

# Package ‘tidyBdE’

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**Title** Download Data from Bank of Spain

**Version** 0.3.5

**Description** Tools to download data series from 'Banco de España' ('BdE') on 'tibble' format. 'Banco de España' is the national central bank and, within the framework of the Single Supervisory Mechanism ('SSM'), the supervisor of the Spanish banking system along with the European Central Bank. This package is in no way sponsored endorsed or administered by 'Banco de España'.

**License** GPL ( $\geq 3$ )

**URL** <https://ropenspain.github.io/tidyBdE/>,  
<https://github.com/rOpenSpain/tidyBdE>

**BugReports** <https://github.com/rOpenSpain/tidyBdE/issues>

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bde_catalog_load	<i>Load BdE catalogs</i>
------------------	--------------------------

---

### Description

Load the time-series catalogs provided by BdE.

### Usage

```
bde_catalog_load(
  catalog = c("ALL", "BE", "SI", "TC", "TI", "PB"),
  parse_dates = TRUE,
  cache_dir = NULL,
  update_cache = FALSE,
  verbose = FALSE
)
```

### Arguments

catalog	A single value indicating the catalogs to be updated or "ALL" as a shorthand. See <b>Details</b> .
parse_dates	Logical. If TRUE the dates would be parsed using <code>bde_parse_dates()</code> .
cache_dir	A path to a cache directory. The directory can also be set via options with <code>options(bde_cache_dir = "path/to/dir")</code> .
update_cache	Logical. If TRUE the requested file would be updated on the cache_dir.
verbose	Logical TRUE or FALSE, display information useful for debugging.

**Details**

Accepted values for catalog are:

<b>CODE</b>	<b>PUBLICATION</b>	<b>UPDATE FREQUENCY</b>	<b>FREQUENCY</b>
<b>BE</b>	Statistical Bulletin	Daily	Monthly
<b>SI</b>	Summary Indicators	Daily	Daily
<b>TC</b>	Exchange Rates	Daily	Daily
<b>TI</b>	Interest Rates	Daily	Daily
<b>PB</b>	Bank Lending Survey	Quarterly	Quarterly

Use "ALL" as a shorthand for updating all the catalogs at a glance.

If the requested catalog is not cached `bde_catalog_update()` is invoked.

**Value**

A [tibble](#).

**Source**

[Time-series bulk data download](#)

**See Also**

Other catalog: `bde_catalog_search()`, `bde_catalog_update()`

**Examples**

```
bde_catalog_load("TI", verbose = TRUE)
```

---

`bde_catalog_search`      *Search BdE catalogs*

---

**Description**

Search for keywords on the time-series catalogs.

**Usage**

```
bde_catalog_search(pattern, ...)
```

## Arguments

pattern	<a href="#">regex</a> pattern to search See <b>Details</b> and <b>Examples</b> .
...	Arguments passed on to <a href="#">bde_catalog_load</a>
catalog	A single value indicating the catalogs to be updated or "ALL" as a shorthand. See <b>Details</b> .
parse_dates	Logical. If TRUE the dates would be parsed using <a href="#">bde_parse_dates()</a> .
update_cache	Logical. If TRUE the requested file would be updated on the cache_dir.
cache_dir	A path to a cache directory. The directory can also be set via options with <code>options(bde_cache_dir = "path/to/dir")</code> .
verbose	Logical TRUE or FALSE, display information useful for debugging.

## Details

**Note that** BdE files are only provided in Spanish, for the time being. Therefore search terms should be provided in Spanish as well in order to get search results.

This function uses `base::grep()` function for finding matches on the catalogs. You can pass [regular expressions](#) to broaden the search.

## Value

A [tibble](#) with the results of the query.

## See Also

[bde\\_catalog\\_load\(\)](#), `base::regex`

Other catalog: [bde\\_catalog\\_load\(\)](#), [bde\\_catalog\\_update\(\)](#)

## Examples

```
# Simple search (needs to be in Spanish)
# !! PIB [es] == GDP [en]

bde_catalog_search("PIB")

# More complex - Single
bde_catalog_search("Francia(.*?)PIB")

# Even more complex - Double
bde_catalog_search("Francia(.*?)PIB|Italia(.*?)PIB|Alemania(.*?)PIB")

# Search a sequential code: Exact match
# Note that this series (sequential code) appears on several tables

bde_catalog_search("^3779313$")
```

---

bde\_catalog\_update      *Update BdE catalogs*

---

### Description

Update the time-series catalogs provided by BdE.

