

Author Metrics

AMIT

April 17, 2020

Degree

```
df= read.csv("C:/Users/amitd/Desktop/FA/MasterDegree.csv")
df_lth = subset(df,df$LowToHigh=="LTH")
df_hlt = subset(df,df$HighToLow=="HTL")
df_clp = subset(df,df$ConsistentlyLowPerf=="CLP")
df_chp = subset(df,df$ConsistentlyHighPerf=="CHP")

##ConsistentHighPerformers
df_chp[,4:24]

##      X1997 X1998 X1999 X2000 X2001 X2002 X2003 X2004 X2005 X2006 X2007 X2008
## 2      24    48    54    23    80    22    27    14    34    57    66    28
## 7      13    14    35    29    24    21    41    39    40    76    35    30
## 13     2     15     7    16    11     4    38    NA    15    21    20     9
## 15     13    12     7    10    31     2    12    12     7    12     6    17
##      X2009 X2010 X2011 X2012 X2013 X2014 X2015 X2016 X2017
## 2      53    54    46    61    63    48    26    76    27
## 7      29    83    59    23    57    88    68    37    15
## 13     15    24     4    14    17    27    31    33     8
## 15     10    10    15     4     3    18     8    23     4

M <- as.matrix(df_chp[,4:24])
M

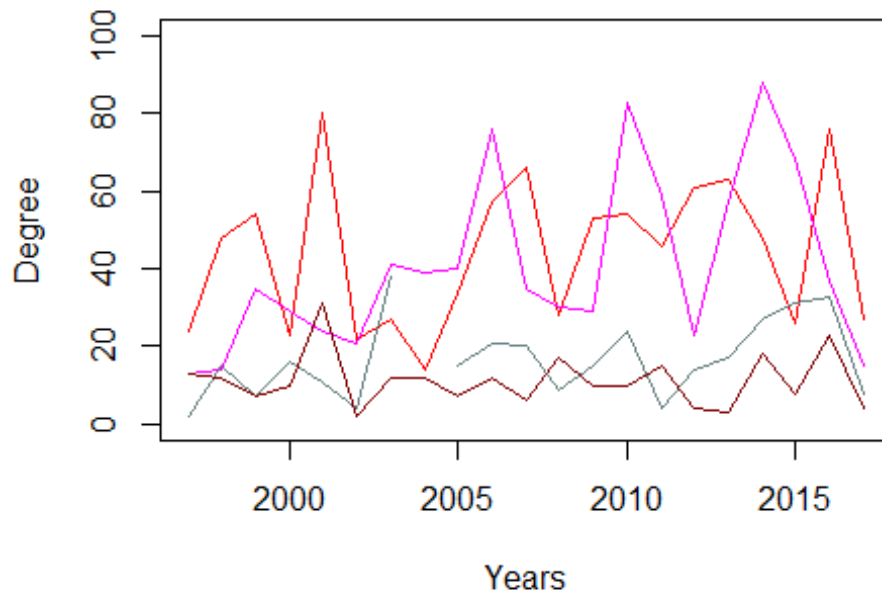
##      X1997 X1998 X1999 X2000 X2001 X2002 X2003 X2004 X2005 X2006 X2007 X2008
## 2      24    48    54    23    80    22    27    14    34    57    66    28
## 7      13    14    35    29    24    21    41    39    40    76    35    30
## 13     2     15     7    16    11     4    38    NA    15    21    20     9
## 15     13    12     7    10    31     2    12    12     7    12     6    17
##      X2009 X2010 X2011 X2012 X2013 X2014 X2015 X2016 X2017
## 2      53    54    46    61    63    48    26    76    27
## 7      29    83    59    23    57    88    68    37    15
## 13     15    24     4    14    17    27    31    33     8
## 15     10    10    15     4     3    18     8    23     4

x <-
c(1997,1998,1999,2000,2001,2002,2003,2004,2005,2006,2007,2008,2009,2010,2011,
2012,2013,2014,2015,2016,2017)
length(x)

## [1] 21
```

```
dim(M)
```

```
## [1] 4 21
```



```
###ConsistentLowPerformers
```

```
dfclp[,4:24]
```

##	X1997	X1998	X1999	X2000	X2001	X2002	X2003	X2004	X2005	X2006	X2007
## 90	NA	3	9	NA	3	4	NA	4	NA	3	NA
## 93	NA	4	NA	NA	8	NA	NA	NA	5	4	4
## 94	9	NA	NA	4	NA	2	NA	NA	4	23	5
## 95	NA	NA	7	5	6	NA	NA	NA	4	5	NA
## 96	NA	NA	2	NA	2	NA	2	NA	NA	2	NA
## 97	NA	NA	6	NA	NA	14	8	NA	NA	NA	NA
## 98	NA	NA	3	3	6	NA	5	NA	NA	NA	12
## 99	7	NA	NA	7	5	3	NA	NA	5	NA	NA
## 100	5	NA	NA	NA	NA	3	10	NA	NA	7	12
##	X2008	X2009	X2010	X2011	X2012	X2013	X2014	X2015	X2016	X2017	
## 90	8	NA	5	NA	5	3	NA	NA	NA	6	
## 93	NA	NA	NA	5	7	3	15	NA	NA	4	
## 94	NA	NA	12	NA	8	NA	NA	NA	NA	19	
## 95	NA	NA	NA	5	11	6	NA	13	NA	NA	
## 96	NA	NA	7	NA	18	NA	NA	NA	18	NA	
## 97	6	NA	9	13	5	9	NA	12	NA	NA	
## 98	NA	6	NA	3	NA	NA	11	NA	6	NA	
## 99	3	NA	NA	5	NA	NA	5	NA	3	NA	
## 100	NA	5	NA	NA	8	NA	NA	NA	8	NA	

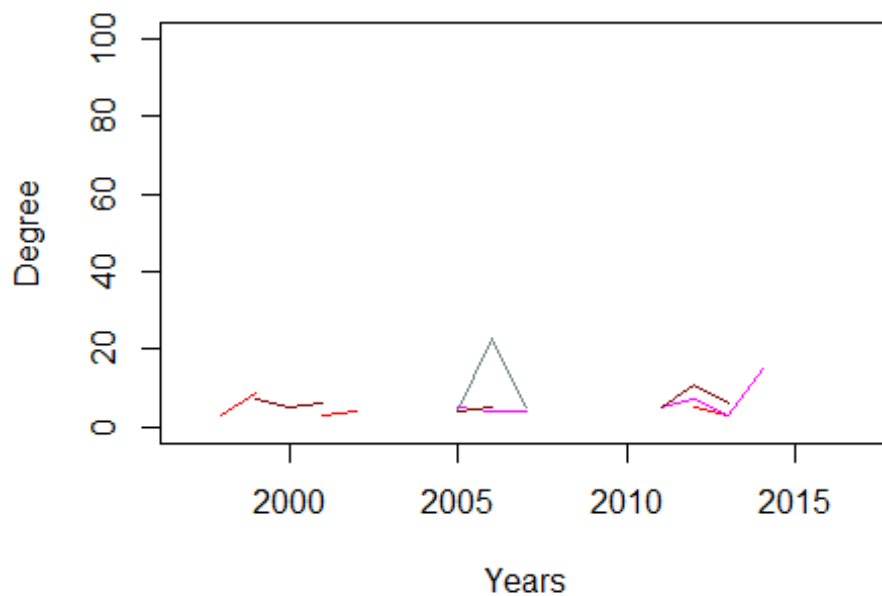
```
M <- as.matrix(dfclp[,4:24])
```

```
M
```

```
##      X1997 X1998 X1999 X2000 X2001 X2002 X2003 X2004 X2005 X2006 X2007
## 90      NA     3     9     NA     3     4     NA     4     NA     3     NA
## 93      NA     4     NA     NA     8     NA     NA     NA     5     4     4
## 94       9     NA     NA     4     NA     2     NA     NA     4    23     5
## 95      NA     NA     7     5     6     NA     NA     NA     4     5     NA
## 96      NA     NA     2     NA     2     NA     2     NA     NA     2     NA
## 97      NA     NA     6     NA     NA    14     8     NA     NA     NA     NA
## 98      NA     NA     3     3     6     NA     5     NA     NA     NA    12
## 99       7     NA     NA     7     5     3     NA     NA     5     NA     NA
## 100      5     NA     NA     NA     NA     3    10     NA     NA     7    12
##      X2008 X2009 X2010 X2011 X2012 X2013 X2014 X2015 X2016 X2017
## 90       8     NA     5     NA     5     3     NA     NA     NA     6
## 93      NA     NA     NA     5     7     3    15     NA     NA     4
## 94      NA     NA    12     NA     8     NA     NA     NA     NA    19
## 95      NA     NA     NA     5    11     6     NA    13     NA     NA
## 96      NA     NA     7     NA    18     NA     NA     NA    18     NA
## 97       6     NA     9    13     5     9     NA    12     NA     NA
## 98      NA     6     NA     3     NA     NA    11     NA     6     NA
## 99       3     NA     NA     5     NA     NA     5     NA     3     NA
## 100      NA     5     NA     NA     8     NA     NA     NA     8     NA
```

```
dim(M)
```

```
## [1]  9 21
```



```
###HighToLowPerformers
dfhtl[,4:24]
```

##	X1997	X1998	X1999	X2000	X2001	X2002	X2003	X2004	X2005	X2006	X2007	X2008
## 2	24	48	54	23	80	22	27	14	34	57	66	28
## 27	15	17	12	19	8	28	15	6	15	23	25	12
## 28	41	37	38	20	24	39	30	28	6	4	30	3
## 39	8	4	39	14	13	20	NA	2	8	34	40	4
## 46	15	16	13	NA	53	18	16	18	30	1	9	NA
## 54	12	5	6	NA	9	6	26	15	10	14	NA	6
## 55	9	5	4	10	4	4	5	6	3	2	11	2
## 66	NA	5	NA	219	273	NA	16	7	6	NA	3	NA
## 69	NA	3	NA	NA	12	3	8	16	12	13	NA	9
## 75	9	5	6	NA	12	5	NA	4	NA	NA	5	8
## 83	NA	4	19	6	6	NA	NA	NA	9	3	NA	NA
## 90	NA	3	9	NA	3	4	NA	4	NA	3	NA	8
## 98	NA	NA	3	3	6	NA	5	NA	NA	NA	12	NA
##	X2009	X2010	X2011	X2012	X2013	X2014	X2015	X2016	X2017			
## 2	53	54	46	61	63	48	26	76	27			
## 27	46	3	18	8	11	62	11	9	15			
## 28	1	28	3	6	NA	4	NA	5	NA			
## 39	5	4	NA	12	NA	10	NA	19	11			
## 46	8	9	NA	NA	23	17	17	NA	2			
## 54	17	NA	11	NA	10	14	12	8	NA			
## 55	7	NA	3	9	NA	NA	NA	NA	5			
## 66	NA	13	NA	6	5	NA	NA	NA	4			
## 69	3	NA	NA	NA	NA	9	NA	6	37			
## 75	NA	11	NA	1	6	NA	7	NA	NA			
## 83	NA	10	NA	4	6	6	NA	NA	20			
## 90	NA	5	NA	5	3	NA	NA	NA	6			
## 98	6	NA	3	NA	NA	11	NA	6	NA			

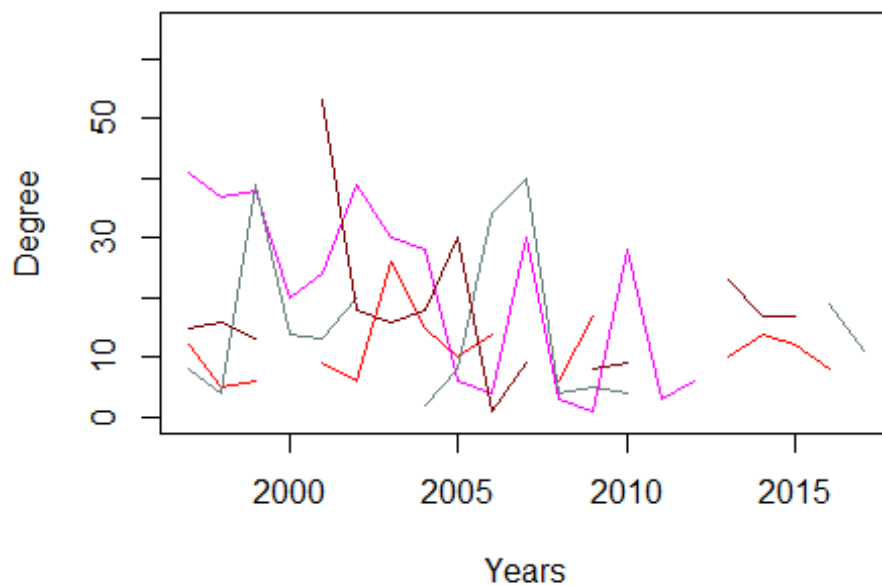
```
M <- as.matrix(dfhtl[,4:24])
M
```

##	X1997	X1998	X1999	X2000	X2001	X2002	X2003	X2004	X2005	X2006	X2007	X2008
## 2	24	48	54	23	80	22	27	14	34	57	66	28
## 27	15	17	12	19	8	28	15	6	15	23	25	12
## 28	41	37	38	20	24	39	30	28	6	4	30	3
## 39	8	4	39	14	13	20	NA	2	8	34	40	4
## 46	15	16	13	NA	53	18	16	18	30	1	9	NA
## 54	12	5	6	NA	9	6	26	15	10	14	NA	6
## 55	9	5	4	10	4	4	5	6	3	2	11	2
## 66	NA	5	NA	219	273	NA	16	7	6	NA	3	NA
## 69	NA	3	NA	NA	12	3	8	16	12	13	NA	9
## 75	9	5	6	NA	12	5	NA	4	NA	NA	5	8
## 83	NA	4	19	6	6	NA	NA	NA	9	3	NA	NA
## 90	NA	3	9	NA	3	4	NA	4	NA	3	NA	8
## 98	NA	NA	3	3	6	NA	5	NA	NA	NA	12	NA
##	X2009	X2010	X2011	X2012	X2013	X2014	X2015	X2016	X2017			

```
## 2      53      54      46      61      63      48      26      76      27
## 27     46       3      18       8      11      62      11       9      15
## 28      1     28       3       6     NA       4     NA       5     NA
## 39      5       4     NA      12     NA      10     NA      19      11
## 46      8       9     NA     NA      23      17      17     NA       2
## 54     17     NA      11     NA      10      14      12       8     NA
## 55      7     NA       3       9     NA     NA     NA     NA       5
## 66     NA     13     NA       6       5     NA     NA     NA       4
## 69      3     NA     NA     NA     NA       9     NA       6      37
## 75     NA     11     NA       1       6     NA       7     NA     NA
## 83     NA     10     NA       4       6       6     NA     NA     20
## 90     NA      5     NA       5       3     NA     NA     NA       6
## 98      6     NA      3     NA     NA      11     NA       6     NA
```

```
dim(M)
```

```
## [1] 13 21
```



```
###LowToHighPerformers
```

```
dflth[,4:24]
```

```
##      X1997 X1998 X1999 X2000 X2001 X2002 X2003 X2004 X2005 X2006 X2007 X2008
## 1      NA     10     NA     12     NA      4     13     37     24     53     49     43
## 3       2      3      6     17     21      4     20      9     14     17     17     31
## 4      NA     NA      7      5     NA     NA     12     15     57     19      9     40
## 5       5     NA      3      5     27      9      5     32     27     36     41     21
## 8       2     NA      5      3     13     NA     14      4     11     25     20     29
```

## 9	7	NA	17	13	4	32	14	94	31	14	26	19
## 10	NA	6	2	7	2	3	25	11	25	12	39	22
## 11	12	NA	NA	194	5	21	NA	NA	291	259	15	25
## 12	8	NA	11	1	10	5	6	7	4	9	45	4
## 16	NA	3	10	NA	22	4	NA	12	NA	2	7	19
## 17	1	12	3	4	5	9	14	3	11	20	17	25
## 18	3	3	12	NA	NA	4	4	7	30	26	5	11
## 20	NA	NA	4	5	29	10	12	4	4	13	10	17
## 23	13	NA	5	NA	25	22	7	14	NA	7	38	51
## 24	6	NA	23	14	21	24	18	22	3	34	30	39
## 25	8	6	3	3	4	11	NA	8	12	14	24	15
## 34	NA	NA	8	2	NA	NA	NA	NA	4	8	5	2
## 37	1	1	NA	1	NA	2	13	15	6	12	NA	4
## 38	3	NA	NA	NA	34	9	NA	9	11	NA	13	23
## 44	8	12	15	NA	NA	5	NA	7	88	NA	NA	41
## 45	NA	NA	8	17	11	11	NA	NA	66	4	11	15
## 48	NA	NA	3	3	NA	NA	NA	NA	6	8	NA	6
## 49	2	3	NA	12	14	NA	2	11	6	NA	12	10
## 56	8	NA	NA	NA	NA	9	NA	9	25	81	NA	NA
## 57	NA	NA	4	2	2	NA	NA	5	12	3	NA	NA
## 58	NA	3	NA	NA	6	1	NA	4	NA	19	NA	NA
## 62	NA	NA	4	3	NA	NA	5	6	NA	9	5	23
## 73	NA	3	NA	3	4	3	8	3	5	NA	3	NA
## 74	NA	8	NA	NA	4	NA	4	2	7	9	4	NA
## 82	NA	6	NA	NA	3	NA	4	NA	3	1	NA	NA
##	X2009	X2010	X2011	X2012	X2013	X2014	X2015	X2016	X2017			
## 1	54	80	84	102	66	90	47	56	55			
## 3	191	63	76	44	29	40	31	28	23			
## 4	35	109	78	49	40	84	106	77	75			
## 5	58	44	190	101	94	150	191	128	46			
## 8	14	33	45	63	76	82	129	51	51			
## 9	27	23	15	43	93	42	47	41	56			
## 10	26	20	31	54	73	162	132	61	42			
## 11	24	24	30	95	111	33	49	13	33			
## 12	19	26	29	10	43	23	18	15	20			
## 16	37	29	54	110	63	134	51	49	14			
## 17	24	43	29	80	46	97	51	23	NA			
## 18	15	30	17	64	55	19	65	55	40			
## 20	19	23	20	27	17	17	29	7	14			
## 23	51	18	45	29	25	68	52	35	44			
## 24	59	100	19	46	16	37	32	31	NA			
## 25	18	14	13	16	32	32	11	27	22			
## 34	4	12	12	28	49	15	19	30	10			
## 37	1	5	13	17	8	3	15	6	7			
## 38	8	32	9	18	24	14	50	26	6			
## 44	156	10	122	96	NA	16	12	7	NA			
## 45	3	11	NA	4	10	17	41	4	2			
## 48	9	39	NA	14	17	NA	NA	17	23			
## 49	16	15	24	25	35	34	16	NA	NA			
## 56	NA	1	NA	4	2	16	31	26	5			

```
## 57      NA      4      2      4      7      9      13      NA      6
## 58      NA     17     10     23     9     19      7      7      NA
## 62      NA      5      7     18     5     18      8     11     NA
## 73       3     NA      5      3     NA      1     NA     15      6
## 74       5     NA     20      7     NA      7     17     NA     NA
## 82       7      1     NA      1      6     NA     NA     11     NA
```

```
M <- as.matrix(df1th[,4:24])
```

