Econometric Methods Homework 6

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Problem 1

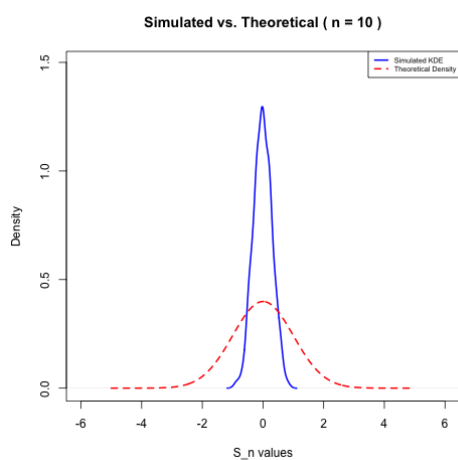## n = 10

Figure 1: N(0, 1) : $\bar{Y}$
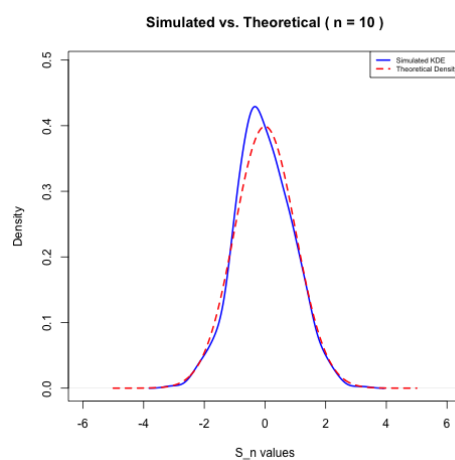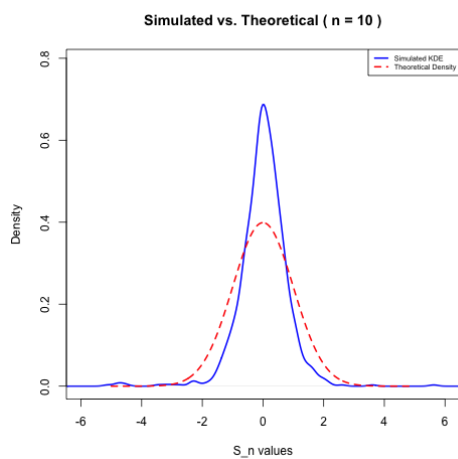

