CDAR

Consortium for Data Analytics in Risk

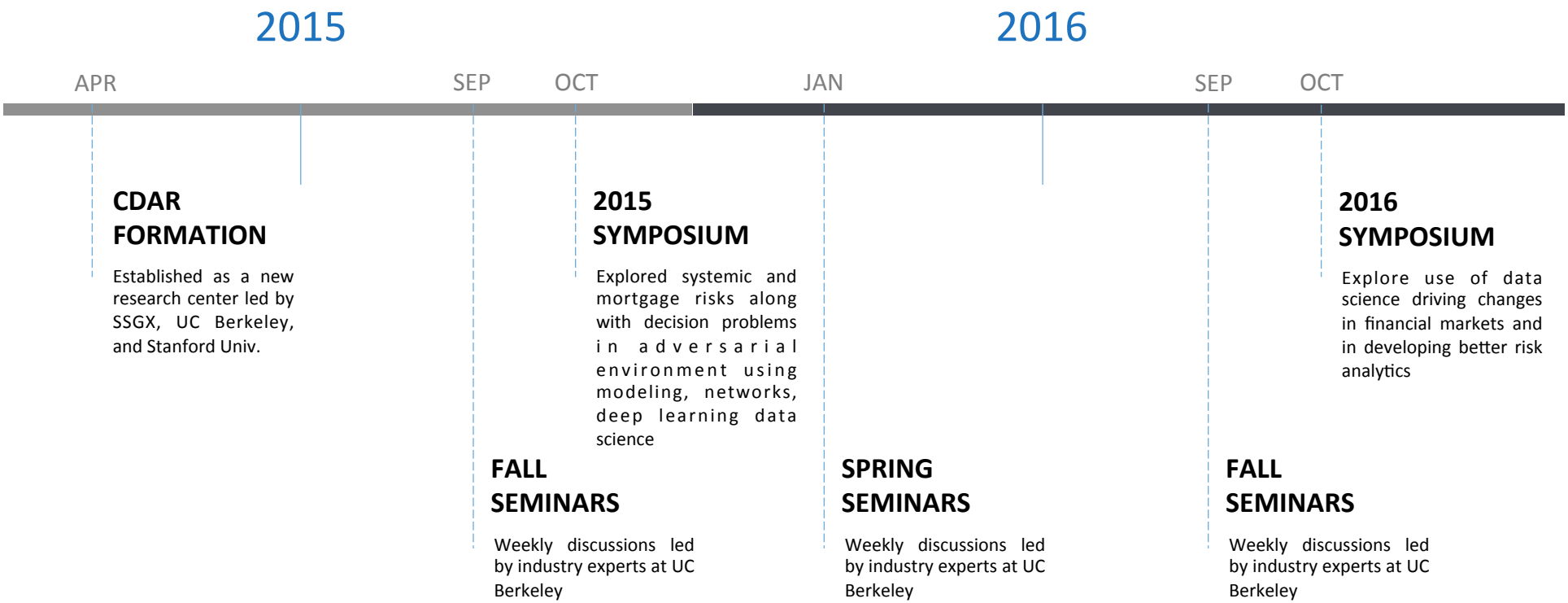
2016 SYMPOSIUM

CDAR: Who we are…

CDAR Mission

Provide an interdisciplinary platform to explore theoretical, applied and engineering approaches for applying data science to risk measurement and management problems.

History


2015
2016
APR
SEP
OCT
JAN
SEP
OCT
CDAR FORMATION
Established as a new research center led by SSGX, UC Berkeley, and Stanford Univ.
2015 SYMPOSIUM
Explored systemic and mortgage risks along with decision problems in adversarial environment using modeling, networks, deep learning data science
FALL SEMINARS
Weekly discussions led by industry experts at UC Berkeley
SPRING SEMINARS
Weekly discussions led by industry experts at UC Berkeley
FALL SEMINARS
Weekly discussions led by industry experts at UC Berkeley
2016 SYMPOSIUM
Explore use of data science driving changes in financial markets and in developing better risk analytics

