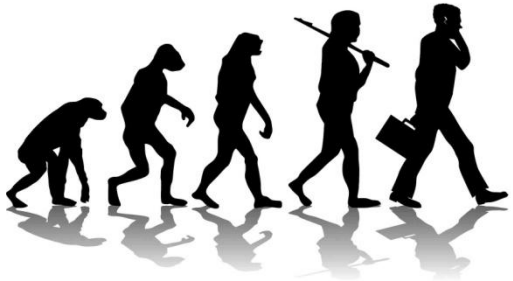
Result

2) Correlation Analysis

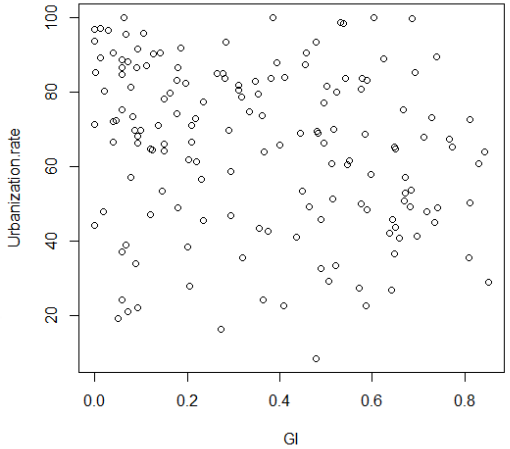
Human Development




```
> cor.test(GI,Human.development)

        Pearson's product-moment correlation

data:  GI and Human.development
t = -6.9485, df = 165, p-value = 8.137e-11
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
 -0.5853564 -0.3491520
sample estimates:
       cor
-0.4757877
```



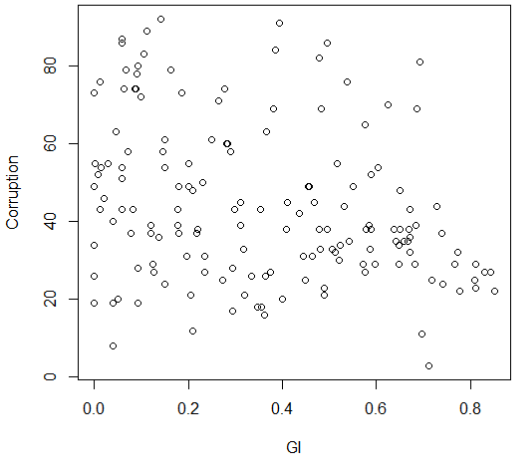
Urbanization Rate

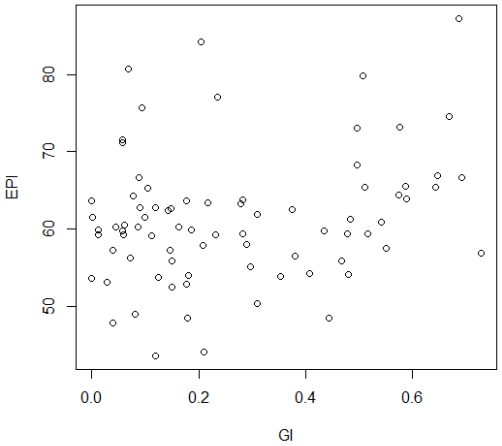



```
> cor.test(GI,Urbanization.rate)

        Pearson's product-moment correlation

data:  GI and Urbanization.rate
t = -2.7947, df = 159, p-value = 0.005834
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
 -0.35904196 -0.06384595
sample estimates:
       cor
-0.2163839
```

