Problem Sheet 2

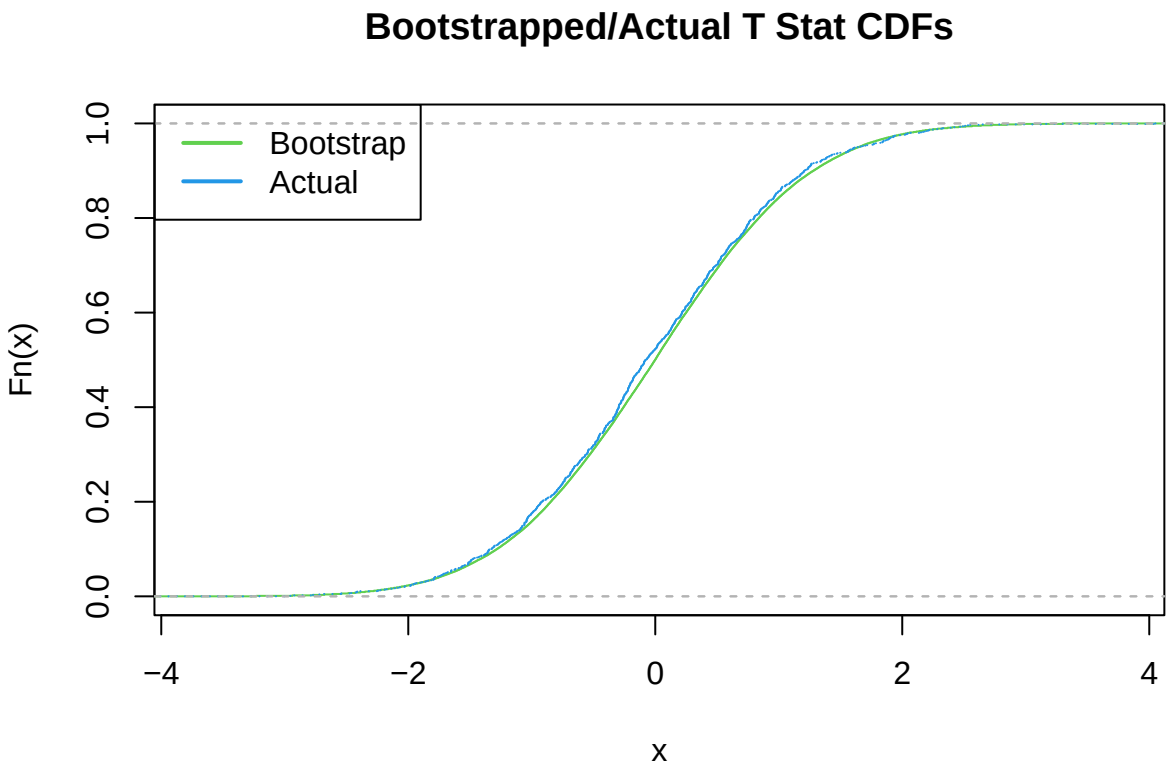
Alexander Ober

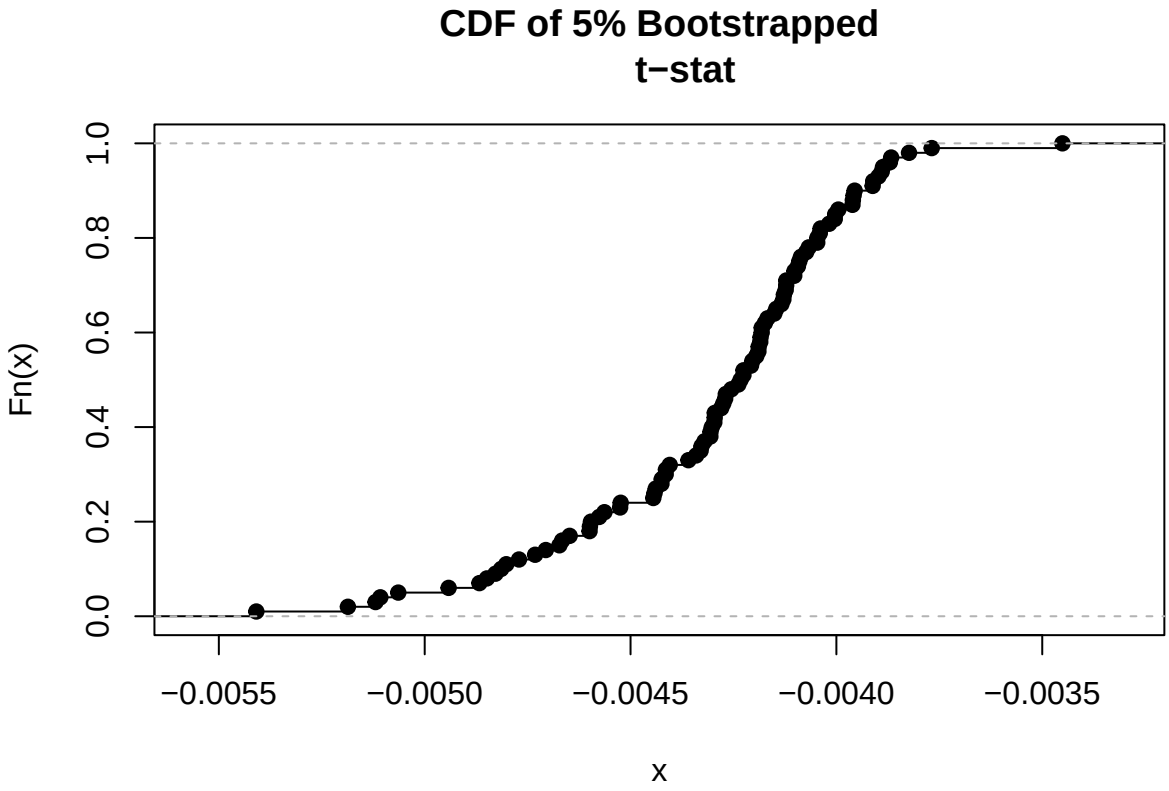
2/22/2022

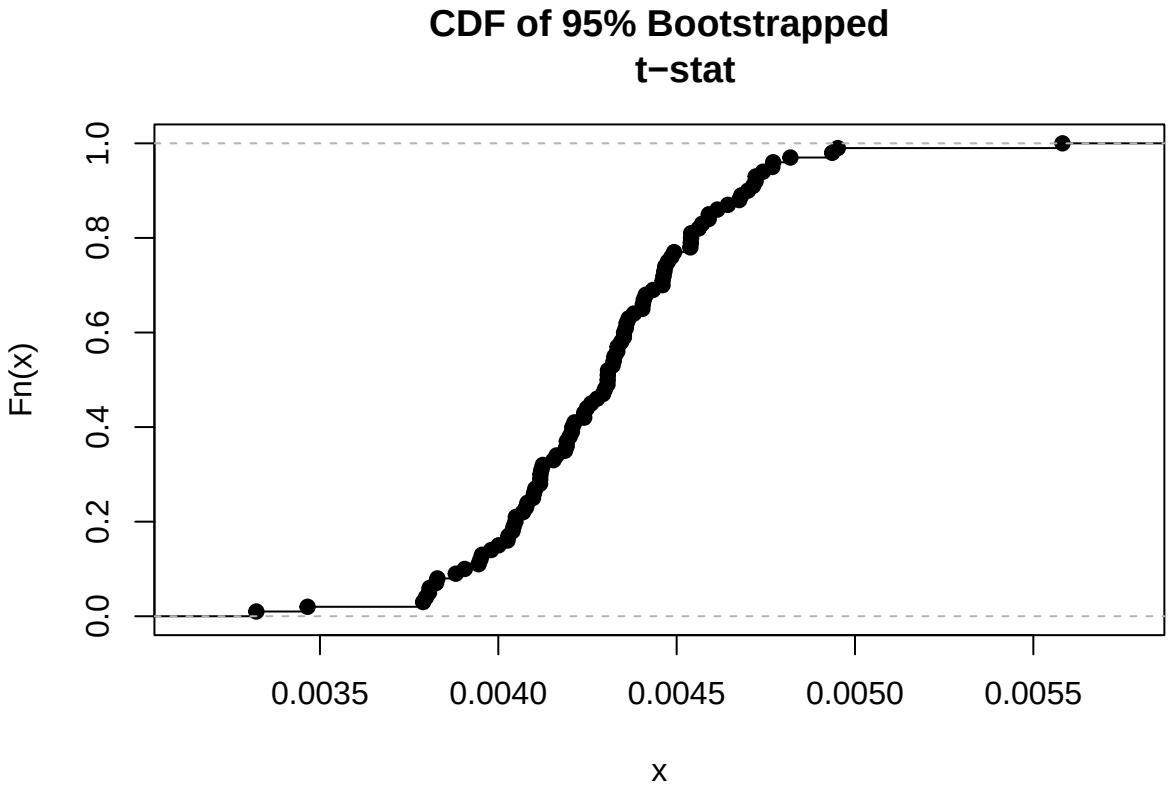
Code is posted at the following site: https://github.com/alexanderober/BUSI525/tree/main/PS2

Part 1

I simply follow what is suggested in the problem sheet. I've commented throughout to hopefully make it clear what I'm doing. Note the CDFs of the actual and bootstrapped match reasonably closely, which is nice.

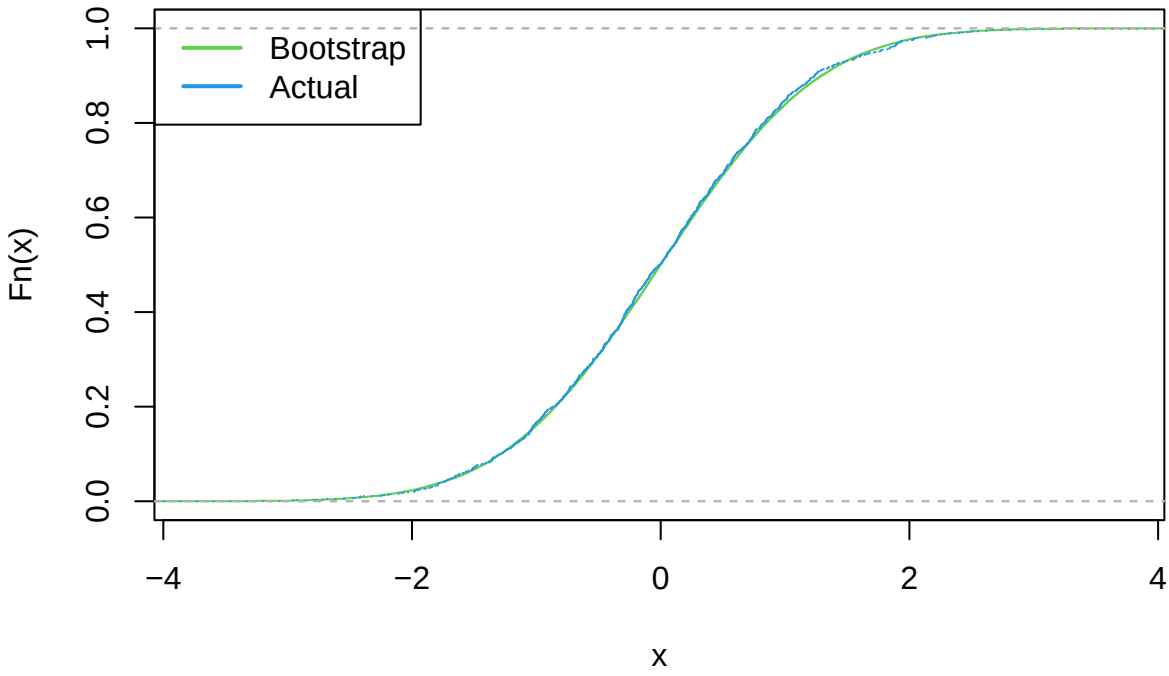


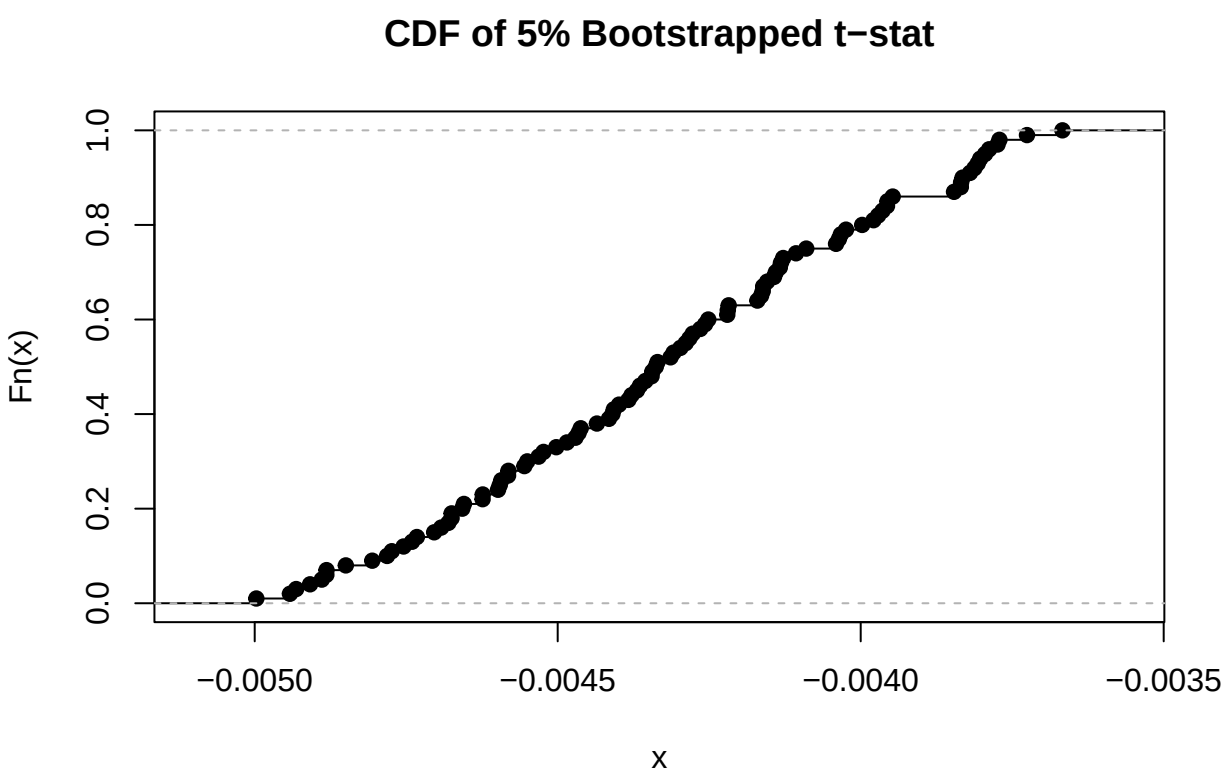

CDF of 5% Bootstrapped
t−stat
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
−0.0055
−0.0050
−0.0045
−0.0040
−0.0035
x

