tipos_de_interes

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Visualización de datos

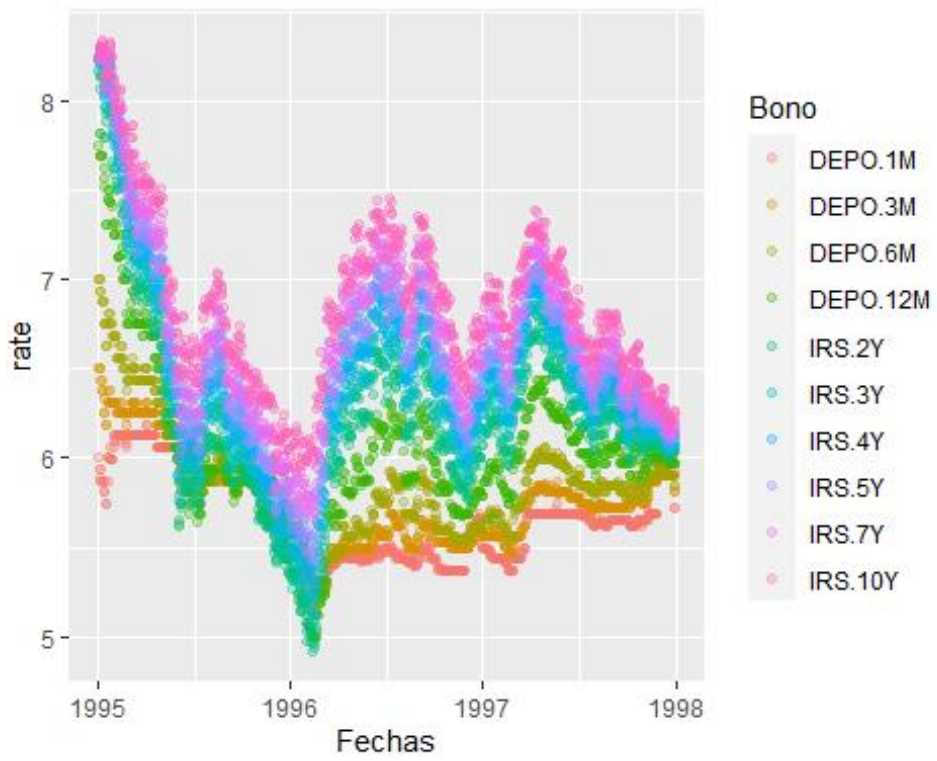
Head y Tail

```
##            X DEPO.1M DEPO.3M DEPO.6M DEPO.12M IRS.2Y IRS.3Y IRS.4Y
IRS.5Y
## 1 02/01/1995   6.000   6.500   7.000    7.750  8.170   8.24   8.25
8.22
## 2 03/01/1995   5.938   6.500   7.000    7.813  8.220   8.28   8.29
8.29
## 3 04/01/1995   5.938   6.500   7.000    7.813  8.130   8.20   8.23
8.24
## 4 05/01/1995   5.898   6.438   6.938    7.688  8.145   8.22   8.26
8.27
## 5 06/01/1995   5.875   6.438   6.938    7.688  8.070   8.20   8.25
8.27
## 6 09/01/1995   5.875   6.375   6.875    7.688  8.135   8.25   8.29
8.31
##   IRS.7Y IRS.10Y
## 1   8.24    8.25
## 2   8.30    8.31
## 3   8.26    8.28
## 4   8.29    8.30
## 5   8.29    8.29
## 6   8.33    8.34

##              X DEPO.1M DEPO.3M DEPO.6M DEPO.12M IRS.2Y IRS.3Y IRS.4Y
IRS.5Y
## 973 23/09/1998      NA   5.500   5.406    5.254  5.105  5.145  5.215
5.295
## 974 24/09/1998      NA   5.438   5.344    5.156  5.025  5.075  5.155
5.245
## 975 25/09/1998      NA   5.313   5.250    5.063  4.935  4.975  5.065
5.145
## 976 28/09/1998      NA   5.313   5.250    5.063  4.925  4.965  5.045
5.125
## 977 29/09/1998      NA   5.313   5.250    5.063  4.945  4.985  5.075
5.155
## 978 30/09/1998      NA   5.313   5.246    5.063  4.815  4.855  4.925
5.005
##     IRS.7Y IRS.10Y
## 973  5.405   5.555
```

```
## 974   5.355   5.495
## 975   5.245   5.385
## 976   5.235   5.375
## 977   5.255   5.395
## 978   5.115   5.245
```

Análisis exploratorio de los datos



Realizamos un summary de las variables de nuestro dataset

```
##          Min  Q1 Med Mean  SD  Q3 Max
## DEPO.1M  5.3 5.4 5.7  5.7  NA 5.9 6.2
## DEPO.3M  5.2 5.6 5.7  5.7 0.2 5.9 6.5
## DEPO.6M  5.1 5.7 5.8  5.8 0.3 5.9 7.0
## DEPO.12M 5.0 5.8 5.9  6.0 0.4 6.1 7.8
## IRS.2Y   4.9 5.9 6.1  6.1 0.5 6.3 8.2
## IRS.3Y   5.1 6.0 6.2  6.3 0.5 6.5 8.3
## IRS.4Y   5.3 6.0 6.3  6.4 0.5 6.6 8.3
## IRS.5Y   5.4 6.1 6.4  6.5 0.5 6.7 8.3
```

Análisis de la matriz de correlación

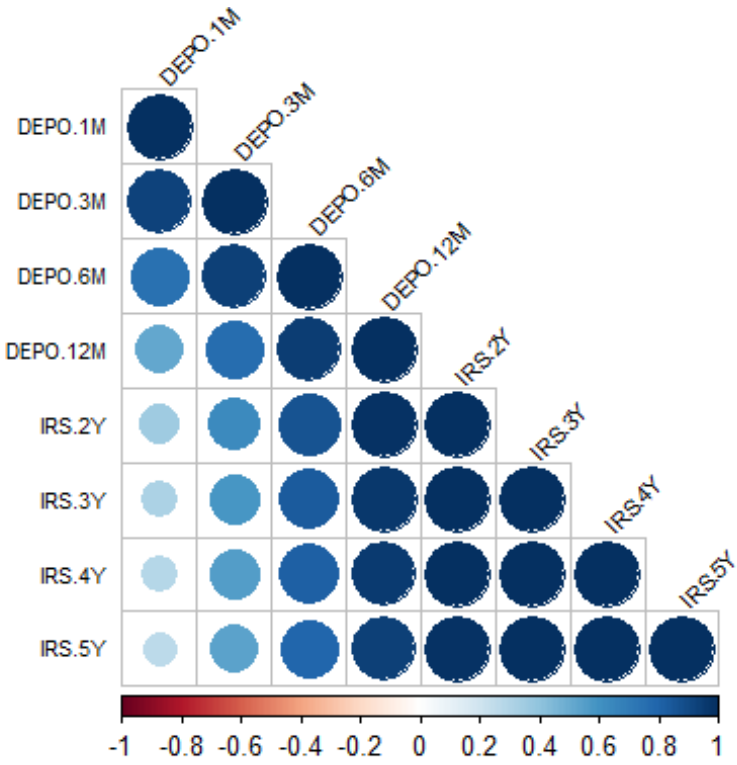
Nos indica el grado de correlacion entre las variables

comenTARIO

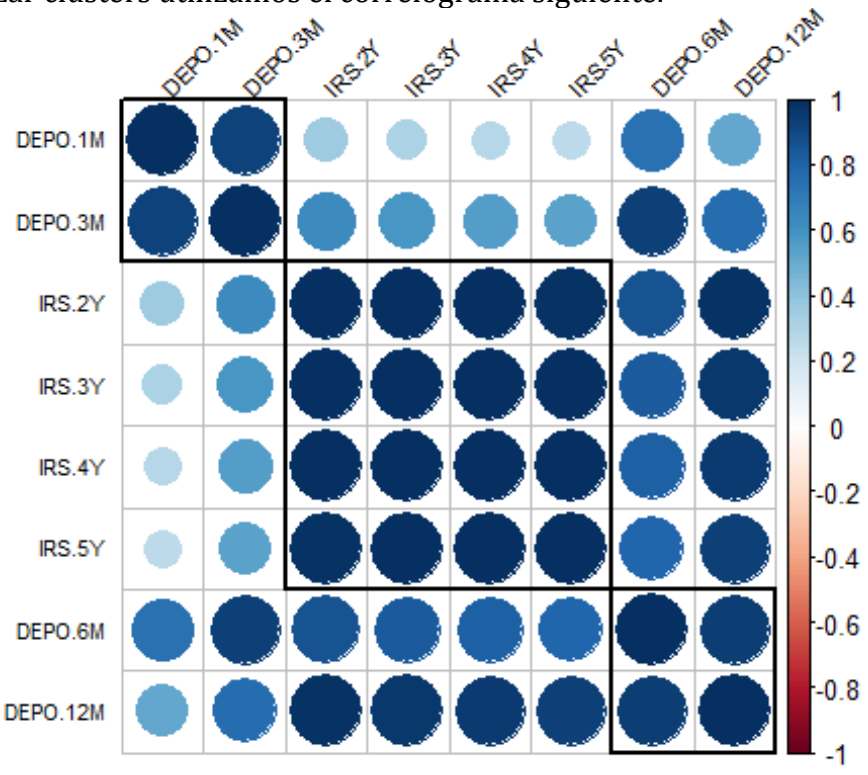
```
##          DEPO.1M DEPO.3M DEPO.6M DEPO.12M IRS.2Y IRS.3Y IRS.4Y IRS.5Y
## DEPO.1M     1.00    0.92    0.74     0.51   0.35   0.31   0.28   0.26
```

```
## DEPO.3M     0.92    1.00    0.93     0.76   0.63   0.59   0.56   0.53
## DEPO.6M     0.74    0.93    1.00     0.94   0.86   0.82   0.80   0.77
## DEPO.12M    0.51    0.76    0.94     1.00   0.97   0.95   0.93   0.91
## IRS.2Y      0.35    0.63    0.86     0.97   1.00   0.99   0.98   0.97
## IRS.3Y      0.31    0.59    0.82     0.95   0.99   1.00   1.00   0.99
## IRS.4Y      0.28    0.56    0.80     0.93   0.98   1.00   1.00   1.00
## IRS.5Y      0.26    0.53    0.77     0.91   0.97   0.99   1.00   1.00
##
## n
##          DEPO.1M DEPO.3M DEPO.6M DEPO.12M IRS.2Y IRS.3Y IRS.4Y IRS.5Y
## DEPO.1M      783     783     783      783    783    783    783    783
## DEPO.3M      783     949     949      949    949    949    949    949
## DEPO.6M      783     949     949      949    949    949    949    949
## DEPO.12M     783     949     949      949    949    949    949    949
## IRS.2Y       783     949     949      949    949    949    949    949
## IRS.3Y       783     949     949      949    949    949    949    949
## IRS.4Y       783     949     949      949    949    949    949    949
## IRS.5Y       783     949     949      949    949    949    949    949
##
## P
##          DEPO.1M DEPO.3M DEPO.6M DEPO.12M IRS.2Y IRS.3Y IRS.4Y IRS.5Y
## DEPO.1M          0       0       0        0      0      0      0
## DEPO.3M   0              0       0        0      0      0      0
## DEPO.6M   0       0              0        0      0      0      0
## DEPO.12M  0       0       0                0      0      0      0
## IRS.2Y    0       0       0       0                0      0      0
## IRS.3Y    0       0       0       0        0              0      0
## IRS.4Y    0       0       0       0        0      0              0
## IRS.5Y    0       0       0       0        0      0      0
```

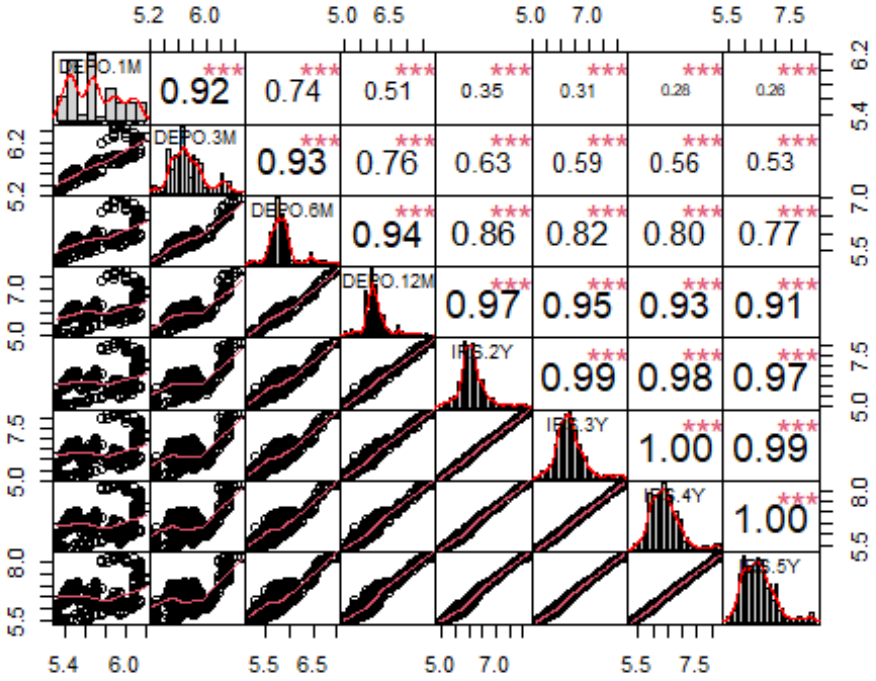
El grafico de correlaciones que presentamos en la parte inferior de este texto nos muestra que cada titulo esta bastante correlacionado con el del periodo inmediatamente posterior e incluso, a partir de un año, suelen presentar correlaciones altas entre ellos



Para visualizar clusters utilizamos el correlograma siguiente.



En el cluster anterior vemos claramente diferenciados tres grupos corto plazo 1my 3m. medio plazo 6m y 12m . largo plazo 2y, 3y, 4y, 5y.