Result

2) Correlation Analysis

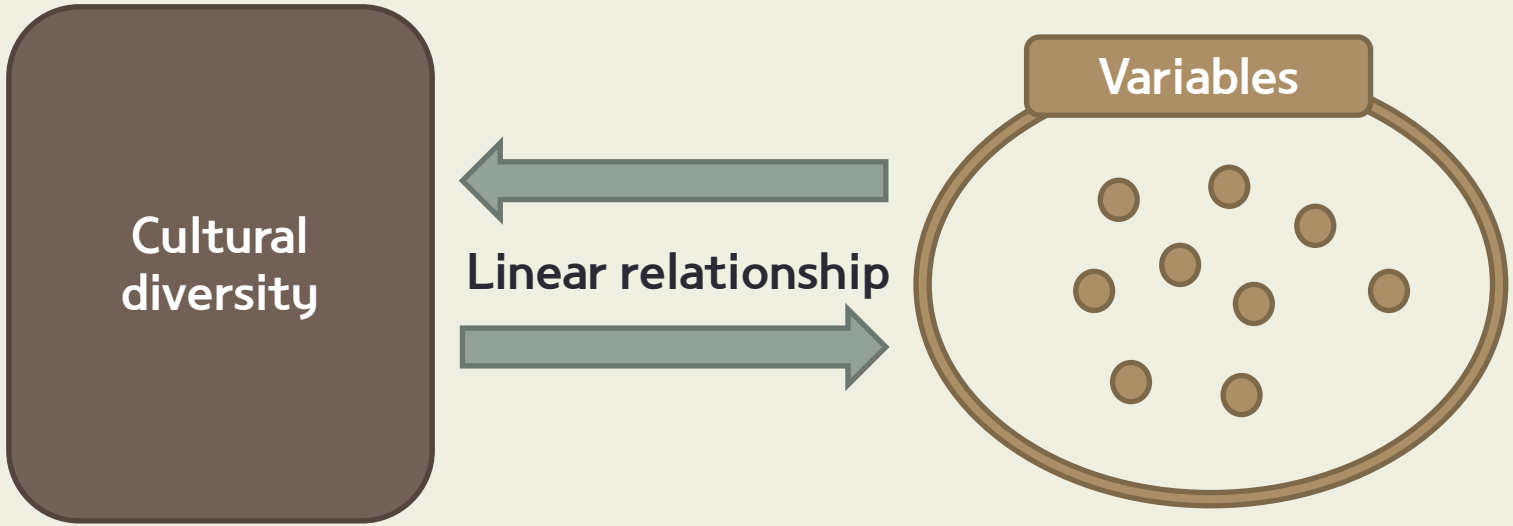





```
> cor.test(GI,Corruption)

        Pearson's product-moment correlation

data:  GI and Corruption
t = -3.8405, df = 155, p-value = 0.0001785
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
 -0.4314878 -0.1448212
sample estimates:
       cor
-0.2947726
```

```
> cor.test(GI,EPI)

        Pearson's product-moment correlation

data:  GI and EPI
t = 2.2238, df = 77, p-value = 0.02909
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
 0.02596134 0.44272395
sample estimates:
      cor
0.2456616
```

3) Regression Analysis



Methods

3) Regression Analysis

All Variables in one equation

S2 =COUNTIF(C2:R2,"")

	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	GII	Exchange rate	Economic g	Total fertil	Life expec	Economic	Crime/10	gender ec	Woman p	Mobileph	urbanizati	Human d	GNI/pers	consumer	price
2	0.705	55.38	4.2	6.33	58.4	N/A		0.705	27.6	70	36.7	0.468	1904	127.2	1
3	0.245	105.67	1.3	1.75	76.3	65.2	157	0.245	17.9	116.2	71.1	0.716	9225	107.6	0
4	0.425	79.37	2.7	2.72	70.3	49.6		0.425	25.8	102	78.7	0.717	12555	117.5	1

D175 =COUNTIF(D2:D174,"")

