

# Factor Models

Wayne Nilsen

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# Types of Factor Models

# Time Series Factor Models

- Based on sector and region mostly
- Can be Fama-French style with a value or growth tilt
- Sharpe(92) style analysis is in this category

# Cross-sectional Factor Models

- Usually based on fundamentals.
  - P/E (“value?”)
  - Dividend Growth
  - Others?
- BARRA popularized
- Can have many many factors

# Statistical Factor Models

- Let statistics tell you what is driving the market risks
- Orthogonalize the covariance matrix to determine the portfolios which drive risk independently
- Normally results in a fairly parsimonious model

# Hybrid Factor Models

- This is where the other types of factor models are joined together in “stages”.
- The residuals from each stage are fed into the next stage.

# Time Series Factor Models

# Definition

- $t \in \mathbb{T} = \{t_1, \dots, t_T\}$  - a point in the time mesh
- $R_t(1 \times 1)$  - the return on some stock in our universe of stocks
- $F_t(1 \times D)$  - the return on  $D$  factors



# Benifits

- Explain the most variance on average

# Pitfalls

# Implementation Tips

# Cross-sectional Factor Models

# Benifits

# Pitfalls

# Implementation Tips

# Statistical Factor Models



# Benifits

# Pitfalls

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# Hybrid Factor Models

# Benifits

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