# Package: mrfactors (via r-universe)

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mrfactors-package

MADRaT based package on factor inputs

### Description

This package provides functions for MAgPIE input data on factor inputs to agricultural production (with a focus on capital and labor).

### Author(s)

Maintainer: Debbora Leip <leip@pik-potsdam.de>

### See Also

Useful links:

• https://github.com/pik-piam/mrfactors

calc Ag Cap Labour Share

```
{\tt calcAgCapLabourShare} \quad {\it calcAgCapLabourShare}
```

### Description

This function calculates historical capital shares (Capital + Labour) of the factor requirements using USDA

### Usage

```
calcAgCapLabourShare()
```

#### Value

MAgPIE object

#### Author(s)

Edna J. Molina Bacca

#### See Also

```
[calcAgCapLabourShare()]
```

### Examples

```
## Not run:
calcOutput("calcAgCapLabourShare")
## End(Not run)
```

calcAgEmplIL0

calcAgEmplILO

#### **Description**

calculates complete dataset of number of people employed in agriculture, forestry and fishery based on ILO modelles dataset and GDPpcPPP05 for regression

### Usage

```
calcAgEmplILO(
  subsectors = TRUE,
  inclFish = FALSE,
  inclForest = FALSE,
  dataVersionILO = "Aug23"
)
```

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#### **Arguments**

subsectors boolean: should overall values be split into the sub-sectors agriculture, forestry

and fishery based on their relative share of people employed, and agriculture

further split into crops and livestock based on VoP

inclFish boolean: should employment in fisheries be included? boolean: should employment in forestry be included?

dataVersionILO which version of the ILO input data to use. "" for the oldest version and old

regression, or "monthYear" (e.g. "Aug23") for newer data

#### Value

List of magpie objects with results on country level, weight on country level, unit and description.

#### Author(s)

Debbora Leip

#### **Examples**

```
## Not run:
calcOutput("AgEmplILO")
## End(Not run)
```

calcFacReq

calcFacReq

#### **Description**

This function calculates factor requirement costs (05USDMER/tDM) on regional level, based FAO databases

#### Usage

```
calcFacReq(splitSectors = FALSE)
```

### Arguments

splitSectors if TRUE requirements for labor and capital will be reported separately

#### Value

MAgPIE object

### Author(s)

Debbora Leip

calcFacReqGLO 5

#### See Also

```
[calcOutput()],[calcFactorIntensity()]
```

### **Examples**

```
## Not run:
calcOutput("calcFacReq")
## End(Not run)
```

calcFacReqGL0

calcFacReqGLO

### Description

This function calculates 2005 global factor requirement costs (05USDMER/tDM) using FAO databases

### Usage

```
calcFacReqGLO()
```

### Value

MAgPIE object

### Author(s)

Edna J. Molina Bacca

#### See Also

```
[calcOutput()],[calcFactorIntensity()]
```

```
## Not run:
calcOutput("calcFacReqGLO")
## End(Not run)
```

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calcFactorCostsCrops calcFactorCostsCrops

### Description

calculates factor costs for crop production in mio. US\$MER05

#### Usage

```
calcFactorCostsCrops(datasource = "USDA")
```

#### **Arguments**

datasource

only source available is "USDA" (calculates factor costs by applying factor cost share from USDA to VoP from FAO)

#### Value

List of magpie objects with results on country level, weight on country level, unit and description.

#### Author(s)

Debbora Leip

#### **Examples**

```
## Not run:
calcOutput("FactorCostsCrops")
## End(Not run)
```

calcFactorCostsLivst calcFactorCostsLivst

### Description

calculates factor costs for livestock production in mio. US\$MER05

#### Usage

```
calcFactorCostsLivst(datasource = "USDA", otherLivst = FALSE)
```

#### **Arguments**

datasource only source available is "USDA" (calculates factor costs by applying factor cost

share from USDA to VoP from FAO)

otherLivst boolean: should FAO livestock categories that can't be matched to MAgPIE cat-

egories (i.e. beeswax, wool, silkworms, and honey) be reported as "livst\_other"?

calcFactorIntensity 7

#### Value

List of magpie objects with results on country level, weight on country level, unit and description.

