Bloomberg Market Concepts - Module 8

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05/21/2025

Portfolio Management: Defining a Portfolio Manager

Introduction

The world of a portfolio manager may seem fast and glamorous in the movies, but in reality, the role demands a great deal of thought, planning, and time. In this module, we'll explore the process a portfolio manager undertakes to build and maintain a portfolio. Portfolio management is inherently dynamic, as markets shift every day—often every minute. To keep up with these changes, portfolio managers rely heavily on tools like the Bloomberg Terminal to monitor and respond to evolving conditions. Mastering portfolio analytics enables you to demonstrate your value as an asset to any investment management firm. By the end of the Portfolio Management module, you will be able to describe the role of a portfolio manager, generate and research investment ideas, create a portfolio using screening tools, and use the PORT function to analyze both historical performance and risk metrics. You will also be able to evaluate future risks and opportunities for your portfolio using the same tools.

Defining a Portfolio Manager

Portfolio managers are professionals responsible for making investment decisions on behalf of others. Active portfolio managers face a myriad of daily challenges that may be political, economic, or operational in nature. In this section, you will learn to describe the differences between value, growth, and GARP (Growth at a Reasonable Price) stocks, and explain how an active manager differs from a passive manager. You will also explore the path an investment takes from its source to an investment consultant and finally to a portfolio manager, while discovering the range of challenges an asset manager may experience in that role. In this module, we'll step into the role of an equity portfolio manager, or PM, who focuses on large-cap, undervalued (or value) stocks within the S&P 500 index. As this PM, you are expected to maintain a long-term vision and remain unfazed by short-term market trends. But how did you get to this point in your career? What does a portfolio manager actually do?

A PM's Career

After graduating from university with a degree in finance, you joined the mutual fund Elixir Capital in Manhattan as a junior analyst. A mutual fund pools money from investors, and that money is managed by a portfolio manager who then invests it in the market. You supported a group of senior analysts, researching and conducting due diligence for specific sectors. Your group focused on the consumer discretionary and consumer staples sectors, and you generated trade ideas for your team's portfolio manager. After several years of work, you became adept at understanding these industries. Subsequently, the firm promoted you to a senior analyst role, and you began managing junior analysts. Over the years, you gained invaluable expertise in these sectors, ultimately generating a wealth of trade ideas for your portfolio manager. Using your recommendations, the portfolio manager was able to outperform the fund's benchmark each quarter. Because of your diligent and accurate work, you earned a promotion to co-manager and began working alongside the portfolio manager. Eventually, you took on more business and began managing more assets. Your years of dedication and investing deepened your understanding of the market, and you ultimately achieved your goal: a promotion to portfolio manager. And now you have a bogey—or a benchmark—to beat!

Investment Strategies

You have studied the markets over a long period of time and have observed that value stocks tend to outperform growth stocks. As a result, Elixir Capital has entrusted you with a $400 million value mandate. A mandate is an allocation of funds that must be managed within specific parameters. Given your experience, you feel confident in your ability to meet this mandate. Your investing style is bottom-up and value-oriented: you look for overlooked companies that are off the radar—typically those trading at lower price-to-earnings (P/E) ratios. Value stocks tend to have low P/E ratios and relatively high dividend yields. A value investor typically selects companies with solid financials that are undervalued by the market. These stocks are often ignored, yet they may represent significant opportunities—diamonds in the rough. A typical value manager is often seen as a maverick, going against mainstream sentiment to find undervalued assets. Alternative investment strategies include selecting growth stocks or GARP stocks. Growth investing focuses on companies with high earnings potential. These firms often lack the historical earnings to validate their projections, making them potentially riskier than value stocks. However, their strong growth outlook drives higher P/E ratios, as investors are willing to pay a premium for future returns. GARP, or Growth at a Reasonable Price, is a hybrid strategy that blends value and growth investing. It targets companies that fall somewhere between the two extremes, aiming for growth potential without overpaying for it.

