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Asset management for financial institutions

- What consequences and opportunities for improvement result arise for the risk management against the background of the investment results of 2008

by Hauke Hess and Dirk Rogowski

If the capital market theory in form of the Capital Asset Pricing Model (CAPM), and the Value-at-Risk (VaR) method, were actually consistent with the investment reality, then the analysis, evaluation, control and monitoring of investment portfolios would be relatively easy. This is admittedly a somewhat provocative thesis. Based on the experience of 2008, however, it can be demonstrated that the currently applied theory failed, what the consequences were and what opportunities for improvements there are, in particular for asset managers whose income streams are usually directly related to the value of the managed assets.

1. What happened so far

An asset-liability study was typically prepared as a basis for the derivation of an optimal investment portfolio. The determination of the optimal portfolio was usually done using the CAPM. Correlation assumptions, assumptions about the normal distribution of returns and the assumption of a linear relationship between expected income and risk on the capital market line are just some of the conditions for the application of this theory. Assuming the validity of these assumptions, the statements of the CAPM are absolutely correct. The next step would have been to estimate a loss for the optimal portfolio with the help of the VaR. Treating the loss approximation as the “risk capital”, is a concept institutional investors can well understand.

This is, more or less, how most institutional investors would have started the year 2008. In general, the risk capital budget was sufficiently high on the basis of the years 2004 to 2007 and discussions regarding capital preservation concepts or methods of strict adherence to defined upper loss limits were probably rarely discussed.

In 2008 the CAPM and VaR witnessed a severe setback. Correlations did not work, the leverage of the optimal portfolio led to sometimes disastrous results, and the volatility as an indicator for risk provided fatally wrong signals. Furthermore, the assumption of a normal distribution of returns proved almost absurd. Institutional investors were constantly forced to reduce their optimal portfolio. It typically started with the asset classes with the highest volatility, since the VaR signals indicated this as necessary and correct.

As a result, by the end of 2008 many institutional investors had completely exited numerous asset classes. Participation in a market recovery was therefore impossible and the initial considerations which had originally led to the optimal portfolio became obsolete. At the same time the loss tolerance, or in other words, the originally proposed risk capital budget was often dramatically exceeded or at least reduced to a residual amount. This was of course often accompanied by a significant drop in assets under management with the resultant negative consequences for the income stream of asset managers. Despite this difficult starting position, many financial institutions continue to have the duty, to achieve a substantial part of their operating profit with their own treasury.

2. What can (should) be done differently in investment management?

Separation from theoretical ballast

The year 2008 was not the first investment year, which raised serious doubts on some theoretical assumptions of the capital market theory. Perhaps it is the proverbial last straw for one or the other theory component and its practical application.
Continuing to assume risk reduction on the basis of correlations during periods of stress, and therefore using correlations as input parameters for an optimal asset allocation, is now seen as questionable.
The fiction of the normal distribution of returns can be treated similarly. The VaR in its standard implementation with a 99 percent confidence level can be viewed skeptically. Following this calculation is like driving and constantly looking in the back mirror. Just because the recent, or whatever, past chosen randomly for the calculation happened to be bearable, this is not an indication for a similar future. Furthermore, at high points of the market it encourages more risk taking because the volatility is very low.

Adapting parts of the capital market theory to the practical environment of institutional investors

