

# Package ‘ionet’

January 22, 2024

**Type** Package

**Title** Network Analysis for Input-Output Tables

**Version** 0.2.2

**Maintainer** Shiyong Xiao <shiyong.xiao@outlook.com>

**Description** Network functionalities specialized for data generated from input-output tables.

**Depends** R (>= 2.10)

**License** GPL (>= 3)

**Encoding** UTF-8

**LazyData** true

**Imports** Rcpp (>= 1.0.8.3)

**LinkingTo** Rcpp

**URL** <https://github.com/Carol-seven/ionet>

**BugReports** <https://github.com/Carol-seven/ionet/issues>

**RoxygenNote** 7.3.0

**Suggests** testthat (>= 3.0.0)

**Config/testthat/edition** 3

**NeedsCompilation** yes

**Author** Shiyong Xiao [aut, cre] (<<https://orcid.org/0000-0002-8846-3258>>),

Jun Yan [aut] (<<https://orcid.org/0000-0003-4401-7296>>),

Panpan Zhang [aut] (<<https://orcid.org/0000-0002-8211-5930>>)

**Repository** CRAN

**Date/Publication** 2024-01-22 17:30:03 UTC

## R topics documented:

btw . . . . .	2
china_2002_122 . . . . .	3
china_2005_42 . . . . .	3
china_2007_135 . . . . .	4

china_2010_41 . . . . .	4
china_2012_139 . . . . .	5
china_2015_42 . . . . .	5
china_2017_149 . . . . .	6
china_2017_42 . . . . .	6
china_2018_153 . . . . .	7
china_2018_42 . . . . .	7
china_2020_153 . . . . .	8
china_2020_42 . . . . .	8
china_employment . . . . .	9
dijkstra . . . . .	9
OECD21ed_CHN_1995to2018 . . . . .	10
OECD21ed_JPN_1995to2018 . . . . .	10

## Index 11

---

btw	<i>Betweenness centrality</i>
-----	-------------------------------

---

### Description

Compute the betweenness centrality with auxiliary information based on strongest path (SP).

### Usage

```
btw(adjmat, gross, aux, alpha = 1, type = "consumption")
```

### Arguments

adjmat	An n-by-n numerical matrix representing the matrix of intermediate transactions in the input-output table.
gross	An n-dimensional numerical vector representing the gross input/output.
aux	An n-dimensional numerical vector representing the node-specific auxiliary information.
alpha	A scalar (default = 1) between 0 and 1, representing the tuning parameter that controls the weights for SP strength and auxiliary information.
type	A character string specifying the type of SP to calculate. Available options: <ul style="list-style-type: none"> <li>• type = "consumption" / type = "pull" (default)</li> <li>• type = "distribution" / type = "push"</li> </ul>

### Value

A list of betweenness score, associated SPs, SP distance and SP strength.

### References

Xiao, S., Yan, J. and Zhang, P. (2022). Incorporating Auxiliary Information in Betweenness Measure for Input-Output Networks. *Physica A: Statistical Mechanics and its Applications*, 607, 128200.

---

china_2002_122	<i>Input-output table for China, 2002, 122 sectors</i>
----------------	--

---

**Description**

The national input-output table of China for 2002, covering 122 sectors. Data are calculated at producers' prices in 2002. Values are denoted in 10 thousand Chinese Yuan (CNY).

**Usage**

```
data(china_2002_122)
```

**Format**

A data frame with 129 rows and 139 columns.

**Source**

[National Bureau of Statistics of China](#)

---

china_2005_42	<i>Input-output table for China, 2005, 42 sectors</i>
---------------	---

---

**Description**

The national input-output table of China for 2005, covering 42 sectors. Data are calculated at producers' prices in 2005. Values are denoted in 10 thousand Chinese Yuan (CNY).

**Usage**

```
data(china_2005_42)
```

**Format**

A data frame with 49 rows and 55 columns.