### Usage

```
bde_catalog_update(
  catalog = c("ALL", "BE", "SI", "TC", "TI", "PB"),
  cache_dir = NULL,
  verbose = FALSE
)
```

### Arguments

**catalog**            A vector of characters indicating the catalogs to be updated or "ALL" as a shorthand. See **Details**.

**cache\_dir**          A path to a cache directory. The directory can also be set via options with `options(bde_cache_dir = "path/to/dir")`.

**verbose**            Logical TRUE or FALSE, display information useful for debugging.

### Details

Accepted values for catalog are:

<b>CODE</b>	<b>PUBLICATION</b>	<b>UPDATE FREQUENCY</b>	<b>FREQUENCY</b>
<b>BE</b>	Statistical Bulletin	Daily	Monthly
<b>SI</b>	Summary Indicators	Daily	Daily
<b>TC</b>	Exchange Rates	Daily	Daily
<b>TI</b>	Interest Rates	Daily	Daily
<b>PB</b>	Bank Lending Survey	Quarterly	Quarterly

Use "ALL" as a shorthand for updating all the catalogs at a glance.

### Value

None. Downloads the catalog file(s) to the local machine.

### Source

[Time-series bulk data download](#)

**See Also**

Other catalog: [bde\\_catalog\\_load\(\)](#), [bde\\_catalog\\_search\(\)](#)

**Examples**

```
bde_catalog_update("TI", verbose = TRUE)
```

---

bde_indicators	<i>Relevant Indicators of Spain</i>
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---

**Description**

Set of helper functions for downloading some of the most relevant macroeconomic indicators of Spain.

**Usage**

```
bde_ind_gdp_var(series_label = "GDP_YoY", ...)
bde_ind_unemployment_rate(series_label = "Unemployment_Rate", ...)
bde_ind_euribor_12m_monthly(series_label = "Euribor_12M_Monthly", ...)
bde_ind_euribor_12m_daily(series_label = "Euribor_12M_Daily", ...)
bde_ind_cpi_var(series_label = "Consumer_price_index_YoY", ...)
bde_ind_ibex_monthly(series_label = "IBEX_index_month", ...)
bde_ind_ibex_daily(series_label = "IBEX_index_day", ...)
bde_ind_gdp_quarterly(series_label = "GDP_quarterly_value", ...)
bde_ind_population(series_label = "Population_Spain", ...)
```

**Arguments**

series_label	Optional. Character vector or value. Allows to specify a custom label for the series extracted. It should have the same length than series_code.
...	Arguments passed on to <a href="#">bde_series_load</a>
out_format	Defines if the format must be returned as a "long" dataset or a "wide" dataset. Possible values are "wide" or "long". See <b>Value</b> for Details and Section <b>Examples</b> .

`parse_numeric` Logical. If TRUE the columns would be parsed to double (numeric) values. See **Note**.

`extract_metadata` Logical TRUE/FALSE. On TRUE the output is the metadata of the requested series.

`parse_dates` Logical. If TRUE the dates would be parsed using `bde_parse_dates()`.

`update_cache` Logical. If TRUE the requested file would be updated on the `cache_dir`.

`cache_dir` A path to a cache directory. The directory can also be set via options with `options(bde_cache_dir = "path/to/dir")`.

`verbose` Logical TRUE or FALSE, display information useful for debugging.

### Details

This functions are convenient wrappers of `bde_series_load()` referencing specific series. Use `verbose = TRUE`, `extract_metadata = TRUE` options to see the specification and the source.

### Value

A tibble with the required series.

### See Also

[bde\\_series\\_load\(\)](#), [bde\\_catalog\\_search\(\)](#)

### Examples

```
bde_ind_gdp_var()
```

---

bde_parse_dates	<i>Parse dates</i>
-----------------	--------------------

---

### Description

This function is tailored for the date formatting used on this package, so it may fail if it is used for another datasets. See **Examples** for checking which formats would be considered.