	A	B	C	D	E
157	TOGO	TGO	0.8118		0.579
158	TONGA	TON	0.0869		0.458
159	TRINIDAD AND T	TTO	0.4783	2.07	0.321
160	TUNISIA	TUN	0.0391	2.01	0.265
161	TURKEY	TUR	0.31	2.44	0.36
162	TURKMENISTAN	TKM	0.2932	2.15	
163	UGANDA	UGA	0.363	2.18	0.529
164	UKRAINE	UKR	0.3349	2.24	0.326
165	UNITED ARAB EM	ARE	0.6246	1.68	0.244
166	UNITED KINGDO	GBR	0.0901	1.79	0.193
167	UNITED STATES	USA	0.278	2.13	0.262
168	URUGUAY	URY	0	1.53	0.364
169	UZBEKISTAN	UZB	0.3564	2.33	
170	VANUATU	VUT	0.0405		
171	VENEZUELA	VEN	0.0392	2.37	0.464
172	VIETNAM	VNM	0.235	1.77	0.322
173	ZAMBIA	ZMB	0.6681	1.83	0.617
174	ZIMBABWE	ZWE	0.3187	2.7	0.516
175				25	26

D176 =AVERAGE(D2:D174)

	A	B	C	D	E
157	TOGO	TGO	0.8118		0.57
158	TONGA	TON	0.0869		0.45
159	TRINIDAD AND T	TTO	0.4783	2.07	0.32
160	TUNISIA	TUN	0.0391	2.01	0.26
161	TURKEY	TUR	0.31	2.44	0.3
162	TURKMENISTAN	TKM	0.2932	2.15	
163	UGANDA	UGA	0.363	2.18	0.52
164	UKRAINE	UKR	0.3349	2.24	0.32
165	UNITED ARAB EM	ARE	0.6246	1.68	0.24
166	UNITED KINGDO	GBR	0.0901	1.79	0.19
167	UNITED STATES	USA	0.278	2.13	0.26
168	URUGUAY	URY	0	1.53	0.36
169	UZBEKISTAN	UZB	0.3564	2.33	
170	VANUATU	VUT	0.0405		
171	VENEZUELA	VEN	0.0392	2.37	0.46
172	VIETNAM	VNM	0.235	1.77	0.32
173	ZAMBIA	ZMB	0.6681	1.83	0.61
174	ZIMBABWE	ZWE	0.3187	2.7	0.51
175				25	2
176				2.034797	

Methods

3) Regression Analysis

All Variables in one equation

```
> all.lm2 <- lm(GI ~ GPI+GII+Exchange.rate+Economic.growth.rate+
+ Total.fertility.rate+Economic.Freedom+gender.equality+Woman.politician+
+ Mobilephone.member.100+urbanization.rate+Human.development+GNI.person+
+ consumer.price+HPI+Corruption+Wellbeing,data=filtered2)
> step(all.lm2)
Start:  AIC=-514.42
GI ~ GPI + GII + Exchange.rate + Economic.growth.rate + Total.fertility.rate $
    Economic.Freedom + gender.equality + Woman.politician + Mobilephone.membe$
    urbanization.rate + Human.development + GNI.person + consumer.price +
    HPI + Corruption + Wellbeing

                         Df Sum of Sq    RSS     AIC
- Woman.politician        1  0.002005 6.2613 -516.36
- Wellbeing               1  0.004139 6.2634 -516.31
- Mobilephone.member.100  1  0.005393 6.2646 -516.27
- GPI                     1  0.011133 6.2704 -516.13
```