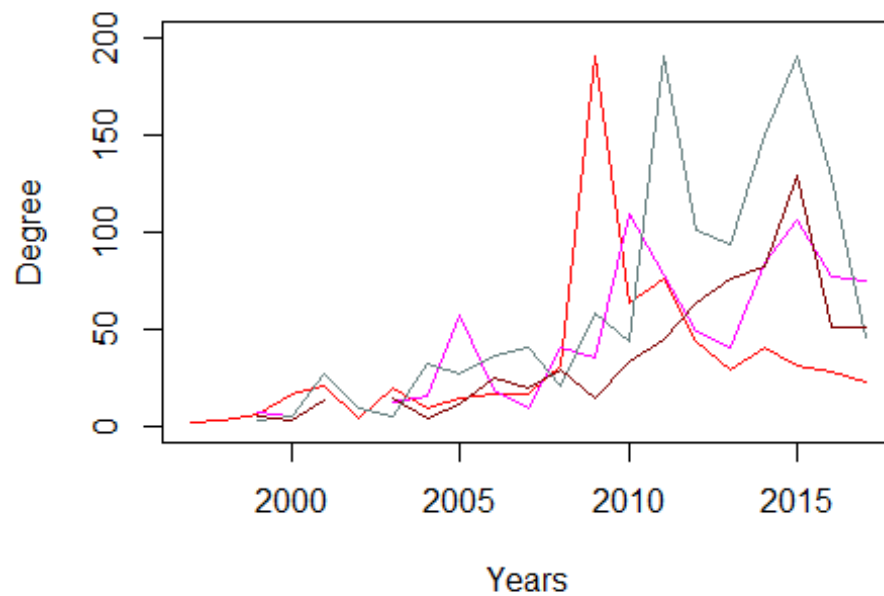
```
M
```

```
##      X1997 X1998 X1999 X2000 X2001 X2002 X2003 X2004 X2005 X2006 X2007 X2008
## 1      NA     10     NA     12     NA      4     13     37     24     53     49     43
## 3       2      3      6     17     21      4     20      9     14     17     17     31
## 4      NA     NA      7      5     NA     NA     12     15     57     19      9     40
## 5       5     NA      3      5     27      9      5     32     27     36     41     21
## 8       2     NA      5      3     13     NA     14      4     11     25     20     29
## 9       7     NA     17     13      4     32     14     94     31     14     26     19
## 10      NA      6      2      7      2      3     25     11     25     12     39     22
## 11     12     NA     NA    194      5     21     NA     NA    291    259     15     25
## 12      8     NA     11      1     10      5      6      7      4      9     45      4
## 16     NA      3     10     NA     22      4     NA     12     NA      2      7     19
## 17      1     12      3      4      5      9     14      3     11     20     17     25
## 18      3      3     12     NA     NA      4      4      7     30     26      5     11
## 20     NA     NA      4      5     29     10     12      4      4     13     10     17
## 23     13     NA      5     NA     25     22      7     14     NA      7     38     51
## 24      6     NA     23     14     21     24     18     22      3     34     30     39
## 25      8      6      3      3      4     11     NA      8     12     14     24     15
## 34     NA     NA      8      2     NA     NA     NA     NA      4      8      5      2
## 37      1      1     NA      1     NA      2     13     15      6     12     NA      4
## 38      3     NA     NA     NA     34      9     NA      9     11     NA     13     23
## 44      8     12     15     NA     NA      5     NA      7     88     NA     NA     41
## 45     NA     NA      8     17     11     11     NA     NA     66      4     11     15
## 48     NA     NA      3      3     NA     NA     NA     NA      6      8     NA      6
## 49      2      3     NA     12     14     NA      2     11      6     NA     12     10
## 56      8     NA     NA     NA     NA      9     NA      9     25     81     NA     NA
## 57     NA     NA      4      2      2     NA     NA      5     12      3     NA     NA
## 58     NA      3     NA     NA      6      1     NA      4     NA     19     NA     NA
## 62     NA     NA      4      3     NA     NA      5      6     NA      9      5     23
## 73     NA      3     NA      3      4      3      8      3      5     NA      3     NA
## 74     NA      8     NA     NA      4     NA      4      2      7      9      4     NA
## 82     NA      6     NA     NA      3     NA      4      NA      3      1     NA     NA
##      X2009 X2010 X2011 X2012 X2013 X2014 X2015 X2016 X2017
## 1      54     80     84    102     66     90     47     56     55
## 3     191     63     76     44     29     40     31     28     23
## 4      35    109     78     49     40     84    106     77     75
## 5      58     44    190    101     94    150    191    128     46
## 8      14     33     45     63     76     82    129     51     51
## 9      27     23     15     43     93     42     47     41     56
## 10     26     20     31     54     73    162    132     61     42
## 11     24     24     30     95    111     33     49     13     33
```

```
## 12    19    26    29    10    43    23    18    15    20
## 16    37    29    54   110    63   134    51    49    14
## 17    24    43    29    80    46    97    51    23    NA
## 18    15    30    17    64    55    19    65    55    40
## 20    19    23    20    27    17    17    29     7    14
## 23    51    18    45    29    25    68    52    35    44
## 24    59   100    19    46    16    37    32    31    NA
## 25    18    14    13    16    32    32    11    27    22
## 34     4    12    12    28    49    15    19    30    10
## 37     1     5    13    17     8     3    15     6     7
## 38     8    32     9    18    24    14    50    26     6
## 44   156    10   122    96    NA    16    12     7    NA
## 45     3    11    NA     4    10    17    41     4     2
## 48     9    39    NA    14    17    NA    NA    17    23
## 49    16    15    24    25    35    34    16    NA    NA
## 56    NA     1    NA     4     2    16    31    26     5
## 57    NA     4     2     4     7     9    13    NA     6
## 58    NA    17    10    23     9    19     7     7    NA
## 62    NA     5     7    18     5    18     8    11    NA
## 73     3    NA     5     3    NA     1    NA    15     6
## 74     5    NA    20     7    NA     7    17    NA    NA
## 82     7     1    NA     1     6    NA    NA    11    NA
```

```
dim(M)
```

```
## [1] 30 21
```




```
##Betweenness
```

```
dfbt= read.csv("C:/Users/amitd/Desktop/FA/MasterBetweenness.csv")
dflthbt = subset(dfbt,dfbt$LowToHigh=="LTH")
dfhtlbt = subset(dfbt,dfbt$HighToLow=="HTL")
dfclpbt = subset(dfbt,dfbt$ConsistentlyLowPerf=="CLP")
dfchpbt = subset(dfbt,dfbt$ConsistentlyHighPerf=="CHP")
```

```
###ConsistentHighPerformers
dfchpbt[,4:24]
```

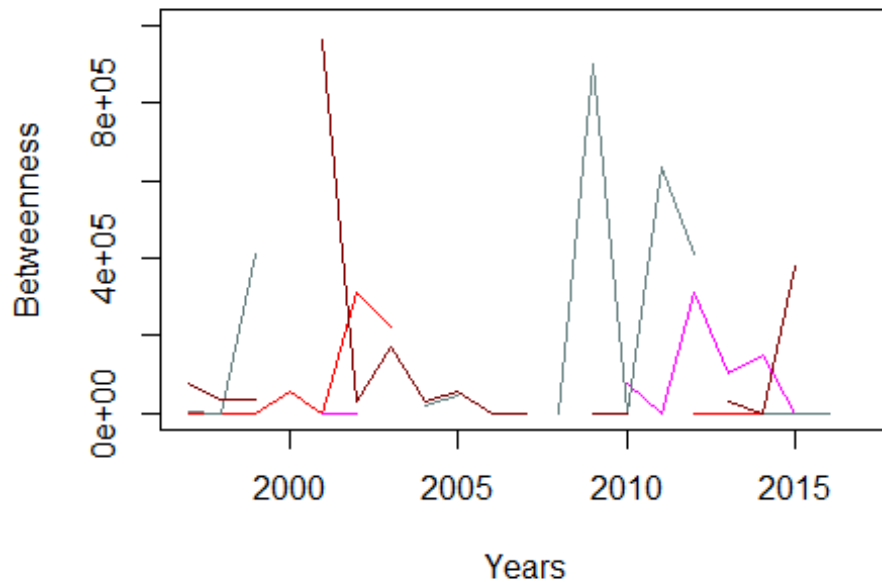
```
##      X1997      X1998      X1999 X2000      X2001      X2002      X2003      X2004
## 2      0.0      0.00      1.5 57396      0.0 309778.67 225964.6      NA
## 7      NA      0.00      NA      NA      0.0      0.00      NA      0.00
## 13 4891.6      0.00 411774.6      NA      NA      0.00      NA 20740.66
## 15 77220.0 35880.21 34074.0      NA 962746.3 32731.99 173942.9 28859.80
##      X2005      X2006      X2007      X2008      X2009      X2010      X2011      X2012
## 2      NA      0      0      NA      30.0      NA      NA      0.0
## 7      NA 123546      NA      NA      NA 76970.667      0.0 312702.2
## 13 47166.50      NA      NA      0 902454.6      0.000 635810.3 413529.1
## 15 58963.92      0      0      NA      0.0 1275.863      NA      NA
##      X2013      X2014      X2015      X2016      X2017
## 2      0.00      48      0.0      0      NA
## 7 102489.82 149718      0.0      0      NA
## 13      NA      0      0.0      0      NA
## 15 32972.97      0 380899.2      NA      0
```

```
M <- as.matrix(dfchpbt[,4:24])
M
```

```
##      X1997      X1998      X1999 X2000      X2001      X2002      X2003      X2004
## 2      0.0      0.00      1.5 57396      0.0 309778.67 225964.6      NA
## 7      NA      0.00      NA      NA      0.0      0.00      NA      0.00
## 13 4891.6      0.00 411774.6      NA      NA      0.00      NA 20740.66
## 15 77220.0 35880.21 34074.0      NA 962746.3 32731.99 173942.9 28859.80
##      X2005      X2006      X2007      X2008      X2009      X2010      X2011      X2012
## 2      NA      0      0      NA      30.0      NA      NA      0.0
## 7      NA 123546      NA      NA      NA 76970.667      0.0 312702.2
## 13 47166.50      NA      NA      0 902454.6      0.000 635810.3 413529.1
## 15 58963.92      0      0      NA      0.0 1275.863      NA      NA
##      X2013      X2014      X2015      X2016      X2017
## 2      0.00      48      0.0      0      NA
## 7 102489.82 149718      0.0      0      NA
## 13      NA      0      0.0      0      NA
## 15 32972.97      0 380899.2      NA      0
```

```
dim(M)
```

```
## [1] 4 21
```



```
###ConsistentLowPerformers
```

```
dfclpbt[,4:24]
```

##	X1997	X1998	X1999	X2000	X2001	X2002	X2003
## 90	143124.432	280324.55	344303.3	53040.66	282155.7	67428.35	85566.178
## 93	NA	NA	0.0	0.00	NA	NA	31696.043
## 94	0.000	NA	0.0	0.00	189229.2	0.00	1702.240
## 95	NA	58890.74	NA	103845.39	NA	0.00	165441.012
## 96	0.000	NA	0.0	0.00	169141.1	NA	132351.960
## 97	0.000	NA	0.0	0.00	37816.0	0.00	0.000
## 98	7259.222	1066205.99	265088.7	99854.78	140844.3	11004.28	26280.912
## 99	NA	0.00	136248.0	NA	189024.5	0.00	NA
## 100	NA	NA	0.0	0.00	218341.6	6146.53	8781.766
##	X2004	X2005	X2006	X2007	X2008	X2009	
## 90	7.860909e+04	193392.955	36646.58	53854.535	117877.91	40363.542	
## 93	8.321105e+05	361708.119	341765.02	169137.783	344786.58	270890.277	
## 94	5.083784e+05	357471.601	218782.47	1084737.922	140876.12	86014.621	
## 95	8.823074e+04	333327.657	452244.15	451261.004	450714.35	492801.369	
## 96	3.333333e-01	7374.407	40102.00	127924.544	47463.00	4560.086	
## 97	0.000000e+00	0.000	22.00	412175.850	13628.50	409060.000	
## 98	1.451539e+04	0.000	114552.94	NA	0.00	0.000	
## 99	1.483987e+04	NA	0.00	2735.046	19023.49	51021.679	
## 100	0.000000e+00	0.000	23129.16	3432.454	32880.57	16259.451	
##	X2010	X2011	X2012	X2013	X2014	X2015	
## 90	170769.51	188113.248	NA	0.00	5478.974	0.0000	
## 93	285928.82	186980.353	75214.80	235598.24	131534.739	310860.4596	
## 94	167307.59	3575594.326	364061.89	297407.41	478250.335	866515.6082	

```
## 95 986158.33 499941.433 821150.14 443803.15 807662.487 637823.1159
## 96 44836.71 156622.985 92186.50 214751.49 91109.406 823969.8747
## 97 237585.43 533916.766 34563.99 514027.71 102924.533 8778.3751
## 98 0.00 8606.558 372600.23 293000.69 87795.000 121.0749
## 99 36193.37 304716.874 59873.88 942285.93 652523.975 88624.2326
## 100 69098.99 61109.007 128983.40 64586.13 23089.071 73023.4165
## X2016 X2017
## 90 0.00 0.000
## 93 599267.59 53252.102
## 94 1045305.16 45361.599
## 95 534703.86 193657.689
## 96 493429.79 14420.146
## 97 11370.83 30935.348
## 98 0.00 171152.606
## 99 74758.90 1195.928
## 100 40604.56 52672.899
```

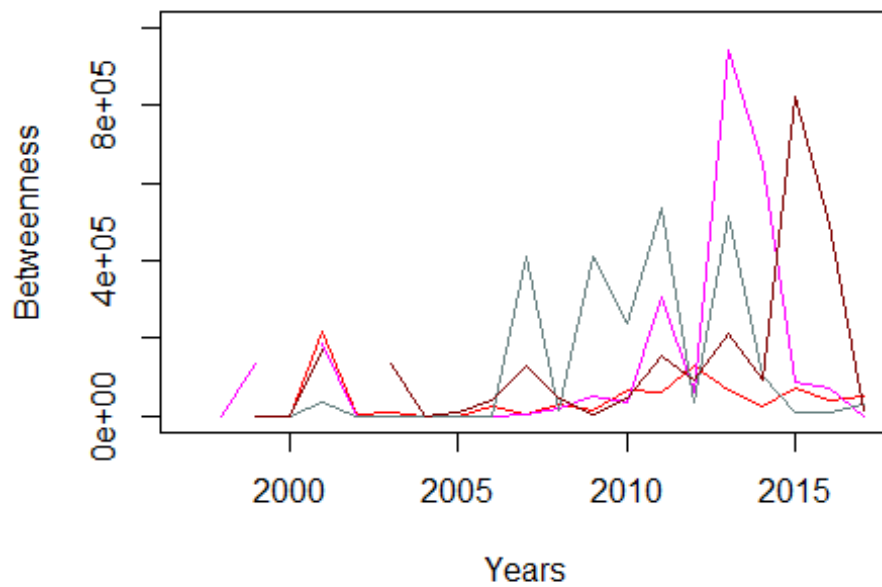
```
M <- as.matrix(dfclpbt[,4:24])
M
```

```
## X1997 X1998 X1999 X2000 X2001 X2002 X2003
## 90 143124.432 280324.55 344303.3 53040.66 282155.7 67428.35 85566.178
## 93 NA NA 0.0 0.00 NA NA 31696.043
## 94 0.000 NA 0.0 0.00 189229.2 0.00 1702.240
## 95 NA 58890.74 NA 103845.39 NA 0.00 165441.012
## 96 0.000 NA 0.0 0.00 169141.1 NA 132351.960
## 97 0.000 NA 0.0 0.00 37816.0 0.00 0.000
## 98 7259.222 1066205.99 265088.7 99854.78 140844.3 11004.28 26280.912
## 99 NA 0.00 136248.0 NA 189024.5 0.00 NA
## 100 NA NA 0.0 0.00 218341.6 6146.53 8781.766
## X2004 X2005 X2006 X2007 X2008 X2009
## 90 7.860909e+04 193392.955 36646.58 53854.535 117877.91 40363.542
## 93 8.321105e+05 361708.119 341765.02 169137.783 344786.58 270890.277
## 94 5.083784e+05 357471.601 218782.47 1084737.922 140876.12 86014.621
## 95 8.823074e+04 333327.657 452244.15 451261.004 450714.35 492801.369
## 96 3.333333e-01 7374.407 40102.00 127924.544 47463.00 4560.086
## 97 0.000000e+00 0.000 22.00 412175.850 13628.50 409060.000
## 98 1.451539e+04 0.000 114552.94 NA 0.00 0.000
## 99 1.483987e+04 NA 0.00 2735.046 19023.49 51021.679
## 100 0.000000e+00 0.000 23129.16 3432.454 32880.57 16259.451
## X2010 X2011 X2012 X2013 X2014 X2015
## 90 170769.51 188113.248 NA 0.00 5478.974 0.0000
## 93 285928.82 186980.353 75214.80 235598.24 131534.739 310860.4596
## 94 167307.59 3575594.326 364061.89 297407.41 478250.335 866515.6082
## 95 986158.33 499941.433 821150.14 443803.15 807662.487 637823.1159
## 96 44836.71 156622.985 92186.50 214751.49 91109.406 823969.8747
## 97 237585.43 533916.766 34563.99 514027.71 102924.533 8778.3751
## 98 0.00 8606.558 372600.23 293000.69 87795.000 121.0749
## 99 36193.37 304716.874 59873.88 942285.93 652523.975 88624.2326
## 100 69098.99 61109.007 128983.40 64586.13 23089.071 73023.4165
```

```
##          X2016      X2017
## 90          0.00      0.000
## 93 599267.59 53252.102
## 94 1045305.16 45361.599
## 95 534703.86 193657.689
## 96 493429.79 14420.146
## 97 11370.83 30935.348
## 98          0.00 171152.606
## 99 74758.90 1195.928
## 100 40604.56 52672.899
```

```
dim(M)
```

```
## [1] 9 21
```



```
###HighToLowPerformers
```

```
dfhtlbt[,4:24]
```

##	X1997	X1998	X1999	X2000	X2001	X2002
## 2	0.000	0.000000e+00	1.5	57396.00	0.00	309778.667
## 27	36.000	0.000000e+00	0.0	0.00	NA	NA
## 28	47572.000	0.000000e+00	0.0	NA	10524.66	6775.916
## 39	543518.649	NA	NA	NA	0.00	116226.000
## 46	NA	NA	14191.1	0.00	NA	NA
## 54	NA	0.000000e+00	NA	NA	0.00	NA
## 55	NA	3.425804e+00	NA	0.00	NA	NA
## 66	12.500	NA	NA	NA	NA	NA

```

## 69      NA 0.000000e+00      NA      0.00      NA      0.000
## 75      NA      NA      0.0      NA      NA      0.000
## 83      0.000 0.000000e+00      0.0      0.00      0.00      0.000
## 90 143124.432 2.803246e+05 344303.3 53040.66 282155.67 67428.350
## 98  7259.222 1.066206e+06 265088.7 99854.78 140844.28 11004.284
##      X2003      X2004      X2005      X2006      X2007      X2008      X2009
## 2  225964.64      NA      NA      0.00      0.00      NA 3.000000e+01
## 27      0.00      0.00      NA 86482.50      0.00 136270.25 1.500000e+01
## 28 173534.88 60376.26      0.000 25337.10      NA      0.00 1.283662e+05
## 39      NA      0.00 2269.241      NA      0.00 334164.59 2.193288e+03
## 46      NA      NA      0.000 49422.00 53006.00      0.00 0.000000e+00
## 54      0.00      NA      0.000      0.00      NA      NA 2.150000e+01
## 55      0.00      0.00      NA      0.00      NA      NA 3.333333e-01
## 66      0.00      8.00      0.000      0.00      0.00      0.00      NA
## 69 335072.00      0.00      0.000      0.00      0.50      0.00 0.000000e+00
## 75  20053.90 10912.01      0.000      NA 75931.91      0.00 0.000000e+00
## 83      NA      0.00      0.000      0.00 53920.04 75114.35 3.096087e+04
## 90 85566.18 78609.09 193392.955 36646.58 53854.53 117877.91 4.036354e+04
## 98 26280.91 14515.39      0.000 114552.94      NA      0.00 0.000000e+00
##      X2010      X2011      X2012      X2013      X2014      X2015
## 2      NA      NA      0.0000      0.00      48.0000      0.0000
## 27      NA 103468.454      NA 160575.00 72588.9487      0.0000
## 28      NA      0.000      NA 192684.00      0.0000      0.0000
## 39  9142.011 1294.967 211.6014 14398.43 132.9228 140948.5467
## 46 2712782.744 193518.000 67728.0235 36139.39 1293.6380 14806.3870
## 54      0.000      NA      0.0000 64236.33      NA      NA
## 55      0.000      0.000      0.0000      NA      NA      NA
## 66      0.000      NA 914.3210      0.00      0.0000      0.0000
## 69      NA      NA      0.0000      NA      NA      0.0000
## 75      NA      NA      0.0000      0.00      NA      0.0000
## 83  20680.371 39647.099 29579.6370 420211.19 98463.8068      12.0000
## 90 170769.513 188113.248      NA      0.00 5478.9744      0.0000
## 98      0.000 8606.558 372600.2304 293000.69 87795.0000      121.0749
##      X2016      X2017
## 2      0.000      NA
## 27      NA      NA
## 28      0.000      NA
## 39  5694.504      0.000
## 46 17704.979 6030.233
## 54  10.500      NA
## 55 699053.632      NA
## 66      0.000      NA
## 69      NA      NA
## 75      NA      NA
## 83 62349.274      0.000
## 90      0.000      0.000
## 98      0.000 171152.606