How a Pension Plan Invests

As a portfolio manager, you are beholden to your asset owners' requirements. Big pension plans and insurance companies are typically the main asset owners of your fund. Here's how that process works. Large pension plans may manage their own funds internally, but smaller pension plans often lack the resources to do so. These smaller plans typically outsource fund management to investment consultants, whose job is to identify investment managers that align with the fund's goals. The consultants work closely with the pension plans to define their objectives and then search for portfolio managers like you to execute the strategy. One of your new clients is a U.S.-based state teacher pension plan. In this system, both the state school districts and the teachers contribute funds to ensure teachers have income in retirement. For the pension plan to remain sustainable, it must generate enough return to meet annual payouts to current retirees while also growing the fund to support future beneficiaries. In this case, the pension plan hires an investment consultant such as Towers Watson or Deloitte. The consultant starts by asking questions like: "What do you want your asset mix to be? Do you want to invest entirely in equities or in a mix of equities and bonds? What is your risk tolerance?" The pension fund determines that it needs at least an 8% return to sustainably fund pensions. After discussion, both parties decide that a 60/40 allocation (60% equities, 40% fixed income) would be the most effective diversified strategy. For the equity allocation, the investment consultant identifies several managers whose strategies align with the pension fund's objectives. After meeting with the pension plan representatives, the consultant requests proposals from the selected investment managers. This comes in the form of an RFP (Request for Proposal)—a document that outlines the plan's investment goals and solicits tailored strategies from each manager. You, as one of the selected managers, submit a proposal presenting your investment approach in hopes of winning the mandate. Congratulations! Your proposal is successful. The investment consultant recommends your fund, the pension plan agrees to invest with you, and they set a benchmark for you to beat.

Benchmarks

There are multiple benchmarks in the world of equity fund management. But what exactly are benchmarks? One way to explore this is to type the word "benchmark" into the Bloomberg Terminal command line and press Enter. Benchmarks are typically indices. And what is an index?

An equity index is a basket of stocks that is rebalanced or adjusted, typically on an annual basis. A benchmark serves as a relative performance measure, used to evaluate the success of a portfolio manager. If you, as a portfolio manager, cannot outperform your benchmark, investors may choose to allocate their capital to a passive, low-cost index fund instead—leaving your fund at risk of losing business. Your management style is active investment. This approach assumes it is possible to generate higher returns than the overall market through carefully selected strategies. The alternative is passive management, which aims to replicate

market performance by tracking an index. Investors following a passive approach might invest in an ETF (exchange-traded fund) that mimics a market index. A widely known example is the SPDR S&P 500 ETF offered by State Street, which mirrors the S&P 500 index composed of the top 500 U.S. stocks. A benchmark is essentially a point of comparison. You can use the Bloomberg Terminal's World Equity Indices function, or `WEI`, to access a list of major global indices. This screen displays index-level data, intraday price changes, and fundamental metrics like price-to-earnings (P/E) ratios and dividend yields. Benchmarking is a critical component of manager selection. Investment consultants will typically meet with you, the asset manager, at least twice a year to review your portfolio's performance and ensure alignment with stated objectives. You also have personal motivation to beat the benchmark. With your recent promotion, you may want to reward yourself with a beach house. But failing to beat the benchmark could result in losing both the client and your fee, which typically ranges from 1.5% to 2% of assets annually. Consider this: 2% of a $400 million mandate is $8 million—enough to buy that house in the Hamptons. So, your ability to consistently outperform isn't just a professional necessity—it's personal.

Performance: Luck or Skill?

After making the commitment to work with you, the pension plan's consultant will push hard—often through long and difficult meetings—to determine whether you're truly worth the cost. Did you genuinely earn the return, or was it just luck? Consultants rely on performance and attribution tools to help distinguish between skill-based performance and random outcomes. Consultants typically recommend that their clients diversify by investing in multiple funds rather than putting all their capital into one. This diversification can be achieved through various strategies and asset classes and is a crucial component in risk reduction. In other words, you have competition. When you first meet with these consultants during the RFP process, they'll ask questions like: "Are you a top-down investor? Or are you a bottom-up stock picker?" You respond by stating that you are an active manager who focuses on bottom-up analysis, conducting detailed evaluations and uncovering opportunities in individual companies. Later, during periodic performance reviews, the consultant will assess whether you are actually delivering results as the active stock picker you claimed to be. This evaluation is critical—any mismatch between your stated strategy and your actual results could damage credibility. To support your claims, you can use tools like PORT on the Bloomberg Terminal, specifically the Attribution function, to break down the sources of your returns and validate your strategy. But before any of that happens, you'll need to build your portfolio.

