# Package: betaSandwich (via r-universe)

August 26, 2024

**Title** Robust Confidence Intervals for Standardized Regression Coefficients

**Version** 1.0.7.9000

**Description** Generates robust confidence intervals for standardized regression coefficients using heteroskedasticity-consistent standard errors for models fitted by lm() as described in Dudgeon (2017) <doi:10.1007/s11336-017-9563-z>. The package can also be used to generate confidence intervals for R-squared, adjusted R-squared, and differences of standardized regression coefficients. A description of the package and code examples are presented in Pesigan, Sun, and Cheung (2023) <doi:10.1080/00273171.2023.2201277>.

**URL** https://github.com/jeksterslab/betaSandwich, https://jeksterslab.github.io/betaSandwich/

**BugReports** https://github.com/jeksterslab/betaSandwich/issues

**License** MIT + file LICENSE

**Encoding** UTF-8

**LazyData** true

**Roxygen** list(markdown = TRUE)

**Depends** R (>= 3.5.0)

**Suggests** knitr, rmarkdown, testthat, betaDelta

**RoxygenNote** 7.3.2

**Repository** https://jeksterslab.r-universe.dev

**RemoteUrl** https://github.com/jeksterslab/betaSandwich

**RemoteRef** HEAD

**RemoteSha** f25c1512d7f608b46eda94f4786a5d7d7c934764

# Contents

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BetaADF                    *Estimate Standardized Regression Coefficients and the Corresponding Sampling Covariance Matrix Using the Asymptotic Distribution-Free Approach*

---

## Description

Estimate Standardized Regression Coefficients and the Corresponding Sampling Covariance Matrix Using the Asymptotic Distribution-Free Approach

## Usage

```
BetaADF(object, alpha = c(0.05, 0.01, 0.001))
```

## Arguments

object          Object of class `lm`.

alpha           Numeric vector. Significance level $\alpha$.

## Details

Note that while the calculation in `BetaADF()` is different from `betaDelta::BetaDelta()` with `type = "adf"`, the results are numerically equivalent. `BetaADF()` is appropriate when sample sizes are moderate to large (n > 250). `BetaHC()` is recommended in most situations.

## Value

Returns an object of class `betasandwich` which is a list with the following elements:

**call**  Function call.

**args**  Function arguments.

**lm_process**  Processed `lm` object.

**gamma_n**  Asymptotic covariance matrix of the sample covariance matrix assuming multivariate normality.

**gamma_hc**  Asymptotic covariance matrix HC correction.

**gamma**  Asymptotic covariance matrix of the sample covariance matrix.

**acov**  Asymptotic covariance matrix of the standardized slopes.

**vcov**  Sampling covariance matrix of the standardized slopes.

**est**  Vector of standardized slopes.

## Author(s)

Ivan Jacob Agaloos Pesigan

## References

Browne, M. W. (1984). Asymptotically distribution-free methods for the analysis of covariance structures. *British Journal of Mathematical and Statistical Psychology*, *37*(1), 62–83. doi:10.1111/j.20448317.1984.tb00789.x

Dudgeon, P. (2017). Some improvements in confidence intervals for standardized regression coefficients. *Psychometrika*, *82*(4), 928–951. doi:10.1007/s113360179563z

Pesigan, I. J. A., Sun, R. W., & Cheung, S. F. (2023). betaDelta and betaSandwich: Confidence intervals for standardized regression coefficients in R. *Multivariate Behavioral Research*. doi:10.1080/00273171.2023.2201277

## See Also

Other Beta Sandwich Functions: `BetaHC()`, `BetaN()`, `DiffBetaSandwich()`, `RSqBetaSandwich()`

## Examples

```
object <- lm(QUALITY ~ NARTIC + PCTGRT + PCTSUPP, data = nas1982)
std <- BetaADF(object)
# Methods -------------------------------------------------
print(std)
summary(std)
coef(std)
```

```
vcov(std)
confint(std, level = 0.95)
```

---

| | |
|---|---|
| BetaHC | *Estimate Standardized Regression Coefficients and the Corresponding Robust Sampling Covariance Matrix Using the Heteroskedasticity Consistent Approach* |

---

## Description

Estimate Standardized Regression Coefficients and the Corresponding Robust Sampling Covariance Matrix Using the Heteroskedasticity Consistent Approach

