Package 'NotAllOilTypesAreAlike'

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Type Package

Title R Package to Replicate the results in Güntner, Irlacher, Öhlinger (2024) ``Not All Oil Types are Alike''

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Author Peter Oehlinger

Maintainer Peter Oehlinger <peter.oehlinger@jku.at>

Description This R package, named ``NotAllOilTypesAreAlike'', serves as a comprehensive toolkit for replicating the findings presented in the paper titled ``Not all oil types are alike.'' The package encapsulates all the necessary code, functions, and data preparation steps employed in the research, enabling users to effortlessly reproduce the results detailed in the paper.

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Encoding UTF-8

LazyData true

Imports car,
openxlsx,
stringr,
xtable

Depends dplyr,
ggpattern,
ggplot2,
lubridate,
tidyr,

Suggests knitr,
rmarkdown

VignetteBuilder knitr

RoxygenNote 7.2.3

R topics documented:

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crude_oil_import_register

Crude Oil Import Register (COIR)

Description

Crude oil imports by European Union countries from 2013 to 2019

Usage

    crude_oil_import_register

Format

'crude_oil_import_register' A data frame with 17,277 rows and 8 columns:

Reporting Country Importing Country

Country of Origin Where the crude oil comes from.

Type of crude oil Name of the crude oil

Volume (1000 bbl) Volume in 1000 bbl

Total Value (\$ 1000) Total value in \$ 1000

CIF price (2) (\$/bbl) Cost, Insurance and Freight price

% of Total Imports % of monthly total crude oil imports entering the European Union

date End of the month (formatted as date)

Source

<https://wayback.archive-it.org/12090/20220915190726/https://energy.ec.europa.eu/data-and-analysis/eu-crude-oil-imports-and-supply-cost_en>

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elasticity_feenstra1994

Calculate the elsticity of substitution using the method described in Feenstra (1994) New Product Varieties and the Measurement of International Prices.

Description

Calculate the elsticity of substitution using the method described in Feenstra (1994) New Product Varieties and the Measurement of International Prices.

Usage

```
elasticity_feenstra1994(
  df,
  t_name = "date",
  v_name = "Type of crude oil",
  p_name = "CIF price (2) ($/bbl)",
  q_name = "Volume (1000 bbl)",
  freq = c("d", "w", "m", "q", "y"),
  conf_int = 0.95,
  bw_2006 = T,
  bw_sigma_min = 1.05,
  bw_sigma_max = 131.05,
  bw_sigma_step = 1,
  bw_rho_min = 0,
  bw_rho_max = 0.99,
  bw_rho_step = 0.01
)
```

Arguments

df	data.frame; trade data from which to estimate elasticities of substitution for a specific variety (see details).
t_name	char; name of time column must be in date-format.
v_name	char; name of variety column Can be countries as in Feenstra (1994) but also more granular import data can be used.
p_name	char; name of price column
q_name	char; name of quantity column
freq	char; frequency of data. Used to calculate first differences correctly. One of "d", "w", "m", "q", "y".
conf_int	num; confidence level (e.g. 0.95)
bw_2006	log; if TRUE (default), then the grid search approach described in Broda and Weinstein (2006) Globalization and the Gains From Variety is applied in cases where sigma cannot be found.
sigma_min	num; minimum sigma for grid search (> 1). Default 1.05 (as in B-W 2006)
sigma_max	num; maximum sigma for grid search. Default 131.5 (as in B-W 2006)
sigma_step	num; step size for sigma grid search. Default 1 (as in B-W 2006)

rho_min	num; minimum rho for grid search (>= 0). Defaults to 0.
rho_max	num; maximum rho for grid search (< 1). Defaults to 0.99.
rho_step	num; step size for rho grid search. Default 0.01.

Details

To follow Feenstra (1994) the data.frame should contain imports of only one specific country (destination) and one product type (e.g. TV's).

