2.4 PORTFOLIO RISK IN THE STANDARD MODEL. pdf

1: Chapter 1 The Scope of Corporate Finance

The risk of a portfolio is measured using the standard deviation of the portfolio. However, the standard deviation of the portfolio will not be simply the weighted average of the standard deviation of the two assets.

How to Calculate the Variance in a Portfolio by Bradley James Bryant ; Updated July 27, In the financial world, risk is the nemesis of return; that is, investors are usually forced to find the balance between the two, but most would prefer a no-risk, high-return investment. As a result, there are numerous measurements for risk in the investment community. One of the most popular is variance, which is the spread of values around the average return. The square root of variance is standard deviation, which is viewed as a measure of volatility. Step 1 Obtain the average return for each asset in your portfolio. Step 2 Subtract the mean from each return number. The mean is the average or the sum divided by the number of assets, which in this case equals The three subtraction results are 8. Step 3 Square each return result. The three results are 4. Step 4 Sum the squares. Step 5 Divide the sum by the number assets in the portfolio. The answer is This is the variance for the portfolio, which represents the average fluctuation in the portfolio. The square root of Tips Variance is difficult to interpret directly, so standard deviation is used instead. In the example presented, the standard deviation is 4. One standard deviation translates into a probability of 68 percent. Therefore, about 68 percent of the time, you would expect the portfolio return to be between 4. Warnings Variance and standard deviation should be applied to "normal" data, that is, data that clusters equally around an average value. Skewed and outlying data can reduce the significance you attach to variance and standard deviation.

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2: Portfolio Returns and Risks; Covariance and the Coefficient of Correlation

A hypothetical million-dollar portfolio is constructed to reduce risk in a decelerating economy. Risk is defined by the Morningstar Bear Ranking System, correlation to my Investment Model Risk.

This model is overly simple, and while it is computationally efficient, it also suffers a number of serious drawbacks. These drawbacks are listed below with information on how SmartFolio handles each of them. Conventional software SmartFolio Since the Markovitz model is single-period, you are not allowed to rebalance your portfolio during its lifespan. This might be OK for short-term investments, but is a serious problem for long-term investment plans. We have placed continuous-time portfolio theory at the heart of SmartFolio. This approach is much more realistic as it enables you to rebalance your portfolio from time to time. Using our built-in tools, you can construct portfolio strategies that not only benefit from rebalancing, but also minimize rebalancing transaction costs. The Markowitz model assumes that the parameters which define market state are known. This applies to the expected returns and volatilities of assets, as well as asset interdependencies, measured using correlations. This assumption together with the common practice of replacing these values with their sample counterparts leads to unjustifiably risky portfolios with weights concentrated in a small number of assets. As a result, in the real world, portfolios obtained in such a way often perform quite poorly. SmartFolio implements various techniques to handle this problem, known as parameter uncertainty. Markowitz assumed that asset returns are normally distributed. Unfortunately even such "regular" assets as stocks and bonds deviate slightly from normality. This is particularly true for more complicated financial instruments such as derivatives or hedge funds. Along with standard analytical methods that utilize normal distribution of returns, SmartFolio includes tools that enable you to test and optimize your portfolios directly on historical data. Thus, combining these two methods allows you to achieve the best result. Portfolio selection in the Markovitz model is based on the Risk-Reward criterion: Along with the standard utility-based approach, SmartFolio incorporates another technique of determining your investment goal. This is based on the assumption that what you care most about when selecting your portfolio is the probability that your portfolio beats the target growth rate. Rates and probabilities are well-defined and very intuitive notions; therefore there is a much lower chance that you will not be satisfied with your investments just because your goals were estimated incorrectly.

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3: Expected Return, Variance And Standard Deviation Of A Portfolio

An Introduction To Risk And Return; Expected Return, Variance And Standard Deviation Of A Portfolio Expected Return For a simple portfolio of calculate the stock's variance and.