## Usage

```
BetaHC(
  object,
  type = "hc3",
  alpha = c(0.05, 0.01, 0.001),
  g1 = 1,
  g2 = 1.5,
  k = 0.7
)
```

## Arguments

| | |
|---|---|
| object | Object of class `lm`. |
| type | Character string. Correction type. Possible values are "hc0", "hc1", "hc2", "hc3", "hc4", "hc4m", and "hc5". |
| alpha | Numeric vector. Significance level $\alpha$. |
| g1 | Numeric. g1 value for `type = "hc4m"`. |
| g2 | Numeric. g2 value for `type = "hc4m"`. |
| k | Numeric. Constant k for `type = "hc5"` $0 \leq k \leq 1$. |

## Value

Returns an object of class `betasandwich` which is a list with the following elements:

**call** Function call.

**args** Function arguments.

**lm_process** Processed `lm` object.

**gamma_n** Asymptotic covariance matrix of the sample covariance matrix assuming multivariate normality.

**gamma_hc** Asymptotic covariance matrix HC correction.

**gamma** Asymptotic covariance matrix of the sample covariance matrix.

**acov** Asymptotic covariance matrix of the standardized slopes.

**vcov** Sampling covariance matrix of the standardized slopes.

**est** Vector of standardized slopes.

## Author(s)

Ivan Jacob Agaloos Pesigan

## References

Dudgeon, P. (2017). Some improvements in confidence intervals for standardized regression coefficients. *Psychometrika*, *82*(4), 928–951. doi:10.1007/s113360179563z

Pesigan, I. J. A., Sun, R. W., & Cheung, S. F. (2023). betaDelta and betaSandwich: Confidence intervals for standardized regression coefficients in R. *Multivariate Behavioral Research*. doi:10.1080/00273171.2023.2201277

## See Also

Other Beta Sandwich Functions: BetaADF(), BetaN(), DiffBetaSandwich(), RSqBetaSandwich()

## Examples

```
object <- lm(QUALITY ~ NARTIC + PCTGRT + PCTSUPP, data = nas1982)
std <- BetaHC(object)
# Methods -------------------------------------------------------
print(std)
summary(std)
coef(std)
vcov(std)
confint(std, level = 0.95)
```

---

| | |
|---|---|
| BetaN | *Estimate Standardized Regression Coefficients and the Corresponding Sampling Covariance Matrix Assuming Multivariate Normality* |

---

## Description

Estimate Standardized Regression Coefficients and the Corresponding Sampling Covariance Matrix Assuming Multivariate Normality

## Usage

```
BetaN(object, alpha = c(0.05, 0.01, 0.001))
```

## Arguments

| object | Object of class `lm`. |
| --- | --- |
| alpha | Numeric vector. Significance level $\alpha$. |

## Details

Note that while the calculation in `BetaN()` is different from `betaDelta::BetaDelta()` with type = "mvn", the results are numerically equivalent. `BetaN()` assumes multivariate normality. `BetaHC()` is recommended in most situations.

## Value

Returns an object of class `betasandwich` which is a list with the following elements:

**call** Function call.

**args** Function arguments.

**lm_process** Processed `lm` object.

**gamma_n** Asymptotic covariance matrix of the sample covariance matrix assuming multivariate normality.

**gamma_hc** Asymptotic covariance matrix HC correction.

**gamma** Asymptotic covariance matrix of the sample covariance matrix.

**acov** Asymptotic covariance matrix of the standardized slopes.

**vcov** Sampling covariance matrix of the standardized slopes.

**est** Vector of standardized slopes.

## Author(s)

Ivan Jacob Agaloos Pesigan

## References

Dudgeon, P. (2017). Some improvements in confidence intervals for standardized regression coefficients. *Psychometrika*, *82*(4), 928–951. doi:10.1007/s113360179563z

Pesigan, I. J. A., Sun, R. W., & Cheung, S. F. (2023). betaDelta and betaSandwich: Confidence intervals for standardized regression coefficients in R. *Multivariate Behavioral Research*. doi:10.1080/00273171.2023.2201277

## See Also

Other Beta Sandwich Functions: `BetaADF()`, `BetaHC()`, `DiffBetaSandwich()`, `RSqBetaSandwich()`

## Examples

```
object <- lm(QUALITY ~ NARTIC + PCTGRT + PCTSUPP, data = nas1982)
std <- BetaN(object)
# Methods --------------------------------------------------------
print(std)
summary(std)
coef(std)
vcov(std)
confint(std, level = 0.95)
```

---

| coef.betasandwich | *Standardized Regression Slopes* |
|---|---|

---

## Description

Standardized Regression Slopes

## Usage

```
## S3 method for class 'betasandwich'
coef(object, ...)
```

## Arguments

| | |
|---|---|
| object | Object of class betasandwich. |
| ... | additional arguments. |

## Value

Returns a vector of standardized regression slopes.