#### Date Formats:

FREQUENCY	FORMAT
<b>Daily / Business day</b>	DD MMMMYYYY
<b>Monthly</b>	MMM YYYY
<b>Quarterly</b>	MMM YYYY, where MMM is the first or the last month of the quarter, depending on the value of its
<b>Half-yearly</b>	MMM YYYY, where MMM is the first or the last month of the halfyear period, depending on the value
<b>Annual</b>	YYYY

**Usage**

```
bde_parse_dates(dates_to_parse)
```

**Arguments**

```
dates_to_parse  Dates to parse
```

**Details**

Tries to parse strings representing dates using [as.Date\(\)](#)

**Value**

A class "Date" object.

**See Also**

[as.Date\(\)](#)

**Examples**

```
# Formats parsed
would_parse <- c(
  "02 FEB2019", "15 ABR 1890", "MAR 2020", "ENE2020",
  "2020", "12-1993", "01-02-2014", "01/02/1990"
)

parsed_ok <- bde_parse_dates(would_parse)

class(parsed_ok)

tibble::tibble(raw = would_parse, parsed = parsed_ok)

#-----

# Formats not admitted
wont_parse <- c("JAN2001", "2010-01-12", "01 APR 2017", "01/31/1990")

parsed_fail <- bde_parse_dates(wont_parse)

class(parsed_fail)

tibble::tibble(raw = wont_parse, parsed = parsed_fail)
```



---

bde\_series\_full\_load *Load BdE full time-series files*

---

## Description

Load a full time-series file provided by BdE.

## Usage

```
bde_series_full_load(
  series_csv,
  parse_dates = TRUE,
  parse_numeric = TRUE,
  cache_dir = NULL,
  update_cache = FALSE,
  verbose = FALSE,
  extract_metadata = FALSE
)
```

## Arguments

series_csv	csv file of a series, as defined in the field Nombre del archivo con los valores de la serie of the corresponding catalog. See <a href="#">bde_catalog_load()</a> .
parse_dates	Logical. If TRUE the dates would be parsed using <a href="#">bde_parse_dates()</a> .
parse_numeric	Logical. If TRUE the columns would be parsed to double (numeric) values. See <b>Note</b> .
cache_dir	A path to a cache directory. The directory can also be set via options with <code>options(bde_cache_dir = "path/to/dir")</code> .
update_cache	Logical. If TRUE the requested file would be updated on the cache_dir.
verbose	Logical TRUE or FALSE, display information useful for debugging.
extract_metadata	Logical TRUE/FALSE. On TRUE the output is the metadata of the requested series.

## Details

### About BdE file naming:

The series name is a positional code showing the location of the table. For example, table **be\_6\_1** represents the Table 1, Chapter 6 of the Statistical Bulletin ("BE"). Although it is a unique value, it is subject to change (i.e. a new table is inserted before).

For that reason, the function [bde\\_series\\_load\(\)](#) is more suitable for extracting specific time-series.

## Value

A [tibble](#) with a field Date and the alias of the fields series as described on the catalogs. See [bde\\_catalog\\_load\(\)](#).

**Note**

This function tries to coerce the columns to numbers. For some series a warning may be displayed if the parser fails. You can override the default behavior with `parse_numeric = FALSE`

**See Also**

Other series: [bde\\_series\\_load\(\)](#)

**Examples**

```
# Metadata
bde_series_full_load("TI_1_1.csv", extract_metadata = TRUE)

# Data
bde_series_full_load("TI_1_1.csv")
```

---

bde_series_load	<i>Load a single BdE time-series.</i>
-----------------	---------------------------------------

---

**Description**

The series alias is a positional code showing the location (column and/or row) of the series in the table. However, although it is unique, it is not a good candidate to be used as the series ID, as it is subject to change. If a series changes position in the table, its alias will also change.

To ensure series can still be identified, even after these changes, they are assigned a sequential number (`series_code` on this function) which will remain unchanged throughout the series' lifetime.

Note that a single series could be used on different tables, so it can have several aliases. If you need to search by alias it is recommended to use [bde\\_series\\_full\\_load\(\)](#).