Result

3) Regression Analysis

All Variables in one equation

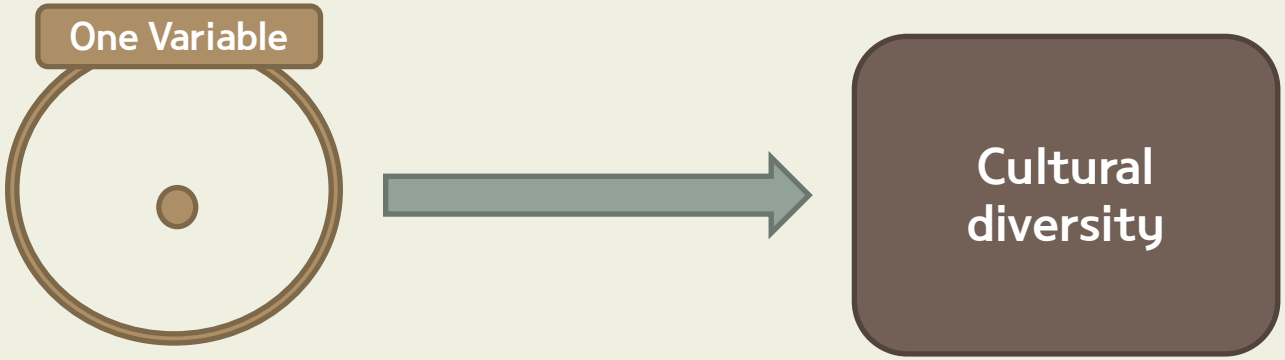
```
> new.lm2 <- lm(formula = GI ~ GII + Total.fertility.rate +
+       HPI, data = filtered2)
> summary(new.lm2)

Call:
lm(formula = GI ~ GII + Total.fertility.rate + HPI, data = filtered2)

Residuals:
    Min      1Q  Median      3Q     Max
-0.6133 -0.1486  0.0092  0.1643  0.4870

Coefficients:
                     Estimate Std. Error t value Pr(>|t|)
(Intercept)          0.357802   0.091728   3.901 0.000140 ***
GII                  0.357924   0.128670   2.782 0.006045 **
Total.fertility.rate 0.049769   0.016052   3.101 0.002276 **
HPI                 -0.006479   0.001848  -3.505 0.000589 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.2035 on 163 degrees of freedom
Multiple R-squared:  0.3375,    Adjusted R-squared:  0.3253
F-statistic: 27.68 on 3 and 163 DF,  p-value: 1.608e-14
```

```
> shapiro.test(new.lm2$resid)

        Shapiro-Wilk normality test

data:  new.lm2$resid
W = 0.9902, p-value = 0.3055

> bptest(new.lm2)

        studentized Breusch-Pagan test

data:  new.lm2
BP = 3.8612, df = 3, p-value = 0.2769

> dwtest(new.lm2)

        Durbin-Watson test

data:  new.lm2
DW = 1.6854, p-value = 0.01935
alternative hypothesis: true autocorrelation is g[illegible]n 0
```

Cultural Diversity = 0.357802 + 0.357964*Gender Inequality + 0.049769*Total Fertility Rate
-0.006479Happy Planet Index

3) Regression Analysis

Each variable -> Cultural Diversity



Methods

3) Regression Analysis

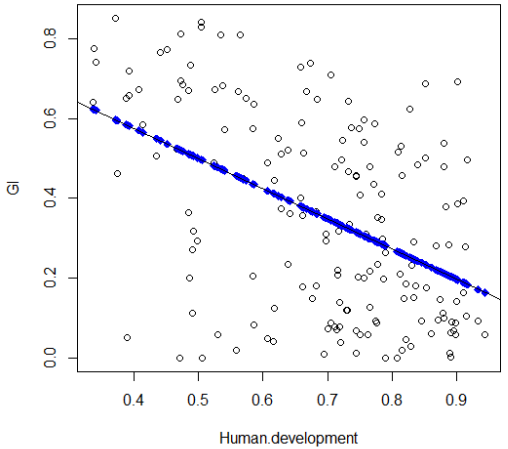
Each variable -> Cultural Diversity

```
> HDI.lm <- lm(GI ~ Human.development)
> summary(HDI.lm)

Call:
lm(formula = GI ~ Human.development)

Residuals:
     Min       1Q   Median       3Q      
-0.53358 -0.16999 -0.00156  0.17326  0.49

Coefficients:
                  Estimate Std. Error t v
(Intercept)        0.87905    0.07741  11
Human.development -0.75801    0.10909  -6
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '

Residual standard error: 0.219 on 165 deg
Multiple R-squared:  0.2264,    Adjusted 
F-statistic: 48.28 on 1 and 165 DF,  p-va
```

