

Package ‘DynareR’

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Type Package

Title Bringing the Power of 'Dynare' to 'R', 'R Markdown', and 'Quarto'

Version 0.1.4

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Description

It allows running 'Dynare' program from base R, R Markdown and Quarto. 'Dynare' is a software platform for handling a wide class of economic models, in particular dynamic stochastic general equilibrium ('DSGE') and overlapping generations ('OLG') models. This package does not only integrate R and Dynare but also serves as a 'Dynare' Knit-Engine for 'knitr' package. The package requires 'Dynare' (<<https://www.dynare.org/>>) and 'Octave' (<<https://www.octave.org/download.html>>). Write all your 'Dynare' commands in R or R Markdown chunk.

Depends R (>= 3.2.3)

Imports knitr (>= 1.20),magrittr

SystemRequirements Dynare, Octave

Suggests rmarkdown

License GPL

URL <https://CRAN.R-project.org/package=DynareR>

BugReports <https://github.com/sagirumati/DynareR/issues>

Encoding UTF-8

VignetteBuilder knitr

NeedsCompilation no

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DynareR-package	<i>DynareR: Bringing the Power of 'Dynare' to 'R', 'R Markdown', and 'Quarto'</i>
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Description

It allows running 'Dynare' program from base R, R Markdown and Quarto. 'Dynare' is a software platform for handling a wide class of economic models, in particular dynamic stochastic general equilibrium ('DSGE') and overlapping generations ('OLG') models. This package does not only integrate R and Dynare but also serves as a 'Dynare' Knit-Engine for 'knitr' package. The package requires 'Dynare' (<https://www.dynare.org/>) and 'Octave' (<https://www.octave.org/download.html>). Write all your 'Dynare' commands in R or R Markdown chunk.

Author(s)

Maintainer: Sagiru Mati <sagirumati@gmail.com> ([ORCID](#))

See Also

Useful links:

- <https://CRAN.R-project.org/package=DynareR>
- Report bugs at <https://github.com/sagirumati/DynareR/issues>

Other important functions: [add_matlab_path\(\)](#), [add_path\(\)](#), [eng_dynare\(\)](#), [import_log\(\)](#), [include_IRF\(\)](#), [input_tex\(\)](#), [run_dynare\(\)](#), [run_models\(\)](#), [set_dynare_version\(\)](#), [set_octave_path\(\)](#), [write_dyn\(\)](#), [write_mod\(\)](#)

add_matlab_path *A wrapper for Octave's addpath to add matlab folder.*

Description

Use this function to add matlab folder. Use this function if Dynare is **NOT** installed in the standard location

Usage

```
add_matlab_path(matlab_path)
```

Arguments

matlab_path Path to the matlab folder. Default path is /usr/lib/dynare/matlab for Linux, /usr/lib/dynare/matlab for macOS and c:/dynare/x.y/matlab for Windows, where x.y is Dynare version number.

Value

Set of Dynare (open-source software for DSGE modelling) outputs

See Also

Other important functions: [DynareR](#), [add_path\(\)](#), [eng_dynare\(\)](#), [import_log\(\)](#), [include_IRF\(\)](#), [input_tex\(\)](#), [run_dynare\(\)](#), [run_models\(\)](#), [set_dynare_version\(\)](#), [set_octave_path\(\)](#), [write_dyn\(\)](#), [write_mod\(\)](#)

Examples

```
library(DynareR)
## Not run:
add_matlab_path('/usr/lib/dynare/matlab') # Default for Linux

add_matlab_path('c:/dynare/5.1/matlab') # Default for Windows, but 5.1 can change
# if later version of `Dynare` is installed.

add_matlab_path('/usr/lib/dynare/matlab') # Default for macOS

## End(Not run)
```

`add_path`*A wrapper for Octave's addpath to add matlab folder.*

Description

Use this function to add matlab folder. Use this function if Dynare is **NOT** installed in the standard location

Usage

```
add_path(path)
```

Arguments

`path` Path to the matlab folder. Default path is `/usr/lib/dynare/matlab` for Linux, `/usr/lib/dynare/matlab` for macOS and `c:/dynare/x.y/matlab` for Windows, where `x.y` is Dynare version number.