Summary

To summarize: a portfolio manager is responsible for making investment decisions on behalf of others. There are three main types of stocks that portfolio managers may target—value stocks, which are often overlooked bargains; growth stocks, which are expected to rise significantly in price; and GARP stocks, which represent a middle ground between growth and value. An active manager believes that it is possible to outperform the market through strategic decisions, while passive managers take the view that markets are efficient over the long term. Passive strategies aim to match the market's performance by replicating an index. Entities with significant capital to invest, such as pension plans, typically hire investment consultants. These consultants guide them through the RFP process to find the portfolio manager best suited to meet their goals. They also assist with ongoing performance reviews to ensure continued alignment. A key challenge for any asset manager is proving their value. Clients must be confident that their manager is delivering results as promised in order to safeguard the client's investments.

Portfolio Management: Generating Ideas for a Portfolio

Introduction

Portfolio managers and their teams of analysts often spend hundreds of hours researching investment ideas before constructing a portfolio. They use tools like EQS, the Equity Screening function, to define their investable universe. Once potential securities are screened, they dive into each company to assess whether it's worth buying. By the end of this section, you'll be able to use the Bloomberg Terminal to screen for

securities, simulate strategies by analyzing their historical performance through backtesting, and research companies for inclusion in a portfolio strategy.

Your Mandate

Let's begin by revisiting your strategy. Elixir Capital has given you a $400M value mandate. You have studied the markets over a long period of time and observed that value stocks tend to outperform growth stocks. Value stocks typically have a low price-to-earnings (P/E) ratio and offer a relatively high dividend yield. As a value investor, you prioritize selecting companies with strong financial statements and lower P/E ratios compared to the broader market. These companies often trade growth potential for dependability. Let's anchor idea generation in fundamentals by reviewing some key terms.

Price-to-Earnings Ratio

The P/E ratio, or price-to-earnings ratio, is the price of a stock divided by its earnings. This metric shows how much investors are willing to pay for each dollar of a company's earnings. For example, if a company earns $1 per share and has a P/E ratio of 10, that means investors are willing to pay $10 for every $1 of that company's earnings. To illustrate, let's examine the description page for General Mills, a packaged consumer foods manufacturer. By clicking on the Ratios tab, we can calculate the P/E ratio. The Last Px, or latest price, is $50.68. Dividing this by the trailing 12-month earnings per share of 3.18 gives a P/E of 16.0x at the time the screen was captured. This figure aligns with a value investing approach—it's a low P/E, though not extremely low. In contrast, growth companies tend to have high P/E ratios. For instance, in April 2019, Netflix had a P/E of 133.7x, meaning that optimistic investors were willing to pay $374.23 for every $2.80 of earnings. Companies with P/E ratios below 5 or 6 are typically considered distressed. Warren Buffett famously referred to these as "cigar butts"—businesses that might have a single puff of value left, but whose long-term viability is uncertain. Other companies with low P/E ratios may simply be in a mature phase of their business cycle. Take General Mills as an example: the company has been operating for nearly a century, consistently pays dividends, and does not actively invest in high-growth initiatives. It's a steady business with dependable returns. As such, it's a classic example of a value company—offering a higher dividend yield and a lower P/E ratio.

Dividend Yield

Dividend yield measures the return a company provides to its investors through dividend payments. Dividends are periodic distributions of a company's earnings made to shareholders. The dividend yield is calculated by dividing the annual dividends per share by the current price per share. For example, General Mills had a dividend yield of 3.9% when this screen was captured. However, unlike bond coupon payments, dividend payments are not guaranteed. Skipping a dividend would not impact the company's credit rating, whereas missing a bond coupon payment would. Consistently paying a dividend is viewed as a sign of financial stability—it signals that the company has sufficient cash flow to reward its investors. When we examine value companies that are well-established and have reached the peak of the business cycle, we typically find that they trade at lower P/E ratios and distribute dividends. However, some institutional investors—most notably Warren Buffett, a renowned value investor—prefer to assess companies using the price-to-book ratio instead of the P/E ratio.

