EDA for the Previous Dashboard Data

Number of Null Values

****

	colSums(is.na(data))
ID	0
name_en	0
iso_a3	0
economy	0
income_grp	0
Degraded_Ecosystems	0
Relative_Deprivation_Index	1083713
Climate_Vulnerability	4204
Marine_Nutritional_Dependency	55054
Marine_Employment_Dependency	75920
Low_Voice_And_Accountability	2455
Political_Instability	2455
Government_Ineffectiveness	2455
Poor_Regulatory_Quality	2455
Weak_Rule_Of_Law	2455
Weak_Control_Of_Corruption	2455
Gender_Inequality	1118
Income_Inequality	96824
Inequality_Adjusted_Life_Expectancy	50219
Income_Inequality_Change	180957
Inequality_Adjusted_Life_Expectancy_Change	50219
vulnerab.score.rank	1090800
gov.score.rank	2455
ineq.score.rank	96824
hierachical.score.rank.ineq	1096528
geometry	0

```
cat("Total number of null values in the database is:", sum(is.na(data)))
```

Total number of null values in the database is: 3899565
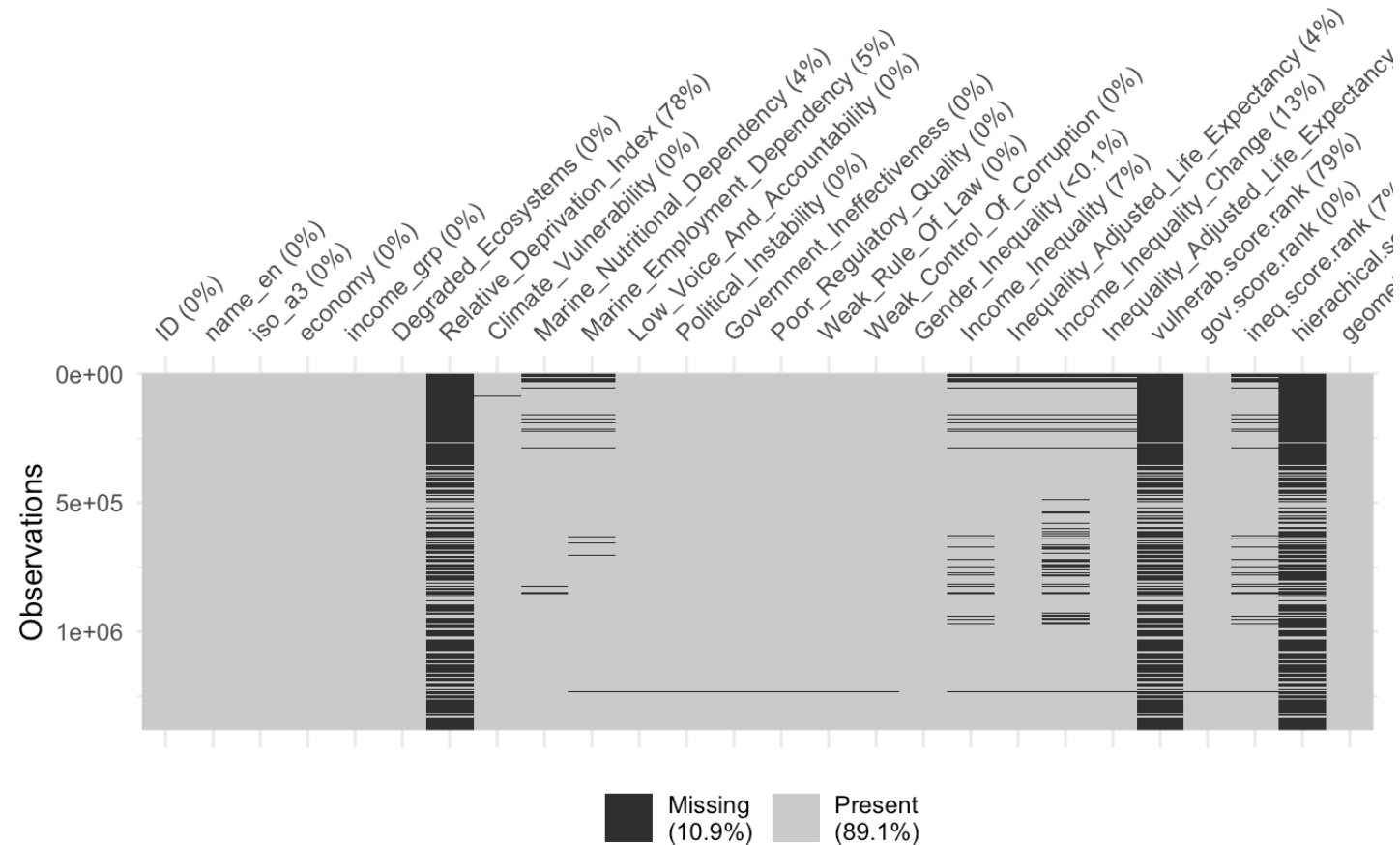
Dimensions of the data

****

[1] 1380998   26

```
Structure: column types and first few entries
***************************************************************

sf [1,380,998 × 25] (S3: sf/tbl_df/tbl/data.frame)
 $ ID                                       : chr [1:1380998] "484900" "484901" "484905" "484906"
...
 $ name_en                                  : Factor w/ 258 levels "Afghanistan",..: 90 90 90 90
90 90 90 90 90 90 ...
 $ iso_a3                                   : Factor w/ 237 levels "-99","ABW","AFG",..: 87 87 87
87 87 87 87 87 87 87 ...
 $ economy                                  : Factor w/ 8 levels "-99","1. Developed region:
G7",..: 3 3 3 3 3 3 3 3 3 3 ...
 $ income_grp                               : Factor w/ 6 levels "-99","1. High income: OECD",..:
3 3 3 3 3 3 3 3 3 3 ...
 $ Degraded_Ecosystems                      : num [1:1380998] 0 0 0 0 0 0 0 0 0 0 ...
 $ Relative_Deprivation_Index               : num [1:1380998] NA NA NA NA NA NA NA NA NA NA ...
 $ Climate_Vulnerability                    : num [1:1380998] 0 0 0 0 0 0 0 0 0 0 ...
 $ Marine_Nutritional_Dependency            : num [1:1380998] NA NA NA NA NA NA NA NA NA NA ...
 $ Marine_Employment_Dependency             : num [1:1380998] NA NA NA NA NA NA NA NA NA NA ...
 $ Low_Voice_And_Accountability             : num [1:1380998] 0.0807 0.0807 0.0807 0.0807 0.0807
...
 $ Political_Instability                    : num [1:1380998] 0 0 0 0 0 0 0 0 0 0 ...
 $ Government_Ineffectiveness               : num [1:1380998] 0.302 0.302 0.302 0.302 0.302 ...
 $ Poor_Regulatory_Quality                  : num [1:1380998] 0.16 0.16 0.16 0.16 0.16 ...
 $ Weak_Rule_Of_Law                         : num [1:1380998] 0.0691 0.0691 0.0691 0.0691 0.0691
...
 $ Weak_Control_Of_Corruption               : num [1:1380998] 0.278 0.278 0.278 0.278 0.278 ...
 $ Gender_Inequality                        : num [1:1380998] 0.284 0.284 0.284 0.284 0.284 ...
 $ Income_Inequality                        : num [1:1380998] NA NA NA NA NA NA NA NA NA NA ...
 $ Inequality_Adjusted_Life_Expectancy      : num [1:1380998] NA NA NA NA NA NA NA NA NA NA ...
 $ Income_Inequality_Change                 : num [1:1380998] NA NA NA NA NA NA NA NA NA NA ...
 $ Inequality_Adjusted_Life_Expectancy_Change: num [1:1380998] NA NA NA NA NA NA NA NA NA NA ...
 $ vulnerab.score.rank                      : num [1:1380998] NA NA NA NA NA NA NA NA NA NA ...
 $ gov.score.rank                           : num [1:1380998] 0.258 0.258 0.258 0.258 0.258 ...
 $ ineq.score.rank                          : num [1:1380998] NA NA NA NA NA NA NA NA NA NA ...
```

```
 $ hierachical.score.rank.ineq        : num [1:1380998] NA NA NA NA NA NA NA NA NA NA ...
 - attr(*, "sf_column")= chr "geometry"
 - attr(*, "agr")= Factor w/ 3 levels "constant","aggregate",..: NA NA NA NA NA NA NA NA NA NA ...
  ..- attr(*, "names")= chr [1:25] "ID" "name_en" "iso_a3" "economy" ...


Summary of each column
***********************************************************


      ID                             name_en              iso_a3
 Length:1380998     Canada                  :173732   CAN   :173732
 Class :character   Russia                  :143121   RUS   :143121
 Mode  :character   United States of America: 90800   USA   : 90800
                    Australia               : 86798   AUS   : 86798
                    Indonesia               : 76122   IDN   : 76122
                    Greenland               : 47104   GRL   : 47104
                    (Other)                 :763321   (Other):763321
              economy                           income_grp
 1. Developed region: G7   :312679   -99                  :     0
 3. Emerging region: BRIC  :250262   1. High income: OECD   :477596
 2. Developed region: nonG7:228464   2. High income: nonOECD: 80372
 5. Emerging region: G20   :170997   3. Upper middle income :481174
 6. Developing region      :165097   4. Lower middle income :249064
 4. Emerging region: MIKT  :137125   5. Low income          : 92792
 (Other)                   :116374
 Degraded_Ecosystems Relative_Deprivation_Index Climate_Vulnerability
 Min.   :0.000000    Min.   :0.00               Min.   :0.0000
 1st Qu.:0.001685    1st Qu.:0.53               1st Qu.:0.0000
 Median :0.008451    Median :0.62               Median :0.0000
 Mean   :0.082616    Mean   :0.61               Mean   :0.0016
 3rd Qu.:0.070274    3rd Qu.:0.72               3rd Qu.:0.0000
 Max.   :1.000000    Max.   :1.00               Max.   :1.0000
                     NA's   :1083713            NA's   :4204
 Marine_Nutritional_Dependency Marine_Employment_Dependency
 Min.   :0.000                 Min.   :0.000
 1st Qu.:0.079                 1st Qu.:0.021
```

```
Median :0.142                    Median :0.021
Mean   :0.140                    Mean   :0.049
3rd Qu.:0.165                    3rd Qu.:0.057
Max.   :1.000                    Max.   :1.000
NA's   :55054                    NA's   :75920
Low_Voice_And_Accountability Political_Instability Government_Ineffectiveness
Min.   :0.00000              Min.   :0.0000        Min.   :0.0000
1st Qu.:0.08073              1st Qu.:0.2103        1st Qu.:0.1683
Median :0.31884              Median :0.4742        Median :0.4727
Mean   :0.36157             Mean   :0.4249         Mean   :0.4119
3rd Qu.:0.62514             3rd Qu.:0.5942         3rd Qu.:0.5697
Max.   :1.00000             Max.   :1.0000         Max.   :1.0000
NA's   :2455                NA's   :2455           NA's   :2455
Poor_Regulatory_Quality Weak_Rule_Of_Law  Weak_Control_Of_Corruption
Min.   :0.0000          Min.   :0.00000   Min.   :0.0000
1st Qu.:0.1519          1st Qu.:0.07624   1st Qu.:0.2470
Median :0.4163          Median :0.48807   Median :0.6436
Mean   :0.3751          Mean   :0.39177   Mean   :0.5076
3rd Qu.:0.5605          3rd Qu.:0.63287   3rd Qu.:0.7641
Max.   :1.0000          Max.   :1.00000   Max.   :1.0000
NA's   :2455            NA's   :2455      NA's   :2455
Gender_Inequality Income_Inequality Inequality_Adjusted_Life_Expectancy
Min.   :0.0000    Min.   :0.000     Min.   :0.000
1st Qu.:0.2686    1st Qu.:0.153     1st Qu.:0.191
Median :0.3067    Median :0.246     Median :0.312
Mean   :0.3716    Mean   :0.301     Mean   :0.398
3rd Qu.:0.4569    3rd Qu.:0.394     3rd Qu.:0.565
Max.   :1.0000    Max.   :1.000     Max.   :1.000
NA's   :1118      NA's   :96824     NA's   :50219
Income_Inequality_Change Inequality_Adjusted_Life_Expectancy_Change
Min.   :0.000            Min.   :0.000
1st Qu.:0.135            1st Qu.:0.203
Median :0.188            Median :0.301
Mean   :0.179           Mean   :0.318
3rd Qu.:0.212           3rd Qu.:0.415
```

```
Max.    :1.000          Max.    :1.000
NA's    :180957         NA's    :50219
vulnerab.score.rank gov.score.rank    ineq.score.rank
Min.    :0.02          Min.    :0.01562   Min.    :0.009
1st Qu.:0.15          1st Qu.:0.25813   1st Qu.:0.302
Median :0.17          Median :0.58763   Median :0.453
Mean    :0.19          Mean    :0.50000   Mean    :0.497
3rd Qu.:0.22          3rd Qu.:0.77293   3rd Qu.:0.706
Max.    :0.56          Max.    :0.99319   Max.    :0.953
NA's    :1090800       NA's    :2455      NA's    :96824
hierachical.score.rank.ineq
Min.    :0.01
1st Qu.:0.36
Median :0.53
Mean    :0.52
3rd Qu.:0.70
Max.    :1.00
NA's    :1096528


Number of Unique Values
**************************************************************

                                      Unique Values
ID                                        1380998
name_en                                       179
iso_a3                                        179
economy                                         7
income_grp                                      5
Degraded_Ecosystems                       1317363
Relative_Deprivation_Index                 292297
Climate_Vulnerability                       25396
Marine_Nutritional_Dependency                 140
Marine_Employment_Dependency                   43
Low_Voice_And_Accountability                  163
Political_Instability                         164
```

```
Government_Ineffectiveness                         163
Poor_Regulatory_Quality                            163
Weak_Rule_Of_Law                                   164
Weak_Control_Of_Corruption                         164
Gender_Inequality                                  139
Income_Inequality                                  135
Inequality_Adjusted_Life_Expectancy                151
Income_Inequality_Change                            52
Inequality_Adjusted_Life_Expectancy_Change          64
vulnerab.score.rank                             290199
gov.score.rank                                     164
ineq.score.rank                                    135
hierachical.score.rank.ineq                     284471
geometry                                       1380998
```

