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Risk-Based Investing but What Risk(s)?

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Discussion at:

Risk Based and Factor Investing Conference

London, 5 November 2015

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What is the paper about?

- A risk-based asset allocation framework
- Targets Expected Shortfall (ES)
- Integrates diverse set of risks
  - Volatility and correlation
  - Valuation
  - Asymmetry and Tail risk
  - Illiquidity

Contribution and strengths

- An analytical framework to measure the contribution of each asset to overall portfolio ES

$$\mathrm{CES}^{CF}_{\alpha(i)} = \mathrm{CMEAN}_i + \mathrm{CVOL}_i + \mathrm{CSKEW}_i + \mathrm{CKURT}_i,$$

with

$$\begin{cases} \mathrm{CMEAN}_i = c_1\, w_i\, \mu_i, \ \sum_{i=1}^n \mathrm{CMEAN}_i = c_1 \mu_p, \\ \mathrm{CVOL}_i = c_2 \frac{w_i\ \sigma_{ip}}{\sigma_p}, \ \sum_{i=1}^n \mathrm{CVOL}_i = c_2\, \sigma_p, \\ \mathrm{CSKEW}_i = c_3 w_i \left(\partial_i s_p + \partial_i \sigma_p \frac{s_p}{\sigma_p}\right), \ \sum_{i=1}^n \mathrm{CSKEW}_i = c_3 s_p, \\ \mathrm{CKURT}_i = c_4 w_i \left(\partial_i k_p + \partial_i \sigma_p \frac{k_p - 3}{\sigma_p}\right), \ \sum_{i=1}^n \mathrm{CKURT}_i = c_4\,(k_p - 3) \end{cases}$$

Informative analysis in Table 6.7(contributions of different moments to ES, i.e. volatility matters more for traditional assets, illiquidity for alternative assets)!

- 'Fundamental' expected return
- Covariance, co-skewness, co-kurtosis corrected for illiquidity

Empirical Set up

- Large Cap, Small Cap, Investment Grade, High Yield, Commodities, Hedge Funds, Private Equity, Real Estate
- 1990 to 2013 quarterly
- Equal risk contribution portfolios
  - NRP, volatility
  - RP, …+ correlation
  - GES, … + expected return
  - MES, … + skewness and kurtosis
  - LAMES, …+ illiquidity

Main results

	NRP	RP	GES	MES	LAMES
	Panel A: portfolio weights				
EQ	6.96%	4.55%	2.87%	7.02%	8.67%
SC	5.34%	3.80%	2.29%	7.19%	8.36%
IG	20.81%	27.85%	31.47%	52.10%	52.01%
HY	10.83%	7.89%	6.54%	7.22%	8.13%
CO	6.15%	6.76%	3.85%	3.21%	3.88%
HF	15.64%	11.05%	6.66%	7.58%	8.33%
PE	11.03%	7.44%	5.02%	6.32%	5.39%
RE	23.23%	30.66%	41.30%	9.38%	5.23%
	Panel B: portfolio metrics				
Average carry	1.58%	1.61%	1.73%	1.64%	1.62%
Volatility	3.61%	3.09%	2.88%	3.03%	3.26%
Skewness	-2.64	-3.52	-4.19	-1.00	-0.62
Excess Kurtosis	12.15	17.74	18.69	3.92	2.91
Gaussian expected shortfall	5.87%	4.77%	4.17%	4.61%	5.11%
Modified expected shortfall	16.99%	18.15%	17.97%	7.83%	7.46%

- 'We observe a substantial variation across models'
- 'Portfolio weights change significantly when we correct ES for non-normal behavior'
- 'More realistic risk models lead to build portfolios with better carry to volatility profiles'
- '…the most significant improvements are appearing for higher moments such as skewness and kurtosis, as well as for the modified ES,..'

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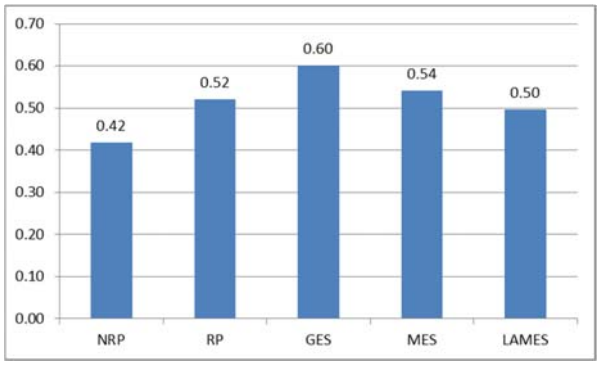
Comments and suggestions

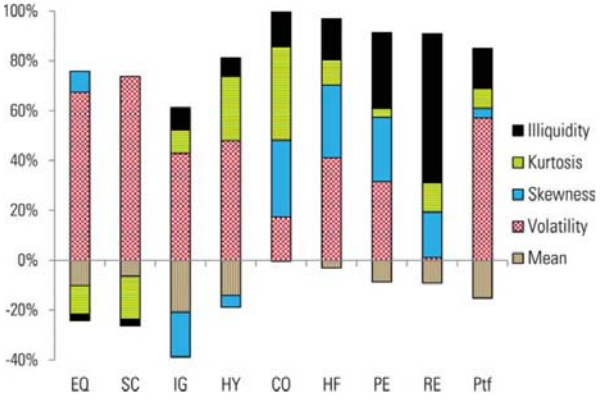
- Change in portfolio weights.
  - Can we be confident they are different (i.e. estimation risk)? Does it matter anyway (in a static assessment)?
- What is the incremental value of adding each facet of risk in your framework? For example, liquidity?
  - Why not adding one at a time? Perhaps start with minimum variance.
- Carry vs. Realized return is reported.
  - Does carry translate to realized return?

Comments and suggestions (cont'd)

- Carry/Volatility profiles
  - Are more realistic models better? Are ratios different?
  - Is the average carry economically different?



- Volatility is the most important/pervasive contributor to ES, i.e. accounts for 6.10% of the 7.46% in LAMES.



- Out of Sample analysis and real life statistics
  - Stability of weights and turnover?

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Minor Comments

- Potential benefits for portfolios of large number of assets (Martellini and Ziemann , 2010)*
- 'Valuation risk'
- Inflation expectations for a portfolio with a quarterly investment horizon (?).

* Martellini L. and V. Ziemann, 2010, Improved Estimates of Higher-Order Comoments and Implications for Portfolio Selection, Rev. Financ. Stud. 23 (4): 1467-1502.

Minor Comments (cont'd)

- A constrained regression, à la Sharpe, may be more appropriate for carry calculation for HFs and PE.
- Average carry per quarter (Table 6.3), test-statistics
- Are your higher co-moment estimators related to those derived in MZ (2010)?

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Thank you

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