

Dr. Michael Schmid

Market risk in an enterprise environment

SUPRA 2011, 15th September 2011

„ For an asset manager, the greatest risk is operational risk“

John C. Hull ¹⁾

¹⁾ Hull, J.: Risk management and financial institutions, Prentice Hall, 2007.

Content

- The 2008-EXPERIENCE...
- Modelling the revenue impact
- Analyzing the drivers of „Fees-at-Risk“
- Integration in a company-wide risk management framework

The 2008-EXPERIENCE...

Raiffeisen Capital Management

- Asset Management Subsidiary of the Raiffeisen Banking Group
- Austria's largest asset manager
- broad portfolio of institution and retail investment fund products ²⁾

Retail	Institutional	Fund Shells
40%	40%	20%

- well diversified asset mix ²⁾

Equities and AI	FI and MM	Balanced	Fund Shells
15%	45%	20%	20%

- app. 40bn EUR AuM in early 2008

²⁾ appr. numbers

The 2008-EXPERIENCE...

Conviction that the company

- was well diversified with respect to
 - Client groups and
 - Asset Classes
- does manage a relatively conservative portfolio
- earned decent returns relative to the presumably moderate business risk

When the financial crisis hit

- AuM dropped significantly below 30bn EUR
- Revenues plunged even more significant in relative terms
- we were somewhat puzzled by the magnitude of the slump