The expected return of this portfolio is calculated thus: Standard deviation, as applied to investment returns, is a quantitative statistical measure of the variation of specific returns to the average of those returns. One standard deviation is equal to the average deviation of the sample. Hence, portfolio risk can be reduced by diversificationâ€"choosing individual investments that rise or fall at different times from the other investments in the portfolio. For most portfolios, diversifiable risk declines, quickly at first, then more slowly, reaching a minimum with about 20 - 25 securities. However, how rapidly risk declines depends on the covariance of the assets composing the portfolio. Portfolio risk consists of 2 components: Systemic risks, also known as systematic risks, are risks that affect all assets, such as general economic conditions, and, thus, systemic risk is not reduced by diversification. Diversifiable risks are risks specific to particular assets, such as factors that affect particular businesses and their stocks. Diversifiable risks can be reduced to the extent that the coefficients of correlation of the assets in the portfolio approaches 0. For instance, when interest rates rise, stocks tend to go down as margin interest rises making it more expensive to borrow money to buy stocks, which lowers their demand, and therefore their prices, while higher interest rates also causes investors to move more money into less risky securities, such as bonds, that pay interest. Covariance is a statistical measure of how 1 investment moves in relation to another. If 2 investments tend to be up or down during the same time periods, then they have positive covariance. If the highs and lows of 1 investment move in perfect coincidence to that of another investment, then the 2 investments have perfect positive covariance. If 1 investment tends to be up while the other is down, then they have negative covariance. If the high of 1 investment coincides with the low of the other, then the 2 investments have perfect negative covariance. The risk of a portfolio composed of these assets can be reduced to zero. If there is no discernible pattern to the up and down cycles of 1 investment compared to another, then the 2 investments have no covariance. An uncorrelated investment pair would have a correlation coefficient close to zero. Note that since the correlation coefficient is a statistical measure, a perfectly uncorrelated pair of investments will rarely, if ever, have an exact correlation coefficient of zero. The most diversified portfolio consists of securities with the greatest negative correlation. A diversified portfolio can also be achieved by investing in uncorrelated assets, but there will be times when the investments will be both up or down, and thus, a portfolio of uncorrelated assets will have a greater degree of risk, but it is still significantly less than positively correlated investments. However, even positively correlated investments will be less risky than single assets or investments that are perfectly positively correlated. However, there is no reduction in risk by combining assets that are perfectly correlated. Correlations can change over time and in different economic conditions. Interest rates were lowered to boost the economy, which caused real estate prices to increase significantly from - Hence, real estate prices were increasing while stocks were either declining, or not increasing by nearly the same rate. This reflects the general negative correlation between the stock market and the real estate market. The real estate market was forming a bubble due to the extremely low interest rates at the time. The bubble finally burst in , and especially , leading to the â€" credit crisis. The fast increase in prices was not due to demand, but due to the transfer of money from assets doing poorlyâ€"stocks and real estateâ€"to commodities and future contracts. In other words, it was another bubble. However, as credit dried up, due to the prevalence of many defaults of subprime mortgages, almost every investment came crashing down in September and October of Only United States Treasuries , which are virtually free of credit-default risk, rose significantly in price, driving their yields down proportionately, with the yields of short-term T-bills reaching almost zero. So the corollary of this story is that correlations can and do change, and that investments always have some risk. Calculating the Covariance and Coefficient of Correlation between 2 Assets In this section, we will actually calculate the covariance and the coefficient of correlation between 2 assets, which is the simplest case, based on the following table:

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4: SmartFolio: Asset Allocation | Portfolio Optimization | Risk Management

Not only are the weights of the assets in the portfolio and the standard deviation for each asset in the portfolio needed, the correlation of the assets in the portfolio is also required to.