Histogram of data$Degraded_Ecosystems
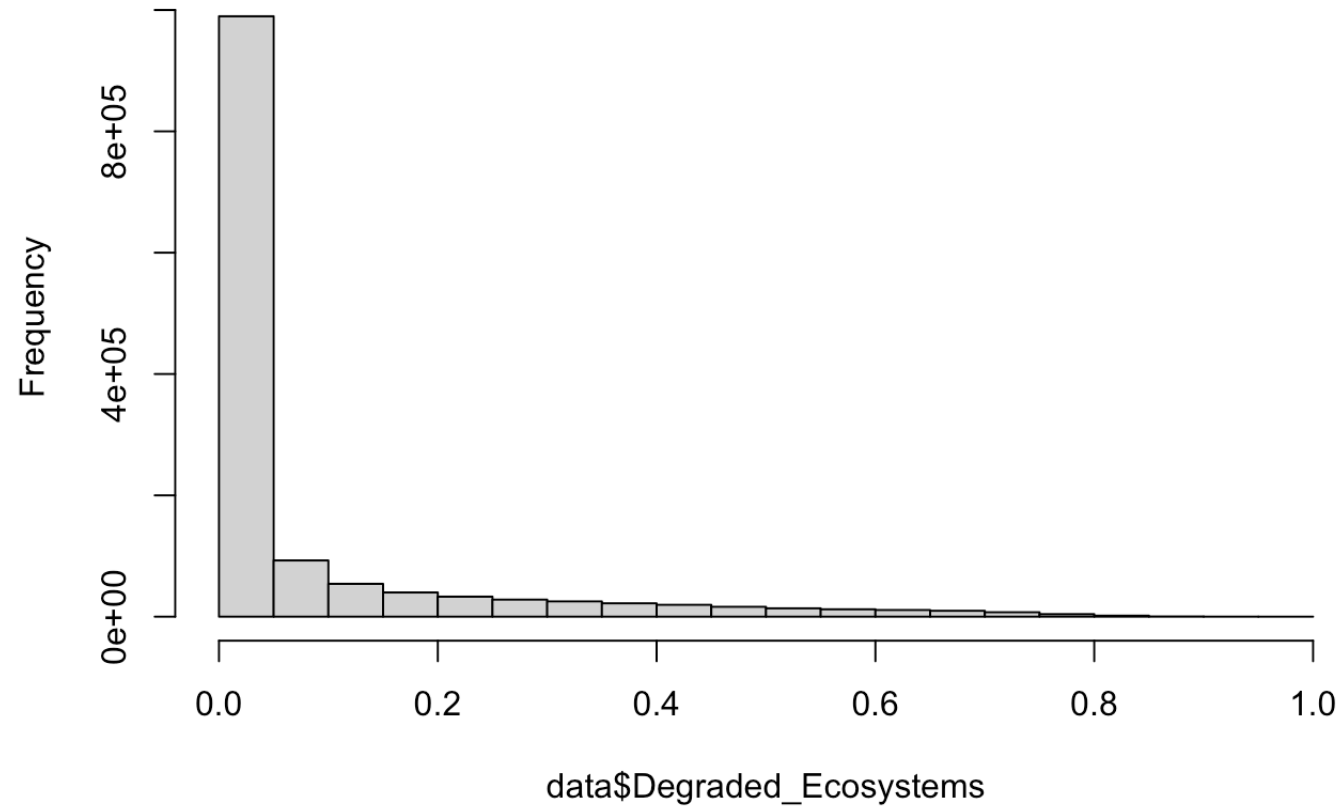
Histogram of data$Relative_Deprivation_Index
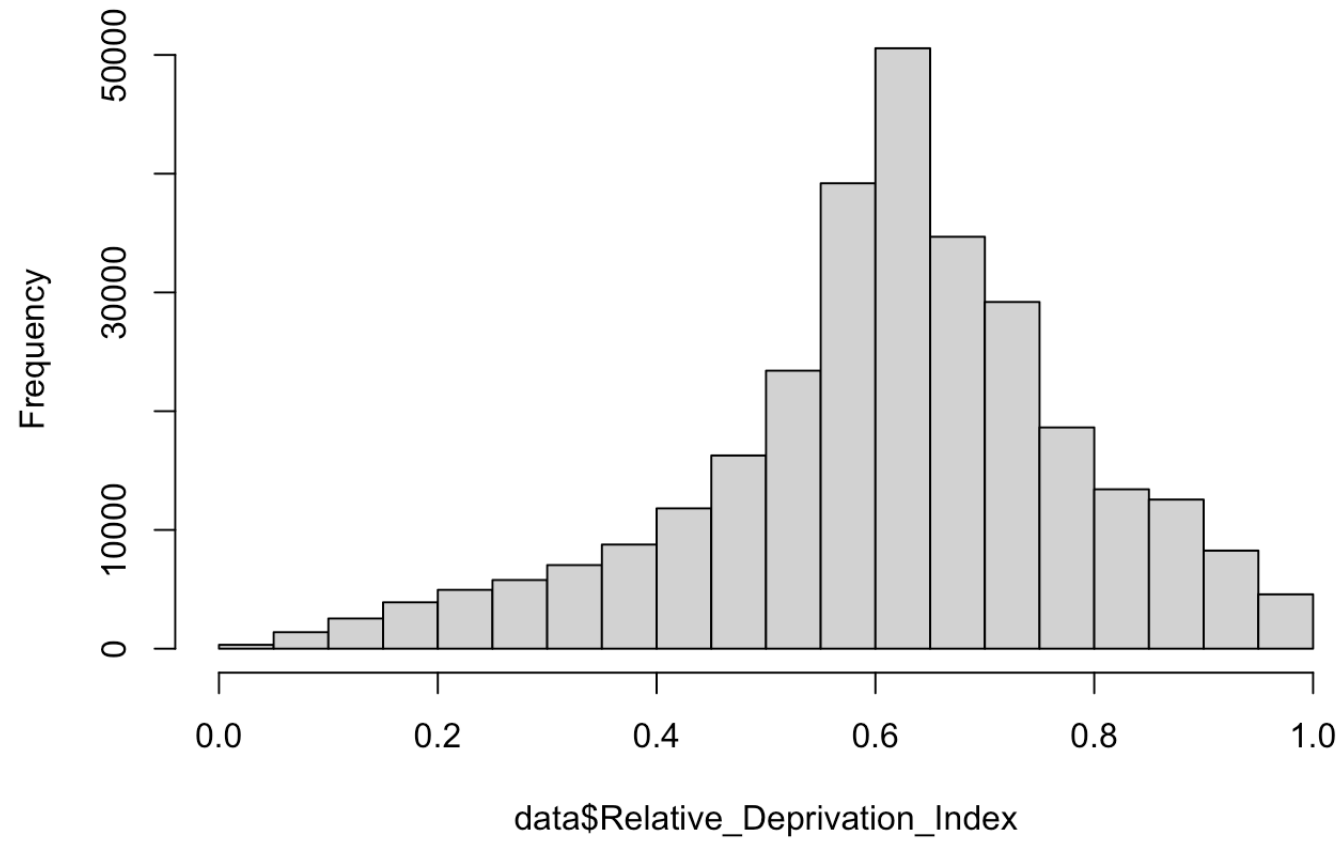
Histogram of data$Climate_Vulnerability
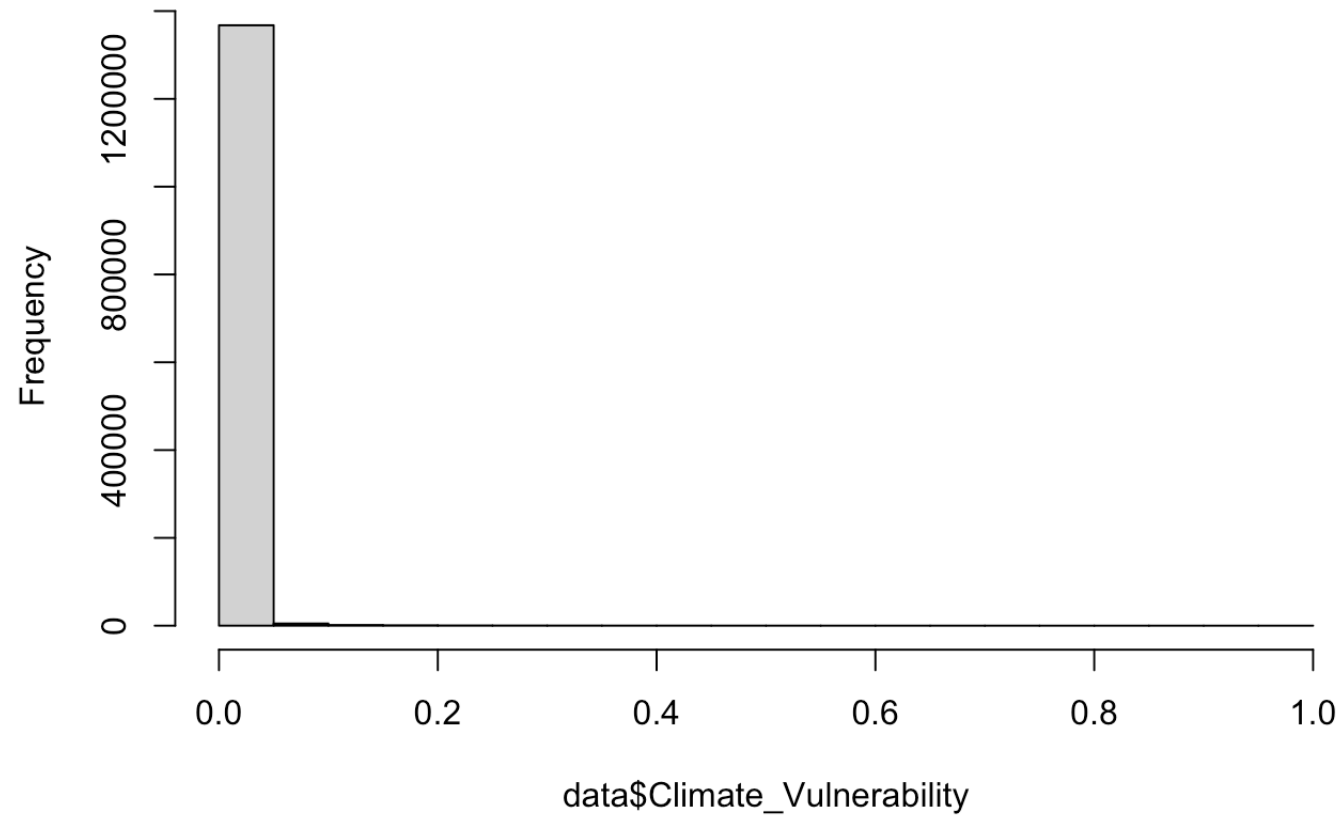