Decision to model the market-related component of our business risk

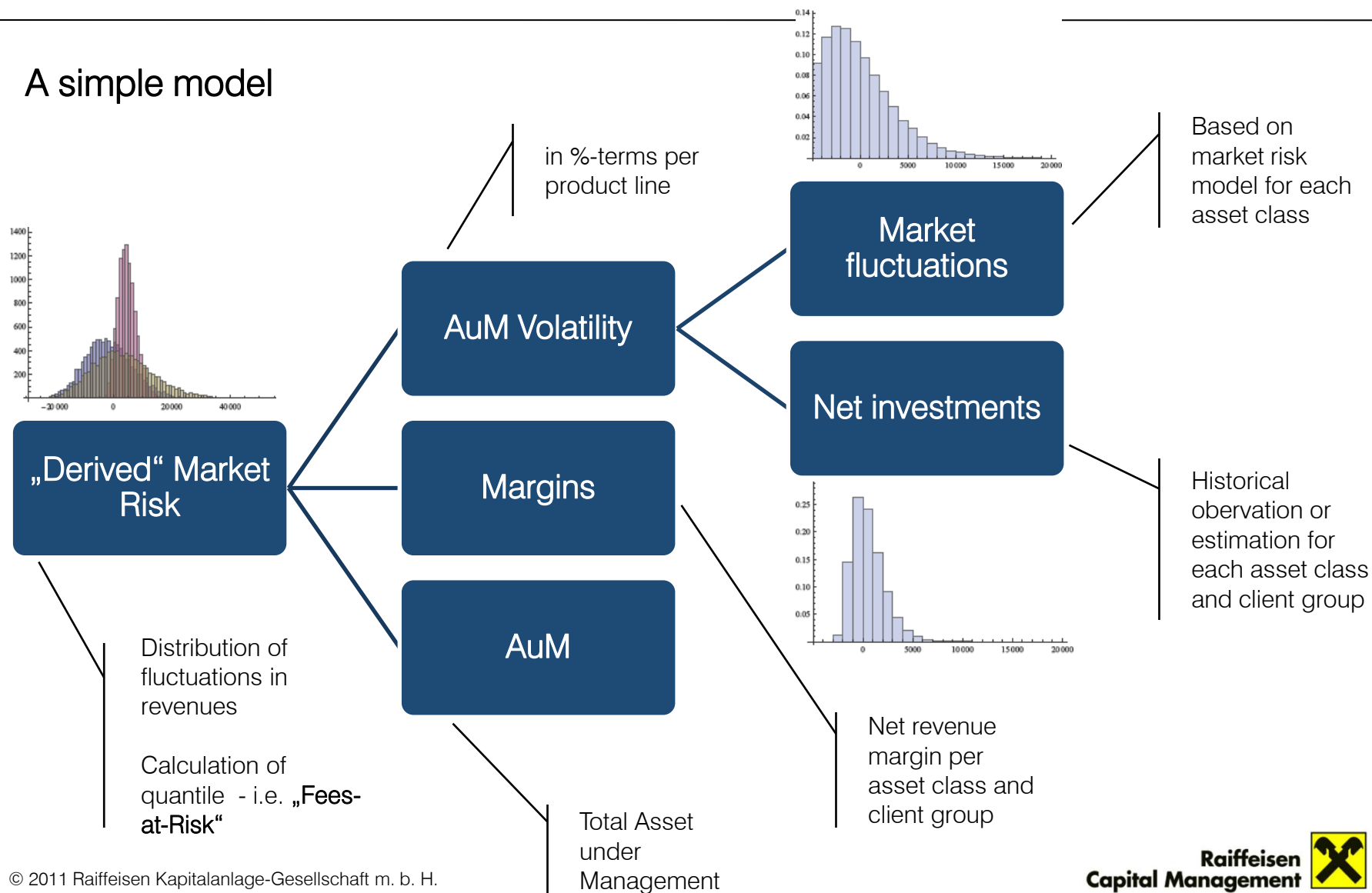
Modelling the revenue impact

Obvious building blocks

- An asset managers revenues are a function of AuM and revenue margins.
- Changes in AuM directly impact revenues.
- Fluctuations in AuM are driven by
 - market risk
 - net investments – i.e. in- and outflows of client funds – further referred to as a special kind of “liquidity risk”
- Market risk is driven by the overall asset mix and the share of high-risk assets
- “Liquidity risk” may be driven by
 - Client groups – i.e. investment behaviour may vary between different groups of clients
 - Asset classes – e.g. the investment behaviour of a typical MM investor may be quite different from the investment behaviour of a EM-Equity investor
- There may be good reasons to assume that Market risk and “Liquidity risk” are not quite independent from each other
- The fact that high-risk assets typically yield higher revenue margins should be taken into consideration.

Modelling the revenue impact

A simple model



Modelling the revenue impact

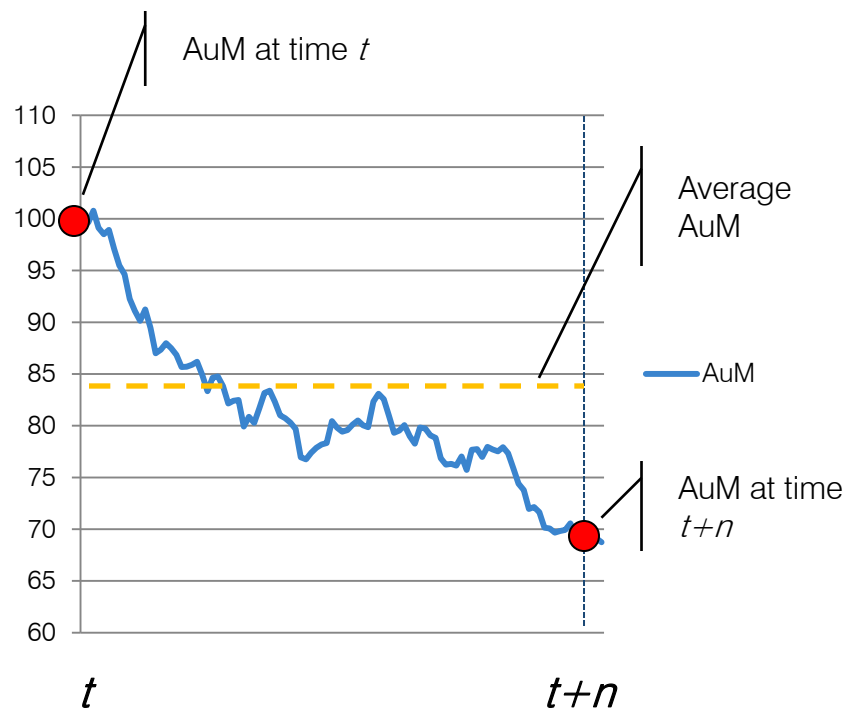
Technicalities

- Inputs
 - Average net revenue margin per asset class and client group
 - Average historical market returns of investment funds per asset class – monthly data
 - Average historical net investments (in %) in investment funds per asset class – monthly data
 - asset weights per asset class and client group (on investment fund level)
 - Total assets under management
- Model Types
 - Variance-Covariance-Model
 - Historical Simulation
 - Monte-Carlo-Simulation
- Output
 - Volatility and quantile of fluctuations in total AuM due to market risk
 - Volatility and quantile of fluctuations in total AuM due to the combined effect of market risk and “Liquidity risk”
 - Volatility and quantile of fluctuations in net revenues due to the combined effect of market risk and “Liquidity risk”
 - risk attribution with respect to typ of risk, asset class or client group