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est_welfare	*Estimate welfare differences for nested CES vs standard CES*

Description

Estimate welfare differences for nested CES vs standard CES

Usage

```
est_welfare(x, x_diff, quantity, type, sigma_ces, sigma_nces, gamma_nces)
```

Arguments

x	data.frame; data.frame of interest
x_diff	data.frame; data with an added/deleted variety/variety group
quantity	char; colname of quantity
type	char; colname of type
sigma_ces	num; elasticity of substitution for the Feenstra method
sigma_nces	num; within product group elasticity of substitution (nested CES)
gamma_nces	num; across product group elasticity of substitution (nested CES)

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eurostat_crude_oil_imports	
	Eurostat Crude Oil Imports

Description

A subset of crude oil imports provided by Eurostat The dataset was filtered to Total EU imports.

Usage

```
eurostat_crude_oil_imports
```

Format

'eurostat_crude_oil_imports' A data frame with 17,277 rows and 8 columns:

DATAFLOW Eurostat specific database name

LAST.UPDATE When the data was last updated

freq Frequency: M = monthly

crudeoil Key for country of origin and crude oil type.

indic_nrg Containing variable keys for volume, trade value, api gravity, sulfur content, average price per barrel

geo Key of importing country/region

TIME_PERIOD Year-Month

OBS_VALUE Value of the data entry

OBS_FLAG Flags: see Eurostat documentation

Source

<https://data.europa.eu/data/datasets/shxq1h97ouyruy8bafkuw?locale=en>

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get_ea_countries	*Get Euro Area countries*

Description

Get Euro Area countries

Usage

```
get_ea_countries()
```

Value

Returns a vector of all Euro Area countries.

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gx_colors	*My own color codes. https://www.sessions.edu/color-calculator/ can be used to find new colors.*

Description

My own color codes. https://www.sessions.edu/color-calculator/ can be used to find new colors.

Usage

```
gx_colors(theme = "light")
```

Arguments

theme   char; "dark" or "light" theme colors

Value

Return my color palette. (HEX codes)

---

gx_theme   *Initialize my ggplot theme.*

Description

Initialize my ggplot theme.

Usage

```
gx_theme(
  plot = NULL,
  print_x = TRUE,
  print_y = TRUE,
  legend_title = FALSE,
  legend_position = "bottom",
  text_size = 12,
  theme = "light",
  text_colour = "#919397",
  legend_line_width = 1.2,
  rect_line_colours = "#919397",
  rect_line_width = 0.1,
  plot_background = "white",
  colours = gx_colors(),
  fill_colours = gx_colors(),
  legend_rows = 1,
  title = NULL,
  subtitle = NULL,
  x_title = NULL,
  y1_title = NULL,
  language = NULL
)
```

Arguments

plot	ggplot object. By default Null and gx_theme can be assigned to plot but otherwise gx_theme will create it's own plot.
print_x	Show x-axis. By default TRUE.
print_y	Show y-axis. By default TRUE.
legend_title	Whether to include a legend title or not default is FALSE.
legend_position	
	Legend position. Default is bottom.
text_size	Fontsize. Default is 14.
theme	"dark" or "light" theme. Defaults to "light".
text_colour	Text colour. Default is black.
legend_line_width	
	Width of line in legend.

rect_line_colours

        Colour of horizontal help lines. Default is #7F7F7F.

rect_line_width

        Width of major grid lines. Different widths needed for various outputs; by default 0.0001.

colours   Colours that should be used for aes color in ggplot. Default is gx_colors(). If both aes, fill and color, are used, by default both will start with yellow so one needs to choose the colours manually using on of the arguments (colour or fill_colour).

fill_colours   Colours that should be used for aes fill in ggplot. Default is gx_colors(). If both aes, fill and color, are used, by default both will start with yellow so one needs to choose the colours manually using on of the arguments (colour or fill_colour).

legend_rows   How many rows should the legend have. Does only work if plot is not null.

title   Add plot title. Does only work if plot is not null.

subtitle   add subtitle. Only works if plot is not nll.

x_title   x-axis title. Does only work if plot is not null.

y1_title   y1-axis title. Does only work if plot is not null.

language   Format of Date and decimal point. By default NULL. In the default case system settings will be applied.

panel_background

        Background colour of plot area. Default is white.

