Discussion

Estimation risk for the VaR of portfolios ...

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This paper

- Develops an asymptotic theory for the estimators of **portfolio** VaR …
- Why do we need an asymptotic theory for the VaR estimators ?
- Model Parameter Estimators
  -> VaR Estimators
  -> Confidence Intervals
  -> Estimation Risk
- Very useful in particular when we have ***a high number of parameters*** to estimate ….

Portfolio VaR

- Consider a m-dimensional portfolio
- M can be big (DAX**30**, CAC**40**, FTSE**100**, SP**500**, …) …..
- To reduce this dimension, the first idea is to work with portfolio returns only …
  - DAX30 Index returns
  - CAC40 Index returns
  - FTSE Index returns
  - SP500 Index returns …..

Portfolio VaR

- Drawback: Portfolio composition can be time-varying …
  - Historical portfolio compositions are different from the current portfolio composition
- But is general the allocation scheme stabilizes portfolio risk
  - Example of m independent assets – conditional volatility σ_t
  - Allocation rule : 1 / σ_t on each asset
  - Each asset contributes for 1 / σ_t x σ_t to the total portfolio risk
  - Can be generalized to dependant assets with more complex Risk Parity (RP) allocation scheme

The alternative solution …

- Use information on current portfolio composition to compute portfolio VaR
- Helpful for investors ? **NO**
- Helpful for portfolio mangers ? **YES**
  - Under the ellipticity assumption,

    Equation (2.9) $\text{Port VaR}_{t-1} = F^*(\theta^{(\alpha)}, a_{t-1})$

  - Allows *What if* scenario, VaR decomposition, ……
  - Complex dynamics as the information set used to compute the conditional Volatility is large (all asset past returns)

… but ….

- Is Estimation Risk increasing too much with the portfolio size m ?
- To evaluate the level of estimation risk, we can check the size of Confidence Intervals … if we are able to compute them !
- This paper gives the solution to this issue !

Comments on the empirical part

- 2 empirical applications with surprising choices
- The idea :

  The elliptical assumption is fundamental and the paper essentially compares two estimation approaches (with or without this assumption)

- **Is it the best way to sell the paper ?**

What is done in the paper …

- Most of the results obtained is this part are trivial
  - Simulated data (***Static portfolio***): The unconstrained estimation procedure gives better results when the elliptical assumption is violated
  - Market data (***Minimum Variance portfolio***) : The two estimation procedures are equivalent when the elliptical assumption holds

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- **Other empirical tests can be more interesting**

What could be done …

- Compare univariate (portfolio returns) versus multivariate (portfolio holdings) approaches
- Clear trade-off between the two approaches
  - The first one includes information of dynamic risk management
  - The second one allows more complex dynamics
- Compare Estimation Risks for the two approaches to choose (will depend on aggregation properties and risk management quality)

In Conclusion

- A very useful theory ….
- … we can it use in practice to choose between estimation approaches