## Author(s)

Ivan Jacob Agaloos Pesigan

## Examples

```
object <- lm(QUALITY ~ NARTIC + PCTGRT + PCTSUPP, data = nas1982)
std <- BetaHC(object)
coef(std)
```

---

coef.diffbetasandwich    *Differences of Standardized Regression Slopes*

---

### Description

Differences of Standardized Regression Slopes

### Usage

```
## S3 method for class 'diffbetasandwich'
coef(object, ...)
```

### Arguments

| | |
|---|---|
| object | Object of class diffbetasandwich. |
| ... | additional arguments. |

### Value

Returns a vector of differences of standardized regression slopes.

### Author(s)

Ivan Jacob Agaloos Pesigan

### Examples

```
object <- lm(QUALITY ~ NARTIC + PCTGRT + PCTSUPP, data = nas1982)
std <- BetaHC(object)
diff <- DiffBetaSandwich(std)
coef(diff)
```

---

coef.rsqbetasandwich    *Multiple Correlation Coefficients (R-Squared and Adjusted R-Squared)*

---

### Description

Multiple Correlation Coefficients (R-Squared and Adjusted R-Squared)

### Usage

```
## S3 method for class 'rsqbetasandwich'
coef(object, ...)
```

## Arguments

| | |
|---|---|
| `object` | Object of class `rsqbetasandwich`. |
| `...` | additional arguments. |

## Value

Returns a vector of multiple correlation coefficients (R-squared and adjusted R-squared)

## Author(s)

Ivan Jacob Agaloos Pesigan

## Examples

```
object <- lm(QUALITY ~ NARTIC + PCTGRT + PCTSUPP, data = nas1982)
std <- BetaHC(object)
rsq <- RSqBetaSandwich(std)
coef(rsq)
```

---

confint.betasandwich    *Confidence Intervals for Standardized Regression Slopes*

---

## Description

Confidence Intervals for Standardized Regression Slopes

## Usage

```
## S3 method for class 'betasandwich'
confint(object, parm = NULL, level = 0.95, ...)
```

## Arguments

| | |
|---|---|
| `object` | Object of class `betasandwich`. |
| `parm` | a specification of which parameters are to be given confidence intervals, either a vector of numbers or a vector of names. If missing, all parameters are considered. |
| `level` | the confidence level required. |
| `...` | additional arguments. |

## Value

Returns a matrix of confidence intervals.

## Author(s)

Ivan Jacob Agaloos Pesigan

## Examples

```
object <- lm(QUALITY ~ NARTIC + PCTGRT + PCTSUPP, data = nas1982)
std <- BetaHC(object)
confint(std, level = 0.95)
```

---

confint.diffbetasandwich

*Confidence Intervals for Differences of Standardized Regression Slopes*

---

## Description

Confidence Intervals for Differences of Standardized Regression Slopes

## Usage

```
## S3 method for class 'diffbetasandwich'
confint(object, parm = NULL, level = 0.95, ...)
```

## Arguments

| | |
|---|---|
| object | Object of class diffbetasandwich. |
| parm | a specification of which parameters are to be given confidence intervals, either a vector of numbers or a vector of names. If missing, all parameters are considered. |
| level | the confidence level required. |
| ... | additional arguments. |

## Value

Returns a matrix of confidence intervals.