History[edit] The term post-modern portfolio theory was created in by software entrepreneurs Brian M. Rom and Kathleen Ferguson to differentiate the portfolio-construction software developed by their company, Investment Technologies, from those provided by the traditional modern portfolio theory. It first appeared in the literature in in an article by Rom and Ferguson in The Journal of Performance Measurement. It combines the theoretical research of many authors and has expanded over several decades as academics at universities in many countries tested these theories to determine whether or not they had merit. This internal rate of return IRR is the link between assets and liabilities. The result is substantially different portfolio constructions. Hal Forsey and Dr. Rom coined the term PMPT and began using it to market portfolio optimization and performance measurement software developed by his company. These systems were built on the PRI downside risk algorithms. This was intended as a graduate seminar text in portfolio management. A more recent book by Sortino was written for practitioners. The first publication in a major journal was co-authored by Sortino and Dr. Robert van der Meer, then at Shell Oil Netherlands. The concept was popularized by numerous articles by Sortino in Pensions and Investments magazine and Dr. Sortino claims the major contributors to the underlying theory are: Peter Fishburn at the University of Pennsylvania who developed the mathematical equations for calculating downside risk and provided proofs that the Markowitz model was a subset of a richer framework. Bradley Efron, Stanford University, who developed the bootstrap procedure for better describing the nature of uncertainty in financial markets. William Sharpe at Stanford University who developed returns-based style analysis that allowed more accurate estimates of risk and return. By defining investment risk in quantitative terms, Markowitz gave investors a mathematical approach to asset-selection and portfolio management. But there are important limitations to the original MPT formulation. Two major limitations of MPT are its assumptions that the variance [2] of portfolio returns is the correct measure of investment risk, and the investment returns of all securities and portfolios can be adequately represented by a joint elliptical distribution , such as the normal distribution. Stated another way, MPT is limited by measures of risk and return that do not always represent the realities of the investment markets. The assumption of a normal distribution is a major practical limitation, because it is symmetrical. Using the variance or its square root, the standard deviation implies that uncertainty about better-than-expected returns is equally averred as uncertainty about returns that are worse than expected. Furthermore, using the normal distribution to model the pattern of investment returns makes investment results with more upside than downside returns appear more risky than they really are. The converse distortion applies to distributions with a predominance of downside returns. The result is that using traditional MPT techniques for measuring investment portfolio construction and evaluation frequently does not accurately model investment reality. It has long been recognized that investors typically do not view as risky those returns above the minimum they must earn in order to achieve their investment objectives. They believe that risk has to do with the bad outcomes i. This view has been noted by researchers in finance, economics and psychology, including Sharpe Markowitz suggests that a model based on the semivariance would be preferable; in light of the formidable computational problems , however, he bases his MV analysis on the mean and the standard deviation. At the same time, a more robust model for the pattern of investment returns, the three-parameter lognormal distribution , [4] was introduced. Downside risk Downside risk DR is measured by target semi-deviation the square root of target semivariance and is termed downside deviation. It is expressed in percentages and therefore allows for rankings in the same way as standard deviation. An intuitive way to view downside risk is the annualized standard deviation of returns below the target. Another is the square root of the probability-weighted squared below-target returns. The squaring of the below-target returns has the effect of penalizing failures quadratically. This is consistent with observations made on the behavior of individual decision-making under d.

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5: Backtest Portfolio Asset Allocation

This is the variance for the portfolio, which represents the average fluctuation in the portfolio. The square root of percent squared, or , in percent units, is the standard deviation, a measure of volatility.

6: Portfolio allocation models

Post-modern portfolio theory (or PMPT) is an extension of the traditional modern portfolio theory (MPT, which is an application of mean-variance analysis or MVA). Both theories propose how rational investors should use diversification to optimize their portfolios, and how a risky asset should be priced.

7: Post-modern portfolio theory - Wikipedia

Modern portfolio theory (MPT), or mean-variance analysis, is a mathematical framework for assembling a portfolio of assets such that the expected return is maximized for a given level of risk.

8: How to Calculate the Variance in a Portfolio | Pocket Sense

theory (APT), introduced by Ross (), involves neither a market portfolio nor a risk-free asset and states that a multifactor model of the form () should hold approximately in the absence of arbitrage for suï¬ƒciently large m.

9: Portfolio Risk and Return

The relevant risk, the risk for which investors should be compensated, is that portion of the total risk that cannot be diversified away. true Dividing the standard deviation of the returns of a stock by the stock's expected return gives us the stock's _____.

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Mr. Gladstone and the nationalities of the United Kingdom. History alive the medieval world and beyond chapter 21 The lost trappers Nemesis by anna banks Combinatorics and computer science My cloud pro series pr4100 Estimating causal effects using a regression-continuity approach addin Cognitive systems engineering Individuals are more important than ever With Beauty Before Me Violence and Factual Television (Public Opinion Broadcasting Standards) Catalog of the modern Greek collection, University of Cincinnati. Small and Large Intestine Painting landscapes In situ fragment-based medicinal chemistry : screening by mass spectrometry Sally-Ann Poulsen and Gary H. Diakonia in the classical Reformed tradition and today Aspects of political theory Eju exam past papers Cellular bioenergetics: ATP and O2 Internet audiences Trading secrets of the inner circle Stalin Must Have Peace Getting to happy One note large crashing I Was a Teenage Fairy (Ageless Books) Drawing a contemporary approach 6th ed Functional programming languages in education Disneys Best for Female Singers Hong Kong, 1841-1870 : all the servants in prison and nobody to take care of the house Christopher Munn Intermediate accounting books Grudge bearer by gav thorpe Magnetodynamic phenomena in the solar atmosphere The adventure of the peerless peer Mark Todds Cross Country Handbook Corporate Vices, Business Virtues Zeolites As Catalysts, Sorbents, and Detergent Builders: Applications and Innovations The Spanish conspiracy Cucet entrance exam books Order in music offers harmony in life Most ancient of all splendors