Package 'r2dii.analysis'

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Title Tools to Calculate Climate Targets for Financial Portfolios

Version 0.0.1

Description These tools help you to assess if a financial portfolio aligns with climate goals. They summarize key metrics attributed to the portfolio (e.g. production, emission factors), and calculate targets based on climate scenarios. They implement in R the last step of the free software 'PACTA' (Paris Agreement Capital Transition Assessment; <https://2degrees-investing.org/>). Financial institutions use 'PACTA' to study how their capital allocation impacts the climate.

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URL https://github.com/2DegreesInvesting/r2dii.analysis

BugReports https://github.com/2DegreesInvesting/r2dii.analysis/issues

Depends R (>= 3.4)

Imports dplyr, magrittr, rlang (>= 0.1.2), tidyr

Suggests covr, r2dii.data, r2dii.match, roxygen2, spelling, testthat (>= 2.1.0)

Encoding UTF-8

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NeedsCompilation no

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R topics documented:

`join_ald_scenario` *Join a data-loanbook object to the ald and scenario*

Description

`join_ald_scenario()` is a simple wrapper of several calls to dplyr::join_*(), forming the master dataset to be used in later steps of the analysis.

Usage

```
join_ald_scenario(data, ald, scenario, region_isos = r2dii.data::region_isos)
```

Arguments

`data`	A data frame like the output of `r2dii.match::prioritize()`.
`ald`	An asset level data frame like r2dii.data::ald_demo.
`scenario`	A scenario data frame like r2dii.data::scenario_demo_2020.
`region_isos`	A data frame like r2dii.data::region_isos (default).

Value

Returns a fully joined data frame, linking portfolio, ald and scenario.

See Also

Other utility functions: `summarize_weighted_production()`

Examples

```
installed <- requireNamespace("r2dii.data", quietly = TRUE) &&
  requireNamespace("r2dii.match", quietly = TRUE)
if (!installed) stop("Please install r2dii.match and r2dii.data")

library(r2dii.data)
library(r2dii.match)

valid_matches <- match_name(loanbook_demo, ald_demo) %>%
  # WARNING: Remember to validate matches (see `?prioritize`)
  prioritize()
```

```
valid_matches %>%
  join_ald_scenario(
    ald = ald_demo,
    scenario = scenario_demo_2020,
    region_isos = region_isos_demo
  )
```

`summarize_weighted_production` *Summarize production based on the weight of each loan per sector per year*

Description

Summarize production based on the weight of each loan per sector per year.

Usage

```
summarize_weighted_production(data, ..., use_credit_limit = FALSE)
```

Arguments

`data`	A data frame like the output of `join_ald_scenario()`.
`...`	Variables to group by.
`use_credit_limit`	Logical vector of length 1. `FALSE` defaults to using the column `loan_size_outstanding`. Set to `TRUE` to use the column `loan_size_credit_limit` instead.

Value

A tibble with the same groups as the input (if any) and columns: `sector`, `technology`, `year`, and `weighted_production`.

See Also

`join_ald_scenario()`.

Other utility functions: `join_ald_scenario()`

Examples

```
library(r2dii.analysis)
library(r2dii.data)
library(r2dii.match)

master <- r2dii.data::loanbook_demo %>%
  r2dii.match::match_name(r2dii.data::ald_demo) %>%
  r2dii.match::prioritize() %>%
  join_ald_scenario(r2dii.data::ald_demo,
```

```
    r2dii.data::scenario_demo_2020,
    region_isos = region_isos_demo
  )

summarize_weighted_production(master)

summarize_weighted_production(master, use_credit_limit = TRUE)
```

`target_market_share` *Add targets for production, using the market share approach*

Description

This function calculates the portfolio-level production targets, as calculated using the market share approach applied to each relevant climate production forecast.

Usage

```
target_market_share(
  data,
  ald,
  scenario,
  region_isos = r2dii.data::region_isos,
  use_credit_limit = FALSE,
  by_company = FALSE
)
```

Arguments

`data`	A "data.frame" like the output of `r2dii.match::prioritize()`.
`ald`	An asset level data frame like r2dii.data::ald_demo.
`scenario`	A scenario data frame like r2dii.data::scenario_demo_2020.
`region_isos`	A data frame like r2dii.data::region_isos (default).
`use_credit_limit`	Logical vector of length 1. `FALSE` defaults to using the column `loan_size_outstanding`. Set to `TRUE` to use the column `loan_size_credit_limit` instead.
`by_company`	Logical vector of length 1. `FALSE` defaults to outputting `weighted_production_value` at the portfolio-level. Set to `TRUE` to output `weighted_production_value` at the company-level.

Value

A tibble with the summarized columns `weighted_production_metric` and `weighted_production_value`. If `by_company = TRUE`, the output will also have the column `name_ald`.

Handling grouped data

This function ignores existing groups and outputs ungrouped data.

See Also

Other functions to calculate scenario targets: `target_sda()`

Examples

```
library(r2dii.analysis)
library(r2dii.data)
library(r2dii.match)

match_result <- r2dii.data::loanbook_demo %>%
  r2dii.match::match_name(r2dii.data::ald_demo) %>%
  r2dii.match::prioritize()

# calculate targets at portfolio level
target_market_share(match_result,
  ald = r2dii.data::ald_demo,
  scenario = r2dii.data::scenario_demo_2020,
  region_isos = r2dii.data::region_isos_demo
)

# calculate targets at company level
target_market_share(match_result,
  ald = r2dii.data::ald_demo,
  scenario = r2dii.data::scenario_demo_2020,
  region_isos = r2dii.data::region_isos_demo,
  by_company = TRUE
)
```

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target_sda *Add targets for CO2 emissions per unit production at the portfolio level, using the SDA approach*

Description

This function calculates targets of CO2 emissions per unit production at the portfolio-level, otherwise referred to as "emissions factors". It uses the sectoral-decarbonization approach (SDA) to calculate these targets.

Usage

```
target_sda(data, ald, co2_intensity_scenario, use_credit_limit = FALSE)
```

Arguments

`data`	A dataframe like the output of `r2dii.match::prioritize()`.
`ald`	An asset-level data frame like r2dii.data::ald_demo.
`co2_intensity_scenario`	A scenario data frame like r2dii.data::co2_intensity_scenario_demo.

use_credit_limit
: Logical vector of length 1. FALSE defaults to using the column loan_size_outstanding. Set to TRUE to instead use the column loan_size_credit_limit.

Value

A tibble with the CO2 emissions factors attributed to the portfolio. These values include the portfolio's actual projected CO2 emissions factors, the scenario pathway CO2 emissions factors and the SDA calculated portfolio target emissions factors (see column emission_factor_metric).

Handling grouped data

This function ignores existing groups and outputs ungrouped data.

See Also

Other functions to calculate scenario targets: target_market_share()

Examples

```
installed <- requireNamespace("r2dii.data", quietly = TRUE) &&
  requireNamespace("r2dii.match", quietly = TRUE)
if (!installed) stop("Please install r2dii.match and r2dii.data")

library(r2dii.data)
library(r2dii.match)

valid_matches <- match_name(loanbook_demo, ald_demo) %>%
  # WARNING: Remember to validate matches (see `?prioritize`)
  prioritize()

out <- valid_matches %>%
  target_sda(
    ald = ald_demo,
    co2_intensity_scenario = co2_intensity_scenario_demo
  )

# The output includes the portfolio's actual projected emissions factors, the
# scenario pathway emissions factors, and the portfolio's target emissions
# factors.
out

# Split view by metric
split(out, out$emission_factor_metric)
```

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