Members

State Street Corporation

SSGX, GX Labs

Members

State Street Corporation
SSGX, GX Labs

Center For Risk Management Research

Members

Center For Risk Management Research

Berkeley Institute for Data Science

Members

Stanford University
Center for Financial
and Risk Analytics

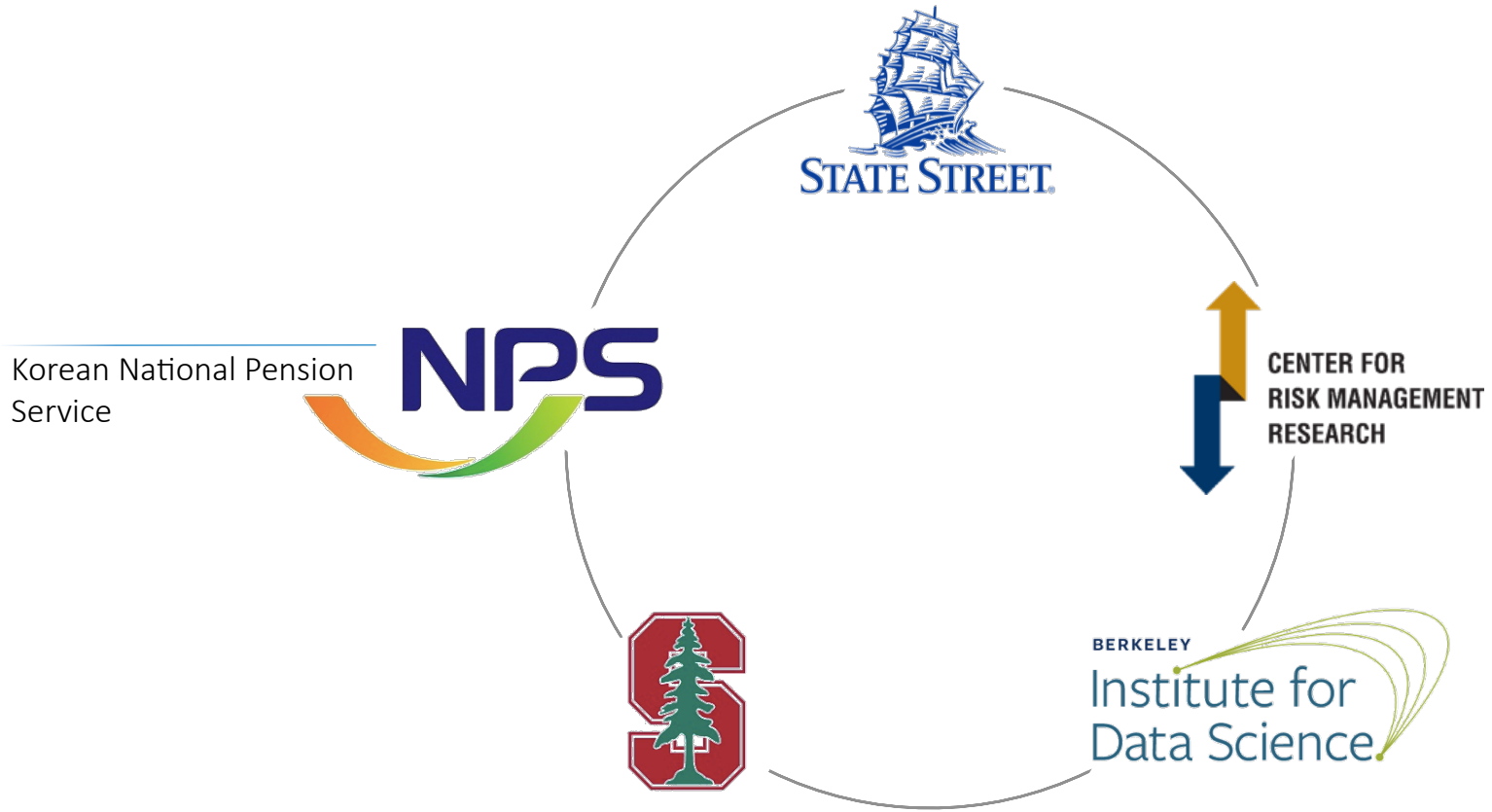
