Package 'clptheory'

May 8, 2026

Title Compute Price of Production and Labor Values

Version 1.0.0

Description Computes the uniform rate of profit, the vector of price of production and the vector of direct prices; and also compute measures of deviation between market prices, direct prices and prices of production. <doi:10.1016/j.strueco.2026.03.009>. You provide the input-output data and 'clptheory' does the calculations for you.

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Encoding UTF-8

RoxygenNote 7.3.3

Imports popdemo, stats, dplyr, magrittr

Depends R (>= 2.10)

LazyData true

Suggests knitr, rmarkdown

URL https://github.com/dbasu-umass/clptheory/

NeedsCompilation no

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Repository CRAN

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Contents

`ausiot` *AUS IO Table*

Description

Input Output Tables for the Australian economy from the World Input Output Database.

Usage

```
ausiot
```

Format

Input Output table for Australia for 15 years, 2000-2014.

Source

doi:10.34894/PJ2M1C

Examples

```
ausiot[1:3,1:3]
```

`aussea` *Socio Economic Accounts*

Description

This is the socio economic accounts for the Australian economy extracted from the 2016 release of the World Input Output Database. It contains industry-level data on employment, capital stocks, gross output and value added at current and constant prices, in millions of local currency. The industry classification is consistent with the world input-output tables.

Usage

```
aussea
```

Format

A industry-level (53 industries) data set for Australia over 15 years, 2000-2014.

country Country code.

code Industry code.

description Description of the industry.

variable One of the following variables:

GO Gross output by industry at current basic prices (in millions of national currency).

II Intermediate inputs at current purchasers' prices (in millions of national currency).

VA Gross value added at current basic prices (in millions of national currency).

EMP Number of persons engaged (thousands).

EMPE Number of employees (thousands).

H_EMPE Total hours worked by employees (millions).

COMP Compensation of employees (in millions of national currency).

LAB Labour compensation (in millions of national currency).

CAP Capital compensation (in millions of national currency).

K Nominal capital stock (in millions of national currency).

GO_PI Price levels gross output, 2010=100.

II_PI Price levels of intermediate inputs, 2010=100.

VA_PI Price levels of gross value added, 2010=100.

GO_QI Gross output, volume indices, 2010=100.

II_QI Intermediate inputs, volume indices, 2010=100.

VA_QI Value added, volume indices, 2010=100.

NOMEXCH Nominal exchange rate between the national currency and the US dollar.

Source

doi:10.34894/PJ2M1C

Examples

```
summary(aussea$COMP)
```

createdata *Create data set for analysis.*

Description

This function creates the data objects (matrices, vectors and scalars) necessary to implement the SI and NI from the WIOD.

Usage

```
createdata(country, year, datasea, dataio)
```

Arguments

country	country code as a character (e.g. "USA").
year	year (eg. 2000).
datasea	the socio economic accounts (data frame).
dataio	the input-output (data frame).

Value

A list with the following elements:

Ahat	The input-output matrix
l	The direct labor input vector (complex labor)
l_simple	The direct labor input vector (simple labor)
Q	The gross output vector
wavg	The average or uniform nominal wage rate
wagevector_all	The vector of nominal wage rates
vlp	Value of labor power
b	Real wage bundle (consumption/total hours)
b1	Real wage bundle (share of PCE * min wage)
pshare	Average profit share

Examples

```
createdata(country="USA",year=2010,datasea=usasea,dataio=usaiot)
```

nonregdist *Nonregression-based measures of distance between MP, DP, PP*

Description

This function computes different measures of distance between prices of production (PP), market prices (MP) and direct prices (DP).

Usage

```
nonregdist(x, y, w, w_avg, Q)
```

Arguments

x	price of production vector (1 x n).
y	direct prices vector (1 x n).
w	vector of nominal wage rates (1 x n).
w_avg	average wage rate (scalar).
Q	gross output vector (1 x n)

Value

A list with the following elements:

rmseppmp	RMSE between price of production and market prices
rmsedpmp	RMSE between direct prices and market prices
rmseppdp	RMSE between prices of production and direct prices
madppmp	MAD between price of production and market prices
maddpmp	MAD between direct prices and market prices
madppdp	MAD between prices of production and direct prices
mawdppmp	MAWD between price of production and market prices
mawddpmp	MAWD between direct prices and market prices
mawdppdp	MAWD between prices of production and direct prices
angleppmp	Angle between price of production and market prices
angledpmp	Angle between direct prices and market prices
angleppdp	Angle between prices of production and direct prices
ddistppmp	D-distance between price of production and market prices
ddistdpmp	D-distance between direct prices and market prices
ddistppdp	D-distance between prices of production and direct prices