## Author(s)

Ivan Jacob Agaloos Pesigan

## Examples

```
object <- lm(QUALITY ~ NARTIC + PCTGRT + PCTSUPP, data = nas1982)
std <- BetaHC(object)
diff <- DiffBetaSandwich(std)
confint(diff, level = 0.95)
```

confint.rsqbetasandwich

*Confidence Intervals for Multiple Correlation Coefficients (R-Squared and Adjusted R-Squared)*

### Description

Confidence Intervals for Multiple Correlation Coefficients (R-Squared and Adjusted R-Squared)

### Usage

```
## S3 method for class 'rsqbetasandwich'
confint(object, parm = NULL, level = 0.95, ...)
```

### Arguments

| | |
|---|---|
| object | Object of class rsqbetasandwich. |
| parm | a specification of which parameters are to be given confidence intervals, either a vector of numbers or a vector of names. If missing, all parameters are considered. |
| level | the confidence level required. |
| ... | additional arguments. |

### Value

Returns a matrix of confidence intervals.

### Author(s)

Ivan Jacob Agaloos Pesigan

### Examples

```
object <- lm(QUALITY ~ NARTIC + PCTGRT + PCTSUPP, data = nas1982)
std <- BetaHC(object)
rsq <- RSqBetaSandwich(std)
confint(rsq, level = 0.95)
```

---

DiffBetaSandwich                 *Estimate Differences of Standardized Slopes and the Corresponding*
                                 *Sampling Covariance Matrix*

---

### Description

Estimate Differences of Standardized Slopes and the Corresponding Sampling Covariance Matrix

### Usage

```
DiffBetaSandwich(object, alpha = c(0.05, 0.01, 0.001))
```

### Arguments

| | |
|---|---|
| object | Object of class betasandwich, that is, the output of the `BetaHC()`, `BetaN()`, or `BetaADF()` functions. |
| alpha | Numeric vector. Significance level $\alpha$. |

### Value

Returns an object of class diffbetasandwich which is a list with the following elements:

**call** Function call.

**fit** The argument object.

**args** Function arguments.

**vcov** Sampling covariance matrix of differences of standardized slopes.

**est** Vector of differences of standardized slopes.

### Author(s)

Ivan Jacob Agaloos Pesigan

### See Also

Other Beta Sandwich Functions: `BetaADF()`, `BetaHC()`, `BetaN()`, `RSqBetaSandwich()`

### Examples

```
object <- lm(QUALITY ~ NARTIC + PCTGRT + PCTSUPP, data = nas1982)
std <- BetaHC(object)
diff <- DiffBetaSandwich(std)
# Methods -----------------------------------------------------
print(diff)
summary(diff)
coef(diff)
vcov(diff)
confint(diff, level = 0.95)
```

---

| nas1982 | *1982 National Academy of Sciences Doctoral Programs Data* |
|---|---|

---

## Description

1982 National Academy of Sciences Doctoral Programs Data

## Usage

```
nas1982
```

## Format

Ratings of 46 doctoral programs in psychology in the USA with the following variables:

**QUALITY** Program quality ratings.

**NFACUL** Number of faculty members in the program.

**NGRADS** Number of program graduates.

**PCTSUPP** Percentage of program graduates who received support.

**PCTGRT** Percent of faculty members holding research grants.

**NARTIC** Number of published articles attributed to program faculty member.

**PCTPUB** Percent of faculty with one or more published article.

## References

National Research Council. (1982). *An assessment of research-doctorate programs in the United States: Social and behavioral sciences*. doi:10.17226/9781. Reproduced with permission from the National Academy of Sciences, Courtesy of the National Academies Press, Washington, D.C.

---

| print.betasandwich | *Print Method for an Object of Class* betasandwich |
|---|---|

---

## Description

Print Method for an Object of Class betasandwich

## Usage

```
## S3 method for class 'betasandwich'
print(x, alpha = NULL, digits = 4, ...)
```

## Arguments

| | |
|---|---|
| x | Object of class betasandwich. |
| alpha | Numeric vector. Significance level $\alpha$. If alpha = NULL, use the argument alpha used in x. |
| digits | Digits to print. |
| ... | additional arguments. |

## Value

Returns a matrix of standardized regression slopes, standard errors, test statistics, degrees of freedom, p-values, and confidence intervals.

## Author(s)

Ivan Jacob Agaloos Pesigan

## Examples

```
object <- lm(QUALITY ~ NARTIC + PCTGRT + PCTSUPP, data = nas1982)
std <- BetaHC(object)
print(std)
```

---

print.diffbetasandwich

*Print Method for an Object of Class* diffbetasandwich

---

## Description

Print Method for an Object of Class diffbetasandwich

## Usage

```
## S3 method for class 'diffbetasandwich'
print(x, alpha = NULL, digits = 4, ...)
```

## Arguments

| | |
|---|---|
| x | Object of class diffbetasandwich. |
| alpha | Numeric vector. Significance level $\alpha$. If alpha = NULL, use the argument alpha used in x. |
| digits | Digits to print. |
| ... | additional arguments. |

## Value

Returns a matrix of differences of standardized regression slopes, standard errors, test statistics, degrees of freedom, p-values, and confidence intervals.