Berkeley Institute
for Data Science

Members

Korean National Pension Service

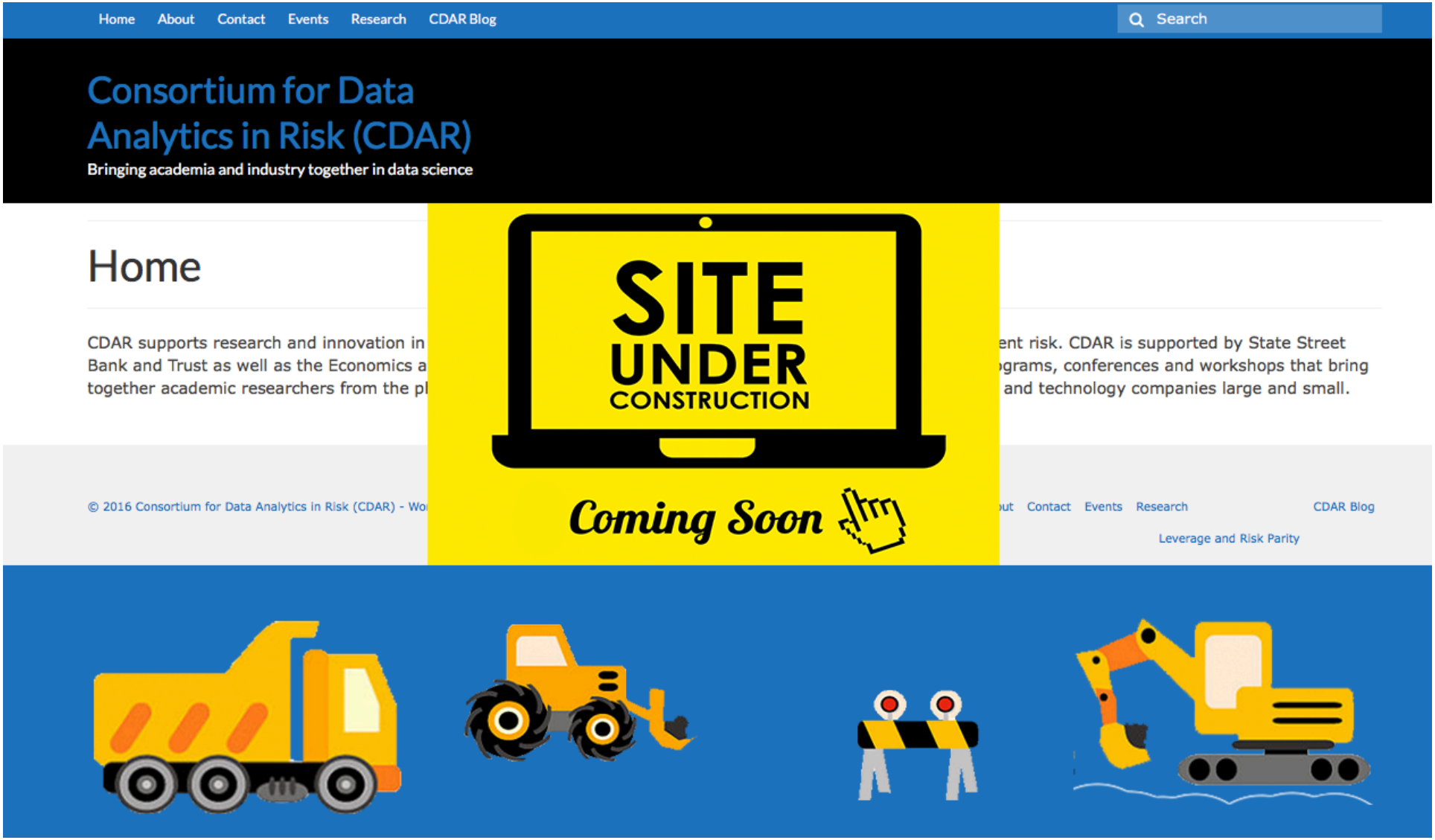
Stanford University
Center for Financial and Risk Analytics

Members


STATE STREET.
Korean National Pension Service
NPS
CENTER FOR
RISK MANAGEMENT
RESEARCH
BERKELEY
Institute for
Data Science

