

# Multivariate Analysis

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## Abstract

## Introduction

## Methodology

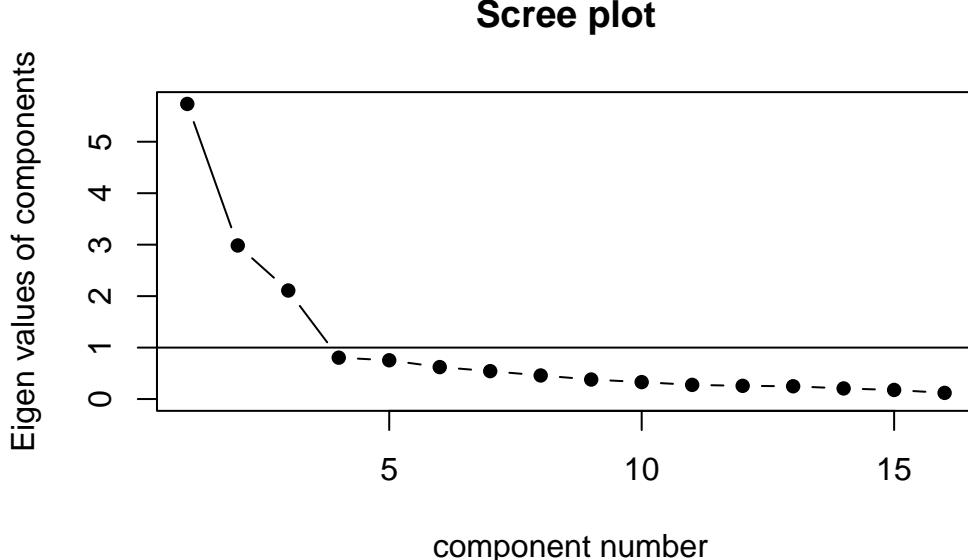
```
Kaiser-Meyer-Olkin factor adequacy
Call: KMO(r = scaled_data)
Overall MSA =  0.86
MSA for each item =
trstprl trstlgl trstplt trstprrt  trstep   trstun imbgeco imueclt imwbcnt imsmetn
      0.92     0.93     0.82     0.83     0.86     0.85     0.93     0.90     0.89     0.90
imdfetn impcntr eqwrkbg eqpolbg eqmgmbg eqpaybg
      0.83     0.87     0.91     0.79     0.77     0.89
```

After executing the Kaiser-Meyer-Olkin test, the MSA (measure of sampling accuracy, which varies between 0 and 1) is calculated as 0.86. This is classified as “meritorious”, so we have an indication that factor analysis is suitable for this data set.

We'll start by performing factor analysis with a high number of values:

	RC2	RC3	RC4	RC5	RC9	RC6	RC10	RC7	RC12
SS loadings	2.667	1.908	1.859	1.090	1.046	1.003	0.977	0.964	0.932
Proportion Var	0.167	0.119	0.116	0.068	0.065	0.063	0.061	0.060	0.058
Cumulative Var	0.167	0.286	0.402	0.470	0.536	0.598	0.659	0.720	0.778
Proportion Explained	0.167	0.119	0.116	0.068	0.065	0.063	0.061	0.060	0.058
Cumulative Proportion	0.167	0.286	0.402	0.470	0.536	0.598	0.659	0.720	0.778
	RC8	RC1	RC13	RC11	RC15	RC14	RC16		
SS loadings	0.913	0.910	0.710	0.461	0.231	0.210	0.120		

