Report

Method

σ: standard deviation of A
The Bonett method is valid for any continuous distribution.
The chi-square method is valid only for the normal distribution.

Descriptive Statistics

N	StDev	Variance	95% Upper Bound for σ using Bonett	95% Upper Bound for σ using Chi-Square
100	2.54	6.45	2.86	2.88

Test

Null hypothesis	$H_0: \sigma^2 = 9$
Alternative hypothesis	$H_1: \sigma^2 < 9$

Method	Test Statistic	DF	P-Value
Bonett	—	—	0.012
Chi-Square	70.93	99	0.015

Method

σ_1: standard deviation of A
σ_2: standard deviation of B
Ratio: σ_1/σ_2
The Bonett and Levene's methods are valid for any continuous distribution.

Descriptive Statistics

Variable	N	StDev	Variance	95% Upper Bound for σ^2
A	100	2.539	6.448	8.207
B	100	3.848	14.806	18.531

Ratio of Variances

Estimated Ratio	95% Upper Bound for	95% Upper Bound for

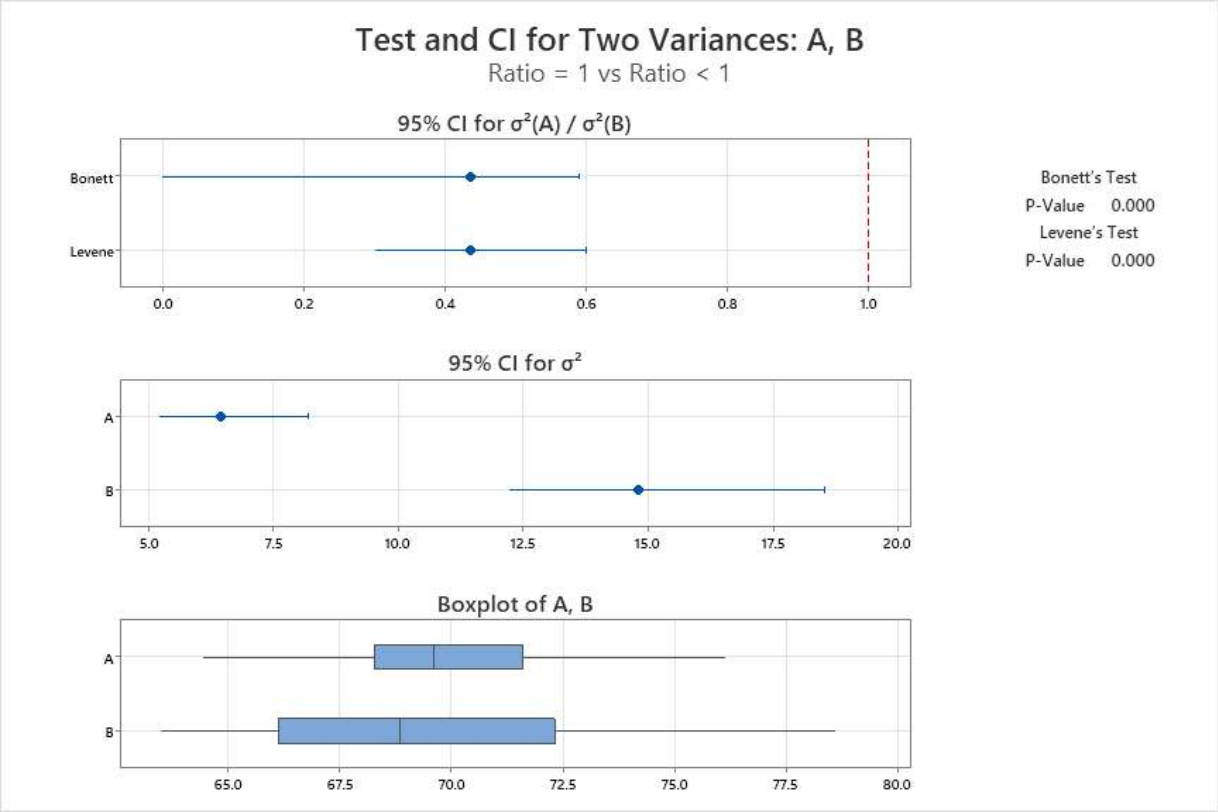
Test

Null hypothesis	$H_0: \sigma_1^2 / \sigma_2^2 = 1$
Alternative hypothesis	$H_1: \sigma_1^2 / \sigma_2^2 < 1$

	Ratio using Bonett	Ratio using Levene
0.435478	0.590	0.600

Significance level α = 0.05

Method	Test Statistic	DF1	DF2	P-Value
Bonett	17.43	1		0.000
Levene	16.03	1	198	0.000



Method

σ_1: standard deviation of A
σ_2: standard deviation of D
Ratio: σ_1/σ_2
The Bonett and Levene's methods are valid for any continuous distribution.