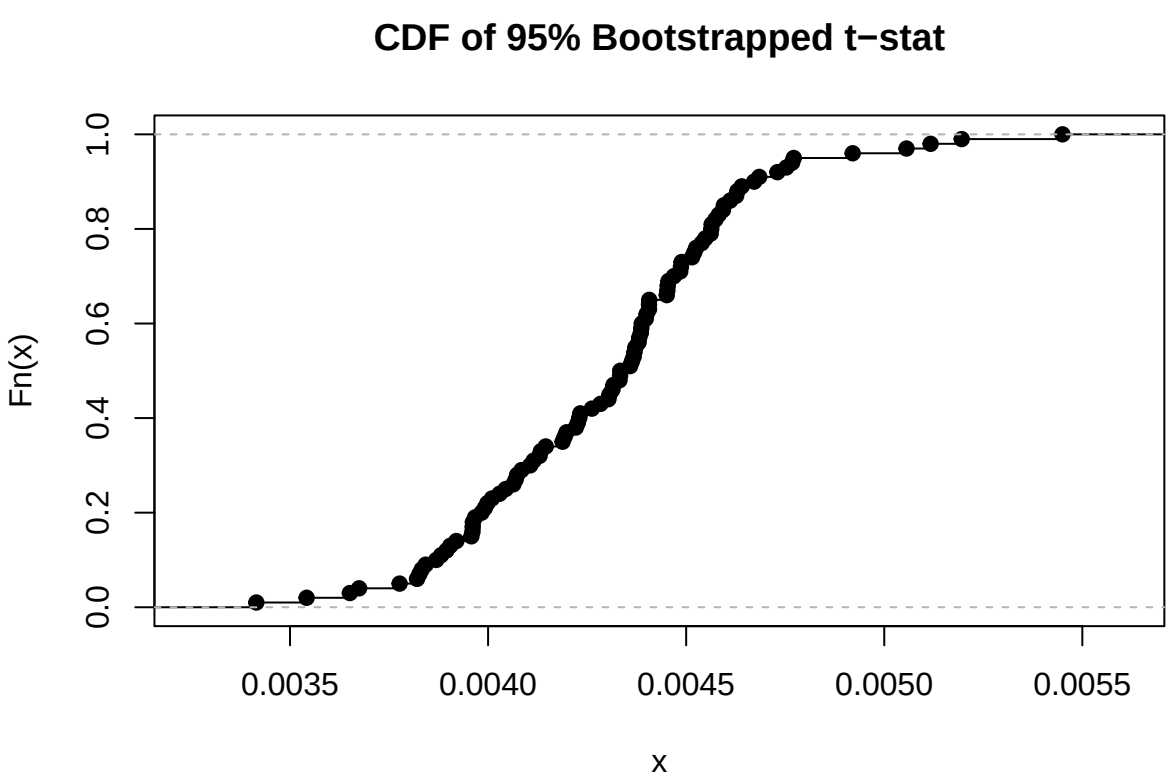


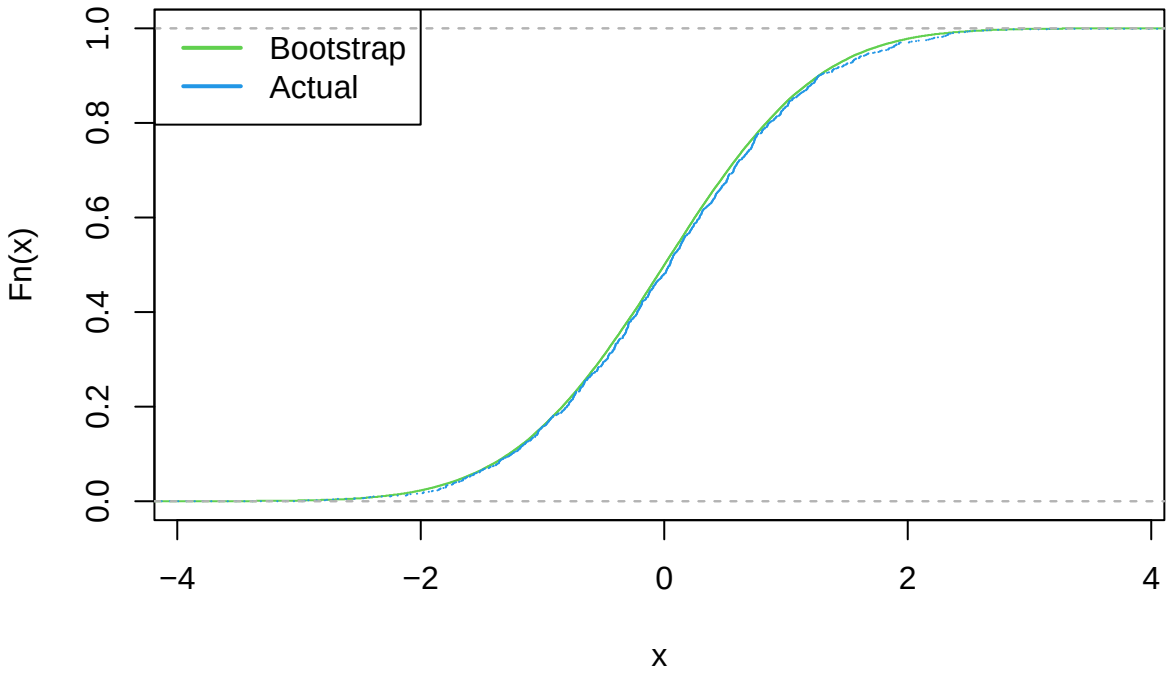
Part 2

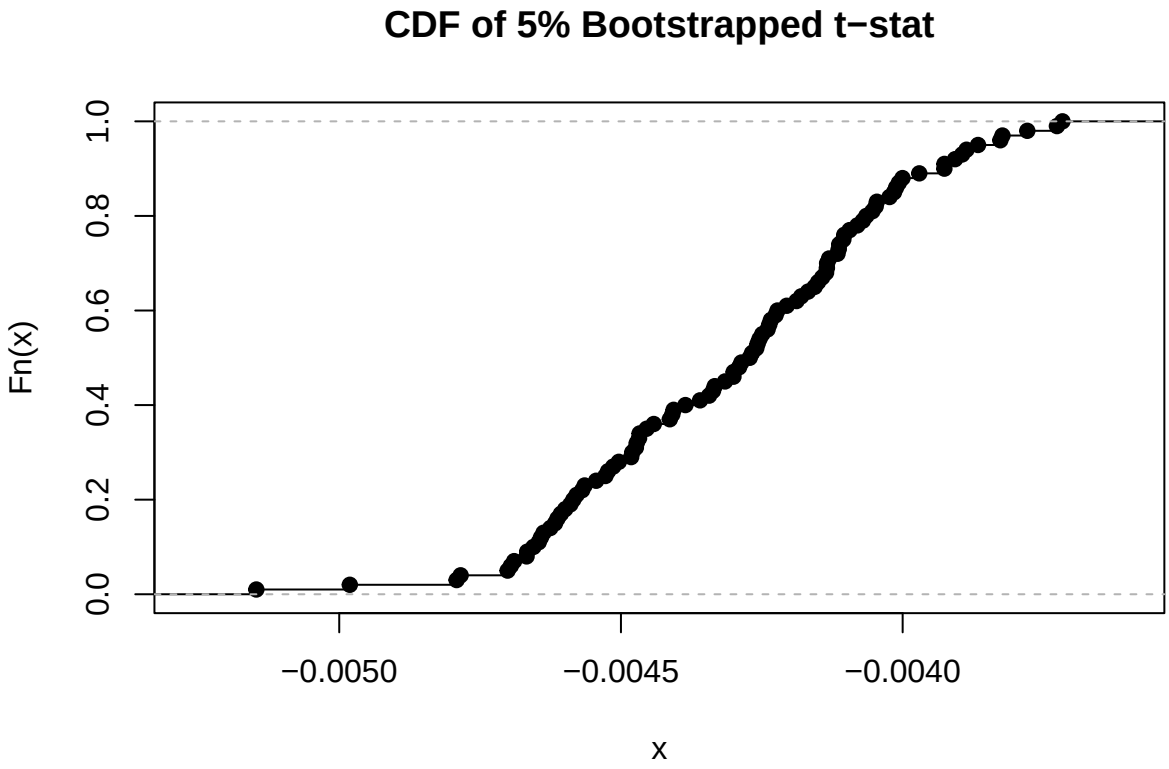
Note as lambda and the alpha increase, the actual CDF moves to the right relative to the unskilled bootstrapped CDF. This is what we'd expect.

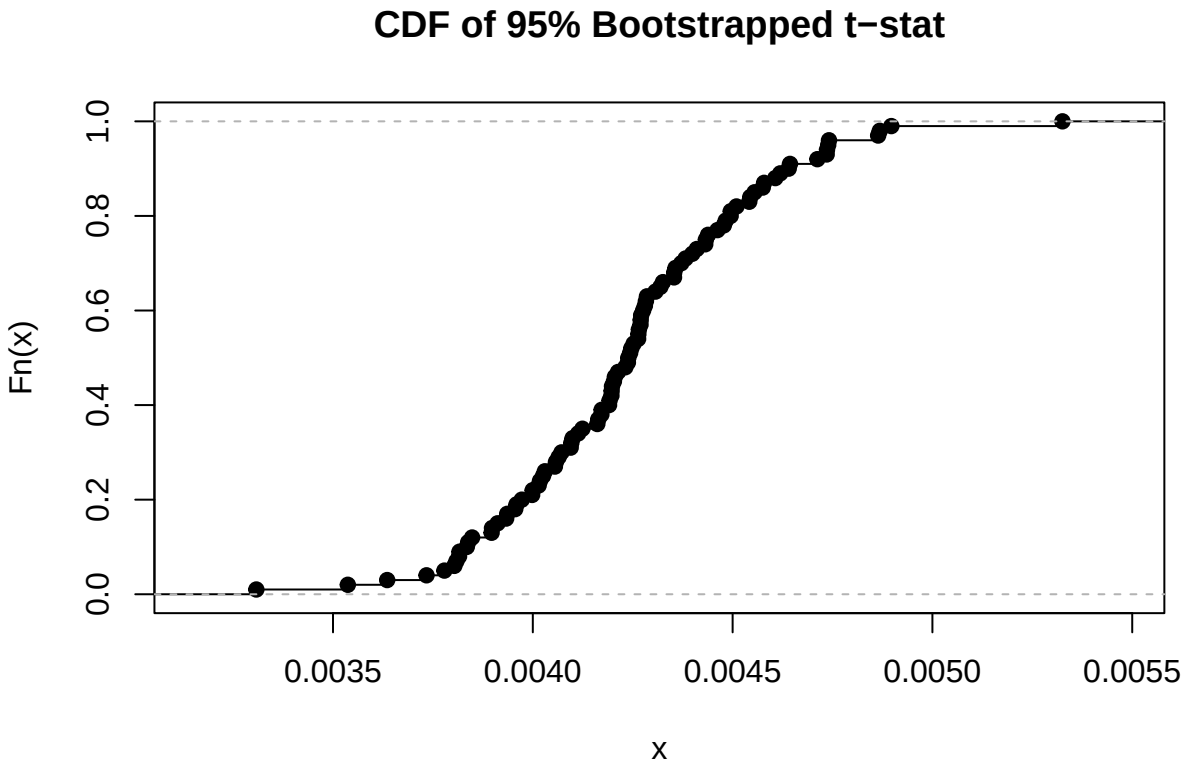

Bootstrapped/Actual T Stat CDFs, alpha_0 = 0.01, lambda = 0.1
Bootstrap
Actual
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
−4
−2
0
2
4
x

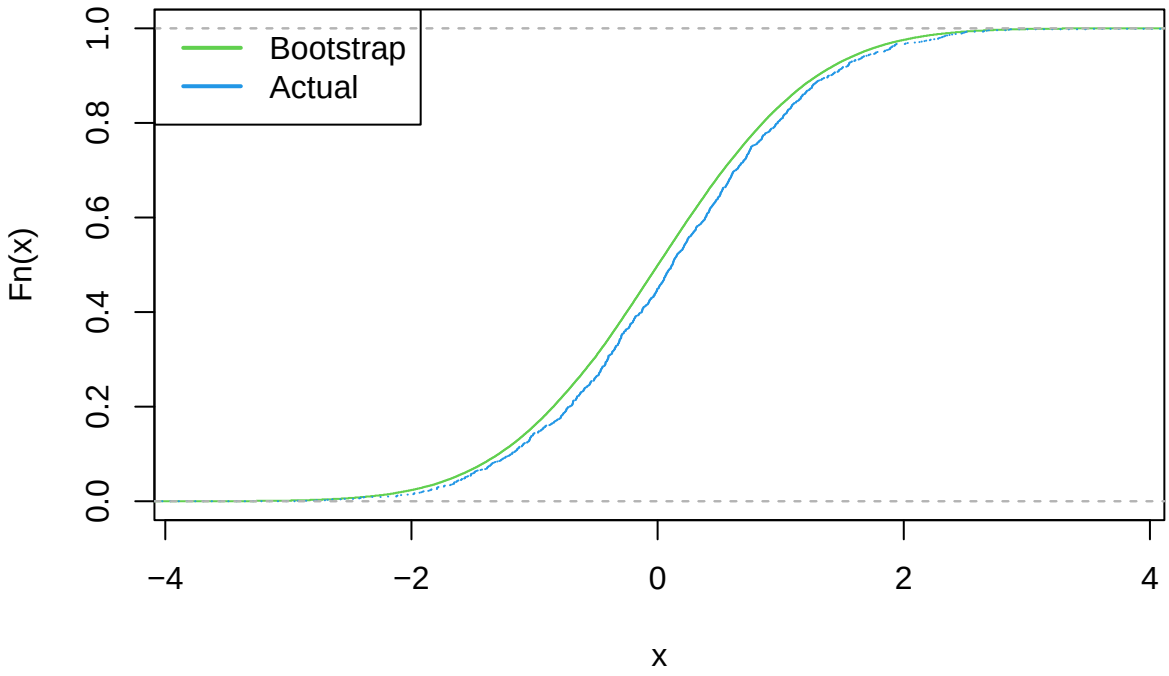

CDF of 5% Bootstrapped t−stat
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
−0.0050
−0.0045
−0.0040
−0.0035
x

