

Package ‘semGOF’

July 2, 2014

Version 0.2-0

Date 2012-08-06

Title Goodness-of-fit indexes for structural equation models

Author Elena Bertossi <bertossielena@gmail.com>

Maintainer Elena Bertossi <bertossielena@gmail.com>

Depends R (>= 2.14.0), sem, stats, MASS, matrixcalc

Suggests boot, tcltk, polycor

Description This is an add-on package which provides fourteen goodness-of-fit indexes for structural equation models using 'sem' package.

License GPL (>= 2)

URL <http://www.r-project.org>, <http://sites.google.com/site/bertossielena>

LazyLoad yes

Repository CRAN

Date/Publication 2012-08-07 19:04:20

NeedsCompilation no

R topics documented:

summaryGOF	2
Index	6

summaryGOF

*Goodness-of-Fit indexes in structural equation models for sem***Description**

summaryGOF computes fourteen Goodness-of-Fit indexes in addition to the output of **sem** (Fox, Byrnes, Culbertson, Friendly, Kramer & Monette; 2011).

Usage

```
summaryGOF(object, digits = 5, ...)
```

Arguments

object	an object of class sem returned by the sem function (see Examples below).
digits	number of digits for printed output.
...	additional arguments affecting the summary produced (see summary).

Details

The goodness of fit indexes calculated in **semGOF**:

ICOMP Information Complexity (Bozdogan, 1990)

Fml Fit Function of maximum likelihood (Long, 1986).

d Estimate of minimized population discrepancy function (McDonald, 1989).

Mc McDonald's Centrality Index (McDonald, 1989).

RNI Relative Noncentrality Index (Bentler, 1990).

IFI Incremental Fit Index (Bollen, 1989).

chisq.df Chi-square/df ratio (Marsh & al., 1988).

CAK Rescaled version of AIC (Cudeck and Browne, 1983).

CSK Information Criterion (Schwartz, 1978).

CN Critical N (Hoelter, 1983), (Hu & Bentler, 1999).

Gamma.hat Gamma hat (Steiger, 1989), (Hu & Bentler, 1999).

BL86 Bollen's Fit Index (Bollen, 1986).

W Wheaton Index (Wheaton et al., 1977).

ECVI Expected Cross Validation Index (Browne & Cudeck, 1992).

Warning

semGOF must be used with **sem**.

Author(s)

Bertossi Elena <bertossielena@gmail.com>

References

- Bentler, P. M. (1990) Comparative fit indexes in structural equation models. *Psychological Bulletin* **107**:238–246.
- Bollen, K. A. (1986) Sample size and Bentler and Bonnett's nonnormed fit index. *Psychometrika* **51**:375–377.
- Bollen, K. A. (1989) A new incremental fit index for general structural equation models. *Sociological Methods and Research* **17**:303–316.
- Bozdogan, H. (1990) Akaike's criterion and recent developments in information complexity. *Journal of Mathematical Psychology* **44**:62–91.
- Browne, M. W., Cudeck, R. (1992) Alternative ways of assessing model fit. *Sociological Methods and Research* **21**:230–258.
- Cudeck, R., Browne, M. W. (1983) Cross-validation of covariance structure. *Multivariate Behavioral Research* **18**:147–167.
- John Fox, Jarrett Byrnes, with contributions from Michael Culbertson, Michael Friendly, Adam Kramer and Georges Monette. (2011) *sem: Structural Equation Models. R package version 2.1-1*. <http://CRAN.R-project.org/package=sem>
- Fox, L. (2006) Structural equation modeling with the sem package in R. *Structural equation modeling* **13**:465–486.
- Hoelter, J. W. (1983) The analysis of covariance structure: goodness of fit indexes. *Sociological Methods and Research* **11**:325–344.
- Hu, J., Bentler, P. M. (1999) Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Structural equation modeling* **6**:1–55.
- Long J. S. (1986) *Confirmatory Factor Analysis*. California, SAGE.
- Marsh, H. W., Balla, J. R. McDonald, R. P. (1988) Goodness-of-fit in confirmatory factor analysis: the effect of sample size. *Psychological Bulletin* **3**:391–410.
- McDonald, R. P. (1989) An index of goodness of fit based on noncentrality. *Journal of Classification* **6**:97–103.
- Schwartz, G. (1978) Estimating the dimension of the model. *Annals of Statistics* **6**:461–464.
- Venables, W. N. & Ripley, B. D. (2002) *Modern Applied Statistics with S*. Fourth Edition. Springer, New York. ISBN 0-387-95457-0.
- Wheaton, B., Muthen, B., Alwin, D. F., Summers, G. (1977) Assessing reliability and stability in panel models. *Sociological Methodology* **8**:84–136.

