

Explanations for Entries on the BIRRXL Reports

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Portfolio Variance Report

This report summarizes the risk exposure characteristics of a portfolio based on its composition as of a certain date.

Basic Information

This section of the report identifies the portfolio and its benchmark and the number and value of the portfolio's assets, including summary information on assets not found in the BIRR database.

Portfolio: The name of the portfolio.

Benchmark: The name of the portfolio's benchmark.

Total Value: The total dollar value of the portfolio as of the holdings date.

Holdings Date: The date of the holdings information on which the report was based.

Model Date: The ending date of the 72-month historical analysis period used.

Total Assets: The number of assets in the portfolio.

Missing Assets: The number of portfolio assets not found in the BIRR database, and the percent of total market value of portfolio holdings in these missing assets.

Macroeconomic Risk Exposure Comparison

This section of the report provides basic risk exposure information. Risk exposures are unitless numbers (betas) representing an asset's sensitivity to the different macroeconomic risks. The columns show the exposures for the benchmark, the portfolio, the difference (portfolio minus benchmark), and the difference in units of standard deviations across a universe of several thousand stocks. The latter information is useful in determining whether the portfolio is markedly different from the benchmark in any of these variables and hence taking an intentional or unintentional bet on some aspect of the broad economy.

Brief explanations of the various risk factors are given below. More complete explanations are given in the paper "Using Macroeconomic Factors to Control Portfolio Risk" by Edwin Burmeister, Richard Roll, and Stephen A. Ross.

Confidence Risk: Sensitivity to investor confidence. It is measured by the return difference between relatively risky long-term corporate bonds and safe long-term government bonds. A positive return difference reflects narrowing of the required yield spread between risky and safe investments. Often small stocks have greater sensitivities to Confidence Risk than large stocks.

Time Horizon Risk: Sensitivity to investors' desired time to payouts. It is measured by the return difference between long-term government bonds and 30-day Treasury bills. A positive return difference means that the price of long-term government bonds has risen relative to the price of 30-day Treasury bills. This is a signal that investors require a lower yield compensation for holding investments with relatively longer times to payouts. Generally growth stocks are more sensitive to Time Horizon Risk than value stocks.

Inflation Risk: Sensitivity to an unexpected drop in the inflation rate. A positive exposure means that asset price will rise in response to an unexpected drop in the inflation rate (or fall in response to an unexpected increase). (Note that in BIRR technical documentation the algebraic sign of this measure is reversed. It was changed for these reports so that all positive factor realizations represent "good news" about the economy that causes asset prices to increase.) Firms selling products that are "luxuries" tend to be more sensitive to Inflation Risk than firms selling "necessities."

Business Cycle Risk: Sensitivity to an unexpected increase in the real (inflation adjusted) growth rate of the U.S. economy. A positive exposure means that asset value will rise in response to an increase in the growth rate and fall in response to a decrease. Firms such as retail stores that do well when business activity increases tend to be more sensitive to Business Cycle Risk than firms such as utility companies whose business activity is more constant over the business cycle.

Market Timing Risk: Sensitivity to unexpected increase in the value of the stock market (as measured by the S&P 500 Index) not accounted for by any of the foregoing macroeconomic factors. For assets with negligible exposures to all the other factors, this sensitivity is nearly identical to the CAPM Beta.

BIRR Risk Index: A single overall risk measure for a stock or portfolio conceptually similar to the CAPM Beta. For assets with zero exposures to the other factors, the BIRR Risk Index is numerically equal to the CAPM Beta, so it can be thought of as a CAPM Beta adjusted for exposure to the other factors. (Technically, it is defined as the standard deviation of the systematic risk for the asset divided by the standard deviation of systematic risk for the S&P 500. "Systematic risk" is the risk that is attributable to exposure to risk factors, as opposed to risk specific to the asset.)

BIRR R-squared: A measure of how well the BIRR model explains the behavior of stocks in the portfolio. An R-squared of 0.9, for example, would mean that 90 percent of the variance of the weighted returns history for the stocks currently held is explained by the BIRR model.

CAPM Beta: The Capital Asset Pricing Model's single measure of an asset's or a portfolio's sensitivity to fluctuations in the S&P 500 Index.

CAPM R-squared: A measure of how well the CAPM model explains the behavior of stocks in the portfolio. (Since the BIRR model is a generalization of the CAPM, the BIRR R-squared is always at least as great and almost always is greater.)

Risk Decomposition

This section of the report gives a breakdown of the variance of the benchmark, of the combined variances of the current holdings in the portfolio (taking into account their weights and covariances), and of the predicted active variance (variance of the difference between portfolio component and benchmark returns), in terms of BIRR risk model factors. In each column both the value of the variance and its percentage of the total variance is given. (Percentages are computed in terms of absolute value.)