Histogram of data$Marine_Employment_Dependency
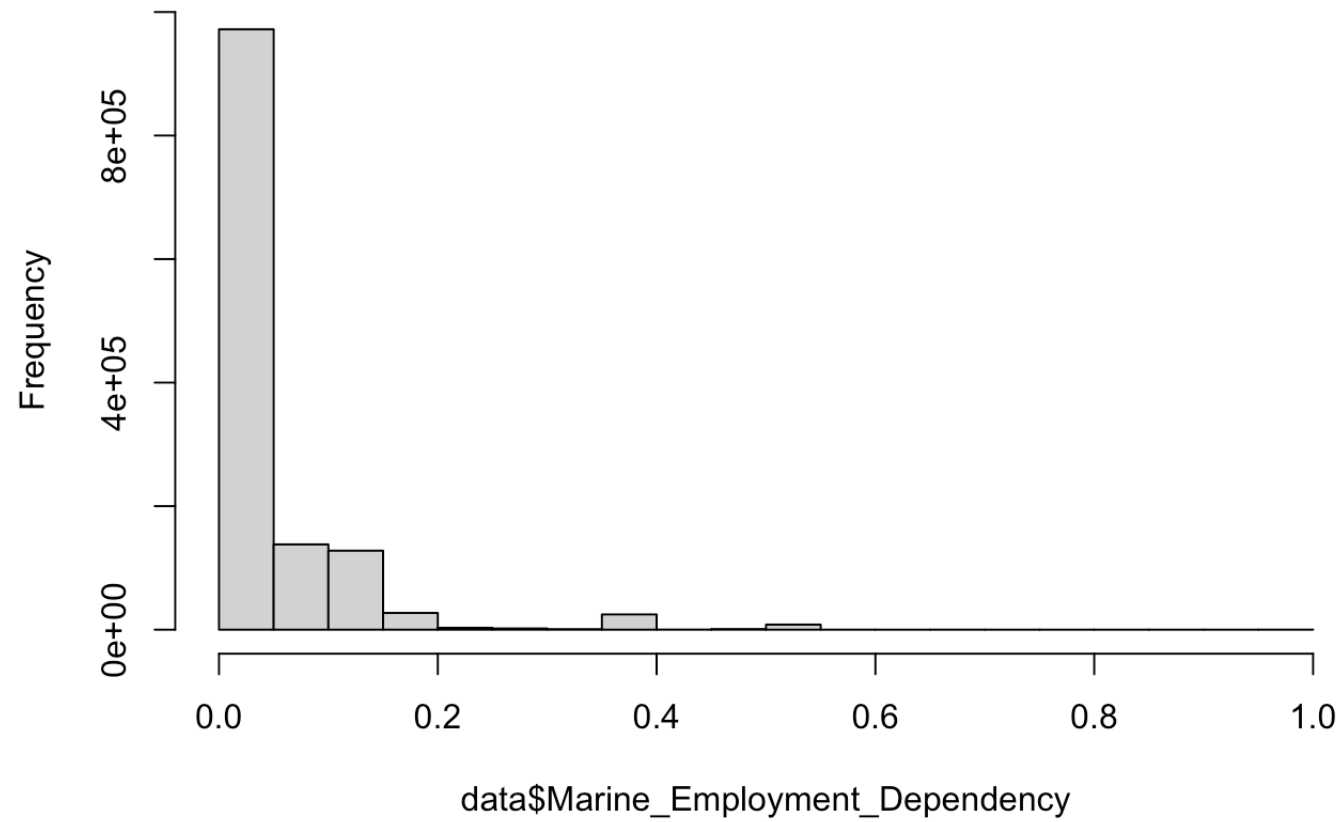
Histogram of data$Marine_Nutritional_Dependency
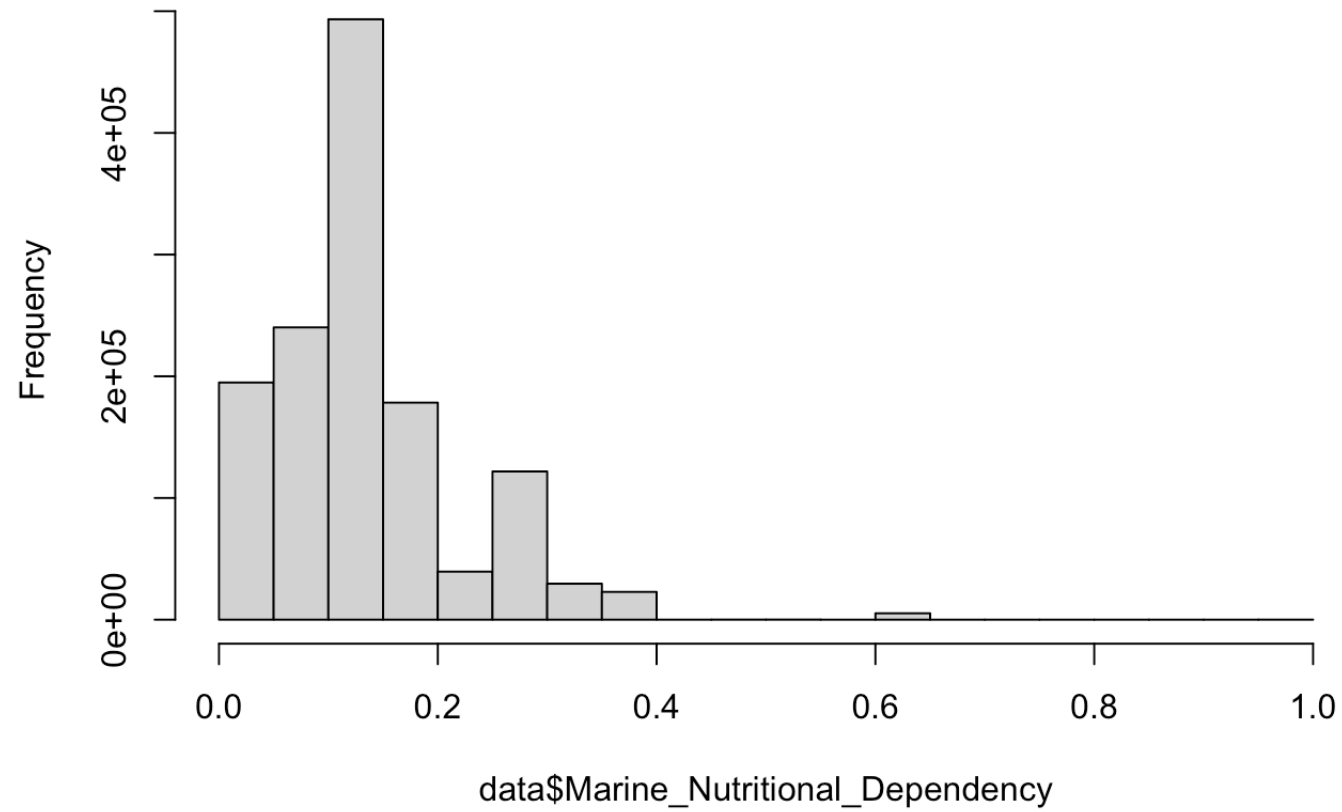
Histogram of data$Low_Voice_And_Accountability