See Also

[sem](#)

Examples

```
# The following model has been created with
# six observed endogenous variables,
# two unobserved endogenous variables and
# four unobserved exogenous variables.
```

```
S <- matrix(c(
1.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0,
0.6321, 1.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0,
0.5932, 0.5881, 1.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0,
0.0965, 0.0987, 0.1564, 1.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0,
0.1785, 0.1256, 0.1124, 0.4567, 1.0000, 0.0000, 0.0000, 0.0000, 0.0000, 0,
0.2135, 0.2003, 0.0762, 0.5589, 0.6097, 1.0000, 0.0000, 0.0000, 0.0000, 0,
0.3875, 0.4011, 0.3211, 0.0134, 0.0189, 0.0556, 1.0000, 0.0000, 0.0000, 0,
0.3569, 0.3989, 0.3301, 0.1323, 0.1036, 0.1132, 0.3215, 1.0000, 0.0000, 0,
0.1034, 0.1201, 0.1010, 0.2981, 0.3265, 0.2920, 0.1092, 0.0981, 1.0000, 0,
0.1324, 0.0622, 0.0123, 0.3056, 0.3525, 0.2661, 0.1234, 0.1207, 0.2221, 1

), ncol=10, byrow=TRUE)

rownames(S) <- c("Y1", "Y2", "Y3", "Y4", "Y5", "Y6",
"CSI1", "CSI2", "CSI3", "CSI4")
colnames(S) <- c("Y1", "Y2", "Y3", "Y4", "Y5", "Y6",
"CSI1", "CSI2", "CSI3", "CSI4")
```

```
ram.I <- matrix(c(
#      heads  to    from  param  start
      1,     1,   11,    1,    NA, # lam1
      1,     2,   11,    0,    0.750,
      1,     3,   11,    2,    NA, # lam2
      1,     4,   12,    3,    NA, # lam3
      1,     5,   12,    4,    NA, # lam4
      1,     6,   12,    0,    0.800,
      1,    11,    7,    5,    NA, # gam1
      1,    11,    8,    6,    NA, # gam2
      1,    12,    9,    7,    NA, # gam3
      1,    12,   10,   8,    NA, # gam4
      2,     1,    1,    9,    NA, # theta1
      2,     2,    2,   10,   NA, # theta2
      2,     3,    3,   11,   NA, # theta3
      2,     4,    4,   12,   NA, # theta4
      2,     5,    5,   13,   NA, # theta5
      2,     6,    6,   14,   NA, # theta6
      2,    11,   11,   15,   NA, # psi1
      2,    12,   12,   16,   NA, # psi2

), ncol=5, byrow=TRUE)
```

```
params.I <- c('lam1', 'lam2', 'lam3', 'lam4', 'gam1', 'gam2',
```

```
'gam3', 'gam4', 'theta1', 'theta2', 'theta3',
'theta4', 'theta5', 'theta6', 'psi1', 'psi2')

vars.I <- c('Y1', 'Y2', 'Y3', 'Y4', 'Y5', 'Y6', 'CSI1',
           'CSI2', 'CSI3', 'CSI4', 'ETA1', 'ETA2')

sem.I <- sem(ram.I, S, 250, param.names=params.I,
            var.names=vars.I, fixed.x=7:10)

summaryGOF(sem.I)

# Goodness-of-Fit indexes of structural equation models for 'sem' package

# ICOMP = -14.964
# Fml = 0.19582
# RNI = 0.97065
# IFI = 0.97133
# chisq.df = 1.6814
# CN = 231.91
# Gamma.hat = 0.98438
# BL86 = 0.89465
# W = 1.6814
# d = 0.079042
# Mc = 0.96125
# CAK = 0.27582
# CSK = 0.41668
# ECVI = 0.40466
```

Index

*Topic **models**

summaryGOF, [2](#)

chisqNull (summaryGOF), [2](#)

print.summaryGOF (summaryGOF), [2](#)

sem, [2](#), [3](#)

semGOF (summaryGOF), [2](#)

summary, [2](#)

summaryGOF, [2](#)