**Source**

[National Bureau of Statistics of China](#)

---

`china_2007_135`*Input-output table for China, 2007, 135 sectors*

---

**Description**

The national input-output table of China for 2007, covering 135 sectors. Data are calculated at producers' prices in 2007. Values are denoted in 10 thousand Chinese Yuan (CNY).

**Usage**

```
data(china_2007_135)
```

**Format**

A data frame with 142 rows and 152 columns.

**Source**

[National Bureau of Statistics of China](#)

---

`china_2010_41`*Input-output table for China, 2010, 41 sectors*

---

**Description**

The national input-output table of China for 2010, covering 41 sectors. Data are calculated at producers' prices in 2010. Values are denoted in 10 thousand Chinese Yuan (CNY).

**Usage**

```
data(china_2010_41)
```

**Format**

A data frame with 48 rows and 58 columns.

**Source**

[National Bureau of Statistics of China](#)

---

china_2012_139	<i>Input-output table for China, 2012, 139 sectors</i>
----------------	--

---

**Description**

The national input-output table of China for 2012, covering 139 sectors. Data are calculated at producers' prices in 2012. Values are denoted in 10 thousand Chinese Yuan (CNY).

**Usage**

```
data(china_2012_139)
```

**Format**

A data frame with 146 rows and 155 columns.

**Source**

[National Bureau of Statistics of China](#)

---

china_2015_42	<i>Input-output table for China, 2015, 42 sectors</i>
---------------	---

---

**Description**

The national input-output table of China for 2015, covering 42 sectors. Data are calculated at producers' prices in 2015. Values are denoted in 10 thousand Chinese Yuan (CNY).

**Usage**

```
data(china_2015_42)
```

**Format**

A data frame with 49 rows and 59 columns.

**Source**

[National Bureau of Statistics of China](#)

---

`china_2017_149`*Input-output table for China, 2017, 149 sectors*

---

**Description**

The national input-output table of China for 2017, covering 149 sectors. Data are calculated at producers' prices in 2017. Values are denoted in 10 thousand Chinese Yuan (CNY).

**Usage**

```
data(china_2017_149)
```

**Format**

A data frame with 156 rows and 165 columns.

**Source**

[National Bureau of Statistics of China](#)

---

`china_2017_42`*Input-output table for China, 2017, 42 sectors*

---

**Description**

The national input-output table of China for 2017, covering 42 sectors. Values are denoted in 10 thousand Chinese Yuan (CNY).

**Usage**

```
data(china_2017_42)
```

**Format**

A data frame with 91 rows and 53 columns.

**Source**

[National Bureau of Statistics of China](#)

---

china_2018_153	<i>Input-output table for China, 2018, 153 sectors</i>
----------------	--

---

**Description**

The national input-output table of China for 2018, covering 153 sectors. Data are calculated at producers' prices in 2018. Values are denoted in 10 thousand Chinese Yuan (CNY).

**Usage**

```
data(china_2018_153)
```

**Format**

A data frame with 160 rows and 169 columns.

**Source**

[National Bureau of Statistics of China](#)

---

china_2018_42	<i>Input-output table for China, 2018, 42 sectors</i>
---------------	---

---

**Description**

The national input-output table of China for 2018, covering 42 sectors. Values are denoted in 10 thousand Chinese Yuan (CNY).

**Usage**

```
data(china_2018_42)
```

**Format**

A data frame with 91 rows and 53 columns.

**Source**

[National Bureau of Statistics of China](#)

---

china\_2020\_153      *Input-output table for China, 2020, 153 sectors*

---

**Description**

The national input-output table of China for 2020, covering 153 sectors. Data are calculated at producers' prices in 2020. Values are denoted in 10 thousand Chinese Yuan (CNY).

**Usage**

```
data(china_2020_153)
```

**Format**

A data frame with 160 rows and 169 columns.

