

Statistical Methods and Data Analysis I

Lecture 18: Testing For Normality.

Oleg Goldshmidt

`oleg.goldshmidt@post.idc.ac.il`

Arison School of Business
Interdisciplinary Center (IDC)
Herzliya, Israel

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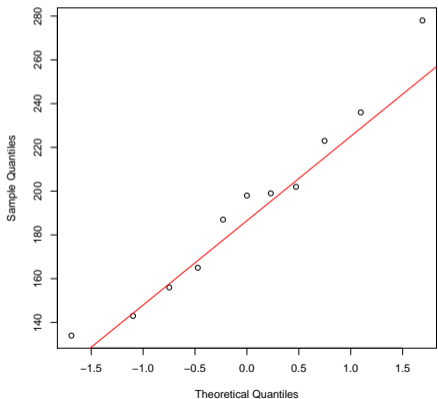
Normality Test With Quantile-Quantile Plot

- Our data analyst recalls that F-test assumes normal distributions!

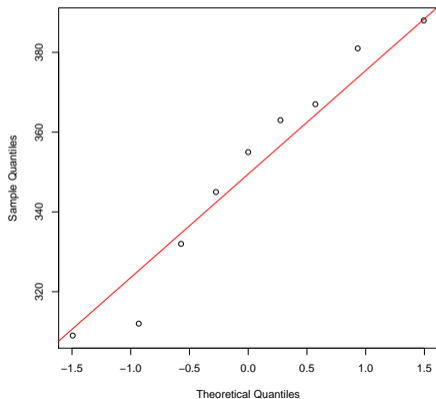
```
> qqnorm(X); qqline(X,col=2)
```

```
> qqnorm(Y); qqline(Y,col=3)
```

Normal Q-Q Plot



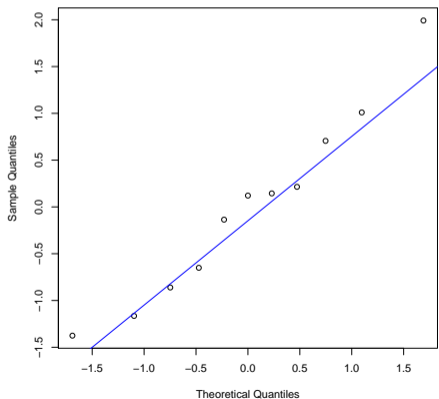
Normal Q-Q Plot



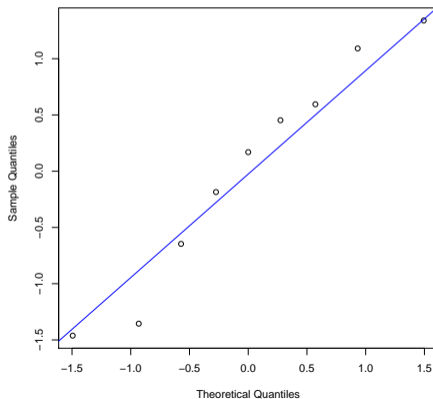
Normality Test With Quantile-Quantile Plot (Cont.)

```
> Zx <- (X-mean(X))/sd(X); Zy <- (Y-mean(Y))/sd(Y)
> qqnorm(Zx); qqline(Zx,col='blue')
> qqnorm(Zy); qqline(Zy,col='blue')
```

Normal Q-Q Plot



Normal Q-Q Plot



Normality Test With Shapiro-Wilk Test

- H_0 : distribution is normal
- H_A : distribution is **not** normal

```
> shapiro.test(X)
```

```
Shapiro-Wilk normality test
```

```
data: X
```

```
W = 0.96381, p-value = 0.8181
```

```
> shapiro.test(Y)
```

```
Shapiro-Wilk normality test
```

```
data: Y
```

```
W = 0.94483, p-value = 0.6335
```

- Both p -values are large, therefore we do not reject H_0 !