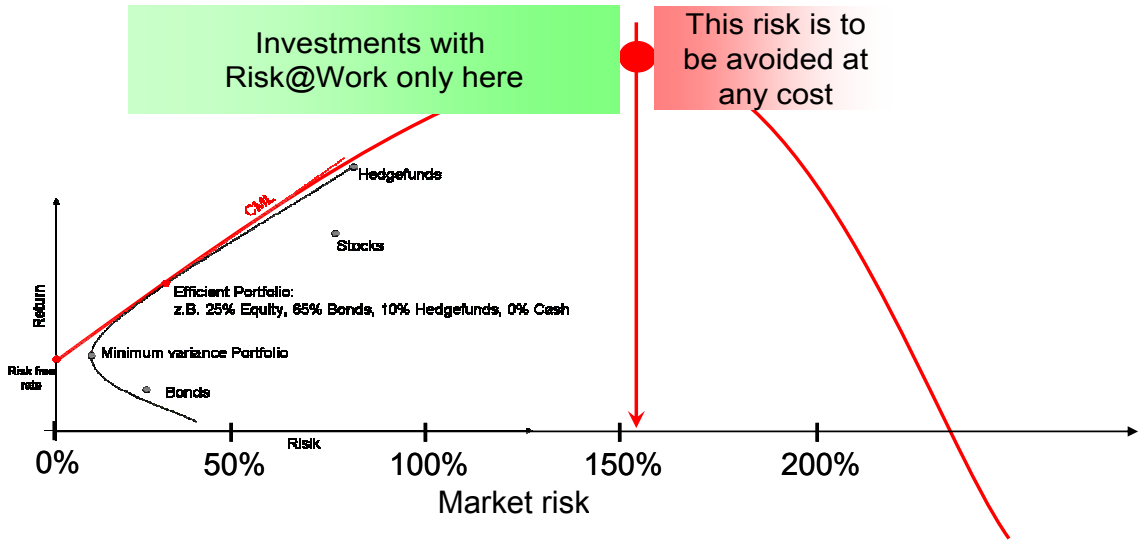
Consider the assumption of a linear relationship between risk and expected return. This relationship takes an unexpected turn when the components are adjusted to the practical environment of institutional investors. We believe that many regulators will in the future put more emphasis on the control of the risk coverage and the available risk capital. Assuming that the increase in capital is the objective of any investment, consequentially, the optimal protection of the capital is a must in risk control terms. Furthermore, it can be assumed that each investor has a pre-identified loss tolerance.
Loss tolerance, or in other words, risk capital is the necessary pre-condition for successful inter action in the capital market, since only in the presence of risk capital can achieve excess returns. Given that the risk capital is the only driver for excess returns, the total portfolio volume that should be exposed to market risk is no longer an independent parameter of the allocation process, it becomes a function of the risk budget instead. Beside the decision of an optimal asset allocation, a second dimension enters the picture: how many times can the risk budget be invested in the allocation portfolio, connecting risk budget and allocated portfolio volume by a factor, the multiple of the risk budget. For example a risk budget of 1 Mio. USD can be invested 10 times in S&P500 stocks resulting in a 10 Mio. USD portfolio of stocks. It also can be invested 50 times in US treasuries, resulting in a 50 Mio. USD portfolio of bonds. But: Would it be reasonable to invest 1 Mio. USD of risk capital with a multiplier of 50 into S&P 500 stocks without risking to lose the whole risk budget during a bad day?

In order to prevent the risk of using up the risk capital completely, the primary questions about portfolio allocations change to:
1) What is the maximum multiple I should apply to my risk capital to derive a reasonable market exposure, so that an optimal investment performance is achieved relative to my risk capital?
2) What is the maximum multiple I can apply to my risk capital, so that the risk capital is never completely used up?

Altering the risk perspective, using this criteria leads to a curvature of the capital market line.

More risk does not automatically result in more return (see Figure 1). A proven practical method to apply this risk perspective is called Risk@Work. The detailed explanation of the theoretical foundations of Risk@Work is presented in a separate paper.

Figure 1 - Relation between market risk position and return taking into account risk capital restrictions (schematic)



3. Risk@Work as a tool for risk mangement

We expect that going forward many regulators will take into account the business strategy, when examining the risk strategy. This means in asset management that in the context of the business strategy, the chosen asset classes and relevant income parameters constitute a constraint for the evaluation of the risk strategy. If however, Risk@Work is used as an implementation method for investments, then, in the context of the business strategy, the management determines what return expectations must be met to achieve the business objectives and with what asset classes this will be achieved with. Return expectations which significantly exceed the prevailing interest rate for risk-free investments (Eonia) clearly indicate the necessity to increase risk capital requirements compared to previous periods in which the risk-free interest rate, might have exceeded the investor's return requirements.
The management then determines the available risk capital from the risk coverage potential. Following this stage in the investment process, Risk@Work comes into operation for the first time. Risk@Work uses the defined risk capital to determine the following:
- Is the income target realistically achievable with the available asset classes.
- Which asset class combinations are possible to achieve the required income.