Sustancialmente bajo vamos a hallar el determinante de la matriz de correlaciones. entendemos debido a su cuantia que hay fuerte asociacion entre las variables

```
## [1] 5.5021e-12
```

p de esfericidad de Bartlett nos va a permitir verificar el dataset, es decir, que sea idoneo para reducir su dimension

```
## R was not square, finding R from data

## $chisq
## [1] 31782.42
##
## $p.value
## [1] 0
##
## $df
## [1] 28

## $KMO
## [1] 0.83799
##
## $MSA
##               MSA
## DEPO.1M  0.79261
## DEPO.3M  0.78144
## DEPO.6M  0.84063
## DEPO.12M 0.91650
```

```
## IRS.2Y   0.84798
## IRS.3Y   0.81641
## IRS.4Y   0.81881
## IRS.5Y   0.85404
##
## $Bartlett
## [1] 26624
##
## $Communalities
##          Initial Communalities Final Extraction
## DEPO.1M                0.94860          0.91222
## DEPO.3M                0.98923          1.01486
## DEPO.6M                0.99477          0.98689
## DEPO.12M               0.99431          0.98145
## IRS.2Y                 0.99957          0.99685
## IRS.3Y                 0.99986          1.00106
## IRS.4Y                 0.99985          0.99612
## IRS.5Y                 0.99955          0.98408
##
## $Factor.Loadings
##             [,1]      [,2]
## DEPO.1M  0.55771  0.775357
## DEPO.3M  0.79742  0.615613
## DEPO.6M  0.95493  0.273862
## DEPO.12M 0.98948 -0.048795
## IRS.2Y   0.96922 -0.239718
## IRS.3Y   0.95662 -0.293141
## IRS.4Y   0.94430 -0.323143
## IRS.5Y   0.93110 -0.342238
##
## $RMS
## [1] 0.0042233
```

Indice KMO de Kaiser-Meyer-Olkin. este contrasta si las correlaciones entre las variables son suficientemente pequeñas, el KMO varia entre 0 y 1 unos valores proximos a cero indican que el analisis puede no ser una buena idea

```
## [1] 0.83799
```

Resultado de 0.83, porseguimos con el estudio ya que el valor se aproxima a uno.

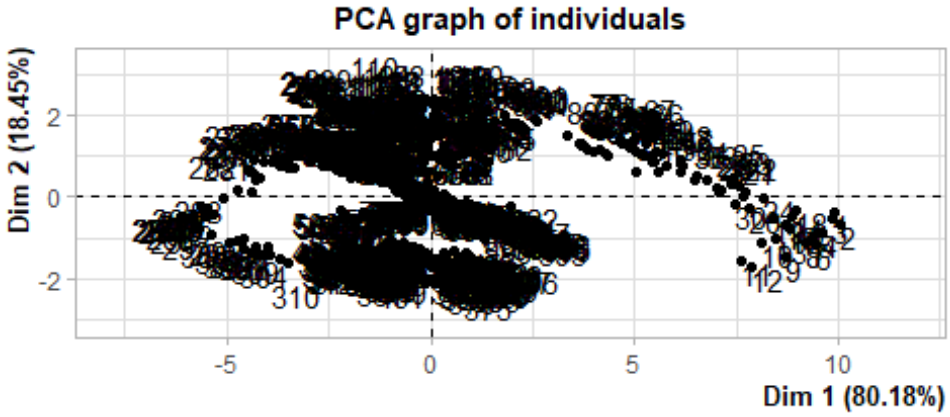
Matriz de Adecuación de la Muestra (MSA) Ya que los coef son altos mantenemos la misma conclusión que anteriormente.

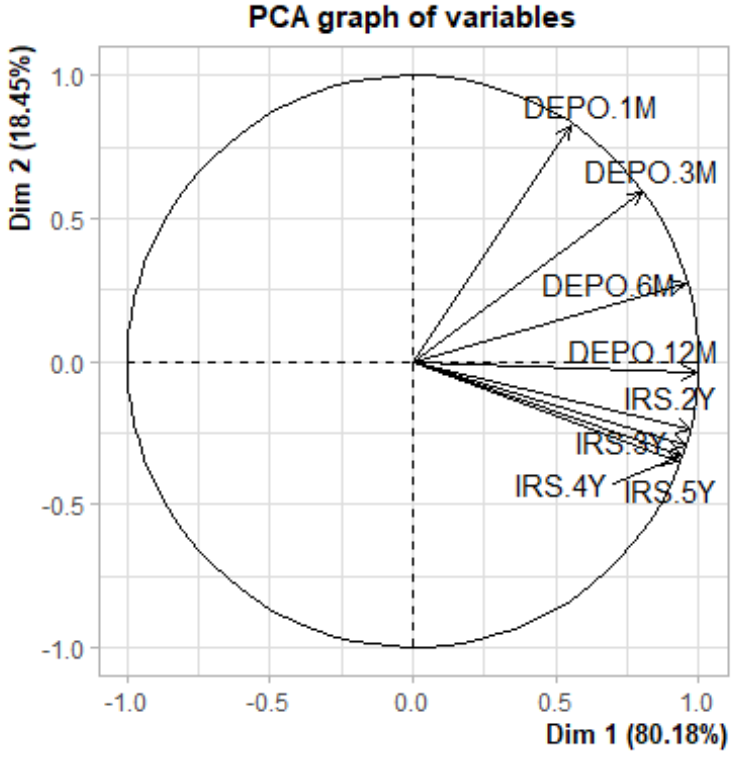
```
##              MSA
## DEPO.1M  0.79261
## DEPO.3M  0.78144
## DEPO.6M  0.84063
## DEPO.12M 0.91650
## IRS.2Y   0.84798
## IRS.3Y   0.81641
```

```
## IRS.4Y   0.81881
## IRS.5Y   0.85404
```

Hacemos honor al nombre de la asignatura reduciendo la dimension, con dos componentes tenemos un 98,63% de la varianza explicada, por ende, continuamos con estos dos.

```
## Warning in PCA(tiposdolar.act, graph = T): Missing values are imputed
by the
## mean of the variable: you should use the imputePCA function of the
missMDA
## package
```

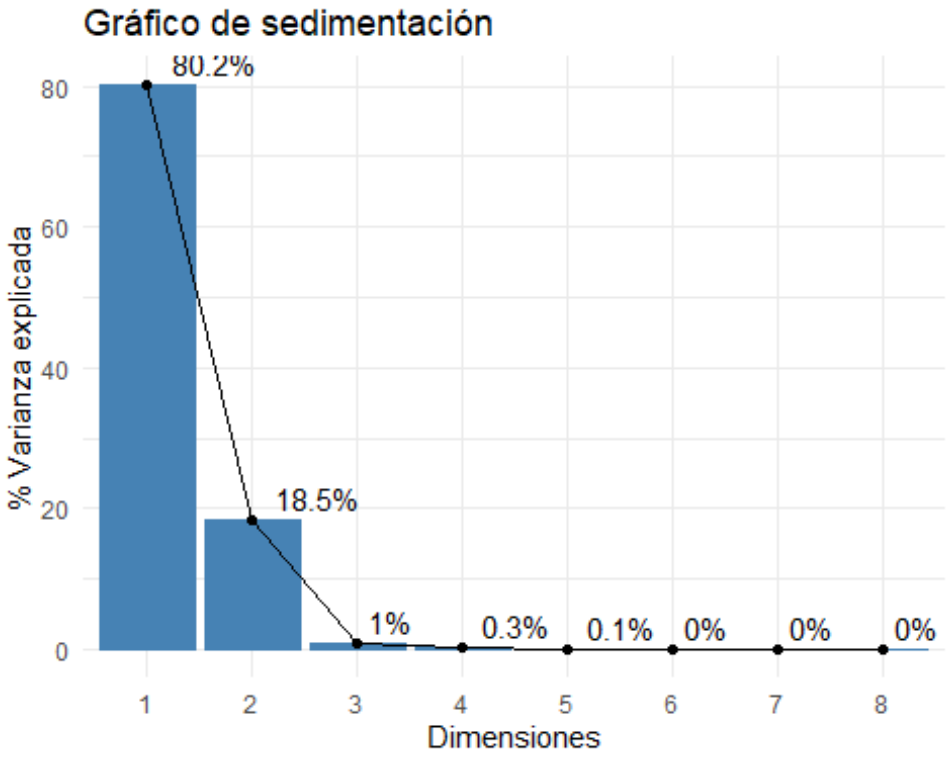





```
##        eigenvalue percentage of variance cumulative percentage of
variance
## comp 1       6.41                  80.18
80.18
```

```
## comp 2       1.48                   18.45
98.63
## comp 3       0.08                    0.98
99.61
## comp 4       0.02                    0.29
99.90
## comp 5       0.00                    0.06
99.96
## comp 6       0.00                    0.04
100.00
## comp 7       0.00                    0.00
100.00
## comp 8       0.00                    0.00
100.00
```

Gráfico de sedimentación o scree plot.



En el grafico se ve que la aportacion de los dos primeros componentes es sustancial

rotación Varimax

“Con la Rotación Varimax de todos los factores se obtiene un mejor resultado, ya que al hacer una rotación ortogonal, tiende a asimilar cada variable con un eje. Esto facilita el significado de la interpretación de los componentes seleccionados” (estamatica, 2020)

```
## Warning in fa.stats(r = r, f = f, phi = phi, n.obs = n.obs, np.obs =
np.obs, :
## The estimated weights for the factor scores are probably incorrect.
Try a
## different factor score estimation method.

## Warning in fac(r = r, nfactors = nfactors, n.obs = n.obs, rotate =
rotate, : An
## ultra-Heywood case was detected. Examine the results carefully

## Factor Analysis using method =  minres
## Call: fa(r = tiposdolar.act, nfactors = 2, rotate = "varimax", fm =
"minres")
## Standardized loadings (pattern matrix) based upon correlation matrix
##           MR1  MR2   h2      u2 com
## DEPO.1M  0.08 0.95 0.92  0.0837 1.0
## DEPO.3M  0.37 0.93 1.00 -0.0036 1.3
## DEPO.6M  0.67 0.73 0.98  0.0175 2.0
## DEPO.12M 0.86 0.48 0.97  0.0310 1.6
## IRS.2Y   0.95 0.30 1.00  0.0048 1.2
## IRS.3Y   0.97 0.24 1.00 -0.0001 1.1
## IRS.4Y   0.97 0.21 0.99  0.0076 1.1
## IRS.5Y   0.97 0.18 0.97  0.0307 1.1
##
##                        MR1  MR2
## SS loadings           5.07 2.76
## Proportion Var        0.63 0.34
## Cumulative Var        0.63 0.98
## Proportion Explained  0.65 0.35
## Cumulative Proportion 0.65 1.00
##
## Mean item complexity =  1.3
## Test of the hypothesis that 2 factors are sufficient.
##
## The degrees of freedom for the null model are  28  and the objective
function was  33.65 with Chi Square of  31782
## The degrees of freedom for the model are 13  and the objective
function was  9.23
##
## The root mean square of the residuals (RMSR) is  0.01
## The df corrected root mean square of the residuals is  0.01
##
## The harmonic number of observations is  904 with the empirical chi
square  3.45  with prob <  1
## The total number of observations was  949  with Likelihood Chi Square
=  8705.1  with prob <  0
##
## Tucker Lewis Index of factoring reliability =  0.41
## RMSEA index =  0.839  and the 90 % confidence intervals are  0.825
0.855
```

```
## BIC =  8616
## Fit based upon off diagonal values = 1
```

