Package ‘migrate’

October 13, 2022

Type Package
Title Create Credit State Migration (Transition) Matrices
Version 0.4.0
Description Tools to help convert credit risk data at two time points into traditional credit state migration (aka, `transition`) matrices. At a higher level, `migrate` is intended to help an analyst understand how risk moved in their credit portfolio over a time interval.

References to this methodology include:

License MIT + file LICENSE
URL https://github.com/mthomas-ketchbrook/migrate
BugReports https://github.com/mthomas-ketchbrook/migrate/issues
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build_matrix Build a migration (transition) matrix

Description

'build_matrix()' creates a credit migration (i.e., "transition") matrix from summarized data representing each credit risk state & a continuous metric at two distinct points in time.

Usage

build_matrix(data, state_start = NULL, state_end = NULL, metric = NULL)

Arguments

data A data frame or data frame extension (e.g., a tibble or data.table) containing a minimum of three (3) column variables representing a starting credit risk state, an ending credit risk state, and a metric containing values representing the movement (i.e., "transition") in that metric between the starting credit risk state point in time and the ending credit risk state point in time. This style of data frame is output by the 'migrate()' function within this package.

state_start (Optional) A symbol or string, representing the column variable of the 'data' data frame argument that contains the starting credit risk state values. If left null, function will attempt to find it for you.

state_end (Optional) A symbol or string, representing the column variable of the 'data' data frame argument that contains the starting credit risk state values. If left null, function will attempt to find it for you.

metric (Optional) A symbol or string, representing the column variable of the 'data' data frame argument that contains the metric for which the grouped difference in value between the starting credit risk state period and ending credit risk state period was computed.

Value

A matrix object, where the first (row) dimension represents the starting credit risk state, the second (column) dimension represents the ending credit risk state, and the values within the matrix represent the transitioned amount based upon the values in the 'metric' continuous column variable from the 'data' data frame.

Note: A matrix object can be coerced to a data frame using 'as.data.frame()'.


Examples

# Let `build_matrix()` guess which column variables represent `state_start`,
# `state_end` and `metric`
mock_credit %>%
migrate(
  time = date,
  state = risk_rating,
  id = customer_id,
  metric = principal_balance
) %>%
build_matrix()

# Specify which column variables represent `state_start`, `state_end` and
# `metric`
mock_credit %>%
migrate(
  id = customer_id,
  time = date,
  state = risk_rating,
  percent = FALSE
) %>%
build_matrix(
  state_start = risk_rating_start,
  state_end = risk_rating_end,
  metric = count
)

migrate

**Summarize the migration of a data frame**

Description

`migrate()` summarizes the transition amount (or percentage) of a continuous variable from each beginning credit risk state category to each ending credit risk state, given a data frame input.

Usage

migrate(
  data,
  id,
  time,
  state,
  metric = NULL,
  percent = TRUE,
  verbose = TRUE,
  rating = NULL,
  date = NULL
)
Arguments

data  A data frame or data frame extension (e.g., a tibble or data.table) containing a minimum of three (3) column variables representing a time, a credit risk state, and an ID identifying the credit facility (we would expect to see most unique values in this column variable appear twice in the dataset; once at the first unique 'time' value and again at the second unique 'time' value, unless the ID only existed at one of those two times).
id  The column variable of the 'data' data frame argument that contains the unique identifier to track where a particular credit facility migrated to/from. If left null, 'migrate()' will attempt to use the first column variable from the data frame provided in the 'data' argument.
time  The column variable of in the 'data' data frame representing the time point (e.g., a Date) of each observation; this column should contain two unique values (migration from Time A to Time B)
state  The column variable of the 'data' data frame argument that contains the credit risk state values.
metric  (Optional) The column variable of type "numeric" in the 'data' data frame argument that contains the continuous metric values to weight the state migration by
percent  If 'FALSE', will calculate the migration on an absolute basis (rather than a percentage basis, which is the default)
verbose  If 'TRUE', the function returns an informational message about the transition period
rating  Deprecated; please use 'state' instead.
date  Deprecated; please use 'time' instead.

Value

A data frame containing three (3) column variables representing the unique combinations of starting & ending credit risk states and the calculated migration observed during the period.

Examples

# Return the percent migration of the number of credit facilities
migrate(
  data = mock_credit,
  id = customer_id,
  time = date,
  state = risk_rating
)

# Return the absolute migration in 'principal_balance'
migrate(
  data = mock_credit,
  id = customer_id,
  time = date,
  state = risk_rating,
mock_credit

    metric = principal_balance,
    percent = FALSE
  )

mock_credit  
Mock dataset containing credit statistics by customer at two time intervals. Some customers only exist in one time interval (they either became a customer after the first time interval, or discontinued being a customer before the second time interval).

Description

Mock dataset containing credit statistics by customer at two time intervals. Some customers only exist in one time interval (they either became a customer after the first time interval, or discontinued being a customer before the second time interval).

Usage

mock_credit

Format

A data frame with columns:

  customer_id  Customer ID for 497 unique customers.
  date        Date of the observation; there are two unique dates in the dataset.
  risk_rating Factor representing risk level on a 1-14 scale.
  principal_balance  Principal balance outstanding on the loan.

Source

Developed by Ketchbrook Analytics

Examples

## Not run:
mock_credit

## End(Not run)
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