```

```
M <- as.matrix(dfhtlbt[,4:24])
```

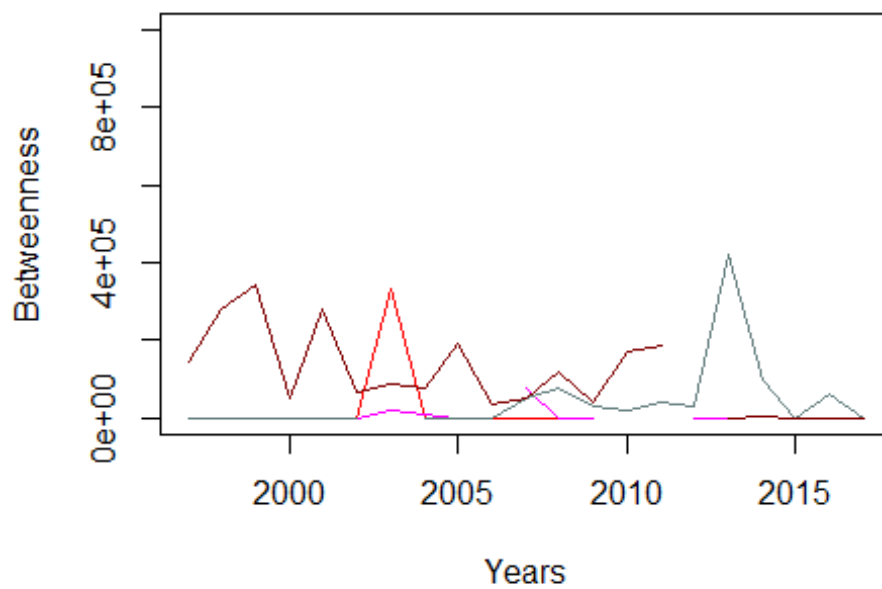
```
M
```

##	X1997	X1998	X1999	X2000	X2001	X2002	
## 2	0.000	0.000000e+00	1.5	57396.00	0.00	309778.667	
## 27	36.000	0.000000e+00	0.0	0.00	NA	NA	
## 28	47572.000	0.000000e+00	0.0	NA	10524.66	6775.916	
## 39	543518.649	NA	NA	NA	0.00	116226.000	
## 46	NA	NA	14191.1	0.00	NA	NA	
## 54	NA	0.000000e+00	NA	NA	0.00	NA	
## 55	NA	3.425804e+00	NA	0.00	NA	NA	
## 66	12.500	NA	NA	NA	NA	NA	
## 69	NA	0.000000e+00	NA	0.00	NA	0.000	
## 75	NA	NA	0.0	NA	NA	0.000	
## 83	0.000	0.000000e+00	0.0	0.00	0.00	0.000	
## 90	143124.432	2.803246e+05	344303.3	53040.66	282155.67	67428.350	
## 98	7259.222	1.066206e+06	265088.7	99854.78	140844.28	11004.284	
##	X2003	X2004	X2005	X2006	X2007	X2008	X2009
## 2	225964.64	NA	NA	0.00	0.00	NA	3.000000e+01
## 27	0.00	0.00	NA	86482.50	0.00	136270.25	1.500000e+01
## 28	173534.88	60376.26	0.000	25337.10	NA	0.00	1.283662e+05
## 39	NA	0.00	2269.241	NA	0.00	334164.59	2.193288e+03
## 46	NA	NA	0.000	49422.00	53006.00	0.00	0.000000e+00
## 54	0.00	NA	0.000	0.00	NA	NA	2.150000e+01
## 55	0.00	0.00	NA	0.00	NA	NA	3.333333e-01
## 66	0.00	8.00	0.000	0.00	0.00	0.00	NA
## 69	335072.00	0.00	0.000	0.00	0.50	0.00	0.000000e+00
## 75	20053.90	10912.01	0.000	NA	75931.91	0.00	0.000000e+00
## 83	NA	0.00	0.000	0.00	53920.04	75114.35	3.096087e+04
## 90	85566.18	78609.09	193392.955	36646.58	53854.53	117877.91	4.036354e+04
## 98	26280.91	14515.39	0.000	114552.94	NA	0.00	0.000000e+00
##	X2010	X2011	X2012	X2013	X2014	X2015	
## 2	NA	NA	0.0000	0.00	48.0000	0.0000	
## 27	NA	103468.454	NA	160575.00	72588.9487	0.0000	
## 28	NA	0.000	NA	192684.00	0.0000	0.0000	
## 39	9142.011	1294.967	211.6014	14398.43	132.9228	140948.5467	
## 46	2712782.744	193518.000	67728.0235	36139.39	1293.6380	14806.3870	
## 54	0.000	NA	0.0000	64236.33	NA	NA	
## 55	0.000	0.000	0.0000	NA	NA	NA	
## 66	0.000	NA	914.3210	0.00	0.0000	0.0000	
## 69	NA	NA	0.0000	NA	NA	0.0000	
## 75	NA	NA	0.0000	0.00	NA	0.0000	
## 83	20680.371	39647.099	29579.6370	420211.19	98463.8068	12.0000	
## 90	170769.513	188113.248	NA	0.00	5478.9744	0.0000	
## 98	0.000	8606.558	372600.2304	293000.69	87795.0000	121.0749	
##	X2016	X2017					
## 2	0.000	NA					
## 27	NA	NA					
## 28	0.000	NA					
## 39	5694.504	0.000					
## 46	17704.979	6030.233					
## 54	10.500	NA					
## 55	699053.632	NA					

```
## 66      0.000      NA
## 69      NA      NA
## 75      NA      NA
## 83 62349.274      0.000
## 90      0.000      0.000
## 98      0.000 171152.606
```

```
dim(M)
```

```
## [1] 13 21
```



```
###LowToHighPerformers
```

```
dflthbt[,4:24]
```

##	X1997	X1998	X1999	X2000	X2001	X2002
## 1	NA	0.000	0.0	NA	0.000000e+00	57274.615
## 3	NA	NA	1.0	0.0000	0.000000e+00	NA
## 4	NA	0.000	NA	655457.4155	0.000000e+00	NA
## 5	0.60	NA	0.0	NA	5.866667e+00	6110.859
## 8	0.00	0.000	299072.9	24860.9263	0.000000e+00	22832.847
## 9	NA	NA	6.0	0.0000	NA	0.000
## 10	NA	NA	0.0	0.0000	NA	NA
## 11	NA	NA	0.0	NA	0.000000e+00	NA
## 12	106996.00	0.000	4.0	NA	0.000000e+00	NA
## 16	NA	NA	153270.0	511634.4293	0.000000e+00	177672.003
## 17	76008.22	24.000	0.0	146646.6958	NA	0.000
## 18	NA	0.000	NA	NA	0.000000e+00	NA

## 20	NA	NA	0.0	0.0000	NA	NA
## 23	18647.42	0.000	0.0	324.6591	0.000000e+00	0.000
## 24	140100.67	24319.289	85170.0	180641.7688	1.922791e+05	0.000
## 25	0.00	3967.933	NA	0.0000	9.452500e+04	0.000
## 34	NA	1.000	0.0	0.0000	NA	NA
## 37	0.00	0.000	NA	9817.5590	9.657982e+03	NA
## 38	23790.00	0.000	NA	NA	0.000000e+00	61973.979
## 44	0.00	NA	NA	NA	NA	0.000
## 45	0.00	0.000	0.0	36592.8512	9.965544e+04	3246.076
## 48	NA	0.000	0.0	0.0000	NA	0.000
## 49	0.00	38242.060	145501.3	19134.0000	NA	NA
## 56	0.00	NA	0.0	0.0000	0.000000e+00	NA
## 57	NA	NA	0.0	NA	0.000000e+00	NA
## 58	NA	0.000	NA	NA	NA	0.000
## 62	NA	0.000	0.0	NA	0.000000e+00	0.000
## 73	0.00	NA	NA	NA	0.000000e+00	0.000
## 74	NA	0.000	0.0	NA	0.000000e+00	NA
## 82	NA	277512.072	136248.0	499080.5792	6.363633e+05	305064.204
##	X2003	X2004	X2005	X2006	X2007	X2008
## 1	180273.7296	54901.194	NA	NA	5.500	40882.500
## 3	NA	0.000	24960.000	0.00	NA	NA
## 4	0.0000	0.000	0.000	NA	0.000	NA
## 5	4983.3769	0.000	4987.000	0.00	0.000	0.000
## 8	NA	0.000	0.000	567752.13	143757.957	0.000
## 9	69836.6667	0.000	0.000	6.00	0.000	NA
## 10	0.0000	0.000	NA	18.00	0.000	20435.250
## 11	1892.9985	80230.915	291075.559	NA	0.000	NA
## 12	27932.0000	206543.441	109681.665	0.00	291675.793	0.000
## 16	NA	NA	0.000	0.00	29676.546	NA
## 17	0.0000	0.000	6.000	0.00	NA	0.000
## 18	0.0000	0.000	2865.849	0.00	3227.474	8396.606
## 20	NA	NA	0.000	0.00	NA	0.000
## 23	740.1487	0.000	0.000	0.00	35106.410	0.000
## 24	0.0000	81005.370	117600.507	53442.05	0.000	0.000
## 25	0.0000	69287.000	0.000	740634.00	238464.000	0.000
## 34	NA	NA	0.000	4.00	27.000	8.000
## 37	0.0000	7824.609	49918.000	NA	4635.695	10664.246
## 38	0.0000	122000.504	0.000	0.00	283915.041	NA
## 44	NA	92368.000	64059.501	401326.48	NA	NA
## 45	109656.8501	74460.970	67542.355	NA	0.000	19286.078
## 48	NA	NA	0.000	30417.96	6218.190	17984.237
## 49	NA	0.000	84027.619	0.00	0.000	0.000
## 56	0.0000	0.000	NA	NA	0.000	0.000
## 57	0.0000	NA	NA	1.00	NA	NA
## 58	0.0000	18038.667	160857.760	0.00	NA	0.000
## 62	NA	0.000	NA	0.00	NA	3.000
## 73	0.0000	23097.778	0.000	NA	0.000	0.000
## 74	0.0000	NA	NA	0.00	132500.000	0.000
## 82	0.0000	162155.172	NA	0.00	NA	817614.213
##	X2009	X2010	X2011	X2012	X2013	X2014

## 1	NA	NA	0.000	0.00	NA	NA
## 3	NA	0.0000	1.000	0.00	0.0000	15.500
## 4	NA	158825.4117	NA	32078.00	32117.0000	NA
## 5	276735.0673	330.5784	0.000	NA	0.0000	NA
## 8	0.0000	0.0000	NA	60955.42	NA	0.000
## 9	NA	6.2500	NA	0.00	0.0000	NA
## 10	NA	0.0000	0.000	448989.00	0.0000	42.000
## 11	NA	NA	141137.557	0.00	0.0000	NA
## 12	24770.6286	14248.3313	5640.029	0.00	0.0000	0.000
## 16	3226.9435	0.0000	4059.727	1739.40	1211931.8640	8914.054
## 17	NA	0.0000	23911.284	39199.88	183.9211	15932.291
## 18	NA	0.0000	NA	0.00	NA	32344.915
## 20	6843.4890	74199.9065	NA	1796.45	4156.2026	NA
## 23	0.0000	NA	0.000	0.00	NA	NA
## 24	64091.1895	118408.0507	2821.400	0.00	53798.0243	164375.473
## 25	137147.8788	NA	154344.566	32080.00	163242.8283	NA
## 34	18.5000	0.0000	0.000	NA	NA	0.000
## 37	26219.0233	0.0000	121469.654	135525.85	137851.2853	142542.431
## 38	NA	NA	33.700	0.00	89374.1103	0.000
## 44	NA	0.0000	NA	0.00	0.0000	235418.529
## 45	26463.5835	0.0000	0.000	0.00	19297.9248	161382.188
## 48	364.1333	1953.0412	0.000	0.00	NA	9415.133
## 49	0.0000	NA	NA	0.00	0.0000	13274.927
## 56	0.0000	NA	NA	0.00	NA	0.000
## 57	NA	0.0000	NA	768346.86	NA	NA
## 58	0.0000	NA	302976.248	0.00	NA	NA
## 62	NA	0.0000	NA	0.00	0.0000	NA
## 73	0.0000	NA	NA	0.00	NA	0.000
## 74	2633075.9640	NA	NA	NA	NA	0.000
## 82	233079.9315	0.0000	453351.016	652103.42	NA	0.000
##	X2015	X2016	X2017			
## 1	256806.00	NA	NA			
## 3	55.50	NA	0.000000e+00			
## 4	NA	NA	0.000000e+00			
## 5	NA	63790.000	NA			
## 8	NA	102072.000	0.000000e+00			
## 9	0.00	0.000	1.500000e+02			
## 10	6.00	10.500	NA			
## 11	0.00	NA	NA			
## 12	256783.97	0.000	0.000000e+00			
## 16	0.00	77142.406	0.000000e+00			
## 17	0.00	98998.104	NA			
## 18	1005.39	NA	NA			
## 20	NA	3745.961	5.440803e+03			
## 23	NA	NA	0.000000e+00			
## 24	82344.09	71604.775	1.132470e+05			
## 25	0.00	NA	1.709440e+05			
## 34	17.00	0.000	NA			
## 37	313852.00	NA	NA			
## 38	0.00	0.000	NA			

```
## 44 259074.45 266444.580 5.281419e+03
## 45 21076.29 182445.266 8.680547e+04
## 48 0.00 NA NA
## 49 NA NA 3.073578e+04
## 56 0.00 80427.543 1.428571e-01
## 57 NA 0.000 NA
## 58 NA 0.000 0.000000e+00
## 62 NA NA 9.000000e+00
## 73 NA NA 0.000000e+00
## 74 NA NA 0.000000e+00
## 82 360336.88 136.000 0.000000e+00
```

```
M <- as.matrix(df1thbt[,4:24])
M
```

```
##      X1997      X1998      X1999      X2000      X2001      X2002
## 1      NA      0.000      0.0      NA 0.000000e+00 57274.615
## 3      NA      NA      1.0      0.0000 0.000000e+00      NA
## 4      NA      0.000      NA 655457.4155 0.000000e+00      NA
## 5      0.60      NA      0.0      NA 5.866667e+00 6110.859
## 8      0.00      0.000 299072.9 24860.9263 0.000000e+00 22832.847
## 9      NA      NA      6.0      0.0000      NA      0.000
## 10     NA      NA      0.0      0.0000      NA      NA
## 11     NA      NA      0.0      NA 0.000000e+00      NA
## 12 106996.00      0.000      4.0      NA 0.000000e+00      NA
## 16     NA      NA 153270.0 511634.4293 0.000000e+00 177672.003
## 17 76008.22 24.000      0.0 146646.6958      NA      0.000
## 18     NA      0.000      NA      NA 0.000000e+00      NA
## 20     NA      NA      0.0      0.0000      NA      NA
## 23 18647.42      0.000      0.0 324.6591 0.000000e+00      0.000
## 24 140100.67 24319.289 85170.0 180641.7688 1.922791e+05      0.000
## 25      0.00 3967.933      NA      0.0000 9.452500e+04      0.000
## 34     NA      1.000      0.0      0.0000      NA      NA
## 37      0.00      0.000      NA 9817.5590 9.657982e+03      NA
## 38 23790.00      0.000      NA      NA 0.000000e+00 61973.979
## 44      0.00      NA      NA      NA      NA      0.000
## 45      0.00      0.000      0.0 36592.8512 9.965544e+04 3246.076
## 48     NA      0.000      0.0      0.0000      NA      0.000
## 49      0.00 38242.060 145501.3 19134.0000      NA      NA
## 56      0.00      NA      0.0      0.0000 0.000000e+00      NA
## 57     NA      NA      0.0      NA 0.000000e+00      NA
## 58     NA      0.000      NA      NA      NA      0.000
## 62     NA      0.000      0.0      NA 0.000000e+00      0.000
## 73      0.00      NA      NA      NA 0.000000e+00      0.000
## 74     NA      0.000      0.0      NA 0.000000e+00      NA
## 82     NA 277512.072 136248.0 499080.5792 6.363633e+05 305064.204
##      X2003      X2004      X2005      X2006      X2007      X2008
## 1 180273.7296 54901.194      NA      NA      5.500 40882.500
## 3      NA      0.000 24960.000      0.00      NA      NA
## 4      0.0000      0.000      0.000      NA      0.000      NA
```