Figure 2: N(0, 1) : $sqrt(n) * \bar{Y}$
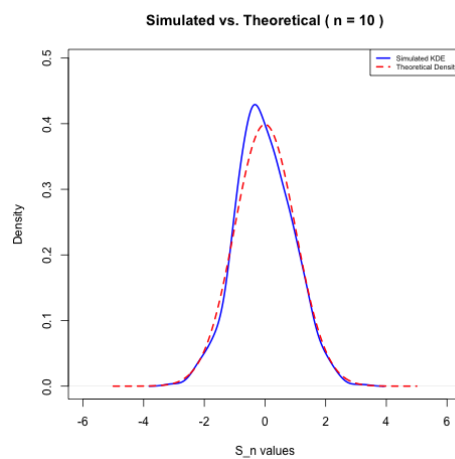

Figure 3: t(2) : $\bar{Y}$

Figure 4: t(2) : $sqrt(n) * \bar{Y}$
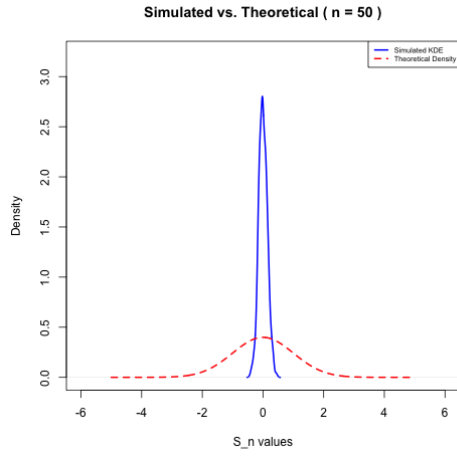
Figure 5: Summary of results: n = 10
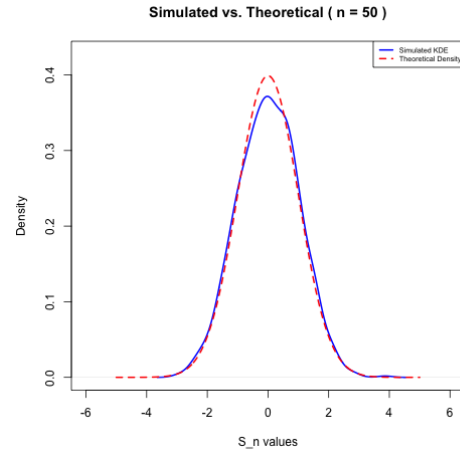
n = 50

Figure 6: N(0, 1) : $\bar{Y}$
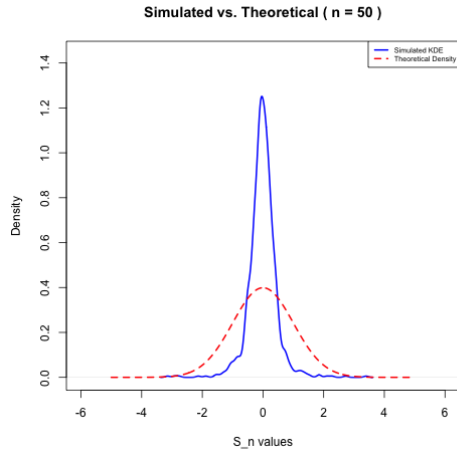

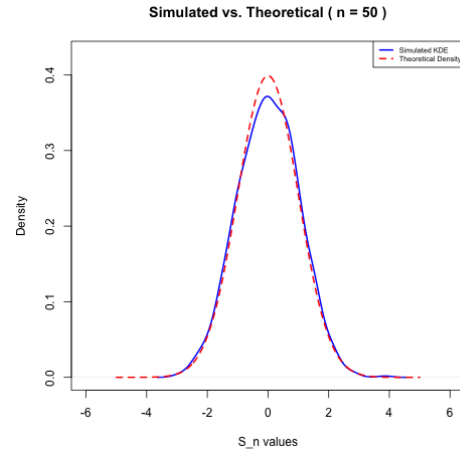Figure 7: N(0, 1) : $sqrt(n) * \bar{Y}$

Figure 8: t(2) : $\bar{Y}$

Figure 9: t(2) : $sqrt(n) * \bar{Y}$

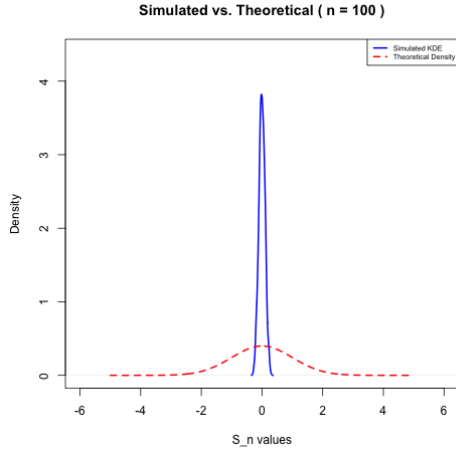Figure 10: Summary of results: n = 50
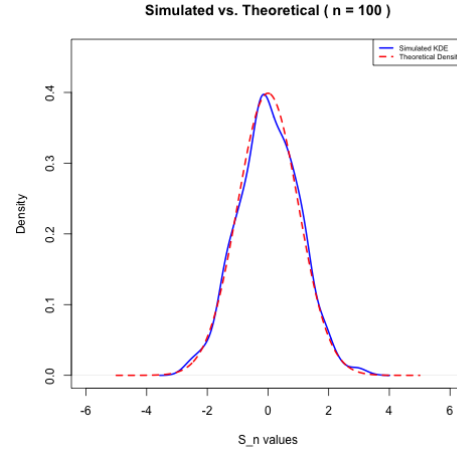
n = 100