If the Risk@Work method concludes that the earnings target was achievable in different historical market environments with the risk capital and the available asset classes, then the optimization is done taking into account historic returns as well as market forecasts of the asset manager, where

available and desired by the investor. This does not involve calculating portfolio weightings rather it uses factors to invest the risk capital per asset class.

The result is a portfolio, which exactly fits the risk capital and ensures the optimal growth of the risk capital. In contrast to usual practices, this optimal portfolio structure is periodically rebalanced. The more liquid the asset class, the more often the portfolio is rebalanced. Consequently, gains in individual asset classes are continuously re-distributed across the entire portfolio and poor performance of asset classes is temporarily covered. Importantly it is the total available risk capital that is relevant, not which asset class has just gained or lost.
What exactly makes the Risk@Work method unique and why it is ideally suited to meet the requirements we expect to be introduced? In essence, it takes a different approach to the risk control process.

1. Risk identification
Risk@Work identifies the market risk for each asset class based on worst-case scenarios.

2. Risk analysis and assessment
The detailed analysis for each asset class is influenced by the liquidity of the asset class. For a hedge fund, for example, it may be nine months. Then the worst case is set to correspond to the minimum holding period. In addition a qualitative assessment is applied to the worst case scenario in coordination with the investor. This effectively means it is decided, what additional safety margin is applied to the previously observed worst case.
For the evaluation of the worst-case risk at portfolio level, Risk@Work calculates the loss with a 1: 1,000,000 probability. This shows that the quality of the probability of the Risk @ Work method as it has an entirely different level than VaR. In its calculations, Risk@Work does not assume that the past performance is a reliable input, but it also combines numerous possible past performances randomly. For example in the simulation October 1987 might be combined for U.S. stocks with October 2008 for high yield and still the risk capital of the portfolio has to be able to withstand this. The calculation of VaR is based on the pre-condition of generally stable asset correlation. These are derived from historical market data assuming that all past market periods included in the calculation are a reliable source for market movement in the near future. Significantly, Risk@Work avoids the pitfalls of the VaR method that arise due to the change in correlations of asset classes during crisis. This leads to portfolios which will be robust, even in crisis periods. In autumn 2008, the effectiveness of the method was stress tested and it passed with flying colors.

3. Risk control
In Risk@Work, the available risk capital is the central reference value to control the risk. In regular intervals, depending on the portfolio structure, the optimal market risk position of the portfolio is set according to the available risk capital.

4. Risk monitoring and communication
For risk monitoring, of course, all the key numbers such as VaR and volatility can be determined and be aggregated for a financial institution if desired and available. In addition, Risk@Work provides transparency at all times about the utilization of risk capital for individual asset classes, or entire portfolios, and whether the necessary revenue targets are still realistically attainable with the current risk capital. The customer is able to make available additional risk capital, if his market assessment or that of his adviser changes. The link between the return requirements from the business strategy and the restrictions of the risk strategy is effective, and covers the requirements both practical and regulatory, demanded by many regulators.

5. Conclusion

Risk@Work is a method that overcomes many shortcomings of the traditional capital market theory and translates it into a risk management application. The risk capital is the central factor and the risk capital utilization is constantly monitored and dynamically controlled.

The practitioner's most astonishing result of Risk@Work had already been identified in the summer of 2007. Even back then Risk@Work demonstrated that in a DAX-REX portfolio a share rate of higher than 15% percent is not optimal. The year 2008 has not changed this. This poses the serious question of whether, after the investment results of 2008, all the typical quantitative models and risk systems should be placed under review and come under renewed scrutiny for their lack of success.

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