## 5	4983.3769	0.000	4987.000	0.00	0.000	0.000
## 8	NA	0.000	0.000	567752.13	143757.957	0.000
## 9	69836.6667	0.000	0.000	6.00	0.000	NA
## 10	0.0000	0.000	NA	18.00	0.000	20435.250
## 11	1892.9985	80230.915	291075.559	NA	0.000	NA
## 12	27932.0000	206543.441	109681.665	0.00	291675.793	0.000
## 16	NA	NA	0.000	0.00	29676.546	NA
## 17	0.0000	0.000	6.000	0.00	NA	0.000
## 18	0.0000	0.000	2865.849	0.00	3227.474	8396.606
## 20	NA	NA	0.000	0.00	NA	0.000
## 23	740.1487	0.000	0.000	0.00	35106.410	0.000
## 24	0.0000	81005.370	117600.507	53442.05	0.000	0.000
## 25	0.0000	69287.000	0.000	740634.00	238464.000	0.000
## 34	NA	NA	0.000	4.00	27.000	8.000
## 37	0.0000	7824.609	49918.000	NA	4635.695	10664.246
## 38	0.0000	122000.504	0.000	0.00	283915.041	NA
## 44	NA	92368.000	64059.501	401326.48	NA	NA
## 45	109656.8501	74460.970	67542.355	NA	0.000	19286.078
## 48	NA	NA	0.000	30417.96	6218.190	17984.237
## 49	NA	0.000	84027.619	0.00	0.000	0.000
## 56	0.0000	0.000	NA	NA	0.000	0.000
## 57	0.0000	NA	NA	1.00	NA	NA
## 58	0.0000	18038.667	160857.760	0.00	NA	0.000
## 62	NA	0.000	NA	0.00	NA	3.000
## 73	0.0000	23097.778	0.000	NA	0.000	0.000
## 74	0.0000	NA	NA	0.00	132500.000	0.000
## 82	0.0000	162155.172	NA	0.00	NA	817614.213
##	X2009	X2010	X2011	X2012	X2013	X2014
## 1	NA	NA	0.000	0.00	NA	NA
## 3	NA	0.0000	1.000	0.00	0.0000	15.500
## 4	NA	158825.4117	NA	32078.00	32117.0000	NA
## 5	276735.0673	330.5784	0.000	NA	0.0000	NA
## 8	0.0000	0.0000	NA	60955.42	NA	0.000
## 9	NA	6.2500	NA	0.00	0.0000	NA
## 10	NA	0.0000	0.000	448989.00	0.0000	42.000
## 11	NA	NA	141137.557	0.00	0.0000	NA
## 12	24770.6286	14248.3313	5640.029	0.00	0.0000	0.000
## 16	3226.9435	0.0000	4059.727	1739.40	1211931.8640	8914.054
## 17	NA	0.0000	23911.284	39199.88	183.9211	15932.291
## 18	NA	0.0000	NA	0.00	NA	32344.915
## 20	6843.4890	74199.9065	NA	1796.45	4156.2026	NA
## 23	0.0000	NA	0.000	0.00	NA	NA
## 24	64091.1895	118408.0507	2821.400	0.00	53798.0243	164375.473
## 25	137147.8788	NA	154344.566	32080.00	163242.8283	NA
## 34	18.5000	0.0000	0.000	NA	NA	0.000
## 37	26219.0233	0.0000	121469.654	135525.85	137851.2853	142542.431
## 38	NA	NA	33.700	0.00	89374.1103	0.000
## 44	NA	0.0000	NA	0.00	0.0000	235418.529
## 45	26463.5835	0.0000	0.000	0.00	19297.9248	161382.188
## 48	364.1333	1953.0412	0.000	0.00	NA	9415.133

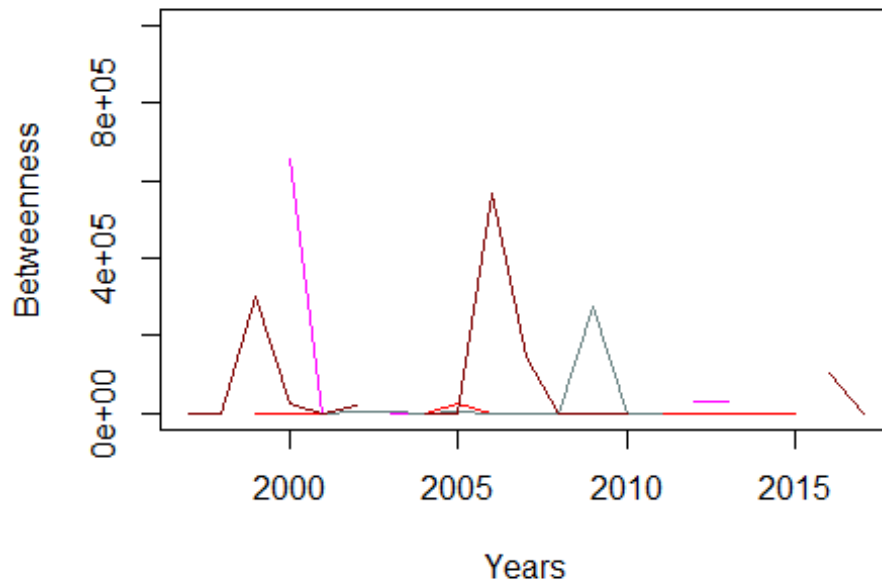
```

## 49      0.0000      NA      NA      0.00      0.0000 13274.927
## 56      0.0000      NA      NA      0.00      NA      0.000
## 57      NA      0.0000      NA 768346.86      NA      NA
## 58      0.0000      NA 302976.248      0.00      NA      NA
## 62      NA      0.0000      NA      0.00      0.0000      NA
## 73      0.0000      NA      NA      0.00      NA      0.000
## 74 2633075.9640      NA      NA      NA      NA      0.000
## 82 233079.9315      0.0000 453351.016 652103.42      NA      0.000
##      X2015      X2016      X2017
## 1 256806.00      NA      NA
## 3      55.50      NA 0.000000e+00
## 4      NA      NA 0.000000e+00
## 5      NA 63790.000      NA
## 8      NA 102072.000 0.000000e+00
## 9      0.00      0.000 1.500000e+02
## 10     6.00     10.500      NA
## 11     0.00      NA      NA
## 12 256783.97      0.000 0.000000e+00
## 16     0.00 77142.406 0.000000e+00
## 17     0.00 98998.104      NA
## 18 1005.39      NA      NA
## 20     NA 3745.961 5.440803e+03
## 23     NA      NA 0.000000e+00
## 24 82344.09 71604.775 1.132470e+05
## 25     0.00      NA 1.709440e+05
## 34     17.00      0.000      NA
## 37 313852.00      NA      NA
## 38     0.00      0.000      NA
## 44 259074.45 266444.580 5.281419e+03
## 45 21076.29 182445.266 8.680547e+04
## 48     0.00      NA      NA
## 49     NA      NA 3.073578e+04
## 56     0.00 80427.543 1.428571e-01
## 57     NA      0.000      NA
## 58     NA      0.000 0.000000e+00
## 62     NA      NA 9.000000e+00
## 73     NA      NA 0.000000e+00
## 74     NA      NA 0.000000e+00
## 82 360336.88     136.000 0.000000e+00

```

```
dim(M)
```

```
## [1] 30 21
```



Eigen Value

```
dfev= read.csv("C:/Users/amitd/Desktop/FA/MasterEigenVector.csv")
dflthev = subset(dfev,dfev$LowToHigh=="LTH")
dfhtlev = subset(dfev,dfev$HighToLow=="HTL")
dfclpev = subset(dfev,dfev$ConsistentlyLowPerf=="CLP")
dfchpev = subset(dfev,dfev$ConsistentlyHighPerf=="CHP")
```

```
###ConsistentHighPerformers
dfchpev[,4:24]
```

	X1997	X1998	X1999	X2000	X2001	X2002	X2003
## 2	0.00e+00	0.00e+00	9.010000e-18	7.98e-10	5.59000e-10	1.42e-08	2.69e-09
## 7	NA	2.49e-17	NA	NA	5.91000e-15	1.31e-17	NA
## 13	5.92e-12	4.57e-08	7.940000e-06	NA	NA	2.73e-17	NA
## 15	1.12e-10	4.12e-06	1.879383e-03	NA	1.37109e-04	7.18e-07	2.51e-07
	X2004	X2005	X2006	X2007	X2008	X2009	X2010
## 2	NA	NA	7.57e-08	1.67e-07	NA	0.000000e+00	NA
## 7	5.17e-10	NA	3.93e-06	NA	NA	NA	1.56e-08
## 13	9.51e-08	8.66e-05	NA	NA	4.62e-05	7.293617e-03	0.00e+00
## 15	9.45e-08	2.64e-07	0.00e+00	5.16e-05	NA	5.840000e-12	1.65e-06
	X2011	X2012	X2013	X2014	X2015	X2016	
## 2	NA	2.93e-09	0.000000000	1.83000e-17	2.76000e-06	4.56e-11	
## 7	5.320000e-09	1.35e-07	0.000124735	4.41000e-07	1.54000e-17	0.00e+00	
## 13	6.053506e-03	4.33e-05	NA	9.18000e-08	1.06460e-04	6.92e-08	
## 15	NA	NA	0.000046600	7.68065e-04	9.07124e-04	NA	
##	X2017						

```
## 2      NA
## 7      NA
## 13     NA
## 15 1.33e-17

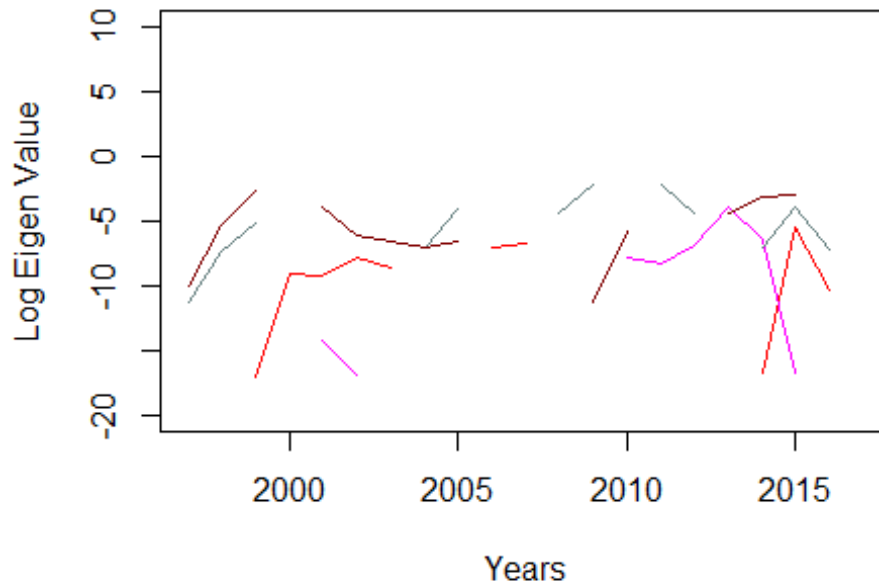
M <- as.matrix(dfchpev[,4:24])
M

##      X1997   X1998      X1999   X2000      X2001   X2002   X2003
## 2  0.00e+00 0.00e+00 9.010000e-18 7.98e-10 5.59000e-10 1.42e-08 2.69e-09
## 7      NA 2.49e-17      NA      NA 5.91000e-15 1.31e-17      NA
## 13 5.92e-12 4.57e-08 7.940000e-06      NA      NA 2.73e-17      NA
## 15 1.12e-10 4.12e-06 1.879383e-03      NA 1.37109e-04 7.18e-07 2.51e-07
##      X2004   X2005   X2006   X2007   X2008      X2009   X2010
## 2      NA      NA 7.57e-08 1.67e-07      NA 0.000000e+00      NA
## 7 5.17e-10      NA 3.93e-06      NA      NA      NA 1.56e-08
## 13 9.51e-08 8.66e-05      NA      NA 4.62e-05 7.293617e-03 0.00e+00
## 15 9.45e-08 2.64e-07 0.00e+00 5.16e-05      NA 5.840000e-12 1.65e-06
##      X2011   X2012      X2013      X2014      X2015   X2016
## 2      NA 2.93e-09 0.000000000 1.83000e-17 2.76000e-06 4.56e-11
## 7 5.320000e-09 1.35e-07 0.000124735 4.41000e-07 1.54000e-17 0.00e+00
## 13 6.053506e-03 4.33e-05      NA 9.18000e-08 1.06460e-04 6.92e-08
## 15      NA      NA 0.000046600 7.68065e-04 9.07124e-04      NA
##      X2017
## 2      NA
## 7      NA
## 13     NA
## 15 1.33e-17

dim(M)

## [1]  4 21
```

Since Eigen Value vary from order 0 to 10^{-18} I chose to plot Log of Eigen Value



```
###ConsistentLowPerformers
dfclpev[,4:24]
```

	X1997	X1998	X1999	X2000	X2001	X2002
## 90	4.71e-05	2.85e-06	7.220000e-05	6.021390e-04	1.990000e-06	0.000006930
## 93	NA	NA	2.750000e-11	3.710000e-18	NA	NA
## 94	0.00e+00	NA	2.050000e-09	1.061450e-04	1.123094e-02	0.002591453
## 95	NA	2.93e-06	NA	3.610000e-05	NA	0.000000172
## 96	1.00e-17	NA	1.630000e-05	4.726345e-03	1.380520e-04	NA
## 97	1.00e-16	NA	1.220000e-05	0.000000e+00	1.890000e-10	0.000051600
## 98	3.27e-06	5.11e-07	1.848713e-03	9.990000e-07	3.070000e-05	0.000053100
## 99	NA	2.28e-13	2.370000e-05	NA	3.629636e-03	0.000002860
## 100	NA	NA	4.310000e-09	2.050000e-07	4.135380e-04	0.000026100
	X2003	X2004	X2005	X2006	X2007	
## 90	1.11e-08	8.000000e-07	1.53044e-04	0.0000223000	0.0000002360	
## 93	1.40e-08	6.250000e-05	7.97819e-04	0.0022139440	0.0001007360	
## 94	4.24e-07	4.041337e-03	5.21081e-04	0.0103278850	0.0050411610	
## 95	2.42e-07	9.190000e-05	4.97670e-04	0.0001007870	0.0000224000	
## 96	4.25e-07	7.770000e-05	1.98242e-04	0.0011930830	0.0000971000	
## 97	3.04e-17	4.460000e-17	2.60000e-09	0.0000000000	0.0000000148	
## 98	1.46e-08	2.240000e-07	2.73000e-19	0.0000037200	NA	
## 99	NA	4.187902e-03	NA	0.0000000162	0.0000462000	
## 100	3.63e-10	8.010000e-07	3.20000e-07	0.0000037800	0.0000002820	

```
##           X2008           X2009           X2010           X2011           X2012
## 90  0.000001480 3.210000e-07 0.0000067100 0.000030800          NA
## 93  0.002530413 1.367817e-03 0.0163831320 0.004128106 0.004930620
## 94  0.006142006 1.862004e-02 0.0029013230 0.008152054 0.010090880
## 95  0.000287638 1.503490e-04 0.0006349740 0.000258225 0.000143923
## 96  0.006654584 3.912405e-03 0.0030405480 0.002360698 0.008782712
## 97  0.000000183 2.280000e-14 0.0000000754 0.000003120 0.000139157
## 98  0.000000778 7.680000e-08 0.0000038600 0.000004890 0.000011900
## 99  0.001045793 1.388158e-03 0.0018415410 0.001395194 0.017167510
## 100 0.000003500 1.400000e-06 0.0000909000 0.000032300 0.000008800
##           X2013           X2014           X2015           X2016           X2017
## 90  5.610000e-11 0.000003390 0.00000139 8.430000e-09 3.380000e-17
## 93  2.153597e-03 0.144868616 0.04167163 9.070804e-03 1.424755e-03
## 94  6.808426e-03 0.238866445 0.13797383 4.485846e-02 5.702400e-04
## 95  5.810000e-05 0.001232782 0.00905797 4.088990e-04 7.280000e-06
## 96  7.938940e-03 0.145135326 0.05432568 7.220248e-03 7.973560e-04
## 97  2.194190e-04 0.001678535 0.00007930 7.090000e-05 3.590000e-06
## 98  7.985980e-04 0.000000191 0.02018366 5.240000e-06 3.790000e-06
## 99  2.630199e-03 0.181051794 0.02792774 9.397069e-03 1.792370e-04
## 100 6.050000e-06 0.000007140 0.00006060 6.242962e-03 2.740000e-06
```

```
M <- as.matrix(dfclpev[,4:24])
```

```
M
```

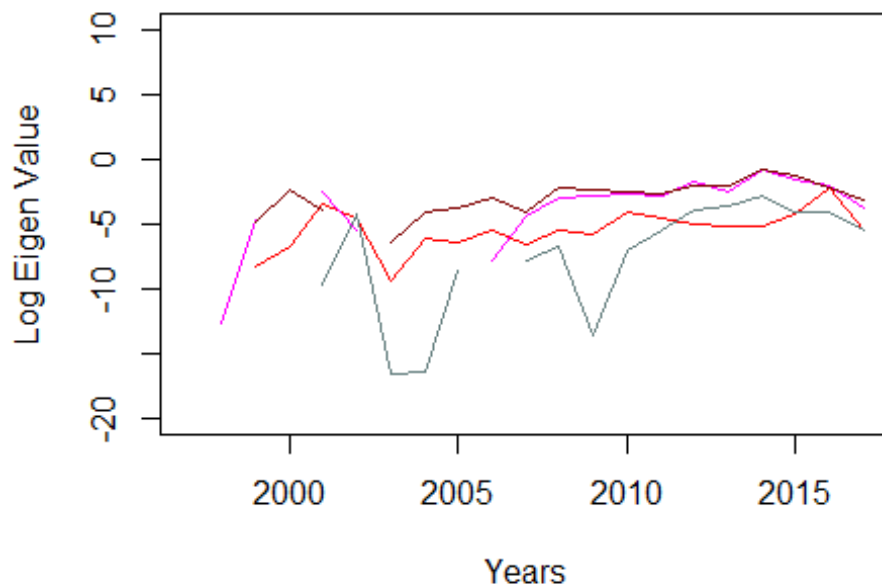
```
##           X1997           X1998           X1999           X2000           X2001           X2002
## 90  4.71e-05 2.85e-06 7.220000e-05 6.021390e-04 1.990000e-06 0.000006930
## 93          NA          NA 2.750000e-11 3.710000e-18          NA          NA
## 94  0.00e+00          NA 2.050000e-09 1.061450e-04 1.123094e-02 0.002591453
## 95          NA 2.93e-06          NA 3.610000e-05          NA 0.000000172
## 96  1.00e-17          NA 1.630000e-05 4.726345e-03 1.380520e-04          NA
## 97  1.00e-16          NA 1.220000e-05 0.000000e+00 1.890000e-10 0.000051600
## 98  3.27e-06 5.11e-07 1.848713e-03 9.990000e-07 3.070000e-05 0.000053100
## 99          NA 2.28e-13 2.370000e-05          NA 3.629636e-03 0.000002860
## 100          NA          NA 4.310000e-09 2.050000e-07 4.135380e-04 0.000026100
##           X2003           X2004           X2005           X2006           X2007
## 90  1.11e-08 8.000000e-07 1.53044e-04 0.0000223000 0.0000002360
## 93  1.40e-08 6.250000e-05 7.97819e-04 0.0022139440 0.0001007360
## 94  4.24e-07 4.041337e-03 5.21081e-04 0.0103278850 0.0050411610
## 95  2.42e-07 9.190000e-05 4.97670e-04 0.0001007870 0.0000224000
## 96  4.25e-07 7.770000e-05 1.98242e-04 0.0011930830 0.0000971000
## 97  3.04e-17 4.460000e-17 2.60000e-09 0.0000000000 0.0000000148
## 98  1.46e-08 2.240000e-07 2.73000e-19 0.0000037200          NA
## 99          NA 4.187902e-03          NA 0.0000000162 0.0000462000
## 100 3.63e-10 8.010000e-07 3.20000e-07 0.0000037800 0.0000002820
##           X2008           X2009           X2010           X2011           X2012
## 90  0.000001480 3.210000e-07 0.0000067100 0.000030800          NA
## 93  0.002530413 1.367817e-03 0.0163831320 0.004128106 0.004930620
## 94  0.006142006 1.862004e-02 0.0029013230 0.008152054 0.010090880
## 95  0.000287638 1.503490e-04 0.0006349740 0.000258225 0.000143923
## 96  0.006654584 3.912405e-03 0.0030405480 0.002360698 0.008782712
```



```
## 97 0.000000183 2.280000e-14 0.0000000754 0.000003120 0.000139157
## 98 0.000000778 7.680000e-08 0.0000038600 0.000004890 0.000011900
## 99 0.001045793 1.388158e-03 0.0018415410 0.001395194 0.017167510
## 100 0.000003500 1.400000e-06 0.0000909000 0.000032300 0.000008800
##          X2013          X2014          X2015          X2016          X2017
## 90 5.610000e-11 0.000003390 0.00000139 8.430000e-09 3.380000e-17
## 93 2.153597e-03 0.144868616 0.04167163 9.070804e-03 1.424755e-03
## 94 6.808426e-03 0.238866445 0.13797383 4.485846e-02 5.702400e-04
## 95 5.810000e-05 0.001232782 0.00905797 4.088990e-04 7.280000e-06
## 96 7.938940e-03 0.145135326 0.05432568 7.220248e-03 7.973560e-04
## 97 2.194190e-04 0.001678535 0.00007930 7.090000e-05 3.590000e-06
## 98 7.985980e-04 0.000000191 0.02018366 5.240000e-06 3.790000e-06
## 99 2.630199e-03 0.181051794 0.02792774 9.397069e-03 1.792370e-04
## 100 6.050000e-06 0.000007140 0.00006060 6.242962e-03 2.740000e-06
```

```
dim(M)
```

```
## [1] 9 21
```



```
###HighToLowPerformers
```

```
dfhtlev[,4:24]
```

```
##          X1997          X1998          X1999          X2000          X2001          X2002
## 2 0.00e+00 0.000000e+00 9.010000e-18 7.98000e-10 5.59e-10 1.42000e-08
## 27 1.51e-16 0.000000e+00 0.000000e+00 4.26000e-18 NA NA
## 28 9.57e-07 4.77000e-08 2.550000e-07 NA 5.62e-08 1.85872e-04
## 39 3.90e-05 NA NA NA 3.13e-05 7.03000e-05
```