Proportion Var	0.057	0.057	0.044	0.029	0.014	0.013	0.008		
Cumulative Var	0.835	0.892	0.936	0.965	0.979	0.992	1.000		
Proportion Explained	0.057	0.057	0.044	0.029	0.014	0.013	0.008		
Cumulative Proportion	0.835	0.892	0.936	0.965	0.979	0.992	1.000		
	MR4	MR1	MR2	MR3	MR5	MR6	MR7	MR8	MR9
SS loadings	2.152	2.122	1.806	1.632	1.511	1.315	0.948	0.085	0.063
Proportion Var	0.135	0.133	0.113	0.102	0.094	0.082	0.059	0.005	0.004
Cumulative Var	0.135	0.267	0.380	0.482	0.576	0.659	0.718	0.723	0.727
Proportion Explained	0.182	0.180	0.153	0.138	0.128	0.111	0.080	0.007	0.005
Cumulative Proportion	0.182	0.362	0.515	0.653	0.781	0.893	0.973	0.980	0.985
	MR11	MR10	MR12	MR15	MR13	MR14	MR16		
SS loadings	0.061	0.047	0.025	0.018	0.013	0.009	0.000		
Proportion Var	0.004	0.003	0.002	0.001	0.001	0.001	0.000		
Cumulative Var	0.731	0.734	0.735	0.737	0.737	0.738	0.738		
Proportion Explained	0.005	0.004	0.002	0.002	0.001	0.001	0.000		
Cumulative Proportion	0.990	0.994	0.997	0.998	0.999	1.000	1.000		



```

pcf_varimax <- principal(scaled_data, nfactors = 3, rotate = "varimax", scores = TRUE)
pcf_quartimax <- principal(scaled_data, nfactors = 3, rotate = "quartimax")
paf_varimax <- fa(scaled_data, nfactors = 3, rotate = "varimax")
paf_quartimax <- fa(scaled_data, nfactors = 3, rotate = "quartimax")
print(pcf_varimax$loadings, cutoff = 0.6, digits = 3)

```

Loadings:

	RC2	RC1	RC3
trstprl	0.846		
trstlgl	0.742		
trstplt	0.885		
trstprrt	0.878		
trstep	0.773		
trstun	0.725		
imbgeco		0.770	
imueclt		0.770	
imwbcnt		0.775	
imsmetn		0.766	
imdftn		0.862	
impctr		0.830	
eqwrkbg		0.703	
eqpolbg		0.853	
eqmgmbg		0.872	
eqpaybg		0.789	

	RC2	RC1	RC3
SS loadings	4.129	3.980	2.719
Proportion Var	0.258	0.249	0.170
Cumulative Var	0.258	0.507	0.677

```
print(pcf_quartimax$loadings, cutoff = 0.6, digits = 3)
```

Loadings:

	RC2	RC1	RC3
trstprl	0.846		
trstlgl	0.742		
trstplt	0.885		
trstprrt	0.878		
trstep	0.773		
trstun	0.725		
imbgeco		0.772	
imueclt		0.772	
imwbcnt		0.777	
imsmetn		0.768	

```
imdfetn      0.865
impctr       0.832
eqwrkbg      0.702
eqpolbg      0.850
eqmgmbg      0.869
eqpaybg      0.786
```

```
          RC2   RC1   RC3
SS loadings  4.130 4.017 2.681
Proportion Var 0.258 0.251 0.168
Cumulative Var 0.258 0.509 0.677
```

```
print(paf_varimax$loadings, cutoff = 0.6, digits = 3)
```

Loadings:

```
          MR2   MR1   MR3
trstprl  0.819
trstlgl  0.670
trstplt  0.879
trstpnt  0.867
trstep   0.717
trstun   0.656
imbgeco   0.720
imueclt   0.724
imwbcnt   0.727
imsmttn   0.694
imdfetn   0.843
impctr    0.794
eqwrkbg
eqpolbg   0.833
eqmgmbg   0.873
eqpaybg   0.685
```

```
          MR2   MR1   MR3
SS loadings  3.780 3.580 2.364
Proportion Var 0.236 0.224 0.148
Cumulative Var 0.236 0.460 0.608
```