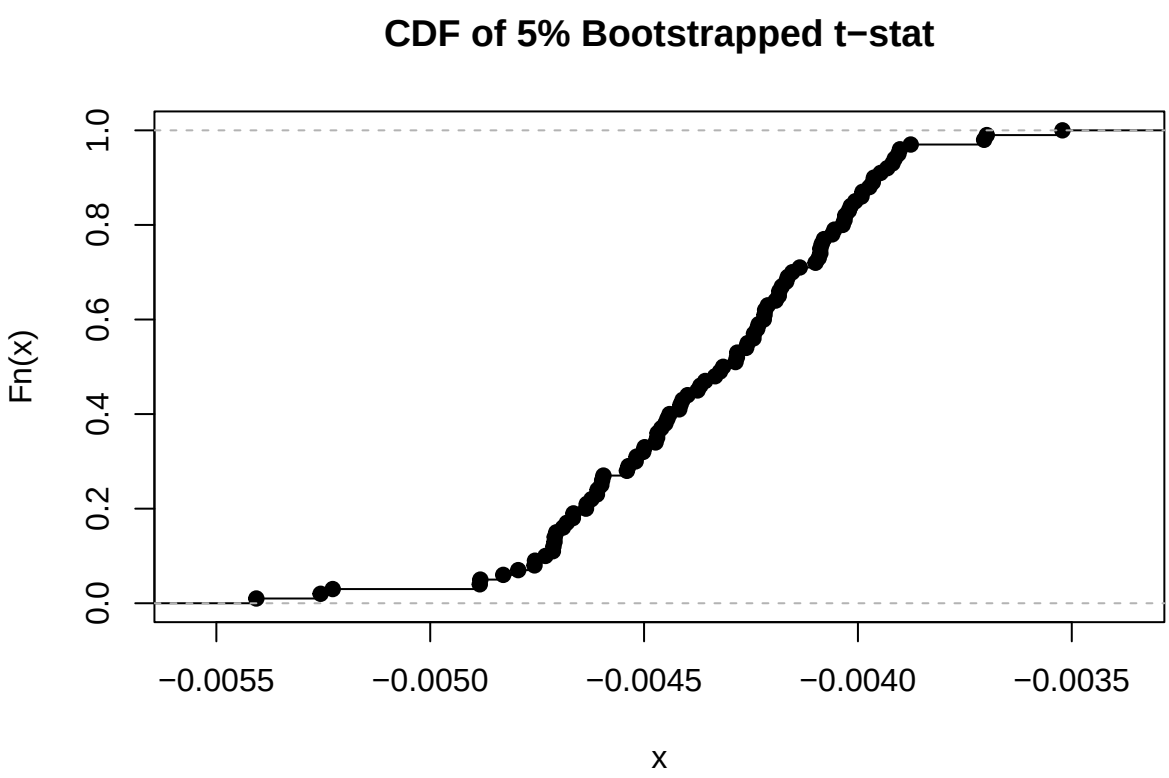

CDF of 95% Bootstrapped t−stat
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
0.0035
0.0040
0.0045
0.0050
0.0055
x

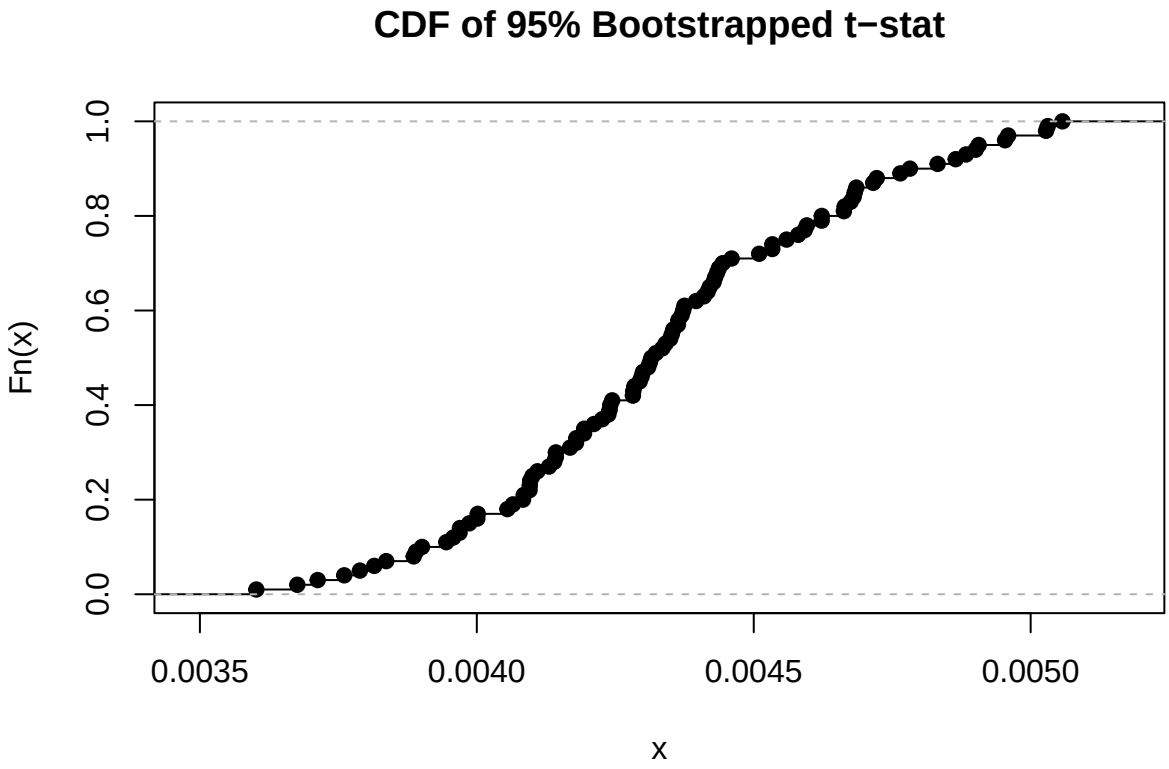

Bootstrapped/Actual T Stat CDFs, alpha_0 = 0.01, lambda = 0.25
Bootstrap
Actual
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
−4
−2
0
2
4
x

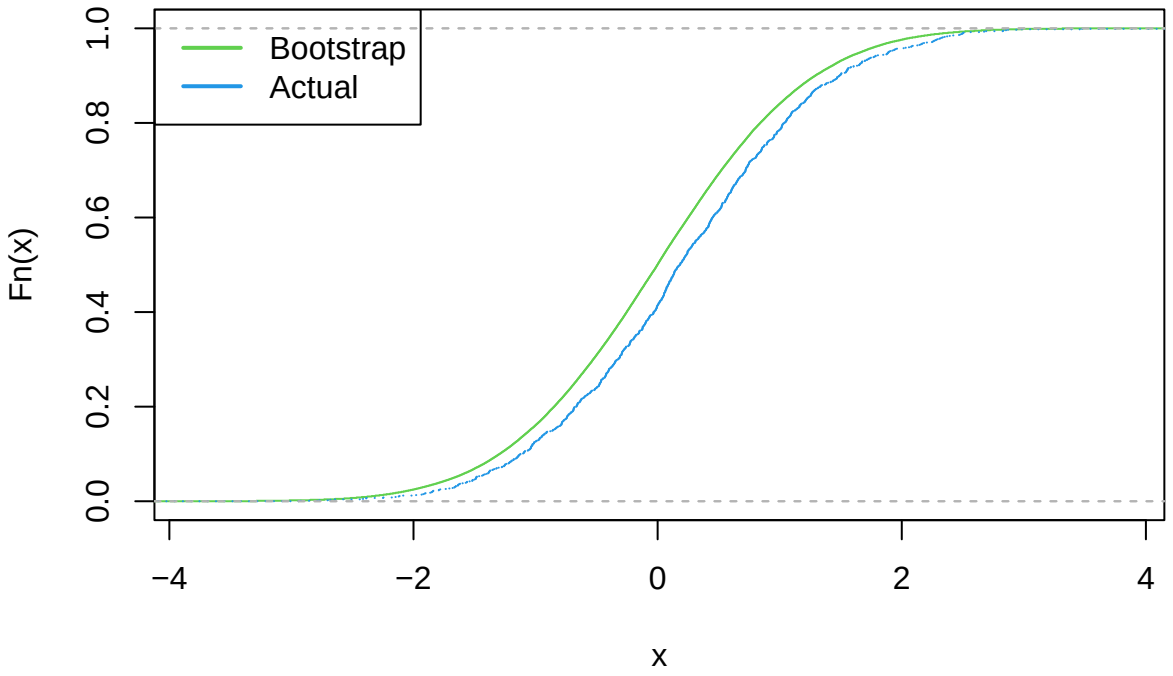

CDF of 5% Bootstrapped t−stat
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
−0.0050
−0.0045
−0.0040
x

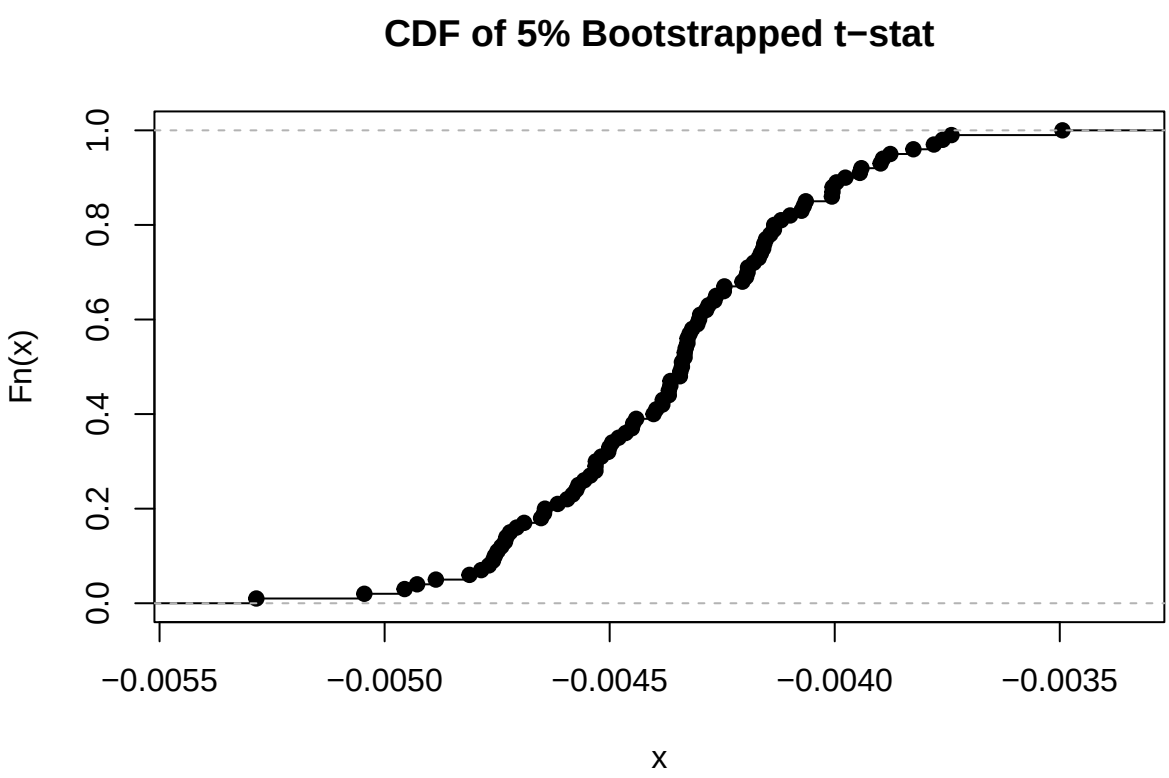

CDF of 95% Bootstrapped t−stat
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
0.0035
0.0040
0.0045
0.0050
0.0055
x

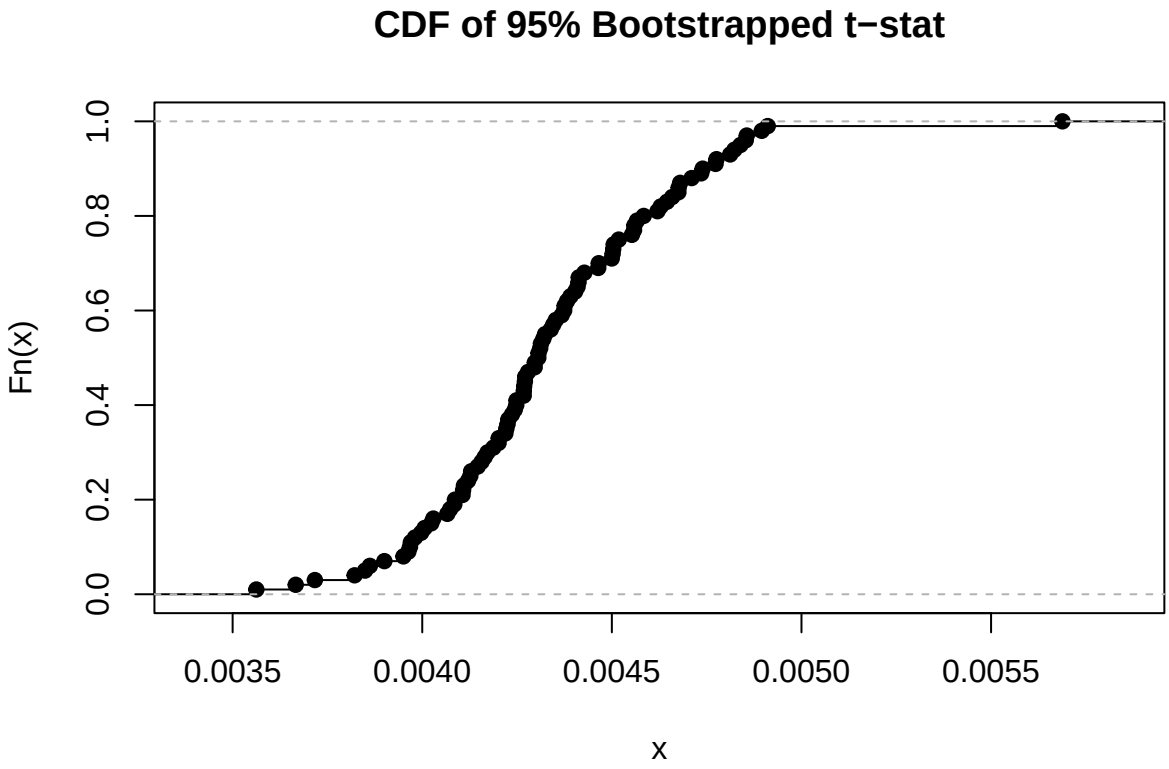

Bootstrapped/Actual T Stat CDFs, alpha_0 = 0.01, lambda = 0.5
Bootstrap
Actual
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
−4
−2
0
2
4
x