#### Author(s)

Debbora Leip

#### **Examples**

```
## Not run:
calcOutput("FactorCostsLivst")
## End(Not run)
```

calcFactorIntensity

calcFactorIntensity

#### **Description**

Calculates factor intensity for labour and/or capital from USDA (Inputs share) and FAO (Value of Production)in 05USDppp per ton. Capital intensity and requirements can also be calculated from FAO's CapitalStock database.

### Usage

```
calcFactorIntensity(output = "intensities", method = "USDA")
```

#### **Arguments**

output needed outputs. It can be either "intensities" (Capital/Labour factor intensities),

"requirements" (Capital Stock requirements per ton), and "CapitalShare" for "USDA" method. For the "CapitalStock" method only "intensities" and "re-

quirements" outputs supported.

method "USDA" or "CapitalStock"

#### Value

magpie object of the factor requirements intensity or factor intensity in 05USDppp/tDM per crop, or capital share fraction.

### Author(s)

Edna J. Molina Bacca

#### See Also

[calcOutput()]

### **Examples**

```
## Not run:
a <- calcOutput("FactorIntensity")
## End(Not run)</pre>
```

calcFractionInputsUSDA

calcFractionInputsUSDA

### Description

Calculates the factor factor shares for crop production from USDA'S Inputs shares.

### Usage

```
calcFractionInputsUSDA(products = "kcr")
```

#### **Arguments**

```
products either "kcr" for crops, or "kli" for livestock
```

#### Value

magpie object of the shares of the factor requirements in agriculture (capital, labor, materials, land).

### Author(s)

```
Edna J. Molina Bacca, Debbora Leip
```

#### See Also

```
[calcOutput()]
```

```
## Not run:
a <- calcOutput("FractionInputsUSDA")
## End(Not run)</pre>
```

calcHourlyLaborCosts 9

calcHourlyLaborCosts calcHourlyLaborCosts

#### **Description**

calculates dataset of hourly labor costs per employee in agriculture

#### **Usage**

```
calcHourlyLaborCosts(
  datasource = "USDA_FAO",
  dataVersionILO = "Aug23",
  sector = "agriculture",
  fillWithRegression = TRUE,
  calibYear = 2010,
  cutAfterCalibYear = TRUE,
  projection = FALSE
)
```

#### **Arguments**

datasource either raw data from "ILO" (agriculture+forestry+fishery) or data calculated

based on total labor costs from "USDA\_FAO" (crop+livestock production).

dataVersionILO Which version of ILO data to use (for hourly labor costs if source is ILO, for ag

empl. if source is USDA\_FAO). "" for the oldest version, or "monthYear" (e.g.

"Aug23") for a newer version)

sector should average hourly labor costs be reported ("agriculture"), or hourly labor

costs specific to either "crops" or "livestock" production. For ILO only the ag-

gregate hourly labor costs are available.

fillWithRegression

boolean: should missing values be filled based on a regression between ILO

hourly labor costs and GDPpcMER (calibrated to countries)

calibYear in case of fillWithRegression being TRUE, data after this year will be ignored

and calculated using the regression (calibrated for each year to calibYear, or the most recent year with data before calibYear). NULL if all data should be used

for calibration

cutAfterCalibYear

boolean, only relevant if fillWithRegression is TRUE. If cutAfterCalibYear is TRUE, raw data after the calib year is overwritten by regression results (necessary for consistency with calculation within MAgPIE). If FALSE, raw data is

kept and only gaps are filled with regression

projection either FALSE or SSP on which projections should be based. Only relevant if

fillWithRegression is TRUE.

#### Value

List of magpie objects with results on country level, weight on country level, unit and description.

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#### Author(s)

Debbora Leip

### **Examples**

```
## Not run:
calcOutput("HourlyLaborCosts")
## End(Not run)
```

calcIFPRIsubsidy

calcIFPRIsubsidy

### Description

Adds non-allocated subsidies to crop subsidies (as most subsidies are linked to land area), and excludes NRP subsidies (as those are border measures, which are already reflected in ag. prices)

#### Usage

```
calcIFPRIsubsidy(fillGaps = TRUE)
```

### Arguments

fillGaps

boolean, should gaps in the dataset be filled using interpolation?