Linear modeling

```
> shapiro.test(HDI.lm$resid)

        Shapiro-Wilk normality test

data:  HDI.lm$resid
W = 0.98556, p-value = 0.08184

> bptest(HDI.lm)

        studentized Breusch-Pagan test

data:  HDI.lm
BP = 4.5271, df = 1, p-value = 0.03336

> dwtest(HDI.lm)

        Durbin-Watson test

data:  HDI.lm
DW = 1.8251, p-value = 0.1262
alternative hypothesis: true autocorrelation is greater than 0
```

Test



Plot & Prediction

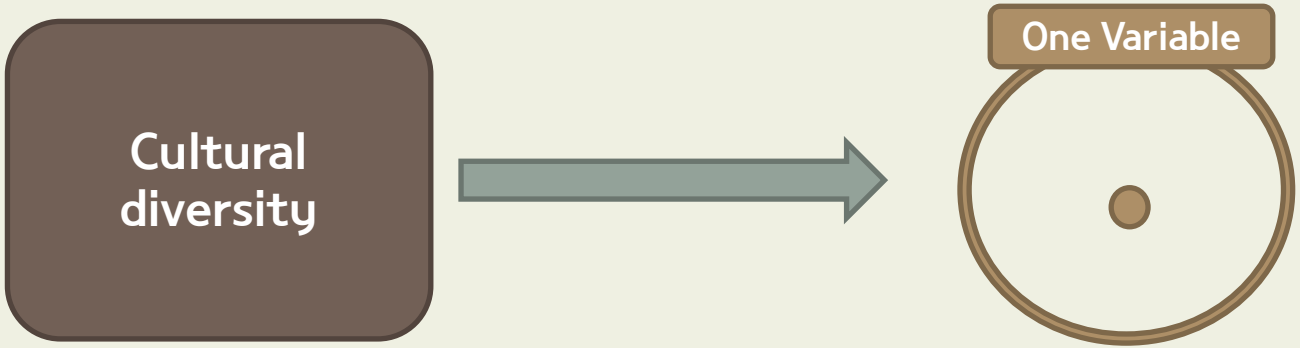
3) Regression Analysis

Each variable -> Cultural Diversity

Normality(residuals) - shapiro.test
Homogeneity of Variance - bptest
Independency - dwtest

3) Regression Analysis

Cultural Diversity -> Each Variable



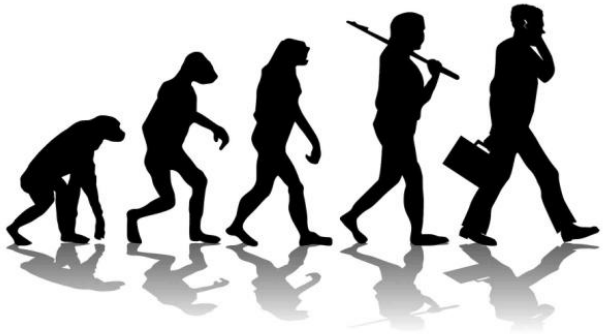
Result

3) Regression Analysis

Cultural Diversity -> Each Variable

```
> HDI.lm2 <- lm(Human.development ~ GI)
> summary(HDI.lm2)

Call:
lm(formula = Human.development ~ GI)

Residuals:
     Min       1Q   Median       3Q      Max
-0.39406 -0.08020  0.00452  0.10226  0.31061

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  0.79817    0.01857  42.980  < 2e-16 ***
GI          -0.29864    0.04298  -6.948 8.14e-11 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.1374 on 165 degrees of freedom
Multiple R-squared:  0.2264,    Adjusted R-squared:  0.2217
F-statistic: 48.28 on 1 and 165 DF,  p-value: 8.137e-11
```