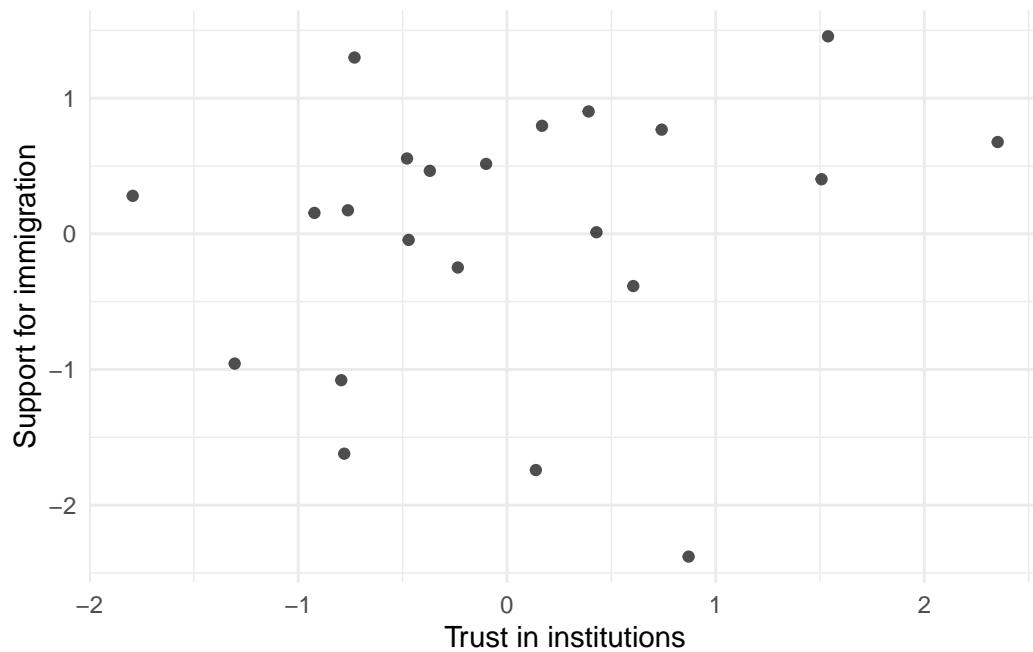
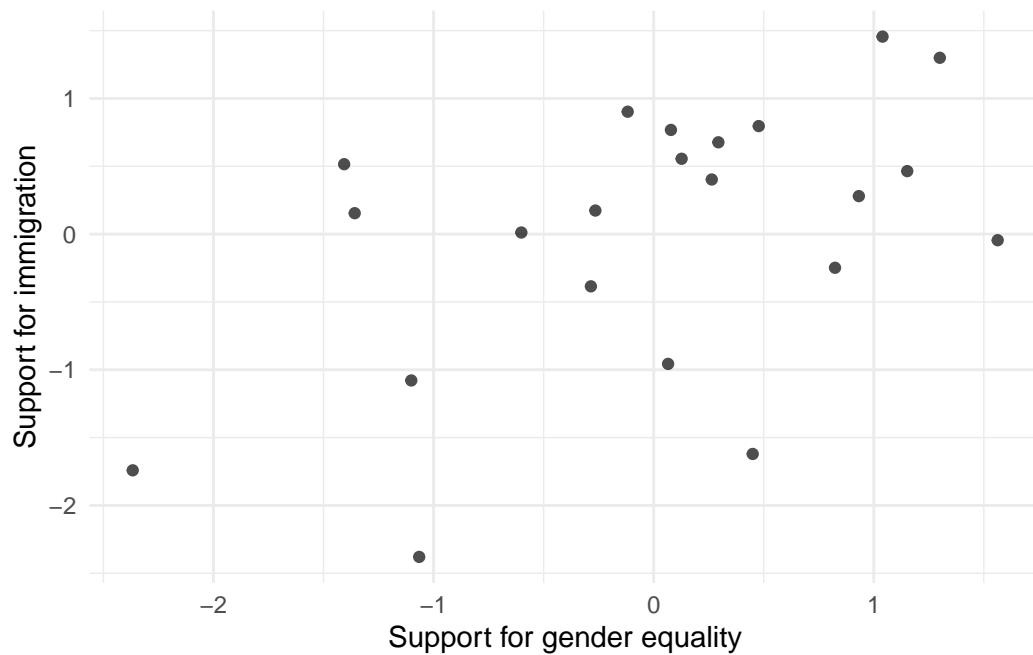
```
print(paf_quartimax$loadings, cutoff = 0.6, digits = 3)
```