Modelling the revenue impact

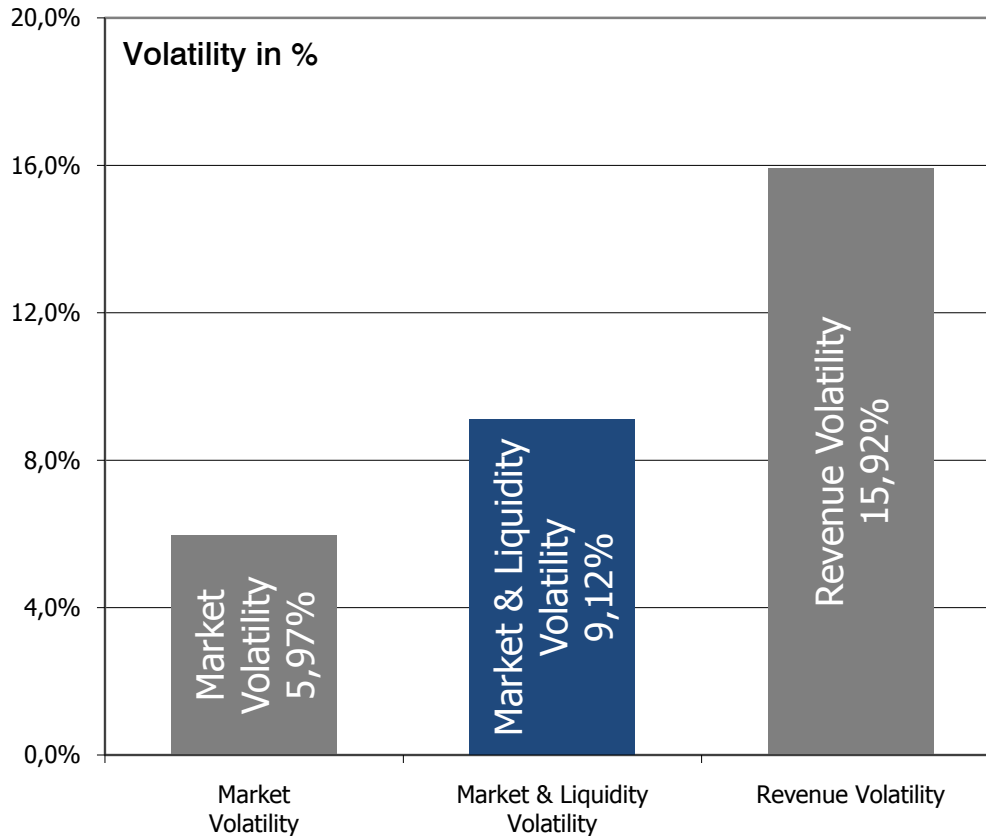
Technicalities

- Should the calculation be based on average AuM or initial AuM?
 - Calculations based on average AuM reflect the loss in revenues over the time horizon under review (n).
 - Calculations based on initial AuM assess the decrease in the expected value of revenues at the end of the time horizon under review ($t+n$)
 - The latter variant results in significantly higher losses in revenues.
- For details on modelling refer to Bernhard Scherer: Fees at Risk, EDHEC, 2008.