Macroeconomic Factors: This is the overall contribution to variance of the five macroeconomic risk factors broken out below.

Confidence Risk, Time Horizon Risk, Inflation Risk, Business Cycle Risk, Market Timing Risk: See above for explanations of these risk factors.

Fundamental Factors: This is the overall contribution to variance of the three residual financial factors broken out below.

Small Firm Risk: Variance attributable to correlation with an index of small stocks.

Low P/E Risk: Variance attributable to correlation with an index of stocks with lower than average P/E ratios.

High P/E Risk: Variance attributable to correlation with an index of stocks with higher than average P/E ratios. Note that it is possible for an asset to be positively exposed to both Low P/E Risk and High P/E Risk.

Sector Exposures: This is the overall contribution to variance of the seven residual economic sectors broken out below.

Agric, Oil, Mine, Constr: Variance attributable to correlation with an index of companies primarily engaged in the agriculture, petroleum, mining, and construction sector.

Light Industry: Variance attributable to correlation with stocks of companies primarily engaged in the light industry sector.

Manufacturing: Variance attributable to correlation with an index of companies primarily engaged in the manufacturing sector.

Transport, Util, Comm: Variance attributable to correlation with an index of companies primarily engaged in the transportation, utilities, and communications sector.

Merchandising: Variance attributable to correlation with an index of companies primarily engaged in the transportation, utilities, and merchandising sector.

Finance: Variance attributable to correlation with an index of companies primarily engaged in the financial sector.

Services, Health Care: Variance attributable to correlation with an index of companies primarily engaged in the services and health care sector.

Residual Variance: Variance not accounted for by the model.

Treasury Bills: The variance of 30-day Treasury bill returns.

Total (Benchmark): The historical 72-month variance of the portfolio.

Total (Portfolio): The total variance of components in the portfolio, taking into account covariances.

Total (Active Variance): The square of the Predicted Tracking Error for the portfolio in comparison with the benchmark, given the current composition.

Predicted Tracking Error: An estimate of future standard deviation of the difference in returns between the portfolio and its benchmark.

Portfolio Components Report

Following the basic portfolio information (described above), this report gives a breakdown of portfolio risk exposure by components. The first line (after the headings) gives information for the portfolio as a whole; the remaining lines show data for the individual components. You can sort the components by any column; simply click in that column below the header and then click the “Sort” button.

Ticker

The ticker symbol for the holding.

Asset Name

The holding’s name. (May be truncated for reasons of space.)

Risk Index

The BIRR Risk Index for each component asset. See the explanation for the BIRR Risk Index on the Portfolio Variance Report.

Weight

The percentage of the portfolio’s value in this holding, not counting missing assets. That is, the values in the column add to 100 percent, even if there are missing assets.

Predicted Tracking Error

This section of the report breaks down Predicted Tracking Error by the contributions of the portfolio holdings. For an explanation of Predicted Tracking Error, see the Portfolio Variance Report.

MC

The column headed MC shows each asset’s marginal contribution to the portfolio’s Predicted Tracking Error. If you were to increase the holding in this asset by an amount equal to one percent of the current total portfolio value (without changing the investment in any of the other holdings), that would increase the portfolio’s tracking error by approximately the amount shown in the MC column. A smaller or larger increase would have a proportionally smaller or larger effect on tracking error. The smaller the change in the holding, the more precise is the predicted effect.

AC

The column headed AC shows each asset’s total contribution to the portfolio’s Predicted Tracking Error. That is, it shows how much of the portfolio’s Predicted Tracking Error is attributable to that particular holding. The value in the AC column on the portfolio line is the portfolio’s Predicted Tracking Error, which is the sum of the entries below and the same as the Predicted Tracking Error on the Portfolio Variance Report.

Macroeconomic Risk Exposure Differences from Benchmark

This section of the report breaks down the macroeconomic risk exposure differences between the portfolio and its benchmark by the contributions of the portfolio holdings.

(For an explanation of the different kinds of macroeconomic risks, see the Portfolio Variance Report.) The entries in this table provide a deeper understanding of contributions to tracking error. If two assets have similar marginal contributions to tracking error, for example, it is useful to know whether or not one of them has larger exposures to the two interest rate factors, especially if you're concerned that interest rates may soon change.

MC

Columns headed MC show each holding's marginal contribution to the portfolio's difference from the benchmark for the indicated risk exposure. If you were to increase the holding in this asset by an amount equal to one percent of the current total portfolio value (without changing the investment in any of the other holdings), that would alter the difference between the portfolio's risk exposure and that of the benchmark by approximately one percent of the amount shown in the MC column. (Note that the scaling is different from that of the MC column for Predicted Tracking Error.) A smaller or larger increase would have a proportionally smaller or larger effect on the risk exposure difference for this factor. The smaller the change, the more precise is the predicted effect.