Value

Set of Dynare (open-source software for DSGE modelling) outputs

See Also

Other important functions: [DynareR](#), [add_matlab_path\(\)](#), [eng_dynare\(\)](#), [import_log\(\)](#), [include_IRF\(\)](#), [input_tex\(\)](#), [run_dynare\(\)](#), [run_models\(\)](#), [set_dynare_version\(\)](#), [set_octave_path\(\)](#), [write_dyn\(\)](#), [write_mod\(\)](#)

Examples

```
library(DynareR)
## Not run:
add_path('/usr/lib/dynare/matlab') # Default for Linux

add_path('c:/dynare/5.1/matlab') # Default for Windows, but 5.1 can change if later version of
# `Dynare` is installed.

add_path('/usr/lib/dynare/matlab') # Default for macOS

## End(Not run)
```

Description

This package runs on top of knitr to facilitate communication with Dynare. Run Dynare scripts from R Markdown document.

Usage

```
eng_dynare(options)
```

Arguments

options Chunk options, as provided by knitr during chunk execution. Chunk option for this is dynare

Details

The dynare engine can be activated via

```
knitr::knit_engines$set(dynare = DynareR::eng_dynare)
```

This will be set within an R Markdown document's setup chunk.

Value

Set of Dynare (open-source software for DSGE modelling) codes

Author(s)

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- Yusuf Maitama Sule (Northwest) University Kano, Nigeria
- SMATI Academy

References

Bob Rudis (2015). Running Go language chunks in R Markdown (Rmd) files. Available at: <https://gist.github.com/hrbrmstr/9a>

Yihui Xie (2019). knitr: A General-Purpose Package for Dynamic Report Generation in R. R package version 1.24.

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Yihui Xie (2014) knitr: A Comprehensive Tool for Reproducible Research in R. In Victoria Stodden, Friedrich Leisch and Roger D. Peng, editors, Implementing Reproducible Computational Research. Chapman and Hall/CRC. ISBN 978-1466561595

See Also

Other important functions: [DynareR](#), [add_matlab_path\(\)](#), [add_path\(\)](#), [import_log\(\)](#), [include_IRF\(\)](#), [input_tex\(\)](#), [run_dynare\(\)](#), [run_models\(\)](#), [set_dynare_version\(\)](#), [set_octave_path\(\)](#), [write_dyn\(\)](#), [write_mod\(\)](#)

Examples

```
knitr::knit_engines$set(dynare = DynareR::eng_dynare)
library(DynareR)
```

import_log	<i>Import dynare log file as a list of R dataframes.</i>
------------	--

Description

Use this function to import dynare log file as a list of R dataframes. The imported list can be accessed via `dynare$modelNmae`.

Usage

```
import_log(path = ".", model = "")
```

Arguments

path	A character string for the path to the dynare log file.
model	Object or a character string representing the name of the Dynare model file (.mod or .dyn extension)

Value

Set of Dynare (open-source software for DSGE modelling) outputs

See Also

Other important functions: [DynareR](#), [add_matlab_path\(\)](#), [add_path\(\)](#), [eng_dynare\(\)](#), [include_IRF\(\)](#), [input_tex\(\)](#), [run_dynare\(\)](#), [run_models\(\)](#), [set_dynare_version\(\)](#), [set_octave_path\(\)](#), [write_dyn\(\)](#), [write_mod\(\)](#)

Examples

```
## Not run:

library(DynareR)

demo(bkk)

import_log(model="bkk")
```

```
# Alternatively, use the path to the log file
import_log(path="bkk/bkk.log")

# Access the imported list

dynare$bkk

dynare$bkk$moments

knitr::kable(dynare$bkk$decomposition,format='pandoc')

## End(Not run)
```

include_IRF *Embed the graphs of Impulse Response Function (IRF) in R Markdown document*

Description

Use this function to include Dynare IRF into the R Markdown document

Usage

```
include_IRF(path = ".", model = "", IRF = "")
```

Arguments

path	A character string for the path to the IRF graph.
model	Object or a character string representing the name of the Dynare model file (.mod or .dyn extension)
IRF	A character string for the name of the Impulse Response Function as defined in the Dynare codes.

Value

Set of Dynare (open-source software for DSGE modelling) outputs

Author(s)

Sagiru Mati, [ORCID: 0000-0003-1413-3974](https://orcid.org/0000-0003-1413-3974)

- Yusuf Maitama Sule (Northwest) University Kano, Nigeria
- SMATI Academy

References

Bob Rudis (2015). Running Go language chunks in R Markdown (Rmd) files. Available at: <https://gist.github.com/hrbrmstr/9a>

Yihui Xie (2019). knitr: A General-Purpose Package for Dynamic Report Generation in R. R package version 1.24.