Analyzing the drivers of „Fees-at-Risk“

AuM and Revenue risk

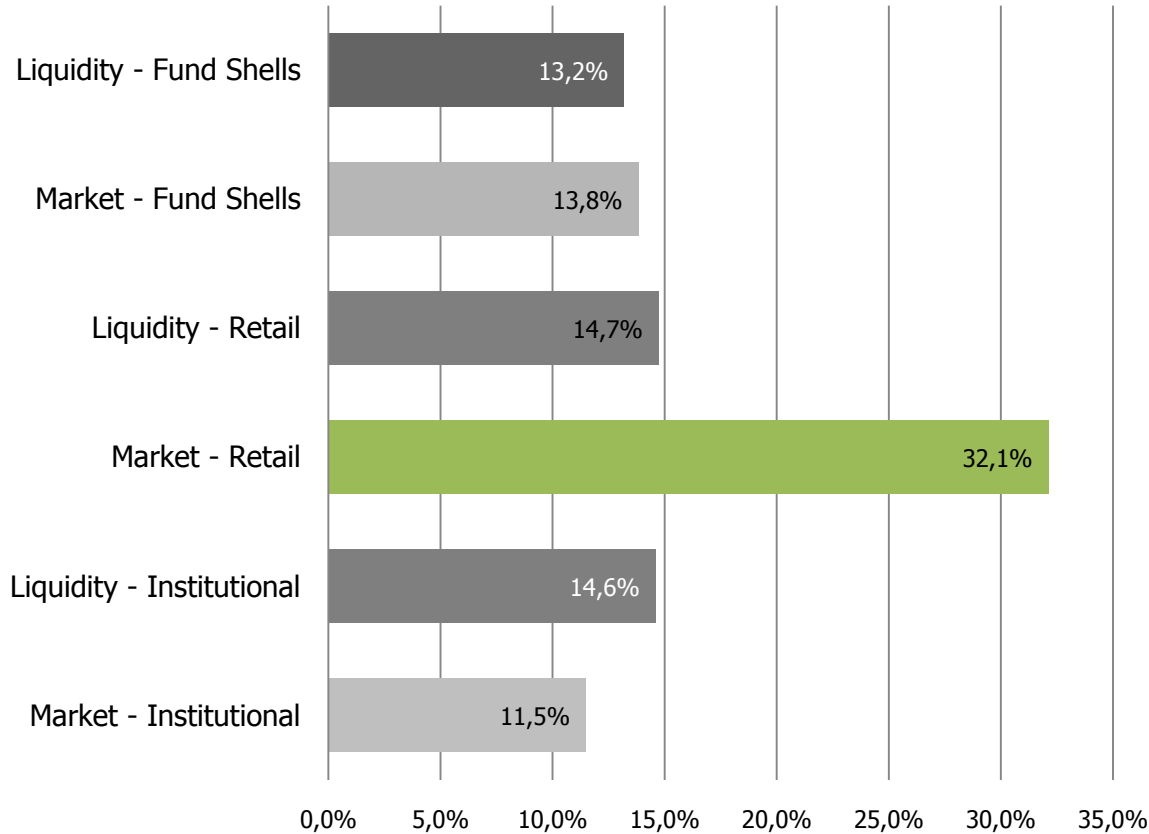


- Market volatility is moderate due to a well diversified asset mix and a low share of high-risk assets
- “Liquidity risk” adds significantly to fluctuations in AuM
- Revenue volatility outstrips AuM volatility by far reaching volatility levels of pure equity portfolio