## 46	NA	NA	1.830933e-03	5.62000e-05	NA	NA
## 54	NA	6.00000e-17	NA	NA	3.76e-17	NA
## 55	NA	4.14000e-08	NA	1.47000e-07	NA	NA
## 66	5.02e-17	NA	NA	NA	NA	NA
## 69	NA	2.75000e-18	NA	1.60000e-17	NA	2.06000e-05
## 75	NA	NA	0.000000e+00	NA	NA	5.03000e-08
## 83	4.52e-17	7.75873e-04	2.460000e-07	1.29000e-07	0.00e+00	9.65000e-07
## 90	4.71e-05	2.85000e-06	7.220000e-05	6.02139e-04	1.99e-06	6.93000e-06
## 98	3.27e-06	5.11000e-07	1.848713e-03	9.99000e-07	3.07e-05	5.31000e-05
##	X2003	X2004	X2005	X2006	X2007	X2008
## 2	2.69e-09	NA	NA	7.570000e-08	1.670000e-07	NA
## 27	9.13e-12	2.82e-08	NA	6.120000e-09	1.590000e-07	9.960000e-10
## 28	5.70e-09	1.95e-07	1.88000e-09	5.340000e-08	NA	3.040000e-08
## 39	NA	8.74e-17	3.34262e-04	NA	2.595622e-03	1.319576e-03
## 46	NA	NA	2.25091e-04	2.070155e-03	2.010000e-05	7.780000e-08
## 54	5.84e-17	NA	3.50000e-09	1.430000e-18	NA	NA
## 55	3.30e-17	9.66e-08	NA	0.000000e+00	NA	NA
## 66	0.00e+00	0.00e+00	2.18000e-17	8.540000e-15	7.220000e-16	4.810000e-17
## 69	5.79e-13	0.00e+00	1.78000e-11	9.190000e-18	2.630000e-17	1.530000e-14
## 75	5.08e-07	4.61e-05	5.34000e-08	NA	3.500000e-05	3.040000e-05
## 83	NA	9.29e-08	1.69000e-06	5.730000e-07	5.160000e-07	8.400000e-07
## 90	1.11e-08	8.00e-07	1.53044e-04	2.230000e-05	2.360000e-07	1.480000e-06
## 98	1.46e-08	2.24e-07	2.73000e-19	3.720000e-06	NA	7.780000e-07
##	X2009	X2010	X2011	X2012	X2013	
## 2	0.000000e+00	NA	NA	2.930000e-09	0.000000e+00	
## 27	2.98000e-17	NA	0.000157266	NA	3.120000e-07	
## 28	1.05090e-04	NA	0.000338222	NA	7.060000e-05	
## 39	1.91047e-04	9.872992e-03	0.000399609	1.613517e-03	8.001754e-03	
## 46	2.89788e-04	2.315170e-04	0.000001340	2.635840e-03	4.528166e-03	
## 54	7.45000e-18	0.000000e+00	NA	0.000000e+00	6.580000e-10	
## 55	5.85000e-09	2.540000e-15	0.000000000	5.061920e-04	NA	
## 66	NA	3.270000e-17	NA	3.010000e-07	0.000000e+00	
## 69	1.01000e-16	NA	NA	0.000000e+00	NA	
## 75	2.32000e-05	NA	NA	7.740000e-05	2.630000e-17	
## 83	8.65000e-09	3.790000e-07	0.000034000	6.830000e-06	7.230000e-06	
## 90	3.21000e-07	6.710000e-06	0.000030800	NA	5.610000e-11	
## 98	7.68000e-08	3.860000e-06	0.000004890	1.190000e-05	7.985980e-04	
##	X2014	X2015	X2016	X2017		
## 2	1.830000e-17	0.000002760	4.560000e-11	NA		
## 27	2.864810e-04	0.000123214	NA	NA		
## 28	7.110000e-05	0.006005438	2.400000e-08	NA		
## 39	3.716832e-02	0.020153285	5.831398e-03	2.39442e-04		
## 46	3.714767e-02	0.020432117	9.285463e-03	8.45000e-05		
## 54	NA	NA	0.000000e+00	NA		
## 55	NA	NA	1.930000e-05	NA		
## 66	1.840000e-05	0.000013600	5.840000e-08	NA		
## 69	NA	0.000000279	NA	NA		
## 75	NA	0.000002770	NA	NA		
## 83	5.640000e-06	0.000007070	1.042550e-04	2.91000e-11		

```
## 90 3.390000e-06 0.000001390 8.430000e-09 3.38000e-17
## 98 1.910000e-07 0.020183661 5.240000e-06 3.79000e-06
```

```
M <- as.matrix(dfhtlev[,4:24])
```

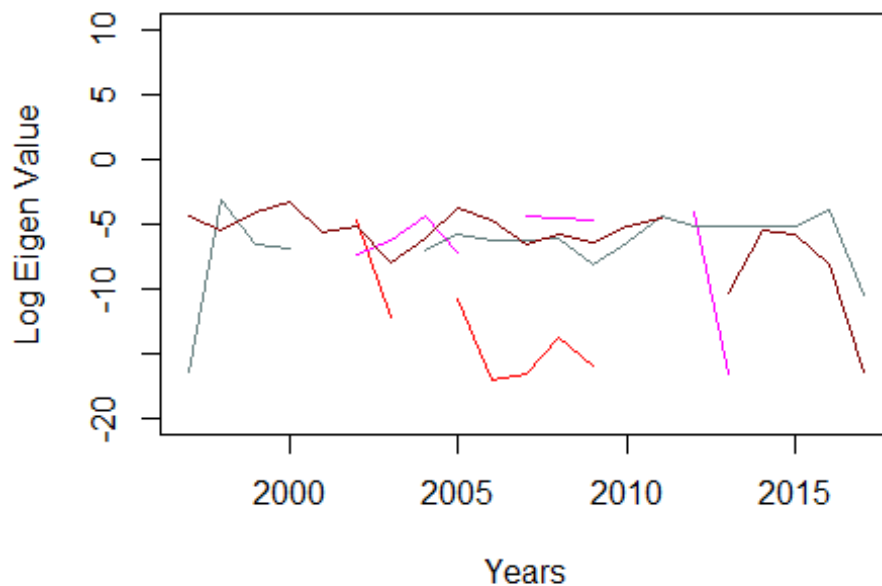
```
M
```

```
##      X1997      X1998      X1999      X2000      X2001      X2002
## 2  0.00e+00 0.00000e+00 9.01000e-18 7.98000e-10 5.59e-10 1.42000e-08
## 27 1.51e-16 0.00000e+00 0.00000e+00 4.26000e-18      NA      NA
## 28 9.57e-07 4.77000e-08 2.55000e-07      NA 5.62e-08 1.85872e-04
## 39 3.90e-05      NA      NA      NA 3.13e-05 7.03000e-05
## 46      NA      NA 1.830933e-03 5.62000e-05      NA      NA
## 54      NA 6.00000e-17      NA      NA 3.76e-17      NA
## 55      NA 4.14000e-08      NA 1.47000e-07      NA      NA
## 66 5.02e-17      NA      NA      NA      NA      NA
## 69      NA 2.75000e-18      NA 1.60000e-17      NA 2.06000e-05
## 75      NA      NA 0.00000e+00      NA      NA 5.03000e-08
## 83 4.52e-17 7.75873e-04 2.46000e-07 1.29000e-07 0.00e+00 9.65000e-07
## 90 4.71e-05 2.85000e-06 7.22000e-05 6.02139e-04 1.99e-06 6.93000e-06
## 98 3.27e-06 5.11000e-07 1.848713e-03 9.99000e-07 3.07e-05 5.31000e-05
##      X2003      X2004      X2005      X2006      X2007      X2008
## 2  2.69e-09      NA      NA 7.57000e-08 1.67000e-07      NA
## 27 9.13e-12 2.82e-08      NA 6.12000e-09 1.59000e-07 9.96000e-10
## 28 5.70e-09 1.95e-07 1.88000e-09 5.34000e-08      NA 3.04000e-08
## 39      NA 8.74e-17 3.34262e-04      NA 2.595622e-03 1.319576e-03
## 46      NA      NA 2.25091e-04 2.070155e-03 2.01000e-05 7.78000e-08
## 54 5.84e-17      NA 3.50000e-09 1.43000e-18      NA      NA
## 55 3.30e-17 9.66e-08      NA 0.00000e+00      NA      NA
## 66 0.00e+00 0.00e+00 2.18000e-17 8.54000e-15 7.22000e-16 4.81000e-17
## 69 5.79e-13 0.00e+00 1.78000e-11 9.19000e-18 2.63000e-17 1.53000e-14
## 75 5.08e-07 4.61e-05 5.34000e-08      NA 3.50000e-05 3.04000e-05
## 83      NA 9.29e-08 1.69000e-06 5.73000e-07 5.16000e-07 8.40000e-07
## 90 1.11e-08 8.00e-07 1.53044e-04 2.23000e-05 2.36000e-07 1.48000e-06
## 98 1.46e-08 2.24e-07 2.73000e-19 3.72000e-06      NA 7.78000e-07
##      X2009      X2010      X2011      X2012      X2013
## 2  0.00000e+00      NA      NA 2.93000e-09 0.00000e+00
## 27 2.98000e-17      NA 0.000157266      NA 3.12000e-07
## 28 1.05090e-04      NA 0.000338222      NA 7.06000e-05
## 39 1.91047e-04 9.872992e-03 0.000399609 1.613517e-03 8.001754e-03
## 46 2.89788e-04 2.315170e-04 0.000001340 2.635840e-03 4.528166e-03
## 54 7.45000e-18 0.00000e+00      NA 0.00000e+00 6.58000e-10
## 55 5.85000e-09 2.54000e-15 0.000000000 5.061920e-04      NA
## 66      NA 3.27000e-17      NA 3.01000e-07 0.00000e+00
## 69 1.01000e-16      NA      NA 0.00000e+00      NA
## 75 2.32000e-05      NA      NA 7.74000e-05 2.63000e-17
## 83 8.65000e-09 3.79000e-07 0.000034000 6.83000e-06 7.23000e-06
## 90 3.21000e-07 6.71000e-06 0.000030800      NA 5.61000e-11
## 98 7.68000e-08 3.86000e-06 0.000004890 1.19000e-05 7.985980e-04
##      X2014      X2015      X2016      X2017
## 2  1.83000e-17 0.000002760 4.56000e-11      NA
```

```
## 27 2.864810e-04 0.000123214 NA NA
## 28 7.110000e-05 0.006005438 2.400000e-08 NA
## 39 3.716832e-02 0.020153285 5.831398e-03 2.39442e-04
## 46 3.714767e-02 0.020432117 9.285463e-03 8.45000e-05
## 54 NA NA 0.000000e+00 NA
## 55 NA NA 1.930000e-05 NA
## 66 1.840000e-05 0.000013600 5.840000e-08 NA
## 69 NA 0.000000279 NA NA
## 75 NA 0.000002770 NA NA
## 83 5.640000e-06 0.000007070 1.042550e-04 2.91000e-11
## 90 3.390000e-06 0.000001390 8.430000e-09 3.38000e-17
## 98 1.910000e-07 0.020183661 5.240000e-06 3.79000e-06
```

```
dim(M)
```

```
## [1] 13 21
```



```
###LowToHighPerformers
```

```
dflthev[,4:24]
```

```
##          X1997      X1998      X1999      X2000      X2001
## 1          NA 5.63000e-18 3.35e-17          NA 5.210000e-08
## 3          NA          NA 1.93e-17 0.000000e+00 0.000000e+00
## 4          NA 4.37000e-08          NA 9.103858e-01 9.495265e-01
## 5 0.000000e+00          NA 1.03e-17          NA 0.000000e+00
## 8 4.150000e-05 1.83000e-07 2.04e-06 1.187725e-03 5.210000e-06
## 9          NA          NA 0.00e+00 0.000000e+00          NA
```

## 10	NA	NA	0.00e+00	1.131710e-04	NA
## 11	NA	NA	8.13e-06	NA	1.880000e-08
## 12	1.850000e-09	1.04000e-17	3.60e-17	NA	3.675483e-03
## 16	NA	NA	8.01e-06	6.131059e-03	1.710000e-09
## 17	8.605440e-04	0.000000e+00	2.15e-05	5.816745e-03	NA
## 18	NA	3.89000e-17	NA	NA	0.000000e+00
## 20	NA	NA	0.00e+00	0.000000e+00	NA
## 23	1.720000e-06	7.56259e-04	1.39e-07	7.290000e-07	3.440000e-05
## 24	4.020000e-05	1.59000e-07	1.10e-07	3.500000e-05	2.480000e-07
## 25	3.760000e-17	8.24000e-08	NA	5.570000e-18	3.340000e-07
## 34	NA	1.57000e-17	0.00e+00	2.210000e-17	NA
## 37	5.920806e-03	7.41000e-07	NA	1.980000e-05	2.410000e-06
## 38	4.080000e-10	0.000000e+00	NA	NA	1.890000e-05
## 44	6.540000e-08	NA	NA	NA	NA
## 45	8.340000e-07	4.90000e-08	5.38e-07	5.020000e-06	2.190000e-07
## 48	NA	8.56000e-09	7.78e-06	2.610000e-05	NA
## 49	4.220000e-05	2.21000e-06	6.03e-05	1.319020e-04	NA
## 56	7.930000e-14	NA	5.95e-15	1.060000e-11	0.000000e+00
## 57	NA	NA	9.65e-18	NA	4.270000e-18
## 58	NA	3.61000e-08	NA	NA	NA
## 62	NA	0.000000e+00	1.20e-07	NA	1.620000e-17
## 73	0.000000e+00	NA	NA	NA	2.820000e-17
## 74	NA	3.13000e-06	1.54e-17	NA	3.130000e-05
## 82	NA	3.27000e-06	7.51e-08	2.060000e-07	5.208719e-02
##	X2002	X2003	X2004	X2005	X2006
## 1	1.270000e-10	4.82e-11	1.670000e-11	NA	NA
## 3	NA	NA	2.340000e-07	1.900000e-05	2.010000e-18
## 4	NA	2.97e-06	0.000000e+00	0.000000e+00	NA
## 5	1.790000e-11	2.77e-08	1.540000e-18	2.120000e-10	6.460000e-09
## 8	2.730000e-06	NA	9.780000e-08	3.030000e-06	3.570000e-06
## 9	2.060000e-18	4.33e-08	3.280000e-17	3.100000e-07	1.700000e-17
## 10	NA	1.42e-17	5.330000e-16	NA	3.700000e-17
## 11	NA	1.18e-08	3.110000e-07	1.530000e-05	NA
## 12	NA	9.66e-14	1.240000e-08	6.520000e-07	1.370000e-06
## 16	3.427006e-02	NA	NA	6.900000e-05	2.890000e-05
## 17	0.000000e+00	2.06e-07	6.310000e-17	0.000000e+00	3.510000e-05
## 18	NA	2.05e-07	4.636568e-03	1.840000e-05	2.342950e-04
## 20	NA	NA	NA	5.310000e-05	3.950000e-05
## 23	5.450000e-05	4.36e-11	6.110000e-05	2.780000e-05	3.362700e-04
## 24	2.070000e-17	1.30e-17	3.860000e-07	9.835460e-04	2.730000e-05
## 25	6.780000e-08	8.81e-09	8.770000e-10	2.310000e-08	4.900000e-07
## 34	NA	NA	NA	1.350000e-17	0.000000e+00
## 37	NA	0.00e+00	4.850000e-07	2.790000e-07	NA
## 38	3.410000e-05	0.00e+00	2.230000e-05	1.950000e-09	1.330000e-17
## 44	5.690000e-07	NA	5.480000e-07	1.560000e-07	1.888267e-03
## 45	5.990000e-06	7.94e-09	2.920000e-06	1.563410e-04	NA
## 48	0.000000e+00	NA	NA	2.330000e-06	2.210000e-05
## 49	NA	NA	1.420000e-08	5.163177e-03	6.660000e-07
## 56	NA	0.00e+00	1.300000e-17	NA	NA
## 57	NA	0.00e+00	NA	NA	1.490000e-17

## 58	1.820000e-07	4.91e-11	3.740000e-06	3.687769e-03	2.060000e-06
## 62	0.000000e+00	NA	0.000000e+00	NA	0.000000e+00
## 73	1.300000e-17	1.21e-17	9.360000e-08	9.680000e-17	NA
## 74	NA	8.72e-18	NA	NA	2.200000e-07
## 82	3.630000e-05	8.78e-06	2.163650e-04	NA	1.620000e-06
##	X2007	X2008	X2009	X2010	X2011
## 1	0.000000e+00	1.450000e-06	NA	NA	2.480000e-17
## 3	NA	NA	NA	0.000000e+00	1.450000e-18
## 4	7.920000e-10	NA	NA	6.680000e-07	NA
## 5	1.100000e-17	1.480000e-11	7.000000e-10	1.110000e-07	5.200000e-17
## 8	3.040000e-05	2.020000e-07	7.680000e-07	8.680000e-08	NA
## 9	1.320000e-17	NA	NA	0.000000e+00	NA
## 10	5.390000e-10	8.450000e-14	NA	1.940000e-13	1.310000e-11
## 11	2.428952e-03	NA	NA	NA	2.780000e-09
## 12	2.626534e-03	5.060000e-06	1.340000e-06	8.190000e-06	1.010000e-06
## 16	9.870000e-05	NA	2.585870e-04	1.528480e-04	1.853989e-03
## 17	NA	5.306623e-03	NA	1.041277e-03	1.251203e-03
## 18	6.400000e-06	3.669020e-04	NA	4.297070e-04	NA
## 20	NA	7.070000e-17	4.302800e-04	3.212408e-03	NA
## 23	7.210000e-06	5.070000e-05	8.090000e-05	NA	4.970000e-05
## 24	1.020000e-07	1.100000e-06	1.860000e-06	4.960000e-05	1.560000e-06
## 25	2.423173e-03	1.138120e-04	7.430000e-09	NA	4.300000e-09
## 34	1.320000e-17	0.000000e+00	1.380000e-16	1.770000e-17	4.980000e-17
## 37	9.200000e-08	8.050000e-07	4.200000e-08	1.110000e-05	8.130000e-05
## 38	2.852035e-03	NA	NA	NA	0.000000e+00
## 44	NA	NA	NA	1.390000e-10	NA
## 45	2.190000e-17	1.990000e-06	9.600000e-08	6.670000e-07	3.580000e-09
## 48	6.630000e-07	6.350000e-05	7.230000e-07	1.160000e-05	1.049680e-04
## 49	2.438813e-03	6.470000e-07	6.160000e-07	NA	NA
## 56	5.980000e-06	8.330000e-18	3.920000e-05	NA	NA
## 57	NA	NA	NA	0.000000e+00	NA
## 58	NA	3.820000e-06	8.480000e-09	NA	4.500000e-09
## 62	NA	7.690000e-17	NA	1.340000e-08	NA
## 73	3.260000e-05	4.960000e-18	0.000000e+00	NA	NA
## 74	8.330000e-10	1.920000e-17	7.282287e-03	NA	NA
## 82	NA	7.572960e-03	1.290000e-07	1.970000e-16	6.998490e-04
##	X2012	X2013	X2014	X2015	X2016
## 1	1.740000e-05	NA	NA	6.850000e-09	NA
## 3	6.490000e-18	7.340000e-17	2.740000e-17	0.000000e+00	NA
## 4	5.200000e-10	2.300000e-06	NA	NA	NA
## 5	NA	2.420000e-07	NA	NA	7.250000e-05
## 8	3.620000e-06	NA	2.080000e-05	NA	4.860000e-05
## 9	3.120000e-12	1.010000e-16	NA	0.000000e+00	8.040000e-17
## 10	3.850000e-08	4.210000e-17	0.000000e+00	0.000000e+00	0.000000e+00
## 11	1.230000e-06	2.690000e-07	NA	2.290000e-07	NA
## 12	6.840000e-08	2.580000e-15	3.570440e-04	6.851800e-04	5.010000e-08
## 16	2.951827e-03	3.417713e-03	8.631178e-02	1.642712e-03	2.673480e-03
## 17	3.413459e-03	9.979670e-04	1.752098e-02	7.680000e-05	1.299382e-02
## 18	3.107177e-03	NA	6.320386e-03	2.332028e-03	NA
## 20	1.052664e-03	1.110522e-03	NA	NA	1.096499e-02