Yihui Xie (2015) Dynamic Documents with R and knitr. 2nd edition. Chapman and Hall/CRC. ISBN 978-1498716963

Yihui Xie (2014) knitr: A Comprehensive Tool for Reproducible Research in R. In Victoria Stodden, Friedrich Leisch and Roger D. Peng, editors, Implementing Reproducible Computational Research. Chapman and Hall/CRC. ISBN 978-1466561595

See Also

Other important functions: [DynareR](#), [add_matlab_path\(\)](#), [add_path\(\)](#), [eng_dynare\(\)](#), [import_log\(\)](#), [input_tex\(\)](#), [run_dynare\(\)](#), [run_models\(\)](#), [set_dynare_version\(\)](#), [set_octave_path\(\)](#), [write_dyn\(\)](#), [write_mod\(\)](#)

Examples

```
## Not run:
library(DynareR)

demo(bkk)

include_IRF(model="bkk", IRF="E_H2")

# The above code fetches the IRF graph from "bkk/bkk/graphs/bkk_IRF_E_H2.pdf"

# Alternatively, the `path` argument can be used as follows

include_IRF(path="bkk/bkk/graphs/bkk_IRF_E_H2.pdf")

## End(Not run)
```

input_tex

Include TeX file in R Markdown or Quarto document.

Description

Use this function to include TeX file in R Markdown or Quarto document.

Usage

```
input_tex(path, start = NA, end = NA)
```


Arguments

path	Object or a character string representing the path to the TeX file
start	Numeric. The start line(s) of the TeX file to include.
end	Numeric. The last line(s) of the TeX file to include.

Value

Set of TeX text

See Also

Other important functions: [DynareR](#), [add_matlab_path\(\)](#), [add_path\(\)](#), [eng_dynare\(\)](#), [import_log\(\)](#), [include_IRF\(\)](#), [run_dynare\(\)](#), [run_models\(\)](#), [set_dynare_version\(\)](#), [set_octave_path\(\)](#), [write_dyn\(\)](#), [write_mod\(\)](#)

Examples

```
library(DynareR)
## Not run:

input_tex("DynareR/TeXFolder/olsTable.tex")

## End(Not run)
```

run_dynare	<i>Create and run Dynare mod file</i>
------------	---------------------------------------

Description

Use this function to create and run Dynare mod file. Use `run_dynare(code="someCode", model="someModel")` if you want the Dynare files to live in the current working directory. Use `run_dynare(run_dynare(code="someCode", model="someModel", someDirectory))` if you want the Dynare files to live in the path different from the current working directory (for example, `someDirectory`).

Usage

```
run_dynare(code, model, import_log = FALSE)
```

Arguments

code	Object or a character string representing the set of Dynare codes
model	Object or a character string representing the name of the Dynare model file (.mod or .dyn extension)
import_log	Logical. Whether or not to import dynare log file.

Value

Set of Dynare (open-source software for DSGE modelling) outputs

See Also

Other important functions: [DynareR](#), [add_matlab_path\(\)](#), [add_path\(\)](#), [eng_dynare\(\)](#), [import_log\(\)](#), [include_IRF\(\)](#), [input_tex\(\)](#), [run_models\(\)](#), [set_dynare_version\(\)](#), [set_octave_path\(\)](#), [write_dyn\(\)](#), [write_mod\(\)](#)

Examples

```
library(DynareR)
## Not run:
DynareCodes='var y, c, k, a, h, b;
varexo e, u;
parameters beta, rho, alpha, delta, theta, psi, tau;
alpha = 0.36;
rho = 0.95;
tau = 0.025;
beta = 0.99;
delta = 0.025;
psi = 0;
theta = 2.95;
phi = 0.1;
model;
c*theta*h^(1+psi)=(1-alpha)*y;
k = beta*(((exp(b)*c)/(exp(b(+1))*c(+1)))
*(exp(b(+1))*alpha*y(+1)+(1-delta)*k));
y = exp(a)*(k(-1)^alpha)*(h^(1-alpha));
k = exp(b)*(y-c)+(1-delta)*k(-1);
a = rho*a(-1)+tau*b(-1) + e;
b = tau*a(-1)+rho*b(-1) + u;
end;
initval;
y = 1.08068253095672;
c = 0.80359242014163;
h = 0.29175631001732;
k = 11.08360443260358;
a = 0;
b = 0;
e = 0;
u = 0;
end;

shocks;
var e; stderr 0.009;
var u; stderr 0.009;
var e, u = phi*0.009*0.009;
end;

stoch_simul;'
```

```

# This is "example1" of the `Dynare` example files executed in current working directory
run_dynare(code=DynareCodes,model="example1",import_log=T)

# import_log=T returns the `dynare` log file as a list of dataframes in an environment `dynare`,
# which can be accessed using `dynare$modelName`

dynare$example1

dynare$example1$correlations

dynare$example1$autocorrelation[4,3]

knitr::kable(dynare$example1$moments,format='pandoc')

# This is "example1" of the `Dynare` example files executed in "DynareR/run_dynare/" folder
run_dynare(code=DynareCodes,model="DynareR/run_dynare/example1")

## End(Not run)

```

run_models

*Run multiple **existing** mod or dyn files.*

Description

Use this function to execute multiple **existing** Dynare files. Use `run_models(model='someModel')` if the Dynare files live in the current working directory. Use `run_models(model='someDirectory/someModel')` if the Dynare files live in the path different from the current working directory (for example, `someDirectory`).