### Value

```
magpie object. in mio. USDMER05
```

#### Author(s)

Debbora Leip

#### See Also

[calcOutput()]

```
## Not run:
a <- calcOutput("IFPRIsubsidy")
## End(Not run)</pre>
```

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|--|--|

### Description

calculates total labor costs in mio. US\$MER05 (coverage depends on source: crop, livestock and fish production for USDA, and additionally forestry for GTAP and ILO)

#### Usage

```
calcLaborCosts(
  datasource = "ILO",
  dataVersionILO = "Aug23",
  subsectors = TRUE,
  inclFish = FALSE,
  inclForest = FALSE,
  otherLivst = TRUE,
  gtapVar = "NVFA",
  addSubsidies = FALSE
)
```

#### **Arguments**

datasource	data source on which the labor costs should be based. Available are ILO, USDA (which also uses data on VoP from FAO), and GTAP.
dataVersionILO	If source is ILO, the version can be chosen. "" for the oldest version, or "monthYear" (e.g. "Aug23") for a newer version)
subsectors	boolean: should output be aggregated or split into available subsectors (crops, livst, forestry, fishery)
inclFish	boolean: should fish labor costs be included?
inclForest	boolean: should forestry labor costs be included (only available for ILO and GTAP)?
otherLivst	boolean: should other_livst category (i.e. beeswax, wool, silkworms, and honey) be included in livestock (only relevant for datasource USDA)?
gtapVar	variable name to use from GTAP (only relevant if source is "GTAP")
addSubsidies	boolean: should subsidy data (from IFPRI) should be added to VoP before applying USDA cost shares (only relevant if datasource is "USDA")

#### Value

List of magpie objects with results on country level, weight on country level, unit and description.

### Author(s)

Debbora Leip

#### **Examples**

```
## Not run:
calcOutput("LaborCosts", datasource = "ILO")
## End(Not run)
```

 ${\tt calcNonMAgPIEFactorCosts}$ 

calcNonMAgPIEFactorCosts

#### **Description**

Calculates factor costs that should affect agricultural employment but are not included in MAgPIE factor costs

#### Usage

```
calcNonMAgPIEFactorCosts(
  subtype = "subsidies",
  aggSubsidies = FALSE,
  extrapolate = TRUE
)
```

### Arguments

subtype either factor cost share of "subsidies" (which don't enter MAgPIE labor costs

as they should not affect prices), or of "missingVoP" (which refers to livestock VoP that can't be mapped to MAgPIE livestock categories, i.e. wool, beeswax,

honey, silk-worms)

aggSubsidies boolean: if subtype is "subsidies", should crop and livestock subsidies be re-

ported separately or as aggregate?

extrapolate boolean: should values be extrapolate (by keeping constant) until 2150?

### Value

```
magpie object. in mio. USDMER05
```

### Author(s)

Debbora Leip

#### See Also

[calcOutput()]

calcPricesProducer 13

#### **Examples**

```
## Not run:
a <- calcOutput("NonMAgPIEFactorCosts", subtype = "subsidies")
## End(Not run)</pre>
```

calcPricesProducer

calcPricesProducer

#### **Description**

producer prices for agricultural products. 05USDMER/tDM prices from FAO, no currency conversion

### Usage

```
calcPricesProducer(
  products = "kcr",
  calculation = "VoP",
  weighting = "production"
)
```

#### **Arguments**

products either "kcr" or "kcl"

calculation type of calculation "FAO" (directly reads the data), "VoP" calculates as VoP/Production,

only "FAO" available for "kli" products.

weighting either "production" (default) or "consumption" based weighting

#### Value

magpie object. prices in year specific annual

#### Author(s)

Edna J. Molina Bacca

#### See Also

```
[calcOutput()]
```

```
## Not run:
a <- calcOutput("PricesProducer")
## End(Not run)</pre>
```

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calcProductionCosts calc

calcProductionCosts

#### **Description**

calculates agricultural production costs (split into different cost categories)

#### Usage

```
calcProductionCosts(datasource = "Vittis")
```

### **Arguments**

datasource

Datasource of production costs, currently only "Vittis"

#### Value

List of magpie objects with results on country level, weight on country level, unit and description.