## Author(s)

Ivan Jacob Agaloos Pesigan

## Examples

```
object <- lm(QUALITY ~ NARTIC + PCTGRT + PCTSUPP, data = nas1982)
std <- BetaHC(object)
diff <- DiffBetaSandwich(std)
print(diff)
```

---

print.rsqbetasandwich    *Print Method for an Object of Class* rsqbetasandwich

---

## Description

Print Method for an Object of Class rsqbetasandwich

## Usage

```
## S3 method for class 'rsqbetasandwich'
print(x, alpha = NULL, digits = 4, ...)
```

## Arguments

| | |
|---|---|
| x | Object of class rsqbetasandwich. |
| alpha | Numeric vector. Significance level $\alpha$. If alpha = NULL, use the argument alpha used in x. |
| digits | Digits to print. |
| ... | additional arguments. |

## Value

Returns a matrix of multiple correlation coefficients (R-squared and adjusted R-squared), standard errors, test statistics, degrees of freedom, p-values, and confidence intervals.

## Author(s)

Ivan Jacob Agaloos Pesigan

## Examples

```
object <- lm(QUALITY ~ NARTIC + PCTGRT + PCTSUPP, data = nas1982)
std <- BetaHC(object)
rsq <- RSqBetaSandwich(std)
print(rsq)
```

---

| RSqBetaSandwich | *Estimate Multiple Correlation Coefficients (R-squared and adjusted R-squared) and the Corresponding Sampling Covariance Matrix* |
|---|---|

---

## Description

Estimate Multiple Correlation Coefficients (R-squared and adjusted R-squared) and the Corresponding Sampling Covariance Matrix

## Usage

```
RSqBetaSandwich(object, alpha = c(0.05, 0.01, 0.001))
```

## Arguments

| | |
|---|---|
| object | Object of class betasandwich, that is, the output of the [BetaHC()](), [BetaN()](), or [BetaADF()]() functions. |
| alpha | Numeric vector. Significance level $\alpha$. |

## Value

Returns an object of class rsqbetasandwich which is a list with the following elements:

**call** Function call.

**fit** The argument object.

**args** Function arguments.

**vcov** Sampling covariance matrix of multiple correlation coefficients (R-squared and adjusted R-squared).

**est** Vector of multiple correlation coefficients (R-squared and adjusted R-squared).

## Author(s)

Ivan Jacob Agaloos Pesigan

## See Also

Other Beta Sandwich Functions: [BetaADF](), [BetaHC](), [BetaN](), [DiffBetaSandwich]()

## Examples

```
object <- lm(QUALITY ~ NARTIC + PCTGRT + PCTSUPP, data = nas1982)
std <- BetaHC(object)
rsq <- RSqBetaSandwich(std)
# Methods -------------------------------------------------
print(rsq)
summary(rsq)
coef(rsq)
vcov(rsq)
confint(rsq, level = 0.95)
```

---

summary.betasandwich     *Summary Method for an Object of Class* betasandwich

---

## Description

Summary Method for an Object of Class betasandwich

## Usage

```
## S3 method for class 'betasandwich'
summary(object, alpha = NULL, digits = 4, ...)
```

## Arguments

| | |
|---|---|
| object | Object of class betasandwich. |
| alpha | Numeric vector. Significance level $\alpha$. If alpha = NULL, use the argument alpha used in object. |
| digits | Digits to print. |
| ... | additional arguments. |

## Value

Returns a matrix of standardized regression slopes, standard errors, test statistics, degrees of freedom, p-values, and confidence intervals.

