Package 'DynareR'

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Type Package

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

Version 0.1.5

Maintainer Sagiru Mati <sagirumati@gmail.com>

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, magick

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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Author Sagiru Mati [aut, cre] (<https://orcid.org/0000-0003-1413-3974>)

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`DynareR-package` *DynareR: Bringing the Power of 'Dynare' to 'R', 'R Markdown', and 'Quarto'*

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_matlab_path()`, `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-package, add_path(), eng_dynare(), import_log(), include_IRF(), input_tex(), run_dynare(), run_models(), set_dynare_version(), set_matlab_path(), 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-package, add_matlab_path(), eng_dynare(), import_log(), include_IRF(), input_tex(), run_dynare(), run_models(), set_dynare_version(), set_matlab_path(), 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)
```

eng_dynare *DynareR: A Seamless Integration of R and Dynare*

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)

Sagiru Mati, ORCID: 0000-0003-1413-3974, https://smati.com.ng

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

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See Also

Other important functions: DynareR-package, add_matlab_path(), add_path(), import_log(), include_IRF(), input_tex(), run_dynare(), run_models(), set_dynare_version(), set_matlab_path(), set_octave_path(), write_dyn(), write_mod()

Examples

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

---

import_log *Import* dynare *log file as a list of R dataframes.*

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-package, add_matlab_path(), add_path(), eng_dynare(), include_IRF(), input_tex(), run_dynare(), run_models(), set_dynare_version(), set_matlab_path(), 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 mported 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 = "", crop = TRUE)
```

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.
crop	Whether to crop the white space around the graph

Value

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

Author(s)

Sagiru Mati, ORCID: 0000-0003-1413-3974

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

References

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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-package, add_matlab_path(), add_path(), eng_dynare(), import_log(), input_tex(), run_dynare(), run_models(), set_dynare_version(), set_matlab_path(), 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-package, add_matlab_path(), add_path(), eng_dynare(), import_log(), include_IRF(), run_dynare(), run_models(), set_dynare_version(), set_matlab_path(), set_octave_path(), write_dyn(), write_mod()

Examples

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

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

## End(Not run)
```

run_dynare *Create and run* Dynare mod *file*

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
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-package, add_matlab_path(), add_path(), eng_dynare(), import_log(), include_IRF(), input_tex(), run_models(), set_dynare_version(), set_matlab_path(), 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

model	Object or a vector of character strings representing the names of the Dynare model files excluding .mod or .dyn file 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-package, add_matlab_path(), add_path(), eng_dynare(), import_log(), include_IRF(), input_tex(), run_dynare(), set_dynare_version(), set_matlab_path(), 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-package, add_matlab_path(), add_path(), eng_dynare(), import_log(), include_IRF(), input_tex(), run_dynare(), run_models(), set_matlab_path(), 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_matlab_path *Set* Matlab *path*

Description

Use this function to set Matlab path

Usage

```
set_matlab_path(matlab_path = "matlab")
```

Arguments

matlab_path	Path to the Matlab executable. This overwrites set_octave_path() function.

Value

Character

See Also

Other important functions: DynareR-package, 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()

Examples

```
library(DynareR)
## Not run:
set_matlab_path('C:/Program Files/MATLAB/R2024a/bin/matlab')

## End(Not run)
```

set_octave_path *Set* Octave *path*

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-package, add_matlab_path(), add_path(), eng_dynare(), import_log(), include_IRF(), input_tex(), run_dynare(), run_models(), set_dynare_version(), set_matlab_path(), 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-package, add_matlab_path(), add_path(), eng_dynare(), import_log(), include_IRF(), input_tex(), run_dynare(), run_models(), set_dynare_version(), set_matlab_path(), 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-package, add_matlab_path(), add_path(), eng_dynare(), import_log(), include_IRF(), input_tex(), run_dynare(), run_models(), set_dynare_version(), set_matlab_path(), 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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write_dyn, *2–4*, *6–10*, *12–15*, 15, *17*
write_mod, *2–4*, *6–10*, *12–15*, 17