Package ‘clptheory’

April 4, 2023

Title Compute Price of Production and Labor Values
Version 0.1.0
Description Computes the uniform rate of profit, the vector of price of production and the vector of labor values; and also compute measures of deviation between relative prices of production and relative values. <https://scholarworks.umass.edu/econ_workingpaper/347/>. You provide the input-output data and ‘clptheory’ does the calculations for you.
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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]
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

Usage

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.
createdata

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.

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
1        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        The consumption or real wage bundle
pshare   Average profit share

References

**Examples**

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

---

### Description

This function computes various non-regression based measures of deviation between the vector of all possible relative labor values and the vector of all possible relative prices of production.

### Usage

```r
nregtestrel(x, y, w, w_avg, mev, Q)
```

### Arguments

- `x`: price vector (1 x n).
- `y`: value vector (1 x n).
- `w`: nominal wage rate vector (1 x n).
- `w_avg`: average nominal wage rate (scalar)
- `mev`: monetary expression of value using gross output (scalar)
- `Q`: gross output vector (n x 1).

### Value

A list with the following elements:

- `rmse`: Root mean squared error
- `mad`: Mean absolute distance
- `mawd`: Mean absolute weighted distance
- `cdm`: Classical distance measure
- `angle`: Angle between the two vectors (in degrees)
- `distangle`: Distance computed using the angle
- `lrelpplv`: Length of the relative price of production (or labor value) vector

### References

Examples

# 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),
col=1
)

# Gross output vector
Q <- matrix(
data = c(26530, 18168, 73840),
col=1
)

# Direct labor input vector (simple)

# Market price vector
m <- matrix(data = c(4, 60, 7), nrow=1)

# Uniform nominal wage rate
wavg <- m%*%b

# Vector of nominal wage rates
w <- matrix(data = rep(wavg, 3), nrow=1)

# Value of labor power
v <- 2/3

# Compute prices of production using NI
ni1 <- ppnewint1(A = A, l = l, w = wavg[1,1], v=v, Q = Q, l_simple = 1)

# Nonregression-based measures of deviation
nregtestrel(x=ni1$ppabs, y=ni1$lvalues, w=w, w_avg=ni1$mevg, Q=Q)

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. The model has uniform wage rates across industries and does not take account of unproductive labor for labor value calculations.

Usage

ppnewint1(A, l, w, v, Q, l_simple)
Arguments

- \( A \): input-output matrix (\( n \times n \)).
- \( l \): vector of complex labor input (\( 1 \times n \)).
- \( w \): uniform nominal wage rate (scalar).
- \( v \): value of labor power (scalar).
- \( Q \): gross output vector (\( n \times 1 \)).
- \( l_{\text{simple}} \): vector of simple labor input (\( 1 \times n \)).

Value

A list with the following elements:

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

References


Examples

```r
# ------ 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),
```
# 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, l = l, w = wavg[1,1], v=v, Q = Q, l_simple = l)

---

ppnewint2

_Circulating capital model 2 using the New Interpretation._

**Description**

This function computes the uniform rate of profit, prices of production and labor values for a circulating capital model using the New Interpretation. The model allows differential wage rates across industries but does not take account of unproductive labor for labor value calculations.

**Usage**

ppnewint2(A, l, w, v, Q, l_simple)

**Arguments**

- **A**: input-output matrix \((n \times n)\).
- **l**: vector of complex labor input \((1 \times n)\).
- **w**: vector of nominal wage rates \((1 \times n)\).
- **v**: value of labor power (scalar).
- **Q**: gross output vector \((n \times 1)\).
- **l_simple**: vector of simple labor input \((1 \times n)\).

**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)

References

Examples

```R
# -------- 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 wage rate
wavg <- m%*%b
# Vector of nominal wage rates
w <- matrix(data = c(wavg-0.5,wavg,wavg+0.5),nrow=1)
# Value of labor power
v <- 2/3
# Compute prices of production
```
Circulating capital model 3 using the New Interpretation.

Description

This function computes the uniform rate of profit, prices of production and labor values for a circulating capital model using the New Interpretation. The model has uniform wage rates across industries and takes account of unproductive labor for labor value calculations.

Usage

\[
\text{ppnewint3}(A, Ap, l, lp, w, v, Q, Qp, lp\_simple)
\]

Arguments

- **A**: input-output matrix \((n \times n)\).
- **Ap**: input-output matrix for the subset of productive industries \((m \times m)\).
- **l**: vector of complex labor input \((1 \times n)\).
- **lp**: vector of complex labor input for the subset of productive industries \((1 \times m)\).
- **w**: uniform nominal wage rate (scalar).
- **v**: value of labor power (scalar).
- **Q**: gross output vector \((n \times 1)\).
- **Qp**: gross output vector for the subset of productive industries \((m \times 1)\).
- **lp\_simple**: vector of simple labor input for the subset of productive industries \((1 \times m)\).

