

Package ‘riskweightedassets’

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Type Package

Title Reproducible Risk-Weighted Asset Calculations

Version 1.2.4

Description Provides transparent, deterministic and auditable calculations of risk-weighted assets, own-funds requirements, interest-rate risk in the banking book and related capital metrics. It supports canonical in-memory tables and versioned spreadsheet datasets, strict validation, synthetic reference profiles, bitemporal snapshots, calculation controls and traceable regulatory source metadata. Methods are parameterised against the European Parliament and Council (2013) Capital Requirements Regulation <<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32013R0575>> and its amending Regulation (EU) 2024/1623 <<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32024R1623>>. A granular analyst API exposes individual formulae, domain views, controls, schemas and auditable parameter overrides. The implementation is intended for analytical, educational and model-validation use and does not constitute legal or supervisory advice.

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<i>analyze_capital_adequacy</i>	<i>Analyse Capital Adequacy, Leverage and MREL/TLAC</i>
---------------------------------	---

Description

Analyse Capital Adequacy, Leverage and MREL/TLAC

Usage

```
analyze_capital_adequacy(x, view = c("applied", "fully_loaded"))
```

Arguments

x	Canonical tables or an existing calculation result.
view	"applied" or "fully_loaded".

Value

An `rwa_domain_analysis`.

analyze_counterparty_risk

Analyse Counterparty Credit Risk, CVA and Settlement Risk

Description

Analyse Counterparty Credit Risk, CVA and Settlement Risk

Usage

```
analyze_counterparty_risk(x, view = c("applied", "fully_loaded"))
```

Arguments

x Canonical tables or an existing calculation result.
view "applied" or "fully_loaded".

Value

An rwa_domain_analysis.

analyze_credit_risk

Analyse Credit Risk

Description

Analyse Credit Risk

Usage

```
analyze_credit_risk(x, view = c("applied", "fully_loaded"))
```

Arguments

x Canonical tables or an existing calculation result.
view "applied" or "fully_loaded".

Value

An rwa_domain_analysis with relevant metrics, tables and controls.

See Also

[calculate_tables\(\)](#)

Examples

```
analyze_credit_risk(generate_synthetic_tables(bank_profile = "KSA_BANK"))
```

analyze_icaap	<i>Analyse ICAAP Economic and Normative Perspectives</i>
---------------	--

Description

Analyse ICAAP Economic and Normative Perspectives

Usage

```
analyze_icaap(x, view = c("applied", "fully_loaded"))
```

Arguments

- x Canonical tables or an existing calculation result.
- view "applied" or "fully_loaded".

Value

An rwa_domain_analysis.

analyze_irrbb	<i>Analyse IRRBB and CSRBB</i>
---------------	--------------------------------

Description

Analyse IRRBB and CSRBB

Usage

```
analyze_irrbb(x, view = c("applied", "fully_loaded"))
```

Arguments

- x Canonical tables or an existing calculation result.
- view "applied" or "fully_loaded".

Value

An rwa_domain_analysis.

analyze_market_risk	<i>Analyse Market Risk and FRTB</i>
---------------------	-------------------------------------

Description

Analyse Market Risk and FRTB

Usage

```
analyze_market_risk(x, view = c("applied", "fully_loaded"))
```

Arguments

x	Canonical tables or an existing calculation result.
view	"applied" or "fully_loaded".

Value

An rwa_domain_analysis.

analyze_operational_risk	<i>Analyse Operational Risk</i>
--------------------------	---------------------------------

Description

Analyse Operational Risk

Usage

```
analyze_operational_risk(x, view = c("applied", "fully_loaded"))
```

Arguments

x	Canonical tables or an existing calculation result.
view	"applied" or "fully_loaded".

Value

An rwa_domain_analysis.

analyze_output_floor	<i>Analyse the Output Floor</i>
----------------------	---------------------------------

Description

Analyse the Output Floor

Usage

```
analyze_output_floor(x, view = c("applied", "fully_loaded"))
```

Arguments

x	Canonical tables or an existing calculation result.
view	"applied" or "fully_loaded".

Value

An rwa_domain_analysis.

analyze_securitisation	<i>Analyse Securitisation Risk</i>
------------------------	------------------------------------

Description

Analyse Securitisation Risk

Usage

```
analyze_securitisation(x, view = c("applied", "fully_loaded"))
```

Arguments

x	Canonical tables or an existing calculation result.
view	"applied" or "fully_loaded".