Prediccion

```
##     DEPO.1M DEPO.3M DEPO.6M DEPO.12M IRS.2Y IRS.3Y IRS.4Y IRS.5Y
IRS.7Y IRS.10Y
## 1     6.000   6.500   7.000    7.750  8.170  8.240  8.250  8.220
8.240   8.250
## 2     5.938   6.500   7.000    7.813  8.220  8.280  8.290  8.290
8.300   8.310
## 3     5.938   6.500   7.000    7.813  8.130  8.200  8.230  8.240
8.260   8.280
## 4     5.898   6.438   6.938    7.688  8.145  8.220  8.260  8.270
8.290   8.300
## 5     5.875   6.438   6.938    7.688  8.070  8.200  8.250  8.270
8.290   8.290
## 6     5.875   6.375   6.875    7.688  8.135  8.250  8.290  8.310
8.330   8.340
## 7     5.875   6.375   6.875    7.688  8.090  8.210  8.250  8.250
8.260   8.270
## 8     5.875   6.336   6.875    7.625  8.070  8.200  8.230  8.240
8.250   8.270
## 9     5.813   6.250   6.758    7.563  8.020  8.150  8.190  8.220
8.240   8.260
## 10    5.813   6.250   6.750    7.523  7.800  7.960  8.030  8.050
8.080   8.130
## 11    5.750   6.188   6.625    7.313  7.790  7.960  8.040  8.070
8.080   8.130
## 12    5.750   6.188   6.625    7.313  7.880  8.040  8.110  8.130
8.150   8.180
## 13    5.875   6.313   6.750    7.438  7.930  8.060  8.110  8.140
8.160   8.180
## 14    6.000   6.375   6.813    7.500  7.940  8.080  8.130  8.160
8.160   8.190
## 15    6.000   6.313   6.750    7.453  7.940  8.080  8.140  8.200
8.230   8.260
## 16    6.000   6.313   6.750    7.438  7.975  8.130  8.190  8.220
8.260   8.320
## 17    6.000   6.313   6.750    7.438  7.980  8.140  8.200  8.240
8.280   8.330
## 18    6.063   6.375   6.813    7.500  7.920  8.080  8.160  8.220
8.260   8.310
## 19    6.000   6.313   6.750    7.414  7.810  7.990  8.080  8.140
8.180   8.250
## 20    6.000   6.313   6.688    7.313  7.660  7.840  7.930  8.010
8.060   8.120
## 21    6.063   6.313   6.688    7.250  7.630  7.780  7.880  7.950
8.010   8.100
## 22    6.094   6.313   6.688    7.250  7.630  7.790  7.880  7.940
```

```
8.000   8.060
## 23    6.125   6.313   6.656    7.250  7.590  7.750  7.830  7.880
7.950   8.020
## 24    6.125   6.313   6.688    7.320  7.800  7.930  7.990  8.020
8.070   8.120
## 25    6.125   6.313   6.688    7.313  7.500  7.650  7.740  7.810
7.870   7.940
## 26    6.109   6.250   6.563    7.125  7.540  7.690  7.770  7.820
7.880   7.950
## 27    6.125   6.250   6.563    7.125  7.510  7.660  7.750  7.810
7.870   7.940
## 28    6.125   6.250   6.563    7.125  7.510  7.670  7.760  7.800
7.870   7.950
## 29    6.125   6.250   6.563    7.125  7.530  7.700  7.790  7.830
7.910   7.990
## 30    6.094   6.250   6.563    7.133  7.690  7.830  7.900  7.950
8.000   8.070
## 31    6.125   6.313   6.625    7.250  7.680  7.820  7.890  7.940
7.980   8.050
## 32    6.125   6.313   6.625    7.250  7.560  7.700  7.770  7.820
7.880   7.950
## 33    6.125   6.250   6.563    7.188  7.420  7.550  7.630  7.710
7.770   7.840
## 34    6.125   6.250   6.563    7.063  7.360  7.510  7.590  7.650
7.720   7.820
## 35    6.125   6.250   6.500    7.000  7.380  7.530  7.620  7.690
7.760   7.850
## 36    6.125   6.250   6.500    7.000  7.410  7.560  7.630  7.680
7.740   7.840
## 37    6.125   6.250   6.500    7.000  7.390  7.540  7.620  7.680
7.750   7.850
## 38    6.117   6.250   6.500    7.000  7.250  7.410  7.500  7.600
7.700   7.830
## 39    6.063   6.188   6.375    6.750  7.040  7.210  7.320  7.400
7.520   7.650
## 40    6.086   6.234   6.438    6.813  7.180  7.340  7.440  7.500
7.620   7.740
## 41    6.125   6.250   6.438    6.750  7.070  7.220  7.300  7.380
7.500   7.660
## 42    6.125   6.250   6.438    6.750  7.130  7.280  7.370  7.440
7.550   7.700
## 43    6.125   6.250   6.438    6.750  7.030  7.170  7.250  7.330
7.450   7.590
## 44    6.125   6.250   6.438    6.813  7.140  7.270  7.360  7.450
7.570   7.690
## 45    6.125   6.250   6.484    6.867  7.210  7.350  7.440  7.510
7.640   7.790
## 46    6.125   6.313   6.500    6.938  7.270  7.420  7.510  7.570
7.700   7.860
## 47    6.125   6.313   6.500    6.938  7.270  7.400  7.480  7.560
```

```
7.690   7.860
## 48    6.125   6.313   6.563    7.000  7.230  7.370  7.460  7.510
7.630   7.800
## 49    6.125   6.313   6.500    6.914  7.130  7.260  7.350  7.420
7.540   7.710
## 50    6.125   6.313   6.500    6.813  7.110  7.240  7.330  7.390
7.500   7.660
## 51    6.125   6.313   6.500    6.813  7.020  7.140  7.230  7.300
7.430   7.610
## 52    6.125   6.250   6.438    6.750  6.950  7.080  7.170  7.240
7.370   7.530
## 53    6.125   6.250   6.438    6.750  6.980  7.110  7.190  7.250
7.380   7.530
## 54    6.125   6.250   6.438    6.750  6.890  7.010  7.100  7.150
7.270   7.420
## 55    6.125   6.250   6.438    6.750  6.960  7.090  7.190  7.260
7.380   7.530
## 56    6.125   6.250   6.438    6.750  6.960  7.090  7.190  7.260
7.380   7.540
## 57    6.125   6.250   6.438    6.750  6.950  7.080  7.180  7.260
7.380   7.540
## 58    6.125   6.250   6.438    6.750  6.990  7.140  7.250  7.330
7.460   7.620
## 59    6.125   6.250   6.438    6.750  6.980  7.120  7.240  7.300
7.420   7.590
## 60    6.125   6.250   6.438    6.750  6.910  7.060  7.160  7.240
7.370   7.540
## 61    6.125   6.250   6.438    6.688  6.870  7.000  7.110  7.200
7.330   7.480
## 62    6.125   6.250   6.438    6.688  6.940  7.080  7.180  7.270
7.400   7.550
## 63    6.125   6.305   6.500    6.750  6.930  7.070  7.170  7.240
7.370   7.530
## 64    6.125   6.250   6.438    6.750  6.970  7.120  7.220  7.290
7.420   7.570
## 65    6.125   6.250   6.500    6.813  7.080  7.220  7.320  7.390
7.500   7.640
## 66    6.188   6.313   6.500    6.875  7.050  7.170  7.250  7.310
7.430   7.570
## 67    6.188   6.313   6.500    6.813  6.990  7.110  7.200  7.260
7.390   7.530
## 68    6.125   6.250   6.438    6.750  6.970  7.090  7.180  7.250
7.380   7.530
## 69    6.125   6.250   6.438    6.750  6.930  7.040  7.130  7.220
7.350   7.510
## 70    6.125   6.250   6.438    6.719  6.910  7.030  7.130  7.230
7.360   7.530
## 71    6.125   6.250   6.438    6.695  6.950  7.070  7.170  7.250
7.380   7.550
## 72    6.125   6.250   6.438    6.688  6.900  7.030  7.130  7.210
```

```
7.370   7.540
## 73    6.125   6.250   6.438    6.688  6.880  7.010  7.110  7.190
7.320   7.490
## 74    6.125   6.250   6.438    6.688  6.760  6.890  6.990  7.100
7.260   7.440
## 75    6.125   6.250   6.438    6.688  6.760  6.890  6.990  7.100
7.260   7.440
## 76    6.125   6.250   6.438    6.688  6.710  6.840  6.940  7.040
7.200   7.400
## 77    6.125   6.250   6.375    6.563  6.680  6.810  6.920  7.020
7.180   7.400
## 78    6.125   6.250   6.375    6.563  6.770  6.900  7.010  7.120
7.280   7.500
## 79    6.125   6.250   6.375    6.563  6.700  6.830  6.950  7.050
7.220   7.440
## 80    6.063   6.188   6.313    6.500  6.690  6.820  6.940  7.050
7.210   7.430
## 81    6.063   6.188   6.313    6.500  6.710  6.840  6.960  7.070
7.220   7.430
## 82    6.063   6.188   6.313    6.500  6.740  6.880  6.990  7.090
7.230   7.430
## 83    6.063   6.188   6.313    6.500  6.750  6.890  7.010  7.110
7.250   7.440
## 84    6.063   6.188   6.313    6.563  6.790  6.930  7.040  7.120
7.260   7.440
## 85    6.063   6.188   6.375    6.625  6.870  7.010  7.110  7.200
7.340   7.510
## 86    6.063   6.188   6.375    6.625  6.860  6.990  7.100  7.170
7.300   7.470
## 87    6.063   6.188   6.375    6.625  6.810  6.940  7.040  7.120
7.270   7.450
## 88    6.063   6.188   6.313    6.563  6.700  6.830  6.940  7.020
7.180   7.380
## 89    6.063   6.188   6.313    6.500  6.600  6.730  6.840  6.920
7.060   7.250
## 90    6.063   6.188   6.250    6.438  6.380  6.500  6.620  6.720
6.860   7.060
## 91    6.063   6.188   6.250    6.438  6.370  6.500  6.610  6.700
6.850   7.060
## 92    6.063   6.125   6.188    6.250  6.210  6.340  6.460  6.550
6.700   6.910
## 93    6.063   6.063   6.125    6.125  6.230  6.360  6.470  6.540
6.690   6.910
## 94    6.063   6.125   6.125    6.188  6.420  6.560  6.660  6.740
6.870   7.060
## 95    6.063   6.125   6.188    6.250  6.380  6.540  6.650  6.710
6.860   7.040
## 96    6.063   6.125   6.172    6.250  6.340  6.490  6.600  6.670
6.810   6.980
## 97    6.063   6.125   6.137    6.215  6.300  6.440  6.540  6.620
```

```
6.750   6.930
## 98    6.063   6.125   6.125    6.188  6.280  6.410  6.520  6.600
6.730   6.890
## 99    6.063   6.125   6.125    6.188  6.340  6.480  6.590  6.670
6.800   6.950
## 100   6.063   6.125   6.188    6.250  6.360  6.500  6.610  6.680
6.820   6.980
## 101   6.063   6.125   6.188    6.250  6.370  6.510  6.620  6.700
6.820   6.990
## 102   6.063   6.125   6.188    6.250  6.320  6.460  6.570  6.640
6.780   6.960
## 103   6.063   6.125   6.125    6.125  6.160  6.290  6.400  6.480
6.620   6.800
## 104   6.063   6.063   6.063    6.063  6.130  6.260  6.370  6.440
6.590   6.790
## 105   6.063   6.063   6.063    6.063  6.130  6.260  6.360  6.450
6.600   6.780
## 106   6.063   6.063   6.063    6.063  6.130  6.260  6.360  6.450
6.600   6.780
## 107   6.063   6.063   6.063    6.063  6.050  6.170  6.280  6.360
6.500   6.700
## 108   6.063   6.063   6.000    6.000  6.050  6.170  6.280  6.360
6.510   6.710
## 109   6.063   6.063   6.000    6.000  5.900  6.020  6.130  6.240
6.390   6.610
## 110   6.055   6.000   5.875    5.875  5.620  5.760  5.890  6.000
6.180   6.450
## 111   6.000   5.875   5.750    5.637  5.660  5.790  5.930  6.050
6.230   6.480
## 112   6.008   5.938   5.813    5.746  5.720  5.830  5.970  6.080
6.270   6.490
## 113   6.008   5.938   5.813    5.750  5.750  5.870  6.010  6.120
6.280   6.500
## 114   6.063   6.039   5.969    5.938  6.020  6.140  6.240  6.330
6.460   6.640
## 115   6.063   6.063   6.000    6.000  6.160  6.270  6.370  6.470
6.590   6.790
## 116   6.070   6.063   6.063    6.063  6.140  6.280  6.390  6.490
6.610   6.800
## 117   6.063   6.063   6.000    6.000  5.880  6.010  6.155  6.260
6.400   6.620
## 118   6.063   6.000   5.875    5.813  5.830  5.960  6.090  6.200
6.360   6.570
## 119   6.063   6.000   5.875    5.813  5.830  5.960  6.080  6.190
6.340   6.560
## 120   6.063   6.063   5.938    5.938  5.940  6.070  6.200  6.300
6.450   6.660
## 121   6.063   6.063   5.938    5.875  5.850  5.990  6.120  6.220
6.370   6.580
## 122   6.063   6.031   5.938    5.813  5.890  6.010  6.130  6.240
```

```
6.370   6.580
## 123   6.063   6.000   5.875    5.750  5.840  5.980  6.100  6.230
6.360   6.560
## 124   6.063   6.000   5.875    5.813  5.740  5.870  6.000  6.130
6.260   6.460
## 125   6.063   5.938   5.813    5.688  5.770  5.900  6.030  6.130
6.270   6.470
## 126   6.063   5.938   5.813    5.750  5.800  5.930  6.050  6.160
6.320   6.500
## 127   6.063   6.000   5.875    5.813  5.830  5.950  6.070  6.200
6.350   6.580
## 128   6.117   6.000   5.887    5.813  5.840  5.970  6.100  6.220
6.360   6.540
## 129   6.066   6.000   5.875    5.762  6.020  6.140  6.250  6.350
6.500   6.670
## 130   6.125   6.059   5.996    5.984  6.000  6.110  6.220  6.320
6.460   6.650
## 131   6.125   6.000   5.938    5.875  5.930  6.060  6.150  6.250
6.420   6.610
## 132   6.125   6.000   5.938    5.875  5.940  6.060  6.160  6.260
6.420   6.610
## 133   6.063   6.000   5.938    5.875  5.930  6.050  6.160  6.240
6.400   6.590
## 134   6.063   5.949   5.914    5.875  5.950  6.070  6.180  6.290
6.430   6.620
## 135   5.875   5.813   5.750    5.641  5.710  5.840  5.960  6.050
6.200   6.430
## 136   5.879   5.875   5.750    5.688  5.730  5.850  5.960  6.040
6.180   6.420
## 137   5.906   5.875   5.750    5.688  5.760  5.880  6.000  6.080
6.240   6.470
## 138   5.879   5.875   5.750    5.750  5.790  5.920  6.030  6.130
6.270   6.500
## 139   5.875   5.813   5.750    5.688  5.770  5.900  6.020  6.120
6.270   6.500
## 140   5.875   5.813   5.750    5.688  5.890  6.030  6.150  6.240
6.370   6.570
## 141   5.875   5.875   5.813    5.813  5.890  6.030  6.150  6.240
6.370   6.570
## 142   5.875   5.875   5.813    5.813  5.910  6.060  6.170  6.270
6.400   6.620
## 143   5.875   5.875   5.875    5.875  6.050  6.210  6.340  6.440
6.580   6.790
## 144   5.875   5.922   5.934    5.934  6.070  6.250  6.390  6.470
6.610   6.840
## 145   5.875   5.875   5.875    5.875  6.060  6.240  6.380  6.490
6.640   6.840
## 146   5.922   5.938   5.938    6.000  6.150  6.310  6.460  6.560
6.710   6.890
## 147   5.887   5.934   5.938    6.000  6.130  6.300  6.430  6.530
```

```
6.660   6.840
## 148   5.875   5.883   5.906    5.938  6.120  6.290  6.420  6.540
6.670   6.850
## 149   5.875   5.918   5.938    5.965  6.110  6.270  6.420  6.520
6.670   6.860
## 150   5.875   5.875   5.875    5.875  6.060  6.240  6.370  6.490
6.630   6.830
## 151   5.875   5.875   5.875    5.938  6.070  6.240  6.380  6.490
6.650   6.870
## 152   5.875   5.875   5.875    5.875  6.110  6.280  6.410  6.530
6.690   6.900
## 153   5.875   5.875   5.875    5.930  6.050  6.220  6.330  6.440
6.600   6.820
## 154   5.875   5.875   5.875    5.930  6.120  6.290  6.430  6.530
6.680   6.900
## 155   5.875   5.875   5.934    5.938  6.120  6.290  6.430  6.530
6.680   6.900
## 156   5.875   5.875   5.934    5.938  6.090  6.240  6.390  6.500
6.650   6.880
