

FILE NAME: Pi0\_hat\_U

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cheng_est	<i>Bias corrected estimator for the proportion of true null hypotheses</i>
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## Description

Estimates the proportion of true null hypotheses by exponential model assumption based bias correction of the estimator in Storey (2002) as described in Biswas et al. (2021). The function works for the multiple single sample tests as given in equation (3.12) of Biswas et al. (2021).

## Usage

cheng\_est (n, pi0.init, p.val, delta)

## Arguments

n	Array of different available sample sizes for each test.
pi0.init	An initial estimate of the proportion of true null hypotheses, a value in (0,1).
p.val	Array of the p-values.
delta	Array of effect sizes. For this case array of sample means.

## Value

Estimate of the proportion of true null hypotheses.

## References

Biswas, A., Chattopadhyay, G., and Chatterjee, A. (2021), "Bias corrected estimators for proportion of true null hypotheses: Application of adaptive FDR-controlling in segmented failure data," *Journal of Applied Statistics*, Under revision.

Storey, J. D. (2002), "A direct approach to false discovery rates," *Journal of the Royal Statistical Society: Series B (Statistical Methodology)*, 64(3), 479-498.

## Author

Aniket Biswas.

FILE NAME: Pi0\_hat\_E

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biswas_est	<i>Bias corrected estimator for the proportion of true null hypotheses</i>
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## Description

Estimates the proportion of true null hypotheses by exponential model assumption based bias correction of the estimator in Biswas (2020) as described in Biswas et al. (2021). The function works for the multiple single sample tests as given in equation (3.12) of Biswas et al. (2021).

## Usage

```
biswas_est (n, pi0.init, p.val, delta)
```

## Arguments

n	Array of different available sample sizes for each test.
pi0.init	An initial estimate of the proportion of true null hypotheses, a value in (0,1).
p.val	Array of the p-values.
delta	Array of effect sizes. For this case array of sample means.

## Value

Estimate of the proportion of true null hypotheses.

## References

Biswas, A. (2020), ``Estimating the proportion of true null hypotheses based on sum of  $\$p\$-values and application in microarray data," *Communications in Statistics - Simulation and Computation*, DOI: 10.1080/03610918.2020.1800036. 1-15.$

Biswas, A., Chattopadhyay, G., and Chatterjee, A. (2021), "Bias corrected estimators for proportion of true null hypotheses: Application of adaptive FDR-controlling in segmented failure data," *Journal of Applied Statistics*, Under revision.

## Author

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