1 Jarque-Bera Statistic

The traditional Jarque-Bera statistic is defined as

$$JB_n = n\left[\frac{s^2}{6} + \frac{(k-3)^2}{24}\right], \tag{1}$$

where s is the sample skewness and K is the sample kurtosis.

Accordingly, a new parameter, we call it the Jarque-Bera parameter, is defined as

$$JB = N\left[\frac{S^2}{6} + \frac{(K-3)^2}{24}\right], \tag{2}$$

where S is the population skewness and K is the population kurtosis.

To apply JEL, we need to prove that JB_n is a consistent estimator of JB, i.e.

$$\lim_{n\to\infty} P_{JB}(|JB_n - JB| < \epsilon) = 1 \tag{3}$$

2 JEL

In practice, it is unknown if the population is normal or not.

Using Owen(1990), we just need to prove that the Jackknife JB has an asymptotic normal distribution.

Wilks Theorem? Owen1990?

3 2017 Restart

3.1 Endpoints of CI

Trying to code in matlab to find the endpoints of the confidence interval. Then hypothesis test can be done inversely.

The 95% confidence interval is of the form:

$$R = \{\theta : l(\theta) \le \chi^2(0.95) = 3.84\}$$

where

$$l(\theta) = 2\sum_{i=1}^{n} \log\{1 + \lambda(\theta)(\hat{V}_i - \theta)\}$$

and λ satisfies:

$$\frac{1}{n}\sum_{i=1}^{n} \frac{(\hat{V}_i - \theta)}{1 + \lambda(\hat{V}_i - \theta)} = 0$$

So, we can apply numerical methods to find the endpoints of the confidence interval R.

That is, starting from different θ:

1. Solve for λ: use `fsolve`.

2. Solve for θ_L, θ_U: use `NEWTZERO(f,xr,n,tol)`; or in `R`.