#### Author(s)

Debbora Leip

#### **Examples**

```
## Not run:
calcOutput("ProductionCosts", source = "Vittis")
## End(Not run)
```

calcRegFactorShare

calc Reg Factor Share

#### **Description**

This function calculates the regression parameters (a and b) for the function Share=a\*log10(GDP)+b Where share is the adjusted share between capital and labour.

#### Usage

```
calcRegFactorShare(datasource = "USDA", factor = "cap")
```

### Arguments

datasource Only USDA available

factor "lab" for Labour and "cap" for capital

calcRegressionsILO15

#### Value

MAgPIE object at global level with slope and intersect as items

#### Author(s)

Debbora Leip, Edna J. Molina Bacca

#### See Also

```
[calcOutput()],[calcFactorIntensity()]
```

#### **Examples**

```
## Not run:
calcOutput("calcRegFactorShare")
## End(Not run)
```

calcRegressionsILO

regressionsILO

#### **Description**

Calculates regression coefficients used by calc functions for ILO data sets

#### Usage

```
calcRegressionsILO(
  subtype = "AgEmplShare",
  dataVersionILO = "Aug23",
  thresholdWage = 0.1,
  forceWageIntercept = TRUE,
  wageRegrType = NULL,
  recalculate = FALSE
)
```

#### **Arguments**

subtype

specifies the regression type: "AgEmplShare" for a regression between the square root of the share of people employed in agriculture (out of total population) and the log (base 10) of GDP pc PPP05. "HourlyLaborCosts" for a regression between mean nominal hourly labor cost per employee in agriculture and GDP pc MER05.

dataVersionILO which version of the ILO input data and regression to use. "" for the oldest version and old regression, or "monthYear" (e.g. "Aug23") for newer data with the new regression type

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thresholdWage only relevant for linear hourly labor cost regression: for low GDP pc MER, the

regression between hourly labor costs and GDP pc MER can lead to unreasonably low or even negative hourly labor costs. Therefore, we set all hourly labor

costs below this threshold to the threshold.

forceWageIntercept

only relevant for linear hourly labor cost regression: If TRUE, the wage threshold is also used as intercept of the regression. If FALSE, the intercept is deter-

mined by the regression

wageRegrType Only relevant for HourlyLaborCosts regression. If NULL, a linear regression

will be used for the oldest data (dataVersionILO: ""), and a loglog regression for all newer data. Can be overwritten by specifically setting wageRegrType to

"linear" or "loglog".

recalculate whether regression should be read from source folder, or recalculated from

scratch. Recalculation can lead to new regression coefficients if data changed,

and result should always be checked.

#### Author(s)

Debbora Leip

#### **Examples**

```
## Not run:
    a <- calcOutput("RegressionsILO", subtype = "HourlyLaborCosts")
## End(Not run)</pre>
```

calcVoPAFF

calcVoPAFF

#### Description

Calculates the overall value of production of the agriculture, forestry and fisheries sectors. Forestry and Fisheries are calculated from exports values.

#### **Usage**

```
calcVoPAFF()
```

#### Value

```
magpie object. in mio. 05USD MER units
```

#### Author(s)

Edna J. Molina Bacca, Debbora Leip

calc VoPcrops 17

#### See Also

```
[calcOutput()]
```

### **Examples**

```
## Not run:
a <- calcOutput("VoPAFF")
## End(Not run)</pre>
```

calcVoPcrops

calcVoPcrops

### Description

Calculates the value of production of individual production items or its fraction compared to overall Value of Production (Agriculture, Fish, Forestry).

#### Usage

```
calcVoPcrops(fillGaps = TRUE)
```

#### **Arguments**

fillGaps

boolean: should gaps be filled using production \* prices (where production data is available)?

#### Value

magpie object. in mio. USD05 MER or fraction

### Author(s)

Edna J. Molina Bacca, Debbora Leip

#### See Also

```
[calcOutput()]
```

```
## Not run:
a <- calcOutput("VoPcrops")
## End(Not run)</pre>
```

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calcVoPlivst

calcVoPlivst

### Description

Calculates the value of production of individual livestock categories

### Usage

```
calcVoPlivst(other = FALSE, fillGaps = TRUE)
```

### Arguments

other boolean: should FAO livestock categories that can't be matched to MAgPIE cat-

egories (i.e. beeswax, wool, silkworms, and honey) be reported as "livst\_other"?

fillGaps boolean: should gaps be filled using production \* prices (where production data

is available)?

