

# Package ‘GiniDecompLY’

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**Title** Gini Decomposition by Income Sources

**Version** 1.0.1

**Description** Estimation of the effect of each income source on income inequalities based on the decomposition of Lerman and Yitzhaki (1985) <[doi:10.2307/1928447](https://doi.org/10.2307/1928447)>.

**License** GPL-3

**Encoding** UTF-8

**LazyData** true

**RoxygenNote** 7.2.3

**URL** <https://github.com/aambarek/GiniDecompLY>

**BugReports** <https://github.com/aambarek/GiniDecompLY/issues>

**Imports** dplyr, tidyr, magrittr,

**Suggests** knitr, rmarkdown, dineq, testthat (>= 3.0.0)

**Config/testthat/edition** 3

**VignetteBuilder** knitr

**Depends** R (>= 2.10)

**NeedsCompilation** no

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`gini_corr`*Gini correlation index*

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**Description**

This function calculates the Gini correlation between two distributions.

**Usage**

```
gini_corr(x, y, weights = NULL)
```

**Arguments**

<code>x</code>	a numeric vector containing at least non-negative elements.
<code>y</code>	a numeric vector containing the distribution with the rank information.
<code>weights</code>	an optional vector of weights to apply in computation. Should be <code>NULL</code> or a numeric vector.

**Value**

The value of the Gini correlation, should be between -1 and 1.

**References**

E. Schechtman and S. Yitzhaki (1999) *On the proper bounds of the Gini correlation*, Economics Letters, Volume 63, Issue 2, p. 133-138, ISSN 0165-1765

Handcock, M. (2016), *Relative Distribution Methods in the Social Sciences*, Springer-Verlag, Inc., New York, 1999 ISBN 0387987789

**Examples**

```
# Calculate the gini correlation between the salary and total income distributions
```

```
Salary_distribution = sample_income_data$wage
Total_income_distribution = rowSums(sample_income_data[3:6])

gini_corr(Salary_distribution, Total_income_distribution)
```

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gini\_decomp\_source      *Gini decomposition by income sources*

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## Description

This function provides a decomposition of Gini index by income sources based on the approach of Lerman and Yitzhaki (1985) [doi:10.2307/1928447](https://doi.org/10.2307/1928447) . It provides a set of indicators :

- `income_source`: Column indicating each income source passed into the function call.
- `Share`: Column indicating the share of the income source to the total income.
- `Gini`: Column showing the Gini index for each income source.
- `Gini_corr`: Column showing the Gini correlation between the income source and the total income.
- `Absolute_Contribution`: Column showing the absolute contribution of each income source to the global Gini index.
- `Relative_Contribution`: Column indicating the relative contribution of each income source to the global Gini index.

## Usage

```
gini_decomp_source(.data, ..., .by = NULL, .wgt = NULL)
```

## Arguments

<code>.data</code>	A data frame, or data frame extension (e.g. a tibble)
<code>...</code>	One or more unquoted expressions separated by commas indicating income sources to consider in the decomposition. Variable names can be used as if they were positions in the data frame.
<code>.by</code>	A column to group the calculations by.
<code>.wgt</code>	an optional vector of weights to apply in computation. Should be NULL or a numeric vector.

## Value

An object of class `data.frame` containing all the calculated indicators. The `data.frame` is grouped by the columns passed into `.by` argument.

## Examples

```
sample_income_data %>%  
  gini_decomp_source(wage, self_employment_rev, farming_rev, other_rev)  
  
gini_decomp_source(sample_income_data, 3:6, .by = region, .wgt = sample_wgt)
```

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gini\_income\_elasticity

*Gini income elasticity*

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### Description

This function computes the elasticity of Gini index associated with a percentage change in the mean income (for each income source). It provides a set of indicators :

- `income_source`: Column indicating each income source passed into the function call.
- `Share`: Column indicating the share of the income source to the total income.
- `Gini`: Column showing the Gini index for each income source.
- `Gini_corr`: Column showing the Gini correlation between the income source and the total income.
- `Elasticity`: Column indicating the elasticity of Gini index associated with a percentage change in the mean income source.
- `Marginal_Impact`: Column indicating the marginal impact of a change in the mean income source on the overall Gini index.

### Usage

```
gini_income_elasticity(.data, ..., .by = NULL, .wgt = NULL)
```

### Arguments

<code>.data</code>	A data frame, or data frame extension (e.g. a tibble)
<code>...</code>	One or more unquoted expressions separated by commas indicating income sources to consider in the decomposition. Variable names can be used as if they were positions in the data frame.
<code>.by</code>	A column to group the calculations by.
<code>.wgt</code>	an optional vector of weights to apply in computation. Should be NULL or a numeric vector.

### Value

An object of class `data.frame` containing all the calculated indicators. The `data.frame` is grouped by the columns passed into `.by` argument.

### Examples

```
sample_income_data %>%
  gini_income_elasticity(wage, self_employment_rev, farming_rev, other_rev,
    .by = region)

gini_income_elasticity(sample_income_data, 3:6, .by = region, .wgt = sample_wgt)
```

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sample_income_data	<i>Sample income data</i>
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**Description**

A simulated data for households income sources

**Usage**

```
sample_income_data
```

**Format**

A data frame with 200 rows and 6 columns:

**region** Whether the households residence is urban or rural

**sample\_wgt** Sample weight

**wage** Wage and salary

**self\_employment\_rev** Earnings from self-employment

**farming\_rev** Income derived from agricultural activities

**other\_rev** Other income sources ...

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social_welfare_impact	<i>Growth-redistribution impacts on social welfare function.</i>
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**Description**

This function provides a Growth-redistribution decomposition of effects (for each income source) on social welfare function defined by Amartya Sen (1970, ISBN:978-0-444-85127-7).

**Usage**

```
social_welfare_impact(.data, ..., .by = NULL, .wgt = NULL)
```

**Arguments**

<code>.data</code>	A data frame, or data frame extension (e.g. a tibble)
<code>...</code>	One or more unquoted expressions separated by commas indicating income sources to consider in the decomposition. Variable names can be used as if they were positions in the data frame.
<code>.by</code>	A column to group the calculations by.
<code>.wgt</code>	an optional vector of weights to apply in computation. Should be NULL or a numeric vector.

## Details

It provides a set of indicators :

- `income_source`: Column indicating each income source passed into the function call.
- `Share`: Column indicating the share of the income source to the total income.
- `Gini`: Column showing the Gini index for each income source.
- `Gini_corr`: Column showing the Gini correlation between the income source and the total income.
- `Growth_Effect`: Column indicating the effect of growth in the income source on the Social Welfare Function.
- `Redistribution_Effect`: Column indicating the effect of redistribution of the income source on the Social Welfare Function.
- `Total_Variation`: Column adding up both effects to calculate the overall effect of each income source on the Social Welfare Function.

## Value

An object of class `data.frame` containing all the calculated indicators. The `data.frame` is grouped by the columns passed into `.by` argument.

## Examples

```
sample_income_data %>%
  social_welfare_impact(wage, self_employment_rev, farming_rev, other_rev,
    .wgt = sample_wgt)

social_welfare_impact(sample_income_data, 3:6, .by = region, .wgt = sample_wgt)
```

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