## 157   5.875   5.875   5.879    5.914  6.050  6.210  6.360  6.460
6.610   6.840
## 158   5.875   5.875   5.875    5.922  6.110  6.290  6.440  6.560
6.700   6.920
## 159   5.875   5.875   5.875    5.930  6.110  6.290  6.430  6.550
6.700   6.910
## 160   5.875   5.875   5.875    5.938  6.230  6.410  6.550  6.665
6.635   6.945
## 161   5.875   5.938   5.938    6.055  6.240  6.420  6.570  6.680
6.820   7.020
## 162   5.883   5.938   5.965    6.063  6.310  6.490  6.620  6.740
6.850   7.040
## 163   5.938   5.941   6.000    6.086  6.280  6.440  6.570  6.670
6.800   6.980
## 164   5.938   5.938   5.996    6.063  6.300  6.470  6.590  6.690
6.830   6.980
## 165   5.938   5.938   6.000    6.105  6.310  6.470  6.590  6.700
6.820   6.980
## 166   5.938   5.938   6.000    6.063  6.230  6.390  6.500  6.610
6.730   6.910
## 167   5.938   5.938   5.988    6.063  6.260  6.420  6.540  6.650
6.790   6.950
## 168   5.938   5.938   5.992    6.063  6.280  6.440  6.570  6.680
6.810   6.970
## 169   5.938   5.938   6.000    6.063  6.170  6.330  6.480  6.600
6.740   6.920
## 170   5.875   5.898   5.938    5.988  6.100  6.260  6.390  6.510
6.650   6.840
## 171   5.875   5.898   5.938    5.988  6.050  6.210  6.350  6.440
6.590   6.760
## 172   5.875   5.875   5.883    5.898  6.050  6.220  6.340  6.450
```

```
6.600   6.770
## 173   5.875   5.875   5.906    5.938  6.040  6.190  6.330  6.420
6.550   6.730
## 174   5.875   5.883   5.906    5.938  6.040  6.190  6.310  6.430
6.560   6.740
## 175   5.875   5.875   5.906    5.926  5.950  6.100  6.220  6.310
6.440   6.620
## 176   5.875   5.875   5.875    5.875  5.950  6.100  6.230  6.330
6.480   6.640
## 177   5.875   5.875   5.879    5.879  5.940  6.070  6.190  6.280
6.420   6.580
## 178   5.875   5.875   5.875    5.875  5.950  6.080  6.190  6.290
6.420   6.590
## 179   5.875   5.875   5.875    5.875  5.940  6.060  6.180  6.270
6.410   6.580
## 180   5.875   5.875   5.875    5.875  6.000  6.130  6.250  6.340
6.470   6.640
## 181   5.875   5.875   5.875    5.875  5.990  6.120  6.240  6.330
6.460   6.630
## 182   5.875   5.875   5.875    5.875  5.950  6.080  6.190  6.290
6.420   6.590
## 183   5.875   5.875   5.875    5.875  5.950  6.070  6.190  6.280
6.400   6.580
## 184   5.875   5.871   5.867    5.863  5.840  5.970  6.100  6.190
6.330   6.510
## 185   5.813   5.813   5.797    5.762  5.860  5.990  6.120  6.240
6.360   6.540
## 186   5.813   5.813   5.813    5.809  5.900  6.030  6.160  6.250
6.390   6.570
## 187   5.813   5.813   5.813    5.813  5.890  6.020  6.140  6.250
6.390   6.560
## 188   5.813   5.813   5.813    5.809  5.870  6.010  6.130  6.230
6.370   6.540
## 189   5.813   5.813   5.813    5.797  5.970  6.090  6.200  6.310
6.430   6.590
## 190   5.836   5.836   5.840    5.844  6.010  6.140  6.260  6.370
6.500   6.680
## 191   5.867   5.867   5.875    5.875  6.030  6.170  6.290  6.400
6.530   6.690
## 192   5.871   5.871   5.875    5.875  6.020  6.140  6.250  6.340
6.480   6.640
## 193   5.875   5.875   5.930    5.938  6.110  6.240  6.340  6.450
6.580   6.740
## 194   5.875   5.938   5.938    5.938  6.080  6.190  6.310  6.390
6.510   6.670
## 195   5.875   5.953   5.945    6.000  6.040  6.170  6.270  6.350
6.470   6.630
## 196   5.875   5.938   5.938    5.938  5.970  6.080  6.170  6.250
6.370   6.520
## 197   5.875   5.938   5.938    5.938  5.970  6.080  6.170  6.250
```

```
6.380   6.530
## 198   5.875   5.938   5.938    5.934  5.930  6.040  6.130  6.210
6.340   6.510
## 199   5.875   5.938   5.914    5.875  5.900  6.000  6.090  6.170
6.300   6.480
## 200   5.875   5.938   5.910    5.875  5.920  6.020  6.120  6.190
6.310   6.480
## 201   5.875   5.938   5.918    5.875  5.930  6.040  6.120  6.190
6.320   6.480
## 202   5.875   5.938   5.918    5.875  5.910  6.010  6.110  6.180
6.300   6.460
## 203   5.875   5.938   5.918    5.875  6.050  6.095  6.140  6.220
6.340   6.500
## 204   5.875   5.938   5.914    5.875  5.920  6.010  6.110  6.180
6.310   6.470
## 205   5.875   5.938   5.887    5.875  5.870  5.960  6.050  6.110
6.230   6.380
## 206   5.875   5.938   5.875    5.875  5.860  5.950  6.020  6.090
6.220   6.360
## 207   5.875   5.938   5.875    5.863  5.860  5.940  6.020  6.090
6.210   6.380
## 208   5.875   5.938   5.875    5.859  5.850  5.930  6.020  6.100
6.210   6.360
## 209   5.875   5.938   5.875    5.871  5.870  5.960  6.060  6.130
6.240   6.380
## 210   5.867   5.938   5.875    5.875  5.900  5.980  6.070  6.160
6.280   6.420
## 211   5.875   5.938   5.875    5.875  5.940  6.030  6.120  6.200
6.320   6.470
## 212   5.875   5.938   5.902    5.895  5.900  6.000  6.080  6.170
6.290   6.440
## 213   5.871   5.938   5.875    5.875  5.830  5.920  6.020  6.100
6.230   6.400
## 214   5.836   5.938   5.875    5.813  5.830  5.920  6.010  6.100
6.240   6.420
## 215   5.840   5.938   5.875    5.813  5.860  5.970  6.070  6.160
6.310   6.480
## 216   5.832   5.938   5.875    5.813  5.840  5.940  6.040  6.130
6.270   6.450
## 217   5.832   5.938   5.875    5.813  5.830  5.930  6.030  6.120
6.250   6.430
## 218   5.828   5.938   5.875    5.813  5.710  5.820  5.920  6.010
6.160   6.350
## 219   5.816   5.906   5.813    5.750  5.650  5.760  5.880  5.980
6.130   6.320
## 220   5.813   5.875   5.750    5.688  5.670  5.780  5.890  5.980
6.140   6.320
## 221   5.813   5.875   5.762    5.688  5.670  5.785  5.900  6.000
6.150   6.340
## 222   5.813   5.875   5.754    5.688  5.710  5.830  5.950  6.040
```

```
6.200   6.380
## 223   5.813   5.875   5.750    5.688  5.650  5.780  5.890  5.990
6.140   6.320
## 224   5.813   5.875   5.750    5.688  5.660  5.780  5.890  6.000
6.150   6.340
## 225   5.813   5.875   5.750    5.688  5.700  5.820  5.940  6.050
6.200   6.390
## 226   5.813   5.875   5.750    5.688  5.670  5.790  5.900  6.000
6.160   6.360
## 227   5.813   5.875   5.750    5.688  5.650  5.770  5.880  5.980
6.140   6.330
## 228   5.813   5.875   5.750    5.688  5.650  5.770  5.870  5.980
6.150   6.340
## 229   5.813   5.875   5.750    5.688  5.620  5.740  5.860  5.950
6.100   6.300
## 230   5.813   5.875   5.750    5.684  5.620  5.730  5.840  5.940
6.100   6.300
## 231   5.813   5.863   5.688    5.625  5.610  5.740  5.850  5.950
6.110   6.310
## 232   5.813   5.867   5.688    5.625  5.630  5.750  5.870  5.970
6.140   6.320
## 233   5.813   5.867   5.688    5.625  5.650  5.770  5.890  6.000
6.160   6.350
## 234   5.813   5.875   5.688    5.625  5.630  5.750  5.880  6.000
6.160   6.350
## 235   5.824   5.867   5.688    5.625  5.630  5.750  5.870  5.980
6.140   6.330
## 236   5.844   5.871   5.688    5.625  5.610  5.720  5.840  5.950
6.110   6.300
## 237   5.855   5.875   5.691    5.625  5.630  5.750  5.870  5.990
6.140   6.310
## 238   5.973   5.875   5.695    5.625  5.600  5.710  5.820  5.940
6.100   6.280
## 239   5.977   5.875   5.688    5.625  5.510  5.610  5.720  5.830
5.980   6.170
## 240   5.938   5.828   5.676    5.563  5.470  5.560  5.670  5.780
5.930   6.130
## 241   5.938   5.813   5.648    5.559  5.420  5.510  5.600  5.700
5.850   6.020
## 242   5.938   5.813   5.625    5.500  5.430  5.510  5.610  5.710
5.850   6.030
## 243   5.938   5.813   5.625    5.500  5.440  5.530  5.630  5.720
5.850   6.000
## 244   5.938   5.809   5.625    5.500  5.490  5.600  5.700  5.800
5.940   6.100
## 245   5.934   5.809   5.625    5.504  5.470  5.580  5.680  5.790
5.940   6.110
## 246   5.930   5.813   5.629    5.520  5.500  5.600  5.700  5.800
5.940   6.100
## 247   5.934   5.813   5.637    5.527  5.510  5.620  5.720  5.820
```

```
5.960   6.120
## 248   5.938   5.813   5.660    5.563  5.520  5.620  5.730  5.840
5.970   6.130
## 249   5.938   5.813   5.664    5.563  5.480  5.580  5.700  5.800
5.950   6.110
## 250   5.930   5.813   5.656    5.555  5.460  5.580  5.680  5.790
5.950   6.110
## 251   5.930   5.813   5.664    5.555  5.510  5.630  5.760  5.870
6.020   6.200
## 252   5.930   5.813   5.660    5.563  5.520  5.660  5.790  5.900
6.050   6.240
## 253   5.750   5.668   5.555    5.438  5.410  5.540  5.670  5.770
5.940   6.120
## 254   5.750   5.680   5.555    5.438  5.460  5.600  5.730  5.850
6.000   6.170
## 255   5.750   5.680   5.563    5.438  5.440  5.580  5.700  5.810
5.950   6.140
## 256   5.750   5.680   5.563    5.438  5.440  5.580  5.700  5.810
5.950   6.140
## 257   5.750   5.680   5.563    5.438  5.440  5.580  5.700  5.810
5.950   6.140
## 258   5.750   5.688   5.563    5.441  5.440  5.580  5.700  5.810
5.950   6.140
## 259   5.688   5.629   5.531    5.438  5.360  5.500  5.610  5.720
5.870   6.050
## 260   5.688   5.625   5.508    5.426  5.360  5.500  5.610  5.720
5.870   6.050
## 261   5.688   5.625   5.508    5.426  5.360  5.500  5.610  5.720
5.870   6.050
## 262   5.629   5.625   5.500    5.375  5.340  5.460  5.570  5.680
5.830   6.000
## 263   5.625   5.625   5.500    5.375  5.310  5.420  5.540  5.630
5.790   5.970
## 264   5.625   5.605   5.492    5.359  5.270  5.380  5.490  5.600
5.760   5.950
## 265   5.625   5.605   5.484    5.359  5.330  5.450  5.570  5.690
5.860   6.070
## 266   5.625   5.602   5.477    5.363  5.340  5.470  5.580  5.690
5.860   6.080
## 267   5.625   5.598   5.477    5.363  5.330  5.460  5.590  5.710
5.880   6.090
## 268   5.625   5.590   5.477    5.363  5.350  5.490  5.620  5.740
5.910   6.130
## 269   5.625   5.609   5.496    5.375  5.370  5.520  5.660  5.770
5.950   6.180
## 270   5.625   5.598   5.484    5.363  5.320  5.450  5.590  5.720
5.910   6.150
## 271   5.625   5.574   5.449    5.332  5.300  5.430  5.580  5.690
5.890   6.130
## 272   5.625   5.563   5.449    5.313  5.230  5.360  5.520  5.650
```

```
5.840   6.070
## 273   5.613   5.559   5.434    5.250  5.200  5.340  5.490  5.610
5.790   6.000
## 274   5.598   5.547   5.430    5.250  5.140  5.270  5.410  5.530
5.710   5.930
## 275   5.563   5.500   5.375    5.188  5.150  5.280  5.430  5.560
5.740   5.960
## 276   5.563   5.500   5.375    5.188  5.170  5.300  5.450  5.580
5.760   5.960
## 277   5.563   5.500   5.375    5.250  5.200  5.340  5.500  5.630
5.810   6.020
## 278   5.563   5.500   5.375    5.234  5.150  5.300  5.460  5.590
5.780   6.000
## 279   5.563   5.500   5.375    5.211  5.220  5.390  5.540  5.670
5.860   6.090
## 280   5.539   5.500   5.375    5.215  5.200  5.370  5.530  5.660
5.860   6.080
## 281   5.500   5.441   5.363    5.188  5.210  5.380  5.540  5.700
5.880   6.100
## 282   5.477   5.426   5.316    5.188  5.120  5.290  5.450  5.590
5.790   6.010
## 283   5.438   5.375   5.266    5.125  5.080  5.250  5.410  5.550
5.750   5.990
## 284   5.375   5.313   5.227    5.074  5.030  5.200  5.360  5.490
5.710   5.980
## 285   5.375   5.313   5.188    5.063  4.980  5.160  5.330  5.470
5.700   5.990
## 286   5.375   5.313   5.191    5.063  5.070  5.250  5.430  5.600
5.820   6.110
## 287   5.375   5.313   5.188    5.063  5.050  5.230  5.410  5.560
5.790   6.060
## 288   5.363   5.301   5.184    5.063  5.030  5.210  5.380  5.540
5.770   6.050
## 289   5.344   5.305   5.184    5.035  5.030  5.210  5.400  5.560
5.790   6.070
## 290   5.332   5.277   5.145    5.008  4.970  5.140  5.330  5.490
5.730   6.020
## 291   5.313   5.258   5.129    5.000  4.960  5.130  5.320  5.490
5.740   6.040
## 292   5.313   5.250   5.121    4.996  4.920  5.080  5.260  5.430
5.670   5.970
## 293   5.313   5.250   5.125    4.996  4.940  5.090  5.270  5.430
5.690   5.990
## 294   5.313   5.250   5.125    5.000  4.960  5.120  5.310  5.470
5.730   6.040
## 295   5.313   5.250   5.125    5.000  5.020  5.190  5.370  5.540
5.800   6.120
## 296   5.313   5.250   5.125    5.000  5.050  5.230  5.410  5.590
5.860   6.180
## 297   5.313   5.250   5.133    5.031  5.130  5.320  5.510  5.690
```

```
5.950   6.280
## 298   5.313   5.293   5.250    5.242  5.310  5.480  5.640  5.800
6.040   6.340
## 299   5.313   5.270   5.207    5.195  5.270  5.450  5.630  5.790
6.030   6.330
## 300   5.313   5.250   5.184    5.125  5.250  5.440  5.620  5.780
6.010   6.300
## 301   5.313   5.250   5.188    5.188  5.350  5.540  5.720  5.870
6.130   6.430
## 302   5.313   5.250   5.227    5.215  5.380  5.590  5.770  5.920
6.160   6.450
## 303   5.313   5.270   5.250    5.250  5.470  5.680  5.840  5.980
6.190   6.440
## 304   5.313   5.305   5.297    5.313  5.610  5.810  5.990  6.140
6.340   6.590
## 305   5.313   5.313   5.309    5.313  5.410  5.630  5.810  5.930
6.140   6.400
## 306   5.313   5.285   5.250    5.250  5.360  5.580  5.760  5.890
6.100   6.380
## 307   5.313   5.254   5.238    5.234  5.420  5.630  5.800  5.930
6.130   6.390
## 308   5.313   5.293   5.250    5.266  5.500  5.700  5.890  5.990
6.210   6.450
## 309   5.313   5.301   5.270    5.313  5.540  5.740  5.940  6.080
6.280   6.530
## 310   5.313   5.309   5.281    5.313  5.910  6.100  6.250  6.380
6.550   6.770
## 311   5.375   5.414   5.441    5.691  5.945  6.155  6.305  6.405
6.605   6.845
## 312   5.375   5.410   5.441    5.625  5.980  6.170  6.320  6.410
6.600   6.830
## 313   5.375   5.414   5.441    5.672  5.930  6.130  6.270  6.390
6.560   6.790
## 314   5.379   5.422   5.445    5.672  5.900  6.110  6.250  6.380
6.560   6.780