CDAR: What we're working on…

A year ago…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Consortium for Data Analytics in Risk (CDAR)
Bringing academia and industry together in data science
Home
CDAR supports research and innovation in
ent risk. CDAR is supported by State Street
Bank and Trust as well as the Economics a
grams, conferences and workshops that bring
together academic researchers from the pl
and technology companies large and small.
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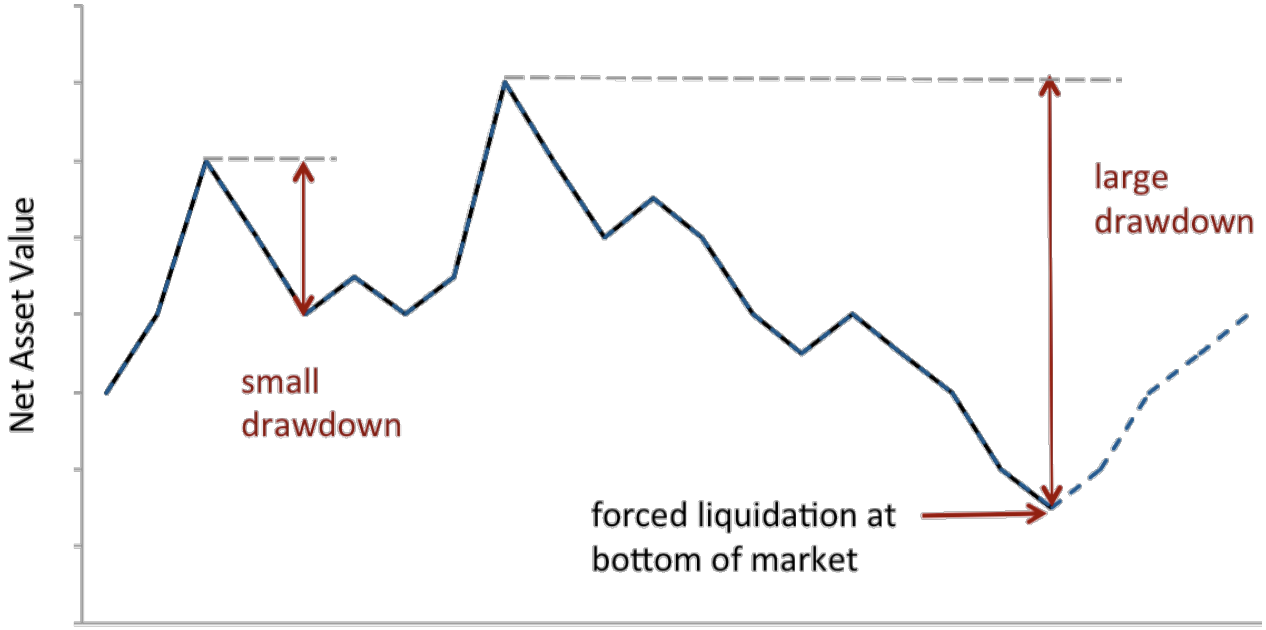
Leverage and Risk Parity

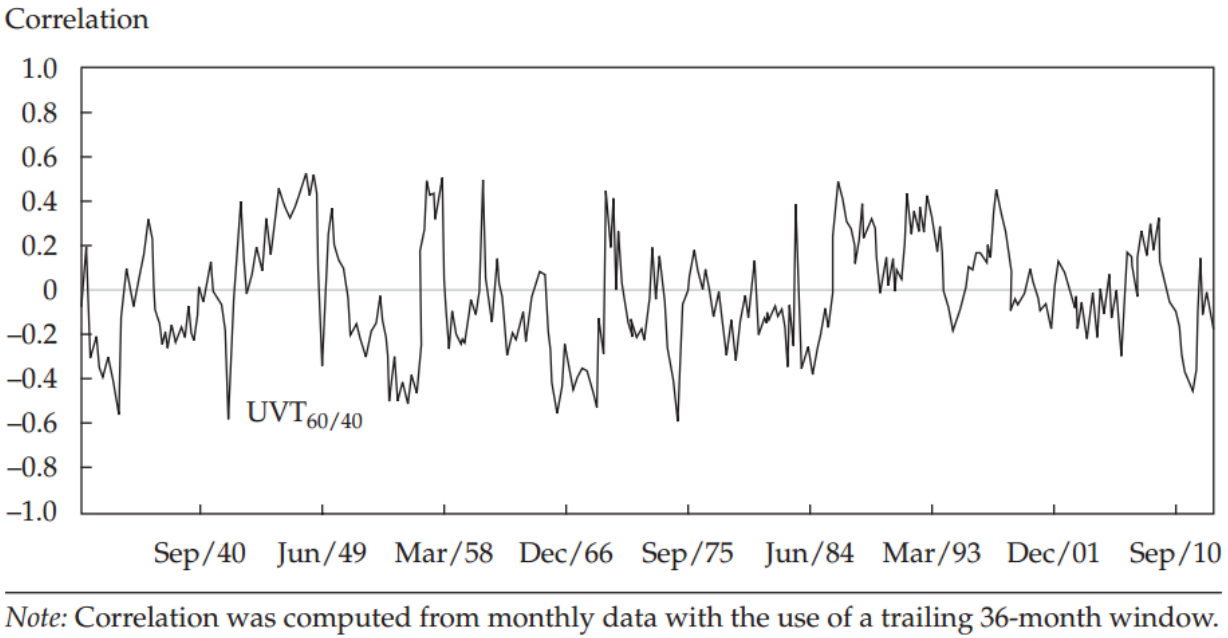
Drawdown Risk



Simulation of a portfolio's net asset value over a finite path.