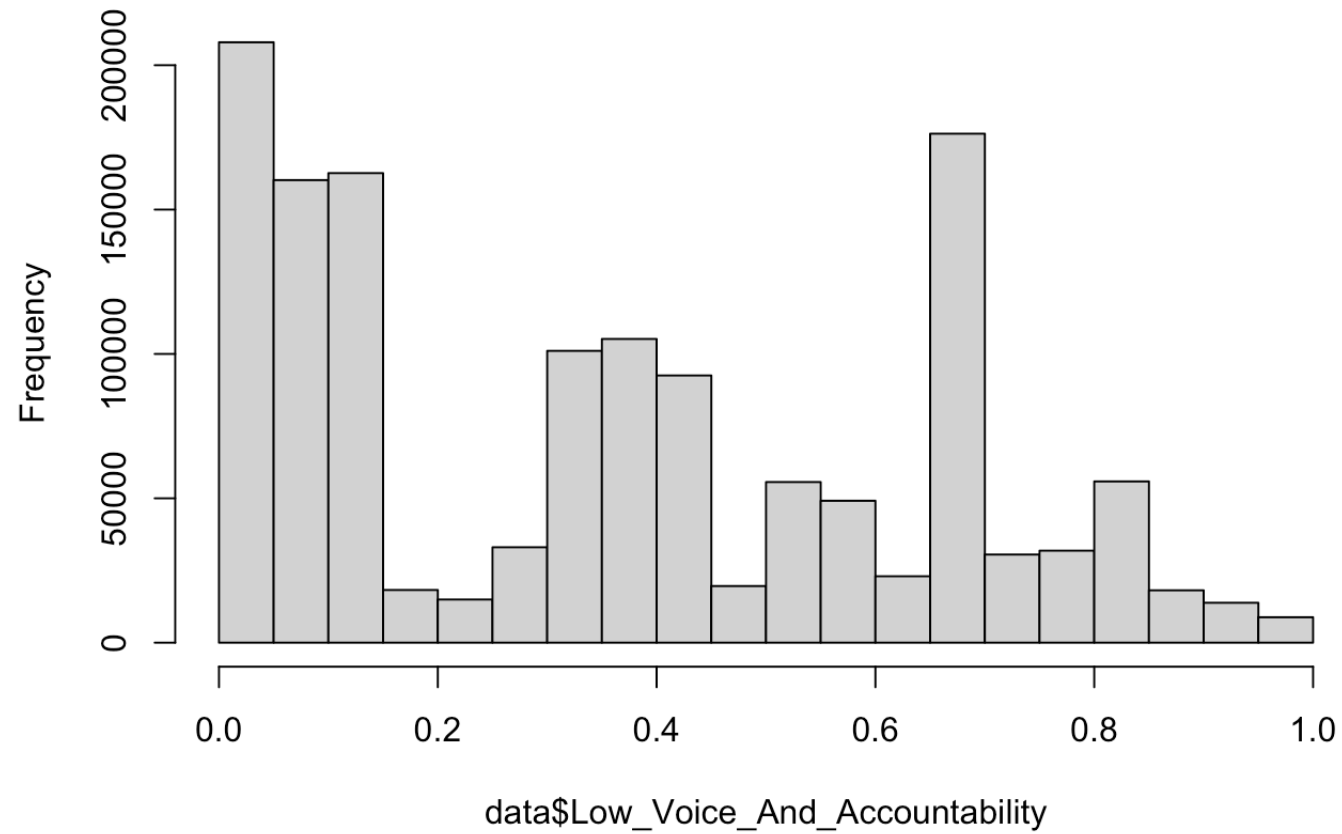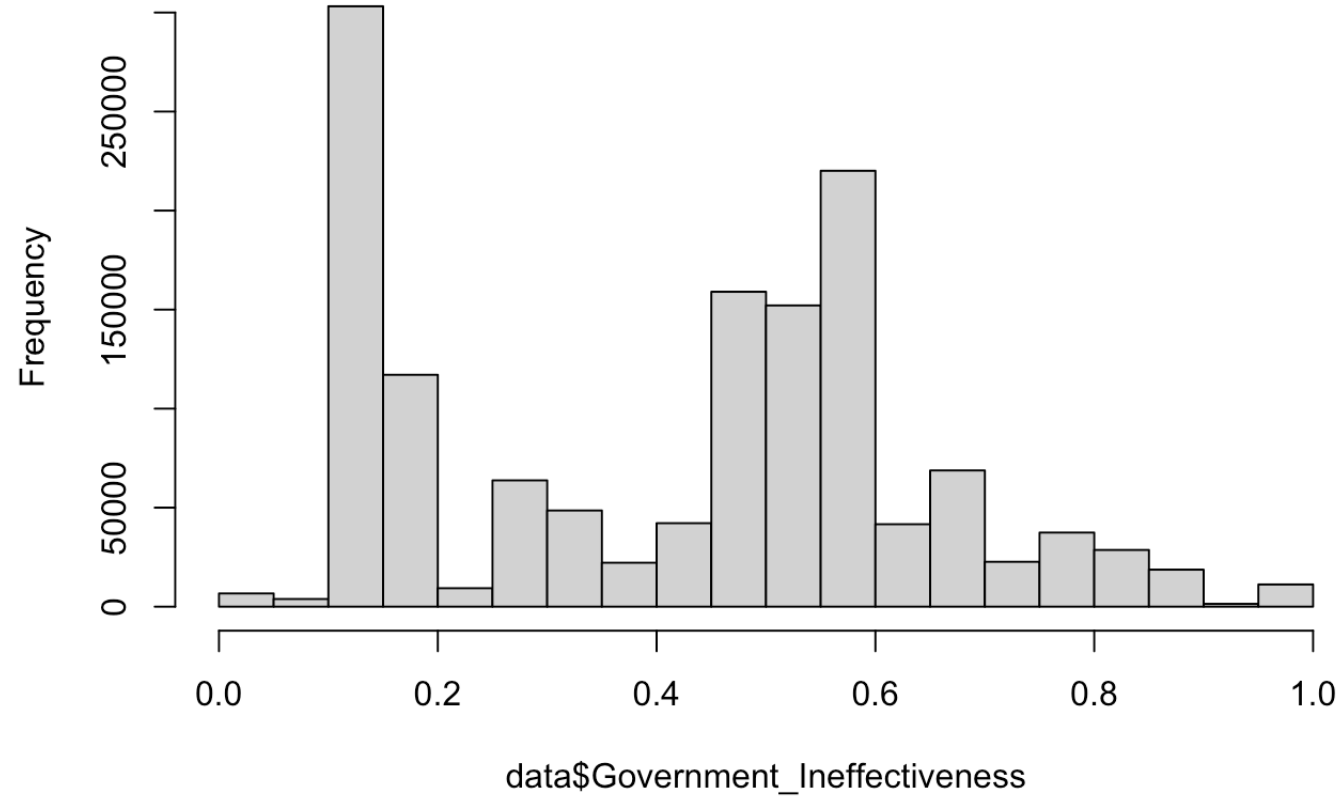
Histogram of data$Weak_Rule_Of_Law
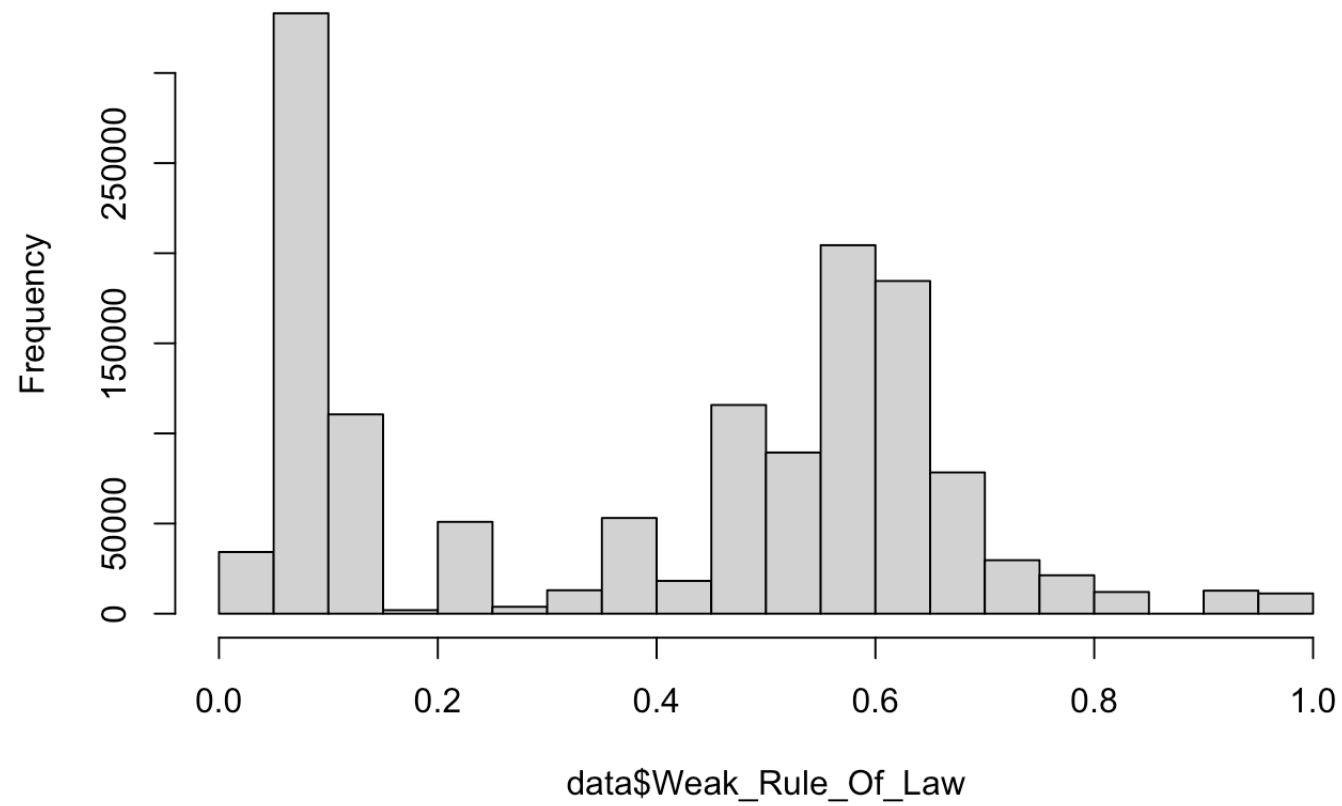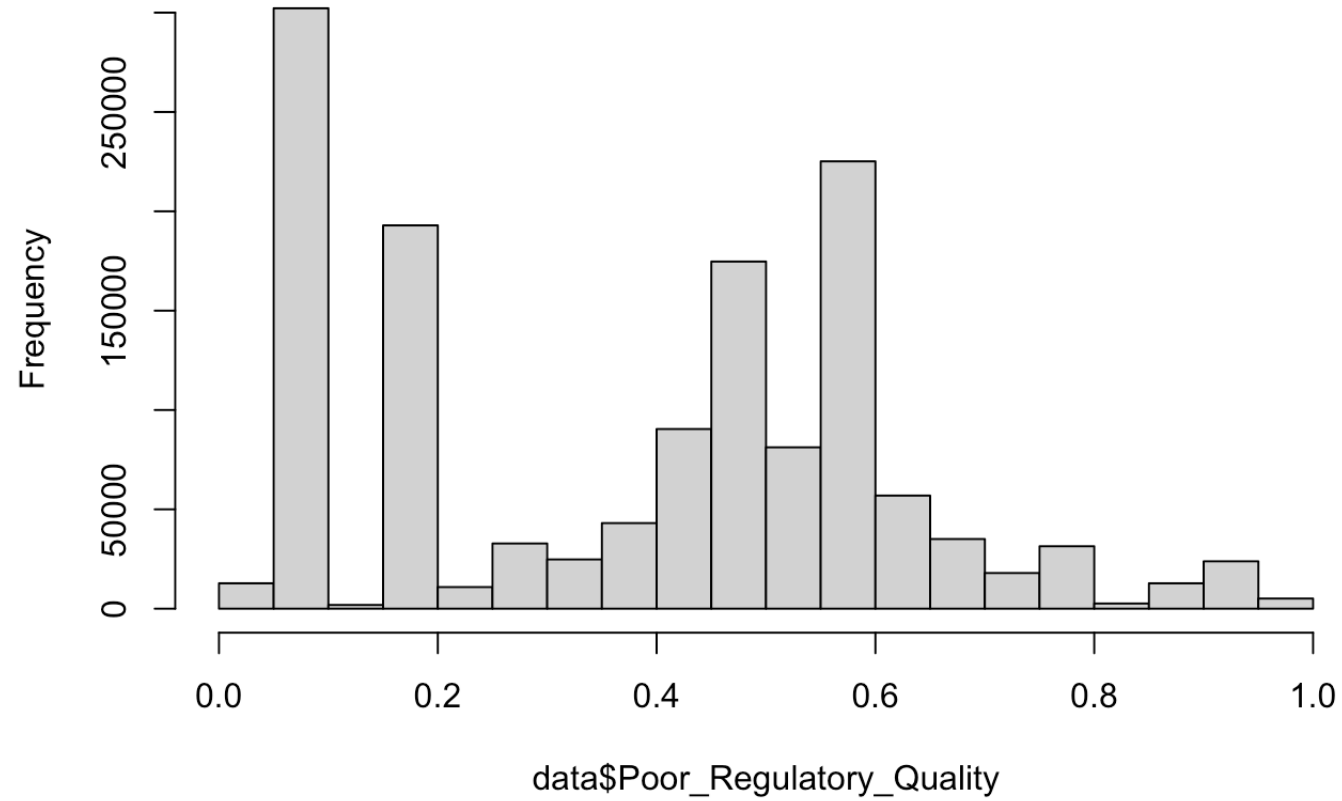
Histogram of data$Weak_Control_Of_Corruption