## 315   5.383   5.422   5.438    5.672  5.980  6.180  6.330  6.470
6.650   6.880
## 316   5.406   5.438   5.500    5.750  6.030  6.220  6.350  6.480
6.650   6.850
## 317   5.406   5.438   5.500    5.746  6.030  6.230  6.370  6.480
6.650   6.840
## 318   5.410   5.438   5.500    5.750  5.940  6.130  6.270  6.390
6.570   6.780
## 319   5.402   5.438   5.457    5.688  5.930  6.100  6.240  6.370
6.540   6.740
## 320   5.402   5.438   5.457    5.645  5.910  6.080  6.230  6.350
6.530   6.730
## 321   5.410   5.438   5.469    5.664  5.860  6.040  6.190  6.310
6.490   6.690
## 322   5.410   5.438   5.441    5.625  5.890  6.080  6.210  6.350
```

```
6.530   6.730
## 323   5.422   5.438   5.449    5.625  5.930  6.120  6.250  6.370
6.530   6.710
## 324   5.438   5.469   5.500    5.688  6.030  6.230  6.360  6.480
6.640   6.830
## 325   5.438   5.473   5.500    5.723  5.980  6.170  6.320  6.450
6.620   6.810
## 326   5.438   5.465   5.500    5.688  5.980  6.180  6.340  6.460
6.620   6.790
## 327   5.438   5.469   5.500    5.688  5.980  6.180  6.340  6.460
6.620   6.790
## 328   5.438   5.461   5.500    5.688  5.970  6.160  6.310  6.430
6.590   6.750
## 329   5.438   5.465   5.500    5.688  5.980  6.180  6.340  6.450
6.610   6.780
## 330   5.438   5.465   5.500    5.688  5.980  6.180  6.340  6.450
6.610   6.780
## 331   5.438   5.465   5.500    5.688  6.290  6.520  6.660  6.780
6.920   7.070
## 332   5.500   5.531   5.617    5.875  6.260  6.470  6.630  6.750
6.920   7.060
## 333   5.500   5.535   5.617    5.871  6.260  6.460  6.630  6.740
6.900   7.060
## 334   5.500   5.535   5.625    5.930  6.310  6.540  6.700  6.800
6.960   7.120
## 335   5.500   5.523   5.625    5.910  6.200  6.410  6.570  6.680
6.870   7.030
## 336   5.488   5.500   5.563    5.813  6.110  6.320  6.480  6.600
6.770   6.950
## 337   5.477   5.500   5.563    5.813  6.130  6.340  6.500  6.630
6.790   6.950
## 338   5.465   5.500   5.563    5.813  6.160  6.370  6.520  6.650
6.810   6.980
## 339   5.445   5.500   5.563    5.813  6.190  6.410  6.580  6.700
6.880   7.050
## 340   5.441   5.500   5.563    5.813  6.120  6.330  6.510  6.640
6.810   6.980
## 341   5.438   5.484   5.559    5.801  6.070  6.280  6.450  6.580
6.760   6.930
## 342   5.438   5.484   5.547    5.793  6.130  6.340  6.510  6.630
6.820   6.980
## 343   5.438   5.480   5.551    5.797  6.120  6.330  6.490  6.620
6.810   6.980
## 344   5.438   5.480   5.551    5.797  6.180  6.400  6.560  6.680
6.850   7.040
## 345   5.434   5.488   5.559    5.813  6.120  6.330  6.490  6.610
6.780   6.980
## 346   5.438   5.484   5.563    5.813  6.170  6.370  6.520  6.640
6.820   7.010
## 347   5.438   5.484   5.563    5.813  6.240  6.440  6.600  6.720
```

```
6.900   7.090
## 348   5.438   5.500   5.598    5.879  6.240  6.460  6.600  6.730
6.910   7.100
## 349   5.438   5.500   5.602    5.875  6.350  6.560  6.720  6.840
7.020   7.230
## 350   5.438   5.527   5.660    6.000  6.360  6.570  6.740  6.870
7.050   7.270
## 351   5.438   5.527   5.660    6.000  6.350  6.580  6.740  6.870
7.070   7.260
## 352   5.438   5.500   5.625    5.945  6.390  6.620  6.790  6.910
7.100   7.290
## 353   5.438   5.500   5.629    5.980  6.390  6.620  6.820  6.940
7.100   7.310
## 354   5.438   5.500   5.625    5.945  6.330  6.570  6.730  6.860
7.050   7.240
## 355   5.438   5.500   5.625    5.945  6.230  6.460  6.630  6.740
6.960   7.140
## 356   5.430   5.500   5.594    5.875  6.250  6.490  6.650  6.770
6.970   7.160
## 357   5.430   5.500   5.582    5.875  6.195  6.420  6.580  6.700
6.890   7.080
## 358   5.418   5.480   5.563    5.852  6.180  6.400  6.570  6.680
6.860   7.060
## 359   5.426   5.488   5.570    5.867  6.260  6.480  6.640  6.750
6.930   7.120
## 360   5.438   5.496   5.590    5.918  6.230  6.440  6.610  6.720
6.900   7.090
## 361   5.438   5.500   5.582    5.879  6.210  6.420  6.570  6.680
6.860   7.040
## 362   5.438   5.492   5.586    5.875  6.200  6.410  6.560  6.680
6.860   7.030
## 363   5.438   5.492   5.582    5.883  6.260  6.470  6.620  6.750
6.910   7.100
## 364   5.434   5.488   5.578    5.875  6.230  6.440  6.590  6.700
6.880   7.050
## 365   5.430   5.492   5.578    5.879  6.230  6.445  6.600  6.710
6.890   7.070
## 366   5.430   5.492   5.578    5.879  6.230  6.445  6.600  6.710
6.890   7.070
## 367   5.434   5.492   5.586    5.875  6.240  6.440  6.600  6.720
6.890   7.070
## 368   5.430   5.480   5.586    5.879  6.230  6.450  6.600  6.710
6.890   7.060
## 369   5.438   5.500   5.625    5.988  6.410  6.630  6.780  6.890
7.070   7.240
## 370   5.438   5.500   5.633    6.000  6.460  6.690  6.840  6.960
7.110   7.260
## 371   5.465   5.531   5.711    6.098  6.455  6.665  6.810  6.910
7.090   7.250
## 372   5.457   5.535   5.688    6.066  6.445  6.655  6.800  6.900
```

```
7.070   7.240
## 373   5.457   5.535   5.688    6.063  6.465  6.675  6.810  6.920
7.080   7.250
## 374   5.453   5.539   5.688    6.063  6.360  6.550  6.700  6.800
6.970   7.140
## 375   5.438   5.500   5.680    6.016  6.600  6.800  6.960  7.060
7.210   7.360
## 376   5.480   5.602   5.789    6.188  6.600  6.810  6.940  7.050
7.190   7.340
## 377   5.484   5.605   5.801    6.203  6.590  6.800  6.940  7.070
7.230   7.370
## 378   5.480   5.609   5.793    6.199  6.580  6.800  6.950  7.060
7.210   7.380
## 379   5.496   5.613   5.813    6.246  6.600  6.820  6.990  7.100
7.270   7.440
## 380   5.484   5.598   5.797    6.188  6.540  6.760  6.900  7.020
7.200   7.380
## 381   5.465   5.582   5.777    6.164  6.540  6.760  6.900  7.020
7.170   7.330
## 382   5.449   5.563   5.754    6.129  6.490  6.690  6.840  6.950
7.110   7.280
## 383   5.438   5.563   5.750    6.148  6.560  6.770  6.920  7.030
7.200   7.350
## 384   5.469   5.563   5.758    6.168  6.590  6.790  6.940  7.050
7.210   7.370
## 385   5.465   5.578   5.773    6.188  6.550  6.760  6.890  7.010
7.160   7.330
## 386   5.480   5.566   5.750    6.176  6.540  6.750  6.890  7.000
7.150   7.320
## 387   5.480   5.563   5.750    6.180  6.530  6.730  6.870  6.970
7.120   7.290
## 388   5.492   5.570   5.766    6.168  6.520  6.720  6.850  6.960
7.110   7.270
## 389   5.500   5.598   5.813    6.172  6.520  6.730  6.860  6.960
7.120   7.290
## 390   5.496   5.582   5.789    6.125  6.310  6.510  6.650  6.760
6.930   7.110
## 391   5.484   5.563   5.750    6.035  6.350  6.540  6.680  6.780
6.940   7.120
## 392   5.492   5.563   5.750    6.063  6.430  6.630  6.750  6.840
7.000   7.170
## 393   5.500   5.598   5.797    6.117  6.440  6.625  6.760  6.850
7.010   7.190
## 394   5.477   5.570   5.762    6.074  6.400  6.600  6.710  6.810
6.970   7.160
## 395   5.477   5.574   5.766    6.094  6.640  6.830  6.960  7.070
7.220   7.400
## 396   5.516   5.688   5.926    6.313  6.690  6.880  7.020  7.130
7.290   7.460
## 397   5.504   5.688   5.930    6.305  6.650  6.850  6.980  7.090
```

```
7.260   7.430
## 398   5.500   5.688   5.914    6.285  6.580  6.780  6.900  7.020
7.180   7.370
## 399   5.496   5.688   5.895    6.250  6.580  6.780  6.900  7.020
7.180   7.370
## 400   5.469   5.676   5.887    6.230  6.470  6.660  6.790  6.910
7.070   7.230
## 401   5.477   5.676   5.887    6.215  6.565  6.750  6.880  6.990
7.140   7.290
## 402   5.477   5.684   5.887    6.230  6.490  6.680  6.810  6.930
7.100   7.280
## 403   5.469   5.660   5.855    6.168  6.465  6.650  6.780  6.900
7.070   7.240
## 404   5.457   5.660   5.867    6.168  6.395  6.580  6.710  6.820
6.980   7.170
## 405   5.438   5.625   5.824    6.125  6.405  6.575  6.710  6.810
6.980   7.150
## 406   5.438   5.625   5.840    6.125  6.435  6.600  6.740  6.850
7.010   7.180
## 407   5.438   5.625   5.848    6.156  6.495  6.670  6.800  6.920
7.070   7.240
## 408   5.438   5.625   5.824    6.125  6.435  6.610  6.750  6.860
7.030   7.200
## 409   5.438   5.625   5.848    6.156  6.445  6.640  6.770  6.880
7.050   7.220
## 410   5.438   5.625   5.848    6.156  6.485  6.680  6.800  6.910
7.070   7.250
## 411   5.453   5.641   5.852    6.188  6.535  6.710  6.840  6.950
7.135   7.290
## 412   5.469   5.688   5.891    6.238  6.505  6.680  6.810  6.930
7.090   7.260
## 413   5.465   5.676   5.883    6.219  6.445  6.630  6.750  6.850
7.020   7.200
## 414   5.441   5.633   5.844    6.188  6.295  6.460  6.570  6.670
6.840   7.020
## 415   5.441   5.586   5.758    6.043  6.115  6.290  6.420  6.530
6.700   6.870
## 416   5.438   5.551   5.691    5.875  6.125  6.310  6.440  6.550
6.710   6.900
## 417   5.434   5.539   5.688    5.902  6.145  6.320  6.450  6.560
6.730   6.910
## 418   5.430   5.539   5.688    5.883  6.135  6.320  6.450  6.560
6.710   6.880
## 419   5.426   5.539   5.688    5.883  6.175  6.360  6.500  6.600
6.760   6.940
## 420   5.426   5.535   5.688    5.875  6.135  6.310  6.450  6.540
6.710   6.880
## 421   5.414   5.500   5.668    5.863  6.100  6.280  6.430  6.530
6.700   6.860
## 422   5.422   5.500   5.664    5.852  6.130  6.320  6.460  6.570
```

```
6.730   6.900
## 423   5.418   5.500   5.688    5.895  6.175  6.360  6.510  6.620
6.780   6.950
## 424   5.430   5.500   5.688    5.883  6.195  6.390  6.550  6.660
6.810   6.980
## 425   5.438   5.500   5.688    5.906  6.175  6.360  6.500  6.610
6.770   6.940
## 426   5.430   5.500   5.688    5.875  6.175  6.370  6.520  6.630
6.790   6.960
## 427   5.430   5.500   5.688    5.891  6.175  6.360  6.510  6.630
6.780   6.950
## 428   5.414   5.500   5.680    5.887  6.185  6.380  6.530  6.650
6.810   6.980
## 429   5.406   5.492   5.680    5.898  6.205  6.400  6.560  6.680
6.850   7.010
## 430   5.398   5.484   5.664    5.895  6.275  6.480  6.630  6.740
6.910   7.070
## 431   5.398   5.484   5.664    5.895  6.320  6.535  6.700  6.820
6.980   7.135
## 432   5.410   5.531   5.719    6.031  6.365  6.560  6.720  6.840
7.000   7.150
## 433   5.406   5.531   5.727    6.012  6.355  6.550  6.700  6.820
6.980   7.140
## 434   5.422   5.551   5.750    6.051  6.435  6.640  6.790  6.910
7.070   7.230
## 435   5.438   5.563   5.773    6.098  6.525  6.730  6.890  7.010
7.160   7.350
## 436   5.438   5.582   5.844    6.191  6.555  6.770  6.920  7.030
7.180   7.330
## 437   5.480   5.656   5.902    6.254  6.595  6.790  6.940  7.050
7.190   7.330
## 438   5.473   5.637   5.875    6.246  6.585  6.770  6.910  7.020
7.170   7.300
## 439   5.473   5.656   5.914    6.262  6.585  6.780  6.910  7.020
7.170   7.320
## 440   5.492   5.656   5.934    6.281  6.585  6.780  6.910  7.020
7.170   7.320
## 441   5.480   5.625   5.875    6.223  6.535  6.730  6.870  6.990
7.140   7.300
## 442   5.484   5.625   5.875    6.188  6.555  6.740  6.890  7.000
7.150   7.310
## 443   5.504   5.625   5.879    6.219  6.575  6.765  6.910  7.020
7.180   7.340
## 444   5.504   5.625   5.875    6.219  6.455  6.650  6.780  6.890
7.060   7.230
## 445   5.492   5.625   5.859    6.176  6.305  6.500  6.650  6.770
6.950   7.120
## 446   5.438   5.563   5.750    6.020  6.315  6.510  6.660  6.770
6.940   7.110
## 447   5.445   5.563   5.750    6.031  6.405  6.605  6.730  6.840
```

```
7.000   7.150
## 448   5.480   5.625   5.816    6.125  6.425  6.615  6.750  6.860
7.020   7.180
## 449   5.488   5.625   5.820    6.125  6.475  6.665  6.810  6.920
7.080   7.230
## 450   5.500   5.629   5.844    6.156  6.445  6.635  6.770  6.880
7.040   7.200
## 451   5.500   5.637   5.852    6.152  6.455  6.645  6.780  6.880
7.050   7.210
## 452   5.531   5.656   5.844    6.129  6.425  6.625  6.750  6.860
7.030   7.170
## 453   5.445   5.563   5.750    6.043  6.285  6.475  6.620  6.730
6.900   7.080
## 454   5.438   5.551   5.750    6.000  6.235  6.415  6.560  6.670
6.840   7.010
## 455   5.438   5.625   5.730    5.984  6.245  6.425  6.570  6.670
6.840   7.000
## 456   5.434   5.625   5.734    5.988  6.305  6.495  6.630  6.730
6.900   7.070
## 457   5.434   5.625   5.734    5.988  6.245  6.435  6.570  6.670
6.840   7.020
## 458   5.434   5.625   5.688    5.945  6.185  6.370  6.520  6.620
6.790   6.970
## 459   5.422   5.605   5.660    5.918  6.195  6.375  6.525  6.625
6.795   6.975
## 460   5.414   5.598   5.660    5.914  6.025  6.205  6.365  6.465
6.645   6.835
## 461   5.387   5.531   5.594    5.813  6.065  6.245  6.395  6.515
6.695   6.875
## 462   5.375   5.531   5.594    5.813  6.075  6.265  6.405  6.525
6.705   6.885
## 463   5.383   5.531   5.594    5.813  6.075  6.265  6.415  6.535
6.705   6.895
## 464   5.383   5.531   5.598    5.848  6.155  6.345  6.495  6.605
6.775   6.955
## 465   5.387   5.563   5.625    5.898  6.095  6.295  6.445  6.565
6.745   6.925
## 466   5.375   5.531   5.594    5.848  6.095  6.285  6.445  6.565
6.745   6.925
## 467   5.375   5.535   5.594    5.844  6.085  6.275  6.425  6.545
6.715   6.905
## 468   5.375   5.535   5.594    5.855  6.125  6.315  6.465  6.585
6.765   6.955
## 469   5.379   5.535   5.594    5.855  6.055  6.245  6.395  6.515
6.705   6.885
## 470   5.375   5.527   5.594    5.813  6.045  6.225  6.375  6.495
6.665   6.845
## 471   5.375   5.531   5.594    5.813  6.065  6.245  6.385  6.505
6.675   6.845
## 472   5.375   5.531   5.594    5.816  6.085  6.275  6.415  6.535
```