Price-to-Book Ratio

The price-to-book (P/B) ratio of a company is calculated by dividing the market price of the company's stock by its book value per share. The book value is found by subtracting a company's liabilities from its assets on the balance sheet and dividing by the number of outstanding shares. This ratio tells investors how much they are willing to pay for each dollar of a company's book value. For example, if a company is trading at a price-to-book ratio of 0.9, that means investors value the company below its actual accounting value—often signaling distress. A P/B ratio less than 1 is generally seen as aggressive or speculative, much like exploring a company with a P/E ratio below 5. These are often referred to as "cigar butts"—distressed

businesses with possibly limited remaining value. However, this is only a general rule. During the 2008 financial crisis, nearly all major banks traded at a price-to-book ratio below 1. Wells Fargo, for instance, dropped 72% in value that winter. Although the market was pessimistic, some banks—including Wells Fargo—eventually recovered, with their price-to-book ratios rising above 1. For those who bought during the dip, it proved to be a worthwhile opportunity. This contrarian view is typical of value investors. When the market says "sell," they look for a reason to buy. Value investors assess whether a company is truly distressed or simply undervalued due to market sentiment. They examine the company's financials and balance sheet to determine its true standing. A price-to-book ratio below 1.5 is often considered a good deal, and below 1 suggests distress—but these benchmarks should be considered in context. For example, in early 2018, during a market upswing, it was rare to find price-to-book values below 2. In conclusion, as a portfolio manager, you and your team of analysts should keep three fundamental ratios in mind while screening for stocks: price-to-earnings, dividend yield, and price-to-book.

Equity Research

How do you generate ideas for your portfolio? You're going to return to your roots: research. You'll now collaborate with your analysts to select the right stocks. Fortunately, you already have a strong framework, built from your years of experience as an analyst. Your approach is grounded in value investing, with a strong focus on fundamentals. You're looking to invest in companies with a market capitalization greater than $20 billion, a price-to-earnings (P/E) ratio under 15, a price-to-book ratio greater than or equal to 1, and a dividend yield of at least 2.5%. Why the 2.5% dividend yield threshold? Because you want to ensure the return on these riskier investments exceeds that of the risk-free U.S. government bond market. Looking at the 10-year U.S. Treasury yield via the USGG10YR Index, you see the yield is currently 2.4%. So a 2.5% or higher dividend yield provides adequate compensation for taking on the additional risk of equity investing.

EQS: Equity Screening

To prove your philosophy and demonstrate to the investment community that you know what you're doing, you need to show that your strategy works in practice. While you have a strong track record as an analyst, you haven't yet proven yourself as a portfolio manager. To gain investor confidence, you must demonstrate that your strategy consistently outperforms the S&P 500 on a year-over-year basis. Using the Equity Screening function (EQS), you input specific criteria to filter for U.S. companies with a market capitalization of over $20 billion—signaling that they are well-established. Since the market cap field in EQS defaults to millions, you enter 20,000 to represent $20 billion. You then set additional filters: a price-to-earnings ratio under 15, a price-to-book ratio greater than or equal to 1, and a dividend yield of at least 2.5%. On the day this screen was run, 42 securities met your criteria. You click on WATC to review the list of companies. While you believe they're promising, you still need further evidence to support your selections. You then click on Actions and save the screen as "Value Screen" so that you can reference it later.

EQBT: Equity Backtesting

Now you want to backtest your strategy over the past ten years. Since your benchmark is the S&P 500, you'll use the SPY (the S&P 500 exchange-traded fund) as your universe. Given your screening criteria, you've identified 42 companies as of the selected date. Click on Backtest to see if historical data supports your strategy. Set the Analysis Period to go back ten years from the current screen date. We'll also go ten years relative to last month, choose to rebalance quarterly, and then click Update. Next, go into Analytic Parameters and select Equal Weight. Set the benchmark as the S&P 500 and click Update. Now run the model and save it as "Value Test." Note that it may take several minutes to generate the results. You'll receive a notification in your inbox once it's complete. You can also monitor progress in Equity Backtesting (EQBT). Once notified, open the results to evaluate performance.

Backtesting Results

If we click on the Counts tab, we'll see that at the time of this screen capture, there are 46 stocks in the investable universe, compared to the 42 we originally saw on the EQS page. This highlights how the

composition of the universe changes over time. The Counts tab provides monthly snapshots in sequential order. For example, as of February 28, 2019, 36 of the stocks remain the same, 5 are newly added, and 6 have been dropped. You can scroll through this list to observe how the basket of stocks evolves and to review the performance of the basket month by month. Returning to the Overview tab, we find that your portfolio has outperformed the benchmark by an average of 1.28% annually over the past ten years. While past performance doesn't guarantee future success, this historical data gives strong validation that your core investment strategy is effective.