Value

An rwa_domain_analysis.

```
apply_credit_supporting_factors
```

Apply Credit Supporting Factors

Description

Apply Credit Supporting Factors

Usage

```
apply_credit_supporting_factors(  
  rwea,  
  sme_factor = 1,  
  infrastructure_factor = 1  
)
```

Arguments

`rwea` Non-negative risk-weighted exposure amount before supporting factors.
`sme_factor, infrastructure_factor` Separate factors in (0, 1].

Details

Both factors may apply together if both sets of legal criteria are fulfilled. This arithmetic helper does not attest eligibility.

Value

RWEA after multiplying the factors once.

Examples

```
apply_credit_supporting_factors(100, 0.7619, 0.75)
```

```
as.data.frame.rwa_validation_report
```

Convert a Validation Report to a Data Frame

Description

Convert a Validation Report to a Data Frame

Usage

```
## S3 method for class 'rwa_validation_report'  
as.data.frame(x, row.names = NULL, optional = FALSE, ...)
```

Arguments

x	An rwa_validation_report.
row.names	Unused compatibility argument.
optional	Unused compatibility argument.
...	Unused.

Value

A data frame with one row per structured validation message.

available_rule_sets	<i>Available Rule Sets</i>
---------------------	----------------------------

Description

Available Rule Sets

Usage

```
available_rule_sets(tables = NULL)
```

Arguments

tables	Optional canonical tables; bundled reference tables are used otherwise.
--------	---

Value

The rule-set data frame.

See Also

[select_rule_set\(\)](#)

Examples

```
available_rule_sets()
```

business_indicator_component

Operational Risk, Output Floor, NPE and Tier-2 Formulae

Description

Operational Risk, Output Floor, NPE and Tier-2 Formulae

Usage

```
business_indicator_component(  
    il,  
    ie,  
    assets,  
    dividends,  
    oi,  
    oe,  
    fi,  
    fe,  
    trading_pnl,  
    banking_pnl,  
    parameters = NULL  
)
```

```
applicable_output_floor_factor(as_of, fully_loaded = FALSE, parameters = NULL)
```

```
apply_output_floor(  
    u_trea,  
    s_trea,  
    factor,  
    optional_cap = FALSE,  
    cap_multiplier = 1  
)
```

```
npe_unsecured_coverage_factor(year, parameters = NULL)
```

```
npe_secured_coverage_factor(year, property_security = TRUE, parameters = NULL)
```

```
tier2_eligible_amount(  
    current_amount,  
    first_day_amount,  
    maturity,  
    as_of,  
    parameters = NULL  
)
```

Arguments

il, ie, assets, dividends, oi, oe, fi, fe, trading_pnl, banking_pnl	Numeric vectors for the business-indicator components.
parameters	Optional parameter data frame or store.
as_of	Reporting date.
fully_loaded	Whether to return the fully-loaded floor factor.
u_trea	Unfloored TREA.
s_trea	Standardised TREA.
factor	Output-floor factor.
optional_cap	Whether an optional cap applies.
cap_multiplier	Cap multiple of unfloored TREA.
year	NPE vintage year.
property_security	Whether secured by property.
current_amount, first_day_amount	Tier-2 instrument amounts.
maturity	Tier-2 maturity date.

Value

Numeric, named numeric vector, or output-floor result list.

Examples

```
apply_output_floor(100, 180, 0.725, FALSE, 1)
applicable_output_floor_factor(as.Date("2026-12-31"), FALSE)
```

calculate_dataset	<i>Calculate a Canonical Workbook Dataset</i>
-------------------	---

Description

Validates a dataset, creates an immutable deterministic run directory and writes six structured output workbooks plus a JSON run manifest.

Usage

```
calculate_dataset(dataset)
```

Arguments

dataset	Dataset directory containing an inputs subdirectory.
---------	--

Details

Output is written below dataset/outputs/<run-id>. The run ID fingerprints the input files, code and package version.

Value

An rwa_calculation_result object with output paths.

See Also

[validate_dataset\(\)](#), [generate_synthetic_dataset\(\)](#)

Examples

```
root <- file.path(tempdir(), "rwa-calculation-example")
dataset <- generate_synthetic_dataset(root, bank_profile = "KSA_BANK")
calculate_dataset(dataset)
```

calculate_tables	<i>Calculate Canonical In-Memory Tables</i>
------------------	---

Description

Validates and calculates canonical tables without producing spreadsheet output. A parallel fully-loaded result is calculated from the same snapshot.

Usage

```
calculate_tables(
  tables,
  run_id = NULL,
  project_root = NULL,
  parameter_overrides = NULL,
  override_reason = NULL,
  override_approved_by = NULL
)
```

Arguments

- tables Named list of canonical data frames.
- run_id Optional caller-defined run identifier.
- project_root Optional root used to resolve local source documents.
- parameter_overrides Optional data frame of controlled parameter overrides prepared as described in [override_regulatory_parameters\(\)](#).
- override_reason, override_approved_by Required non-empty governance information when parameter_overrides is supplied.