Frequency

data$Weak_Control_Of_Corruption
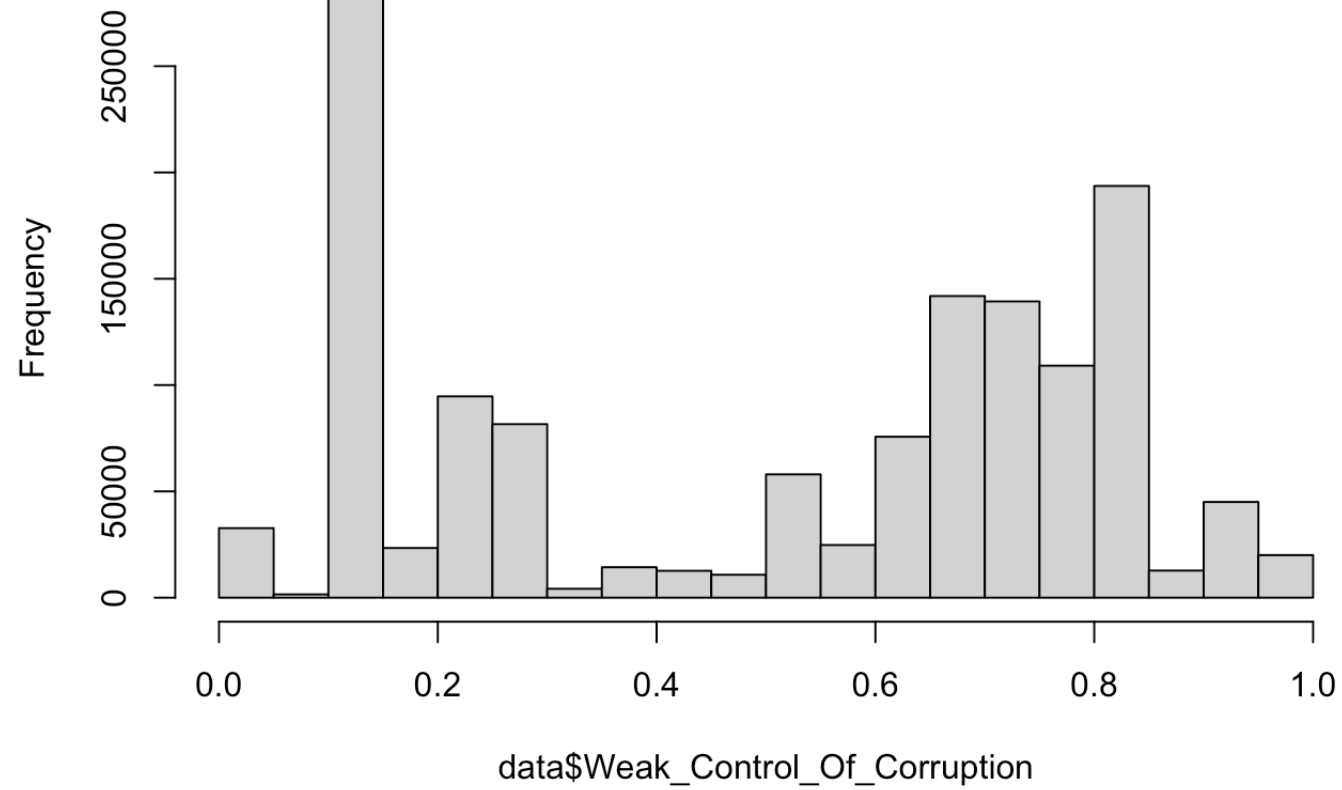
Histogram of data$Political_Instability
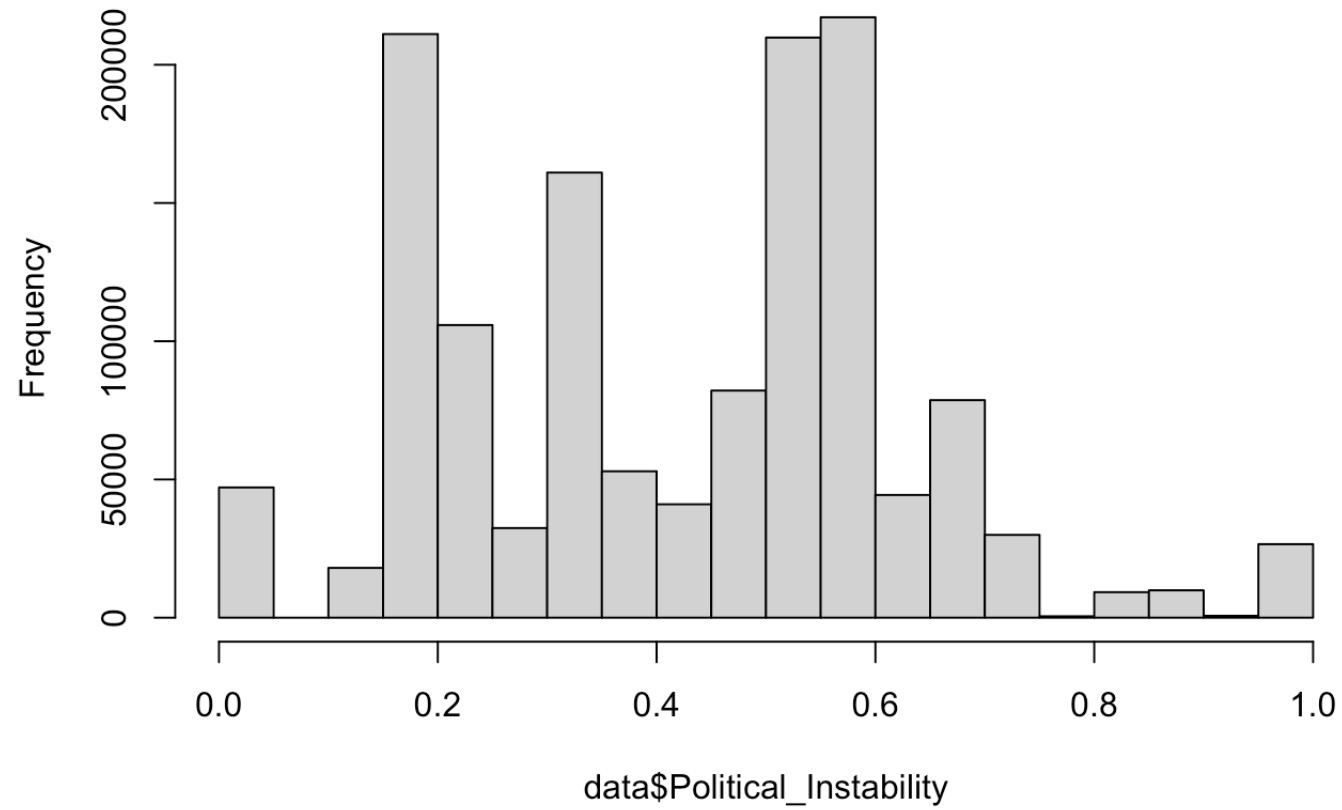
Histogram of data$Government_Ineffectiveness
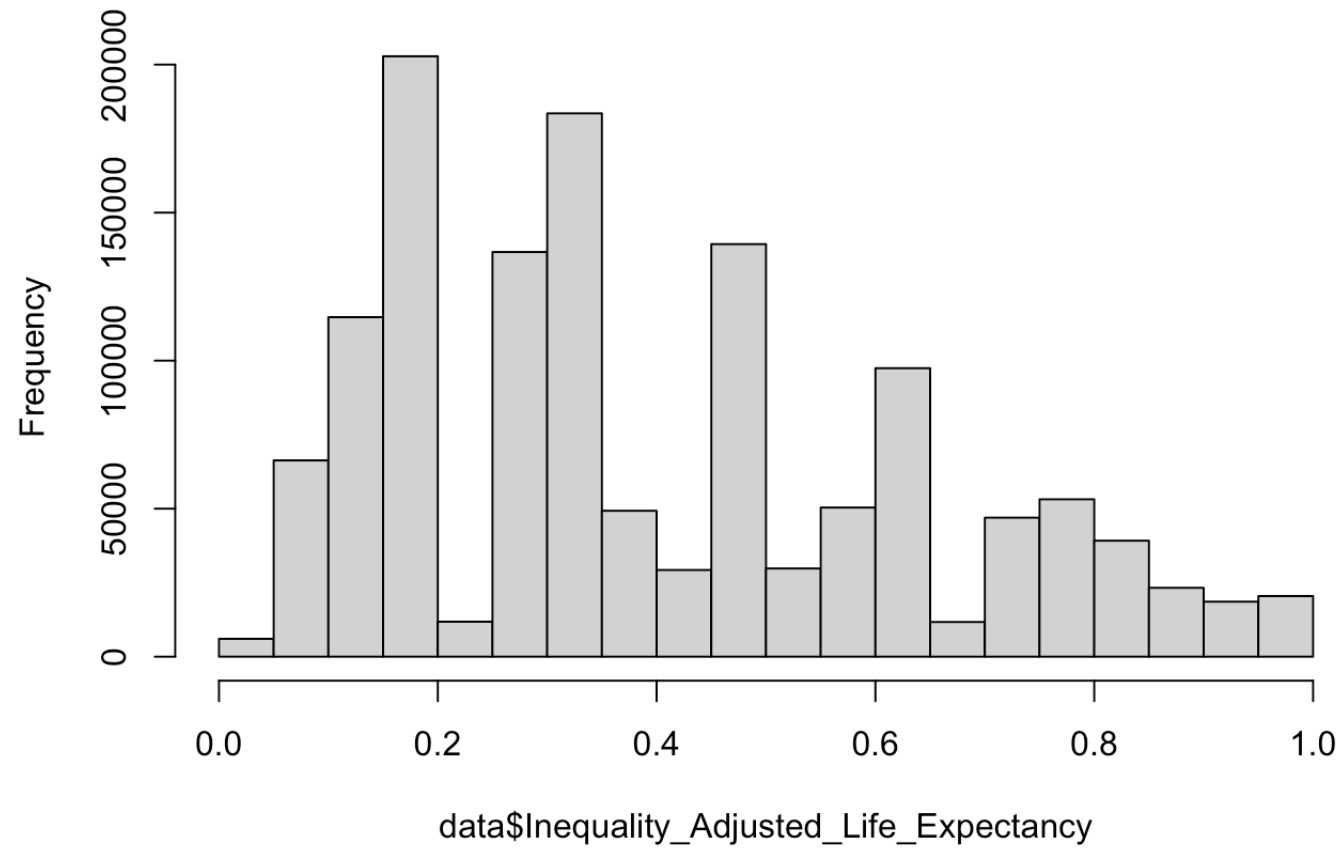