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? \((1=Y, 0=N)\)
ppnewint4

References

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 <- 3/5
# Compute prices of production
ppnewint3(A=A,Ap=A[1:2,1:2],l=l,lp=l[1,1:2],w=wavg[1,1],v=v,Q=Q,Qp=Q[1:2,1],lp_simple=l[1,1:2])

ppnewint4

Circulating capital model 4 using the New Interpretation.

Description
This function computes the uniform rate of profit, prices of production and labor values for a circulating capital model using the New Interpretation. The model allows differential wage rates across industries and takes account of unproductive labor for labor value calculations.
Usage

ppnewint4(A, Ap, l, lp, w, wp, v, Q, Qp, lp_simple)

Arguments

A  input-output matrix (n x n).
Ap input-output matrix for the subset of productive industries (m x m).
l  vector of complex labor input (1 x n).
lp vector of complex labor input for the subset of productive industries (1 x m).
w  vector of nominal wage rates (1 x n).
wp vector of nominal wage rates for the subset of productive industries (1 x m).
v  value of labor power (scalar).
Q  gross output vector (n x 1).
Qp gross output vector for the subset of productive industries (m x 1).
lp_simple vector of simple labor input for the subset of productive industries (1 x m).

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)

References

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 wage rate
wavg <- m%*%b

# Vector of nominal wage rates
w <- matrix(data=c(wavg-0.5,wavg,wavg+0.5),nrow=1)

# Value of labor power
v <- 3/5

# Compute prices of production
ppnewint4(A=A,Ap=A[1:2,1:2],l=l,lp=l[1,1:2],w=w[1,],wp=w[1,1:2],v=v,
Q=Q,Qp=Q[1:2,1],lp_simple=l[1,1:2])

ppnewint5  
Capital stock model 1 using the New Interpretation.

Description

This function computes the uniform rate of profit, prices of production and labor values for a basic capital stock model using the New Interpretation. The model has uniform wage rates across industries and does not take account of unproductive labor for labor value calculations.

Usage

ppnewint5(A, l, w, v, Q, D, K, t, l_simple)
Arguments

A input-output matrix (n x n).

l vector of complex labor input (1 x n).

w uniform 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 turnover times matrix (n x n diagonal).

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

Nnonneg Is N Nonnegative? (1=Y,0=N)

Nirred Is N Irreducible? (1=Y,0=N)

References


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

# 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)

# 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 turnover matrix
t <- diag(c(0.317, 0.099, 0.187))

# Compute prices of production
ppnewint5(A = A, l = l, w = wavg[1,1], v=v, Q = Q, l_simple = l, D=D, K=K, t=t)

---

### ppnewint6

**Capital stock model 2 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. The model allows differential wage rates across industries but does not take account of unproductive labor for labor value calculations.

### Usage

```
ppnewint6(A, l, w, v, Q, D, K, t, l_simple)
```
Arguments

- **A**: input-output matrix (n x n).
- **l**: vector of complex labor input (1 x n).
- **w**: vector of nominal wage rates (1 x n).
- **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**: turnover times matrix (n x n diagonal).
- **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
- **Nnonneg**: Is N Nonnegative? (1=Y, 0=N)
- **Nirred**: Is N Irreducible? (1=Y, 0=N)