Human Development



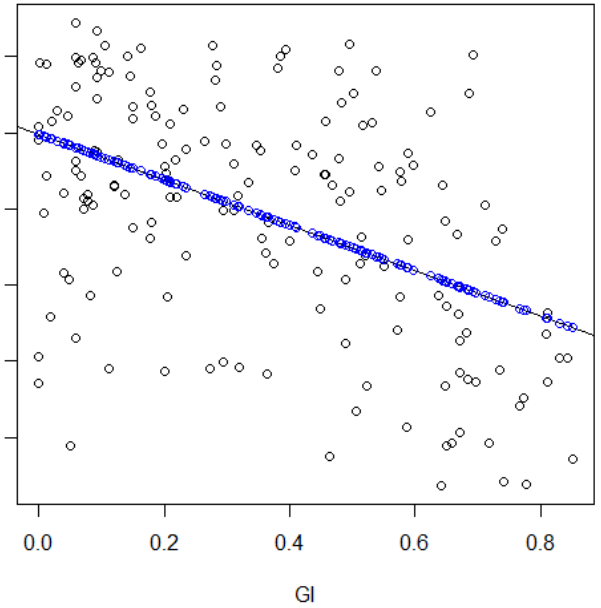
Human Development = 0.79817 - 0.29864*Cultural Diversity

Result

3) Regression Analysis

Cultural Diversity -> Each Variable

```
> shapiro.test(HDI.lm2$resid)

        Shapiro-Wilk normality test

data:  HDI.lm2$resid
W = 0.98245, p-value = 0.033

> bptest(HDI.lm2)

        studentized Breusch-Pagan test

data:  HDI.lm2
BP = 0.34629, df = 1, p-value = 0.5562

> dwtest(HDI.lm2)

        Durbin-Watson test

data:  HDI.lm2
DW = 1.887, p-value = 0.2281
alternative hypothesis: true autocorrelation is greater than 0
```

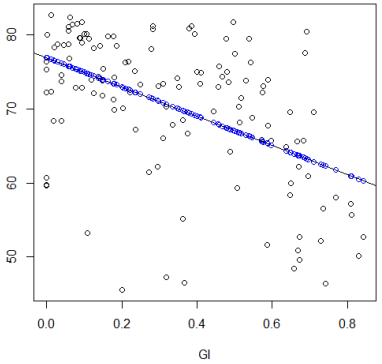


Result

3) Regression Analysis

Cultural Diversity -> Each Variable

```
> LIF.lm2 <- lm(EL ~ GI)
> summary(LIF.lm2)

Call:
lm(formula = EL ~ GI)

Residuals:
    Min      1Q  Median      3Q     Max
-27.381  -3.610   1.640   5.415  17.233

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   76.946      1.273  60.442  < 2e-16 ***
GI           -19.757      3.039  -6.501 1.75e-09 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 8.363 on 124 degrees of freedom
  (1 observation deleted due to missingness)
Multiple R-squared:  0.2542,    Adjusted R-squared:  0.2482
F-statistic: 42.27 on 1 and 124 DF,  p-value: 1.754e-09

> shapiro.test(LIF.lm2$resid)

        Shapiro-Wilk normality test

data:  LIF.lm2$resid
W = 0.94437, p-value = 5.644e-05

> bptest(LIF.lm2)

        studentized Breusch-Pagan test

data:  LIF.lm2
BP = 0.83858, df = 1, p-value = 0.3598

> dwtest(LIF.lm2)

        Durbin-Watson test

data:  LIF.lm2
DW = 1.9079, p-value = 0.3002
alternative hypothesis: true autocorrelation is greater than 0
```



