Package ‘gEcon.iosam’

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Description Package gEcon.iosam simplifies calibration of CGE (and multisector DSGE) models in gEcon and provides functions for operating on Input-Output Tables and Social Accounting Matrices.

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gEcon.iosam-package *Input-Output Tables and Social Accounting Matrices for gEcon*

Description

Package gEcon.iosam simplifies calibration of CGE (and multisector DSGE) models in gEcon and provides functions for operating on Input-Output Tables and Social Accounting Matrices.

Details

The package provides iosam class for representing Input-Output Tables and Social Accounting Matrices and a set of functions for importing and manipulating them. To streamline the process of calibration of CGE (and multisector DSGE) models written using gEcon template mechanism, function get_flow_values is provided.

Author(s)

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Examples

```
# Run the following code to copy the file with an example
# of CGE model calibration to your current working directory.
## Not run:
file.copy(file.path(system.file("examples", package = "gEcon.iosam"),
                  "cge_calibr_iosam.R"), getwd())
file.copy(file.path(system.file("examples", package = "gEcon.iosam"),
                  "cge_calibr_iosam.gcn"), getwd())

## End(Not run)

# Run the following code to copy the file with examples of data imports
# to your current working directory.
## Not run:
file.copy(file.path(system.file("examples", package="gEcon.iosam"),
                    "databases.R"), getwd())

## End(Not run)
```

aggregate_iosam *Aggregation*

Description

Function aggregate_iosam aggregates objects of iosam class.

Usage

```
aggregate_iosam(x, map, map_columns)
```

Arguments

x an object of iosam class.

map a data frame with the map for aggregation. Its first vector should correspond to x labels in rows.

map_columns a data frame with the map for columns' aggregation (optional, used only if the table is non symmetric). Its first vector should correspond to x labels in columns.

Value

An object of iosam class with aggregated data.

Examples

```
flowdata <- matrix(c(0, 0, 0, 38.1, 95.74, 133.84, 0, 0, 0, 9.44, 78.80,
                     88.24, 133.84, 88.24, 0, 0, 0, 222.08, 0, 0, 117.39,
                     68.4, 159.29, 345.08, 0, 0, 104.69, 229.14, 334.57,
                     668.4, 133.84, 88.24, 222.08, 345.08, 668.4, 0),
                   6, 6,
                   byrow = TRUE)
rows <- c("L", "K", "Household", "SectorA", "SectorB", "Total")
x <- iosam(flowdata, nproducts = c(2, 2),
           rows = rows, products_ind = c(4, 4))
x
map2 <- c("Factor", "Factor", "Household",
          "Sectors", "Sectors", "Total")
map <- data.frame(rows, map2, stringsAsFactors = FALSE)
xa <- aggregate_iosam(x, map)
xa


# Run the following code to copy the file with additional examples to
# your current working directory.
## Not run:
file.copy(file.path(system.file("examples", package="gEcon.iosam"),
                  "databases.R"), getwd())

## End(Not run)
```

as.matrix,iosam-method

Coercion to matrix

Description

Method for coercing an `iosam` object to matrix.

Usage

```
## S4 method for signature 'iosam'
as.matrix(x)
```

Arguments

`x`	object of `iosam` class.

Value

The underlying matrix.

get_flow_values

Getting flow values from matrices and `iosam` objects

Description

Function `get_flow_values` returns a list with variables in format "X__RowA__ColumnB" and their values.

- If x is a matrix or a vector, the list contains variables for all its elements. In this case, parameter 'rows' (and 'columns') is required.
- If x is an Input-Output Table of `iosam` class or a part of an `iosam` object, the list contains variables for all its elements as well, but the parameters 'rows' and 'columns' are optional - when not provided, appropriate labels are used.
- If x is a Social Accounting Matrix of `iosam` class, only the part which constitutes an Input-Output Table is used. Parameters 'rows' and 'columns' are optional.

Usage

```
get_flow_values(x, prefix = "X", rows, columns)
```

Arguments

x — a vector, matrix, object of `iosam` class or its part.

prefix — (default "X") the name of the output variable.

rows — a vector with sectors’ names corresponding to the rows of x (and columns, if parameter ’columns’ is missing and both dimensions of x are greater than 1) to be added to the output variable’s name.

columns — a vector with sectors’ names corresponding to the columns of x to be added to the output variable’s name (optional).

Value

A named list with selected data.