Value

Return RBI theme to add to ggplot object.

Examples

```
library( "ggplot2" )
plot <- ggplot( data = iris,
                aes( x     = Sepal.Length,
                     y     = Sepal.Width,
                     color = Species ) ) +
          geom_line()
# change the main theme to RBI corporate design (colors are not changed)
## Not run:
plot + gx_theme()
# change theme including colors
gx_theme( plot )

## End(Not run)
```

---

mean_api   *Calculates the mean of API gravity of different types of crude oil.*

Description

Calculates the mean of API gravity of different types of crude oil.

Usage

```
mean_api(x, weight = NULL, na.rm = FALSE)
```

Arguments

x	num; numeric vector
weight	num; weighting vector
na.rm	logical evaluating to TRUE or FALSE indicating whether NA values should be stripped before the computation proceeds.

Details

As API gravity cannot be added linearly it is necessary to convert to specific gravity, then calculate means and only then convert back to API gravity. In practice, the difference between this method and taking means directly may not result into to large differences due to similarity of crude oils.

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merge_quality_quantity

Merge Quality and Quantity data and adjust Russian missspecification

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Description

Merge Quality and Quantity data and adjust Russian missspecification

Usage

```
merge_quality_quantity(share_urals = 0.7)
```

Arguments

share_urals	num; how much of Russian crude oil reported as Other should be treated as Urals crude oil

Details

Most imports from Russia are classified as "Other Russian Crude Oil". Thus, no quality can be assigned. However, various EU Institutions stated that the largest share (more than 80 type Urlas. Also the more recent data on Eurostat supports this fact. Therefore, we make a conservative assumption and treat 70 imports as Urlas crude oil. This parameter can be varied for robustness checks. Lowering it to 50

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oil_gravity *CEPII Gravity database*

Description

Subsample of the CEPII Gravity database. Only distance used in hedonic pricing model.

Usage

    oil_gravity

Format

'oil_gravity' A data frame with 36,500 rows and 87 columns:

year Year

iso3_o 3-digit ISO of origin country

iso3_d 3-digit ISO of destination country

dist Distance

Source

<http://www.cepii.fr/cepii/en/bdd_modele/bdd_modele_item.asp?id=8>

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oil_ngl_pipelines *Global Oil Infrastructure Tracker, Global Energy Monitor, June 2022 release.*

Description

Contiaining information on pipeline connections arround the world. Visit Global Energy Monitor for a variable description.

Usage

    oil_ngl_pipelines

Format

'oil_ngl_pipelines' A data frame with 92 rows and 35 columns:

Source

<https://globalenergymonitor.org/projects/global-oil-infrastructure-tracker/download-data/>

| prepare_coir | *Import and combine raw data files from the Crude Oil Import Register (data from 2013 to 2019)* |

Description

Import and combine raw data files from the Crude Oil Import Register (data from 2013 to 2019)

Usage

```
prepare_coir()
```

Details

No data transformations are implemented. This function solely imports all Excel files and consolidates them into one data.frame. The ultimate dataset is included with the package installation and can be accessed directly. This function serves exclusively for reproducibility purposes.

| prepare_eurostat | *Import and prepare Eurostat crude oil import data.* |

Description

Import and prepare Eurostat crude oil import data.

Usage

```
prepare_eurostat(only_eu = T)
```

Arguments

only_eu   log; if FALSE column COMP_NR will be removed. That is necessary if the original dataset is used. Here we just use a subsample and consider only imports into the whole European Union.

Details

This function just renames variables and matches country names to country codes and creates some new variables from existing ones but no data transformations are applied.

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