Details

The return includes applied and fully-loaded result tables. All calculations use one official bitemporal snapshot. The function does not write files and does not change the global random-number stream. Exposure default_flag values are normalised once on the selected snapshot. Accepted inputs are logicals, numeric 0/1, and case-insensitive strings TRUE/FALSE, 1/0, 1.0/0.0, YES/NO or JA/NEIN (whitespace is trimmed). Missing or unknown values fail closed. Both SA and IRB detail tables expose the effective status in defaulted, shared by both reporting views.

Value

An rwa_calculation_result object.

See Also

[generate_synthetic_tables\(\)](#), [calculate_dataset\(\)](#)

Examples

```
tables <- generate_synthetic_tables(bank_profile = "KSA_BANK")
result <- calculate_tables(tables)
result$metrics[c("RWEA_KSA", "TREA")]
```

compare_calculation_views

Compare Applied and Fully-loaded Metrics

Description

Compare Applied and Fully-loaded Metrics

Usage

```
compare_calculation_views(result)
```

Arguments

result An rwa_calculation_result.

Value

A data frame with both values and their difference.

Examples

```
r <- calculate_tables(generate_synthetic_tables(bank_profile = "KSA_BANK"))
compare_calculation_views(r)
```

create_workspace	<i>Create a Writable RWA Workspace</i>
------------------	--

Description

Exports the package's synthetic reference environment to a caller-controlled directory. Existing non-empty directories require explicit overwrite.

Usage

```
create_workspace(path, overwrite = FALSE)
```

Arguments

path	Destination directory.
overwrite	Whether existing files may be replaced.

Value

An rwa_workspace object.

Examples

```
workspace <- create_workspace(file.path(tempdir(), "rwa-example"), overwrite = TRUE)
print(workspace)
```

default_workspace	<i>Default Writable Workspace</i>
-------------------	-----------------------------------

Description

Uses RWA_WORKSPACE when it is set, otherwise a rwa-workspace directory below the current working directory. The function only describes the path; it does not create or modify it.

Usage

```
default_workspace()
```

Value

An rwa_workspace object.

Examples

```
default_workspace()
```

failed_controls	<i>Failed Calculation Controls</i>
-----------------	------------------------------------

Description

Failed Calculation Controls

Usage

```
failed_controls(result, view = c("applied", "fully_loaded"))
```

Arguments

- result An rwa_calculation_result.
- view "applied" or "fully_loaded".

Value

A data frame containing only failed controls.

Examples

```
r <- calculate_tables(generate_synthetic_tables(bank_profile = "KSA_BANK"))
failed_controls(r)
```

formula_catalog	<i>Formula Catalogue</i>
-----------------	--------------------------

Description

Formula Catalogue

Usage

```
formula_catalog(tables = NULL)
```

Arguments

- tables Optional canonical tables; bundled reference tables are used otherwise.

Value

The versioned formula-definition data frame.

See Also

[regulatory_parameters\(\)](#)

Examples

```
head(formula_catalog())
```

generate_synthetic_dataset
<i>Generate a Synthetic Workbook Dataset</i>

Description

Generate a Synthetic Workbook Dataset

Usage

```
generate_synthetic_dataset(  
  root,  
  as_of = NULL,  
  version = NULL,  
  seed = NULL,  
  bank_profile = "MID_SIZE_UNIVERSAL",  
  config_root = NULL,  
  overwrite = FALSE  
)
```

Arguments

root	Parent directory for dated datasets.
as_of	Reporting date.
version	Dataset version.
seed	Integer lineage seed.
bank_profile	Profile identifier.
config_root	Optional profile configuration directory.
overwrite	Whether an existing dataset may be replaced.

Details

The function writes 16 canonical workbooks plus a dataset manifest. An existing non-empty target requires `overwrite = TRUE`.

Value

The generated dataset directory.

See Also

[validate_dataset\(\)](#), [calculate_dataset\(\)](#)

Examples

```
generate_synthetic_dataset(file.path(tempdir(), "rwa-runs"),
                           bank_profile = "KSA_BANK")
```

generate_synthetic_tables

Generate Synthetic Canonical Tables

Description

Materializes a complete synthetic banking profile from immutable package fixtures. The seed is recorded for lineage; no business distributions are generated at runtime.

Usage

```
generate_synthetic_tables(  
  as_of = NULL,  
  seed = NULL,  
  bank_profile = "MID_SIZE_UNIVERSAL",  
  config_root = NULL  
)
```

Arguments

as_of	Reporting date. Defaults to the profile base date.
seed	Integer lineage seed.
bank_profile	Profile identifier.
config_root	Optional directory containing profile YAML files.