**Source**

[National Bureau of Statistics of China](#)

---

china\_2020\_42      *Input-output table for China, 2020, 42 sectors*

---

**Description**

The national input-output table of China for 2020, covering 42 sectors. Values are denoted in 10 thousand Chinese Yuan (CNY).

**Usage**

```
data(china_2020_42)
```

**Format**

A data frame with 91 rows and 53 columns.

**Source**

[National Bureau of Statistics of China](#)



---

china_employment	<i>Sectoral employment data for China, 1990-2018</i>
------------------	--

---

**Description**

Number of employed persons (in the unit of 10 thousands) in China 1990-2018, by sector.

**Usage**

```
data(china_employment)
```

**Format**

A data frame with 115 rows and 32 columns.

**References**

Wang, Y., Jia, X. and Wang, C. (2021). Research on Sectoral Employment Accounting of China. *Statistical Research*, 38(12), 3–18. [URL](#)

---

dijkstra	<i>Dijkstra's algorithm</i>
----------	-----------------------------

---

**Description**

Implement the Dijkstra's algorithm to find the shortest paths from the source node to all nodes in the given network.

**Usage**

```
dijkstra(adjmat, src)
```

**Arguments**

adjmat	The adjacency matrix of a directed, weighted network.
src	An integer specifying the given source node to find the shortest distance.

**Value**

A list of distance and previous node.

**References**

Dijkstra, E. W. (1959). A Note on Two Problems in Connexion with Graphs. *Numerische Mathematik*, 1, 269–271.

---

OECD21ed\_CHN\_1995to2018

*Input-output tables of the OECD 2021 edition for China, 1995–2018,  
45 sectors*

---

**Description**

The national input-output tables of China for the period from 1995 to 2018, covering 45 sectors. Data are calculated in current prices. Values are denoted in millions of US dollars (USD).

**Usage**

data(OECD21ed\_CHN\_1995to2018)

**Format**

A list containing 24 data frames, each with 50 rows and 56 columns.

**Source**

[Input-Output Tables \(IOTs\) 2021 ed. - OECD](#)

---

OECD21ed\_JPN\_1995to2018

*Input-output tables of the OECD 2021 edition for Japan, 1995–2018,  
45 sectors*

---

**Description**

The national input-output tables of Japan for the period from 1995 to 2018, covering 45 sectors. Data are calculated in current prices. Values are denoted in millions of US dollars (USD).

**Usage**

data(OECD21ed\_JPN\_1995to2018)

**Format**

A list containing 24 data frames, each with 50 rows and 56 columns.

**Source**

[Input-Output Tables \(IOTs\) 2021 ed. - OECD](#)

# Index

## \* datasets

- china\_2002\_122, [3](#)
- china\_2005\_42, [3](#)
- china\_2007\_135, [4](#)
- china\_2010\_41, [4](#)
- china\_2012\_139, [5](#)
- china\_2015\_42, [5](#)
- china\_2017\_149, [6](#)
- china\_2017\_42, [6](#)
- china\_2018\_153, [7](#)
- china\_2018\_42, [7](#)
- china\_2020\_153, [8](#)
- china\_2020\_42, [8](#)
- china\_employment, [9](#)
- OECD21ed\_CHN\_1995to2018, [10](#)
- OECD21ed\_JPN\_1995to2018, [10](#)

btw, [2](#)

- china\_2002\_122, [3](#)
- china\_2005\_42, [3](#)
- china\_2007\_135, [4](#)
- china\_2010\_41, [4](#)
- china\_2012\_139, [5](#)
- china\_2015\_42, [5](#)
- china\_2017\_149, [6](#)
- china\_2017\_42, [6](#)
- china\_2018\_153, [7](#)
- china\_2018\_42, [7](#)
- china\_2020\_153, [8](#)
- china\_2020\_42, [8](#)
- china\_employment, [9](#)

dijkstra, [9](#)

- OECD21ed\_CHN\_1995to2018, [10](#)
- OECD21ed\_JPN\_1995to2018, [10](#)