Lisa Goldberg and Ola Mahmoud formalize drawdown risk as Conditional Expected Drawdown (CED), which can be used for portfolio construction and risk attribution. http://link.springer.com/article/10.1007/s11579-016-0181-9

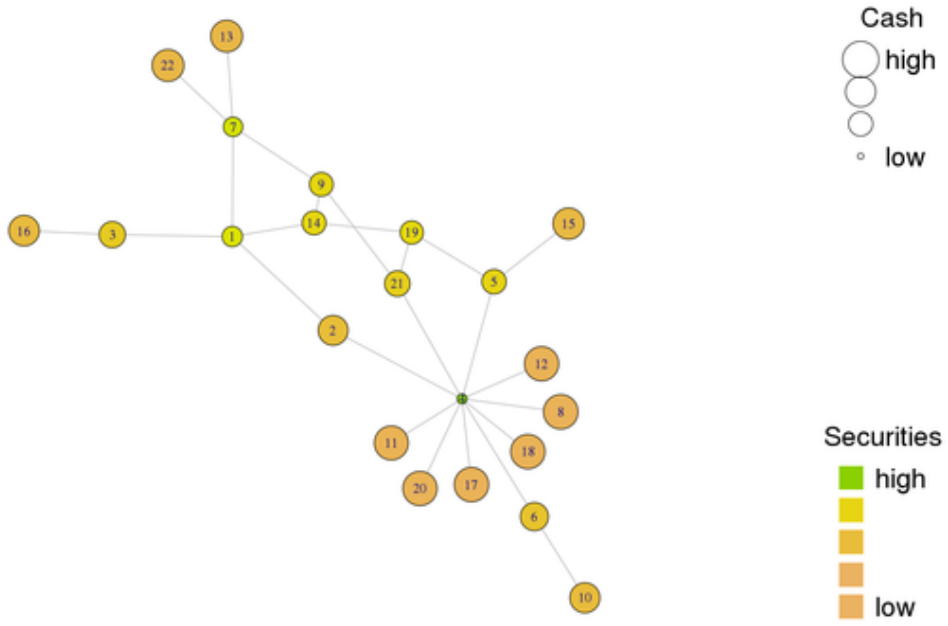
Leverage and Risk Parity



Note: Correlation was computed from monthly data with the use of a trailing 36-month window.

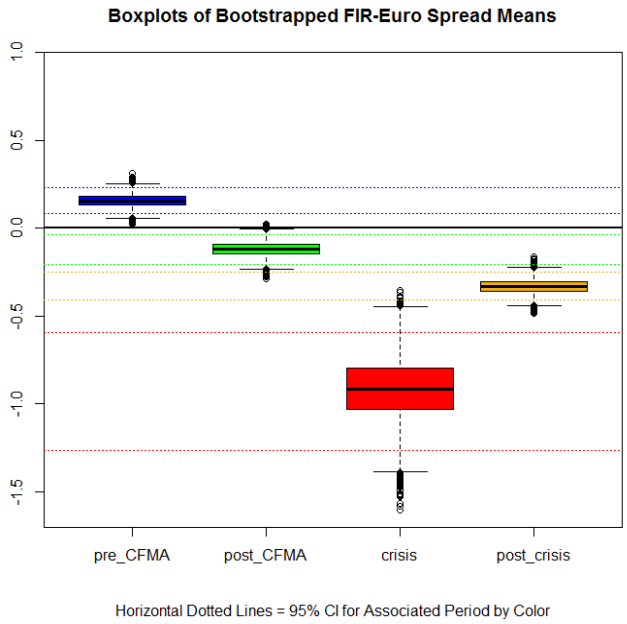
Risk parity strategies are exposed to variable leverage and rising interest rates.