Value

A named list of canonical data frames.

See Also

[calculate_tables\(\)](#), [generate_synthetic_dataset\(\)](#)

Examples

```
tables <- generate_synthetic_tables(bank_profile = "KSA_BANK")  
length(tables)
```

infrastructure_supporting_factor

Infrastructure Supporting Factor under Article 501a CRR

Description

Infrastructure Supporting Factor under Article 501a CRR

Usage

```
infrastructure_supporting_factor(parameters = NULL)
```

Arguments

parameters Optional governed parameter table or parameter store.

Details

Eligibility under all Article 501a criteria must be established separately. This function returns the configured factor, not an approval.

Value

Numeric infrastructure supporting factor.

Examples

```
infrastructure_supporting_factor()
```

irb_asset_correlation *Internal Ratings Based Formulae*

Description

Direct access to IRB asset correlations, maturity adjustment and capital requirement. Probability, LGD and correlation inputs are decimal rates.

Usage

```
irb_asset_correlation(
  pd,
  annual_sales_million = NULL,
  financial_multiplier = FALSE,
  parameters = NULL
)
```

```

irb_retail_correlation(pd, subclass, parameters = NULL)

irb_maturity_coefficient(pd, parameters = NULL)

irb_maturity_factor(pd, maturity, parameters = NULL)

irb_capital_requirement(
  pd,
  lgd,
  correlation,
  maturity,
  apply_maturity_adjustment = TRUE,
  defaulted = FALSE,
  elbe = 0,
  parameters = NULL,
  lgd_treatment = NULL
)

```

Arguments

pd	Probability of default.
annual_sales_million	Optional annual sales in millions.
financial_multiplier	Whether to apply the financial-sector multiplier.
parameters	Optional parameter data frame or store.
subclass	Retail exposure subclass.
maturity	Effective maturity in years.
lgd	Loss given default.
correlation	Asset correlation.
apply_maturity_adjustment	Whether the maturity adjustment applies.
defaulted	Whether the exposure is defaulted.
elbe	Best estimate of expected loss for a defaulted exposure.
lgd_treatment	Required for defaults: "SUPERVISORY" (K = 0, ELBE ignored) or "OWN_ESTIMATES" (K = max(LGD - ELBE, 0)). Default normalises PD to 1; PD = 1 without default is rejected.

Value

One numeric coefficient or capital-requirement rate.

See Also

[regulatory_parameters\(\)](#)

Examples

```
irb_asset_correlation(0.01)
irb_capital_requirement(0.01, 0.45, 0.20, 2.5, TRUE, FALSE, 0)
```

```
irb_risk_weighted_assets
```

IRB Risk-Weighted Exposure Amount including Supporting Factors

Description

IRB Risk-Weighted Exposure Amount including Supporting Factors

Usage

```
irb_risk_weighted_assets(
  ead,
  capital_requirement,
  sme_factor = 1,
  infrastructure_factor = 1,
  parameters = NULL
)
```

Arguments

ead	Non-negative exposure at default.
capital_requirement	Non-negative unadjusted K rate, for example from <code>irb_capital_requirement()</code> .
sme_factor, infrastructure_factor	Separate factors in (0, 1].
parameters	Optional governed parameter table or parameter store.

Details

This helper does not change K, PD, LGD or expected loss. Its caller establishes eligibility; the table calculation API requires supporting evidence.

Value

EAD times configured RWA multiplier times K times both factors.

Examples

```
irb_risk_weighted_assets(1000000, 0.08, infrastructure_factor = 0.75)
```

irrbb_scenario_shock *IRRBB, FRTB and Economic-capital Formulae*

Description

IRRBB, FRTB and Economic-capital Formulae

Usage

```
irrbb_scenario_shock(scenario, t, parallel, short, long, parameters = NULL)

irrbb_shocked_zero_rate(base, shock, t, parameters = NULL)

present_value_discount_factor(continuous_zero_rate, t)

aggregate_correlated_capital(capitals, correlation)

frtb_scenario_correlation(base, scenario, parameters = NULL)

frtb_quadratic_charge(values, correlation, curvature = FALSE)
```

Arguments

scenario	IRRBB or FRTB correlation scenario.
t	Time in years.
parallel, short, long	Scenario shocks as decimal rates.
parameters	Optional parameter data frame or store.
base	Base continuously compounded zero rate or base correlation.
shock	Rate shock.
continuous_zero_rate	Continuously compounded zero rate.
capitals	Vector of standalone capital amounts.
correlation	Correlation matrix or scalar intra-bucket correlation.
values	Weighted sensitivities.
curvature	Whether curvature aggregation applies.