## 23	1.760630e-04	NA	NA	NA	NA
## 24	4.850000e-06	3.720000e-05	5.603460e-04	2.682460e-04	1.519170e-04
## 25	5.910000e-10	1.290000e-07	NA	4.620000e-17	NA
## 34	NA	NA	9.780000e-19	0.000000e+00	1.100000e-08
## 37	2.250000e-05	3.860000e-06	2.512660e-04	2.990000e-07	NA
## 38	2.760000e-07	4.189670e-04	3.390000e-04	0.000000e+00	3.180000e-06
## 44	6.590000e-07	3.020000e-17	8.552825e-03	5.275170e-04	5.110000e-07
## 45	6.570000e-09	3.710000e-06	4.926960e-04	4.619910e-04	2.420000e-06
## 48	1.100000e-05	NA	3.059730e-04	9.880000e-05	NA
## 49	2.100000e-08	1.570000e-06	6.118220e-04	NA	NA
## 56	0.000000e+00	NA	1.840000e-17	9.780000e-16	2.020000e-06
## 57	4.645290e-04	NA	NA	NA	1.940000e-09
## 58	8.080000e-08	NA	NA	NA	4.650000e-05
## 62	8.820000e-09	1.160000e-08	NA	NA	NA
## 73	1.410000e-12	NA	0.000000e+00	NA	NA
## 74	NA	NA	1.630000e-17	NA	NA
## 82	1.880000e-07	NA	1.005753e-03	2.841872e-03	1.590000e-16
##	X2017				
## 1	NA				
## 3	0.000000e+00				
## 4	6.220000e-09				
## 5	NA				
## 8	1.280000e-06				
## 9	1.430000e-16				
## 10	NA				
## 11	NA				
## 12	4.950000e-08				
## 16	5.250000e-05				
## 17	NA				
## 18	NA				
## 20	1.860980e-04				
## 23	9.270000e-06				
## 24	3.230000e-07				
## 25	3.770000e-05				
## 34	NA				
## 37	NA				
## 38	NA				
## 44	5.600000e-05				
## 45	7.020000e-07				
## 48	NA				
## 49	6.010000e-06				
## 56	0.000000e+00				
## 57	NA				
## 58	3.290000e-05				
## 62	1.720000e-17				
## 73	6.880000e-17				
## 74	3.064614e-03				
## 82	8.490000e-09				

```
M <- as.matrix(df1$thev[,4:24])
```

```
M
```

##		X1997	X1998	X1999	X2000	X2001
## 1		NA	5.63000e-18	3.35e-17	NA	5.210000e-08
## 3		NA	NA	1.93e-17	0.000000e+00	0.000000e+00
## 4		NA	4.37000e-08	NA	9.103858e-01	9.495265e-01
## 5	0.000000e+00		NA	1.03e-17	NA	0.000000e+00
## 8	4.150000e-05	1.83000e-07	2.04e-06	1.187725e-03	5.210000e-06	
## 9		NA	NA	0.00e+00	0.000000e+00	NA
## 10		NA	NA	0.00e+00	1.131710e-04	NA
## 11		NA	NA	8.13e-06	NA	1.880000e-08
## 12	1.850000e-09	1.04000e-17	3.60e-17		NA	3.675483e-03
## 16		NA	NA	8.01e-06	6.131059e-03	1.710000e-09
## 17	8.605440e-04	0.000000e+00	2.15e-05	5.816745e-03		NA
## 18		NA	3.89000e-17	NA	NA	0.000000e+00
## 20		NA	NA	0.00e+00	0.000000e+00	NA
## 23	1.720000e-06	7.56259e-04	1.39e-07	7.290000e-07	3.440000e-05	
## 24	4.020000e-05	1.59000e-07	1.10e-07	3.500000e-05	2.480000e-07	
## 25	3.760000e-17	8.24000e-08	NA	5.570000e-18	3.340000e-07	
## 34		NA	1.57000e-17	0.00e+00	2.210000e-17	NA
## 37	5.920806e-03	7.41000e-07	NA	1.980000e-05	2.410000e-06	
## 38	4.080000e-10	0.000000e+00	NA	NA	1.890000e-05	
## 44	6.540000e-08		NA	NA	NA	NA
## 45	8.340000e-07	4.90000e-08	5.38e-07	5.020000e-06	2.190000e-07	
## 48		NA	8.56000e-09	7.78e-06	2.610000e-05	NA
## 49	4.220000e-05	2.21000e-06	6.03e-05	1.319020e-04		NA
## 56	7.930000e-14		NA	5.95e-15	1.060000e-11	0.000000e+00
## 57		NA	NA	9.65e-18	NA	4.270000e-18
## 58		NA	3.61000e-08	NA	NA	NA
## 62		NA	0.000000e+00	1.20e-07	NA	1.620000e-17
## 73	0.000000e+00		NA	NA	NA	2.820000e-17
## 74		NA	3.13000e-06	1.54e-17	NA	3.130000e-05
## 82		NA	3.27000e-06	7.51e-08	2.060000e-07	5.208719e-02
##		X2002	X2003	X2004	X2005	X2006
## 1	1.270000e-10	4.82e-11	1.670000e-11		NA	NA
## 3		NA	NA	2.340000e-07	1.900000e-05	2.010000e-18
## 4		NA	2.97e-06	0.000000e+00	0.000000e+00	NA
## 5	1.790000e-11	2.77e-08	1.540000e-18	2.120000e-10	6.460000e-09	
## 8	2.730000e-06		NA	9.780000e-08	3.030000e-06	3.570000e-06
## 9	2.060000e-18	4.33e-08	3.280000e-17	3.100000e-07	1.700000e-17	
## 10		NA	1.42e-17	5.330000e-16	NA	3.700000e-17
## 11		NA	1.18e-08	3.110000e-07	1.530000e-05	NA
## 12		NA	9.66e-14	1.240000e-08	6.520000e-07	1.370000e-06
## 16	3.427006e-02		NA	NA	6.900000e-05	2.890000e-05
## 17	0.000000e+00	2.06e-07	6.310000e-17	0.000000e+00	3.510000e-05	
## 18		NA	2.05e-07	4.636568e-03	1.840000e-05	2.342950e-04
## 20		NA	NA	NA	5.310000e-05	3.950000e-05
## 23	5.450000e-05	4.36e-11	6.110000e-05	2.780000e-05	3.362700e-04	
## 24	2.070000e-17	1.30e-17	3.860000e-07	9.835460e-04	2.730000e-05	

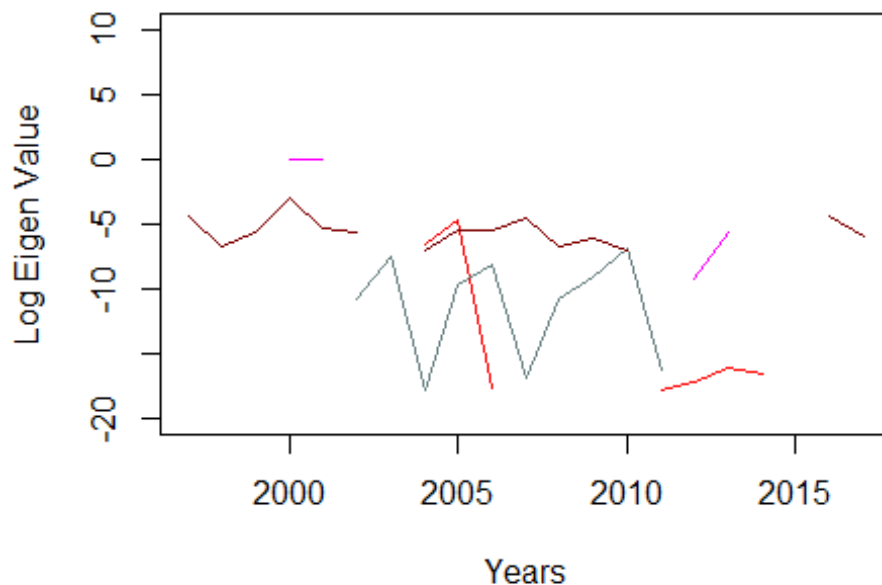
## 25	6.780000e-08	8.81e-09	8.770000e-10	2.310000e-08	4.900000e-07
## 34	NA	NA	NA	1.350000e-17	0.000000e+00
## 37	NA	0.00e+00	4.850000e-07	2.790000e-07	NA
## 38	3.410000e-05	0.00e+00	2.230000e-05	1.950000e-09	1.330000e-17
## 44	5.690000e-07	NA	5.480000e-07	1.560000e-07	1.888267e-03
## 45	5.990000e-06	7.94e-09	2.920000e-06	1.563410e-04	NA
## 48	0.000000e+00	NA	NA	2.330000e-06	2.210000e-05
## 49	NA	NA	1.420000e-08	5.163177e-03	6.660000e-07
## 56	NA	0.00e+00	1.300000e-17	NA	NA
## 57	NA	0.00e+00	NA	NA	1.490000e-17
## 58	1.820000e-07	4.91e-11	3.740000e-06	3.687769e-03	2.060000e-06
## 62	0.000000e+00	NA	0.000000e+00	NA	0.000000e+00
## 73	1.300000e-17	1.21e-17	9.360000e-08	9.680000e-17	NA
## 74	NA	8.72e-18	NA	NA	2.200000e-07
## 82	3.630000e-05	8.78e-06	2.163650e-04	NA	1.620000e-06
##	X2007	X2008	X2009	X2010	X2011
## 1	0.000000e+00	1.450000e-06	NA	NA	2.480000e-17
## 3	NA	NA	NA	0.000000e+00	1.450000e-18
## 4	7.920000e-10	NA	NA	6.680000e-07	NA
## 5	1.100000e-17	1.480000e-11	7.000000e-10	1.110000e-07	5.200000e-17
## 8	3.040000e-05	2.020000e-07	7.680000e-07	8.680000e-08	NA
## 9	1.320000e-17	NA	NA	0.000000e+00	NA
## 10	5.390000e-10	8.450000e-14	NA	1.940000e-13	1.310000e-11
## 11	2.428952e-03	NA	NA	NA	2.780000e-09
## 12	2.626534e-03	5.060000e-06	1.340000e-06	8.190000e-06	1.010000e-06
## 16	9.870000e-05	NA	2.585870e-04	1.528480e-04	1.853989e-03
## 17	NA	5.306623e-03	NA	1.041277e-03	1.251203e-03
## 18	6.400000e-06	3.669020e-04	NA	4.297070e-04	NA
## 20	NA	7.070000e-17	4.302800e-04	3.212408e-03	NA
## 23	7.210000e-06	5.070000e-05	8.090000e-05	NA	4.970000e-05
## 24	1.020000e-07	1.100000e-06	1.860000e-06	4.960000e-05	1.560000e-06
## 25	2.423173e-03	1.138120e-04	7.430000e-09	NA	4.300000e-09
## 34	1.320000e-17	0.000000e+00	1.380000e-16	1.770000e-17	4.980000e-17
## 37	9.200000e-08	8.050000e-07	4.200000e-08	1.110000e-05	8.130000e-05
## 38	2.852035e-03	NA	NA	NA	0.000000e+00
## 44	NA	NA	NA	1.390000e-10	NA
## 45	2.190000e-17	1.990000e-06	9.600000e-08	6.670000e-07	3.580000e-09
## 48	6.630000e-07	6.350000e-05	7.230000e-07	1.160000e-05	1.049680e-04
## 49	2.438813e-03	6.470000e-07	6.160000e-07	NA	NA
## 56	5.980000e-06	8.330000e-18	3.920000e-05	NA	NA
## 57	NA	NA	NA	0.000000e+00	NA
## 58	NA	3.820000e-06	8.480000e-09	NA	4.500000e-09
## 62	NA	7.690000e-17	NA	1.340000e-08	NA
## 73	3.260000e-05	4.960000e-18	0.000000e+00	NA	NA
## 74	8.330000e-10	1.920000e-17	7.282287e-03	NA	NA
## 82	NA	7.572960e-03	1.290000e-07	1.970000e-16	6.998490e-04
##	X2012	X2013	X2014	X2015	X2016
## 1	1.740000e-05	NA	NA	6.850000e-09	NA
## 3	6.490000e-18	7.340000e-17	2.740000e-17	0.000000e+00	NA
## 4	5.200000e-10	2.300000e-06	NA	NA	NA

## 5	NA	2.420000e-07	NA	NA	7.250000e-05
## 8	3.620000e-06	NA	2.080000e-05	NA	4.860000e-05
## 9	3.120000e-12	1.010000e-16	NA	0.000000e+00	8.040000e-17
## 10	3.850000e-08	4.210000e-17	0.000000e+00	0.000000e+00	0.000000e+00
## 11	1.230000e-06	2.690000e-07	NA	2.290000e-07	NA
## 12	6.840000e-08	2.580000e-15	3.570440e-04	6.851800e-04	5.010000e-08
## 16	2.951827e-03	3.417713e-03	8.631178e-02	1.642712e-03	2.673480e-03
## 17	3.413459e-03	9.979670e-04	1.752098e-02	7.680000e-05	1.299382e-02
## 18	3.107177e-03	NA	6.320386e-03	2.332028e-03	NA
## 20	1.052664e-03	1.110522e-03	NA	NA	1.096499e-02
## 23	1.760630e-04	NA	NA	NA	NA
## 24	4.850000e-06	3.720000e-05	5.603460e-04	2.682460e-04	1.519170e-04
## 25	5.910000e-10	1.290000e-07	NA	4.620000e-17	NA
## 34	NA	NA	9.780000e-19	0.000000e+00	1.100000e-08
## 37	2.250000e-05	3.860000e-06	2.512660e-04	2.990000e-07	NA
## 38	2.760000e-07	4.189670e-04	3.390000e-04	0.000000e+00	3.180000e-06
## 44	6.590000e-07	3.020000e-17	8.552825e-03	5.275170e-04	5.110000e-07
## 45	6.570000e-09	3.710000e-06	4.926960e-04	4.619910e-04	2.420000e-06
## 48	1.100000e-05	NA	3.059730e-04	9.880000e-05	NA
## 49	2.100000e-08	1.570000e-06	6.118220e-04	NA	NA
## 56	0.000000e+00	NA	1.840000e-17	9.780000e-16	2.020000e-06
## 57	4.645290e-04	NA	NA	NA	1.940000e-09
## 58	8.080000e-08	NA	NA	NA	4.650000e-05
## 62	8.820000e-09	1.160000e-08	NA	NA	NA
## 73	1.410000e-12	NA	0.000000e+00	NA	NA
## 74	NA	NA	1.630000e-17	NA	NA
## 82	1.880000e-07	NA	1.005753e-03	2.841872e-03	1.590000e-16
##	X2017				
## 1	NA				
## 3	0.000000e+00				
## 4	6.220000e-09				
## 5	NA				
## 8	1.280000e-06				
## 9	1.430000e-16				
## 10	NA				
## 11	NA				
## 12	4.950000e-08				
## 16	5.250000e-05				
## 17	NA				
## 18	NA				
## 20	1.860980e-04				
## 23	9.270000e-06				
## 24	3.230000e-07				
## 25	3.770000e-05				
## 34	NA				
## 37	NA				
## 38	NA				
## 44	5.600000e-05				
## 45	7.020000e-07				
## 48	NA				

```
## 49 6.010000e-06
## 56 0.000000e+00
## 57      NA
## 58 3.290000e-05
## 62 1.720000e-17
## 73 6.880000e-17
## 74 3.064614e-03
## 82 8.490000e-09
```

```
dim(M)
```

```
## [1] 30 21
```



Closeness

```
dfcl= read.csv("C:/Users/amitd/Desktop/FA/MasterCloseness.csv")
dfclthcl = subset(dfcl,dfcl$LowToHigh=="LTH")
dfhtlcl = subset(dfcl,dfcl$HighToLow=="HTL")
dfclpcl = subset(dfcl,dfcl$ConsistentlyLowPerf=="CLP")
dfchpcl = subset(dfcl,dfcl$ConsistentlyHighPerf=="CHP")
```

```
###ConsistentHighPerformers
dfchpcl[,4:24]
```

##	X1997	X1998	X1999	X2000	X2001	X2002
## 2	0.000056700	0.000050800	0.000043500	0.000177008	0.000177694	0.000178939
## 7	NA	0.000050700	NA	NA	0.000177646	0.000040100
## 13	0.000173018	0.000176763	0.000168081	NA	NA	0.000040100

```
## 15 0.000173021 0.000176797 0.000168093 NA 0.000177755 0.000178960
##      X2003      X2004      X2005      X2006      X2007      X2008
## 2  0.000214499      NA      NA 0.000201323 0.000224978      NA
## 7      NA 0.000194157      NA 0.000201344      NA      NA
## 13      NA 0.000194210 0.000199992      NA      NA 0.000220255
## 15 0.000214532 0.000194200 0.000199963 0.000033700 0.000225031      NA
##      X2009      X2010      X2011      X2012      X2013      X2014
## 2  0.000029900      NA      NA 0.000267231 0.000027800 0.000030200
## 7      NA 0.000226519 0.000258295 0.000267305 0.000261782 0.000260929
## 13 0.000237107 0.000030100 0.000258400 0.000267377      NA 0.000260902
## 15 0.000236944 0.000226560      NA      NA 0.000261753 0.000261008
##      X2015      X2016      X2017
## 2  0.000229937 0.000257757      NA
## 7  0.000030400 0.000034000      NA
## 13 0.000229958 0.000257828      NA
## 15 0.000229996      NA 3.88e-05
```