**Usage**

```
bde_series_load(
  series_code,
  series_label = NULL,
  out_format = "wide",
  parse_dates = TRUE,
  parse_numeric = TRUE,
  cache_dir = NULL,
  update_cache = FALSE,
  verbose = FALSE,
  extract_metadata = FALSE
)
```

**Arguments**

series_code	a numeric (or coercible with <code>base::as.double()</code> ) value or vector with time-series code(s), as defined in the field <code>Número secuencial</code> of the corresponding series. See <code>bde_catalog_load()</code> .
series_label	Optional. Character vector or value. Allows to specify a custom label for the series extracted. It should have the same length than <code>series_code</code> .
out_format	Defines if the format must be returned as a "long" dataset or a "wide" dataset. Possible values are "wide" or "long". See <b>Value</b> for Details and Section <b>Examples</b> .
parse_dates	Logical. If TRUE the dates would be parsed using <code>bde_parse_dates()</code> .
parse_numeric	Logical. If TRUE the columns would be parsed to double (numeric) values. See <b>Note</b> .
cache_dir	A path to a cache directory. The directory can also be set via options with <code>options(bde_cache_dir = "path/to/dir")</code> .
update_cache	Logical. If TRUE the requested file would be updated on the <code>cache_dir</code> .
verbose	Logical TRUE or FALSE, display information useful for debugging.
extract_metadata	Logical TRUE/FALSE. On TRUE the output is the metadata of the requested series.

**Details**

Load a single time-series provided by BdE.

**Value**

A [tibble](#) with a field `Date` and :

- With `out_format = "wide"` each series is presented in a separate column with the name defined by `series_label`.
- With `out_format = "long"` the tibble would have two more columns, `serie_name` with the labels of each series and `serie_value` with the value of the series.

"wide" format is more suitable for exporting to a `.csv` file while "long" format is more suitable for producing plots with `ggplot2::ggplot()`. See also `tidyr::pivot_longer()` and `tidyr::pivot_wider()`.

**Note**

This function tries to coerce the columns to numbers. For some series a warning may be displayed if the parser fails. You can override the default behavior with `parse_numeric = FALSE`

**See Also**

[bde\\_catalog\\_load\(\)](#), [bde\\_catalog\\_search\(\)](#), [bde\\_indicators\(\)](#)

Other series: [bde\\_series\\_full\\_load\(\)](#)

## Examples

```
# Metadata
bde_series_load(573234, verbose = TRUE, extract_metadata = TRUE)

# Data
bde_series_load(573234, extract_metadata = FALSE)

# Vectorized
bde_series_load(c(573234, 573214),
  series_label = c("US/EUR", "GBP/EUR"),
  extract_metadata = TRUE
)

wide <- bde_series_load(c(573234, 573214),
  series_label = c("US/EUR", "GBP/EUR")
)

# Wide format
wide

# Long format
long <- bde_series_load(c(573234, 573214),
  series_label = c("US/EUR", "GBP/EUR"),
  out_format = "long"
)

long

# Use with ggplot
library(ggplot2)

ggplot(long, aes(Date, serie_value)) +
  geom_line(aes(group = serie_name, color = serie_name)) +
  scale_color_bde_d() +
  theme_tidybde()
```

---

bde\_tidy\_palettes

*BdE color palettes*

---

## Description

Custom palettes based on the publications of BdE. These are manual palettes with a maximum of 6 colors.

**Usage**

```
bde_tidy_palettes(
  n = 6,
  palette = c("bde_vivid_pal", "bde_rose_pal", "bde_qual_pal"),
  alpha = NULL,
  rev = FALSE
)
```

**Arguments**

**n** The number of colors ( $\geq 1$ ) to be in the palette.

**palette** A valid palette name.

**alpha** An alpha-transparency level in the range  $[0,1]$  (0 means transparent and 1 means opaque). A missing, i.e., `alpha = NULL`, does not add opacity codes ("FF") to the individual color hex codes. See `ggplot2::alpha()`.

**rev** Logical indicating whether the ordering of the colors should be reversed.

**Value**

A vector of colors.

**See Also**

Other `bde_plot`: `scales_bde`, `theme_tidybde()`

**Examples**

```
# BdE vivid pal
scales::show_col(bde_tidy_palettes(palette = "bde_vivid_pal"),
  labels = FALSE
)

# BdE rose pal
scales::show_col(bde_tidy_palettes(palette = "bde_rose_pal"), labels = FALSE)

# BdE qual pal
scales::show_col(bde_tidy_palettes(palette = "bde_qual_pal"), labels = FALSE)
```

---

scales\_bde *BdE scales for R* [hrefhttps://CRAN.R-project.org/package=ggplot2](https://CRAN.R-project.org/package=ggplot2)**ggplot2**.

