

# Package ‘NotAllOilTypesAreAlike’

February 2, 2024

**Type** Package  
**Title** R Package to Replicate the results in Güntner, Irlacher, Öhlinger (2024)  
``Not All Oil Types are Alike"  
**Version** 1.0.0  
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**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.  
**License** GPL-3  
**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)*

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## 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](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 elasticity of substitution using the method described in Feenstra (1994) New Product Varieties and the Measurement of International Prices.*

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## Description

Calculate the elasticity 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 ( $\geq 0$ ). Default 0.
rho_max	num; maximum rho for grid search ( $< 1$ ). Default 0.99.
rho_step	num; step size for rho grid search. Default 0.01.

### Details

Following 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_prod_loss	<i>Estimate production differences for nested CES vs standard CES</i>
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### Description

Estimate production differences for nested CES vs standard CES

### Usage

```
est_prod_loss(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	<i>Eurostat Crude Oil Imports</i>
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### Description

A subset of crude oil imports provided by Eurostat. We applied a filter to the dataset, selecting only Total EU imports.

### Usage

```
eurostat_crude_oil_imports
```



**Value**

Return my color palette. (HEX codes)

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gx_theme	<i>Initialize my ggplot theme.</i>
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**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 its own plot.
print_x	Show x-axis. Default TRUE.
print_y	Show y-axis. Default TRUE.
legend_title	Whether to include a legend title or not default FALSE.
legend_position	Legend position. Default "bottom".
text_size	Fontsize. Default 14.
theme	"dark" or "light" theme. Default "light".
text_colour	Text colour. Default "black".
legend_line_width	Width of line in legend.

rect_line_colours	Colour of horizontal help lines. Default "#7F7F7F".
rect_line_width	Width of major grid lines. Different widths needed for various outputs; default 0.0001.
colours	Colours that should be used for 'aes' color in ggplot. Default <code>gx_colors()</code> . If both 'aes' ('fill' and 'color'), are used, by default both will start with yellow so one needs to choose the colours manually using one of the arguments (colour or fill_colour).
fill_colours	Colours that should be used for aes fill in ggplot. Default is <code>gx_colors()</code> . If both 'aes' ('fill' and 'color'), are used, by default both will start with yellow so one needs to choose the colours manually using one 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 NULL.
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. Default NULL. In the default case system settings will be applied.
panel_background	Background colour of plot area. Default "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)
```

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mean\_api

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

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### Description

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

**Usage**

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

**Arguments**

<code>x</code>	num; numeric vector
<code>weight</code>	num; weighting vector
<code>na.rm</code>	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 will not result in large differences due to similarity of crude oils.

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```
merge_quality_quantity
```

*Merge Quality and Quantity data and adjust Russian misspecification*

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**Description**

Merge Quality and Quantity data and adjust Russian misspecification

**Usage**

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

**Arguments**

<code>share_urals</code>	num; how much of Russian crude oil reported as Other should be treated as Urals crude oil
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**Details**

Most imports from Russia are classified as "Other Russian Crude Oil". Thus, no quality can be assigned. However, various EU Institutions state that 80% of imports from Russia are Urals. Also the more recent data on Eurostat supports this fact. Therefore, we conservatively assume that 70% of oil imports from Russia are Urals. This parameter can be varied for robustness checks. Lowering it to 50% does not impair our results.



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oil_gravity	<i>CEPII Gravity database</i>
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**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](http://www.cepii.fr/cepii/en/bdd_modele/bdd_modele_item.asp?id=8)>

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oil_ngl_pipelines	<i>Global Oil Infrastructure Tracker, Global Energy Monitor, June 2022 release.</i>
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**Description**

Contains information on pipeline connections around the world. Visit Global Energy Monitor for a definition of the variables.

**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/>>

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prepare_coir	<i>Import and combine raw data files from the Crude Oil Import Register (data from 2013 to 2019)</i>
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**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 applied. 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 replication purposes.

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prepare_eurostat	<i>Import and prepare Eurostat crude oil import data.</i>
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**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. Necessary if the original dataset is used. Here we just use a subsample and consider only imports into the European Union as a whole.
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**Details**

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

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