#### Value

```
magpie object. in mio. USDMER05
```

### Author(s)

Debbora Leip

### See Also

```
[calcOutput()]
```

```
## Not run:
a <- calcOutput("VoPlivst")
## End(Not run)</pre>
```

calcWeeklyHoursILO 19

calcWeeklyHoursILO calcWeeklyHoursILO

#### **Description**

calculates complete dataset of mean weekly hours worked by people employed in agriculture, forestry and fishery based on ILO dataset

### Usage

```
calcWeeklyHoursILO(projections = FALSE, dataVersionILO = "Aug23")
```

#### **Arguments**

projections boolean, should weekly hours be projected (by keeping constant) up to 2150? dataVersionILO which version of the ILO input data to use. "" for the oldest version and old regression, or "monthYear" (e.g. "Aug23") for newer data

#### Value

List of magpie objects with results on country level, weight on country level, unit and description.

#### Author(s)

Debbora Leip

#### **Examples**

```
## Not run:
calcOutput("WeeklyHoursILO")
## End(Not run)
```

convertIFPRIsubsidy

convertIFPRIsubsidy

#### **Description**

disaggregates EU subsidies for crops and livestock from IFPRI table to country level

#### Usage

```
convertIFPRIsubsidy(x)
```

#### **Arguments**

Χ

magpie object provided by the read function

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#### Value

magpie object of agricultural subsidies

#### Author(s)

Debbora Leip

### **Examples**

```
## Not run:
a <- readSource("IFPRIsubsidy", convert = TRUE)
## End(Not run)</pre>
```

convertILOSTAT

convertILOSTAT

### Description

transforms currencies where applicable, and fills missing countries in ILOSTAT data with  $\boldsymbol{0}$ 

#### Usage

```
convertILOSTAT(x)
```

#### **Arguments**

Х

unconverted magpie object from read-script

#### Value

Data as MAgPIE object with common country list

#### Author(s)

Debbora Leip

```
## Not run:
a <- readSource("ILOSTAT", subtype = "EmplByActivityModelled", convert = TRUE)
## End(Not run)</pre>
```

convertVittis 21

convertVittis

convertVittis

### Description

Aggregate production costs from Vittis dataset to MAgPIE crop categories and change unit from US\$2000 to US\$2005.

### Usage

```
convertVittis(x)
```

#### **Arguments**

Х

MAgPIE object to be converted

#### Value

A MAgPIE object containing national-scale costs of production for 10 crops, disaggregated in 9 distinct cost elements

#### Author(s)

Debbora Leip

correctVittis

correctVittis

### Description

Correct inconsistencies in crop naming in the Vittis dataset

### Usage

```
correctVittis(x)
```

### Arguments

Χ

magpie object provided by the read function

### Value

corrected mapie object on national-scale costs of production for 10 crops, disaggregated in 9 distinct cost elements

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#### Author(s)

Debbora Leip

### See Also

[readVittis()]

downloadILOSTAT

download ILOSTAT

### Description

Download data from ILOSTAT

### Usage

```
downloadILOSTAT(subtype)
```

### Arguments

subtype

Type of ILOSTAT data that should be downloaded, version specified by suffic "\_MonthYear" (month and year of download)

#### Value

metadata entry

### Author(s)

Debbora Leip

```
## Not run:
   downloadSource("ILOSTAT", "EmplByActivityModelled")
## End(Not run)
```

downloadTFPUSDA 23

downloadTFPUSDA

download TFPUSDA

#### **Description**

Downloads data of input shares based on a TFP assessment from USDA.

#### Usage

```
downloadTFPUSDA()
```

#### Value

raw TFP file from USDA

#### Author(s)

Edna J. Molina Bacca

### See Also

[downloadSource()]

readHourlyLaborCostsChina

readHourlyLaborCostsChina

#### **Description**

Read in data on hourly labor costs in agriculture for China.

