Accepted Manuscript

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Please cite this article as: Pablo Jose Campos de Carvalho, Aparna Gupta, A Network Approach to Unravel Asset Price Comovement Using Minimal Dependence Structure, *Journal of Banking and Finance* (2018), doi: 10.1016/j.jbankfin.2018.04.012

A Network Approach to Unravel Asset Price Comovement Using Minimal Dependence Structure

This version: February 28, 2018

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Abstract

We develop a network representation-based methodology to aid an exploratory analysis of temporally evolving comovement in asset prices. This parsimonious order-n representation of the most significant comovement in asset prices, filtered by common factors, allows tackling a large number of assets and unraveling their complex comovement structure. Flexibility in choosing explanatory factors to suit the specific objectives of a study makes this methodology useful for portfolio analysis, risk parity approaches, and risk management decisions. We illustrate the features of the methodology for a set of major industry equity indices and to blue chip stocks, where we analyze the dynamic relevance of Fama-French factors. Investigating the network for more than 20 years, including the dot-com bust, global financial crisis, and European debt crisis, helps draw many insights. For instance, unexpected industries are seen to connect idiosyncratically through the dot-com bust. We demonstrate that a network factor model based portfolio allocation performs better than a regular factor model based allocation.

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