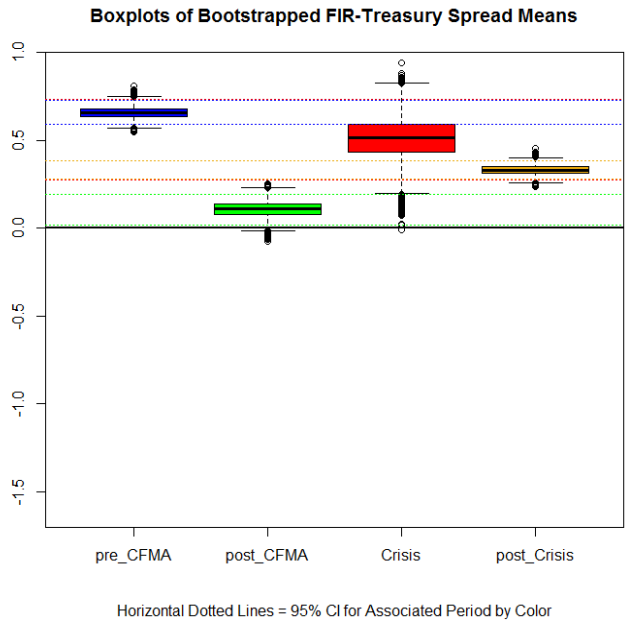
Financial Networks



The model for repurchase agreement market is not always stable and market stability is determined by relationships between the system leverage A/C, repo rate, haircut and the network

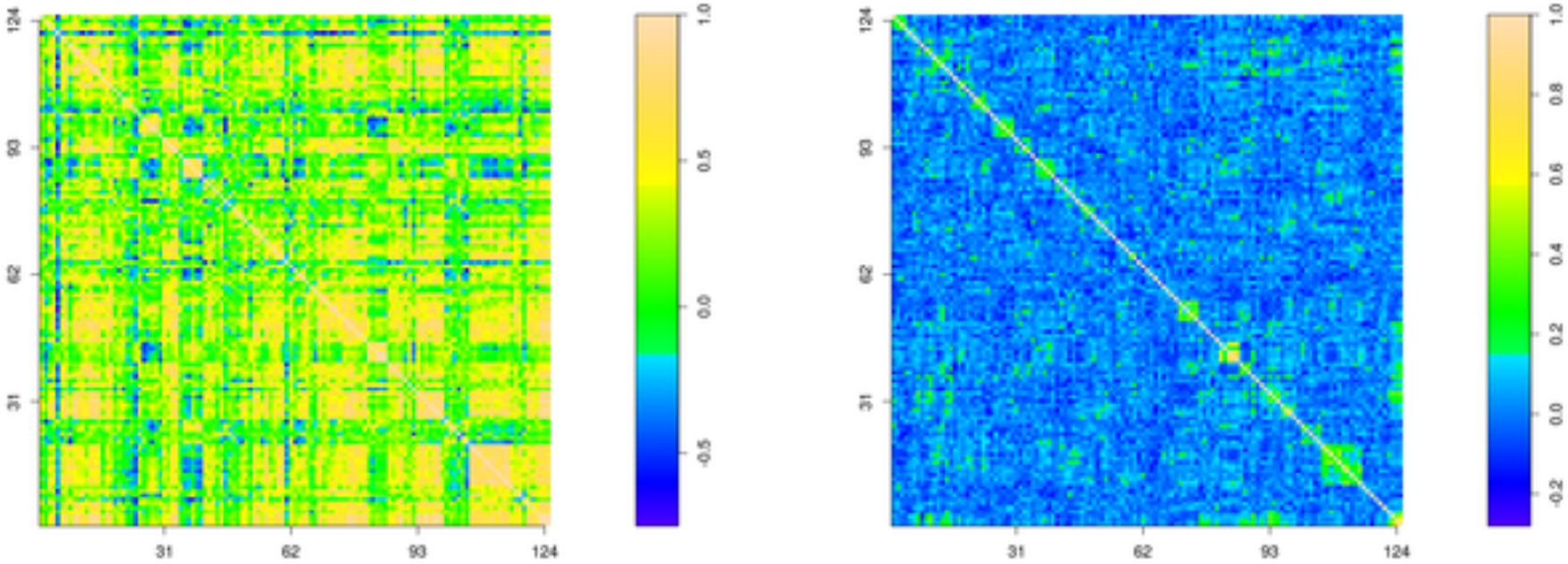
Futures Implied Financing Rate (FIR)