Results based on sample data

Analyzing the drivers of „Fees-at-Risk“

Risk Contributions to AuM Volatility

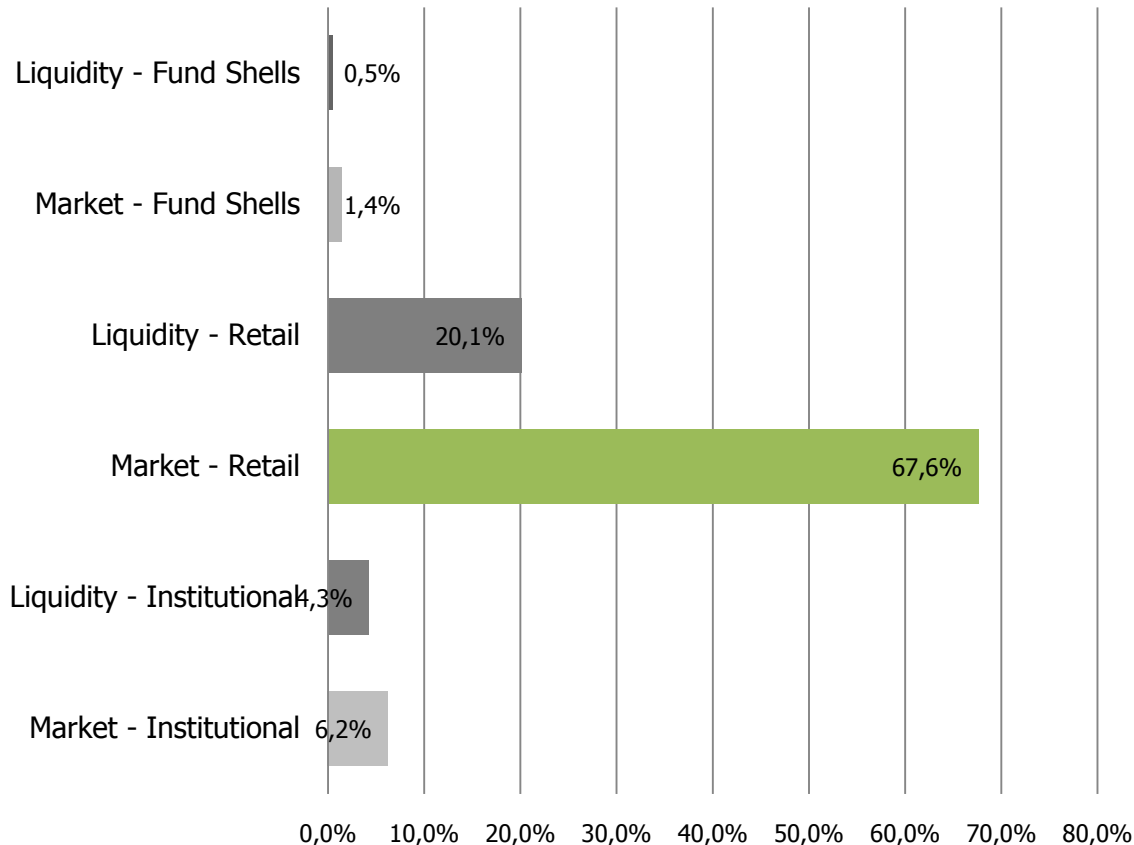


- Contributions to AuM volatility show a reasonable diversification among risk drivers
- The more aggressive asset allocation of retail clients (relative to institutional business) is reflected in the respective risk contribution
- Data suggests that liquidity risk dominates market risk for institutional clients.