References


Examples

```r
# ------ 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 <- 1
# Market price vector
m <- matrix(data = c(4, 60, 7),nrow=1)
# Uniform nominal wage rate
wavg <- m%*%b
# Vector of nominal wage rates
w <- matrix(data=c(wavg-0.5,wavg,wavg+0.5),nrow=1)
# Value of labor power
v <- 2/3
# Depreciation matrix
D <- matrix(data = c(0,0,0.00568,0.0267,0.0028,0.00265,0.0147,0.00246),
nrow=3, ncol=3, byrow = TRUE)

# Capital stock coefficient matrix
K <- matrix(
data = c(0,0,0.120,0.791,0.096,0.037,0.251,0.043),
nrow=3, ncol=3, byrow = TRUE)

# Diagonal turnover matrix
t <- diag(c(0.317, 0.099, 0.187))
# Compute prices of production
ppnewint6(A=A,l=l,w=w[1,],v=v,Q=Q,l_simple=l,D=D,K=K,t=t)

---

**ppnewint7**  
*Capital stock model 3 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. The model has uniform wage rates across industries and takes account of unproductive labor for labor value calculations.

**Usage**

ppnewint7(A, Ap, l, lp, w, v, Q, Qp, D, Dp, K, t, lp_simple)
Arguments

A
input-output matrix (n x n).

Ap
input-output matrix for the subset of productive industries (m x m).

l
vector of complex labor input (1 x n).

lp
vector of complex labor input for the subset of productive industries (1 x m).

w
uniform nominal wage rate (scalar).

v
value of labor power (scalar).

Q
gross output vector (n x 1).

Qp
gross output vector for the subset of productive industries (m x 1).

D
depreciation matrix (n x n).

Dp
depreciation matrix for the subset of productive industries (m x m).

K
capital stock coefficient matrix (n x n).

t
turnover times matrix (n x n diagonal).

lp_simple
vector of simple labor input for the subset of productive industries (1 x m).

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

Nnonneg
Is N Nonnegative? (1=Y,0=N)

Nirred
Is N Irreducible? (1=Y,0=N)

References

Examples

```r
# ------ 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

# Vector of nominal wage rates
w <- matrix(data=c(wavg-0.5, wavg, wavg+0.5), nrow=1)

# Value of labor power
v <- 3/5

# Depreciation matrix
D <- matrix(
data = c(0, 0, 0.00568, 0.0267, 0.0028, 0.00265, 0.0147, 0.00246),
nrow=3, ncol=3, byrow = TRUE)

# Capital stock coefficient matrix
K <- matrix(
data = c(0, 0, 0.120, 0.791, 0.096, 0.037, 0.251, 0.043),
nrow=3, ncol=3, byrow = TRUE)

# Diagonal turnover matrix
t <- diag(c(0.317, 0.099, 0.187))

# Compute prices of production
ppnewint7(A=A, Ap=A[1:2,1:2], l=l, lp=l[1,1:2], w=wavg[1,1], v=v, 
Q=Q, Qp=Q[1:2,1], lp_simple=l[1,1:2], D=D, Dp=D[1:2,1:2], K=K, t=t)
```

Capital stock model 4 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. The model allows differential wage rates across industries and takes account of unproductive labor for labor value calculations.

Usage

\[
\text{ppnewint8}(A, Ap, l, lp, w, wp, v, Q, Qp, D, Dp, K, t, lp\_simple)
\]

Arguments

- **A**: input-output matrix \((n \times n)\).
- **Ap**: input-output matrix for the subset of productive industries \((m \times m)\).
- **l**: vector of complex labor input \((1 \times n)\).
- **lp**: vector of complex labor input for the subset of productive industries \((1 \times m)\).
- **w**: vector of nominal wage rates \((1 \times n)\).
- **wp**: vector of nominal wage rates for the subset of productive industries \((1 \times m)\).
- **v**: value of labor power (scalar).
- **Q**: gross output vector \((n \times 1)\).
- **Qp**: gross output vector for the subset of productive industries \((m \times 1)\).
- **D**: depreciation matrix \((n \times n)\).
- **Dp**: depreciation matrix for the subset of productive industries \((m \times m)\).
- **K**: capital stock coefficient matrix \((n \times n)\).
- **t**: turnover times matrix \((n \times n\text{ diagonal})\).
- **lp\_simple**: vector of simple labor input for the subset of productive industries \((1 \times m)\).

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
- **Nnonneg**: Is \(N\) Nonnegative? \((1=Y,0=N)\)
- **Nirred**: Is \(N\) Irreducible? \((1=Y,0=N)\)
References


Examples