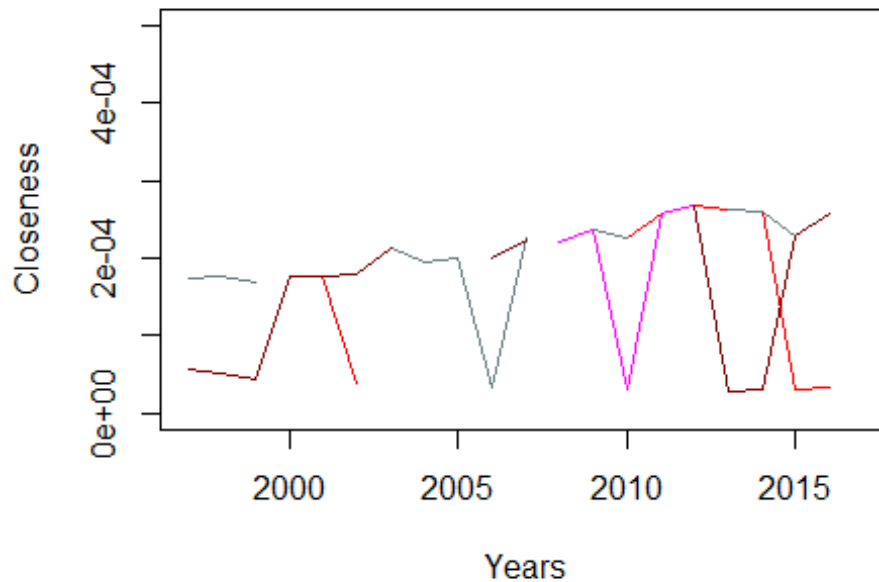
```
M <- as.matrix(dfchpcl[,4:24])
```

```
M
```

```
##      X1997      X1998      X1999      X2000      X2001      X2002
## 2  0.000056700 0.000050800 0.000043500 0.000177008 0.000177694 0.000178939
## 7      NA 0.000050700      NA      NA 0.000177646 0.000040100
## 13 0.000173018 0.000176763 0.000168081      NA      NA 0.000040100
## 15 0.000173021 0.000176797 0.000168093      NA 0.000177755 0.000178960
##      X2003      X2004      X2005      X2006      X2007      X2008
## 2  0.000214499      NA      NA 0.000201323 0.000224978      NA
## 7      NA 0.000194157      NA 0.000201344      NA      NA
## 13      NA 0.000194210 0.000199992      NA      NA 0.000220255
## 15 0.000214532 0.000194200 0.000199963 0.000033700 0.000225031      NA
##      X2009      X2010      X2011      X2012      X2013      X2014
## 2  0.000029900      NA      NA 0.000267231 0.000027800 0.000030200
## 7      NA 0.000226519 0.000258295 0.000267305 0.000261782 0.000260929
## 13 0.000237107 0.000030100 0.000258400 0.000267377      NA 0.000260902
## 15 0.000236944 0.000226560      NA      NA 0.000261753 0.000261008
##      X2015      X2016      X2017
## 2  0.000229937 0.000257757      NA
## 7  0.000030400 0.000034000      NA
## 13 0.000229958 0.000257828      NA
## 15 0.000229996      NA 3.88e-05
```

```
dim(M)
```

```
## [1] 4 21
```



```
###ConsistentLowPerformers
```

```
dfclpcl[,4:24]
```

	X1997	X1998	X1999	X2000	X2001
## 90	0.000173078	0.000176808	0.000168106	0.000177063	0.000177749
## 93	NA	NA	0.000168037	0.000040400	NA
## 94	0.000056600	NA	0.000168074	0.000177033	0.000177761
## 95	NA	0.000176786	NA	0.000177050	NA
## 96	0.000056600	NA	0.000168095	0.000177049	0.000177753
## 97	0.000056600	NA	0.000168069	0.000040400	0.000177690
## 98	0.000173063	0.000176806	0.000168105	0.000177051	0.000177752
## 99	NA	0.000176715	0.000168072	NA	0.000177749
## 100	NA	NA	0.000168078	0.000177039	0.000177759
	X2002	X2003	X2004	X2005	X2006
## 90	0.000178989	0.000214534	0.000194240	0.000200009	0.000201357
## 93	NA	0.000214521	0.000194249	0.000200020	0.000201379
## 94	0.000178996	0.000214544	0.000194263	0.000200017	0.000201386
## 95	0.000178965	0.000214533	0.000194250	0.000200015	0.000201373
## 96	NA	0.000214543	0.000194249	0.000200013	0.000201384
## 97	0.000178972	0.000039000	0.000035400	0.000199939	0.000033700
## 98	0.000178991	0.000214528	0.000194238	0.000033400	0.000201362
## 99	0.000178972	NA	0.000194260	NA	0.000201317
## 100	0.000178983	0.000214518	0.000194242	0.000199979	0.000201361
	X2007	X2008	X2009	X2010	X2011
## 90	0.000225001	0.000220237	0.000237043	0.000226582	0.000258385
## 93	0.000225031	0.000220288	0.000237107	0.000226639	0.000258442
## 94	0.000225046	0.000220278	0.000237113	0.000226629	0.000258446

```
## 95 0.000225020 0.000220268 0.000237081 0.000226614 0.000258410
## 96 0.000225024 0.000220279 0.000237102 0.000226629 0.000258432
## 97 0.000224951 0.000220183 0.000236892 0.000226541 0.000258354
## 98      NA 0.000220230 0.000237016 0.000226586 0.000258379
## 99 0.000225021 0.000220273 0.000237103 0.000226623 0.000258430
## 100 0.000225002 0.000220246 0.000237058 0.000226588 0.000258372
##      X2012      X2013      X2014      X2015      X2016
## 90      NA 0.000261625 0.000260968 0.000229944 0.000257787
## 93 0.000267421 0.000261814 0.000261078 0.000230028 0.000257975
## 94 0.000267433 0.000261831 0.000261085 0.000230041 0.000257983
## 95 0.000267395 0.000261781 0.000261034 0.000230018 0.000257930
## 96 0.000267429 0.000261827 0.000261076 0.000230032 0.000257970
## 97 0.000267344 0.000261793 0.000261025 0.000229972 0.000257914
## 98 0.000267367 0.000261806 0.000260926 0.000229987 0.000257900
## 99 0.000267432 0.000261816 0.000261074 0.000230024 0.000257964
## 100 0.000267356 0.000261757 0.000260978 0.000229980 0.000257920
##      X2017
## 90 0.000038800
## 93 0.000226491
## 94 0.000226484
## 95 0.000226451
## 96 0.000226489
## 97 0.000226441
## 98 0.000226445
## 99 0.000226476
## 100 0.000226443
```

```
M <- as.matrix(dfclpcl[,4:24])
M
```

```
##      X1997      X1998      X1999      X2000      X2001
## 90 0.000173078 0.000176808 0.000168106 0.000177063 0.000177749
## 93      NA      NA 0.000168037 0.000040400      NA
## 94 0.000056600      NA 0.000168074 0.000177033 0.000177761
## 95      NA 0.000176786      NA 0.000177050      NA
## 96 0.000056600      NA 0.000168095 0.000177049 0.000177753
## 97 0.000056600      NA 0.000168069 0.000040400 0.000177690
## 98 0.000173063 0.000176806 0.000168105 0.000177051 0.000177752
## 99      NA 0.000176715 0.000168072      NA 0.000177749
## 100      NA      NA 0.000168078 0.000177039 0.000177759
##      X2002      X2003      X2004      X2005      X2006
## 90 0.000178989 0.000214534 0.000194240 0.000200009 0.000201357
## 93      NA 0.000214521 0.000194249 0.000200020 0.000201379
## 94 0.000178996 0.000214544 0.000194263 0.000200017 0.000201386
## 95 0.000178965 0.000214533 0.000194250 0.000200015 0.000201373
## 96      NA 0.000214543 0.000194249 0.000200013 0.000201384
## 97 0.000178972 0.000039000 0.000035400 0.000199939 0.000033700
## 98 0.000178991 0.000214528 0.000194238 0.000033400 0.000201362
## 99 0.000178972      NA 0.000194260      NA 0.000201317
## 100 0.000178983 0.000214518 0.000194242 0.000199979 0.000201361
```

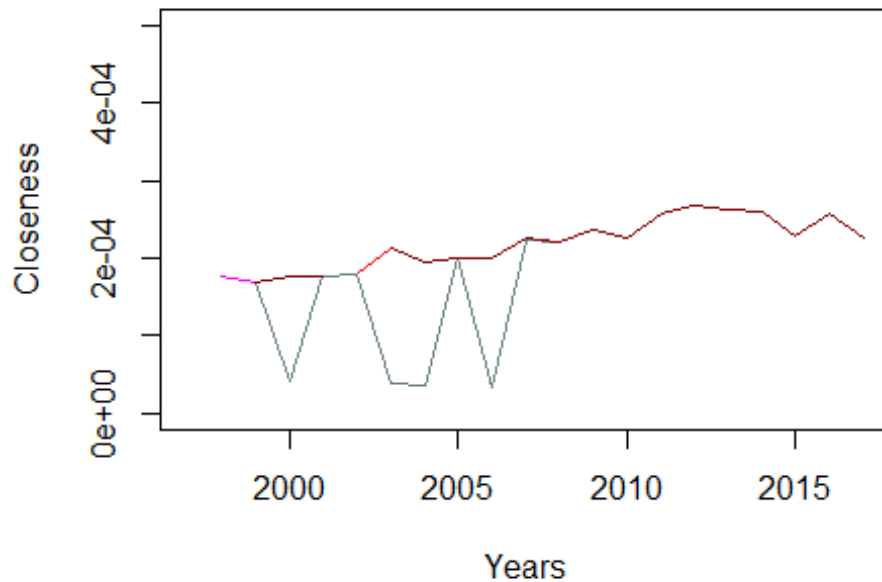
```

##           X2007           X2008           X2009           X2010           X2011
## 90  0.000225001 0.000220237 0.000237043 0.000226582 0.000258385
## 93  0.000225031 0.000220288 0.000237107 0.000226639 0.000258442
## 94  0.000225046 0.000220278 0.000237113 0.000226629 0.000258446
## 95  0.000225020 0.000220268 0.000237081 0.000226614 0.000258410
## 96  0.000225024 0.000220279 0.000237102 0.000226629 0.000258432
## 97  0.000224951 0.000220183 0.000236892 0.000226541 0.000258354
## 98           NA 0.000220230 0.000237016 0.000226586 0.000258379
## 99  0.000225021 0.000220273 0.000237103 0.000226623 0.000258430
## 100 0.000225002 0.000220246 0.000237058 0.000226588 0.000258372
##           X2012           X2013           X2014           X2015           X2016
## 90           NA 0.000261625 0.000260968 0.000229944 0.000257787
## 93  0.000267421 0.000261814 0.000261078 0.000230028 0.000257975
## 94  0.000267433 0.000261831 0.000261085 0.000230041 0.000257983
## 95  0.000267395 0.000261781 0.000261034 0.000230018 0.000257930
## 96  0.000267429 0.000261827 0.000261076 0.000230032 0.000257970
## 97  0.000267344 0.000261793 0.000261025 0.000229972 0.000257914
## 98  0.000267367 0.000261806 0.000260926 0.000229987 0.000257900
## 99  0.000267432 0.000261816 0.000261074 0.000230024 0.000257964
## 100 0.000267356 0.000261757 0.000260978 0.000229980 0.000257920
##           X2017
## 90  0.000038800
## 93  0.000226491
## 94  0.000226484
## 95  0.000226451
## 96  0.000226489
## 97  0.000226441
## 98  0.000226445
## 99  0.000226476
## 100 0.000226443

dim(M)

## [1]  9 21

```



```
###HighToLowPerformers
```

```
dfhtlcl[,4:24]
```

	X1997	X1998	X1999	X2000	X2001	X2002
## 2	0.000056700	0.000050800	0.000043500	0.000177008	0.000177694	0.000178939
## 27	0.000056600	0.000050800	0.000043500	0.000040400	NA	NA
## 28	0.000173068	0.000176784	0.000168086	NA	0.000177726	0.000178988
## 39	0.000173067	NA	NA	NA	0.000177740	0.000178981
## 46	NA	NA	0.000168094	0.000177042	NA	NA
## 54	NA	0.000050800	NA	NA	0.000040800	NA
## 55	NA	0.000176787	NA	0.000177019	NA	NA
## 66	0.000056600	NA	NA	NA	NA	NA
## 69	NA	0.000050700	NA	0.000040400	NA	0.000178959
## 75	NA	NA	0.000167988	NA	NA	0.000178949
## 83	0.000056600	0.000176786	0.000168083	0.000177014	0.000040800	0.000178966
## 90	0.000173078	0.000176808	0.000168106	0.000177063	0.000177749	0.000178989
## 98	0.000173063	0.000176806	0.000168105	0.000177051	0.000177752	0.000178991
	X2003	X2004	X2005	X2006	X2007	X2008
## 2	0.000214499	NA	NA	0.000201323	0.000224978	NA
## 27	0.000214432	0.000194209	NA	0.000201307	0.000224975	0.000220165
## 28	0.000214531	0.000194224	0.000199942	0.000201327	NA	0.000220208
## 39	NA	0.000035400	0.000200010	NA	0.000225037	0.000220282
## 46	NA	NA	0.000200009	0.000201375	0.000225009	0.000220204
## 54	0.000039000	NA	0.000199946	0.000033700	NA	NA
## 55	0.000039000	0.000194189	NA	0.000033700	NA	NA
## 66	0.000039000	0.000035400	0.000033400	0.000201213	0.000224846	0.000031500
## 69	0.000214446	0.000035400	0.000199910	0.000033700	0.000032300	0.000220082


```
## 75 0.000214531 0.000194236 0.000199950 NA 0.000225028 0.000220233
## 83 NA 0.000194206 0.000199983 0.000201335 0.000224997 0.000220226
## 90 0.000214534 0.000194240 0.000200009 0.000201357 0.000225001 0.000220237
## 98 0.000214528 0.000194238 0.000033400 0.000201362 NA 0.000220230
## X2009 X2010 X2011 X2012 X2013 X2014
## 2 0.000029900 NA NA 0.000267231 0.000027800 0.000030200
## 27 0.000029900 NA 0.000258399 NA 0.000261721 0.000261003
## 28 0.000237084 NA 0.000258415 NA 0.000261776 0.000261002
## 39 0.000237089 0.000226629 0.000258415 0.000267402 0.000261814 0.000261061
## 46 0.000237093 0.000226609 0.000258343 0.000267413 0.000261824 0.000261060
## 54 0.000029900 0.000030000 NA 0.000027900 0.000261664 NA
## 55 0.000237004 0.000226393 0.000027700 0.000267397 NA NA
## 66 NA 0.000030000 NA 0.000267306 0.000027800 0.000260970
## 69 0.000029900 NA NA 0.000027900 NA NA
## 75 0.000237058 NA NA 0.000267382 0.000027800 NA
## 83 0.000237021 0.000226551 0.000258353 0.000267356 0.000261768 0.000260963
## 90 0.000237043 0.000226582 0.000258385 NA 0.000261625 0.000260968
## 98 0.000237016 0.000226586 0.000258379 0.000267367 0.000261806 0.000260926
## X2015 X2016 X2017
## 2 0.000229937 0.000257757 NA
## 27 0.000229973 NA NA
## 28 0.000230012 0.000257836 NA
## 39 0.000230022 0.000257967 0.000226472
## 46 0.000230019 0.000257968 0.000226469
## 54 NA 0.000034000 NA
## 55 NA 0.000257892 NA
## 66 0.000229956 0.000257837 NA
## 69 0.000229890 NA NA
## 75 0.000229936 NA NA
## 83 0.000229949 0.000257936 0.000226333
## 90 0.000229944 0.000257787 0.000038800
## 98 0.000229987 0.000257900 0.000226445
```

```
M <- as.matrix(dfhtlcl[,4:24])
M
```

```
## X1997 X1998 X1999 X2000 X2001 X2002
## 2 0.000056700 0.000050800 0.000043500 0.000177008 0.000177694 0.000178939
## 27 0.000056600 0.000050800 0.000043500 0.000040400 NA NA
## 28 0.000173068 0.000176784 0.000168086 NA 0.000177726 0.000178988
## 39 0.000173067 NA NA NA 0.000177740 0.000178981
## 46 NA NA 0.000168094 0.000177042 NA NA
## 54 NA 0.000050800 NA NA 0.000040800 NA
## 55 NA 0.000176787 NA 0.000177019 NA NA
## 66 0.000056600 NA NA NA NA NA
## 69 NA 0.000050700 NA 0.000040400 NA 0.000178959
## 75 NA NA 0.000167988 NA NA 0.000178949
## 83 0.000056600 0.000176786 0.000168083 0.000177014 0.000040800 0.000178966
## 90 0.000173078 0.000176808 0.000168106 0.000177063 0.000177749 0.000178989
## 98 0.000173063 0.000176806 0.000168105 0.000177051 0.000177752 0.000178991
```

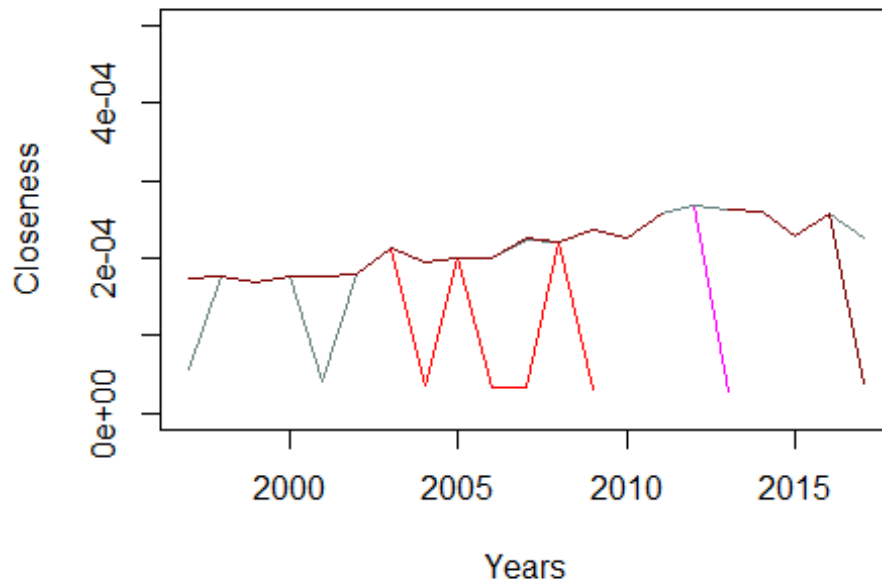
```

##          X2003          X2004          X2005          X2006          X2007          X2008
## 2  0.000214499          NA          NA  0.000201323  0.000224978          NA
## 27 0.000214432 0.000194209          NA  0.000201307  0.000224975 0.000220165
## 28 0.000214531 0.000194224 0.000199942 0.000201327          NA 0.000220208
## 39          NA 0.000035400 0.000200010          NA 0.000225037 0.000220282
## 46          NA          NA 0.000200009 0.000201375 0.000225009 0.000220204
## 54 0.000039000          NA 0.000199946 0.000033700          NA          NA
## 55 0.000039000 0.000194189          NA 0.000033700          NA          NA
## 66 0.000039000 0.000035400 0.000033400 0.000201213 0.000224846 0.000031500
## 69 0.000214446 0.000035400 0.000199910 0.000033700 0.000032300 0.000220082
## 75 0.000214531 0.000194236 0.000199950          NA 0.000225028 0.000220233
## 83          NA 0.000194206 0.000199983 0.000201335 0.000224997 0.000220226
## 90 0.000214534 0.000194240 0.000200009 0.000201357 0.000225001 0.000220237
## 98 0.000214528 0.000194238 0.000033400 0.000201362          NA 0.000220230
##          X2009          X2010          X2011          X2012          X2013          X2014
## 2  0.000029900          NA          NA  0.000267231  0.000027800 0.000030200
## 27 0.000029900          NA 0.000258399          NA 0.000261721 0.000261003
## 28 0.000237084          NA 0.000258415          NA 0.000261776 0.000261002
## 39 0.000237089 0.000226629 0.000258415 0.000267402 0.000261814 0.000261061
## 46 0.000237093 0.000226609 0.000258343 0.000267413 0.000261824 0.000261060
## 54 0.000029900 0.000030000          NA 0.000027900 0.000261664          NA
## 55 0.000237004 0.000226393 0.000027700 0.000267397          NA          NA
## 66          NA 0.000030000          NA 0.000267306 0.000027800 0.000260970
## 69 0.000029900          NA          NA 0.000027900          NA          NA
## 75 0.000237058          NA          NA 0.000267382 0.000027800          NA
## 83 0.000237021 0.000226551 0.000258353 0.000267356 0.000261768 0.000260963
## 90 0.000237043 0.000226582 0.000258385          NA 0.000261625 0.000260968
## 98 0.000237016 0.000226586 0.000258379 0.000267367 0.000261806 0.000260926
##          X2015          X2016          X2017
## 2  0.000229937 0.000257757          NA
## 27 0.000229973          NA          NA
## 28 0.000230012 0.000257836          NA
## 39 0.000230022 0.000257967 0.000226472
## 46 0.000230019 0.000257968 0.000226469
## 54          NA 0.000034000          NA
## 55          NA 0.000257892          NA
## 66 0.000229956 0.000257837          NA
## 69 0.000229890          NA          NA
## 75 0.000229936          NA          NA
## 83 0.000229949 0.000257936 0.000226333
## 90 0.000229944 0.000257787 0.000038800
## 98 0.000229987 0.000257900 0.000226445