Results based on sample data

Analyzing the drivers of „Fees-at-Risk“

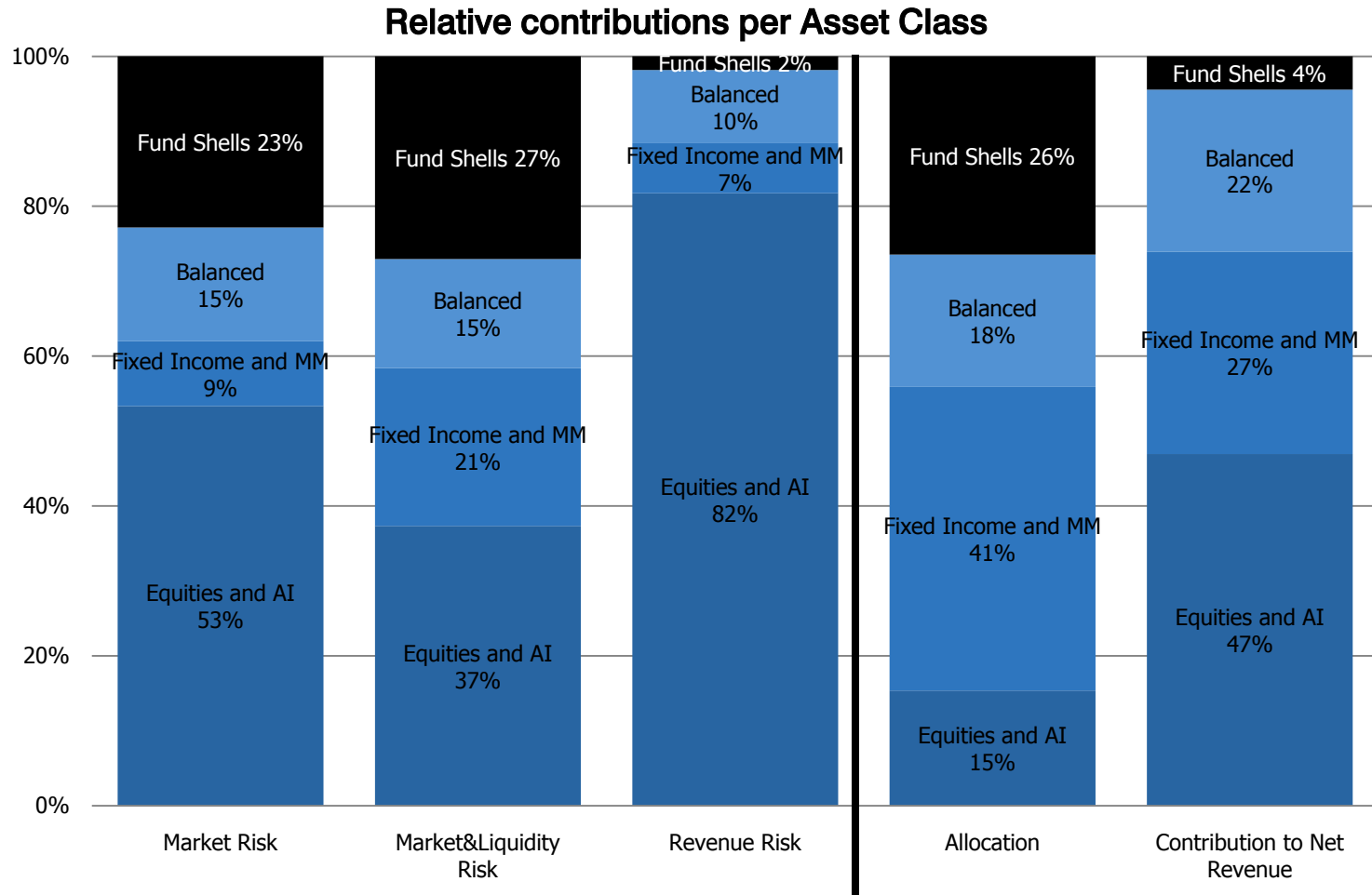
Contributions to revenue risk



- Diversification collapses when looking at contributions to revenue volatility.
- This reflects the interaction of high market volatility and high net revenues.
- A further drilldown into risk contributions on asset class level reveals that app. $\frac{3}{4}$ of the fluctuations in revenues are due to retail equity funds.
- Business risk is significantly driven by a small set of products with a comparably low share in AuM.

Results based on sample data

Analyzing the drivers of „Fees-at-Risk“



Results based on sample data

Integration in a company-wide risk management framework

Monitoring and Analysis

- Continuous monitoring of results
- Integration into internal risk reporting
- Establishment of internal warning limits
- Scenario Analysis and Stresstesting
- Sensitivity Analysis

Financial Planning and Budgeting

- Assessing confidence levels for revenues
- Calibrating cost budgets based on these levels
- Managing operational leverage (ratio of fixed to variable costs)
- Assess impact of product and sales strategies on business risk
- ICAAP

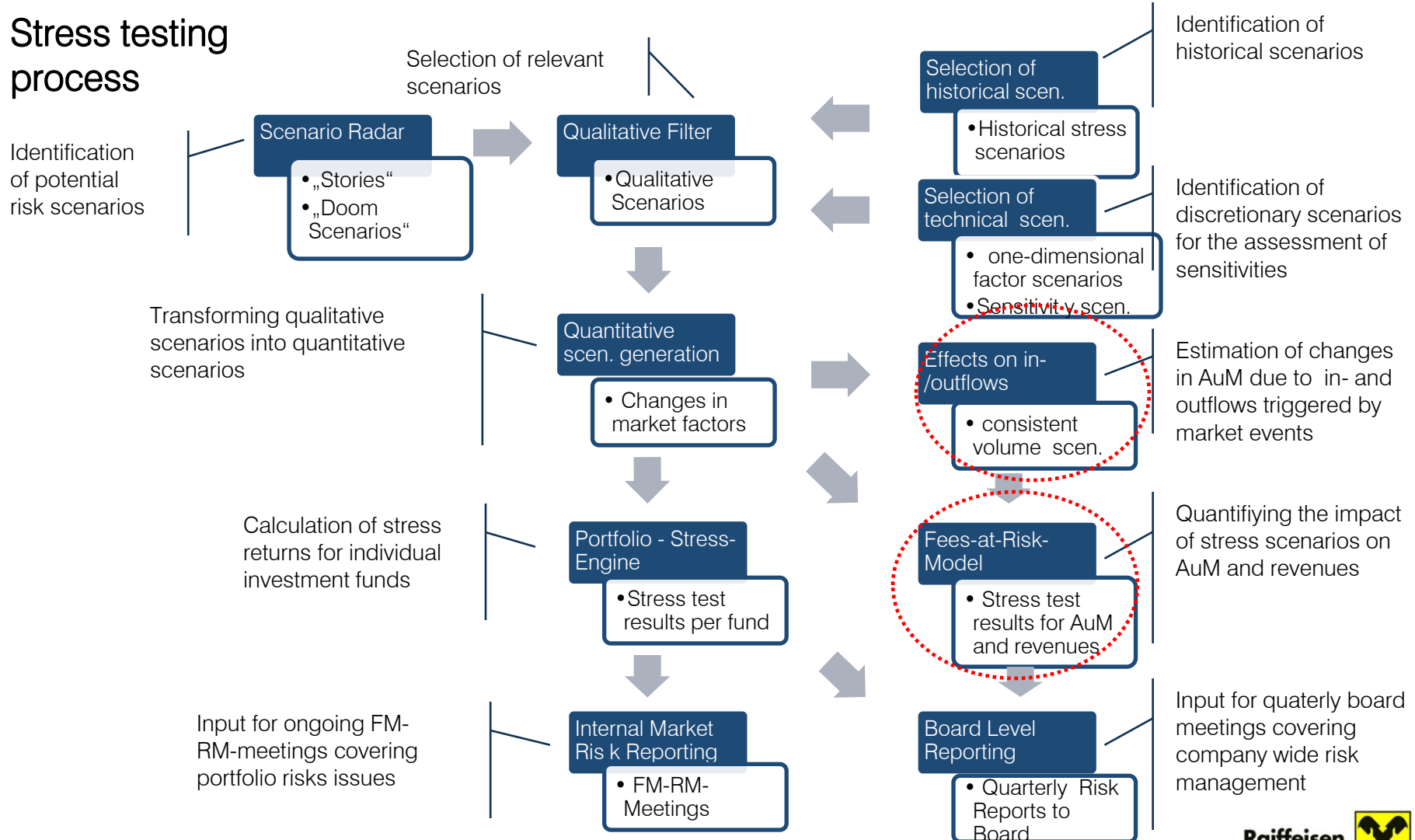
Integration in a company-wide risk management framework