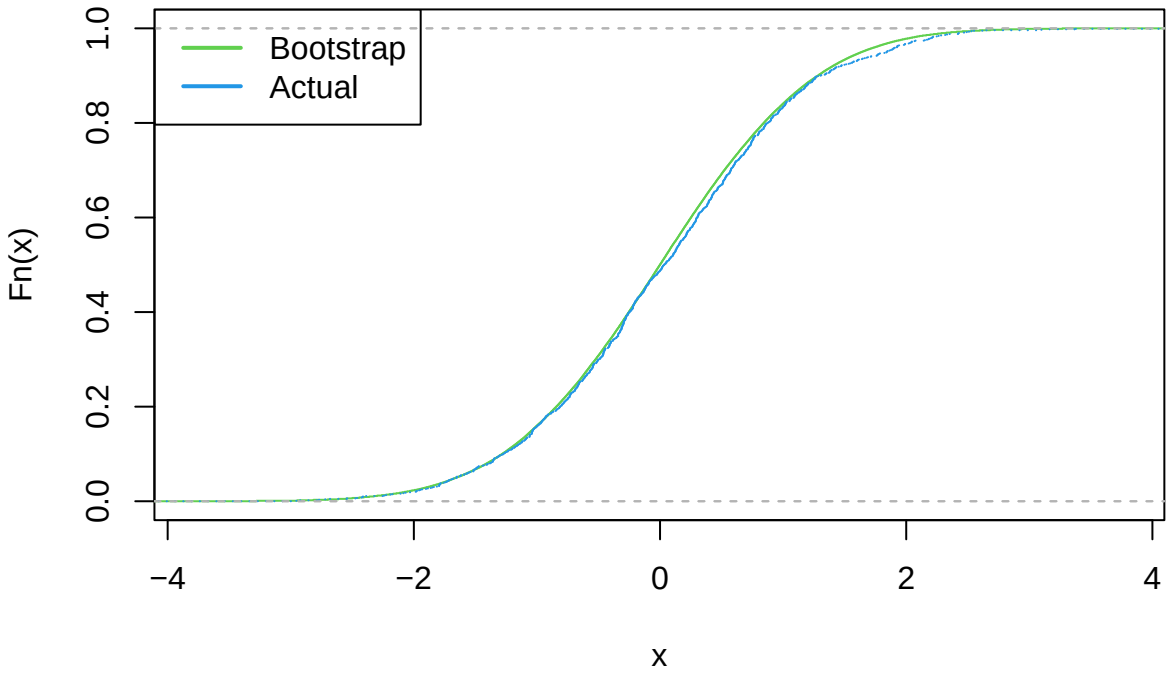

CDF of 5% Bootstrapped t−stat
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
−0.0055
−0.0050
−0.0045
−0.0040
−0.0035
x

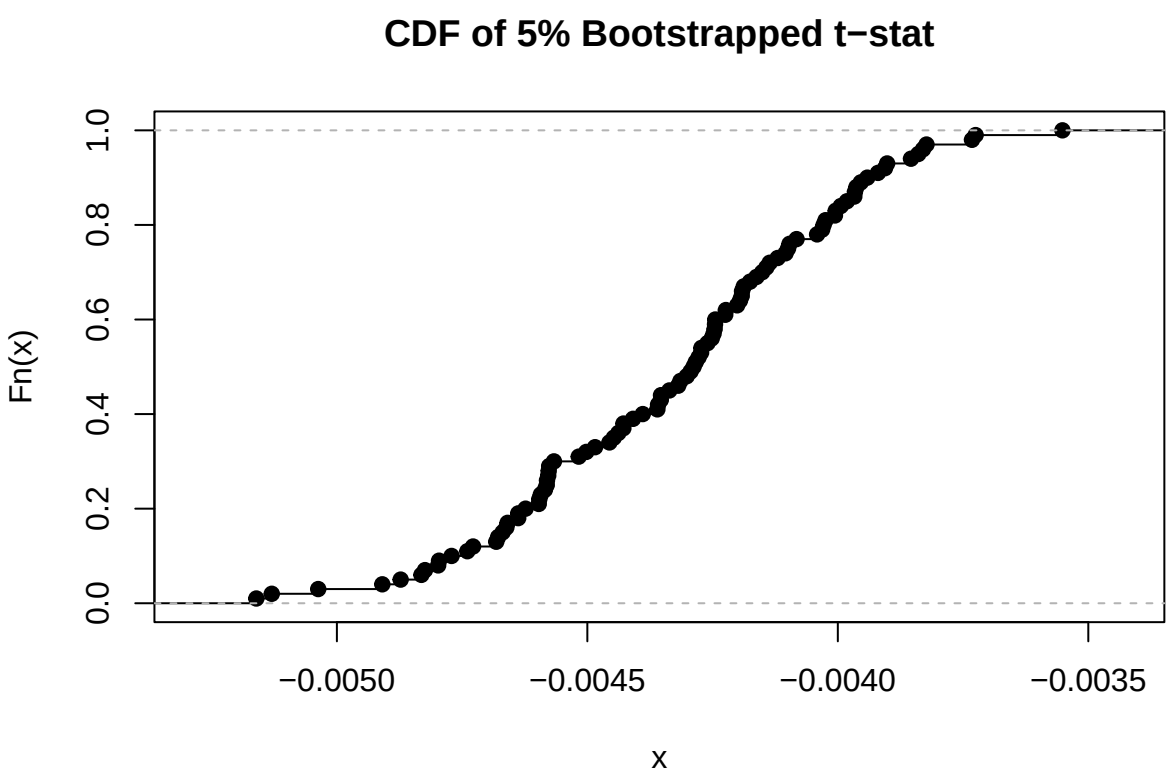

CDF of 95% Bootstrapped t−stat
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
0.0035
0.0040
0.0045
0.0050
x

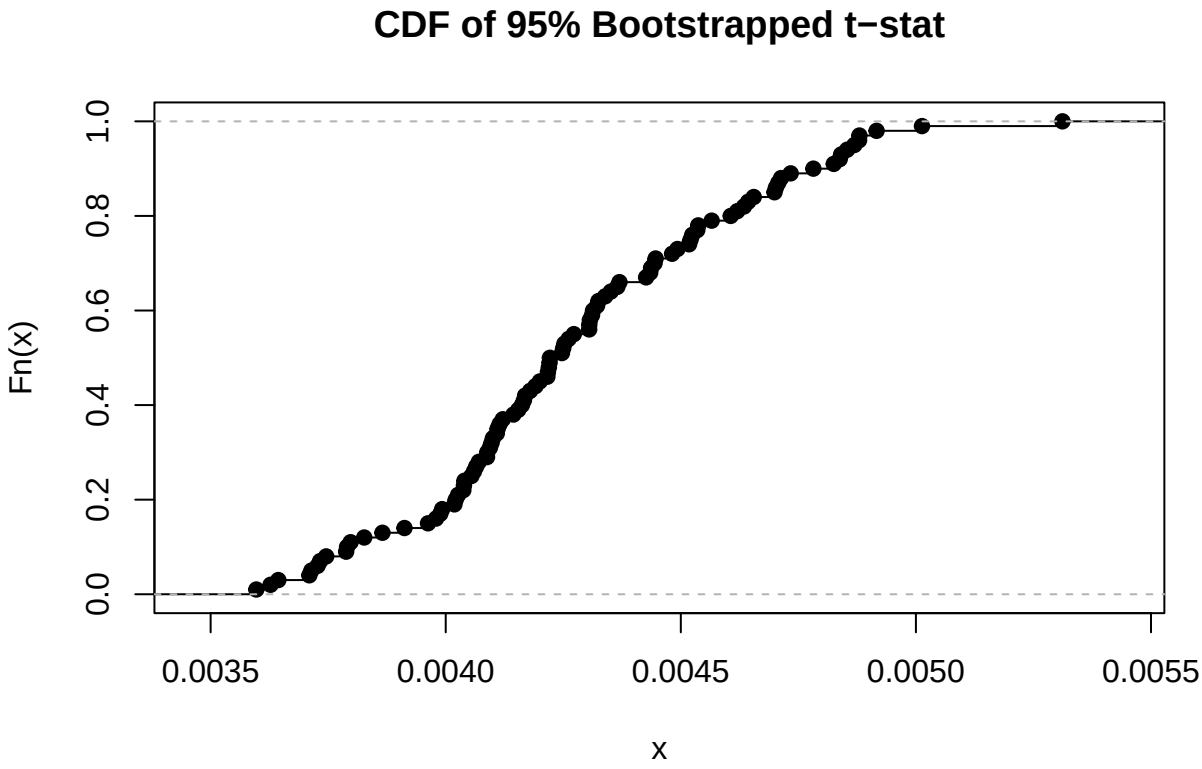

Bootstrapped/Actual T Stat CDFs, alpha_0 = 0.01, lambda = 0.75
Bootstrap
Actual
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
−4
−2
0
2
4
x

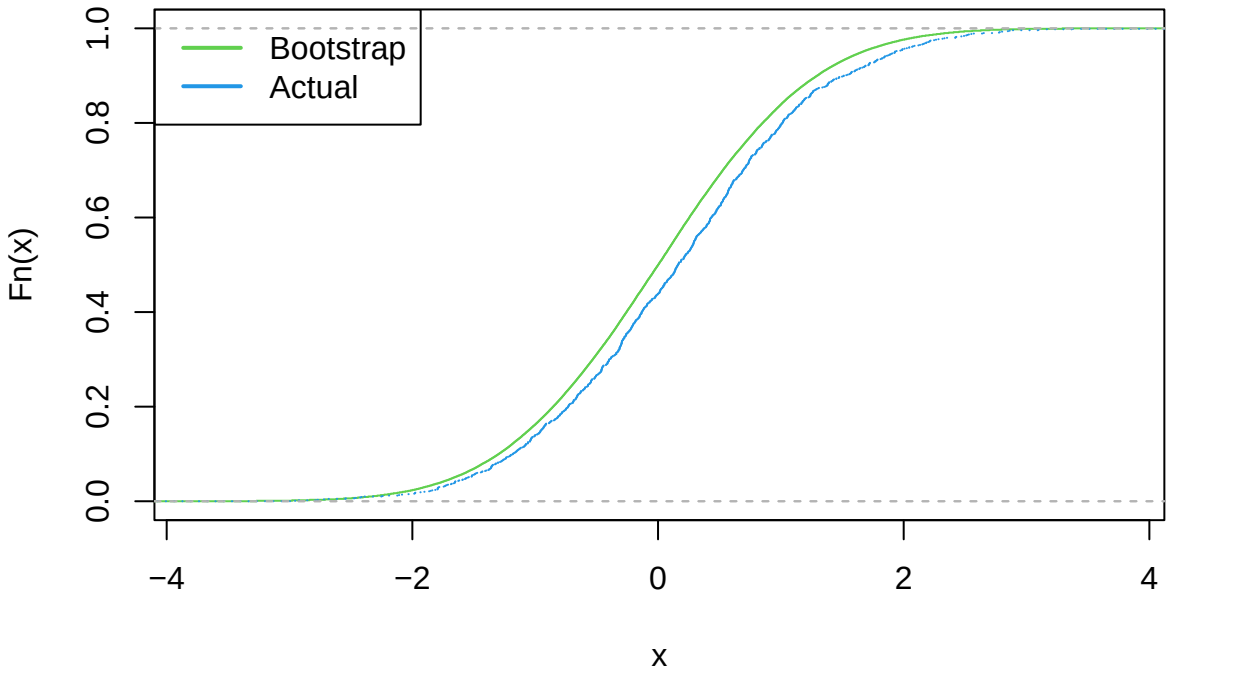

CDF of 5% Bootstrapped t−stat
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
−0.0055
−0.0050
−0.0045
−0.0040
−0.0035
x

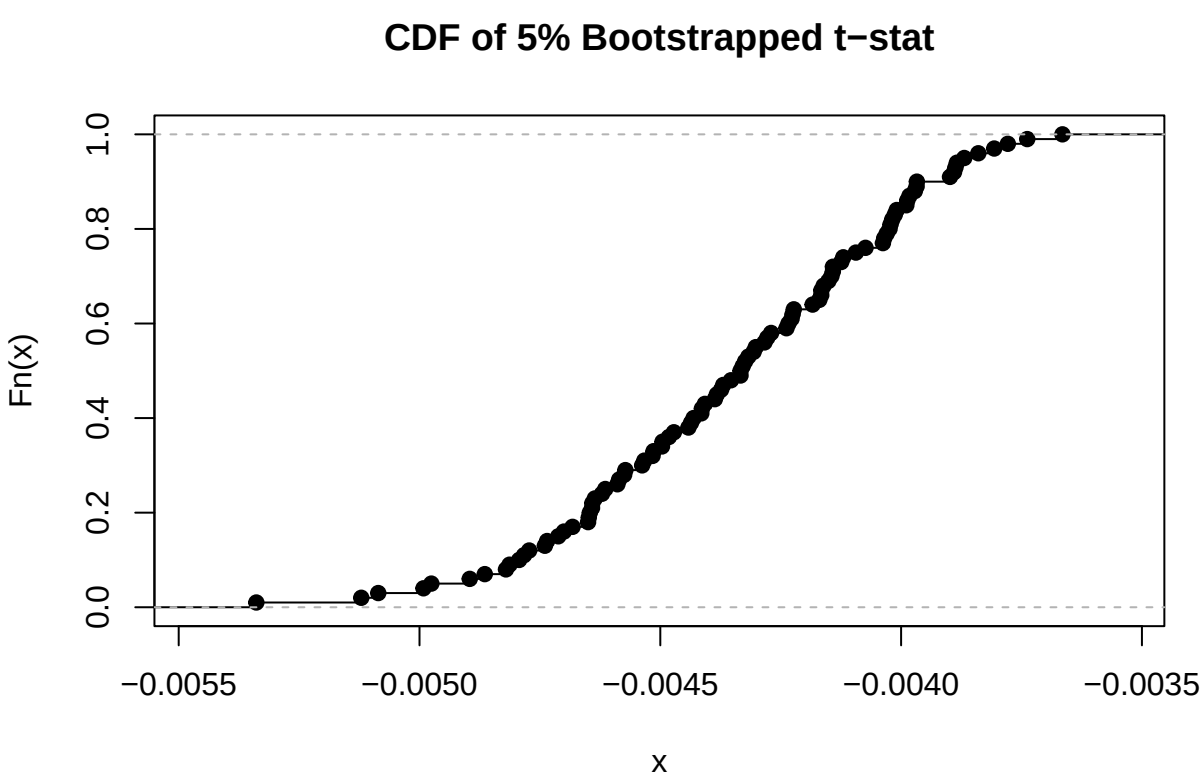

CDF of 95% Bootstrapped t−stat
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
0.0035
0.0040
0.0045
0.0050
0.0055
x

