

Package ‘VIRF’

May 7, 2026

Type Package

Title Computation of Volatility Impulse Response Function of
Multivariate Time Series

Version 0.1.1

Author Dr. Ranjit Kumar Paul [aut, cre],
Dr. Md Yeasin [aut],
Mr. Ankit Tanwar [aut]

Maintainer Dr. Ranjit Kumar Paul <ranjitstat@gmail.com>

Description Computation of volatility impulse response function for multivariate time series model using algorithm by Jin, Lin and Tamvakis (2012) <doi:10.1016/j.eneco.2012.03.003>.

License GPL

Imports stats, rmgarch, mgarchBEKK, gnm, expm, BigVAR, ks, matrixcalc,
matlib

NeedsCompilation no

Repository CRAN

Date/Publication 2025-08-29 13:10:08 UTC

Contents

VIRF	1
Index	3

VIRF	<i>Volatility Impulse Response Function</i>
------	---

Description

Provide information about the impact of independent shocks on volatility.

Usage

VIRF(data, shock)

Arguments

data log return multivariate time series
shock shock time point from time series

Value

virfresult List containing variance and covariance values

References

Anthony, N.R. and Ahammad, S.M. 2016. Investigating the interdependency of agricultural production volatility spillovers between Bangladesh, India, and Pakistan. *Review of Urban and Regional Development Studies*, 28, 32 to 54
Jin, X., Lin, S.X. and Tamvakis, M. 2012. Volatility transmission and volatility impulse response functions in crude oil markets. *Energy Economics*, 34, 2125 to 2134

Examples

```
k=3 #number of series
p=6 # maximum lag order
ns=100 #number of simulations
B=matrix(0,nrow=k,ncol=p*k)
A1<- matrix(c(.4,-.02,.01,-.02,.3,.02,.01,.04,.3),ncol=3,nrow=3)
A2 <- matrix(c(.2,0,0,0,.3,0,0,0,.13),ncol=3,nrow=3)
B[,1:k]=A1
B[(4*k+1):(5*k)]=A2
A <- BigVAR::VarptoVar1MC(B,p,k)
Y <-BigVAR::MultVarSim(k,A,p,.1*diag(k),ns)
lr<-VIRF(Y,40) # Y: multivariate time series data, shock time point: 40
print(lr)
```

Index

VIRF, 1