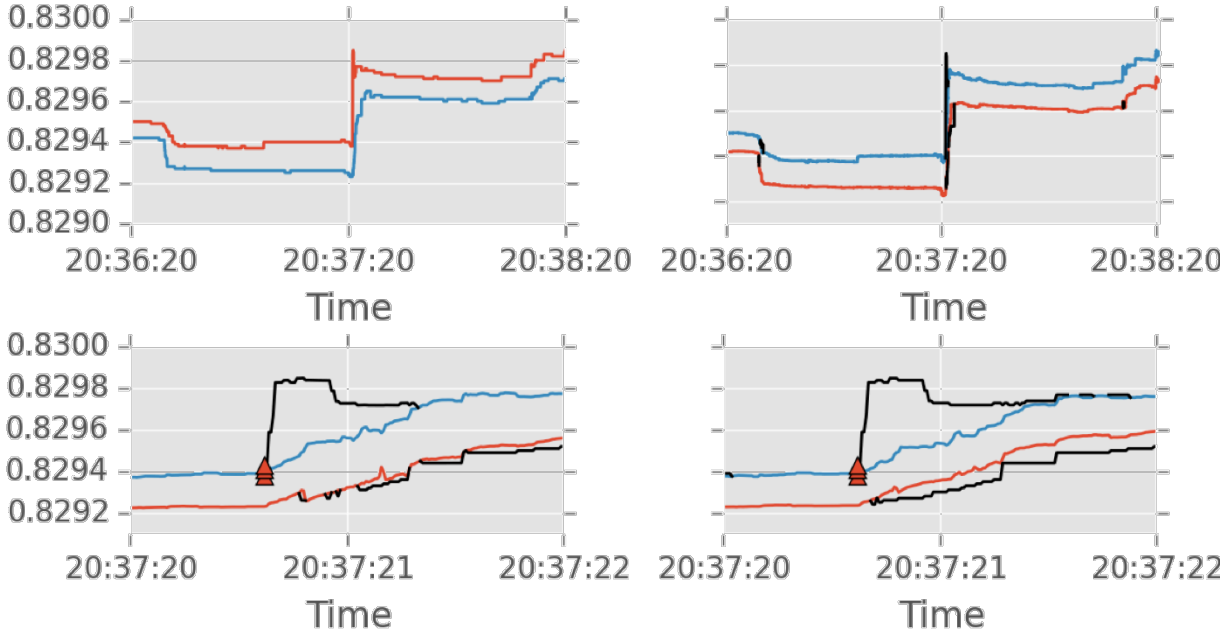
Daily financing rates implied by equity futures contracts are estimated and averaged within four distinct regimes from 1996 to 2013.

Using Convex Identification to Identify Financial Risk Factors



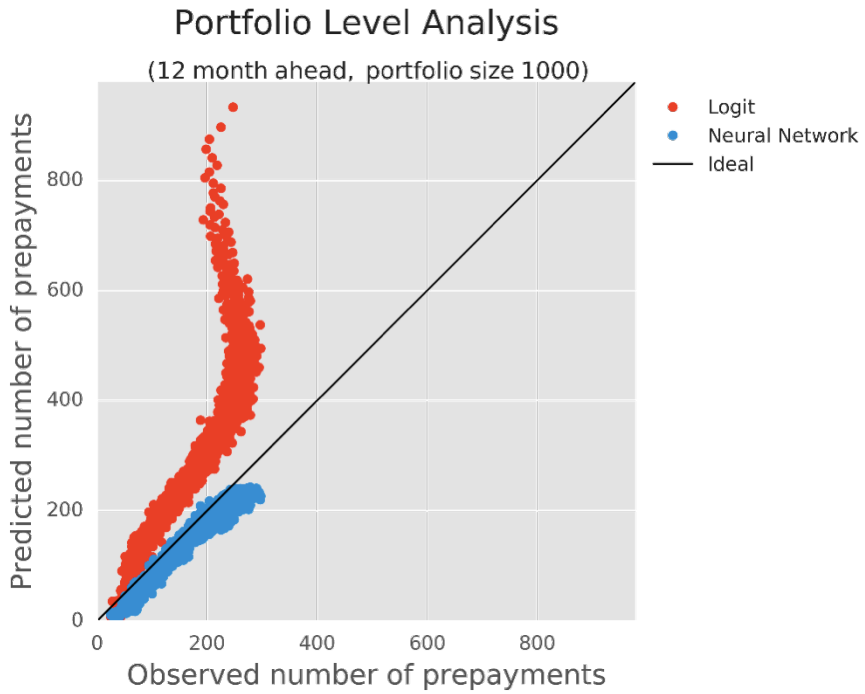
Low-rank sparse matrix decompositions identify narrow factors that may be missed by Principal Component Analysis.

