Title

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mvtest — Multivariate tests

Syntax   Description   References   Also see

Syntax

`mvtest` *subcommand* ... [, ...]

subcommand	Description	See
`means`	test means	[MV] **mvtest means**
`covariances`	test covariances	[MV] **mvtest covariances**
`correlations`	test correlations	[MV] **mvtest correlations**
`normality`	test multivariate normality	[MV] **mvtest normality**

Description

`mvtest` performs multivariate tests on means, covariances, and correlations and tests of univariate, bivariate, and multivariate normality. The tests of means, covariances, and correlations assume multivariate normality (Mardia, Kent, and Bibby 1979). Both one-sample and multiple-sample tests are provided. All multiple-sample tests provided by `mvtest` assume independent samples.

Structural equation modeling provides a more general framework for estimating means, covariances, and correlations and testing for differences across groups; see [SEM] **intro 5** and [SEM] **example 16**.

References

Achenback, T. M. 1991. *Manual for the Youth Self-Report and 1991 Profile*. Burlington, VT: University of Vermont.

Anderson, E. 1935. The irises of the Gaspe Peninsula. *Bulletin of the American Iris Society* 59: 2–5.

Baum, C. F., and N. J. Cox. 2007. omninorm: Stata module to calculate omnibus test for univariate/multivariate normality. Boston College Department of Economics, Statistical Software Components S417501. http://ideas.repec.org/c/boc/bocode/s417501.html.

Beall, G. 1945. Approximate methods in calculating discriminant functions. *Psychometrika* 10: 205–217.

Doornik, J. A., and H. Hansen. 2008. An omnibus test for univariate and multivariate normality. *Oxford Bulletin of Economics and Statistics* 70: 927–939.

Henze, N. 1994. On Mardia's kurtosis test for multivariate normality. *Communications in Statistics, Theory and Methods* 23: 1031–1045.

———. 1997. Extreme smoothing and testing for multivariate normality. *Statistics and Probability Letters* 35: 203–213.

Henze, N., and T. Wagner. 1997. A new approach to the BHEP tests for multivariate normality. *Journal of Multivariate Analysis* 62: 1–23.

Henze, N., and B. Zirkler. 1990. A class of invariant consistent tests for multivariate normality. *Communications in Statistics, Theory and Methods* 19: 3595–3617.

James, G. S. 1954. Tests of linear hypotheses in univariate and multivariate analysis when the ratios of the population variances are unknown. *Biometrika* 41: 19–43.

Jennrich, R. I. 1970. An asymptotic χ^2 test for the equality of two correlation matrices. *Journal of the American Statistical Association* 65: 904–912.

Johnson, R. A., and D. W. Wichern. 2007. *Applied Multivariate Statistical Analysis*. 6th ed. Englewood Cliffs, NJ: Prentice Hall.

Korin, B. P., and E. H. Stevens. 1973. Some approximations for the distribution of a multivariate likelihood ratio criterion. *Journal of the Royal Statistical Society, Series B* 29: 24–27.

Kramer, C. Y., and D. R. Jensen. 1969. Fundamentals of multivariate analysis, part I. Inference about means. *Journal of Quality Technology* 1: 120–133.

Krishnaiah, P. R., and J. C. Lee. 1980. Likelihood ratio tests for mean vectors and covariance matrices. In *Handbook of Statistics, Volume 1: Analysis of Variance*, ed. P. R. Krishnaiah. Amsterdam: North-Holland.

Krishnamoorthy, K., and J. Yu. 2004. Modified Nel and Van der Merwe test for the multivariate Behrens–Fisher problem. *Statistics and Probability Letters* 66: 161–169.

Lawley, D. N. 1963. On testing a set of correlation coefficients for equality. *Annals of Mathematical Statistics* 34: 149–151.

Mardia, K. V. 1970. Measures of multivariate skewness and kurtosis with applications. *Biometrika* 57: 519–530.

——. 1974. Applications of some measures of multivariate skewness and kurtosis for testing normality and robustness studies. *Sankhyā, Series B* 36: 115–128.

——. 1980. Tests of univariate and multivariate normality. In *Handbook of Statistics, Volume 1: Analysis of Variance*, ed. P. R. Krishnaiah. Amsterdam: North-Holland.

Mardia, K. V., J. T. Kent, and J. M. Bibby. 1979. *Multivariate Analysis*. London: Academic Press.

Nel, D. G., and C. A. Van der Merwe. 1986. A solution to the multivariate Behrens–Fisher problem. *Communications in Statistics, Theory and Methods* 15: 3719–3735.

Rencher, A. C., and W. F. Christensen. 2012. *Methods of Multivariate Analysis*. 3rd ed. Hoboken, NJ: Wiley.

Seber, G. A. F. 1984. *Multivariate Observations*. New York: Wiley.

Vollebergh, W. A. M., S. van Dorsselaer, K. Monshouwer, J. Verdurmen, J. van der Ende, and T. ter Bogt. 2006. Mental health problems in early adolescents in the Netherlands: Differences between school and household surveys. *Social Psychiatry and Psychiatric Epidemiology* 41: 156–163.

Also see

[MV] **canon** — Canonical correlations

[MV] **hotelling** — Hotelling's T-squared generalized means test

[MV] **manova** — Multivariate analysis of variance and covariance

[R] **correlate** — Correlations (covariances) of variables or coefficients

[R] **mean** — Estimate means

[R] **sdtest** — Variance-comparison tests

[R] **sktest** — Skewness and kurtosis test for normality

[R] **swilk** — Shapiro–Wilk and Shapiro–Francia tests for normality

[R] **ttest** — t tests (mean-comparison tests)

[SEM] **intro 5** — Tour of models

[SEM] **example 16** — Correlation