EXECUTIVE SUMMARY

Establishing a Risk Management Framework for Investment Ideas within Belfius Investment Strategy's Research Center

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Context and objective

Belfius Investment Strategy's Research Center publishes investment ideas for Belfius Private clients. There was no structured way to measure the risk of these ideas taken together as a portfolio. This thesis builds that framework. The goal is simple: estimate every day how much the portfolio could lose on a bad day in the markets, and show which positions drive that loss.

Approach

The framework runs in four steps, every day.

1. Volatility

Each asset is modelled with a GJR-GARCH model. Volatility changes over time and rises more after falls than after gains.

2. Dependence

A copula links the assets together, so the model captures how they move jointly, including in stressed markets.

3. Simulation

Thousands of possible scenarios for the next day are generated by Monte Carlo simulation.

4. Risk measures

Value at Risk (VaR) and Expected Shortfall (ES) are computed from the scenarios and split by position.

Expected Shortfall is the average loss on the worst days, beyond the VaR. The model was backtested out of sample on a rolling window with standard statistical tests, and compared with simpler approaches.

Main findings

- **Risk changes fast.** A model that updates volatility every day reacts to market stress much faster than a static one.
- **Diversification is weakest when it is needed most.** Correlations between assets rise sharply in crisis periods such as March 2020.
- **Risk is concentrated.** A few positions can drive a much larger share of the Expected Shortfall than their weight in the portfolio.
- **A new idea can add or remove risk.** A what-if analysis shows the effect on total risk before the decision is taken.

Use at Belfius

The framework runs every day and feeds a risk dashboard for the Investment Strategy team. It reports the portfolio VaR and ES, the contribution of each position, and flags the positions to watch. The model supports decisions. It does not replace the judgement of the people who take them.

Conclusion

The thesis delivers a risk framework that is statistically sound, validated on past data and simple to use day to day. It gives the team a common way to discuss the risk of its investment ideas. A natural next step is a finer treatment of the most extreme losses, for example with Extreme Value Theory.