```

```
dim(M)
```

```
## [1] 13 21
```



###LowToHighPerformers

dflthcl[,4:24]

##	X1997	X1998	X1999	X2000	X2001	X2002
## 1	NA	0.000050700	0.000043500	NA	0.000177707	0.000178931
## 3	NA	NA	0.000043500	0.000040400	0.000040800	NA
## 4	NA	0.000176783	NA	0.000177073	0.000177769	NA
## 5	0.000056700	NA	0.000043500	NA	0.000040800	0.000178902
## 8	0.000173072	0.000176787	0.000168101	0.000177059	0.000177750	0.000178986
## 9	NA	NA	0.000043500	0.000040400	NA	0.000040100
## 10	NA	NA	0.000043500	0.000177055	NA	NA
## 11	NA	NA	0.000168080	NA	0.000177721	NA
## 12	0.000173026	0.000050700	0.000043500	NA	0.000177749	NA
## 16	NA	NA	0.000168072	0.000177067	0.000177710	0.000179011
## 17	0.000173073	0.000050800	0.000168093	0.000177062	NA	0.000040100
## 18	NA	0.000050700	NA	NA	0.000040800	NA
## 20	NA	NA	0.000043500	0.000040400	NA	NA
## 23	0.000173072	0.000176797	0.000168085	0.000177045	0.000177751	0.000178980
## 24	0.000173067	0.000176792	0.000168081	0.000177050	0.000177741	0.000040100
## 25	0.000056600	0.000176767	NA	0.000040400	0.000177734	0.000178945
## 34	NA	0.000050800	0.000043500	0.000040400	NA	NA
## 37	0.000173073	0.000176796	NA	0.000177049	0.000177747	NA
## 38	0.000173040	0.000050800	NA	NA	0.000177741	0.000178974
## 44	0.000173043	NA	NA	NA	NA	0.000178978
## 45	0.000173061	0.000176794	0.000168095	0.000177050	0.000177746	0.000178984
## 48	NA	0.000176774	0.000168081	0.000177041	NA	0.000040100
## 49	0.000173068	0.000176801	0.000168104	0.000177063	NA	NA

## 56	0.000172986	NA	0.000168000	0.000176991	0.000040800	NA
## 57	NA	NA	0.000043500	NA	0.000040800	NA
## 58	NA	0.000176789	NA	NA	NA	0.000178937
## 62	NA	0.000050700	0.000168075	NA	0.000040800	0.000040100
## 73	0.000056600	NA	NA	NA	0.000040800	0.000040100
## 74	NA	0.000176791	0.000043500	NA	0.000177740	NA
## 82	NA	0.000176792	0.000168067	0.000177032	0.000177771	0.000178976
##	X2003	X2004	X2005	X2006	X2007	X2008
## 1	0.000214465	0.000194169	NA	NA	0.000032300	0.000220207
## 3	NA	0.000194221	0.000199991	0.000033700	NA	NA
## 4	0.000214522	0.000035400	0.000033400	NA	0.000224936	NA
## 5	0.000214478	0.000035400	0.000199929	0.000201323	0.000032400	0.000220127
## 8	NA	0.000194221	0.000199991	0.000201369	0.000225029	0.000220218
## 9	0.000214513	0.000035400	0.000199959	0.000033700	0.000032300	NA
## 10	0.000039000	0.000194081	NA	0.000033700	0.000224937	0.000220057
## 11	0.000214499	0.000194223	0.000199992	NA	0.000225011	NA
## 12	0.000214449	0.000194211	0.000199962	0.000201341	0.000225012	0.000220239
## 16	NA	NA	0.000200002	0.000201355	0.000225028	NA
## 17	0.000214532	0.000035400	0.000033400	0.000201351	NA	0.000220254
## 18	0.000214537	0.000194260	0.000199990	0.000201370	0.000224999	0.000220265
## 20	NA	NA	0.000200000	0.000201363	NA	0.000031500
## 23	0.000214497	0.000194254	0.000199994	0.000201368	0.000225018	0.000220258
## 24	0.000039000	0.000194229	0.000200020	0.000201360	0.000224995	0.000220232
## 25	0.000214524	0.000194185	0.000199959	0.000201332	0.000225011	0.000220245
## 34	NA	NA	0.000033400	0.000033700	0.000032300	0.000031500
## 37	0.000039000	0.000194235	0.000199976	NA	0.000224998	0.000220217
## 38	0.000039000	0.000194246	0.000199942	0.000033700	0.000225029	NA
## 44	NA	0.000194211	0.000199962	0.000201384	NA	NA
## 45	0.000214541	0.000194250	0.000200010	NA	0.000032300	0.000220235
## 48	NA	NA	0.000199986	0.000201358	0.000225006	0.000220246
## 49	NA	0.000194222	0.000200025	0.000201353	0.000225015	0.000220225
## 56	0.000039000	0.000035400	NA	NA	0.000224967	0.000031500
## 57	0.000039000	NA	NA	0.000033700	NA	NA
## 58	0.000214471	0.000194253	0.000200015	0.000201357	NA	0.000220241
## 62	NA	0.000035400	NA	0.000033700	NA	0.000031500
## 73	0.000039000	0.000194214	0.000033400	NA	0.000225014	0.000219927
## 74	0.000039000	NA	NA	0.000201320	0.000224935	0.000031500
## 82	0.000214510	0.000194244	NA	0.000201337	NA	0.000220288
##	X2009	X2010	X2011	X2012	X2013	X2014
## 1	NA	NA	0.000027700	0.000267289	NA	NA
## 3	NA	0.000030000	0.000027700	0.000027900	0.000027800	0.000030200
## 4	NA	0.000226549	NA	0.000267204	0.000261734	NA
## 5	0.000236996	0.000226523	0.000027700	NA	0.000261700	NA
## 8	0.000237054	0.000226533	NA	0.000267345	NA	0.000260982
## 9	NA	0.000030100	NA	0.000267133	0.000027800	NA
## 10	NA	0.000226397	0.000258207	0.000267262	0.000027800	0.000030200
## 11	NA	NA	0.000258298	0.000267312	0.000261715	NA
## 12	0.000237039	0.000226570	0.000258338	0.000267283	0.000261500	0.000261008
## 16	0.000237084	0.000226597	0.000258431	0.000267414	0.000261826	0.000261067
## 17	NA	0.000226614	0.000258427	0.000267414	0.000261804	0.000261052

## 18	NA	0.000226610	NA	0.000267411	NA	0.000261038
## 20	0.000237093	0.000226628	NA	0.000267399	0.000261808	NA
## 23	0.000237080	NA	0.000258388	0.000267380	NA	NA
## 24	0.000237059	0.000226587	0.000258354	0.000267352	0.000261780	0.000261028
## 25	0.000237010	NA	0.000258301	0.000267221	0.000261703	NA
## 34	0.000029900	0.000030000	0.000027700	NA	NA	0.000030200
## 37	0.000237019	0.000226590	0.000258400	0.000267374	0.000261767	0.000261021
## 38	NA	NA	0.000027700	0.000267305	0.000261791	0.000261001
## 44	NA	0.000226486	NA	0.000267310	0.000027800	0.000261041
## 45	0.000237035	0.000226544	0.000258292	0.000267273	0.000261756	0.000261017
## 48	0.000237038	0.000226585	0.000258376	0.000267358	NA	0.000261016
## 49	0.000237035	NA	NA	0.000267276	0.000261748	0.000261023
## 56	0.000237035	NA	NA	0.000027900	NA	0.000030200
## 57	NA	0.000030100	NA	0.000267389	NA	NA
## 58	0.000236999	NA	0.000258300	0.000267304	NA	NA
## 62	NA	0.000226527	NA	0.000267254	0.000261675	NA
## 73	0.000029900	NA	NA	0.000267135	NA	0.000030200
## 74	0.000237107	NA	NA	NA	NA	0.000030200
## 82	0.000237016	0.000030100	0.000258420	0.000267299	NA	0.000261012
##	X2015	X2016	X2017			
## 1	0.000229892	NA	NA			
## 3	0.000030400	NA	0.000038800			
## 4	NA	NA	0.000226378			
## 5	NA	0.000257882	NA			
## 8	NA	0.000257906	0.000226432			
## 9	0.000030400	0.000034000	0.000038800			
## 10	0.000030400	0.000034000	NA			
## 11	0.000229929	NA	NA			
## 12	0.000229992	0.000257841	0.000226392			
## 16	0.000229998	0.000257956	0.000226467			
## 17	0.000229975	0.000257969	NA			
## 18	0.000230000	NA	NA			
## 20	NA	0.000257966	0.000226477			
## 23	NA	NA	0.000226454			
## 24	0.000229991	0.000257931	0.000226425			
## 25	0.000030400	NA	0.000226463			
## 34	0.000030400	0.000257829	NA			
## 37	0.000229911	NA	NA			
## 38	0.000030400	0.000257887	NA			
## 44	0.000229983	0.000257870	0.000226427			
## 45	0.000229986	0.000257900	0.000226434			
## 48	0.000229967	NA	NA			
## 49	NA	NA	0.000226450			
## 56	0.000229736	0.000257892	0.000038800			
## 57	NA	0.000257792	NA			
## 58	NA	0.000257880	0.000226451			
## 62	NA	NA	0.000038800			
## 73	NA	NA	0.000038800			
## 74	NA	NA	0.000226425			
## 82	0.000230008	0.000034000	0.000226387			

```
M <- as.matrix(dflthcl[,4:24])
```

```
M
```

##	X1997	X1998	X1999	X2000	X2001	X2002
## 1	NA	0.000050700	0.000043500	NA	0.000177707	0.000178931
## 3	NA	NA	0.000043500	0.000040400	0.000040800	NA
## 4	NA	0.000176783	NA	0.000177073	0.000177769	NA
## 5	0.000056700	NA	0.000043500	NA	0.000040800	0.000178902
## 8	0.000173072	0.000176787	0.000168101	0.000177059	0.000177750	0.000178986
## 9	NA	NA	0.000043500	0.000040400	NA	0.000040100
## 10	NA	NA	0.000043500	0.000177055	NA	NA
## 11	NA	NA	0.000168080	NA	0.000177721	NA
## 12	0.000173026	0.000050700	0.000043500	NA	0.000177749	NA
## 16	NA	NA	0.000168072	0.000177067	0.000177710	0.000179011
## 17	0.000173073	0.000050800	0.000168093	0.000177062	NA	0.000040100
## 18	NA	0.000050700	NA	NA	0.000040800	NA
## 20	NA	NA	0.000043500	0.000040400	NA	NA
## 23	0.000173072	0.000176797	0.000168085	0.000177045	0.000177751	0.000178980
## 24	0.000173067	0.000176792	0.000168081	0.000177050	0.000177741	0.000040100
## 25	0.000056600	0.000176767	NA	0.000040400	0.000177734	0.000178945
## 34	NA	0.000050800	0.000043500	0.000040400	NA	NA
## 37	0.000173073	0.000176796	NA	0.000177049	0.000177747	NA
## 38	0.000173040	0.000050800	NA	NA	0.000177741	0.000178974
## 44	0.000173043	NA	NA	NA	NA	0.000178978
## 45	0.000173061	0.000176794	0.000168095	0.000177050	0.000177746	0.000178984
## 48	NA	0.000176774	0.000168081	0.000177041	NA	0.000040100
## 49	0.000173068	0.000176801	0.000168104	0.000177063	NA	NA
## 56	0.000172986	NA	0.000168000	0.000176991	0.000040800	NA
## 57	NA	NA	0.000043500	NA	0.000040800	NA
## 58	NA	0.000176789	NA	NA	NA	0.000178937
## 62	NA	0.000050700	0.000168075	NA	0.000040800	0.000040100
## 73	0.000056600	NA	NA	NA	0.000040800	0.000040100
## 74	NA	0.000176791	0.000043500	NA	0.000177740	NA
## 82	NA	0.000176792	0.000168067	0.000177032	0.000177771	0.000178976
##	X2003	X2004	X2005	X2006	X2007	X2008
## 1	0.000214465	0.000194169	NA	NA	0.000032300	0.000220207
## 3	NA	0.000194221	0.000199991	0.000033700	NA	NA
## 4	0.000214522	0.000035400	0.000033400	NA	0.000224936	NA
## 5	0.000214478	0.000035400	0.000199929	0.000201323	0.000032400	0.000220127
## 8	NA	0.000194221	0.000199991	0.000201369	0.000225029	0.000220218
## 9	0.000214513	0.000035400	0.000199959	0.000033700	0.000032300	NA
## 10	0.000039000	0.000194081	NA	0.000033700	0.000224937	0.000220057
## 11	0.000214499	0.000194223	0.000199992	NA	0.000225011	NA
## 12	0.000214449	0.000194211	0.000199962	0.000201341	0.000225012	0.000220239
## 16	NA	NA	0.000200002	0.000201355	0.000225028	NA
## 17	0.000214532	0.000035400	0.000033400	0.000201351	NA	0.000220254
## 18	0.000214537	0.000194260	0.000199990	0.000201370	0.000224999	0.000220265
## 20	NA	NA	0.000200000	0.000201363	NA	0.000031500
## 23	0.000214497	0.000194254	0.000199994	0.000201368	0.000225018	0.000220258
## 24	0.000039000	0.000194229	0.000200020	0.000201360	0.000224995	0.000220232

## 25	0.000214524	0.000194185	0.000199959	0.000201332	0.000225011	0.000220245
## 34	NA	NA	0.000033400	0.000033700	0.000032300	0.000031500
## 37	0.000039000	0.000194235	0.000199976	NA	0.000224998	0.000220217
## 38	0.000039000	0.000194246	0.000199942	0.000033700	0.000225029	NA
## 44	NA	0.000194211	0.000199962	0.000201384	NA	NA
## 45	0.000214541	0.000194250	0.000200010	NA	0.000032300	0.000220235
## 48	NA	NA	0.000199986	0.000201358	0.000225006	0.000220246
## 49	NA	0.000194222	0.000200025	0.000201353	0.000225015	0.000220225
## 56	0.000039000	0.000035400	NA	NA	0.000224967	0.000031500
## 57	0.000039000	NA	NA	0.000033700	NA	NA
## 58	0.000214471	0.000194253	0.000200015	0.000201357	NA	0.000220241
## 62	NA	0.000035400	NA	0.000033700	NA	0.000031500
## 73	0.000039000	0.000194214	0.000033400	NA	0.000225014	0.000219927
## 74	0.000039000	NA	NA	0.000201320	0.000224935	0.000031500
## 82	0.000214510	0.000194244	NA	0.000201337	NA	0.000220288
##	X2009	X2010	X2011	X2012	X2013	X2014
## 1	NA	NA	0.000027700	0.000267289	NA	NA
## 3	NA	0.000030000	0.000027700	0.000027900	0.000027800	0.000030200
## 4	NA	0.000226549	NA	0.000267204	0.000261734	NA
## 5	0.000236996	0.000226523	0.000027700	NA	0.000261700	NA
## 8	0.000237054	0.000226533	NA	0.000267345	NA	0.000260982
## 9	NA	0.000030100	NA	0.000267133	0.000027800	NA
## 10	NA	0.000226397	0.000258207	0.000267262	0.000027800	0.000030200
## 11	NA	NA	0.000258298	0.000267312	0.000261715	NA
## 12	0.000237039	0.000226570	0.000258338	0.000267283	0.000261500	0.000261008
## 16	0.000237084	0.000226597	0.000258431	0.000267414	0.000261826	0.000261067
## 17	NA	0.000226614	0.000258427	0.000267414	0.000261804	0.000261052
## 18	NA	0.000226610	NA	0.000267411	NA	0.000261038
## 20	0.000237093	0.000226628	NA	0.000267399	0.000261808	NA
## 23	0.000237080	NA	0.000258388	0.000267380	NA	NA
## 24	0.000237059	0.000226587	0.000258354	0.000267352	0.000261780	0.000261028
## 25	0.000237010	NA	0.000258301	0.000267221	0.000261703	NA
## 34	0.000029900	0.000030000	0.000027700	NA	NA	0.000030200
## 37	0.000237019	0.000226590	0.000258400	0.000267374	0.000261767	0.000261021
## 38	NA	NA	0.000027700	0.000267305	0.000261791	0.000261001
## 44	NA	0.000226486	NA	0.000267310	0.000027800	0.000261041
## 45	0.000237035	0.000226544	0.000258292	0.000267273	0.000261756	0.000261017
## 48	0.000237038	0.000226585	0.000258376	0.000267358	NA	0.000261016
## 49	0.000237035	NA	NA	0.000267276	0.000261748	0.000261023
## 56	0.000237035	NA	NA	0.000027900	NA	0.000030200
## 57	NA	0.000030100	NA	0.000267389	NA	NA
## 58	0.000236999	NA	0.000258300	0.000267304	NA	NA
## 62	NA	0.000226527	NA	0.000267254	0.000261675	NA
## 73	0.000029900	NA	NA	0.000267135	NA	0.000030200
## 74	0.000237107	NA	NA	NA	NA	0.000030200
## 82	0.000237016	0.000030100	0.000258420	0.000267299	NA	0.000261012
##	X2015	X2016	X2017			
## 1	0.000229892	NA	NA			
## 3	0.000030400	NA	0.000038800			
## 4	NA	NA	0.000226378			

```
## 5      NA 0.000257882      NA
## 8      NA 0.000257906 0.000226432
## 9 0.000030400 0.000034000 0.000038800
## 10 0.000030400 0.000034000      NA
## 11 0.000229929      NA      NA
## 12 0.000229992 0.000257841 0.000226392
## 16 0.000229998 0.000257956 0.000226467
## 17 0.000229975 0.000257969      NA
## 18 0.000230000      NA      NA
## 20      NA 0.000257966 0.000226477
## 23      NA      NA 0.000226454
## 24 0.000229991 0.000257931 0.000226425
## 25 0.000030400      NA 0.000226463
## 34 0.000030400 0.000257829      NA
## 37 0.000229911      NA      NA
## 38 0.000030400 0.000257887      NA
## 44 0.000229983 0.000257870 0.000226427
## 45 0.000229986 0.000257900 0.000226434
## 48 0.000229967      NA      NA
## 49      NA      NA 0.000226450
## 56 0.000229736 0.000257892 0.000038800
## 57      NA 0.000257792      NA
## 58      NA 0.000257880 0.000226451
## 62      NA      NA 0.000038800
## 73      NA      NA 0.000038800
## 74      NA      NA 0.000226425
## 82 0.000230008 0.000034000 0.000226387
```

```
dim(M)
```

```
## [1] 30 21
```