Examples

```
flowdata <- matrix(c(0, 0, 0, 38.1, 95.74, 133.84, 0, 0, 0, 9.44, 78.80,
                     88.24, 133.84, 88.24, 0, 0, 0, 222.08, 0, 0, 117.39,
                     68.4, 159.29, 345.08, 0, 0, 104.69, 229.14, 334.57,
                     668.4, 133.84, 88.24, 222.08, 345.08, 668.4, 0),
                   6, 6,
                   byrow = TRUE)
rows <- c(”L”, ”K”, ”Household”, ”SectorA”, ”SectorB”, ”Total”)
x <- iosam(flowdata, nproducts = c(2, 2),
           rows = rows, products_ind = c(4, 4))
get_flow_values(x)
get_flow_values(x, rows = c(”A”, ”B”), columns = c(”A”, ”B”))
get_flow_values(x[1, 4:5], rows = c(”L”), columns = c(”A”, ”B”))
get_flow_values(x[c(”L”, ”K”), c(”SectorA”, ”SectorB”)])


# Run the following code to copy the file with a more detailed example
# (CGE model calibration) to your current working directory.
## Not run:
file.copy(file.path(system.file(”examples”, package = ”gEcon.iosam”),
                  ”cge_calibr_iosam.R”), getwd())
file.copy(file.path(system.file(”examples”, package = ”gEcon.iosam”),
                  ”cge_calibr_iosam.gcn”), getwd())

## End(Not run)
```

`iosam` *Constructor of objects of* `iosam` *class*

Description

Constructor of objects of `iosam` class

Usage

```
iosam(flowdata, nproducts, rows, columns = NULL, products_ind = c(1, 1))
```

Arguments

flowdata	a matrix with the values of intermediate outputs (and additional data).
nproducts	a numeric vector giving the number of products in rows and columns (for an Input-Output Table without additional data, it is equal to the flowdata dimensions).
rows	a vector giving the labels for rows (and for columns, if parameter 'columns' is missing).
columns	(default NULL) a vector giving the labels for columns. If missing, labels from parameter 'rows' will be taken.
products_ind	(default c(1,1)) a numeric vector with the location of the Input-Output Table's first element in the whole matrix (for IO Tables - equal to c(1,1), for Social Accounting Matrices - usually different from c(1,1)).

Value

An object of iosam class.

Examples

```
flowdata <- matrix(c(0, 0, 0, 38.1, 95.74, 133.84, 0, 0, 0, 9.44, 78.80,
                     88.24, 133.84, 88.24, 0, 0, 0, 222.08, 0, 0, 117.39,
                     68.4, 159.29, 345.08, 0, 0, 104.69, 229.14, 334.57,
                     668.4, 133.84, 88.24, 222.08, 345.08, 668.4, 0),
                   6, 6,
                   byrow = TRUE)
rows <- c("L", "K", "Household", "SectorA", "SectorB", "Total")
x <- iosam(flowdata, nproducts = c(2, 2),
           rows = rows, products_ind = c(4, 4))
x
summary(x)
```

---

iosam-attributes *Accessing attributes*

Description

Methods for accessing and setting attributes of iosam objects.

Usage

```
## S4 method for signature 'iosam'
nrow(x)

## S4 method for signature 'iosam'
ncol(x)

## S4 method for signature 'iosam'
dim(x)

## S4 method for signature 'iosam'
length(x)

## S4 method for signature 'iosam'
rownames(x)

## S4 replacement method for signature 'iosam,character'
rownames(x) <- value

## S4 method for signature 'iosam'
colnames(x)

## S4 replacement method for signature 'iosam,character'
colnames(x) <- value
```

Arguments

`x`	an object of `iosam` class.
`value`	a character vector with labels for rows or columns.

`iosam-class` *Class definition for* `iosam`

Description

Class definition for `iosam`

Slots

`flowdata` a matrix with values of intermediate inputs (and additional data).

`nproducts` a numeric vector giving the number of products in rows and columns (for an Input-Output Table without additional data, it is equal to the flowdata dimensions).

`rows` a vector with labels for rows.

`columns` a vector with labels for columns.

`products_ind` a vector giving the location of the Input-Output Table.

`iosam-display` *Displaying objects of* `iosam` *class*

Description

Displaying objects of `iosam` class

Usage

```
## S4 method for signature 'iosam'
print(x)

## S4 method for signature 'iosam'
show(object)

## S4 method for signature 'iosam'
summary(object)
```

Arguments

`x`	an object of `iosam` class.
`object`	an object of `iosam` class.

`iosam-get-data` *Retrieving data*

Description

Functions for accessing the contents of `iosam` objects.

Usage

```
get_flowdata(x)

get_products(x)

get_add_rows(x)

get_add_columns(x)
```

Arguments

`x`	an object of `iosam` class.