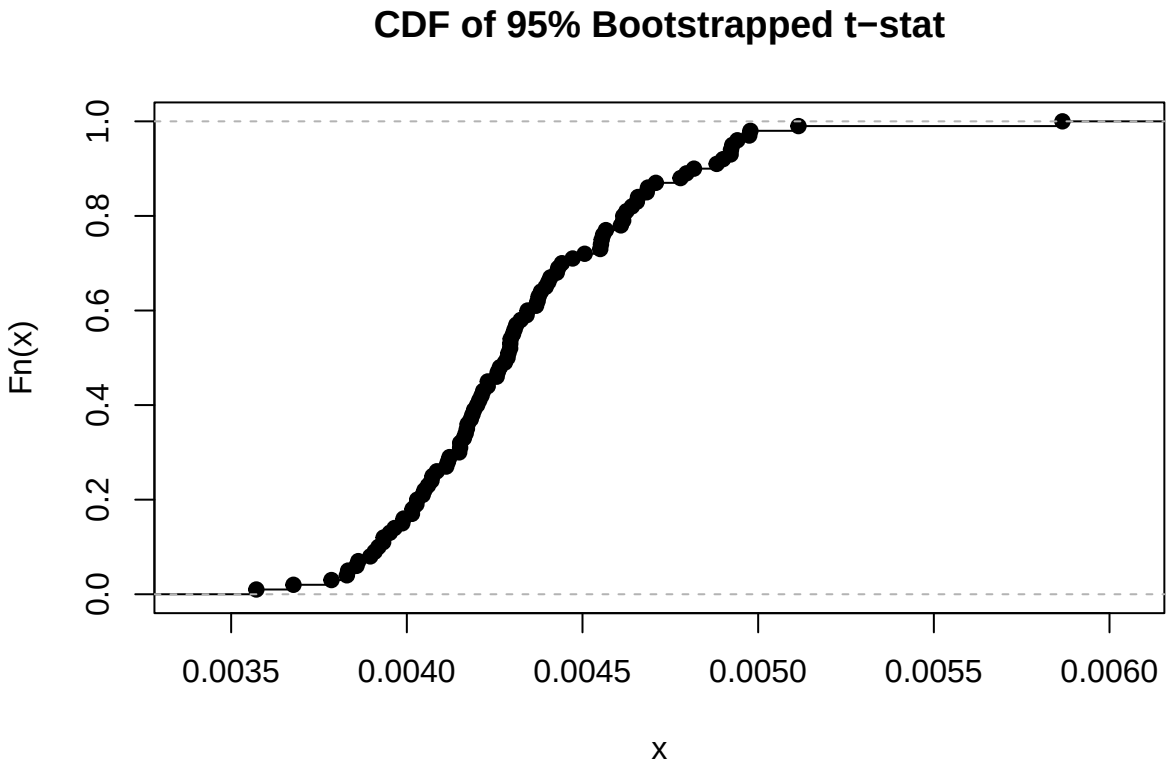

Bootstrapped/Actual T Stat CDFs, alpha_0 = 0.025, lambda = 0.1
Bootstrap
Actual
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
−4
−2
0
2
4
x

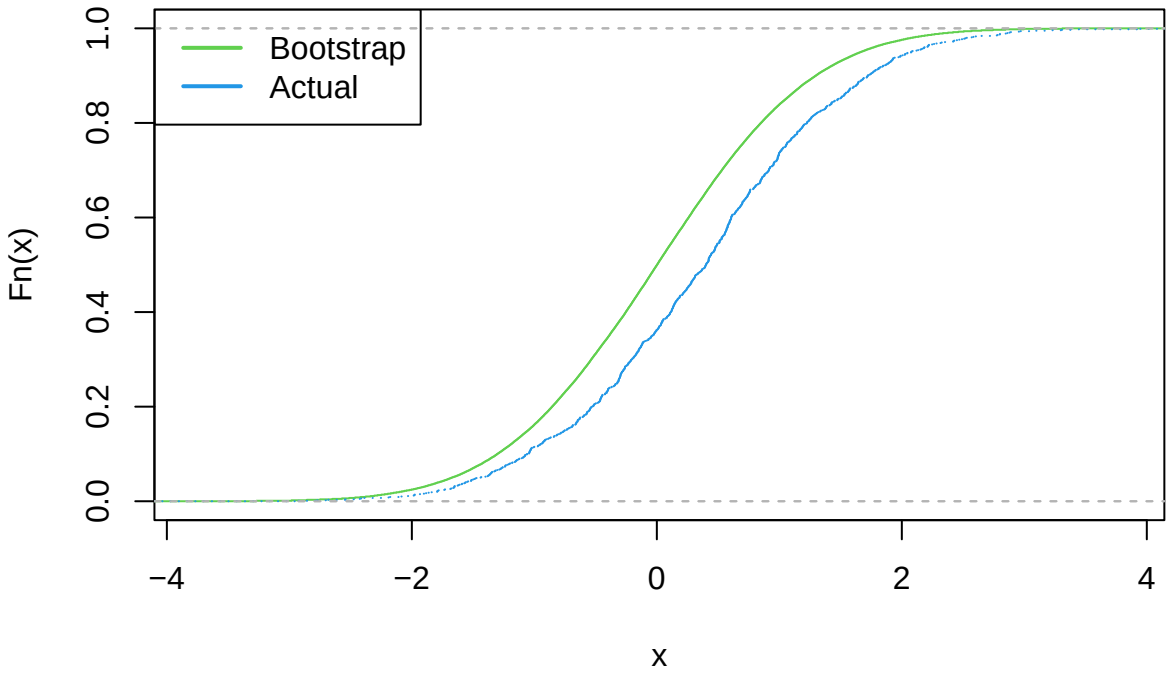

CDF of 5% Bootstrapped t−stat
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
−0.0050
−0.0045
−0.0040
−0.0035
x

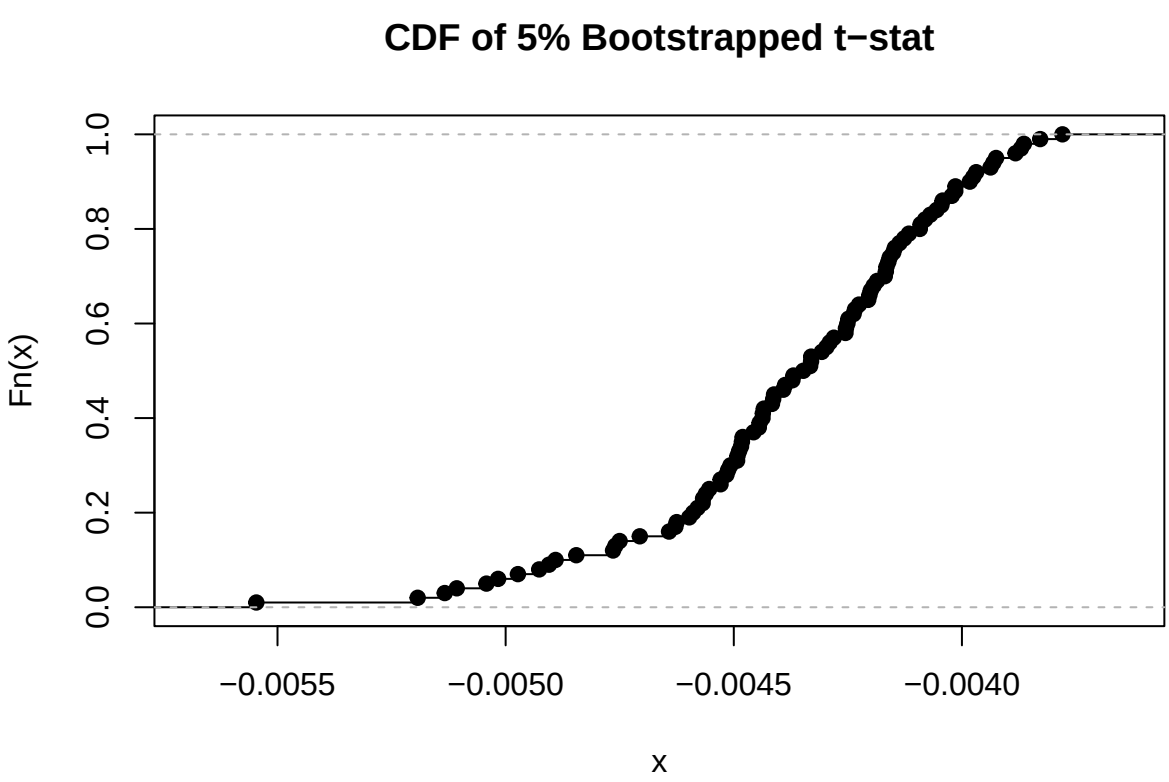

CDF of 95% Bootstrapped t−stat
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
0.0035
0.0040
0.0045
0.0050
0.0055
x

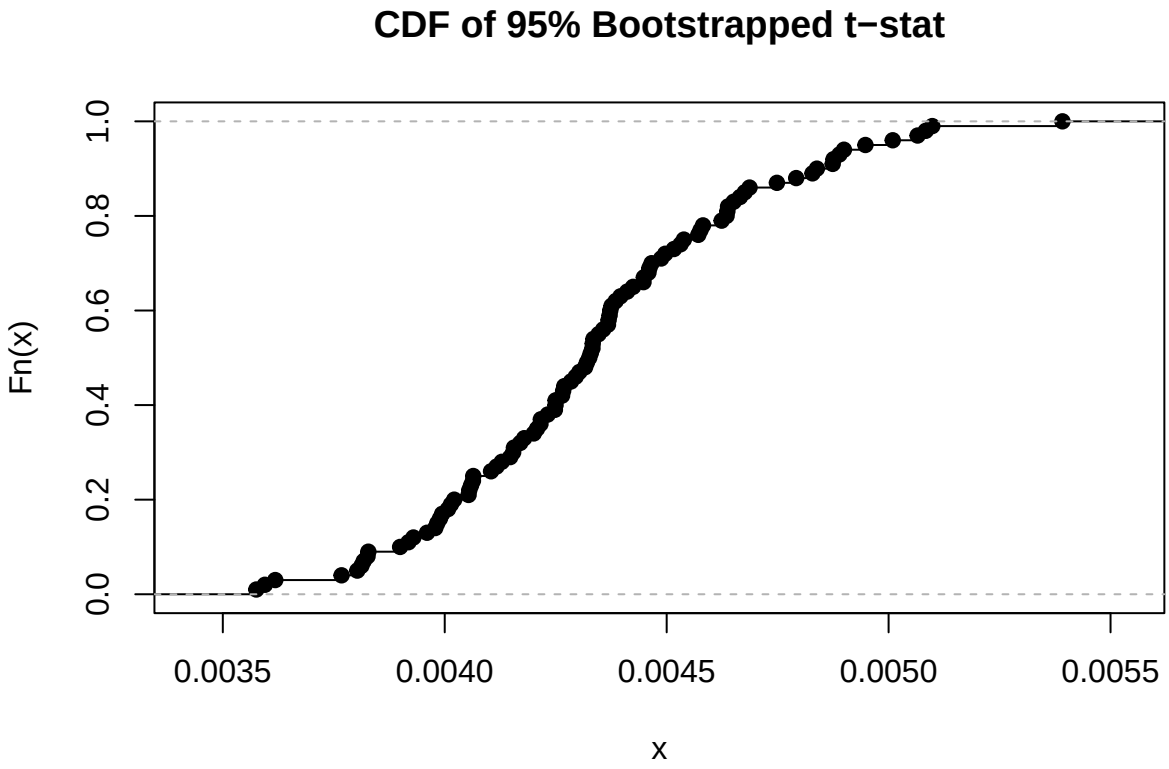

Bootstrapped/Actual T Stat CDFs, alpha_0 = 0.025, lambda = 0.25
Bootstrap
Actual
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
−4
−2
0
2
4
x

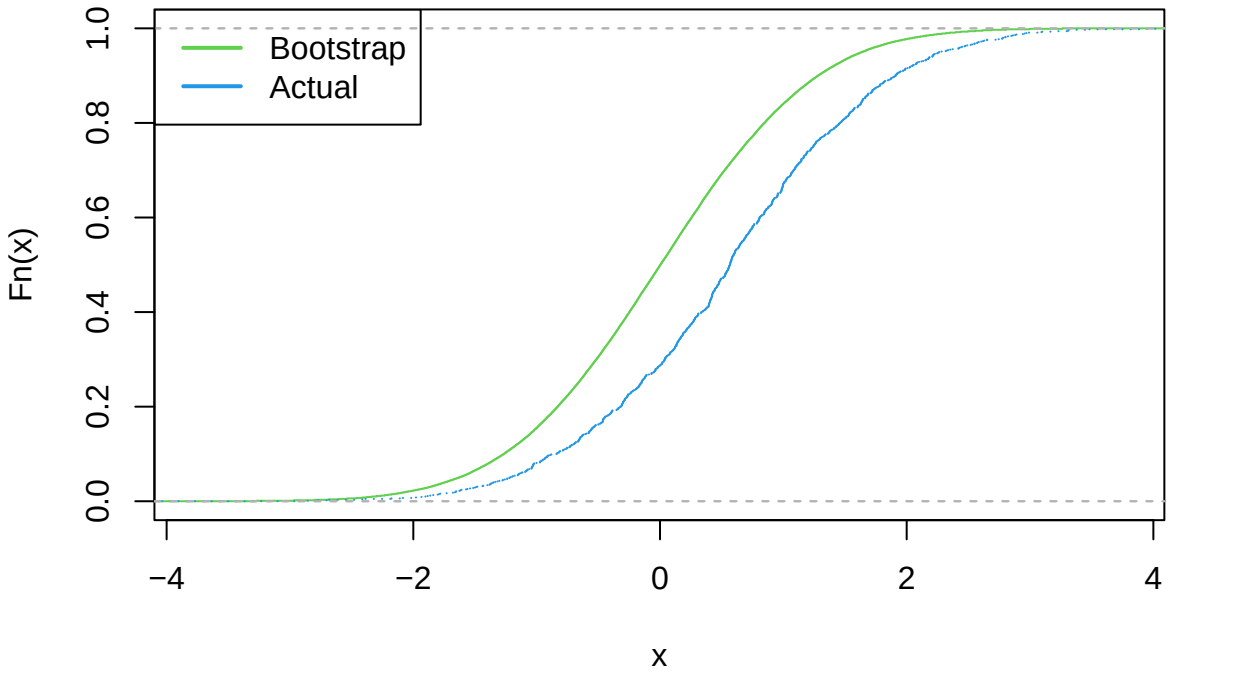

CDF of 5% Bootstrapped t−stat
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
−0.0055
−0.0050
−0.0045
−0.0040
−0.0035
x

