Package 'gravityGE'

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Title One Sector Armington-CES Gravity Model with General Equilibrium

Type Package

Version 1.0.0

Description Implements a one-sector Armington-CES gravity model with general equilibrium (GE) effects. This model is designed to analyze international and domestic trade by capturing the impacts of trade costs and policy changes within a general equilibrium framework. Additionally, it includes a local parameter to run simulations on productivity. The package provides functions for calibration, simulation, and analysis of the model.

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Encoding UTF-8

RoxygenNote 7.3.2

Suggests testthat (>= 3.0.0)

Config/testthat/edition 3

Imports stats

NeedsCompilation no

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Contents

gravityGE *Solves one sector Armington-CES gravity model with general equilibrium*

Description

Solves one sector Armington-CES gravity model with general equilibrium

Usage

```
gravityGE(
  trade_data,
  theta = 4,
  beta_hat_name = NULL,
  a_hat_name = NULL,
  multiplicative = FALSE
)
```

Arguments

trade_data	A data frame that contains 'orig', 'dest', and 'flow' named columns, with additional variables as described below.
theta	Trade elasticity parameter (default = 4).
beta_hat_name	A character name in trade_data for the beta_hat variable. If NULL, a matrix of ones is used. Domestic trade ('orig' == 'dest') must have a value of 0.
a_hat_name	A character name in trade_data for the a_hat variable. If NULL, a matrix of ones is used. All values across 'orig' in a_hat must be the same.
multiplicative	Logical. If TRUE, the model is multiplicative. If FALSE, the model is additive. Default = FALSE. Additive is recommended when trade data is unbalanced.

Value

A list containing two data frames. A dyadic ('orig' and 'dest') data frame with the new trade flows, and a unidirectional ('orig') data frame with the welfare effects.

Examples

```
flows <- expand.grid(LETTERS, LETTERS)
flows$flow <- 1
names(flows)[1:2] <- c("orig", "dest")

# There should be no change in welfare (all ones)
out <- gravityGE::gravityGE(
  trade_data = flows,
  theta = 4,
  beta_hat_name = NULL,
  a_hat_name = NULL,
```

```
  multiplicative = FALSE
)
```

Index