Value

Numeric shock, rate, discount factor or aggregated capital.

Examples

```
present_value_discount_factor(0.03, 5)
aggregate_correlated_capital(c(10, 20), matrix(c(1, .25, .25, 1), 2))
```

`list_reference_datasets`*List Bundled Reference Datasets*

Description

List Bundled Reference Datasets

Usage

```
list_reference_datasets()
```

Value

A data frame with dataset identifiers and versions.

Examples

```
list_reference_datasets()
```

`list_reference_profiles`*List Bundled Reference Profiles*

Description

Returns metadata for every synthetic reference profile included with the package. No customer or production data is included.

Usage

```
list_reference_profiles()
```

Value

A data frame with profile identifiers, versions, base dates, seeds, default dataset versions and descriptions.

Examples

```
list_reference_profiles()
```

official_snapshot	Select the Official Bitemporal Snapshot
-------------------	---

Description

Select the Official Bitemporal Snapshot

Usage

official_snapshot(tables, as_of_date = NULL, knowledge_time = NULL)

Arguments

- tables Canonical table list.
- as_of_date Optional business date; defaults to run_config.
- knowledge_time Optional knowledge timestamp; defaults to run_config. Accepts a POSIXt instant or a UTC string with a T or space separator, optional fractional seconds and optional trailing Z. Date-only values denote midnight UTC. Missing, malformed or non-scalar values are rejected.

Details

The time-of-day is preserved, including when read from run_config. The same timestamp parser is used by [calculate_tables\(\)](#).

Value

Canonical tables reduced to the effective official records.

Examples

```
t <- generate_synthetic_tables(bank_profile = "KSA_BANK")
s <- official_snapshot(t)
```

override_regulatory_parameters	Apply Auditable Regulatory Parameter Overrides
--------------------------------	--

Description

Creates a modified copy of canonical tables. Existing parameter rows are replaced only when key and both dimensions identify exactly one row. The original input is not mutated and an audit record is attached.

Usage

```
override_regulatory_parameters(tables, overrides, reason, approved_by)
```

Arguments

- tables Canonical input tables.
- overrides Data frame with parameter_key, parameter_value and optional dimension_1, dimension_2 columns.
- reason Non-empty business rationale.
- approved_by Non-empty approver or governance reference.

Value

A copied table list carrying an rwa_parameter_overrides audit attribute.

See Also

[parameter_overrides\(\)](#), [calculate_tables\(\)](#)

Examples

```
t <- generate_synthetic_tables(bank_profile = "KSA_BANK")
o <- data.frame(parameter_key = "RWA_MULTIPLIER", dimension_1 = "PILLAR1",
                dimension_2 = "", parameter_value = 12.5)
t2 <- override_regulatory_parameters(t, o, "Sensitivity", "Model Risk")
parameter_overrides(t2)
```

parameter_overrides	<i>Parameter Override Audit Trail</i>
---------------------	---------------------------------------

Description

Parameter Override Audit Trail

Usage

```
parameter_overrides(x)
```

Arguments

- x Canonical tables or an rwa_calculation_result.

Value

A data frame of old/new values and governance information.

See Also[override_regulatory_parameters\(\)](#)**Examples**

```
parameter_overrides(generate_synthetic_tables(bank_profile = "KSA_BANK"))
```

```
print.rwa_calculation_result
```

Print a Calculation Result

Description

Print a Calculation Result

Usage

```
## S3 method for class 'rwa_calculation_result'
print(x, ...)
```

Arguments

x	An rwa_calculation_result.
...	Unused.

Value

x, invisibly.

```
print.rwa_domain_analysis
```

Print a Domain Analysis

Description

Print a Domain Analysis

Usage

```
## S3 method for class 'rwa_domain_analysis'
print(x, ...)
```

Arguments

x	An rwa_domain_analysis.
...	Unused.

Value

x, invisibly.

<code>print.rwa_validation_report</code>	<i>Print a Validation Report</i>
--	----------------------------------

Description

Print a Validation Report

Usage

```
## S3 method for class 'rwa_validation_report'
print(x, ...)
```

Arguments

x	An rwa_validation_report.
...	Unused.

Value

x, invisibly.

<code>print.rwa_workspace</code>	<i>Print a Workspace</i>
----------------------------------	--------------------------

Description

Print a Workspace

Usage

```
## S3 method for class 'rwa_workspace'
print(x, ...)
```

Arguments

x	An rwa_workspace.
...	Unused.