Value

The content of x.

`iosam-import` *Importing tables from a .csv file*

Description

Functions that import data from files and create `iosam` objects: `read_iosam` is an universal function while `read_from_database` is designed to import Input-Output Tables from Eurostat and the World Input-Output Database or Social Accounting Matrices from the GTAP database. For tables from Eurostat and WIOD, it is required to change the cells format to numeric before importing.

Usage

```
read_iosam(filename, sep = ";", dec = ",", nproducts, table_ind, data_ind,
  data_dim, add = TRUE, products_ind)

read_from_database(filename, database, add = TRUE)
```

Arguments

`filename` the location of a .csv file.

`sep` (default ;) the field separator character.

`dec` (default ,) the character used in the file for decimal points.

`nproducts` a numeric vector, the number of products (or sectors) in the imported table.

`table_ind` a numeric vector, indices of the first element of the imported matrix, giving the row with column labels and the column with row labels.

`data_ind` a numeric vector, indices of the first data element.

`data_dim` a numeric vector, dimensions of the matrix with data.

`add` (default TRUE) logical, should the output table include rows and columns with additional data?

`products_ind` a numeric vector, indices of the first element from the intermediate outputs' matrix (if not specified c(1, 1) will be taken).

`database` a character string, source of the imported table ('eurostat', 'wiod' or 'gtap').

Value

An object of `iosam` class.

Examples

```
file <- file.path(system.file("extdata", package="gEcon.iosam"),
                "iot_eurostat.csv")
pl_input_output <- read_from_database(file, database = 'eurostat',
                                  add = TRUE)
summary(pl_input_output)
View(as.matrix(pl_input_output))
```

```
data_file <- file.path(system.file("extdata", package = "gEcon.iosam"),
             "calibr_sam.csv")
sam <- read_iosam(data_file,
                  nproducts = c(8, 8),
                  table_ind = c(2, 2),
                  data_ind = c(3, 3),
                  data_dim = c(18, 18),
                  products_ind = c(10, 10))
summary(sam)
View(as.matrix(sam))

# Run the following code to copy the file with a detailed example to
# your current working directory.
## Not run:
file.copy(file.path(system.file("examples", package="gEcon.iosam"),
                    "databases.R"), getwd())

## End(Not run)
```

iosam-indexing *Indexing objects of* iosam *class*

Description

Selecting values from underlying data matrix as in matrix[i, j], matrix[, j] or matrix[i,].

Usage

```
## S4 method for signature 'iosam,vector,vector,ANY'
x[i, j]

## S4 method for signature 'iosam,vector,missing,ANY'
x[i, j]

## S4 method for signature 'iosam,missing,vector,ANY'
x[i, j]
```

Arguments

x	an object of iosam class.
i	a numeric or character vector, rows to be selected.
j	a numeric or character vector, columns to be selected.

Value

Matrix with selected values.

iosam-math *Overloading mathematical operators*

Description

Overloading mathematical operators

Usage

```
## S4 method for signature 'iosam'
sum(x)

## S4 method for signature 'iosam'
max(x)

## S4 method for signature 'iosam'
min(x)

## S4 method for signature 'iosam'
mean(x)

## S4 method for signature 'iosam'
rowSums(x)

## S4 method for signature 'iosam'
colSums(x)

## S4 method for signature 'iosam,numeric'
Arith(e1, e2)

## S4 method for signature 'iosam,iosam'
Arith(e1, e2)

## S4 method for signature 'numeric,iosam'
Arith(e1, e2)
```

Arguments

x	an object of iosam class.
e1	an object of iosam class or numeric.
e2	an object of iosam class or numeric.

Value

Depending on type of operation an object of the iosam class or numeric with the result.

iosam_to_tex *Export to LaTeX*

Description

Function iosam_to_tex exports iosam objects to LaTeX tables. For compilation of LaTeX code tabularx LaTeX package is required.

Usage

```
iosam_to_tex(x)
```

Arguments

x	an object of iosam class.

Value

LaTeX code.

products_x_products *Retrieving the Input-Output Table*

Description

Function for retrieving the IO Table from an iosam object.

Usage

```
products_x_products(x)
```

Arguments

x	an object of iosam class.

Value

An object of iosam class with the part of x that constitutes an Input-Output Table.

t,iosam-method *Transposition*

Description

Transposition of iosam objects.

Usage

```
## S4 method for signature 'iosam'
t(x)
```

Arguments

x	an object of iosam class.

Value

An object of iosam class with transposed data.

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