WATC: Watchlist Analytics

Now that you've completed the backtesting process, you return to the Equity Screening page, pull up your saved screen labeled "Value Screen," and navigate to the WATC results page to examine each stock on your list. This list is only a starting point. The next step is to closely examine the financial statements and news associated with each company. You'll read research reports from the sell side—particularly from banks—and engage in direct meetings with companies. This includes speaking with chief financial officers (CFOs), chief executive officers (CEOs), investment executives, and sellside analysts. You're not going to build a portfolio just because the screen produced a list of companies with a P/E ratio under 15. At this stage of portfolio construction, you'll also assign research tasks to your team of analysts. There is a significant amount of due diligence required before any investment decisions are made.

DES: Security Description

For example, you've assigned one analyst to each sector, so you asked your pharmaceutical analyst to research Gilead Sciences Inc. The analyst begins by reviewing the company overview in DES. He finds that Gilead Sciences is a biotech company that discovers, develops, and commercializes therapeutics focused on diseases such as HIV, AIDS, liver disease, and serious cardiovascular and respiratory conditions. From the initial overview, the company appears to match the screening criteria. On the date the screen was captured, Gilead had a price-to-earnings ratio of 12.32 and a gross yield—equivalent to the dividend yield—of 3.87%.

CN: Company News

The analyst next investigates recent developments by using the Company News function, or CN. This tool allows him to browse headlines, gain deeper insights into the company, and understand public sentiment surrounding Gilead Sciences. He then clicks on Key Themes, a feature that uses artificial intelligence to organize news search results into thematic categories. This enables the analyst to quickly identify the most significant and relevant recent stories related to Gilead Sciences.

BI: Bloomberg Intelligence

The analyst also wants to examine the broader industry landscape. He returns to the Description screen and clicks on the Industry Info tab. From there, he navigates to the Primary Industry Dashboard to access the Bloomberg Intelligence (BI) Biotech Dashboard. This tool allows him to compare Gilead with other companies in the same sector and gain insights into general industry trends. For instance, by clicking on the Industry tab, he can explore Bloomberg's perspectives on companies and upcoming innovations within the biotech space. This type of information can significantly influence your investment decision as a portfolio manager—helping determine whether your firm should invest in Gilead Sciences.

FA: Financial Analysis

Along with company and industry research, the analyst also needs to understand the company's financials. To do this, he accesses Financial Analysis (FA) to obtain a consolidated and organized view of the company's reported financial statements. For instance, he can examine both recent and historical income statements and balance sheets to assess the company's solvency over time. On the Bloomberg Terminal, the analyst can trace every reported number back to its source in the original financial documents. For example, by navigating to the Income Statement (I/S) tab and clicking on the Cost of Revenue for 2016 (which shows

as 4,272), he can expand the plus signs to view breakdowns like Cost of Goods and Other Adjustments. Eventually, he will see a document icon. Clicking this icon reveals the original financial statement, with the relevant figure highlighted. The analyst uses these screens and other related tools to review all of his assigned securities, as well as any others that arise during research—even if they were not part of the original EQS screen. The goal is to be comprehensive and leave no stone unturned. Equity research is an ongoing process, constantly informing the overall quality of the portfolio.

Company Analysis

So what do portfolio managers (PMs) do that equity analysts don't? How do they determine what is overvalued and what is undervalued? Money managers typically evaluate companies in a variety of ways, leveraging the detailed information provided by the analysts. In essence, deep-dive research into a sector or company is performed by analysts and then reviewed by the PM. Analysts are expected to be experts in their coverage and often apply various valuation models to assess investment opportunities. One common approach is the Discounted Cash Flow (DCF) model, which was introduced in the Equities module. This model estimates a company's value by calculating the present value of its projected free cash flows. To apply this, your analyst opens the XLTP XDCF function and uses the spreadsheet to evaluate a company based on its expected future cash flows. Many analysts also build out their own models in Excel to conduct similar valuations.

Relative Valuation

Another method for valuing a company is relative valuation. Imagine you're buying a house and trying to determine its fair price. The seller lists it at $300,000—but how do you know that's accurate? One approach is to examine comparable houses in the same neighborhood. These comparables, or "comps," help you assess value by comparing key features. For instance, a neighboring house might be worth less if it only has two bedrooms or one bathroom. The same principle applies to companies. Suppose you're evaluating JPMorgan Chase & Co.'s stock. To decide whether to buy or wait, you compare JPMorgan to its industry peers—just like comparing houses in the same neighborhood. Is JPMorgan expensive, affordable, or undervalued compared to other banks? Let's say another analyst on your team is currently evaluating whether JPMorgan would be a good addition to the portfolio using this relative valuation approach.