Frequency

data$Government_Ineffectiveness

Histogram of data$Poor_Regulatory_Quality

Histogram of data$Gender_Inequality
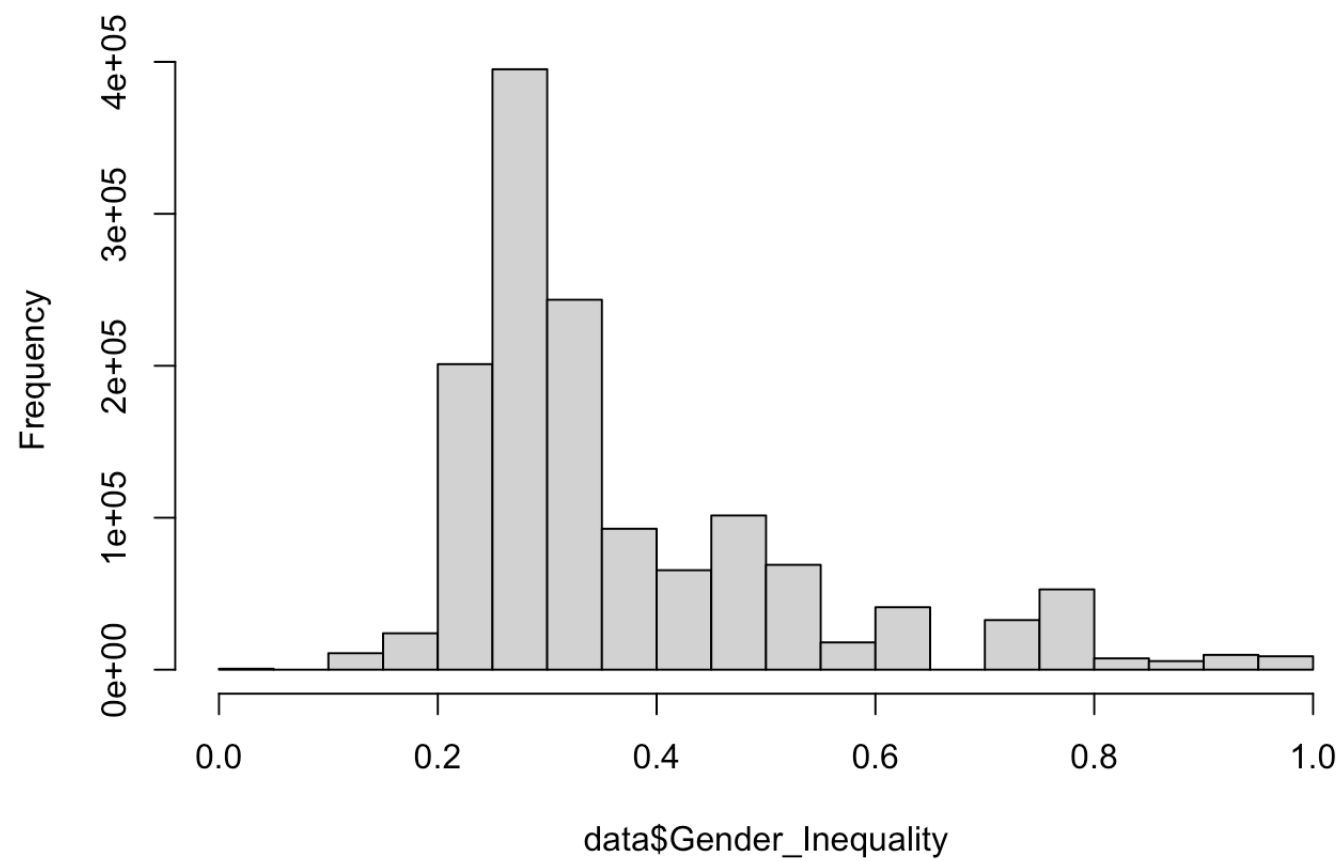
# Histogram of data$Inequality_Adjusted_Life_Expectancy

