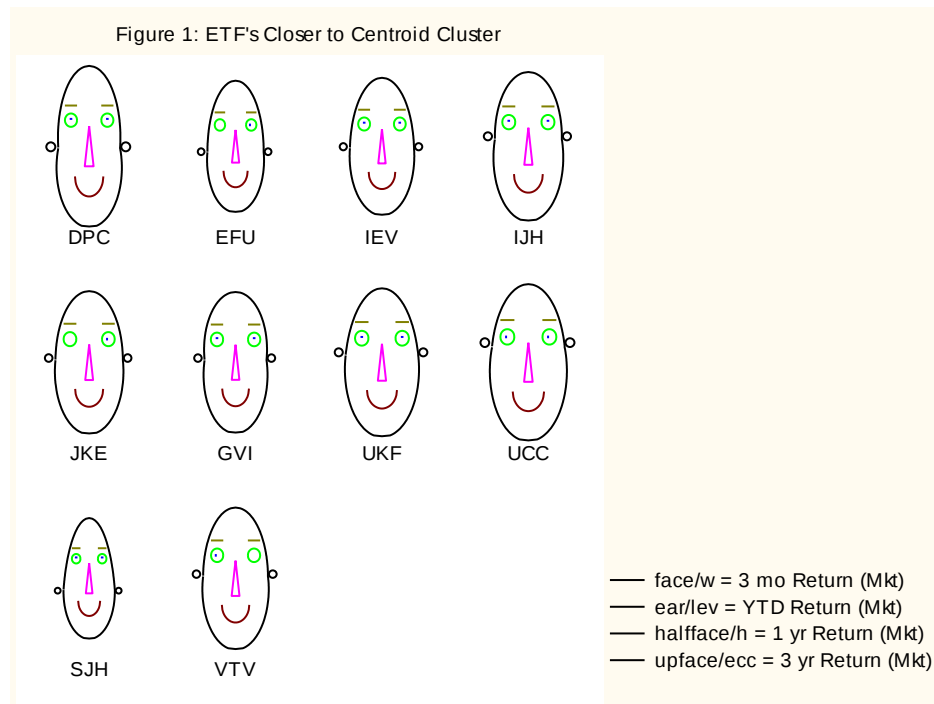


Exchange-Traded Funds: A Multidimensional Comparison

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ABSTRACT

A sample of 574 Exchange-Traded Funds (ETFs) was analyzed using two multivariate graphical methods: Chernoff-Faces and Cluster Analysis. Return data collected on January 5, 2011 included: Intraday, YTD, 3-Month, 1-Year and 3-Year returns (finance.yahoo.com). Based on the above variables and using a standard k-means technique (Hartigan and Wong, 1979) we formed 10 clusters. Clusters varied in size from 8 to 125 ETF's (composition is shown in full paper). The second part of the analysis shows the 10 ETF's that were closer to their cluster centroid as a Chernoff Face (1973). The 10 ETF's closer to each cluster centers are shown below:



The results show surprising similarities for some of the ETF's that supposed to follow totally different stock indexes. A practical application of this study could provide investors with a tool to further diversify their ETF portfolio.

REFERENCES

- Chernoff, H. (1973). The Use of Faces to Represent Points in K-Dimensional Space Graphically. *JASA*, Vol. 68, No. 342, pp. 361-368.
- Hartigan J. A. and Wong M. A. (1979). Algorithm AS 136: A K-Means Clustering Algorithm. *Journal of the Royal Statistical Society. Series C (Applied Statistics)*, Vol. 28, No. 1, pp. 100-108.