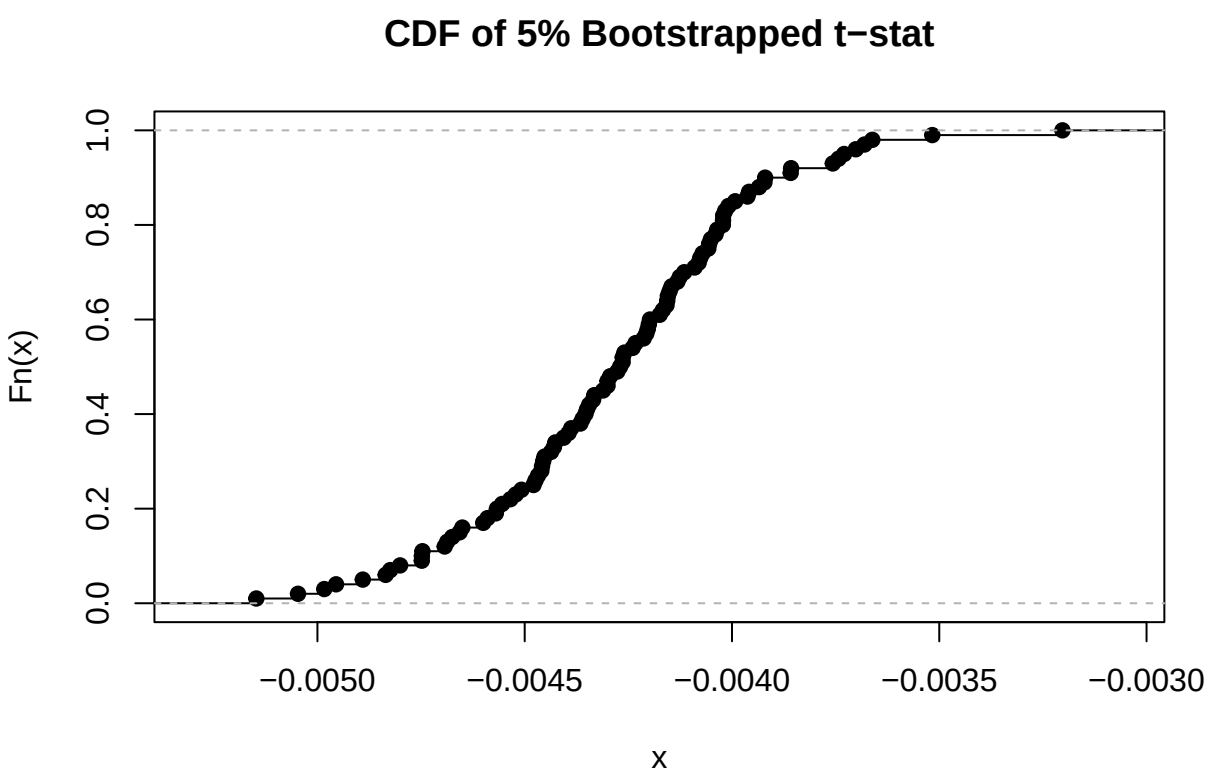

CDF of 95% Bootstrapped t−stat
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
0.0035
0.0040
0.0045
0.0050
0.0055
0.0060
x

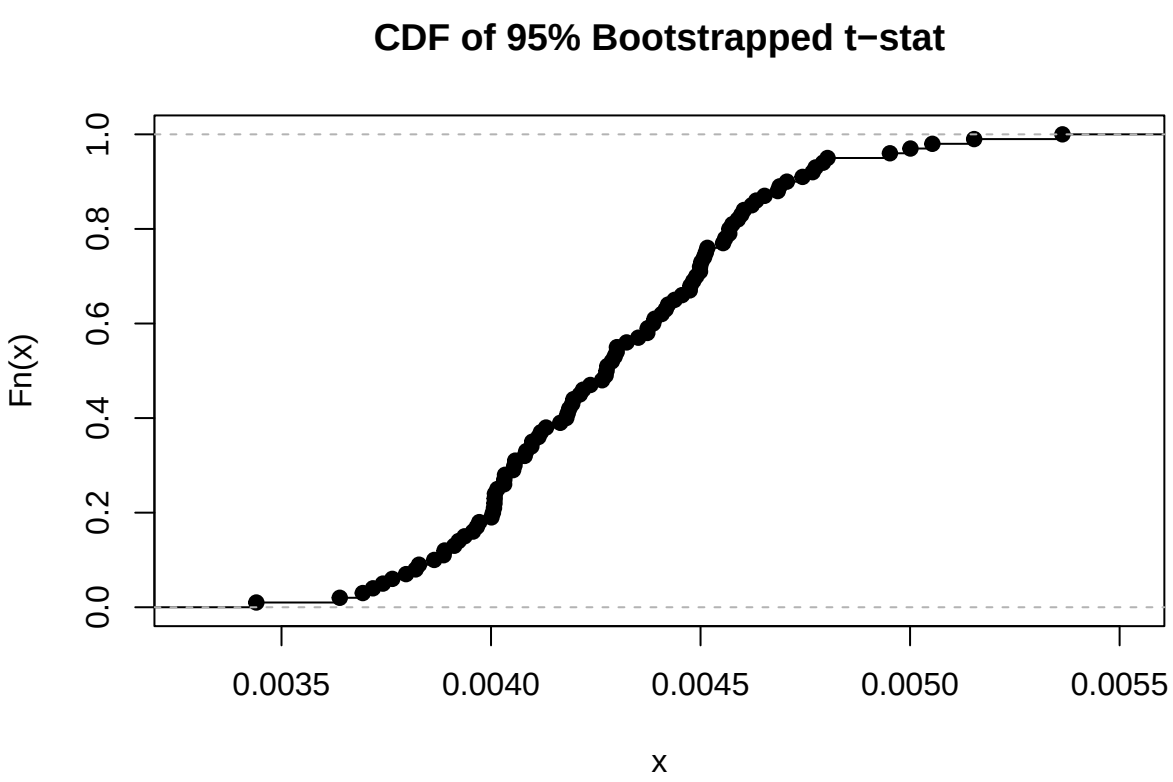

Bootstrapped/Actual T Stat CDFs, alpha_0 = 0.025, lambda = 0.5
Bootstrap
Actual
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
−4
−2
0
2
4
x

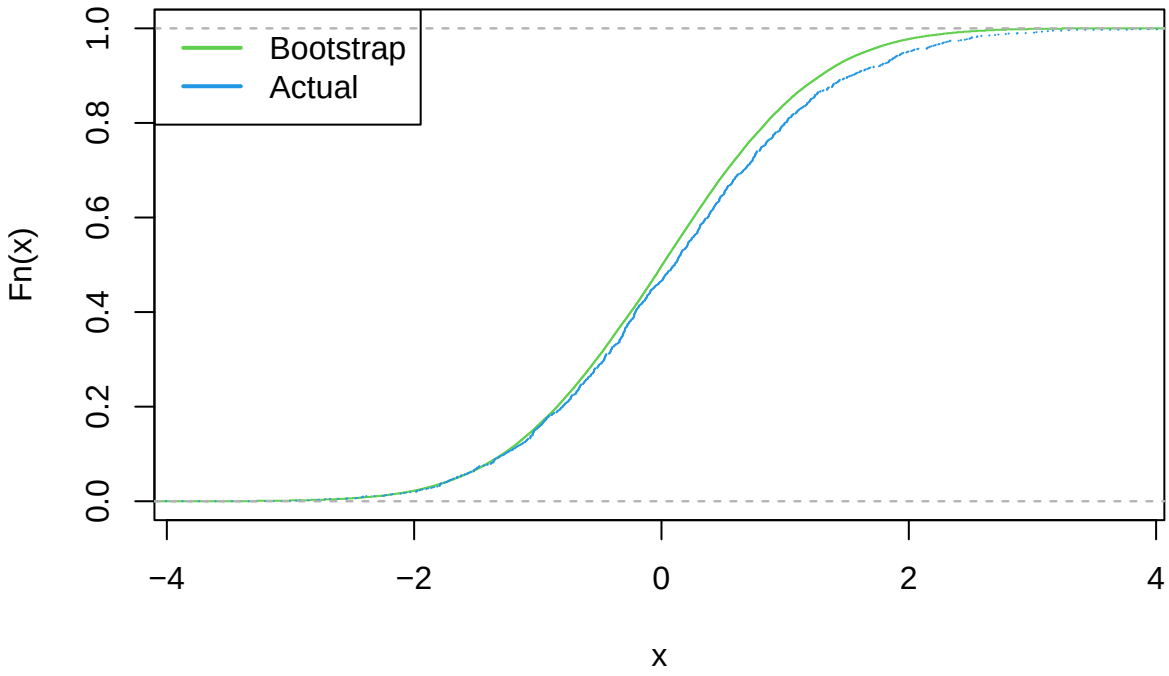

CDF of 5% Bootstrapped t−stat
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
−0.0055
−0.0050
−0.0045
−0.0040
x

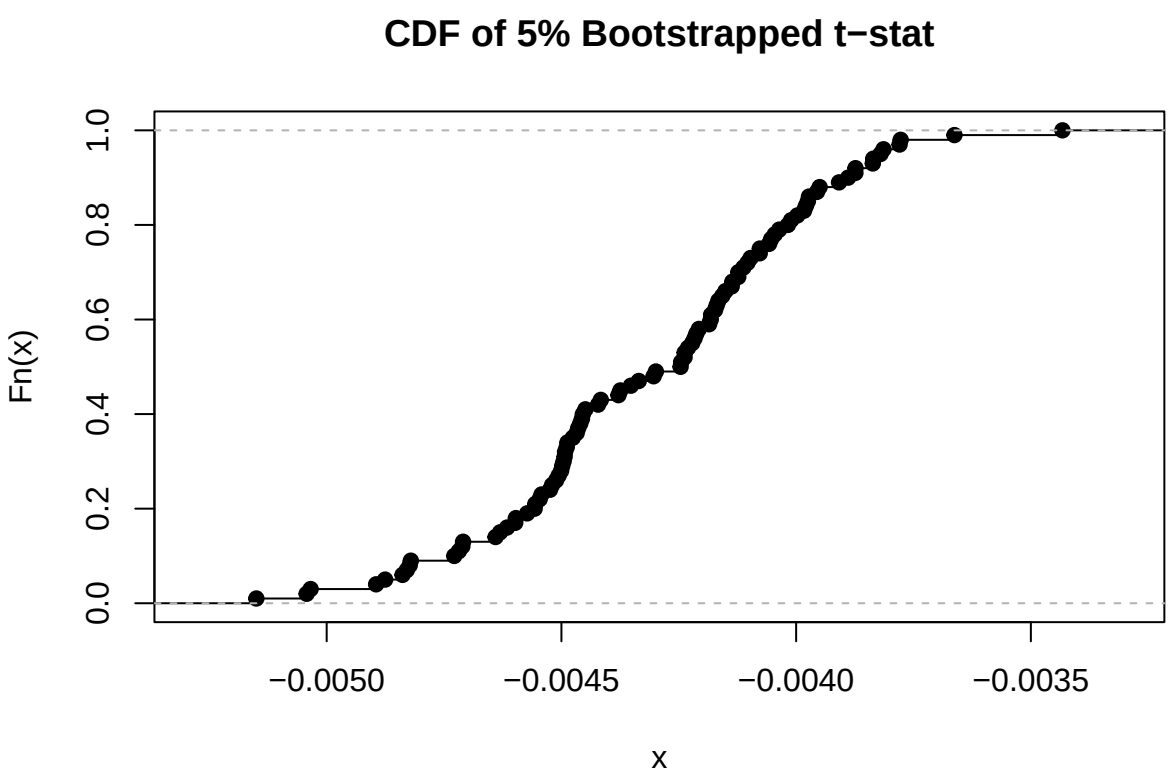

CDF of 95% Bootstrapped t−stat
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
0.0035
0.0040
0.0045
0.0050
0.0055
x