Histogram of data$Income_Inequality
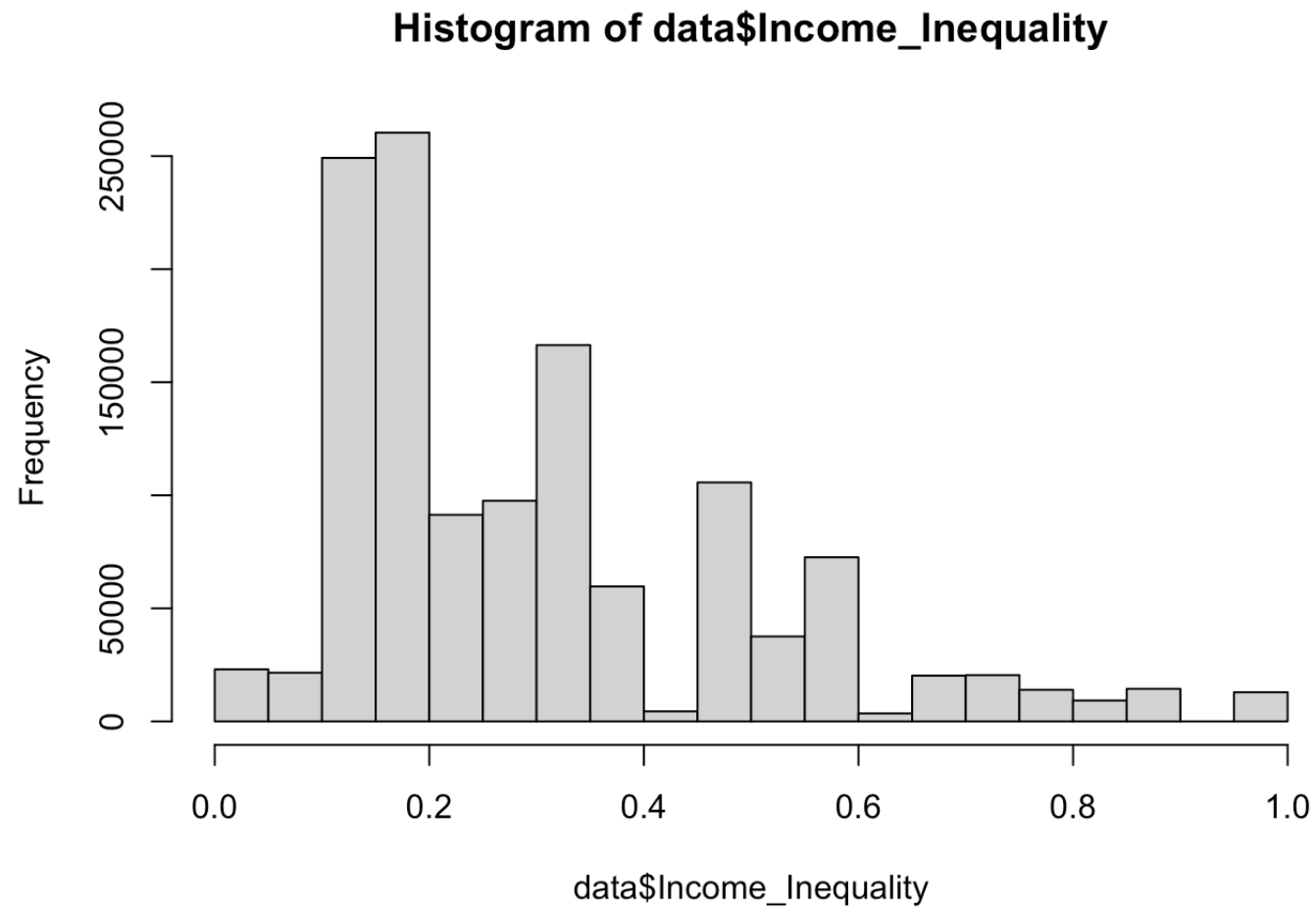
Percentage Frequency of the Types of Economy (%)

****

|	-99	1. High income: OECD	2. High income: nonOECD
	0.00	34.58	5.82
	3. Upper middle income	4. Lower middle income	5. Low income
	34.84	18.04	6.72

Percentage Frequency of the Income Groups (%)
****

	-99	1. High income: OECD	2. High income: nonOECD
	0.00	34.58	5.82
	3. Upper middle income	4. Lower middle income	5. Low income
	34.84	18.04	6.72

Visualization of the Correlation Matrix
****
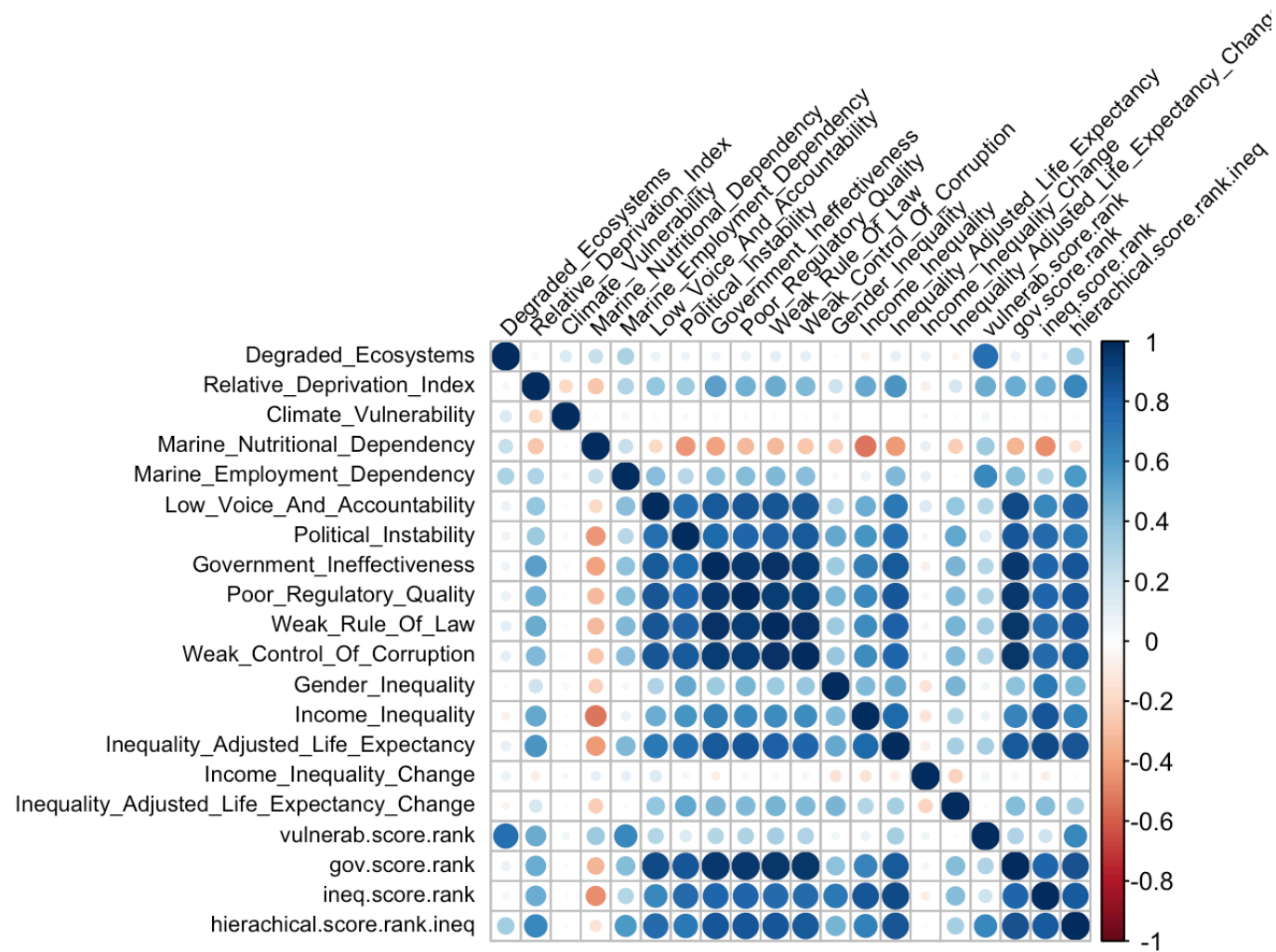
Scree diagram:

****

Explained Variance by Principal Components
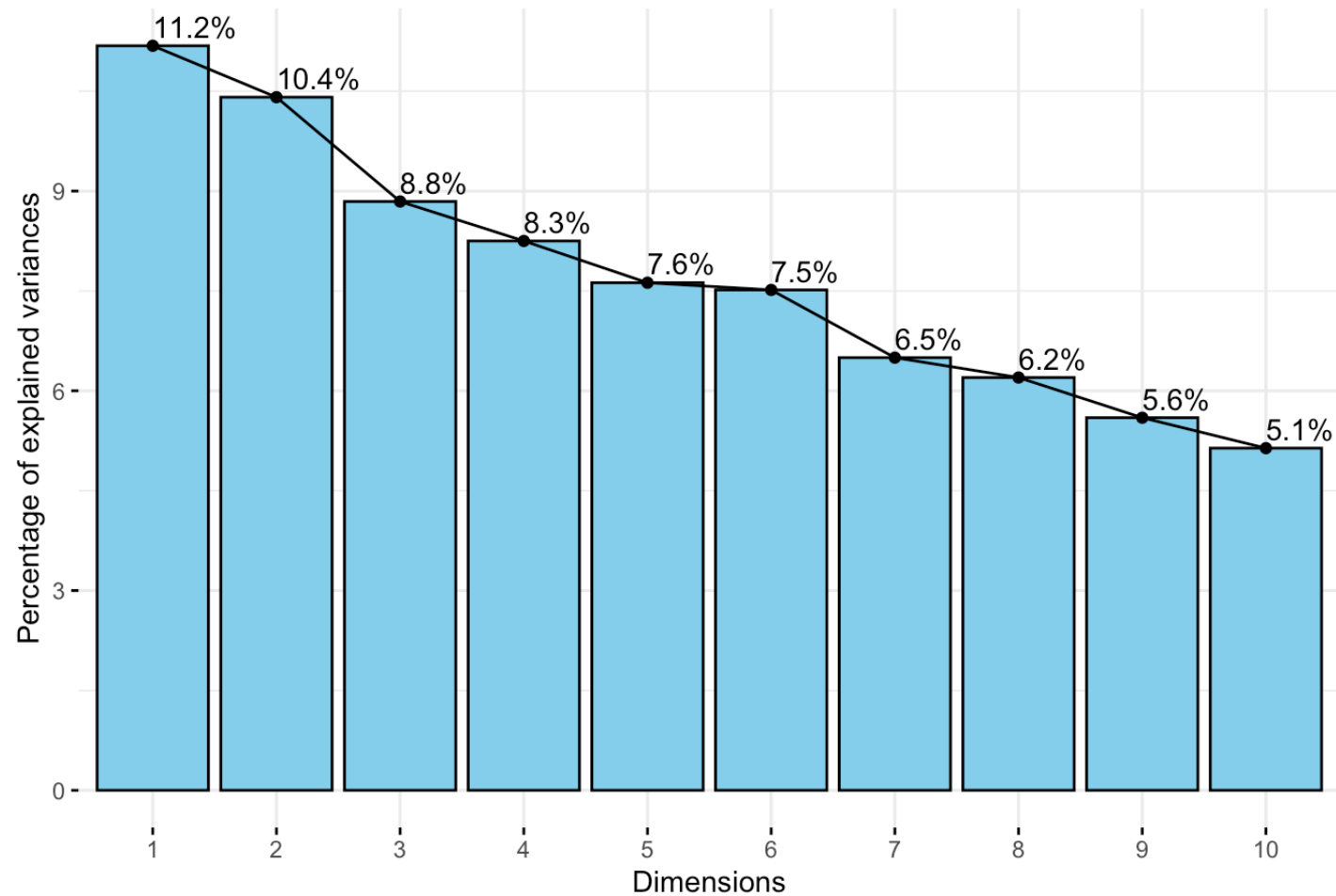
	Variable	PC1	PC2	PC3	PC4
1	Degraded_Ecosystems	−0.04999536	0.06022806	0.54306974	0.41835800
2	Relative_Deprivation_Index	−0.04202958	−0.32352991	−0.37080963	0.13241399
3	Climate_Vulnerability	−0.17352912	0.18725831	−0.20775374	0.43779995
4	Marine_Employment_Dependency	−0.13835634	−0.32265746	−0.06332614	−0.12867026
5	Marine_Nutritional_Dependency	0.04380522	0.52886679	−0.25952724	0.07063555
6	Low_Voice_And_Accountability	−0.34250969	−0.33518531	0.00656365	0.16559432