Stresstesting

- Model allows for an easy integration of stresstesting and scenario analysis with respect to
 - Market risk scenarios
 - „Liquidity risk“ scenarios
 - Pressure on margins
 - Shifts in overall asset structure
- Central integrated process covering
 - Scenario generation
 - Stresstesting on portfolio level
 - Stresstesting for AuM and revenues on a company-wide scale
 - Integration in internal reporting

Integration in a company-wide risk management framework

Stress testing process



Disclaimer

This document was prepared and designed by Raiffeisen Kapitalanlage-Gesellschaft m.b.H., Vienna, Austria ("Raiffeisen Capital Management" or "Raiffeisen KAG"). Although all information contained therein has been carefully researched, it is for information purposes only, non-binding, based on the current state of knowledge of the persons responsible for its preparation at the time of its completion and subject to change by Raiffeisen KAG at any time without further notice. Raiffeisen KAG is exempted from all liability in connection with this document and the associated oral presentation, in particular with regard to the updated status, correctness and completeness of the included information / sources of information and the actual occurrence of the forecasts contained therein. Furthermore, no forecasts or simulated historical performance in this document constitute a reliable indicator of future performance. Regarding our clients whose home currency differs from the fund currency, we would like to point out that the yield may rise or fall also due to currency fluctuations.

The contents of this document constitute neither an offer nor a buying or selling recommendation nor an investment analysis. In particular, they shall not serve as a replacement for individual investment advisory services or other types of advisory services. Prior to investing in any of our products, we would be pleased to provide you with the full prospectus, which can be used for informational purposes and in addition to the services provided by your financial advisor. Concrete investments should not be made before an advisory appointment has taken place, which should consider the full prospectus. We would like to point out in particular that securities transactions are sometimes subject to a high degree of risk and that the tax treatment depends on the investor's personal situation and may be subject to future changes.

The performance is calculated by Raiffeisen KAG in accordance with the method developed by the OeKB (Österreichische Kontrollbank AG) on the basis of data provided by the custodian bank (in the event that the payment of the redemption price is suspended, using an indicative price). Individual costs such as the subscription and redemption fees have not been included in the performance calculation. Where these costs are included this will result in a lower performance figure according to the amount of the subscription and redemption fees. The maximum level of the subscription and redemption fees may be found in the simplified prospectus. Past performance results do not permit any reliable inferences as to the future performance of an investment fund. Performance is shown as a percentage (excl. charges) while considering reinvestment of dividends. Current versions of the published prospectuses for the investment funds described in this document (including all changes since their initial publication) are available at www.rcm.at

The information and data contained in this document, in particular texts, parts of texts and picture material, may not be reproduced without Raiffeisen KAG's prior approval.