EQRV: Equity Relative Valuation

Let's follow your analyst as she examines JPMorgan in the Equity Relative Valuation (EQRV) screen. In the upper left-hand corner, she sees that the stock is trading at $114. To determine whether that's cheap or expensive, she looks at comps listed at the bottom of the screen, such as Bank of America and Citigroup. However, she believes Morgan Stanley should be included in the list—and maybe Goldman Sachs as well. To update the comp list, she clicks the Edit pencil icon next to the Comp Source dropdown. She types "Goldman Sachs" into the amber field, selects it from the autocomplete, and repeats the process to add Morgan Stanley. Next, she clicks Save and names the comp group "Investment Banking Group." To streamline future analysis, she also checks "Set as my default for all group members," so she doesn't have to repeat this setup for each bank. After saving, she clicks Back to return to the main screen. Now, EQRV displays her custom peer group. She can see that the Comp Source is set to "My Comp Groups" and specifically points to "Investment Banking Group," which now includes Morgan Stanley and Goldman Sachs.

In the top left quadrant of the Equity Relative Valuation (EQRV) screen, we see that JPMorgan is trading at a 14% premium on a blended forward price-to-earnings (P/E) basis. But how does the analyst know that? The blended forward P/E projects earnings over the next twelve months and is based on estimates from the dealer community—essentially a consensus of all analysts covering the company. To calculate this, we divide the stock's current price by the analysts' projected earnings for the upcoming twelve months. Based on the average of these estimates, JPMorgan is currently trading at about 11.2x forward P/E. The question is: is that cheap or expensive? Earlier, you concluded that any stock trading below 15x forward P/E would qualify as a value stock. So by that definition, JPMorgan at 11.2x is indeed a value stock. However, when

compared to its peer group—whose average forward P/E is 9.9x—JPMorgan is trading at a premium. In fact, it is 14% more expensive than its peers. The key question now becomes: is this 14% premium historically typical for JPMorgan, or is it unusually high? Has it always traded at that level relative to its peers?

The analyst observes that JPMorgan is currently trading at a 14% premium. Historically, over the past two years, the stock has traded at a 12% premium. This means the current premium is 1% above its historical average. So, is JPMorgan cheap in comparison? Not exactly. It appears slightly expensive when evaluated against its historical trend—specifically, it is 0.3 standard deviations above the historical average relative to its peers. She also notes the recent 3-month trend: the premium rose slightly, dipped, and now appears to be increasing again as of April 2019, the date this screen was captured.

If the analyst examining JPMorgan clicks on the three-month trend line, she can view the full picture. JPMorgan is represented by a white line, while the average of its peers—the comps—is shown in orange. Green segments on the graph indicate periods when JPMorgan was trading at a discount, often considered the best time to buy. Red segments represent times when the stock was trading at a premium, typically a signal to sell. Many asset managers and analysts rely on this chart to help answer the key question: "Is this stock expensive or cheap?" At present, JPMorgan appears to be trading slightly more expensively than it has in the past. The general expectation is that such a premium will revert to the mean, meaning the valuation will gradually normalize. This is typically the case unless the company has experienced a significant positive catalyst, such as a blockbuster deal, a spike in profits, or an increase in trading activity. The analyst can also click on the red, blue, and green flags on the chart to access the Earnings History screen (ERN). This tool allows her to investigate why the company, for example, missed its earnings expectations on January 15, 2019. The ERN function provides insight into past earnings reports and investor sentiment.

She clicks "Back" to return to the EQRV page. Her belief is that, over time, the company will revert to its historical mean—what goes up must come down, and vice versa. In this case, she thinks the premium should return to its historical average of 12%, rather than the current 14%. To estimate the fair value, she calculates the fair value multiple—the price-to-earnings (P/E) ratio the company should trade at if the premium were 12%. A 12% premium translates to 112% of the base multiple. She converts this to a decimal (1.12) and multiplies it by the peer group average P/E of 9.9x, resulting in an 11.1x multiple. Thus, the fair value multiple for JPMorgan, assuming it reverts to the historical average premium, is 11.1x. She then multiplies this 11.1x P/E multiple by the earnings per share. Since the E's (earnings) cancel out in the equation (P/E * E), this calculation gives her a target stock price of $112.74. This function effectively provides analysts and portfolio managers with a tool to determine whether a stock is trading rich (expensive) or cheap (discounted) relative to its historical valuation. In this case, the analyst believes the fair value price is $112.74, but JPMorgan is currently trading at $114.07. So, she considers it slightly overvalued. If she buys JPMorgan at $114.07 and the price reverts to $112.74, she stands to lose $1.33 per share. This reflects the view that JPMorgan is currently trading rich relative to its history and peers.