Descriptive Statistics

Variable	N	StDev	Variance	95% Upper Bound for σ^2
A	100	2.539	6.448	8.207
D	100	2.728	7.442	9.262

Ratio of Variances

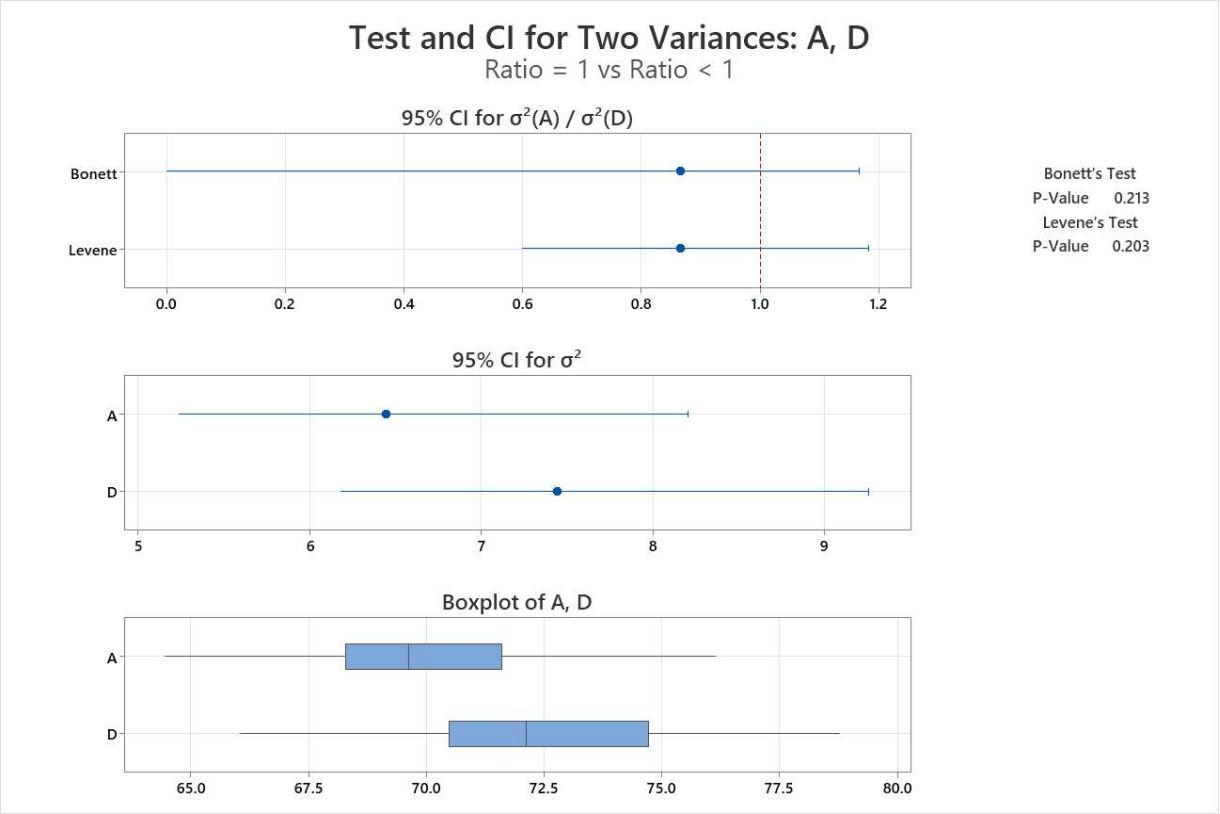
Estimated Ratio	95% Upper Bound for	95% Upper Bound for

Test

Null hypothesis	$H_0: \sigma_1^2 / \sigma_2^2 = 1$
Alternative hypothesis	$H_1: \sigma_1^2 / \sigma_2^2 < 1$
Significance level	$\alpha = 0.05$

	Ratio using Bonett	Ratio using Levene
0.866451	1.167	1.183

Method	Test Statistic	DF1	DF2	P-Value
Bonett	0.63	1		0.213
Levene	0.70	1	198	0.203



Method

Null hypothesis	All variances are equal
Alternative hypothesis	At least one variance is different
Significance level	α = 0.05

95% Bonferroni Confidence Intervals for Standard Deviations

Sample	N	StDev	CI
A	100	2.53927	(2.16508, 3.05443)
B	100	3.84792	(3.32354, 4.56916)
C	100	4.58362	(4.12145, 5.22819)
D	100	2.72796	(2.36633, 3.22541)

Individual confidence level = 98.75%

Tests

Method	Test Statistic	P-Value
Multiple comparisons	—	0.000

Levene	20.01	0.000