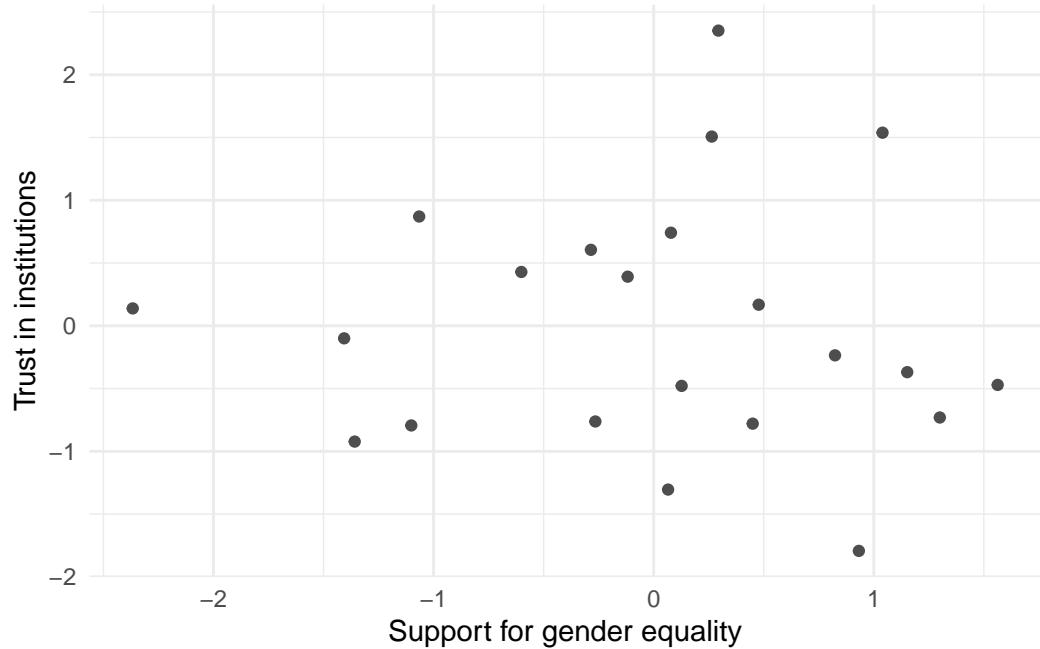
**Loadings:**

	MR2	MR1	MR3
trstprl	0.819		
trstlgl	0.670		
trstplt	0.879		
trstprt	0.867		
trstep	0.717		
trstun	0.655		
imbgeco		0.723	
imueclt		0.728	
imwbcnt		0.729	
imsmetn		0.697	
imdfetn		0.848	
impctr		0.799	
eqwrkbg			
eqpolbg		0.828	
eqmgmbg		0.868	
eqpaybg		0.680	

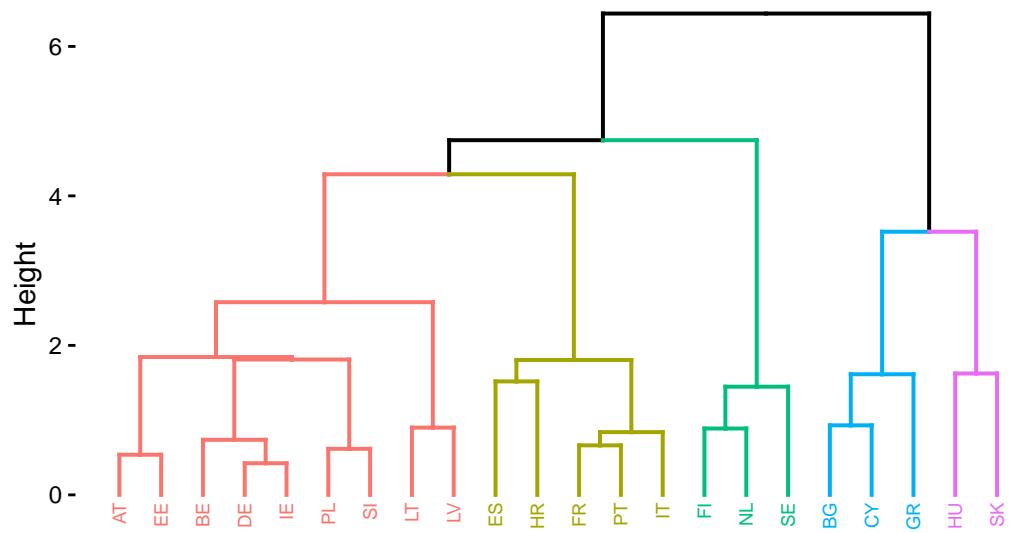
	MR2	MR1	MR3
SS loadings	3.777	3.646	2.300
Proportion Var	0.236	0.228	0.144
Cumulative Var	0.236	0.464	0.608

Explicar porque standardizamos a média das observações para cada país .





Cluster Dendrogram



Ver várias métricas?

**Results**

**Discussion**

**Conclusions**

**References**