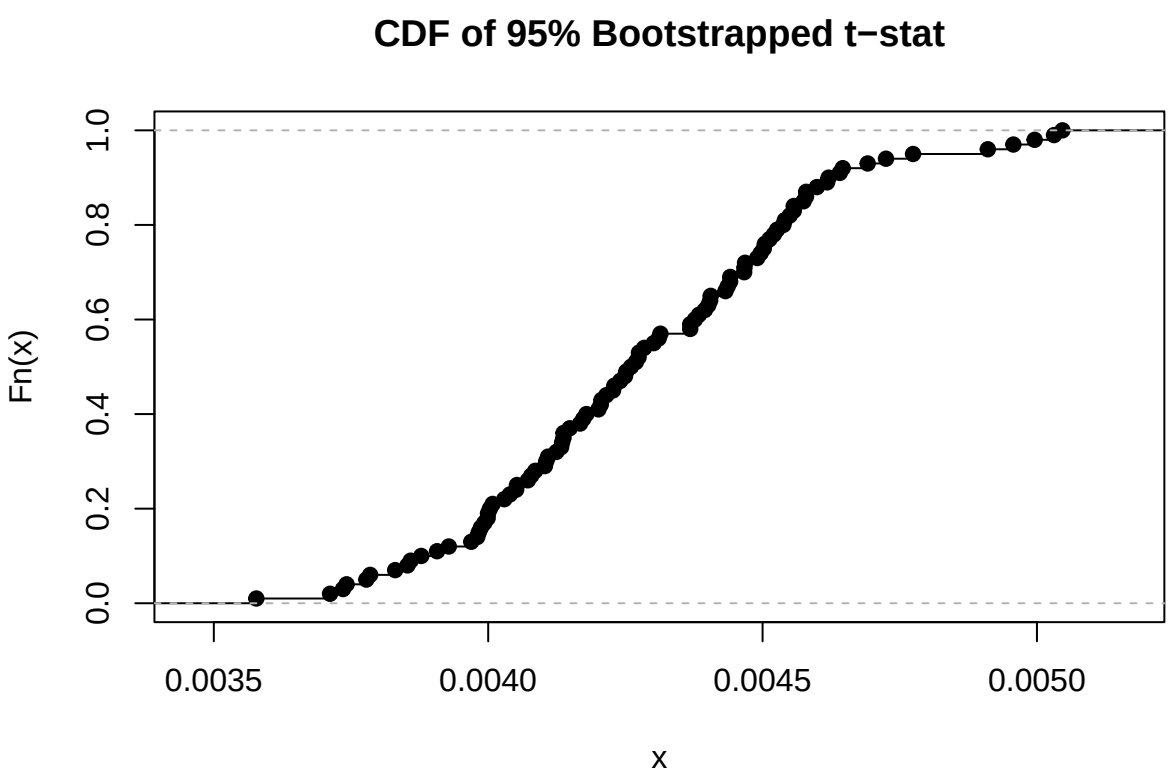

Bootstrapped/Actual T Stat CDFs, alpha_0 = 0.025, lambda = 0.75
Bootstrap
Actual
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
−4
−2
0
2
4
x

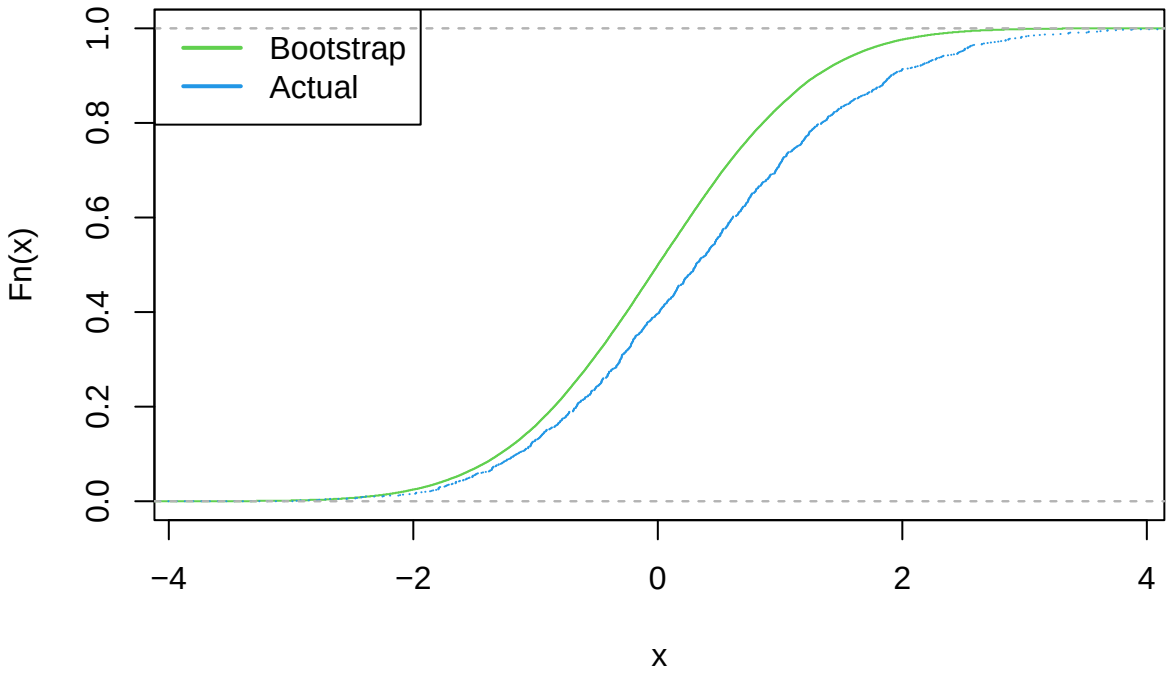

CDF of 5% Bootstrapped t−stat
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
−0.0050
−0.0045
−0.0040
−0.0035
−0.0030
x

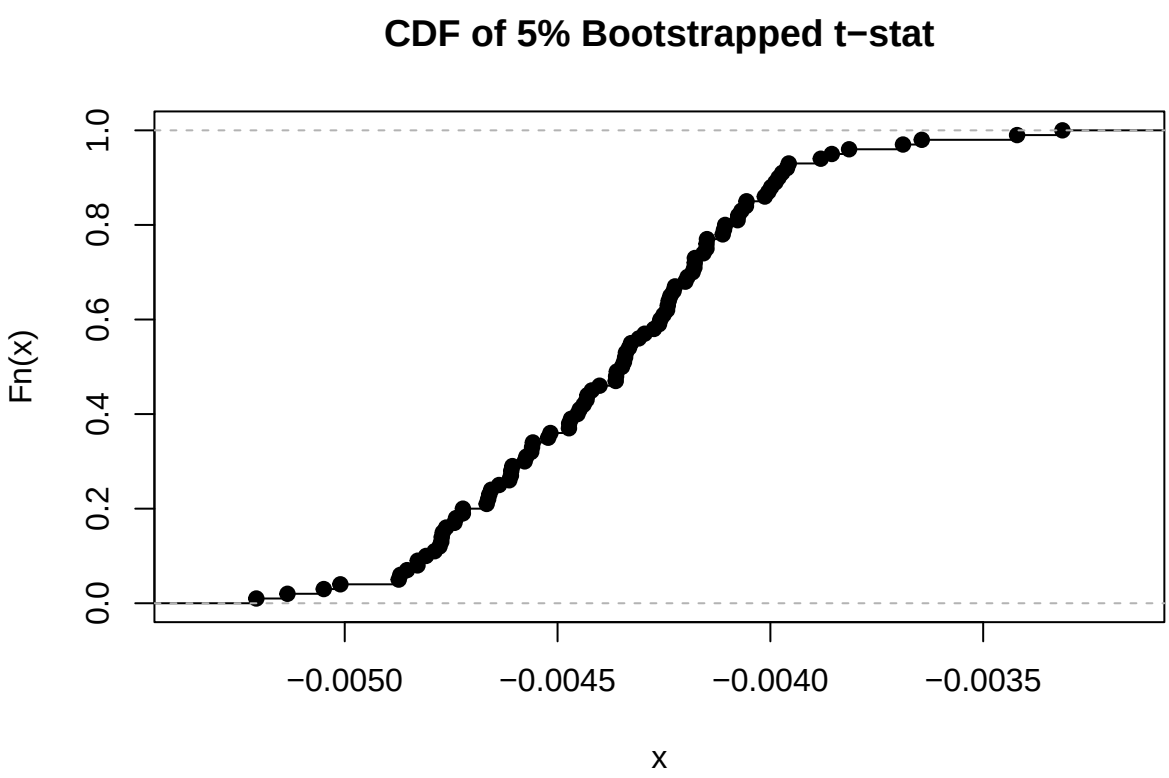

CDF of 95% Bootstrapped t−stat
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
0.0035
0.0040
0.0045
0.0050
0.0055
x

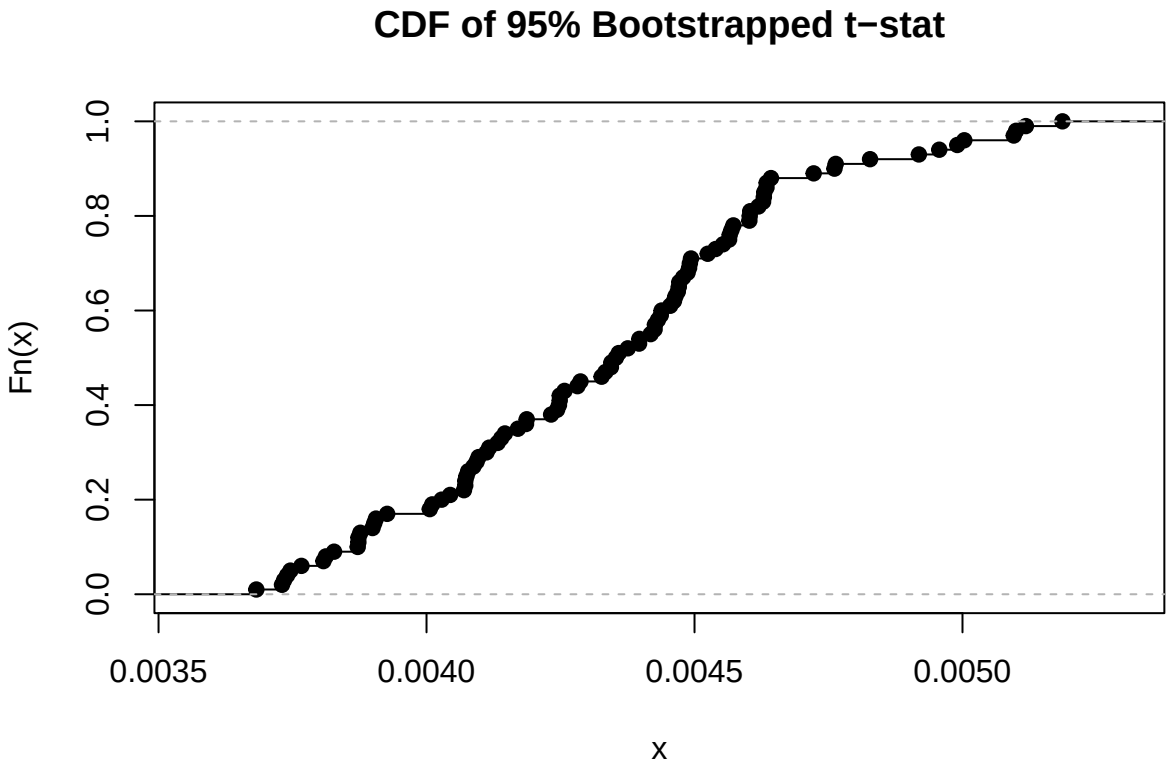

Bootstrapped/Actual T Stat CDFs, alpha_0 = 0.05, lambda = 0.1
Bootstrap
Actual
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
−4
−2
0
2
4
x

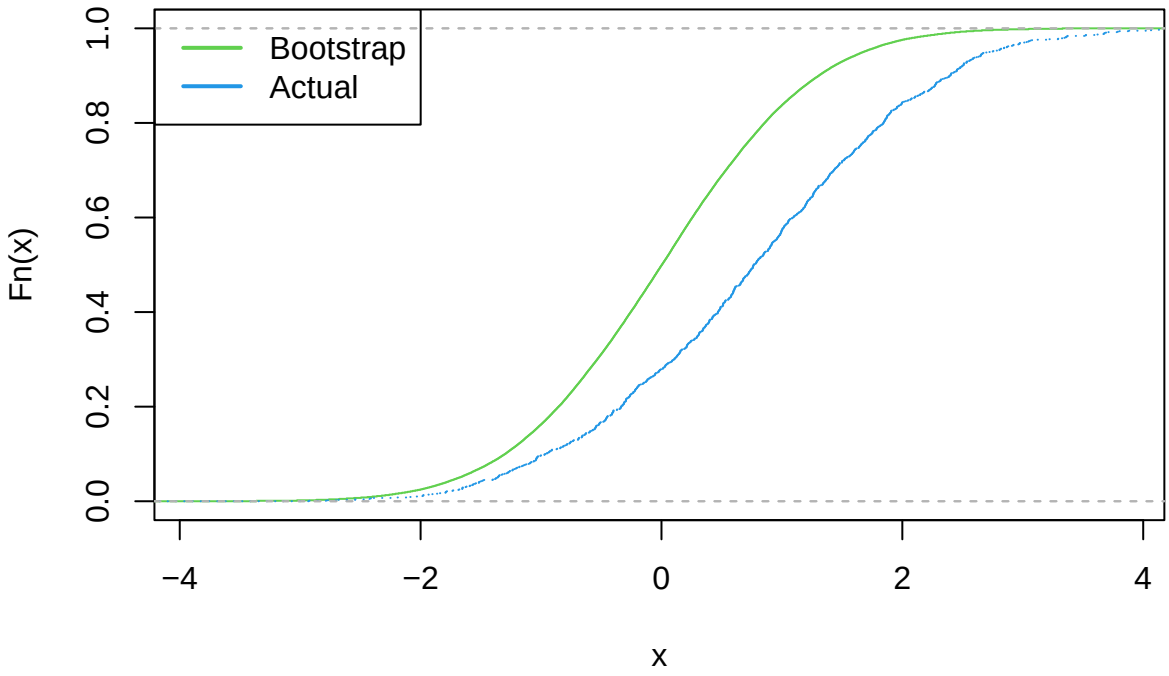

CDF of 5% Bootstrapped t−stat
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
−0.0050
−0.0045
−0.0040
−0.0035
x