Figure 11: N(0, 1) : $\bar{Y}$

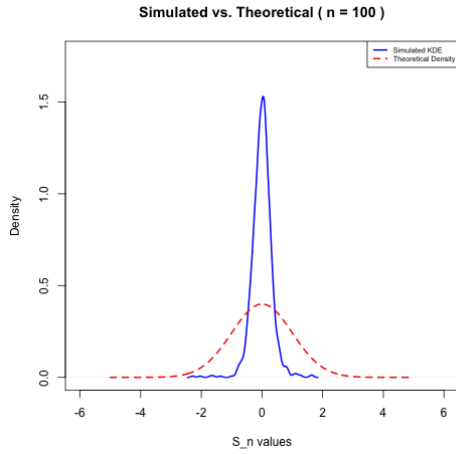Figure 12: N(0, 1) : $sqrt(n) * \bar{Y}$

Figure 13: t(2) : $\bar{Y}$
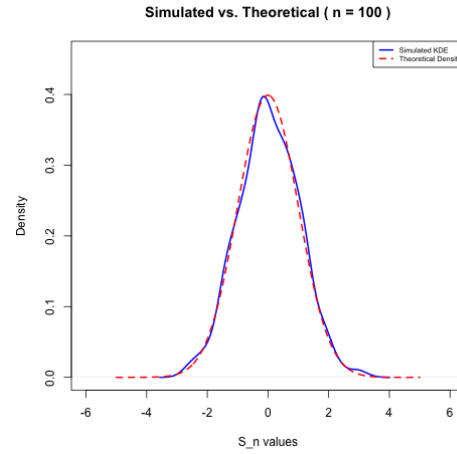
Figure 14: t(2) : $sqrt(n) * \bar{Y}$

Figure 15: Summary of results: n = 100

Discussion

According to the above graphs, it can be observed that: Compared with t(2), Normal distribution is less likely to the simulated outcome. In both density distribution, the scaled one has well performance.

For Normal distribution, as n become larger and without scaling, the difference between simulated outcome and the density function becomes larger.

for T(2) distribution, when n changes from 10 to 50, it can be observed that the difference between simulated outcome and the density function becomes larger. However, when n changes from 50 to 100, the difference is hard to be observed.

Problem 2

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```
> test
            p_value GreaterThanAlpha
UpdatedX1  0.0005490618            FALSE
UpdatedX2  0.2084322820             TRUE
UpdatedX3  0.5553804406             TRUE
UpdatedX4  0.7965392642             TRUE
UpdatedX5  0.1109472182             TRUE
UpdatedX6  0.0051549300            FALSE
UpdatedX7  0.0645120943             TRUE
UpdatedX8  0.0002727608            FALSE
UpdatedX9  0.0881238502             TRUE
UpdatedX10 0.8121751096             TRUE
UpdatedX11 0.3725443638             TRUE
UpdatedX12 0.5788007321             TRUE
```

If p is smaller than α, H_0 can be rejected: $X_1 = X_1$, $X_3 = X_{tbl}$, $X_3 = X_{db}$.

2 - 2

```
> wald

Linear hypothesis test:
UpdatedX1 = 0
UpdatedX2  + UpdatedX3 = 0

Model 1: restricted model
Model 2: Y ~ (UpdatedX - 1)

  Res.Df     RSS Df Sum of Sq      F    Pr(>F)
1    494 0.97081
2    492 0.93777  2  0.033039 8.6671 0.0001999 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Because p is smaller than α, H_0 can be rejected.

GitHub Link

EconometricMethods-homework6-b10901069