Examples

```
# ------ Data

# price of production vector
x<- matrix(
data = c(0.25, 0.50, 0.75),
nrow=1
)
# direct price vector
y <- matrix(
data = c(0.33, 0.275, 0.85),
ncol=1
)
# Gross output vector
Q <- matrix(
data = c(26530, 18168, 73840),
ncol=1
)
# nominal wage rate vector
w <- matrix(
data = c(0.5, 0.33, 0.75),
ncol=1
)
# average wage (scalar)
w_avg <- 0.66
# Compute prices of production
nonregdist(x = x, y = y, Q = Q, w = w, w_avg = w_avg)
```

`ppnewint1` *Circulating capital model using the New Interpretation.*

Description

This function computes the uniform rate of profit, prices of production and labor values for a basic circulating capital model using the New Interpretation.

Usage

```
ppnewint1(A, w, v, Q, l_simple)
```

Arguments

`A`	input-output matrix (n x n).
`w`	uniform nominal wage rate (scalar).
`v`	value of labor power (scalar)
`Q`	gross output vector (n x 1).
`l_simple`	vector of simple labor input (1 x n).

Value

A list with the following elements:

meig	Maximum eigen value of A
urop	Uniform rate of profit (as a fraction)
mrop	Maximum rate of profit (as a fraction)
pp	Price of production vector
dp	Direct prices
lvalues	Labor values vector
Anonneg	Is A Nonnegative? (1=Y,0=N)
Airred	Is A Irreducible? (1=Y,0=N)

Examples

```
# ------ Data
# Input-output matrix
A <- matrix(
data = c(0.265,0.968,0.00681,0.0121,0.391,0.0169,0.0408,0.808,0.165),
nrow=3, ncol=3, byrow = TRUE
)
# Direct labor input vector (complex)
l <- matrix(
data = c(0.193, 3.562, 0.616),
nrow=1
)
# Real wage bundle
b <- matrix(
data = c(0.0109, 0.0275, 0.296),
ncol=1
)
# Gross output vector
Q <- matrix(
data = c(26530, 18168, 73840),
ncol=1
)
# Direct labor input vector (simple)
l_simple <- l
# Market price vector
m <- matrix(data = c(4, 60, 7),nrow=1)
# Uniform nominal wage rate
wavg <- m%*%b
# Value of labor power
v <- 2/3
# Compute prices of production
ppnewint1(A = A,w = wavg[1,1],v=v,Q = Q,l_simple = l)
```

ppnewint2 *Capital stock model using the New Interpretation.*

Description

This function computes the uniform rate of profit, prices of production and labor values for a capital stock model using the New Interpretation.

Usage

```
ppnewint2(A, l, w, v, Q, D, K, t, Tax)
```

Arguments

A	input-output matrix (n x n).
l	vector of simple labor input (1 x n).
w	average nominal wage rate (scalar)
v	value of labor power (scalar)
Q	gross output vector (n x 1).
D	depreciation matrix (n x n).
K	capital stock coefficient matrix (n x n).
t	diagonal matrix of turnover rates (n x n).
Tax	matrix of tax rates (n x n).

Value

A list with the following elements:

meig	Maximum eigen value of A
urop	Uniform rate of profit (as a fraction)
mrop	Maximum rate of profit (as a fraction)
pp	Price of production vector
dp	Direct prices
lvalues	Labor values vector
Mnonneg	Is M Nonnegative? (1=Y,0=N)
Mirred	Is M Irreducible? (1=Y,0=N)
Nnonneg	Is N Nonnegative? (1=Y,0=N)
Nirred	Is N Irreducible? (1=Y,0=N)
MNirred	Is M and N both Irreducible? (1=Y,0=N)