```
6.695   6.875
## 473   5.375   5.531   5.594    5.844  6.115  6.305  6.455  6.565
6.735   6.925
## 474   5.375   5.531   5.594    5.816  6.115  6.295  6.445  6.555
6.725   6.915
## 475   5.375   5.531   5.594    5.844  6.055  6.235  6.385  6.495
6.665   6.865
## 476   5.375   5.531   5.594    5.813  6.075  6.265  6.405  6.525
6.685   6.885
## 477   5.375   5.531   5.625    5.840  5.965  6.145  6.285  6.385
6.555   6.755
## 478   5.375   5.531   5.625    5.840  5.955  6.125  6.265  6.375
6.535   6.735
## 479   5.375   5.500   5.566    5.750  5.945  6.125  6.255  6.365
6.525   6.725
## 480   5.375   5.500   5.563    5.719  5.925  6.095  6.225  6.325
6.485   6.685
## 481   5.375   5.500   5.563    5.719  5.945  6.105  6.235  6.345
6.495   6.695
## 482   5.375   5.500   5.563    5.719  5.895  6.055  6.185  6.285
6.435   6.615
## 483   5.375   5.500   5.547    5.688  5.895  6.055  6.175  6.275
6.415   6.595
## 484   5.375   5.500   5.563    5.719  5.955  6.125  6.255  6.355
6.495   6.685
## 485   5.375   5.500   5.547    5.688  5.925  6.075  6.205  6.295
6.435   6.605
## 486   5.375   5.500   5.547    5.688  5.905  6.075  6.195  6.295
6.435   6.595
## 487   5.375   5.500   5.559    5.711  5.895  6.045  6.165  6.265
6.395   6.555
## 488   5.375   5.500   5.543    5.695  5.905  6.045  6.165  6.255
6.385   6.555
## 489   5.375   5.500   5.551    5.707  5.845  5.985  6.115  6.205
6.335   6.515
## 490   5.375   5.500   5.539    5.688  5.835  5.975  6.095  6.185
6.325   6.495
## 491   5.375   5.500   5.543    5.688  5.845  6.005  6.115  6.215
6.365   6.535
## 492   5.375   5.500   5.547    5.688  5.825  5.975  6.095  6.185
6.315   6.485
## 493   5.375   5.500   5.539    5.680  5.855  5.995  6.115  6.205
6.345   6.505
## 494   5.375   5.500   5.535    5.680  5.835  5.965  6.075  6.165
6.285   6.445
## 495   5.375   5.500   5.543    5.688  5.855  5.985  6.095  6.185
6.305   6.465
## 496   5.375   5.500   5.547    5.688  5.845  5.975  6.085  6.175
6.305   6.455
## 497   5.375   5.500   5.543    5.688  5.815  5.945  6.045  6.135
```

```
6.265   6.425
## 498   5.375   5.500   5.547    5.688  5.845  5.965  6.075  6.165
6.305   6.465
## 499   5.563   5.500   5.547    5.688  5.835  5.965  6.075  6.165
6.295   6.455
## 500   5.563   5.500   5.543    5.688  5.785  5.905  6.005  6.095
6.225   6.385
## 501   5.563   5.500   5.543    5.688  5.795  5.925  6.025  6.105
6.225   6.395
## 502   5.563   5.500   5.539    5.684  5.765  5.885  5.985  6.065
6.195   6.355
## 503   5.563   5.500   5.539    5.684  5.795  5.915  6.015  6.105
6.245   6.405
## 504   5.563   5.500   5.539    5.688  5.885  6.015  6.115  6.205
6.355   6.525
## 505   5.605   5.547   5.617    5.801  5.905  6.055  6.175  6.265
6.425   6.585
## 506   5.594   5.535   5.590    5.723  5.875  6.005  6.125  6.225
6.375   6.535
## 507   5.598   5.531   5.574    5.719  5.895  6.035  6.145  6.245
6.385   6.545
## 508   5.598   5.531   5.594    5.750  5.965  6.125  6.245  6.345
6.515   6.665
## 509   5.605   5.535   5.605    5.758  5.995  6.155  6.285  6.395
6.555   6.725
## 510   5.617   5.551   5.605    5.762  5.945  6.105  6.225  6.335
6.505   6.685
## 511   5.617   5.543   5.598    5.758  5.965  6.115  6.235  6.345
6.515   6.695
## 512   5.625   5.563   5.613    5.789  6.045  6.205  6.335  6.445
6.605   6.785
## 513   5.645   5.582   5.625    5.813  6.035  6.195  6.325  6.425
6.585   6.755
## 514   5.656   5.594   5.629    5.844  6.035  6.205  6.325  6.425
6.585   6.765
## 515   5.660   5.594   5.625    5.789  6.005  6.155  6.275  6.375
6.525   6.685
## 516   5.668   5.594   5.625    5.813  6.005  6.165  6.285  6.375
6.515   6.675
## 517   5.664   5.594   5.625    5.813  6.005  6.175  6.285  6.395
6.525   6.695
## 518   5.664   5.594   5.625    5.813  6.005  6.175  6.285  6.395
6.525   6.695
## 519   5.664   5.594   5.625    5.813  6.005  6.175  6.285  6.395
6.525   6.695
## 520   5.688   5.617   5.625    5.813  6.005  6.165  6.285  6.375
6.525   6.685
## 521   5.504   5.563   5.598    5.785  5.960  6.135  6.255  6.350
6.500   6.655
## 522   5.500   5.563   5.602    5.789  6.075  6.245  6.365  6.465
```

```
6.615   6.775
## 523   5.500   5.563   5.602    5.789  6.075  6.245  6.365  6.465
6.615   6.775
## 524   5.500   5.563   5.656    5.875  6.155  6.335  6.465  6.575
6.735   6.895
## 525   5.500   5.563   5.656    5.875  6.125  6.295  6.415  6.525
6.665   6.845
## 526   5.492   5.563   5.660    5.875  6.165  6.325  6.455  6.565
6.735   6.905
## 527   5.492   5.563   5.660    5.891  6.165  6.335  6.475  6.585
6.745   6.915
## 528   5.488   5.563   5.660    5.895  6.145  6.305  6.435  6.535
6.715   6.885
## 529   5.484   5.563   5.660    5.914  6.145  6.315  6.445  6.545
6.705   6.875
## 530   5.480   5.563   5.660    5.875  6.285  6.455  6.595  6.705
6.855   7.015
## 531   5.484   5.594   5.703    5.969  6.255  6.435  6.555  6.655
6.815   6.975
## 532   5.477   5.594   5.711    5.977  6.215  6.375  6.495  6.585
6.735   6.895
## 533   5.449   5.563   5.688    5.938  6.215  6.375  6.505  6.605
6.755   6.915
## 534   5.449   5.563   5.688    5.938  6.195  6.355  6.485  6.585
6.735   6.895
## 535   5.445   5.563   5.688    5.945  6.205  6.365  6.485  6.585
6.745   6.905
## 536   5.613   5.625   5.625    5.668  6.185  6.355  6.475  6.575
6.735   6.895
## 537   5.438   5.563   5.688    5.938  6.205  6.365  6.485  6.585
6.735   6.895
## 538   5.438   5.563   5.684    5.910  6.185  6.345  6.465  6.565
6.715   6.865
## 539   5.438   5.563   5.688    5.938  6.205  6.365  6.485  6.585
6.735   6.895
## 540   5.438   5.563   5.688    5.953  6.255  6.430  6.555  6.665
6.815   6.975
## 541   5.438   5.563   5.688    5.969  6.265  6.435  6.565  6.675
6.825   6.985
## 542   5.438   5.625   5.707    6.000  6.185  6.365  6.485  6.585
6.735   6.905
## 543   5.438   5.563   5.688    5.969  6.215  6.395  6.525  6.635
6.795   6.975
## 544   5.438   5.563   5.688    5.938  6.205  6.385  6.515  6.625
6.785   6.955
## 545   5.438   5.563   5.688    5.938  6.135  6.305  6.415  6.525
6.685   6.865
## 546   5.438   5.563   5.672    5.879  6.065  6.225  6.345  6.455
6.605   6.785
## 547   5.438   5.563   5.637    5.863  6.085  6.255  6.375  6.485
```

```
6.645   6.815
## 548   5.438   5.563   5.629    5.852  6.105  6.255  6.375  6.475
6.625   6.795
## 549   5.438   5.547   5.625    5.848  6.085  6.245  6.365  6.465
6.625   6.795
## 550   5.438   5.543   5.633    5.852  6.025  6.185  6.305  6.395
6.555   6.725
## 551   5.414   5.512   5.613    5.813  6.035  6.205  6.325  6.415
6.585   6.745
## 552   5.414   5.512   5.613    5.813  6.045  6.205  6.325  6.415
6.565   6.735
## 553   5.414   5.512   5.613    5.813  6.045  6.205  6.335  6.425
6.565   6.735
## 554   5.422   5.504   5.602    5.813  6.035  6.195  6.315  6.405
6.555   6.725
## 555   5.426   5.496   5.570    5.781  5.975  6.125  6.225  6.325
6.465   6.635
## 556   5.426   5.473   5.570    5.750  5.965  6.115  6.225  6.315
6.455   6.625
## 557   5.375   5.477   5.547    5.750  5.965  6.115  6.225  6.325
6.465   6.635
## 558   5.375   5.469   5.547    5.750  5.995  6.135  6.255  6.345
6.485   6.645
## 559   5.375   5.473   5.563    5.781  6.015  6.165  6.275  6.375
6.515   6.675
## 560   5.375   5.473   5.563    5.781  6.035  6.195  6.305  6.405
6.555   6.715
## 561   5.375   5.477   5.563    5.797  6.055  6.225  6.335  6.435
6.585   6.755
## 562   5.375   5.484   5.563    5.793  6.055  6.215  6.325  6.425
6.575   6.735
## 563   5.375   5.500   5.563    5.793  6.195  6.345  6.455  6.565
6.705   6.855
## 564   5.438   5.539   5.656    5.938  6.245  6.415  6.515  6.615
6.755   6.905
## 565   5.438   5.539   5.688    5.969  6.275  6.435  6.555  6.645
6.785   6.925
## 566   5.438   5.547   5.707    6.000  6.305  6.455  6.575  6.675
6.805   6.955
## 567   5.438   5.555   5.715    6.000  6.285  6.445  6.555  6.645
6.775   6.925
## 568   5.438   5.563   5.719    6.031  6.315  6.485  6.595  6.695
6.835   6.985
## 569   5.438   5.563   5.719    6.000  6.305  6.465  6.585  6.675
6.815   6.965
## 570   5.438   5.563   5.750    6.063  6.315  6.475  6.595  6.685
6.835   6.975
## 571   5.438   5.563   5.719    6.000  6.285  6.445  6.565  6.655
6.795   6.945
## 572   5.438   5.563   5.719    6.000  6.315  6.475  6.585  6.685
```

```
6.815   6.975
## 573   5.438   5.563   5.730    6.031  6.315  6.475  6.595  6.685
6.825   6.985
## 574   5.438   5.563   5.734    6.031  6.375  6.565  6.685  6.775
6.915   7.065
## 575   5.469   5.598   5.758    6.109  6.380  6.555  6.675  6.775
6.915   7.065
## 576   5.473   5.598   5.754    6.094  6.400  6.585  6.695  6.805
6.945   7.095
## 577   5.500   5.625   5.781    6.125  6.425  6.605  6.725  6.815
6.965   7.105
## 578   5.500   5.625   5.789    6.125  6.445  6.625  6.735  6.835
6.985   7.125
## 579   5.500   5.625   5.789    6.125  6.495  6.675  6.775  6.875
7.015   7.155
## 580   5.625   5.719   5.875    6.219  6.515  6.685  6.795  6.875
7.005   7.135
## 581   5.656   5.738   5.875    6.219  6.505  6.665  6.765  6.855
6.985   7.115
## 582   5.668   5.750   5.875    6.219  6.475  6.625  6.725  6.805
6.935   7.055
## 583   5.688   5.762   5.930    6.262  6.585  6.745  6.845  6.945
7.065   7.185
## 584   5.688   5.773   5.938    6.273  6.655  6.825  6.925  7.015
7.135   7.265
## 585   5.688   5.773   5.938    6.273  6.655  6.825  6.925  7.015
7.135   7.265
## 586   5.688   5.773   5.938    6.273  6.655  6.825  6.925  7.015
7.135   7.265
## 587   5.688   5.813   5.969    6.344  6.665  6.835  6.935  7.025
7.155   7.285
## 588   5.688   5.813   5.969    6.344  6.685  6.845  6.945  7.015
7.165   7.285
## 589   5.688   5.813   5.973    6.344  6.665  6.835  6.925  7.005
7.135   7.265
## 590   5.688   5.813   5.973    6.344  6.685  6.855  6.955  7.045
7.165   7.295
## 591   5.688   5.816   5.988    6.375  6.675  6.835  6.935  7.015
7.145   7.265
## 592   5.688   5.816   5.980    6.359  6.695  6.855  6.955  7.035
7.155   7.275
## 593   5.688   5.813   6.000    6.375  6.685  6.855  6.945  7.025
7.155   7.275
## 594   5.688   5.816   6.000    6.375  6.705  6.875  6.975  7.055
7.185   7.295
## 595   5.688   5.816   6.000    6.375  6.795  6.975  7.065  7.155
7.275   7.385
## 596   5.688   5.844   6.031    6.438  6.795  6.965  7.065  7.145
7.265   7.375
## 597   5.688   5.852   6.035    6.441  6.735  6.905  6.985  7.065
```

```
7.175   7.275
## 598   5.688   5.844   6.031    6.406  6.775  6.935  7.035  7.095
7.205   7.315
## 599   5.688   5.844   6.031    6.406  6.665  6.825  6.925  6.995
7.105   7.215
## 600   5.688   5.836   6.000    6.375  6.665  6.835  6.925  7.005
7.115   7.235
## 601   5.688   5.832   6.000    6.359  6.665  6.825  6.915  7.005
7.125   7.235
## 602   5.688   5.836   6.004    6.375  6.695  6.855  6.945  7.015
7.135   7.235
## 603   5.688   5.828   6.000    6.375  6.695  6.855  6.945  7.025
7.135   7.235
## 604   5.688   5.840   6.000    6.375  6.745  6.905  6.995  7.065
7.175   7.275
## 605   5.688   5.852   6.055    6.438  6.775  6.945  7.035  7.115
7.205   7.315
## 606   5.688   5.852   6.063    6.441  6.775  6.945  7.035  7.115
7.215   7.315
## 607   5.688   5.859   6.063    6.438  6.615  6.775  6.865  6.945
7.065   7.175
## 608   5.688   5.816   6.000    6.313  6.525  6.675  6.775  6.845
6.965   7.095
## 609   5.688   5.813   6.000    6.313  6.515  6.665  6.755  6.825
6.945   7.075
## 610   5.688   5.820   6.000    6.301  6.515  6.665  6.745  6.825
6.945   7.075
## 611   5.688   5.820   6.000    6.301  6.515  6.665  6.745  6.825
6.935   7.045
## 612   5.688   5.816   6.000    6.285  6.535  6.675  6.775  6.845
6.955   7.065
## 613   5.688   5.816   6.000    6.289  6.555  6.705  6.795  6.855
6.965   7.085
## 614   5.688   5.844   6.031    6.316  6.575  6.715  6.815  6.875
7.005   7.115
## 615   5.688   5.813   6.000    6.258  6.505  6.645  6.745  6.815
6.935   7.065
## 616   5.688   5.813   6.000    6.250  6.455  6.595  6.695  6.765
6.885   7.025
## 617   5.688   5.813   5.980    6.227  6.475  6.615  6.705  6.775
6.905   7.045
## 618   5.688   5.813   6.000    6.250  6.465  6.595  6.695  6.765
6.885   7.015
## 619   5.688   5.813   6.000    6.250  6.485  6.625  6.715  6.795
6.915   7.045
## 620   5.688   5.816   6.000    6.250  6.505  6.645  6.735  6.815
6.935   7.065
## 621   5.711   5.840   6.000    6.258  6.505  6.645  6.735  6.815
6.935   7.065
## 622   5.750   5.875   6.031    6.285  6.555  6.695  6.795  6.865
```

```
6.995   7.115
## 623   5.688   5.813   5.969    6.219  6.475  6.635  6.735  6.815
6.955   7.095
## 624   5.688   5.813   5.969    6.219  6.505  6.665  6.765  6.855
6.995   7.135
## 625   5.688   5.805   5.969    6.223  6.495  6.645  6.755  6.845
6.985   7.125
## 626   5.688   5.805   5.969    6.223  6.495  6.645  6.755  6.845
6.985   7.125
## 627   5.688   5.813   5.969    6.219  6.545  6.705  6.805  6.895
7.025   7.165
## 628   5.688   5.813   5.996    6.254  6.545  6.695  6.795  6.885
7.015   7.155
## 629   5.691   5.813   6.000    6.277  6.555  6.715  6.815  6.905
7.025   7.155