Value

x, invisibly.

regulatory_parameter	<i>Read One Regulatory Parameter</i>
----------------------	--------------------------------------

Description

Read One Regulatory Parameter

Usage

```
regulatory_parameter(  
  key,  
  dimension_1 = "",  
  dimension_2 = "",  
  parameters = NULL  
)
```

Arguments

- key Regulatory parameter key.
- dimension_1, dimension_2 Optional parameter dimensions.
- parameters A parameter-store object or parameter data frame. Bundled regulatory defaults are used when omitted.

Value

One numeric parameter value.

See Also

```
regulatory_parameters()
```

Examples

```
regulatory_parameter("RWA_MULTIPLIER", "PILLAR1")
```

regulatory_parameters	<i>Regulatory Parameter Inventory</i>
-----------------------	---------------------------------------

Description

Returns the effective parameter table used by granular formulas. Analysts can inspect every weight and coefficient before calculation.

Usage

```
regulatory_parameters(tables = NULL)
```

Arguments

tables Optional canonical table list. If omitted, bundled defaults are used.

Value

A data frame containing parameter keys, dimensions and values.

See Also

[regulatory_parameter\(\)](#), [override_regulatory_parameters\(\)](#)

Examples

```
head(regulatory_parameters())
```

regulatory_sources	<i>Regulatory Source Metadata</i>
--------------------	-----------------------------------

Description

Returns links and archived checksums for official sources used to design the engine. The source documents themselves are deliberately not redistributed.

Usage

```
regulatory_sources()
```

Value

A data frame. The redistributed column is always false for the bundled metadata.

Examples

```
regulatory_sources()
```

rwa_controls	<i>Calculation Controls</i>
--------------	-----------------------------

Description

Calculation Controls

Usage

```
rwa_controls(result, view = c("applied", "fully_loaded"))
```

Arguments

- result An rwa_calculation_result.
- view "applied" or "fully_loaded".

Value

A data frame containing reconciliation and governance controls.

See Also

```
failed\_controls\(\)
```

Examples

```
r <- calculate_tables(generate_synthetic_tables(bank_profile = "KSA_BANK"))
rwa_controls(r)
```

rwa_metric	<i>Read One Calculation Metric</i>
------------	------------------------------------

Description

Read One Calculation Metric

Usage

```
rwa_metric(result, metric, view = c("applied", "fully_loaded"))
```

Arguments

- result An rwa_calculation_result.
- metric Metric identifier.
- view "applied" or "fully_loaded".

Value

One numeric value.

Examples

```
r <- calculate_tables(generate_synthetic_tables(bank_profile = "KSA_BANK"))
rwa_metric(r, "CET1_RATIO")
```

rwa_metrics	<i>Calculation Metrics</i>
-------------	----------------------------

Description

Calculation Metrics

Usage

```
rwa_metrics(result, view = c("applied", "fully_loaded"))
```

Arguments

- result An rwa_calculation_result.
- view "applied" or "fully_loaded".

Value

A tidy data frame with metric, value, unit and view.

See Also

```
rwa\_metric\(\), compare\_calculation\_views\(\)
```

Examples

```
r <- calculate_tables(generate_synthetic_tables(bank_profile = "KSA_BANK"))
rwa_metrics(r)
```

rwa_result_table	<i>Read One Result Table</i>
------------------	------------------------------

Description

Read One Result Table

Usage

```
rwa_result_table(result, table, view = c("applied", "fully_loaded"))
```

Arguments

result	An rwa_calculation_result.
table	Result-table name.
view	"applied" or "fully_loaded".

Value

A result data frame.

Examples

```
r <- calculate_tables(generate_synthetic_tables(bank_profile = "KSA_BANK"))  
rwa_result_table(r, "Capital_Stack")
```

rwa_result_tables	<i>Result Tables</i>
-------------------	----------------------

Description

Result Tables

Usage

```
rwa_result_tables(result, view = c("applied", "fully_loaded"))
```

Arguments

result	An rwa_calculation_result.
view	"applied" or "fully_loaded".

Value

A named list of result data frames.

See Also

```
rwa_result_table(), rwa_table_names()
```

Examples

```
r <- calculate_tables(generate_synthetic_tables(bank_profile = "KSA_BANK"))
names(rwa_result_tables(r))
```

rwa_summary	<i>Compact Calculation Summary</i>
-------------	------------------------------------

Description

Compact Calculation Summary

Usage

```
rwa_summary(result)
```

Arguments

result An rwa_calculation_result.

Value

A list with identity, core metrics, controls and overrides.

