

Title: **A PROTOCOL FOR FACTOR IDENTIFICATION**

Speaker: **RICHARD ROLL**
California Institute of Technology

Importance: Why this matters:
There has been tremendous growth of factor-based investing, but there is little agreement on the identify of priced factors. Roll outlines how to identify “true” factors from the list of 300+ discussed in academic literature, and differentiates priced risk factors from anomalies.

Investigation: "Speaker analyzed XXX data to address the questions yyy, zzz, etc."
Roll’s process for factor identification incorporate higher level econometrics, but the process can be shown as having four steps. He focused on U.S. equities, but the approach can be applied to other countries and asset classes.

1. Identify largest eigenvectors from covariance matrix using 1100 equities with minimal leverage
2. Select a list of potential factors and develop related return series
3. Compute canonical correlations between eigenvectors and factor candidates
4. Examine candidate factors to see if they are statistically related to eigenvectors.

Innovations: Are there new techniques of interest in the data or approach to the problem?

1. Roll developed a procedure using Principle Components Analysis (PCA) to identify priced risk factors, and differentiate them from anomalies.
2. He also developed an approach splitting the data into three subsets to produce unbiased estimates of risk and risk-premia.

Insights: 1-2-3, what are the three most important things the speaker offered?

4. Stock characteristics are not the same as risk factors. Factor returns should not be easily predictable. Characteristics may be related to mean returns because they align with factor loadings or arbitrage opportunities (anomalies)
5. Risk factors must be related to the principle components of the covariance matrix.
6. Rejected factors with non-zero mean returns suggest an anomaly, because the related risk can be diversified away.

Audience rating: 4.19