Package ‘decompr’

August 29, 2016

Version 4.5.0

Title Global-Value-Chain Decomposition

Description Two global-value-chain decompositions are implemented. Firstly, the Wang-Wei-Zhu (Wang, Wei, and Zhu, 2013) algorithm splits bilateral gross exports into 16 value-added components. Secondly, the Leontief decomposition (default) derives the value added origin of exports by country and industry, which is also based on Wang, Wei, and Zhu (Wang, Z., S.-J. Wei, and K. Zhu. 2013. ``Quantifying International Production Sharing at the Bilateral and Sector Levels.'').

Maintainer Bastiaan Quast <bquast@gmail.com>

Depends R (>= 2.10)

License GPL-3

URL http://qua.st/decompr, https://github.com/bquast/decompr

BugReports https://github.com/bquast/decompr/issues

Suggests gvc, testthat, knitr

VignetteBuilder knitr

RoxygenNote 5.0.1

NeedsCompilation no

Author Bastiaan Quast [aut, cre],
Fei Wang [aut],
Victor Kummritz [aut],
Oliver Reiter [ctb]

Repository CRAN

Date/Publication 2016-08-17 11:47:36

R topics documented:

`countries` *Leather Example*

Description

the names of the countries data

`decomp` *Interface function for decompositions*

Description

This function runs the decomposition. NOTE: the default method is now "leontief", please specify method="wwz" explicitly for Wang-Wei-Zhu. See http://qua.st/decompr/decompr-v2/ for more information.

Usage

```
decomp(x, y, k, i, o, v, method = c("leontief", "wwz"), verbose = FALSE,
  ...)
```

Arguments

`x`	intermediate demand table, it has dimensions GN x GN (G = no. of country, N = no. of industries), excluding the first row and the first column which contains the country names, and the second row and second column which contain the industry names for each country. In addition, an extra row at the end should contain final demand.
`y`	final demand table it has dimensions GN x MN, excluding the first row and the first column which contains the country names, the second column which contains the industry names for each country, and second row which contains the five decomposed final demands (M). #' @param k is a vector of country of region names
`k`	vector or country or region names
`i`	vector of sector or industry names

`o`	vector of final outputs
`v`	vector of value added, optional. If this vector is not specified, value added will be calculated as gross output - intermediate consumption
`method`	user specified the decomposition method
`verbose`	logical, should timings of the calculation be displayed? Default is FALSE
`...`	arguments to pass on the respective decomposition method

Details

Version 2 introduces several important changes, the default method is now leontief, which means that wwz has to be specified explicitly. Furthermore, the input object have a different structure, see the information below for details.

Value

The output when using the WWZ algorithm is a matrix with dimensions GNG*19. Whereby 19 is the 16 objects the WWZ algorithm decomposes exports into, plus three checksums. GNG represents source country, using industry and using country.

Author(s)

Bastiaan Quast

References

Timmer, Marcel P. (ed) (2012), "The World Input-Output Database (WIOD): Contents Sources and Methods", WIOD Working Paper Number 10, downloadable at http://www.wiod.org/publications/papers/wiod10.pdf

Wang, Zhi, Shang-Jin Wei, and Kunfu Zhu. Quantifying international production sharing at the bilateral and sector levels. No. w19677. National Bureau of Economic Research, 2013.

Examples

```
# load leather example data
data(leather)

# explore the data set
ls()

# explore each of the objects
inter
final
countries
industries
out

# use the direct approach

# run the Leontief decomposition
decomp(inter,
       final,
```

```
        countries,
        industries,
        out,
        method = "leontief")

# run the WWZ decomposition
decomp(inter,
        final,
        countries,
        industries,
        out,
        method = "wwz")
```

`decompr` *Export Decomposition using the Wang-Wei-Zhu and Leontief decompositions algorithms.*

Description

Two global-value-chain decompositions are implemented. Firstly, the Wang-Wei-Zhu (Wang, Wei, and Zhu, 2013) algorithm splits bilateral gross exports into 16 value-added components. Secondly, the Leontief decomposition (default) derives the value added origin of exports by country and industry, which is also based on Wang, Wei, and Zhu (Wang, Z., S.-J. Wei, and K. Zhu. 2013. "Quantifying International Production Sharing at the Bilateral and Sector Levels.").