Examples

```
r <- calculate_tables(generate_synthetic_tables(bank_profile = "KSA_BANK"))
rwa_summary(r)
```

rwa_table_names	<i>List Result-Table Names</i>
-----------------	--------------------------------

Description

List Result-Table Names

Usage

```
rwa_table_names(result, view = c("applied", "fully_loaded"))
```

Arguments

`result` An `rwa_calculation_result`.
`view` "applied" or "fully_loaded".

Value

Character vector of result-table names.

Examples

```
r <- calculate_tables(generate_synthetic_tables(bank_profile = "KSA_BANK"))  
rwa_table_names(r)
```

rwa_validation	<i>Calculation Validation Report</i>
----------------	--------------------------------------

Description

Calculation Validation Report

Usage

```
rwa_validation(result)
```

Arguments

`result` An `rwa_calculation_result`.

Value

The `rwa_validation_report` attached to the result.

Examples

```
r <- calculate_tables(generate_synthetic_tables(bank_profile = "KSA_BANK"))  
rwa_validation(r)
```

sa_ccr_multiplier_value

Counterparty, SFT, Securitisation, CVA and Settlement Formulae

Description

Granular formula interface for SA-CCR, SFT, securitisation approaches, BA-CVA and settlement risk. Rates are decimal values.

Usage

```
sa_ccr_multiplier_value(V, C, addon, parameters = NULL)
```

```
sa_ccr_exposure_value(V, C, addon, alpha, parameters = NULL)
```

```
sft_exposure_value(cash_leg, security_value, security_haircut, fx_haircut)
```

```
securitisation_irb_pool_capital(
  rwea_pool_irb_ul,
  el_pool_irb,
  pool_ead,
  parameters = NULL
)
```

```
securitisation_sa_pool_capital(rwea_pool_sa, pool_ead, parameters = NULL)
```

```
securitisation_ssfa_coefficient(ka, attachment, detachment, p)
```

```
securitisation_ssfa_risk_weight(
  pool_k,
  attachment,
  detachment,
  p,
  floor,
  parameters = NULL
)
```

```
securitisation_irba_p(
  pool_type,
  senior,
  effective_number,
  pool_k,
  average_lgd,
  tranche_maturity,
  sts,
  parameters = NULL
)
```

```

securitisation_erba_risk_weight(
    cqs,
    maturity,
    senior,
    sts,
    attachment,
    detachment,
    parameters = NULL
)

securitisation_risk_weight(
    approach,
    pool_k,
    attachment,
    detachment,
    p,
    sts = FALSE,
    senior = FALSE,
    resecuritisation = FALSE,
    cqs = 0,
    parameters = NULL
)

cva_basic_approach_capital(items, parameters = NULL)

settlement_risk_factor(days_late, parameters = NULL)

```

Arguments

V, C	Current value and collateral under SA-CCR.
addon	Aggregate SA-CCR add-on.
parameters	Optional parameter data frame or store.
alpha	SA-CCR regulatory alpha.
cash_leg, security_value	Monetary SFT legs.
security_haircut, fx_haircut	Haircuts.
rwea_pool_irb_ul, el_pool_irb, rwea_pool_sa, pool_ead	Pool inputs.
ka, pool_k	Pool capital ratio.
attachment, detachment	Tranche attachment and detachment points.
p	Supervisory SSFA parameter.
floor	Minimum risk weight.
pool_type	Pool category.

senior, sts, resecuritisation	Logical tranche flags.
effective_number	Effective number of pool exposures.
average_lgd	Average pool LGD.
tranche_maturity, maturity	Maturity in years.
cqs	Credit-quality step.
approach	Securitisation approach.
items	BA-CVA rows, each with the documented nine numeric fields.
days_late	Settlement delay in days.

Value

Numeric formula result or named vector.

See Also

[analyze_counterparty_risk\(\)](#), [analyze_securitisation\(\)](#)

Examples

```
sa_ccr_exposure_value(100, 30, 20, 1.4)
sft_exposure_value(100, 90, 0.1, 0.05)
```

sa_exposure_value	<i>Standardised Credit-risk and CRM Formulae</i>
-------------------	--

Description

Granular, side-effect-free formulae for exposure value, risk weights, real estate treatment and credit-risk mitigation. Rates and weights are decimals. Monetary inputs and outputs use one caller-selected currency consistently.

