

For comparing 2 variables list methods on testing for Cointegration , looking for consistence i.e The Phillips,Johansen and Engle -Granger list mothods for the Causality, and the test that can be carried out before running the tests

Cointegration is a statistical property of two or more time series variables that have a long-term relationship, meaning that they move together in the long run despite short-term fluctuations. Testing for cointegration is important for determining whether a set of variables are related in a meaningful way.

There are several methods available for testing cointegration between two variables:

Augmented Dickey-Fuller (ADF) Test: This test is used to determine if a time series is stationary or not. It tests the null hypothesis that the time series has a unit root, which indicates that the series is non-stationary.

Phillips-Perron (PP) Test: This test is similar to the ADF test, but it uses a slightly different test statistic to account for the potential presence of autocorrelation in the errors.

Johansen Test: This test is used to determine the number of cointegrating relationships between a set of variables. It tests the null hypothesis that there are no cointegrating relationships.

Engle-Granger Test: This test is used to test for cointegration between two variables. It involves running a regression of one variable on the other, and then testing the residuals for stationarity using the ADF or PP tests.

Before running these tests, it is important to check for data quality, such as missing values or outliers, and to ensure that the data is stationary or can be transformed to be stationary. Exploratory data analysis can help identify any potential issues with the data, such as trends or seasonal patterns.

When testing for causality between two variables, it is important to consider the direction of causality and to use appropriate methods such as Granger causality tests or regression models with lagged variables. Phillips, Johansen, and Engle-Granger tests can also be used to test for causality, but they primarily focus on the presence of cointegration rather than the direction of causality.

In summary, testing for cointegration and causality between two variables requires careful consideration of the data quality and appropriate statistical methods. A combination of exploratory

data analysis, stationarity tests, and cointegration/causality tests can help ensure accurate and meaningful results.

for testing cointegration between two variables:

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2. Phillips-Perron (PP) Test: This test is similar to the ADF test, but it uses a slightly different test statistic to account for the potential presence of autocorrelation in the errors.
3. Johansen Test: This test is used to determine the number of cointegrating relationships between a set of variables. It tests the null hypothesis that there are no cointegrating relationships.
4. Engle-Granger Test: This test is used to test for cointegration between two variables. It involves running a regression of one variable on the other, and then testing the residuals for stationarity using the ADF or PP tests.

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