## Author(s)

Ivan Jacob Agaloos Pesigan

## Examples

```
object <- lm(QUALITY ~ NARTIC + PCTGRT + PCTSUPP, data = nas1982)
std <- BetaHC(object)
summary(std)
```

---

summary.diffbetasandwich

*Summary Method for an Object of Class* diffbetasandwich

---

### Description

Summary Method for an Object of Class diffbetasandwich

### Usage

```
## S3 method for class 'diffbetasandwich'
summary(object, alpha = NULL, digits = 4, ...)
```

### Arguments

| | |
|---|---|
| object | Object of class diffbetasandwich. |
| alpha | Numeric vector. Significance level $\alpha$. If alpha = NULL, use the argument alpha used in object. |
| digits | Digits to print. |
| ... | additional arguments. |

### Value

Returns a matrix of differences of standardized regression slopes, standard errors, test statistics, degrees of freedom, p-values, and confidence intervals.

### Author(s)

Ivan Jacob Agaloos Pesigan

### Examples

```
object <- lm(QUALITY ~ NARTIC + PCTGRT + PCTSUPP, data = nas1982)
std <- BetaHC(object)
diff <- DiffBetaSandwich(std)
summary(diff)
```

---

summary.rsqbetasandwich

*Summary Method for an Object of Class* rsqbetasandwich

---

### Description

Summary Method for an Object of Class rsqbetasandwich

### Usage

```
## S3 method for class 'rsqbetasandwich'
summary(object, alpha = NULL, digits = 4, ...)
```

### Arguments

| | |
|---|---|
| object | Object of class rsqbetasandwich. |
| alpha | Numeric vector. Significance level $\alpha$. If alpha = NULL, use the argument alpha used in object. |
| digits | Digits to print. |
| ... | additional arguments. |

### Value

Returns a matrix of multiple correlation coefficients (R-squared and adjusted R-squared), standard errors, test statistics, degrees of freedom, p-values, and confidence intervals.

### Author(s)

Ivan Jacob Agaloos Pesigan

### Examples

```
object <- lm(QUALITY ~ NARTIC + PCTGRT + PCTSUPP, data = nas1982)
std <- BetaHC(object)
rsq <- RSqBetaSandwich(std)
summary(rsq)
```

---

vcov.betasandwich          *Sampling Covariance Matrix of the Standardized Regression Slopes*

---

### Description

Sampling Covariance Matrix of the Standardized Regression Slopes

### Usage

```
## S3 method for class 'betasandwich'
vcov(object, ...)
```

### Arguments

object          Object of class betasandwich.

...             additional arguments.

### Value

Returns a matrix of the variance-covariance matrix of standardized slopes.

### Author(s)

Ivan Jacob Agaloos Pesigan

### Examples

```
object <- lm(QUALITY ~ NARTIC + PCTGRT + PCTSUPP, data = nas1982)
std <- BetaHC(object)
vcov(std)
```

---

vcov.diffbetasandwich   *Sampling Covariance Matrix of Differences of Standardized Regres-*
                        *sion Slopes*

---

### Description

Sampling Covariance Matrix of Differences of Standardized Regression Slopes

### Usage

```
## S3 method for class 'diffbetasandwich'
vcov(object, ...)
```

## Arguments

| | |
|---|---|
| object | Object of class `diffbetasandwich`. |
| ... | additional arguments. |

## Value

Returns a matrix of the variance-covariance matrix of differences of standardized regression slopes.

## Author(s)

Ivan Jacob Agaloos Pesigan

## Examples

```
object <- lm(QUALITY ~ NARTIC + PCTGRT + PCTSUPP, data = nas1982)
std <- BetaHC(object)
diff <- DiffBetaSandwich(std)
vcov(diff)
```

---

| | |
|---|---|
| vcov.rsqbetasandwich | *Sampling Covariance Matrix of Multiple Correlation Coefficients (R-Squared and Adjusted R-Squared)* |

---

## Description

Sampling Covariance Matrix of Multiple Correlation Coefficients (R-Squared and Adjusted R-Squared)

## Usage

```
## S3 method for class 'rsqbetasandwich'
vcov(object, ...)
```

## Arguments

| | |
|---|---|
| object | Object of class `rsqbetasandwich`. |
| ... | additional arguments. |

## Value

Returns a matrix of the variance-covariance matrix of multiple correlation coefficients (R-squared and adjusted R-squared).

## Author(s)

Ivan Jacob Agaloos Pesigan

## Examples

```
object <- lm(QUALITY ~ NARTIC + PCTGRT + PCTSUPP, data = nas1982)
std <- BetaHC(object)
rsq <- RSqBetaSandwich(std)
vcov(rsq)
```

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