## 630   5.688   5.813   6.000    6.258  6.475  6.625  6.715  6.795
6.915   7.055
## 631   5.688   5.813   5.945    6.219  6.485  6.625  6.715  6.795
6.915   7.035
## 632   5.688   5.813   5.965    6.219  6.455  6.595  6.685  6.765
6.875   6.995
## 633   5.688   5.813   5.961    6.219  6.435  6.575  6.665  6.735
6.845   6.975
## 634   5.688   5.813   5.965    6.219  6.445  6.595  6.675  6.755
6.865   6.995
## 635   5.688   5.813   5.965    6.219  6.425  6.565  6.645  6.715
6.825   6.935
## 636   5.688   5.809   5.938    6.188  6.405  6.525  6.605  6.675
6.775   6.885
## 637   5.688   5.813   5.938    6.188  6.395  6.535  6.615  6.675
6.795   6.905
## 638   5.688   5.813   5.938    6.188  6.425  6.545  6.635  6.705
6.815   6.915
## 639   5.688   5.813   5.938    6.188  6.335  6.475  6.555  6.635
6.745   6.865
## 640   5.688   5.781   5.879    6.125  6.265  6.385  6.475  6.545
6.655   6.785
## 641   5.688   5.781   5.875    6.094  6.265  6.395  6.475  6.545
6.665   6.775
## 642   5.688   5.781   5.875    6.094  6.295  6.425  6.505  6.575
6.685   6.815
## 643   5.688   5.781   5.875    6.094  6.285  6.415  6.505  6.575
6.685   6.805
## 644   5.688   5.781   5.875    6.094  6.305  6.425  6.505  6.575
6.675   6.805
## 645   5.688   5.781   5.875    6.094  6.275  6.395  6.475  6.545
6.655   6.765
## 646   5.688   5.781   5.875    6.094  6.285  6.405  6.485  6.555
6.665   6.785
## 647   5.688   5.781   5.875    6.094  6.305  6.425  6.515  6.585
```

```
6.685   6.815
## 648   5.688   5.781   5.879    6.102  6.305  6.435  6.525  6.595
6.705   6.825
## 649   5.688   5.781   5.879    6.094  6.325  6.455  6.545  6.625
6.745   6.875
## 650   5.688   5.781   5.906    6.125  6.315  6.445  6.545  6.625
6.735   6.865
## 651   5.688   5.781   5.906    6.125  6.385  6.525  6.615  6.705
6.815   6.945
## 652   5.688   5.809   5.938    6.156  6.325  6.455  6.535  6.615
6.725   6.855
## 653   5.688   5.781   5.906    6.125  6.315  6.435  6.515  6.595
6.705   6.815
## 654   5.688   5.781   5.906    6.125  6.195  6.305  6.385  6.455
6.565   6.685
## 655   5.680   5.750   5.848    6.031  6.195  6.305  6.385  6.455
6.565   6.685
## 656   5.688   5.750   5.844    6.031  6.175  6.285  6.355  6.425
6.535   6.655
## 657   5.688   5.750   5.844    6.031  6.175  6.285  6.365  6.435
6.535   6.655
## 658   5.688   5.750   5.844    6.031  6.175  6.285  6.365  6.435
6.545   6.655
## 659   5.688   5.750   5.844    6.031  6.175  6.285  6.365  6.435
6.545   6.655
## 660   5.680   5.750   5.844    6.023  6.175  6.285  6.365  6.435
6.545   6.655
## 661   5.668   5.750   5.844    6.008  6.185  6.295  6.365  6.425
6.525   6.635
## 662   5.676   5.750   5.848    6.031  6.225  6.335  6.405  6.465
6.555   6.675
## 663   5.676   5.750   5.844    6.031  6.175  6.275  6.345  6.405
6.505   6.615
## 664   5.664   5.746   5.836    6.000  6.175  6.265  6.335  6.385
6.495   6.595
## 665   5.672   5.750   5.844    6.031  6.195  6.285  6.355  6.405
6.505   6.625
## 666   5.672   5.750   5.844    6.031  6.225  6.335  6.395  6.465
6.555   6.665
## 667   5.672   5.750   5.844    6.031  6.205  6.315  6.385  6.445
6.535   6.635
## 668   5.648   5.719   5.813    5.969  6.105  6.205  6.275  6.335
6.435   6.525
## 669   5.648   5.719   5.813    5.969  6.125  6.225  6.295  6.365
6.465   6.565
## 670   5.648   5.719   5.813    5.969  6.125  6.235  6.295  6.355
6.455   6.565
## 671   5.645   5.719   5.813    5.969  6.115  6.225  6.305  6.355
6.465   6.575
## 672   5.625   5.719   5.813    5.969  6.085  6.185  6.255  6.325
```

```
6.425   6.535
## 673   5.625   5.719   5.813    5.969  6.055  6.145  6.215  6.285
6.375   6.475
## 674   5.625   5.707   5.801    5.938  6.045  6.135  6.205  6.265
6.335   6.445
## 675   5.625   5.688   5.781    5.906  6.165  6.265  6.325  6.385
6.475   6.575
## 676   5.629   5.719   5.813    6.000  6.205  6.315  6.385  6.445
6.525   6.635
## 677   5.629   5.719   5.813    6.008  6.215  6.325  6.395  6.445
6.535   6.645
## 678   5.633   5.719   5.844    6.031  6.205  6.305  6.375  6.425
6.515   6.625
## 679   5.637   5.719   5.834    6.025  6.195  6.295  6.365  6.415
6.505   6.615
## 680   5.633   5.719   5.844    6.063  6.305  6.425  6.495  6.545
6.655   6.765
## 681   5.633   5.750   5.875    6.125  6.325  6.445  6.515  6.575
6.685   6.815
## 682   5.645   5.750   5.875    6.125  6.285  6.385  6.465  6.535
6.635   6.765
## 683   5.652   5.750   5.875    6.125  6.265  6.375  6.465  6.535
6.645   6.795
## 684   5.645   5.742   5.852    6.063  6.215  6.315  6.395  6.465
6.565   6.715
## 685   5.645   5.738   5.844    6.031  6.215  6.325  6.405  6.475
6.585   6.725
## 686   5.633   5.719   5.813    5.969  6.115  6.235  6.325  6.395
6.505   6.655
## 687   5.625   5.719   5.813    5.969  6.145  6.255  6.335  6.405
6.515   6.655
## 688   5.629   5.719   5.813    5.969  6.175  6.285  6.365  6.435
6.545   6.685
## 689   5.629   5.719   5.813    5.969  6.205  6.315  6.405  6.465
6.575   6.715
## 690   5.625   5.719   5.844    6.031  6.245  6.365  6.455  6.535
6.645   6.805
## 691   5.625   5.719   5.844    6.031  6.245  6.365  6.455  6.535
6.645   6.805
## 692   5.625   5.723   5.844    6.070  6.265  6.385  6.465  6.545
6.655   6.795
## 693   5.633   5.727   5.844    6.063  6.265  6.385  6.475  6.535
6.655   6.775
## 694   5.656   5.734   5.844    6.063  6.225  6.335  6.435  6.495
6.615   6.755
## 695   5.656   5.719   5.844    6.031  6.245  6.355  6.435  6.505
6.625   6.755
## 696   5.656   5.723   5.844    6.063  6.265  6.375  6.475  6.545
6.665   6.795
## 697   5.656   5.719   5.844    6.063  6.235  6.345  6.425  6.495
```

```
6.605   6.735
## 698   5.656   5.719   5.844    6.031  6.225  6.335  6.425  6.495
6.605   6.735
## 699   5.656   5.719   5.844    6.063  6.265  6.375  6.455  6.525
6.645   6.775
## 700   5.656   5.719   5.844    6.063  6.245  6.355  6.435  6.515
6.635   6.765
## 701   5.656   5.719   5.844    6.063  6.255  6.375  6.455  6.525
6.645   6.775
## 702   5.656   5.719   5.844    6.063  6.265  6.385  6.465  6.525
6.635   6.765
## 703   5.656   5.719   5.844    6.063  6.295  6.405  6.485  6.555
6.675   6.795
## 704   5.656   5.719   5.863    6.090  6.315  6.425  6.505  6.575
6.685   6.815
## 705   5.656   5.719   5.871    6.094  6.245  6.355  6.435  6.495
6.605   6.745
## 706   5.656   5.719   5.844    6.043  6.225  6.325  6.405  6.465
6.585   6.705
## 707   5.656   5.719   5.844    6.039  6.145  6.235  6.305  6.365
6.465   6.595
## 708   5.656   5.719   5.813    5.980  6.115  6.195  6.265  6.315
6.405   6.525
## 709   5.656   5.719   5.813    5.969  6.105  6.195  6.255  6.305
6.395   6.515
## 710   5.656   5.719   5.813    5.969  6.135  6.235  6.295  6.345
6.445   6.555
## 711   5.656   5.719   5.813    5.969  6.105  6.195  6.255  6.305
6.395   6.505
## 712   5.656   5.719   5.813    5.969  6.115  6.205  6.275  6.325
6.415   6.515
## 713   5.656   5.719   5.813    5.969  6.105  6.195  6.255  6.315
6.385   6.495
## 714   5.656   5.719   5.813    5.969  6.145  6.235  6.305  6.355
6.435   6.535
## 715   5.656   5.719   5.844    6.000  6.145  6.235  6.295  6.355
6.435   6.545
## 716   5.656   5.777   5.844    6.000  6.155  6.245  6.305  6.365
6.455   6.555
## 717   5.656   5.770   5.844    6.000  6.165  6.245  6.305  6.365
6.465   6.565
## 718   5.656   5.773   5.844    6.000  6.105  6.185  6.245  6.295
6.385   6.485
## 719   5.652   5.758   5.816    5.969  6.095  6.175  6.235  6.285
6.385   6.485
## 720   5.648   5.750   5.813    5.969  5.995  6.075  6.135  6.185
6.265   6.365
## 721   5.625   5.719   5.781    5.906  6.005  6.085  6.145  6.205
6.305   6.415
## 722   5.625   5.719   5.781    5.906  5.985  6.065  6.135  6.195
```

```
6.295   6.405
## 723   5.625   5.719   5.781    5.906  6.085  6.165  6.235  6.305
6.415   6.525
## 724   5.625   5.750   5.813    5.973  6.105  6.195  6.265  6.335
6.435   6.555
## 725   5.625   5.750   5.824    5.984  6.155  6.235  6.305  6.355
6.475   6.585
## 726   5.625   5.758   5.848    6.031  6.175  6.255  6.325  6.375
6.495   6.605
## 727   5.625   5.754   5.848    6.031  6.145  6.235  6.285  6.335
6.435   6.555
## 728   5.625   5.754   5.844    6.031  6.175  6.255  6.325  6.385
6.475   6.595
## 729   5.625   5.773   5.875    6.063  6.155  6.235  6.295  6.345
6.435   6.545
## 730   5.625   5.781   5.875    6.063  6.215  6.295  6.355  6.405
6.505   6.605
## 731   5.648   5.809   5.906    6.094  6.255  6.345  6.405  6.455
6.535   6.635
## 732   5.652   5.813   5.906    6.094  6.255  6.335  6.395  6.445
6.535   6.625
## 733   5.656   5.813   5.906    6.094  6.255  6.335  6.395  6.445
6.535   6.625
## 734   5.656   5.813   5.875    6.063  6.165  6.245  6.305  6.345
6.435   6.535
## 735   5.656   5.813   5.879    6.063  6.135  6.225  6.275  6.325
6.405   6.495
## 736   5.656   5.781   5.844    5.992  6.095  6.185  6.235  6.285
6.355   6.475
## 737   5.625   5.750   5.781    5.867  6.065  6.135  6.205  6.255
6.345   6.455
## 738   5.656   5.781   5.840    5.969  6.045  6.135  6.185  6.235
6.325   6.435
## 739   5.641   5.750   5.781    5.906  6.035  6.105  6.165  6.205
6.285   6.405
## 740   5.648   5.750   5.785    5.918  6.015  6.095  6.145  6.195
6.265   6.385
## 741   5.656   5.750   5.813    5.938  6.055  6.135  6.195  6.245
6.325   6.425
## 742   5.656   5.750   5.813    5.938  6.075  6.165  6.225  6.265
6.345   6.455
## 743   5.656   5.773   5.844    5.969  6.075  6.165  6.225  6.265
6.345   6.445
## 744   5.656   5.777   5.828    5.969  6.085  6.155  6.215  6.255
6.345   6.435
## 745   5.656   5.762   5.813    5.938  6.085  6.165  6.215  6.255
6.335   6.425
## 746   5.656   5.781   5.844    6.000  6.105  6.185  6.225  6.275
6.345   6.425
## 747   5.688   5.813   5.875    6.031  6.135  6.205  6.255  6.285
```

```
6.335   6.425
## 748   5.695   5.875   5.938    6.063  6.145  6.215  6.255  6.295
6.365   6.435
## 749   5.688   5.875   5.910    6.031  6.075  6.145  6.185  6.225
6.295   6.365
## 750   5.688   5.875   5.906    6.000  6.055  6.115  6.165  6.195
6.255   6.335
## 751   5.688   5.875   5.906    6.031  6.105  6.165  6.205  6.235
6.305   6.375
## 752   5.688   5.875   5.906    6.000  6.085  6.145  6.185  6.215
6.275   6.345
## 753   5.688   5.875   5.906    6.000  6.085  6.135  6.175  6.205
6.255   6.315
## 754   5.688   5.875   5.906    6.000  6.085  6.135  6.175  6.195
6.245   6.305
## 755   5.688   5.875   5.887    5.980  6.105  6.155  6.205  6.225
6.275   6.335

##     DEPO.1M DEPO.3M DEPO.6M DEPO.12M IRS.2Y IRS.3Y IRS.4Y IRS.5Y
IRS.7Y IRS.10Y
## 756   5.688   5.875   5.887    5.980  6.075  6.135  6.165  6.205
6.245   6.315
## 757   5.688   5.875   5.906    6.000  6.075  6.135  6.165  6.195
6.255   6.315
## 758   5.688   5.875   5.906    6.000  6.075  6.135  6.175  6.205
6.265   6.325
## 759   5.969   5.879   5.906    6.000  6.095  6.155  6.185  6.215
6.265   6.325
## 760   5.969   5.902   5.914    6.012  6.115  6.165  6.195  6.215
6.265   6.315
## 761   5.969   5.906   5.938    6.031  6.115  6.165  6.195  6.225
6.265   6.315
## 762   5.992   5.918   5.938    6.047  6.125  6.175  6.205  6.225
6.265   6.315
## 763   6.000   5.938   5.938    6.047  6.085  6.135  6.165  6.195
6.245   6.295
## 764   6.000   5.938   5.938    6.027  6.055  6.105  6.125  6.155
6.205   6.265
## 765   5.969   5.906   5.906    6.000  6.125  6.165  6.205  6.245
6.305   6.375
## 766   6.000   5.938   5.969    6.094  6.165  6.215  6.255  6.275
6.325   6.385
## 767   6.000   5.938   6.000    6.125  6.165  6.215  6.255  6.285
6.335   6.395
## 768   6.000   5.938   5.969    6.094  6.125  6.175  6.205  6.235
6.295   6.355
## 769   5.980   5.938   5.938    6.063  6.055  6.095  6.125  6.155
6.205   6.265
## 770   5.965   5.906   5.906    6.012  6.025  6.065  6.095  6.125
6.175   6.235
```

```
## 771   5.961   5.906   5.906    5.973  6.015  6.055  6.085  6.105
6.155   6.215
## 772   5.961   5.906   5.906    6.000  6.055  6.095  6.115  6.145
6.195   6.255
## 773   5.965   5.906   5.914    6.031  6.055  6.095  6.125  6.155
6.195   6.255
## 774   5.969   5.906   5.906    6.031  6.045  6.075  6.105  6.135
6.185   6.235
## 775   5.969   5.906   5.906    6.000  5.995  6.025  6.045  6.075
6.115   6.165
## 776   5.941   5.906   5.906    5.969  6.025  6.065  6.085  6.105
6.145   6.195
## 777   5.969   5.906   5.906    5.969  6.025  6.055  6.095  6.115
6.145   6.195
## 778   6.000   5.906   5.906    5.969  6.025  6.065  6.095  6.105
6.145   6.205
## 779   6.000   5.906   5.906    5.969  6.025  6.065  6.095  6.105
6.145   6.205
## 780   6.000   5.906   5.906    5.969  6.025  6.065  6.095  6.105
6.145   6.205
## 781   5.938   5.906   5.906    5.969  6.035  6.075  6.115  6.145
6.175   6.235
## 782   5.723   5.813   5.844    5.969  6.035  6.075  6.125  6.155
6.185   6.255
## 783   5.719   5.813   5.844    5.969  6.045  6.085  6.125  6.155
6.195   6.265

## Warning: package 'pls' was built under R version 4.0.3

##
## Attaching package: 'pls'

## The following object is masked from 'package:corrplot':
##
##     corrplot

## The following object is masked from 'package:stats':
##
##     loadings
```

