Andreas Krause
Risk Management

Difficulties of risk management

- Investors are exposed to risks which can cause them significant losses
- Investors may want to address such risks by taking measures to reduce them
- Risk management is a complex process that requires a detailed assessment of the risks an investor is exposed to
- Knowledge of the assets invested in, their interrelations and the factors influencing their future prices are essential
- Abstracting from these requirements, we will explore some basic principles of risk management for investors

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Managing and eliminating risks

- The aim of risk management can be to either limit the amount of risk that is taken or prevent losses
- Limiting the exposure to risk does not prevent unexpected losses from occurring
- To eliminate risks, derivatives have been developed, but these are not always available
- We will look at the a way investors can limit the risks they are taking, but still exposing them to larger losses and for alternatives in which large losses are eliminated

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Value-at-Risk is widely used

- One of the most common risk measures used in banks is Value-at-Risk due to regulatory requirements
- Regulators favour expected shortfall, a closely related concept, to which the same principles can be applied
- Many investors have also adopted Value-at-Risk, or expected shortfall, as their risk management tool
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Value-at-risk
LIVERMORE
TRADING GROUP
NEW YORK STOCK EXCHANGE
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Managing risks with Value-at-Risk

- Value-at-Risk focusses on potential losses and allows investors to limit the likelihood of making large losses, but such losses can still occur
- Using Value-at-Risk can give guidance on how to adjust a portfolio of assets to reduce the risks that are taken

? If you observe a loss that exceeds your Value-at-Risk, does this mean your Value-at-Risk estimate is wrong?

! Losses larger than the Value-at-Risk occur a fraction c of times and it is therefore expected that losses larger than the Value-at-Risk are observed; not observing such losses would indicate that the estimate is too high

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Eliminating risks without derivatives

- Hedging with derivatives is a common way to eliminate risks, but for many investors such derivatives do not exist
- Derivatives are not readily available for small stocks, emerging markets and many alternative investments
- Investors can still obtain protection from losses through portfolio insurance
- In portfolio insurance investments are conducted in a specific way to eliminate risks

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Risk elimination through limited investment into risky assets

- Constant Proportion Portfolio Insurance is one way investors can eliminate risks, it allows investors to avoid losses beyond a set limit
- Investors adjust the amount of risky assets held constantly to ensure that any losses they may incur still allow the minimum value to be reached

? Using Constant Proportion Portfolio Insurance will eliminate any risk and the value of the investment in the future is known, is this correct?

! Constant Proportion Portfolio Insurance limits the losses, but there remains an uncertainty about how much the investment is worth at the end of the time horizon; there will still be volatility in the final value

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Summary of key results

- Measuring risk can allow investors to use their results to manage these risks, but losses beyond what is expected can nevertheless be observed
- Risk management is not primarily about eliminating risks, but about maintaining risk levels that are consistent with the risk preferences of investors
- There are investment strategies, beyond the use of derivatives, that allow investors to limit any losses they make
- Such portfolio insurance will require specific investment strategies to be followed and these might not be suitable for all investors

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