Life Expectancy

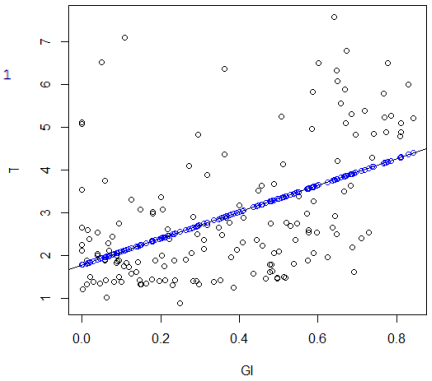
Life Expectancy = 76.947 - 19.757*Cultural Diversity

Result

3) Regression Analysis

Cultural Diversity -> Each Variable

```
> TFR.lm2 <- lm(TFR ~ GI)
> summary(TFR.lm2)

Call:
lm(formula = TFR ~ GI)

Residuals:
    Min      1Q  Median      3Q     Max
-2.3064 -0.9323 -0.2542  0.6834  4.9731

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   1.7881     0.1878   9.521  < 2e-16 ***
GI            3.1028     0.4288   7.235 1.86e-11 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 1.348 on 159 degrees of freedom
Multiple R-squared:  0.2477,    Adjusted R-squared:  0.243
F-statistic: 52.35 on 1 and 159 DF,  p-value: 1.859e-11
> shapiro.test(TFR.lm2$resid)

        Shapiro-Wilk normality test

data:  TFR.lm2$resid
W = 0.93151, p-value = 5.841e-07

> bptest(TFR.lm2)

        studentized Breusch-Pagan test

data:  TFR.lm2
BP = 0.8854, df = 1, p-value = 0.3467

> dwtest(TFR.lm2)

        Durbin-Watson test

data:  TFR.lm2
DW = 1.9489, p-value = 0.3687
alternative hypothesis: true autocorrelation is greater than 0
```



Total Fertility Rate

Total Fertility Rate = 1.7881 + 3.1028*Cultural Diversity

Group's idea :

There will be significant factors influencing on Cultural diversity in a positive way.

Cultural diversity don't have necessarily good influence on country

Missing points

- We did not consider complex factors as much
- There were many missing values in some Indexes

Conclusion

The result of analysis did not correspond to our prediction

Future study needed
- With more data & more significant factors

References

- - Economic Effects of Domestic and Neighbouring Countries' Cultural Diversity(E Gören - 2013 - papers.ssrn.com)
- - GDP per capita average annual growth rate(http://data.un.org/Data.aspx?q=gdp+growth+rate&d=SOWC&f=inID%3a93)
- - Population by religion, sex and urban/rural
- - http://data.worldbank.org/country
- - http://www.heritage.org/index/ranking
- - https://en.wikipedia.org/wiki/List_of_countries_by_economic_freedom
- - http://www.tradingeconomics.com/country-list/gdp
- - http://journals.lww.com/academicmedicine/Abstract/2007/06000/Measures_of_Cultural_Competence__Examining_Hidden.5.aspx
- - http://www.theguardian.com/news/datablog/2014/jun/18/global-peace-index-2014-every-country-ranked
- - http://www.numbeo.com/crime/rankings_by_country.jsp
- - http://hdr.undp.org/en/content/gender-inequality-index-gii
- -http://kosis.kr/statisticsList/statisticsList_03List.jsp?vwcd=MT_RTITLE&parmTabId=M_03_01#SubCont