```r
# ----- 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
# Vector of nominal wage rates
w <- matrix(data=c(wavg-0.5, wavg, wavg+0.5), nrow=1)
# Value of labor power
v <- 3/5
# Depreciation matrix
D <- matrix(
data = c(0, 0, 0.00568, 0.0267, 0.0028, 0.00265, 0.0147, 0.00246),
nrow=3, ncol=3, byrow = TRUE
)
# Capital stock coefficient matrix
K <- matrix(
data = c(0, 0, 0.120, 0.791, 0.096, 0.037, 0.251, 0.043),
nrow=3, ncol=3, byrow = TRUE
)
# Diagonal turnover matrix
t <- diag(c(0.317, 0.099, 0.187))
# Compute prices of production
ppnewint8(A=A, Ap=A[1:2, 1:2], l = l, lp = l[1, 1:2], w = w[1, ], wp = w[1, 1:2], v = v,
```
Circulating capital model 1 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. The model has uniform wage rates across industries and does not take into account unproductive labor for labor value calculations.

Usage

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

Arguments

- **A**: input-output matrix (n x n).
- **l**: vector of complex labor input (1 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)
- **ppabs**: Price of production vector (absolute)
- **pprel**: Price of production vector (relative)
- **lvalues**: Labor values vector
- **dprice**: Direct price vector
- **mevg**: Monetary expression of value using gross output
- **mnonneg**: Is M Nonnegative? (1=Y,0=N)
- **mirred**: Is M Irreducible? (1=Y,0=N)

References

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
ppstdint2(A = A, l = l, b = b, Q = Q, l_simple = l)

ppstdint2  
Circulating capital model 2 using the Standard Interpretation.

Description

This function computes the uniform rate of profit, prices of production and labor values for a circulating capital model using the Standard Interpretation. The model has uniform wage rates across industries and takes into account unproductive labor for labor value calculations.

Usage

ppstdint2(A, Ap, l, b, Q, Qp, lp_simple)

Arguments

A  input-output matrix (n x n).
Ap input-output matrix for the subset of productive industries (m x m).
l  vector of complex labor input (1 x n).
b  vector real wage bundle (n x 1).
Q \quad \text{gross output vector (n x 1).}

Qp \quad \text{gross output vector for the subset of productive industries (m x 1).}

lp\_simple \quad \text{vector of simple labor input for the subset of productive industries (1 x m).}

Value

A list with the following elements:

meig \quad \text{Maximum eigen value of M}

urop \quad \text{Uniform rate of profit (as a fraction)}

mrop \quad \text{Maximum rate of profit (as a fraction)}

ppabs \quad \text{Price of production vector (absolute)}

pprel \quad \text{Price of production vector (relative)}

lvalues \quad \text{Labor values vector}

dprice \quad \text{Direct price vector}

mevg \quad \text{Monetary expression of value using gross output}

mnonneg \quad \text{Is M Nonnegative? (1=Y,0=N)}

mirred \quad \text{Is M Irreducible? (1=Y,0=N)}

References


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
)
Capital stock model 1 using the Standard Interpretation.

Description
This function computes the uniform rate of profit, prices of production and labor values for a basic capital stock model using the Standard Interpretation. The model has uniform wage rates across industries and does not take into account unproductive labor for labor value calculations.

Usage

```
ppstdint3(A, l, b, Q, D, K, t, l_simple)
```

Arguments

- `A` input-output matrix (n x n).
- `l` vector of complex 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` turnover matrix (n x n diagonal matrix).
- `l_simple` vector of simple labor input (1 x n).

Value

A list with the following elements:

- `meig` Maximum eigen value of N
- `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
- `dprice` Direct price vector
- `mevg` Monetary expression of value using gross output
- `nnonneg` Is N Nonnegative? (1=Y,0=N)
- `nirred` Is N Irreducible? (1=Y,0=N)
References


Examples

```r
# ---- 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
# 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
)
# 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 turnover matrix
t <- diag(c(0.317, 0.099, 0.187))
# Compute prices of production
ppst3int3(A = A, l = l, b = b, Q = Q, l_simple = l, D=D, K=K, t=t)
```
Description

This function computes various regression based measures of deviation between the vector of all possible relative labor values and the vector of all possible relative prices of production. It runs a log-log and a level-level regression of relative prices on relative values and tests the joint null hypothesis that the intercept is 0 and the slope is 1.

Usage

regtestrel(x, y)

Arguments

x  price vector (1 x n).

y  value vector (1 x n).

Value

A list with the following elements:

a0lg  Intercept in the log-log regression

a1lg  Slope in the log-log regression

r2lg  R-squared in the log-log regression

fstatlg  F-stat of the null hypothesis that a0=0 and a1=1 in the log-log regression

pvallg  P-value of the null hypothesis that a0=0 and a1=1 in the log-log regression

nlg  Number of observations in the log-log regression

a0lv  Intercept in the level-level regression

a1lv  Slope in the level-level regression

r2lv  R-squared in the level-level regression

fstatlv  F-stat of the null hypothesis that a0=0 and a1=1 in the level-level regression

pvallv  P-value of the null hypothesis that a0=0 and a1=1 in the level-level regression

nlv  Number of observations in the level-level regression

References


Examples

# 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
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]

---

**usrwb**  
*Rear 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

usrwb

Format

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

Source

doi:10.34894/PJ2M1C

Examples

data(usrwb)

---

**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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