Examples

```
# ------ Data
# Input-output matrix
A <- matrix(
data = c(0.265,0.968,0.00681,0.0121,0.391,0.0169,0.0408,0.808,0.165),
nrow=3, ncol=3, byrow = TRUE
)
# Depreciation matrix
D <- matrix(
data = c(0,0,0,0.00568,0.0267,0.0028,0.00265,0.0147,0.00246),
nrow = 3, ncol = 3, byrow = TRUE
)
# Direct labor input vector (complex)
l <- matrix(
data = c(0.193, 3.562, 0.616),
nrow=1
)
# Value of labor power
v <- 2/3
# Gross output vector
Q <- matrix(
data = c(26530, 18168, 73840),
ncol=1
)
# Gross output vector
Q <- matrix(
data = c(26530, 18168, 73840),
ncol = 1
)
# Capital stock coefficient matrix
K <- matrix(
data = c(0,0,0,0.120,0.791,0.096,0.037,0.251,0.043),
nrow=3, ncol=3, byrow=TRUE
)
# Diagonal matrix of turnover rates
t <- diag(c(0.317, 0.099, 0.187))
# Matrix of tax rates (assumed 0 for this example)
Tax <- matrix(0,nrow=3,ncol=3)
# Average nominal wage rate
w <- 3.765
# Compute prices of production
ppnewint2(A=A,l=l,w=w,v=v,Q=Q,D=D,K=K,t=t,Tax=Tax)
```

---

ppsraffa1 *Circulating capital model using the Sraffian method.*

Description

This function computes the uniform rate of profit, prices of production and labor values for a basic circulating capital model using the Sraffian method.

Usage

```
ppsraffa1(A, Q, pshare, l_simple)
```

Arguments

A	input-output matrix (n x n).
Q	gross output vector (n x 1).
pshare	profit share (scalar)
l_simple	vector of simple labor input (1 x n).

Value

A list with the following elements:

meig	Maximum eigen value of A
urop	Uniform rate of profit (as a fraction)
mrop	Maximum rate of profit (as a fraction)
ppabs	Price of production vector (absolute)
pprel	Price of production vector (relative)
lvalues	Labor values vector
mevn	Monetary expression of value using net output
mevg	Monetary expression of value using gross output
Anonneg	Is A Nonnegative? (1=Y,0=N)
Airred	Is A Irreducible? (1=Y,0=N)

Examples

```
# ------ Data
# Input-output matrix
A <- matrix(
data = c(0.265,0.968,0.00681,0.0121,0.391,0.0169,0.0408,0.808,0.165),
nrow=3, ncol=3, byrow = TRUE
)
# Direct labor input vector (complex)
l <- matrix(
data = c(0.193, 3.562, 0.616),
nrow=1
)
# Gross output vector
Q <- matrix(
data = c(26530, 18168, 73840),
ncol=1
)
# Direct labor input vector (simple)
l_simple <- l
# Profit share
pshare <- 1/3
```

```
# Compute prices of production
ppsraffa1(A = A,pshare=pshare,Q = Q,l_simple = l)
```

---

ppstdint1 *Circulating capital model using the Standard Interpretation.*

Description

This function computes the uniform rate of profit, prices of production and labor values for a basic circulating capital model using the Standard Interpretation.

Usage

```
ppstdint1(A, b, Q, l_simple)
```

Arguments

A	input-output matrix (n x n).
b	vector real wage bundle (n x 1).
Q	gross output vector (n x 1).
l_simple	vector of simple labor input (1 x n).

Value

A list with the following elements:

meig	Maximum eigen value of M
urop	Uniform rate of profit (as a fraction)
mrop	Maximum rate of profit (as a fraction)
pp	Price of production vector
dp	Direct prices
lvalues	Labor values vector
Mnonneg	Is M Nonnegative? (1=Y,0=N)
Mirred	Is M Irreducible? (1=Y,0=N)

Examples

```
# ------ Data
# Input-output matrix
A <- matrix(
data = c(0.265,0.968,0.00681,0.0121,0.391,0.0169,0.0408,0.808,0.165),
nrow=3, ncol=3, byrow = TRUE
)
# Direct labor input vector (complex)
l <- matrix(
```

```
data = c(0.193, 3.562, 0.616),
nrow=1
)
# Real wage bundle
b <- matrix(
data = c(0.0109, 0.0275, 0.296),
ncol=1
)
# Gross output vector
Q <- matrix(
data = c(26530, 18168, 73840),
ncol=1
)
# Direct labor input vector (simple)
l_simple <- l
# Compute prices of production
ppstdint1(A = A,b = b,Q = Q,l_simple = l)
```

`ppstdint2` *Capital stock model using the Standard Interpretation.*

Description

This function computes the uniform rate of profit, prices of production and labor values for a capital stock model using the Standard Interpretation.