Usage

```
sa_exposure_value(
  gross_carrying_amount,
  specific_adjustments = 0,
  additional_valuation_adjustments = 0,
  other_own_funds_reductions = 0,
  committed_undrawn = 0,
  annex_i_class,
  data_path = "GROSS_COMPONENTS",
  net_carrying_amount_article_111 = NULL,
  parameters = NULL
```

```

)

sa_risk_weight(
  exposure_class,
  cqs = NULL,
  short_term = FALSE,
  transactor = FALSE,
  retail_eligible = FALSE,
  defaulted = FALSE,
  default_coverage_ratio = 0,
  specialised_lending_type = "",
  parameters = NULL
)

real_estate_risk_weight(
  ead,
  property_value,
  property_type,
  ipre,
  counterparty_rw,
  senior_liens = 0,
  adc = FALSE,
  parameters = NULL
)

crm_maturity_factor(t_protection, t_exposure, minimum_t = 0.25, maximum_T = 5)

crm_adjusted_exposure(exposure, collateral, he, hc, hfx)

```

Arguments

gross_carrying_amount,	specific_adjustments,
additional_valuation_adjustments,	other_own_funds_reductions
Monetary amounts.	
committed_undrawn	Undrawn commitment amount.
annex_i_class	CRR Annex I conversion-factor class.
data_path	"GROSS_COMPONENTS" or "NET_ARTICLE_111".
net_carrying_amount_article_111	Optional net carrying amount.
parameters	Optional parameter data frame or rwa_parameter_store; bundled regulatory parameters are used by default.
exposure_class, cqs	Exposure class and credit-quality step.
short_term, transactor, retail_eligible, defaulted	Logical classification flags.
default_coverage_ratio	Coverage ratio for defaulted exposures.

specialised_lending_type Optional specialised-lending category.
ead, property_value, senior_liens Monetary real-estate inputs.
property_type Property category.
ipre, adc Logical real-estate flags.
counterparty_rw Counterparty risk weight.
t_protection, t_exposure, minimum_t, maximum_T Maturity-mismatch inputs in years.
exposure, collateral Exposure and collateral values.
he, hc, hfx Exposure, collateral and currency haircuts.

Value

Numeric value, named numeric vector, or documented list depending on the formula.

See Also

[regulatory_parameters\(\)](#), [override_regulatory_parameters\(\)](#)

Examples

```
sa_exposure_value(100, 2, 0, 0, 40, "CLASS_2", "GROSS_COMPONENTS")
crm_adjusted_exposure(100, 60, 0.05, 0.10, 0.08)
```

select_rule_set	<i>Select a Rule Set</i>
-----------------	--------------------------

Description

Returns a modified copy of canonical tables with the requested rule set in run_config; it never mutates the caller’s object.

Usage

```
select_rule_set(tables, rule_set_id)
```

Arguments

tables Canonical input tables.
rule_set_id Identifier listed by [available_rule_sets\(\)](#).

Value

Modified canonical tables.

Examples

```
t <- generate_synthetic_tables(bank_profile = "KSA_BANK")
t <- select_rule_set(t, "CRR3-EU-FL")
```

sme_supporting_factor *SME Supporting Factor under Article 501 CRR*

Description

SME Supporting Factor under Article 501 CRR

Usage

```
sme_supporting_factor(total_amount_owed_eur, parameters = NULL)
```

Arguments

total_amount_owed_eur	Positive Article 501 E* amount in EUR, including the prescribed connected-client/institution-group aggregation and residential collateral exclusion/fallback. This is not necessarily the individual EAD.
parameters	Optional governed parameter table or parameter store.

Details

This pure numeric function does not certify legal eligibility. The threshold and lower/upper rates are read from SUPPORTING_FACTOR parameters.

Value

Numeric weighted SME supporting factor.

Examples

```
sme_supporting_factor(5000000)
```

table_dictionary	<i>Canonical Table Dictionary</i>
------------------	-----------------------------------

Description

Canonical Table Dictionary

Usage

table_dictionary()

Value

A data frame describing all logical tables, workbooks and sheets.

See Also

[table_schema\(\)](#)

Examples

head(table_dictionary())

table_schema	<i>Canonical Table Schema</i>
--------------	-------------------------------

Description

Canonical Table Schema

Usage

table_schema(table)

Arguments

table Logical table name from [table_dictionary\(\)](#).

Value

A list with workbook, sheet, Excel table, required flag and columns.

Examples

table_schema("exposure_lot")

validate_dataset	<i>Validate a Canonical Dataset</i>
------------------	-------------------------------------

Description

Reads and validates all canonical input workbooks without calculating or writing any output files.

Usage

```
validate_dataset(dataset)
```

Arguments

dataset	Dataset directory containing an inputs subdirectory.
---------	--

Value

An rwa_validation_report object.

See Also

[calculate_dataset\(\)](#), [generate_synthetic_dataset\(\)](#)

Examples

```
root <- file.path(tempdir(), "rwa-validation-example")
dataset <- generate_synthetic_dataset(root, bank_profile = "KSA_BANK")
as.data.frame(validate_dataset(dataset))
```

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