Background Subtraction for Pattern Recognition in High Frequency Financial Data



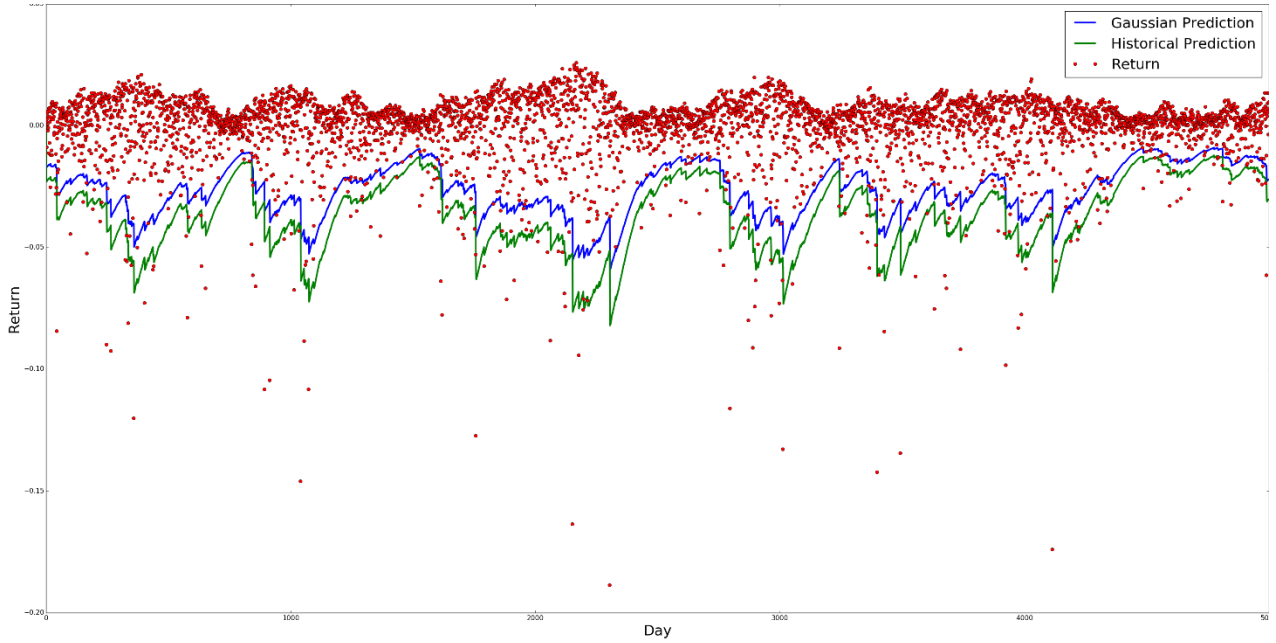
Low-rank sparse matrix decompositions allow the detection of unusual trades.

Deep Learning for Mortgage Risk



The deep learning (neural network) model takes into account nonlinear effects of prepayment for predicting mortgage prepayments at a portfolio level, out of sample, versus logistic regression model.

PCA with Model Misspecification



Compare VaR predictions derived from past empirical distribution to those from Gaussian model. Illustration of simulated returns with Variable Volatility and Negative Skew, one-day 3% VaR predictions.

A Glimpse at Today's Program

Incorporation of Text News Analytics in Risk Assessment

Dan diBartolomeo
President, Northfield

News, the information set that bridges the past and the future, can be explicitly incorporated in portfolio risk forecasts.

Exploiting Myopic Prediction Models in Reinforcement Learning

Craig Boutilier
Principal Scientist, Google

"Myopic" reinforcement learning methods for predicting short-term behavior are used to optimize over longer horizons.

What Can Statistical Methods do (or not do) for Finance?

Alex Shkolnik
Postdoctoral Scholar, UC Berkeley

Are there limitations to what statistical methods can tell us about financial markets?

Alex Papanicolaou
Postdoctoral fellow, CDAR

Computational Thinking, Inferential Thinking and Data Science

Mike Jordan

Professor, UC Berkeley

The growing size and scope of scientific data sets is leading to novel perspectives on data analysis that blend inferential and computational sciences.

ESG Discussion

Jeff Bohn

Chief Science Officer, State Street Global Exchange

Liz Michaels

Head of SRI, Aperio Group LLC

Lloyd Kurtz

Head of Social Impact Investing, Wells Fargo Private Bank

Ronald C. Cohen

Director, Berkeley Atmospheric Science Center