Author(s)

Bastiaan Quast <`bquast@gmail.com`> Fei Wang Victor Kummritz

References

Wang, Zhi, Shang-Jin Wei, and Kunfu Zhu. Quantifying international production sharing at the bilateral and sector levels. No. w19677. National Bureau of Economic Research, 2013.

See Also

http://qua.st/decompr

`final` *Leather Example*

Description

the final demand data

`industries` *Leather Example*

Description

the names of the industries data

`inter` *Leather Example*

Description

the intermediate demand data

`leontief` *Leontief Decomposition*

Description

Leontief Decomposition

Usage

```
leontief(x, post = c("exports", "output", "final_demand", "none"),
  long = TRUE)
```

Arguments

`x`	an object of class decompr
`post`	post-multiply the Leontief inverse with something, the default is exports
`long`	transform the output data into a long (tidy) data set or not, default it TRUE.

Value

a data frame containing the square matrix and labelled column and rows

Author(s)

Bastiaan Quast

References

Wang, Zhi, Shang-Jin Wei, and Kunfu Zhu. Quantifying international production sharing at the bilateral and sector levels. No. w19677. National Bureau of Economic Research, 2013.

Examples

```
## load example data
data(leather)

## create intermediate object (class decompr)
decompr_object <- load_tables_vectors(inter,
                                      final,
                                      countries,
                                      industries,
                                      out        )

## run the Leontief decomposition on the decompr object
leontief(decompr_object )
```

---

load_tables *Load the Input-Output and Final demand tables*

Description

This function loads the demand tables and defines all variables for the decomposition

Usage

```
load_tables(x, y)
```

Arguments

x	the intermediate demand table, it has dimensions GN x GN (G = no. of country, N = no. of industries), excluding the first row and the first column which contains the country names, and the second row and second column which contain the industry names for each country. In addition, an extra row at the end should contain final demand.
y	the final demand table it has dimensions GN x MN, excluding the first row and the first column which contains the country names, the second column which contains the industry names for each country, and second row which contains the five decomposed final demands (M).

Details

Adapted from code by Fei Wang.

Value

a decompr class object

Author(s)

Bastiaan Quast

load_tables_vectors *Load the Input-Output and Final demand tables*

Description

This function loads the demand tables and defines all variables for the decomposition

Usage

```
load_tables_vectors(x, y, k, i, o, v = NULL, null_inventory = FALSE)
```

Arguments

x	intermediate demand table, it has dimensions GN x GN (G = no. of country, N = no. of industries), excluding the first row and the first column which contains the country names, and the second row and second column which contain the industry names for each country. In addition, an extra row at the end should contain final demand.
y	final demand table it has dimensions GN x MN, excluding the first row and the first column which contains the country names, the second column which contains the industry names for each country, and second row which contains the five decomposed final demands (M). #' @param k is a vector of country of region names
k	vector or country or region names
i	vector of sector or industry names
o	vector of final outputs
v	vector of value added
null_inventory	when the inventory (last FDC) should be set to zero

Details

Adapted from code by Fei Wang.

Value

a decompr class object

Author(s)

Bastiaan Quast

Examples

```
# load example data
data(leather)

# create intermediate object (class decompr)
decompr_object <- load_tables_vectors(inter,
                                      final,
                                      countries,
                                      industries,
                                      out)

# examine output object
str(decompr_object)
```

`out` *Leather Example*

Description

final output

`wwz` *Runs the Wang-Wei-Zhu decomposition*

Description

This function runs the Wang-Wei-Zhu decomposition.

Usage

```
wwz(x, verbose = FALSE)
```

Arguments

`x`	an object of the class decompr
`verbose`	logical, should timings of the calculation be displayed? Default is FALSE

Details

Adapted from code by Fei Wang.

Value

the decomposed table

Author(s)

Bastiaan Quast

References

Wang, Zhi, Shang-Jin Wei, and Kunfu Zhu. Quantifying international production sharing at the bilateral and sector levels. No. w19677. National Bureau of Economic Research, 2013.

Examples

```
# load example data
data(leather)

# create intermediate object (class decompr)
decompr_object <- load_tables_vectors(inter,
                                      final,
                                      countries,
                                      industries,
                                      out        )

# run the WWZ decomposition on the decompr object
wwz(decompr_object)
```

Index