modelo acp

```
## Data:    X dimension: 755 9
##  Y dimension: 755 1
## Fit method: svdpc
## Number of components considered: 9
## TRAINING: % variance explained
##          1 comps  2 comps  3 comps  4 comps  5 comps  6 comps  7 comps
8 comps
## X          92.22    99.26    99.82    99.93    99.97    99.99   100.00
100.00
```

```
## IRS.10Y    93.53    96.63    99.26    99.82    99.82    99.82    99.86
99.86
##          9 comps
## X         100.00
## IRS.10Y    99.86
```

Calculo del error

```
## , , 2 comps
##
##     IRS.10Y
## 756  6.5839
## 757  6.5849
## 758  6.5904
## 759  6.5686
## 760  6.5741
## 761  6.5765
## 762  6.5792
## 763  6.5470
## 764  6.5136
## 765  6.5894
## 766  6.6219
## 767  6.6272
## 768  6.5868
## 769  6.5167
## 770  6.4916
## 771  6.4768
## 772  6.5121
## 773  6.5174
## 774  6.5029
## 775  6.4493
## 776  6.4802
## 777  6.4789
## 778  6.4753
## 779  6.4753
## 780  6.4753
## 781  6.5022
## 782  6.5408
## 783  6.5464
```

```
##       prediccion
##  [1,]     6.5839 6.315
##  [2,]     6.5849 6.315
##  [3,]     6.5904 6.325
##  [4,]     6.5686 6.325
##  [5,]     6.5741 6.315
##  [6,]     6.5765 6.315
##  [7,]     6.5792 6.315
##  [8,]     6.5470 6.295
##  [9,]     6.5136 6.265
## [10,]     6.5894 6.375
```

```
## [11,]     6.6219 6.385
## [12,]     6.6272 6.395
## [13,]     6.5868 6.355
## [14,]     6.5167 6.265
## [15,]     6.4916 6.235
## [16,]     6.4768 6.215
## [17,]     6.5121 6.255
## [18,]     6.5174 6.255
## [19,]     6.5029 6.235
## [20,]     6.4493 6.165
## [21,]     6.4802 6.195
## [22,]     6.4789 6.195
## [23,]     6.4753 6.205
## [24,]     6.4753 6.205
## [25,]     6.4753 6.205
## [26,]     6.5022 6.235
## [27,]     6.5408 6.255
## [28,]     6.5464 6.265

## [1] 0.068356
```

El error es de: 0.052682

#El objetivo de esta técnica estadística es reducir el numero de variables con las que vamos a trabajar. quizas esto no sea un problema con el actual dataset pero de cara a mas varibles sintetizarlas y reducir la información con la que trabajamos al máximo perdiendo el mínimo de información nos dara una eficiencia computacional relevante de cara a la optimizacion del analisis.

#Hemos reducido a dos los componentes con éxito.

#Referencias

Apuntes de la asignatura. Rotacion Varimax, estamatematica, 2020. a partir de: https://estamatica.net/analisis-factorial-malaga/