Package 'gvcAnalyzer'

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Type Package

Title Global Value Chain Decomposition for Value-Added Trade

Version 0.1.1

Description Provides tools for decomposing Global Value Chain (GVC) participation and value-added trade. It implements the frameworks proposed by Borin and Mancini (2023) 10.1080/09535314.2022.2153221> for source-based and sink-based decompositions, and by Borin, Mancini, and Taglioni (2025) 10.1093/wber/lhaf017> for tripartite and output-based GVC measures.

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Contents

bm_2023_bilateral_pure . . . 2
bm_2023_bilateral_pure_all . . . 3
bm_2023_bilateral_sink . . . 3
bm_2023_bilateral_sink_all . . . 4
bm_2023_bilateral_source . . . 4
bm_2023_bilateral_source_all . . . 5
bm_2023_exporter_total . . . 5
bm_2023_exporter_total_all . . . 6
bm_2025_output_components . . . 6
bm_2025_output_components_sector . . . 7
bm_2025_output_measures . . . 7
bm_2025_output_measures_sector . . . 8
bm_2025_trade_exporter . . . 8
bm_2025_trade_measures . . . 9
bm_2025_tripartite_trade . . . 9
bm_2025_tripartite_trade_all . . . 10
bm_build_io . . . 10
bm_get_e_sr . . . 11
bm_get_e_star . . . 11
bm_toy_data . . . 12

Index **13**

`bm_2023_bilateral_pure` *BM_2023 pure bilateral decomposition of exports from s to r*

Description

BM_2023 pure bilateral decomposition of exports from s to r

Usage

```
bm_2023_bilateral_pure(io, s, r)
```

Arguments

`io`	A `bm_io` object.
`s`	Exporter country (name or index).
`r`	Importer country (name or index).

Value

A data frame with the pure bilateral value-added decomposition.

`bm_2023_bilateral_pure_all` *BM_2023 pure bilateral (/sr) decomposition for all pairs*

Description

BM_2023 pure bilateral (/sr) decomposition for all pairs

Usage

```
bm_2023_bilateral_pure_all(io)
```

Arguments

`io`	A `bm_io` object.

Value

Data frame of pure bilateral decomposition for all pairs.

`bm_2023_bilateral_sink` *BM_2023 sink-based bilateral decomposition of exports from s to r*

Description

BM_2023 sink-based bilateral decomposition of exports from s to r

Usage

```
bm_2023_bilateral_sink(io, s, r)
```

Arguments

`io`	A `bm_io` object.
`s`	Exporter country (name or index).
`r`	Importer country (name or index).

Value

A data frame with the sink-based value-added decomposition.

bm_2023_bilateral_sink_all

BM_2023 sink-based bilateral decomposition for all pairs

Description

BM_2023 sink-based bilateral decomposition for all pairs

Usage

```
bm_2023_bilateral_sink_all(io)
```

Arguments

io	A bm_io object.

Value

Data frame of sink-based decomposition for all pairs.

bm_2023_bilateral_source

BM_2023 source-based bilateral decomposition of exports from s to r

Description

BM_2023 source-based bilateral decomposition of exports from s to r

Usage

```
bm_2023_bilateral_source(io, s, r)
```

Arguments

io	A bm_io object.
s	Exporter country (name or index).
r	Importer country (name or index).

Value

A data frame with the source-based value-added decomposition.

bm_2023_bilateral_source_all

BM_2023 source-based bilateral decomposition for all pairs

Description

BM_2023 source-based bilateral decomposition for all pairs

Usage

```
bm_2023_bilateral_source_all(io)
```

Arguments

io	A bm_io object.

Value

Data frame of source-based decomposition for all pairs.

bm_2023_exporter_total

BM_2023 exporter-perspective decomposition of total exports of s

Description

BM_2023 exporter-perspective decomposition of total exports of s

Usage

```
bm_2023_exporter_total(io, s)
```

Arguments

io	A bm_io object.
s	Exporter country (name or index).

Value

A data frame with the exporter-total decomposition.

bm_2023_exporter_total_all

BM_2023 exporter totals for all countries

Description

BM_2023 exporter totals for all countries

Usage

```
bm_2023_exporter_total_all(io)
```

Arguments

io	A bm_io object.

Value

Data frame of exporter totals for all countries.

bm_2025_output_components

BM_2025 output-based GVC components by exporter

Description

BM_2025 output-based GVC components by exporter

Usage

```
bm_2025_output_components(io)
```

Arguments

io	A bm_io object.

Value

Data frame with output-based GVC components.

bm_2025_output_components_sector

BM 2025 output components by country and sector

Description

BM 2025 output components by country and sector

Usage

```
bm_2025_output_components_sector(io)
```

Arguments

io	A bm_io object.

Value

Data frame with sectoral output components.

bm_2025_output_measures

BM_2025 output-based GVC participation indicators

Description

BM_2025 output-based GVC participation indicators

Usage

```
bm_2025_output_measures(io)
```

Arguments

io	A bm_io object.