Usage

```
run_models(model = "*", import_log = FALSE)
```

Arguments

<code>model</code>	Object or a vector of character strings representing the names of the Dynare model files excluding <code>.mod</code> or <code>.dyn</code> file extension
<code>import_log</code>	Logical. Whether or not to import dynare log file.

Value

Set of Dynare (open-source software for DSGE modelling) outputs

See Also

Other important functions: [DynareR](#), [add_matlab_path\(\)](#), [add_path\(\)](#), [eng_dynare\(\)](#), [import_log\(\)](#), [include_IRF\(\)](#), [input_tex\(\)](#), [run_dynare\(\)](#), [set_dynare_version\(\)](#), [set_octave_path\(\)](#), [write_dyn\(\)](#), [write_mod\(\)](#)

Examples

```

library(DynareR)

## Not run:
demo(agtrend)
demo(bkk)
demo(example1)

# Provide the list of the `Dynare` files in a vector
# Ensure that "agtrend.mod", "bkk.mod" and "example1.mod"
# live in the current working directory

# Copy the dynare files to the current working directory

lapply(c("agtrend","bkk","example1"),\ (x) file.copy(paste0(x,"/",x,".mod"),"."))

run_models(c("agtrend","bkk","example1")) # Run the models in the vector.

run_models() # Run all models in Current Working Directory.

# You can run all models that live in "DynareR/run_dynare/" folder

# Copy the dynare files to the 'DynareR/run_dynare' directory

lapply(c("agtrend","bkk","example1"),\ (x) file.copy(paste0(x,".mod"),"DynareR/run_dynare"))

run_models("DynareR/run_dynare*") # Note the * at the end.

## End(Not run)

```

```

set_dynare_version      Set Dynare version

```

Description

Use this function to set Dynare version

Usage

```

set_dynare_version(dynare_version="")

```

Arguments

`dynare_version` Character representing Dynare version (for example 6.1, 4.6.1 and so on). This has effect on Windows only.

Value

Character

See Also

Other important functions: [DynareR](#), [add_matlab_path\(\)](#), [add_path\(\)](#), [eng_dynare\(\)](#), [import_log\(\)](#), [include_IRF\(\)](#), [input_tex\(\)](#), [run_dynare\(\)](#), [run_models\(\)](#), [set_octave_path\(\)](#), [write_dyn\(\)](#), [write_mod\(\)](#)

Examples

```
library(DynareR)
## Not run:

# If you want to use the development version of Dynare

set_dynare_version("6-unstable-2022-04-03-0800-700a0e3a") # The development version of Dynare

# If you want to use Dynare version 5.2

set_dynare_version("5.2")

## End(Not run)
```

set_octave_path	<i>Set Octave path</i>
-----------------	------------------------

Description

Use this function to set Octave path

Usage

```
set_octave_path(octave_path = "octave")
```

Arguments

octave_path Path to the Octave executable

Value

Character

See Also

Other important functions: [DynareR](#), [add_matlab_path\(\)](#), [add_path\(\)](#), [eng_dynare\(\)](#), [import_log\(\)](#), [include_IRF\(\)](#), [input_tex\(\)](#), [run_dynare\(\)](#), [run_models\(\)](#), [set_dynare_version\(\)](#), [write_dyn\(\)](#), [write_mod\(\)](#)

Examples

```
library(DynareR)
## Not run:
set_octave_path('C:/Program Files/GNU Octave/Octave-6.4.0/mingw64/bin/octave20.exe')

## End(Not run)
```

write_dyn

write a new dyn file.

Description

Use `write_dyn(code="someCode", model="someModel")` if you want the Dynare file to live in the current working directory. Use `write_dyn(code="someCode", model="someDirectory/someModel")` if you want the Dynare file to live in the path different from the current working directory (for example, `someDirectory`).