Usage

```
ppstdint2(A, l, b, Q, D, K, t, Tax)
```

Arguments

`A`	input-output matrix (n x n).
`l`	vector of simple labor input (1 x n).
`b`	vector real wage bundle (n x 1).
`Q`	gross output vector (n x 1).
`D`	depreciation matrix (n x n).
`K`	capital stock coefficient matrix (n x n).
`t`	diagonal matrix of turnover rates (n x n).
`Tax`	matrix of tax rates (n x n).

Value

A list with the following elements:

meig	Maximum eigen value of M
urop	Uniform rate of profit (as a fraction)
mrop	Maximum rate of profit (as a fraction)
pp	Price of production vector
dp	Direct prices
lvalues	Labor values vector
Mnonneg	Is M Nonnegative? (1=Y,0=N)
Mirred	Is M Irreducible? (1=Y,0=N)

Examples

```
# ------ Data
# Input-output matrix
A <- matrix(
data = c(0.265,0.968,0.00681,0.0121,0.391,0.0169,0.0408,0.808,0.165),
nrow=3, ncol=3, byrow = TRUE
)
# Depreciation matrix
D <- matrix(
data = c(0,0,0,0.00568,0.0267,0.0028,0.00265,0.0147,0.00246),
nrow = 3, ncol = 3, byrow = TRUE
)
# Direct labor input vector (complex)
l <- matrix(
data = c(0.193, 3.562, 0.616),
nrow=1
)
# Real wage bundle
b <- matrix(
data = c(0.0109, 0.0275, 0.296),
ncol=1
)
# Gross output vector
Q <- matrix(
data = c(26530, 18168, 73840),
ncol=1
)
# Gross output vector
Q <- matrix(
data = c(26530, 18168, 73840),
ncol = 1
)
# Capital stock coefficient matrix
K <- matrix(
data = c(0,0,0,0.120,0.791,0.096,0.037,0.251,0.043),
nrow=3, ncol=3, byrow=TRUE
```

```
)
# Diagonal matrix of turnover rates
t <- diag(c(0.317, 0.099, 0.187))
# Matrix of tax rates (assumed 0)
Tax <- matrix(0,nrow=3,ncol=3)

# Compute prices of production
ppstdint2(A=A,l=l,b=b,Q=Q,D=D,K=K,t=t,Tax=Tax)
```

`usaiot` *USA IO Table*

Description

Input Output Tables for the US economy from the World Input Output Database.

Usage

```
usaiot
```

Format

Input Output table for USA for 15 years, 2000-2014.

Source

doi:10.34894/PJ2M1C

Examples

```
usaiot[1:5,1:5]
```

`usarwb` *Real Wage Bundle, USA*

Description

Personal Consumption Expenditure from the Input Output Table for the USA. This data is used to construct the real wage bundle for computing the price of production vector.

Usage

```
usarwb
```

Format

Consumption expenditure on the output of 53 industries for USA for 15 years, 2000-2014.

Source

doi:10.34894/PJ2M1C

Examples

```
data(usarwb)
```

`usasea` *Socio Economic Accounts*

Description

This is the socio economic accounts for the USA extracted from the 2016 release of the World Input Output Database. It contains industry-level data on employment, capital stocks, gross output and value added at current and constant prices, in millions of local currency. The industry classification is consistent with the world input-output tables.

Usage

```
usasea
```

Format

A industry-level (53 industries) data set for USA over 15 years, 2000-2014.

country Country code.
code Industry code.
description Description of the industry.
variable One of the following variables:
GO Gross output by industry at current basic prices (in millions of national currency).
II Intermediate inputs at current purchasers' prices (in millions of national currency).
VA Gross value added at current basic prices (in millions of national currency).
EMP Number of persons engaged (thousands).
EMPE Number of employees (thousands).
H_EMPE Total hours worked by employees (millions).
COMP Compensation of employees (in millions of national currency).
LAB Labour compensation (in millions of national currency).
CAP Capital compensation (in millions of national currency).
K Nominal capital stock (in millions of national currency).
GO_PI Price levels gross output, 2010=100.
II_PI Price levels of intermediate inputs, 2010=100.
VA_PI Price levels of gross value added, 2010=100.
GO_QI Gross output, volume indices, 2010=100.
II_QI Intermediate inputs, volume indices, 2010=100.
VA_QI Value added, volume indices, 2010=100.
NOMEXCH Nominal exchange rate between the national currency and the US dollar.

Source

doi:10.34894/PJ2M1C

Examples

```
summary(usasea$COMP)
```

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