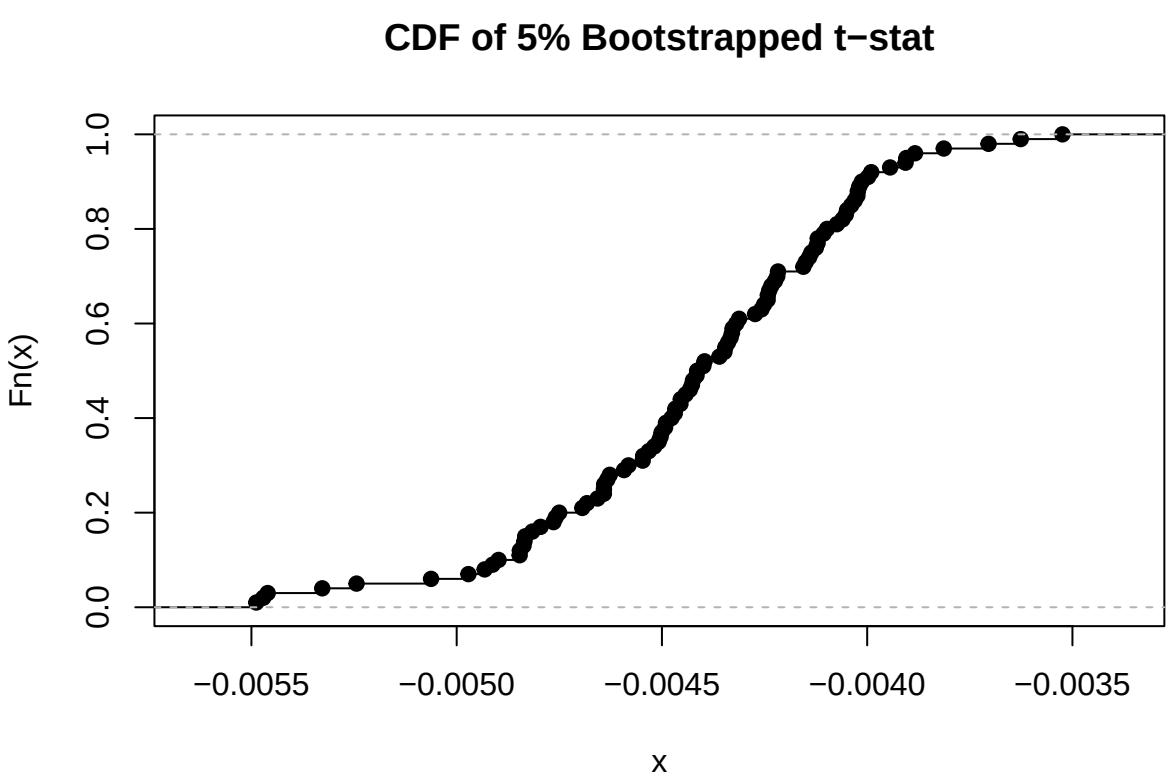

CDF of 95% Bootstrapped t−stat
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
0.0035
0.0040
0.0045
0.0050
x

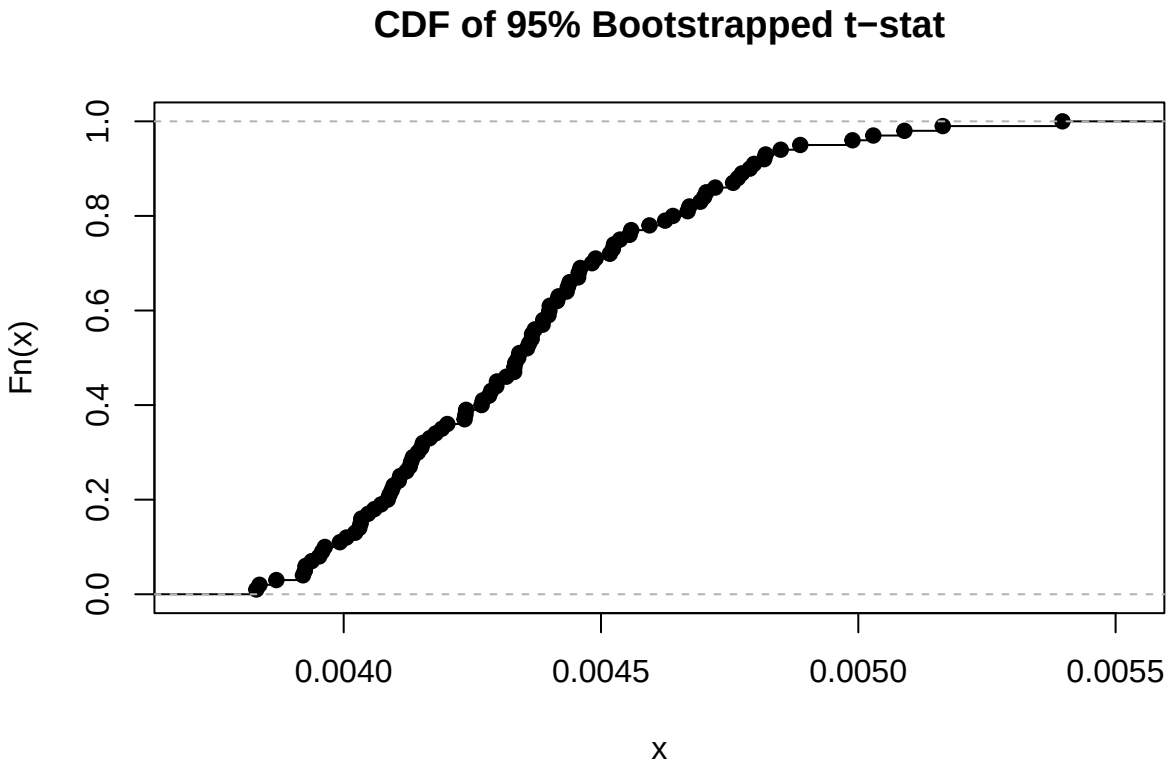

Bootstrapped/Actual T Stat CDFs, alpha_0 = 0.05, lambda = 0.25
Bootstrap
Actual
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
−4
−2
0
2
4
x

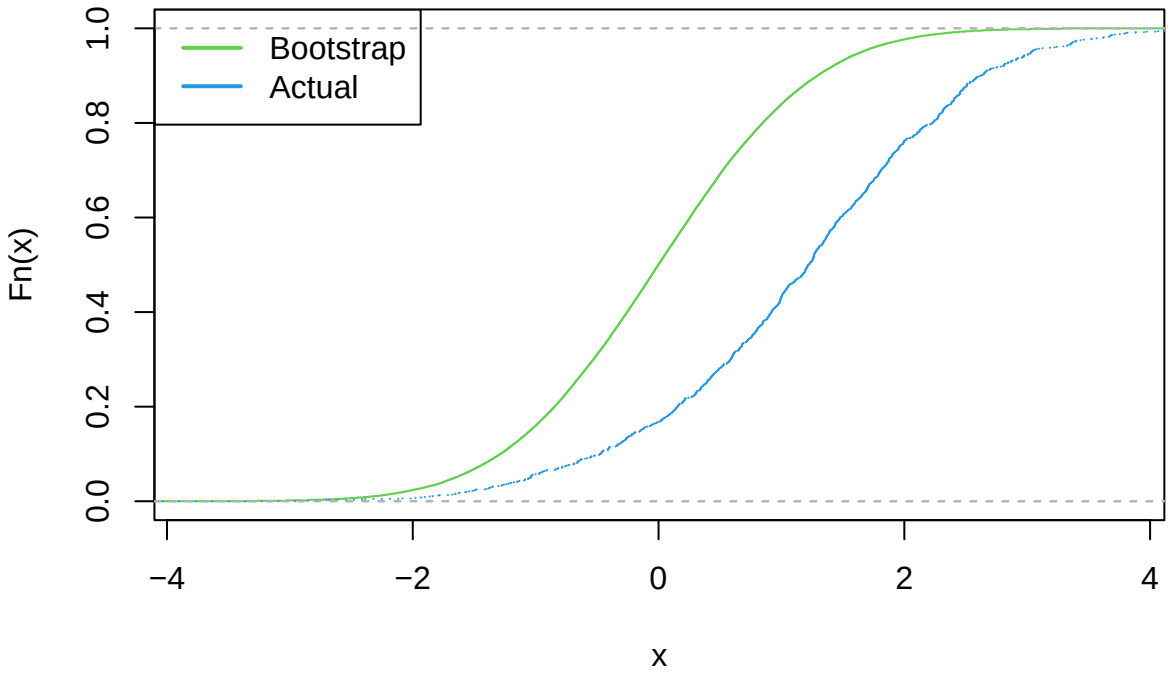

CDF of 5% Bootstrapped t−stat
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
−0.0050
−0.0045
−0.0040
−0.0035
x

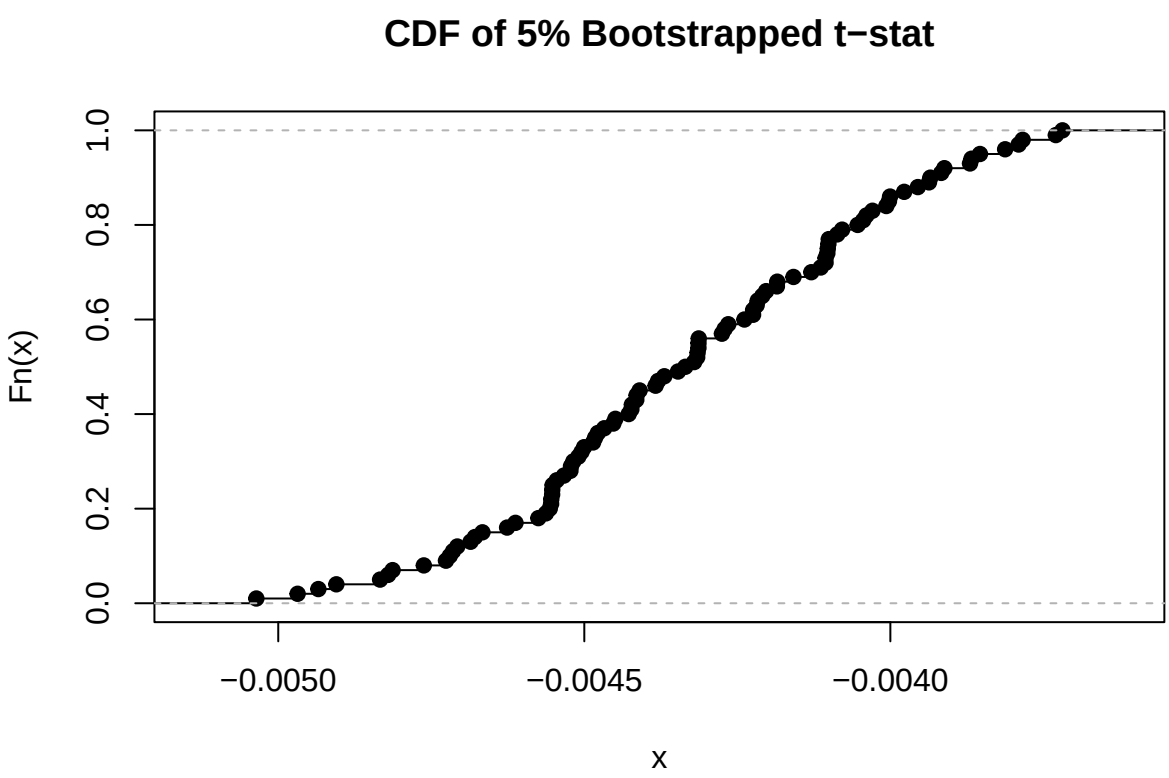

CDF of 95% Bootstrapped t−stat
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
0.0035
0.0040
0.0045
0.0050
x

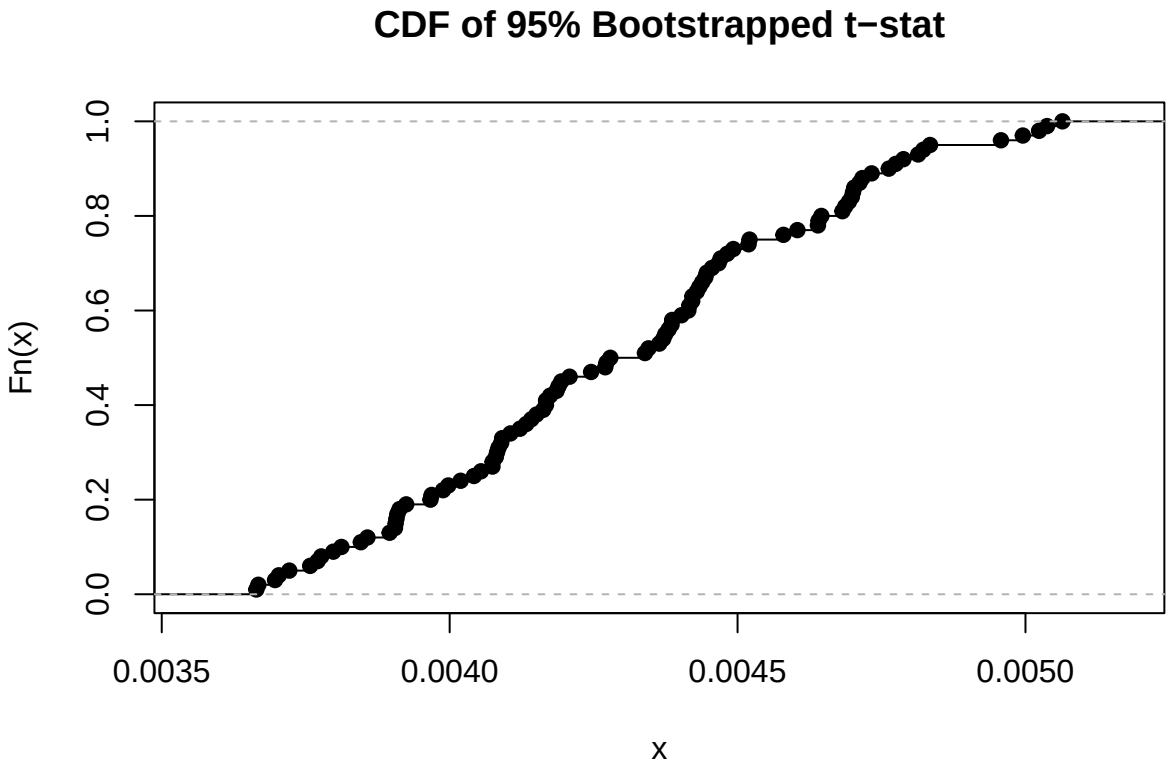

Bootstrapped/Actual T Stat CDFs, alpha_0 = 0.05, lambda = 0.5
Bootstrap
Actual
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
−4
−2
0
2
4
x


CDF of 5% Bootstrapped t−stat
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
−0.0055
−0.0050
−0.0045
−0.0040
−0.0035
x


CDF of 95% Bootstrapped t−stat
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
0.0040
0.0045
0.0050
0.0055
x


Bootstrapped/Actual T Stat CDFs, alpha_0 = 0.05, lambda = 0.75
Bootstrap
Actual
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
−4
−2
0
2
4
x


CDF of 5% Bootstrapped t−stat
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
−0.0050
−0.0045
−0.0040
x


CDF of 95% Bootstrapped t−stat
Fn(x)
0.0
0.2
0.4
0.6
0.8
1.0
0.0035
0.0040
0.0045
0.0050
x