---

**Description**

Scales to be used with the **ggplot2** package. Discrete palettes are named as `scale*_bde_d` while continuous palettes are named `scale*_bde_c`.

**Usage**

```

scale_color_bde_d(
  palette = c("bde_vivid_pal", "bde_rose_pal", "bde_qual_pal"),
  alpha = NULL,
  rev = FALSE,
  ...
)

scale_fill_bde_d(
  palette = c("bde_vivid_pal", "bde_rose_pal", "bde_qual_pal"),
  alpha = NULL,
  rev = FALSE,
  ...
)

scale_color_bde_c(
  palette = c("bde_rose_pal", "bde_vivid_pal", "bde_qual_pal"),
  alpha = NULL,
  rev = FALSE,
  ...
)

scale_fill_bde_c(
  palette = c("bde_rose_pal", "bde_vivid_pal", "bde_qual_pal"),
  alpha = NULL,
  rev = FALSE,
  ...
)

```

**Arguments**

<code>palette</code>	Name of the BdE palette to apply. See <a href="#">bde_tidy_palettes()</a> for details.
<code>alpha</code>	An alpha-transparency level in the range $[0, 1]$ (0 means transparent and 1 means opaque). A missing, i.e., <code>alpha = NULL</code> , does not add opacity codes ("FF") to the individual color hex codes. See <a href="#">ggplot2::alpha()</a> .
<code>rev</code>	Logical indicating whether the ordering of the colors should be reversed.
<code>...</code>	Further arguments of <a href="#">ggplot2::discrete_scale()</a> or <a href="#">ggplot2::continuous_scale()</a> .

**Value**

A **ggplot2** color scale.

**See Also**

[ggplot2::discrete\\_scale\(\)](#), [ggplot2::continuous\\_scale\(\)](#)

Other bde-plot: [bde\\_tidy\\_palettes\(\)](#), [theme\\_tidybde\(\)](#)

**Examples**

```
library(ggplot2)

set.seed(596)
txsamp <- subset(
  txhousing,
  city %in% c(
    "Houston", "Fort Worth",
    "San Antonio", "Dallas", "Austin"
  )
)

ggplot(txsamp, aes(x = sales, y = median)) +
  geom_point(aes(colour = city)) +
  scale_color_bde_d() +
  theme_minimal()

ggplot(txsamp, aes(x = sales, y = median)) +
  geom_point(aes(colour = city)) +
  scale_color_bde_d("bde_qual_pal") +
  theme_minimal()
```

---

 theme\_tidybde

*BdE ggplot2 theme*


---

**Description**

A custom **ggplot2** theme based on the publications of BdE.

**Usage**

```
theme_tidybde(...)
```

**Arguments**

```
... Arguments passed on to ggplot2::theme\_classic
base_size base font size, given in pts.
base_family base font family
base_line_size base size for line elements
base_rect_size base size for rect elements
```

**Details**

Theme based on [ggplot2::theme\\_classic\(\)](#).

**Value**

A `ggplot2::theme_classic()`.

**See Also**

`ggplot2::theme_classic()`

Other bde\_plot: `bde_tidy_palettes()`, `scales_bde`

**Examples**

```
library(ggplot2)
library(dplyr)
library(tidyr)

series_TC <- bde_series_full_load("TC_1_1.csv")

# If download was OK then plot
if (nrow(series_TC) > 0) {
  series_TC <- series_TC[c(1, 2)]

  series_TC_pivot <- series_TC %>%
    filter(
      Date >= "2020-01-01" & Date <= "2020-12-31",
      !is.na(series_TC[[2]])
    )

  names(series_TC_pivot) <- c("x", "y")

  ggplot(series_TC_pivot, aes(x = x, y = y)) +
    geom_line(linewidth = 0.8, color = bde_tidy_palettes(n = 1)) +
    labs(
      title = "Title",
      subtitle = "Some metric",
      caption = "Bank of Spain"
    ) +
    theme_tidybde()
}
```



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