AC

Columns headed AC show each holding's aggregate contribution to the portfolio's difference from the benchmark for that risk exposure. That is, it shows how much of the current difference is attributable to that particular holding. (The portfolio line shows the total difference for that type of risk exposure.)

Missing Assets Report

This report details the assets whose identifying tickers or CUSIPs were not found in the database, which contains more than ten thousand U.S. and Canadian equities. Missing assets are usually those with fewer than 24 months of returns history (the minimum sufficient to permit the necessary statistical analysis) or with a different identifier. (Tickers and even CUSIP numbers change, and there are variant ways of writing some tickers, particularly Canadian ones. BIRR follows Standard & Poor's ticker conventions.)

Portfolio Asset Returns Report

Following the basic portfolio information (described above), this report analyzes the level of historical weighted mean returns for the assets in the portfolio, based on the asset weightings as of the indicated date.

Macroeconomic Risk Exposure Comparison

This section of the report provides basic risk exposure information, similar to that in the Portfolio Variance Report but with more ways of looking at the risk exposure differences: the absolute difference, the difference in units of standard deviations (based on a universe of stocks with at least six years of return history), the difference as a percentage of the benchmark value, and the ratio of the portfolio value to the benchmark value. For more information on the BIRR risk factors, see the description of the Variance Report.

Risk Decomposition

This section of the report gives a breakdown of the 72-month mean return of the benchmark and of the weighted combination of the corresponding returns on the portfolio assets. (Where assets have fewer than 72 months of returns history, a comparable adjusted mean return is calculated statistically.) Other reports in the BIRR system are capable of analyzing the actual historical return of the portfolio based upon its varying composition over time.

Portfolio Component Returns Report

This tab is available only when using the BIRRXL2.xlt Excel report template.

Following the basic portfolio information (described above), this report gives a breakdown of portfolio risk exposure by components. The first line (after the headings) gives information for the portfolio as a whole; the remaining lines show data for the individual components. You can sort the components by any column; simply click in that column below the header and then click the “Sort” button.

Ticker

The ticker symbol for the holding.

Asset Name

The holding’s name. (May be truncated for reasons of space.)

Risk Index

The BIRR Risk Index for each component asset. See the explanation for the BIRR Risk Index on the Portfolio Variance Report.

Weight

The percentage of the portfolio’s value in this holding, not counting missing assets. That is, the values in the column add to 100 percent, even if there are missing assets.

Predicted Tracking Error

This section of the report breaks down Predicted Tracking Error by the contributions of the portfolio holdings. For an explanation of Predicted Tracking Error, see the Portfolio Variance Report.

MC

The column headed MC shows each asset’s marginal contribution to the portfolio’s Predicted Tracking Error. If you were to increase the holding in this asset by an amount equal to one percent of the current total portfolio value (without changing the investment in any of the other holdings), that would increase the portfolio’s tracking error by approximately the amount shown in the MC column. A smaller or larger increase would have a proportionally smaller or larger effect on tracking error. The smaller the change in the holding, the more precise is the predicted effect.

AC

The column headed AC shows each asset's total contribution to the portfolio's Predicted Tracking Error. That is, it shows how much of the portfolio's Predicted Tracking Error is attributable to that particular holding. The value in the AC column on the portfolio line is the portfolio's Predicted Tracking Error, which is the sum of the entries below and the same as the Predicted Tracking Error on the Portfolio Variance Report.

Predicted Wealth Ratio

This section of the report breaks down Predicted Wealth Ratio by the contributions of the portfolio holdings. The Predicted Wealth Ratio is the median of the "portfolio value"/"benchmark value" ratio at a 12-month time horizon. A Predicted Wealth Ratio larger than one means that you would expect your portfolio to outperform its benchmark more than 50% of the time.

MC

The column headed MC shows each asset's marginal contribution to the portfolio's Predicted Wealth Ratio. If you were to increase the holding in this asset by an amount equal to one percent of the current total portfolio value (without changing the investment in any of the other holdings), that would increase the wealth ratio by approximately the amount shown in the MC column. A smaller or larger increase would have a proportionally smaller or larger effect on wealth ratio. The smaller the change in the holding, the more precise is the predicted effect.

AC

The column headed AC shows each asset's total contribution to the Predicted Wealth Ratio. That is, it shows how much of the Predicted Wealth Ratio is attributable to that particular holding. The value in the AC column on the portfolio line is the portfolio's Predicted Wealth Ratio, which is the sum of the entries below.

Notes

1. Edwin Burmeister, Richard Roll, and Stephen A. Ross explain the BIRR model with equations in the paper "Using Macroeconomic Factors to Control Portfolio Risk."
2. For additional details, see the paper "Technical Notes about the BIRR[®] Reports for Excel" by Edwin Burmeister.