### Usage

```
readHourlyLaborCostsChina()
```

### Value

```
data as MAgPIE object
```

#### Author(s)

Debbora Leip

```
## Not run:
readSource("HourlyLaborCostsChina")
## End(Not run)
```

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readIFPRIsubsidy

readIFPRIsubsidy

### Description

read subsidies for crops and livestock (and non-allocated) from IFPRI table

### Usage

```
readIFPRIsubsidy()
```

#### Value

magpie object of agricultural subsidies

#### Author(s)

Debbora Leip

### **Examples**

```
## Not run:
    readSource("IFPRIsubsidy")
## End(Not run)
```

readILOSTAT

readILOSTAT

### Description

Read in ILOSTAT data that has been downloaded from the ILOSTAT website

#### Usage

```
readILOSTAT(subtype)
```

#### **Arguments**

subtype

Type of ILOSTAT data that should be downloaded, version specified by suffic "\_MonthYear" (month and year of download)

- 'EmplByActivityModelled': "Employment by sex and economic activity ILO modelled estimates, Nov. 2020 (thousands)"
- 'WeeklyHoursByActivity': "Mean weekly hours actually worked per employed person by sex and economic activity"

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'HourlyLaborCostsByActivity': "Mean nominal hourly labour cost per employee by economic activity"

- 'EmplByISIC2': "Employment by sex and economic activity ISIC level 2 (thousands) | Annual"
- 'EmplByActivityMonthly': "Employment by sex and economic activity (thousands) | Monthly"
- 'EmplByActivityMonthlyAdj': "Employment by sex and economic activity, seasonally adjusted series (thousands) | Monthly"
- 'EmplByActivityAndStatus': "Employment by sex, status in employment and economic activity (thousands) | Annual"
- 'WeeklyHoursByActivityMonthly': "Mean weekly hours actually worked per employee by sex and economic activity | Monthly"
- 'WeeklyHoursByISIC2': "Mean weekly hours actually worked per employed person by sex and economic activity ISIC level 2 | Annual"
- 'WeeklyHoursEmployeesByISIC2': "Mean weekly hours actually worked per employee by sex and economic activity ISIC level 2 | Annual"
- 'LaborIncomeShareGDPModelled': "Labour income share as a percent of GDP ILO modelled estimates, July 2019 (
- 'OutputPerWorkerModelled': "Output per worker (GDP constant 2010 US \$) ILO modelled estimates, Nov. 2020 | Annual"

#### Value

ILOSTAT data as MAgPIE object

#### Author(s)

Debbora Leip

#### **Examples**

```
## Not run:
    readSource("ILOSTAT", "EmplByActivityModelled")
## End(Not run)
```

readRegressionsILO

readRegressionsILO

#### **Description**

Read regression coefficients which are used to fill missing values of ILO datasets

#### Usage

```
readRegressionsILO(subtype = "AgEmplShare")
```

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### Arguments

subtype

Type of ILOSTAT data for which regression coefficients should be read

- 'AgEmplShare': regression coefficients for sqr(ag empl share) ~ log(GDP pc PPP)
- 'HourlyLaborCosts': regression coefficients for hourly labor costs ~ GDP pc MER (old version) or log(hourly labor costs) ~ log(GDP pc MER) (new version)

The version of regression and underlying data can be chosen by adding a suffix to the subtype, "" for the oldest version, or "\_monthYear" (e.g. "\_Aug23") for newer version

#### Value

regression coefficients as MAgPIE object

#### Author(s)

Debbora Leip

#### **Examples**

```
## Not run:
    readSource("RegressionsILO", "AgEmpl")
## End(Not run)
```

readTFPUSDA

readTFPUSDA

### Description

Reads the input shares from USDA's Agricultural total factor productivity growth indices assessment.

### Usage

```
readTFPUSDA()
```

#### Value

magpie object with fractions of different input factors in the overall production value

#### Author(s)

Edna J. Molina Bacca

#### See Also

[readSource()]

readVittis 27

 ${\sf readVittis}$ 

readVittis

### Description

Read-in cost data from Vittis dataset.

### Usage

```
readVittis()
```

### Value

National-scale costs of production for 10 crops, disaggregated in 9 distinct cost elements

### Author(s)

Debbora Leip

#### See Also

```
[readSource()]
```

```
## Not run:
a <- readSource("Vittis")
## End(Not run)</pre>
```

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