Value

Data frame with output-based GVC participation measures.

bm_2025_output_measures_sector

BM 2025 output participation measures by country and sector

Description

BM 2025 output participation measures by country and sector

Usage

```
bm_2025_output_measures_sector(io)
```

Arguments

io	A bm_io object.

Value

Data frame with sectoral GVC measures.

bm_2025_trade_exporter

BM_2025 exporter-level GVC trade totals

Description

BM_2025 exporter-level GVC trade totals

Usage

```
bm_2025_trade_exporter(io)
```

Arguments

io	A bm_io object.

Value

Data frame of exporter totals.

`bm_2025_trade_measures` *BM_2025 trade-based GVC participation indicators*

Description

BM_2025 trade-based GVC participation indicators

Usage

```
bm_2025_trade_measures(io)
```

Arguments

`io`	A `bm_io` object.

Value

Data frame of trade-based indicators.

`bm_2025_tripartite_trade` *BM_2025 tripartite GVC trade decomposition for one pair (s,r)*

Description

BM_2025 tripartite GVC trade decomposition for one pair (s,r)

Usage

```
bm_2025_tripartite_trade(io, s, r)
```

Arguments

`io`	A `bm_io` object.
`s`	Exporter country (name or index).
`r`	Importer country (name or index).

Value

Data frame for the pair (s,r).

bm_2025_tripartite_trade_all *BM_2025 tripartite GVC trade decomposition for all pairs*

Description

BM_2025 tripartite GVC trade decomposition for all pairs

Usage

```
bm_2025_tripartite_trade_all(io)
```

Arguments

io	A bm_io object.

Value

Data frame for all pairs.

bm_build_io *Build a bm_io object from IO table blocks*

Description

Build a bm_io object from IO table blocks

Usage

```
bm_build_io(Z, Y, VA, X, countries, sectors)
```

Arguments

Z	Intermediate demand matrix (GN x GN).
Y	Final demand matrix. Can be (GN x G) OR (GN x (G * FD_categories)).
VA	Value added. Can be a vector (length GN) or matrix (Rows x GN).
X	Output vector (length GN).
countries	Character vector of country names/codes (length G).
sectors	Character vector of sector names/codes (length N).

Value

An object of class "bm_io".

bm_get_e_sr *Exports from s to r (sectoral)*

Description

Exports from s to r (sectoral)

Usage

```
bm_get_e_sr(io, exporter, importer)
```

Arguments

io	bm_io object.
exporter	Exporter country (name or index).
importer	Importer country (name or index).

Value

Numeric vector of exports.

bm_get_e_star *Total exports of s to all foreign destinations*

Description

Total exports of s to all foreign destinations

Usage

```
bm_get_e_star(io, exporter)
```

Arguments

io	bm_io object.
exporter	Exporter country (name or index).

Value

Numeric vector of total exports.

`bm_toy_data` *Toy 4-country, 3-sector IO table for bmGVC*

Description

A small multi-country input–output data set used in bmGVC examples and vignettes. It contains four countries (China, India, Japan, ROW) and three sectors (Primary, Manufacturing, Service).

Format

bm_toy_Z numeric matrix 12 x 12

bm_toy_Y numeric matrix 12 x 4

bm_toy_VA numeric vector of length 12

bm_toy_X numeric vector of length 12

bm_toy_countries character vector of length 4

bm_toy_sectors character vector of length 3

Details

The data are stored in six objects:

- `bm_toy_Z`: 12 x 12 intermediate demand matrix
- `bm_toy_Y`: 12 x 4 final demand matrix
- `bm_toy_VA`: length-12 value-added vector
- `bm_toy_X`: length-12 gross output vector
- `bm_toy_countries`: character vector of length 4
- `bm_toy_sectors`: character vector of length 3

The ordering of industries is (China P,M,S; India P,M,S; Japan P,M,S; ROW P,M,S).

Index

∗ **datasets**
bm_toy_data, 12

bm_2023_bilateral_pure, 2
bm_2023_bilateral_pure_all, 3
bm_2023_bilateral_sink, 3
bm_2023_bilateral_sink_all, 4
bm_2023_bilateral_source, 4
bm_2023_bilateral_source_all, 5
bm_2023_exporter_total, 5
bm_2023_exporter_total_all, 6
bm_2025_output_components, 6
bm_2025_output_components_sector, 7
bm_2025_output_measures, 7
bm_2025_output_measures_sector, 8
bm_2025_trade_exporter, 8
bm_2025_trade_measures, 9
bm_2025_tripartite_trade, 9
bm_2025_tripartite_trade_all, 10
bm_build_io, 10
bm_get_e_sr, 11
bm_get_e_star, 11
bm_toy_countries *(*bm_toy_data*)*, 12
bm_toy_data, 12
bm_toy_sectors *(*bm_toy_data*)*, 12
bm_toy_VA *(*bm_toy_data*)*, 12
bm_toy_X *(*bm_toy_data*)*, 12
bm_toy_Y *(*bm_toy_data*)*, 12
bm_toy_Z *(*bm_toy_data*)*, 12