Usage

```
write_dyn(code, model)
```

Arguments

code	Object or a character string representing the set of Dynare codes
model	Object or a character string representing the name of the Dynare model file (.mod or .dyn extension)

Value

Set of Dynare (open-source software for DSGE modelling) outputs

See Also

Other important functions: [DynareR](#), [add_matlab_path\(\)](#), [add_path\(\)](#), [eng_dynare\(\)](#), [import_log\(\)](#), [include_IRF\(\)](#), [input_tex\(\)](#), [run_dynare\(\)](#), [run_models\(\)](#), [set_dynare_version\(\)](#), [set_octave_path\(\)](#), [write_mod\(\)](#)

Examples

```
library(DynareR)
## Not run:
dynareCodes='var y, c, k, a, h, b;
varexo e, u;
parameters beta, rho, alpha, delta, theta, psi, tau;
alpha = 0.36;
rho   = 0.95;
tau   = 0.025;
beta  = 0.99;
```

```

delta = 0.025;
psi   = 0;
theta = 2.95;
phi   = 0.1;
model;
c*theta*h^(1+psi)=(1-alpha)*y;
k = beta*(((exp(b)*c)/(exp(b(+1))*c(+1)))
          *(exp(b(+1))*alpha*y(+1)+(1-delta)*k));
y = exp(a)*(k(-1)^alpha)*(h^(1-alpha));
k = exp(b)*(y-c)+(1-delta)*k(-1);
a = rho*a(-1)+tau*b(-1) + e;
b = tau*a(-1)+rho*b(-1) + u;
end;
initval;
y = 1.08068253095672;
c = 0.80359242014163;
h = 0.29175631001732;
k = 11.08360443260358;
a = 0;
b = 0;
e = 0;
u = 0;
end;

shocks;
var e; stderr 0.009;
var u; stderr 0.009;
var e, u = phi*0.009*0.009;
end;

stoch_simul;'

# This writes "example1" of the `Dynare` example with dyn extension

write_dyn(code=dynareCodes,model="example1")

# This writes "example1" of the `Dynare` example with dyn extension in "DynareR/write_dyn" folder

write_dyn(code=dynareCodes,model="DynareR/write_dyn/example1")

## End(Not run)

```

write_mod

Write a new mod file.

Description

Use `write_mod(code="someCode", model="someModel")` if you want the Dynare file to live in the current working directory. Use `write_mod(code="someCode", model="someDirectory/someModel")` if you want the Dynare file to live in the path different from the current working directory (for example, `someDirectory`).

Usage

```
write_mod(code, model)
```

Arguments

code	Object or a character string representing the set of Dynare codes
model	Object or a character string representing the name of the Dynare model file (.mod or .dyn extension)

Value

Set of Dynare (open-source software for DSGE modelling) outputs

See Also

Other important functions: [DynareR](#), [add_matlab_path\(\)](#), [add_path\(\)](#), [eng_dynare\(\)](#), [import_log\(\)](#), [include_IRF\(\)](#), [input_tex\(\)](#), [run_dynare\(\)](#), [run_models\(\)](#), [set_dynare_version\(\)](#), [set_octave_path\(\)](#), [write_dyn\(\)](#)

Examples

```
library(DynareR)
## Not run:
dynareCodes='var y, c, k, a, h, b;
varexo e, u;
parameters beta, rho, alpha, delta, theta, psi, tau;
alpha = 0.36;
rho = 0.95;
tau = 0.025;
beta = 0.99;
delta = 0.025;
psi = 0;
theta = 2.95;
phi = 0.1;
model;
c*theta*h^(1+psi)=(1-alpha)*y;
k = beta*(((exp(b)*c)/(exp(b(+1))*c(+1)))
*(exp(b(+1))*alpha*y(+1)+(1-delta)*k));
y = exp(a)*(k(-1)^alpha)*(h^(1-alpha));
k = exp(b)*(y-c)+(1-delta)*k(-1);
a = rho*a(-1)+tau*b(-1) + e;
b = tau*a(-1)+rho*b(-1) + u;
end;
initval;
y = 1.08068253095672;
c = 0.80359242014163;
h = 0.29175631001732;
k = 11.08360443260358;
a = 0;
b = 0;
e = 0;
```



```
u = 0;
end;

shocks;
var e; stderr 0.009;
var u; stderr 0.009;
var e, u = phi*0.009*0.009;
end;

stoch_simul;'

# This writes "example1" of the `Dynare` example with mod extension

write_mod(code=dynareCodes,model="example1")

# This writes "example1" of the `Dynare` example with mod extension in "DynareR/write_mod" folder

write_mod(code=dynareCodes,model="DynareR/write_mod/example1")

## End(Not run)
```

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