PC5	PC6	PC7	PC8	PC9	PC10

```
1   0.14797437   0.11535850   0.004398409  -0.021099180  -0.29392863   0.03270956
2  -0.17806437  -0.25494041   0.154203340   0.020695802  -0.26199326   0.50412240
3   0.22494292  -0.18685710  -0.391409944  -0.169194156  -0.01417921  -0.12319054
4   0.10704959   0.52828584   0.075910357  -0.035167444   0.29610173  -0.34060438
5  -0.07581388  -0.04761793  -0.160114193  -0.275744441   0.07269086  -0.19202914
6  -0.12943404  -0.30370604  -0.269451665   0.005828216   0.08967136  -0.14519794
            PC11          PC12          PC13          PC14          PC15         PC16
1  -0.29276838  -0.01679414  -0.10197284  -0.29704622  -0.20025304   0.4195960
2  -0.36224597  -0.06466430  -0.18712913  -0.02057652   0.32394671   0.1380380
3  -0.01553662  -0.52204119   0.19613330  -0.12886717   0.18526173  -0.2347466
4  -0.39318147  -0.22438529   0.06426552   0.04755620   0.31795821   0.2062079
5  -0.19594167   0.20590362  -0.36997233   0.37572858   0.05754041   0.3633724
6  -0.16197813   0.39033606   0.46763585   0.26749242  -0.20272110   0.1489657
```

Top PC1 contributors:

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*************************************************************
```

```
                                 Variable         PC1          PC2
1                         Weak_Rule_Of_Law  -0.4947555  -0.18555390
2                 Government_Ineffectiveness  -0.3692629   0.06123092
3              Low_Voice_And_Accountability  -0.3425097  -0.33518531
4                 Weak_Control_Of_Corruption   0.3316706  -0.24547375
5                    Income_Inequality_Change   0.3202127  -0.14453336
6                       Political_Instability  -0.2981423   0.07760416
7  Inequality_Adjusted_Life_Expectancy_Change   0.2740770  -0.21007909
8         Inequality_Adjusted_Life_Expectancy  -0.1961084   0.06307883
9                       Climate_Vulnerability  -0.1735291   0.18725831
10              Marine_Employment_Dependency  -0.1383563  -0.32265746
             PC3          PC4          PC5          PC6          PC7          PC8
1   0.0004751595   0.20128691   0.10542269   0.02616905   0.18199457  -0.276501771
2  -0.0505057821   0.03661209   0.32730137  -0.23662787   0.17840850   0.538312441
3   0.0065636499   0.16559432  -0.12943404  -0.30370604  -0.26945167   0.005828216
4   0.4124161676   0.21315736  -0.05781647  -0.20959553  -0.13797945   0.099238636
5  -0.3049194818   0.36910325  -0.06113041   0.02407237   0.21751329  -0.263063835
6   0.1784561003  -0.48557831   0.07877507  -0.14741309  -0.19521371  -0.394672892
```

```
7  -0.1955489381 -0.28242915  0.23087093 -0.31815869 -0.32746870  0.191832633
8  -0.0761600558 -0.07717147 -0.49766273 -0.16196697  0.32271122  0.061063277
9  -0.2077537432  0.43779995  0.22494292 -0.18685710 -0.39140994 -0.169194156
10 -0.0633261413 -0.12867026  0.10704959  0.52828584  0.07591036 -0.035167444
             PC9         PC10         PC11         PC12         PC13         PC14
1   0.23063013 -0.01954495  0.01351561  0.18083947 -0.52562700 -0.07678242
2   0.11531793 -0.09025587  0.37045143 -0.03513567 -0.14185843  0.02543104
3   0.08967136 -0.14519794 -0.16197813  0.39033606  0.46763585  0.26749242
4  -0.03713421 -0.29879327  0.03306835  0.14205189 -0.26569859  0.20999291
5   0.18345325 -0.18205220  0.32363365  0.27878888  0.13926250 -0.44003430
6  -0.16828493  0.01662242  0.06507976  0.23418969  0.05958785 -0.37649408
7   0.11784778 -0.23307219 -0.26684029 -0.02473368 -0.29353717 -0.36434841
8  -0.39717377 -0.57867283 -0.04622537 -0.19913285 -0.02496287 -0.13494530
9  -0.01417921 -0.12319054 -0.01553662 -0.52204119  0.19613330 -0.12886717
10  0.29610173 -0.34060438 -0.39318147 -0.22438529  0.06426552  0.04755620
             PC15         PC16
1  -0.19597063 -0.38968509
2   0.21310101  0.38102477
3  -0.20272110  0.14896574
4   0.50592877 -0.23551884
5   0.09802073  0.23374659
6   0.41887751  0.08492057
7  -0.32087254  0.04776863
8  -0.08856169 -0.05438330
9   0.18526173 -0.23474662
10  0.31795821  0.20620788


Top PC2 contributors:
****************************************************************
```

	Variable	PC1	PC2
1	Marine_Nutritional_Dependency	0.04380522	0.5288668
2	Low_Voice_And_Accountability	-0.34250969	-0.3351853
3	Poor_Regulatory_Quality	0.12775670	-0.3271034
4	Relative_Deprivation_Index	-0.04202958	-0.3235299

```
5                Marine_Employment_Dependency -0.13835634 -0.3226575
6                         Gender_Inequality -0.11292262 -0.2823305
7                Weak_Control_Of_Corruption  0.33167060 -0.2454738
8  Inequality_Adjusted_Life_Expectancy_Change  0.27407700 -0.2100791
9                     Climate_Vulnerability -0.17352912  0.1872583
10                        Weak_Rule_Of_Law -0.49475550 -0.1855539
            PC3          PC4          PC5          PC6          PC7          PC8
1  -0.2595272411  0.070635554 -0.07581388 -0.04761793 -0.16011419 -0.275744441
2   0.0065636499  0.165594325 -0.12943404 -0.30370604 -0.26945167  0.005828216
3  -0.0161551364 -0.121168562  0.42137894 -0.14653739  0.18808085 -0.442577348
4  -0.3708096284  0.132413991 -0.17806437 -0.25494041  0.15420334  0.020695802
5  -0.0633261413 -0.128670260  0.10704959  0.52828584  0.07591036 -0.035167444
6  -0.0153138201  0.006610478 -0.41016387  0.26588676 -0.51882673 -0.016337888
7   0.4124161676  0.213157363 -0.05781647 -0.20959553 -0.13797945  0.099238636
8  -0.1955489381 -0.282429151  0.23087093 -0.31815869 -0.32746870  0.191832633
9  -0.2077537432  0.437799952  0.22494292 -0.18685710 -0.39140994 -0.169194156
10  0.0004751595  0.201286913  0.10542269  0.02616905  0.18199457 -0.276501771
            PC9         PC10         PC11         PC12         PC13         PC14
1   0.07269086 -0.19202914 -0.19594167  0.20590362 -0.36997233  0.375728582
2   0.08967136 -0.14519794 -0.16197813  0.39033606  0.46763585  0.267492419
3  -0.33616555 -0.10996903  0.22543771 -0.22782552 -0.01107925  0.377775198
4  -0.26199326  0.50412240 -0.36224597 -0.06466430 -0.18712913 -0.020576518
5   0.29610173 -0.34060438 -0.39318147 -0.22438529  0.06426552  0.047556200
6  -0.06644238  0.07994595  0.43769542 -0.21193566 -0.28197981  0.004732975
7  -0.03713421 -0.29879327  0.03306835  0.14205189 -0.26569859  0.209992911
8   0.11784778 -0.23307219 -0.26684029 -0.02473368 -0.29353717 -0.364348415
9  -0.01417921 -0.12319054 -0.01553662 -0.52204119  0.19613330 -0.128867168
10  0.23063013 -0.01954495  0.01351561  0.18083947 -0.52562700 -0.076782420
           PC15         PC16
1   0.05754041  0.36337241
2  -0.20272110  0.14896574
3  -0.17470061  0.17398846
4   0.32394671  0.13803803
5   0.31795821  0.20620788
6  -0.08685988  0.25397221
```

```
 7   0.50592877 −0.23551884
 8  −0.32087254  0.04776863
 9   0.18526173 −0.23474662
10  −0.19597063 −0.38968509
```