References

- – About Index - Global Peace Index
- https://en.wikipedia.org/wiki/Global_Peace_Index
- – The Global Peace Index (GPI) is an attempt to measure the relative position of nations' and regions' peacefulness.[1] It is the product of the Institute for Economics and Peace (IEP) and developed in consultation with an international panel of peace experts from peace institutes and think tanks with data collected and collated by the Economist Intelligence Unit.
- he index gauges global peace using three broad themes: the level of safety and security in society, the extent of domestic and international conflict, and the degree of militarization.
- – lower value, more peace
- – visionofhumanity
-
- Gender Inequality Index
- http://hdr.undp.org/en/content/gender-inequality-index-gii
- https://en.wikipedia.org/wiki/Gender_Inequality_Index
- – The Gender Inequality Index (GII) is an index for measurement of gender disparity that was introduced in the 2010 Human Development Report 20th anniversary edition by the United Nations Development Programme (UNDP). According to the UNDP, this index is a composite measure which captures the loss of achievement within a country due to gender inequality. It uses three dimensions to do so: reproductive health, empowerment, and labor market participation.
- – The GII is built on the same framework as the HDI and the IHDI — to better expose differences in the distribution of achievements between women and men. It measures the human development costs of gender inequality, thus the higher the GII value the more disparities between females and males. The GII values vary tremendously across countries, they range from 2.1 percent to 73.3 percent.
- – near zero, equal, near 1, unequal
- – UNITED NATIONS DEVELOPMENT PROGRAMME

References

- Life Expectancy Index
- https://en.wikipedia.org/wiki/List_of_countries_by_life_expectancy
- Life expectancy equals the average number of years a person born in a given country would live if mortality rates at each age were to remain constant in the future.
- - correlated with HDI in itself
-
- Human Development Index
- https://en.wikipedia.org/wiki/Human_Development_Index
- https://www.google.co.kr/search?q=happy+planet+index&oq=happy+planet+index&aqs=chrome..69i57j0l5.3208j0j4&sourceid=chrome&es_sm=93&ie=UTF-8#newwindow=1&q=human+development+index
- - The Human Development Index (HDI) is a composite statistic of life expectancy, education, and per capita income indicators, which is used to rank countries into four tiers of human development.
- - The HDI was created to emphasize that people and their capabilities should be the ultimate criteria for assessing the development of a country, not economic growth alone. The HDI can also be used to question national policy choices, asking how two countries with the same level of GNI per capita can end up with different human development outcomes. These contrasts can stimulate debate about government policy priorities.
- - The Human Development Index (HDI) is a summary measure of average achievement in key dimensions of human development: a long and healthy life, being knowledgeable and have a decent standard of living. The HDI is the geometric mean of normalized indices for each of the three dimensions.
- - UNITED NATIONS DEVELOPMENT PROGRAMME

References

- Total Fertility Rate
- https://en.wikipedia.org/wiki/Total_fertility_rate
- - The total fertility rate (TFR), sometimes also called the fertility rate, period total fertility rate (PTFR) or total period fertility rate (TPFR) of a population is the average number of children that would be born to a woman over her lifetime if:
- She was to experience the exact current age-specific fertility rates (ASFRs) through her lifetime, and
- She was to survive from birth through the end of her reproductive life.
- It is obtained by summing the single-year age-specific rates at a given time.
-
- Urbanization Rate
- - There are two measures of the degree of urbanization of a population. The first, urban population, describes the percentage of the total population living in urban areas, as defined by the country.- The second measure, rate of urbanization, describes the projected average rate of change of the size of the urban population over the given period of time. World Corruption Indexhttp://www.transparency.org/research/cpi/overview- What does a number mean to you? Each year we score countries on how corrupt their public sectors are seen to be. Our Corruption Perceptions Index sends a powerful message and governments have been forced to take notice and act.- TRANSPARENCY INTERNATIONAL Economic Participation Ratehttps://en.wikipedia.org/wiki/Workforce- The labour force participation rate, LFPR (or economic activity rate, EAR), is the ratio between the labour force and the overall size of their cohort (national population of the same age range).- KOSIS Happy Planet Indexhttp://www.happyplanetindex.org/about/- The HPI measures what matters: the extent to which countries deliver long, happy, sustainable lives for the people that live in them. The Index uses global data on life expectancy, experienced well-being and Ecological Footprint to calculate this.- The index is an efficiency measure, it ranks countries on how many long and happy lives they produce per unit of environmental input.

Thank You For Listening!