

# Package ‘dynamo’

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**Title** Dynamic Models

**Type** Package

**Version** 0.1.3

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**Author** Christian T. Brownlees

**SystemRequirements** Gnu Scientific Library version  $\geq 1.5$

**Maintainer** Christian T. Brownlees <ctb@ds.unifi.it>

**Depends** R ( $\geq 2.5$ )

**Description** Routines for estimation, simulation, regularization and prediction of univariate dynamic models including: ARMA, ARMA-GARCH, ACD, MEM.

**License** GPL ( $\geq 3$ )

**Repository** CRAN

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dynamo-package

*Dynamic Models*


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### Description

DynaMo (Dynamic Models) is a package for time series analysis with a special focus on the time series models used in Financial Econometrics. The package provides methods for simulation, estimation, inference, regularization and prediction of a set of univariate dynamic models including: ARMA, ARMA-GARCH, ACD, MEM, Spline-MEM.

### Details

Package: dynamo  
 Type: Package  
 Version: 0.1.3  
 Date: 2007-12-20  
 License: GPL 2

```
rdm dm
```

### Author(s)

Christian T. Brownlees

Maintainer: Christian T. Brownlees <ctb@ds.unifi.it>

### Examples

```
#y ~ rdm( ~arma(1,1)+garch(1,1) , 1000 )
#a11g11 <- dm( y~arma(1,1)+garch(1,1) )
1+1
```

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dm

*Fitting Dynamic Models*


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### Description

'dm' is used to fit dynamic models. It can be used to estimate several univariate dynamic models including ARMA, GARCH, ARMA-GARCH, ACD and MEM.

### Usage

```
dm(formula, innovations=NULL, data=parent.frame(), est='mle', maxiter=NULL, param=NULL, ftol=NULL, log='no')
```

**Arguments**

formula	a dynamo symbolic description of the model to be simulated.
innovations	the family of distributions of model innovations.
data	data frame with exogenous data.
est	estimation method.
maxiter	max iter.
param	dynamic model parameters.
ftol	tollerance.
log	log level.

**Value**

'dm' returns an object of 'class' "dm".

An object of class "dm" is a list containing:

coefficients    fitted parameters.

**Author(s)**

Christian T. Brownlees

**See Also**

[summary.dm](#) [print.dm](#) [rdm](#)

**Examples**

```
# AR(1) GARCH(1,1)
# simulate data
#y <- rdm( y~0+ar(1)+garch(1,1) , innovations='st' , 1000 , param=c(0.2,0.2,0.1,0.8,0.1) )
# estimate
#ar1garch11 <- dm( y~0+ar(1)+garch(1,1) , innovations='st' )
# view estimation results
#summary( ar1garch11 )

# ACD(1,1)
# simulate data
#y <- rdm( y~acd(1,1), 1000 , param=c(0.1,0.8,0.1,20.0) )
# estimate
#acd11 <- dm( y~acd(1,1) )
# view estimation results
#summary( acd11 )
1+1
```

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`plot.dm`*Plot Diagnostics for a dm Object*

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**Description**

Plots of the data and fitted dynamic model.

**Usage**

```
plot.dm( x , ... )
```

**Arguments**

`x` a dynamic model object.  
`...` other parameters to be passed through to plotting functions.

**Author(s)**

Christian T. Brownlees

**See Also**

[rdm](#)

**Examples**

```
# AR(1) GARCH(1,1)
# simulate data
#y <- rdm( y~0+ar(1)+garch(1,1) , innovations='st' , 1000 , param=c(0.2,0.2,0.1,0.8,0.1) )
# estimate
#ar1garch11 <- dm( y~0+ar(1)+garch(1,1) , innovations='st' )
# view estimation results
#summary( ar1garch11 )

# ACD(1,1)
# simulate data
#y <- rdm( y~acd(1,1), 1000 , param=c(0.1,0.8,0.1,20.0) )
# estimate
#acd11 <- dm( y~acd(1,1) )
# view estimation results
#summary( acd11 )
1+1
```

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predict.dm	<i>Predict Method for Dynamic Model Fits</i>
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**Description**

Predicted values based on dynamic model object.

**Usage**

```
predict.dm( object, type=stop('Forecast type not specified!'), call.=FALSE), iterate=NULL, nfor=1, ql=0.
```

**Arguments**

object	a dynamic model object.
type	number of digits.
iterate	some desc
nfor	some desc
ql	some desc
qu	some desc
yo	some desc
Xo	some desc
Zo	some desc
...	some desc

**Author(s)**

Christian T. Brownlees

**See Also**

[rdm](#)

**Examples**

```
# AR(1) GARCH(1,1)
# simulate data
#y <- rdm( y~0+ar(1)+garch(1,1) , innovations='st' , 1000 , param=c(0.2,0.2,0.1,0.8,0.1) )
# estimate
#ar1garch11 <- dm( y~0+ar(1)+garch(1,1) , innovations='st' )
# view estimation results
#summary( ar1garch11 )

# ACD(1,1)
# simulate data
#y <- rdm( y~acd(1,1), 1000 , param=c(0.1,0.8,0.1,20.0) )
# estimate
```

```
#acd11 <- dm( y~acd(1,1) )  
# view estimation results  
#summary( acd11 )  
1+1
```

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rdm

*Dynamic Model Simulation*

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## Description

'rdm' is used to simulate dynamic models.

## Usage

```
rdm(formula, innovations=NULL, n, param, data=parent.frame(), seed=as.integer(Sys.time()), lst=FALSE)
```

## Arguments

formula	a dynamo symbolic description of the model to be simulated.
innovations	the family of distributions of model innovations.
n	number of observations to be simulated
param	dynamic model parameters
data	data frame with exogenous data
seed	simulation seed
lst	data frame option

## Value

If the 'lst' argument (which stands for 'data.frame') is FALSE (the default) the function returns the simulated series. If 'lst' is TRUE the function returns a data frame containing the simulated series and the simulated conditional mean and variance of the series.

## Author(s)

Christian T. Brownlees

## References

~put references to the literature/web site here ~

## See Also

[dm](#)

**Examples**

```
# ACD(1,1)
# simulate data
y <- rdm( ~acd(1,1), n=1000, param=c(0.2,0.1,0.8))

# plot
plot( y )
```

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summary.dm

*Summarizing Dynamic Model Fits*

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**Description**

summary method for class "dm"

**Usage**

```
summary.dm( object , diag.resid.lag=5 , ... )
```

**Arguments**

object            a dynamo symbolic description of the model to be simulated.  
diag.resid.lag    the family of distributions of model innovations.  
...                some desc

**Value**

The function summary.dm computes and returns a list of summary statistics of the fitted dynamic model given in object.

**Author(s)**

Christian T. Brownlees

**See Also**

[rdm](#)

**Examples**

```
# AR(1) GARCH(1,1)
# simulate data
#y <- rdm( y~0+ar(1)+garch(1,1) , innovations='st' , 1000 , param=c(0.2,0.2,0.1,0.8,0.1) )
# estimate
#ar1garch11 <- dm( y~0+ar(1)+garch(1,1) , innovations='st' )
# view estimation results
#summary( ar1garch11 )
```

```
# ACD(1,1)
# simulate data
#y <- rdm( y~acd(1,1), 1000 , param=c(0.1,0.8,0.1,20.0) )
# estimate
#acd11 <- dm( y~acd(1,1) )
# view estimation results
#summary( acd11 )
1+1
```

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