As we discussed, this tool helps us estimate target prices and implied valuations based on mean reversion. Let's return to our earlier analogy of buying a house. You're not going to perform a discounted cash flow analysis to determine how much profit you'll make on the house—unless it's an industrial property or investment asset. Instead, you'll compare the house to others on the same block and ask: am I paying a premium or getting a discount? The same logic applies to stocks. Is the stock cheap or expensive relative to similar companies? Just as you would assess a house by comparing it to others in the neighborhood, you evaluate a stock by comparing it to its peers. In both cases, valuation is relative.

The analyst examines the premium over a longer timeframe by selecting the 5Yr button in the top-right corner of the EQRV screen. The current premium remains at 13%, but over a five-year horizon, the historical average premium is only 7%, compared to the previously discussed 12% over two years. This makes the stock appear even more expensive—about one standard deviation above the historical average, whereas it was only 0.3 standard deviations above when using a two-year timeframe. A 7% premium equates to 107% of the base valuation. Converting that to a decimal (1.07) and multiplying by the peer group average P/E of 10.6x gives an implied multiple of 11.3x. Based on this, the implied fair value price is calculated to be

$107.55. With JPMorgan currently trading at $114.07, this implies a potential loss of nearly $7 if the price reverts to its five-year historical mean. For analysts trying to determine whether a stock is trading rich or cheap, this method provides a fast and effective way to assess relative valuation.

She explores one final feature—Group Dynamics. By examining the broader industry, she can identify which companies appear cheap or expensive by sorting on the blended forward P/E column. For example, Goldman Sachs is trading at a current P/E of 8.4x, which represents a 15% discount relative to its peer group. Historically, Goldman Sachs has traded at only a 2% discount, so this 15% figure is significant. At this moment, it is 2.1 standard deviations below the historical average of its peers—indicating a major discount. In contrast, JPMorgan is trading at a premium. Analysts can use a variety of metrics to evaluate companies relative to their peer group. By clicking on the Metric dropdown menu, analysts can switch from blended forward P/E to other valuation metrics. For instance, selecting "current fiscal year price" may completely change the picture of which company is cheapest or most expensive. In short, there are many different ways to crunch peer data, and each lens offers a new perspective on value.

Now the analyst takes a deeper look at a single security. Relative-to-peers analysis tends to be more intuitive, but once she identifies a stock as trading cheaply or richly—in this case, slightly expensively—she then examines the stock relative to its own history. Here, she uses a five-year forward P/E perspective. The historical average forward P/E for JPMorgan is 11.2x. At the time of this screen capture, JPMorgan was trading at 11.3x. That means the stock is currently about 1% more expensive than its five-year average and sits 0.1 standard deviations above that historical norm. Relative to itself, JPMorgan is only $0.88 more expensive. However, if she assumes JPMorgan will revert to its historical average multiple of 11.2x, then multiplying that figure by the current earnings yields a fair value price target of $113.59. Since JPMorgan is trading at $114.47, this valuation suggests the stock might be slightly overpriced. If she ignores peer comparisons and focuses solely on absolute valuation, JPMorgan appears more reasonably priced. Ultimately, it's up to her to decide how to frame her thesis using the tools Bloomberg offers. EQRV remains one of the best tools to help analysts assess whether a stock is cheap or expensive.

GF: Graph Fundamentals

Next, the analyst explores another useful tool: the Graph Fundamentals function (GF). This tool allows her to visualize a company's fundamentals over time—compared to peers, indices, economic data, and more. By default, the graph displays Revenue and Earnings per Share for JPMorgan. She removes these fields and focuses instead on valuation. In the "Add a Field" amber box, she types "best PE" and selects "Best P/E Ratio." From the new dropdown, she selects "Blended Forwards 12 Months," a commonly used metric across the industry. Rather than looking at the data quarterly, she chooses a daily frequency over the past five years. This is how analysts on the street have traditionally forecasted P/E ratios. Why use forward P/E instead of trailing P/E? The answer lies in the nature of earnings. Trailing earnings are already reported but may include extraordinary items—non-recurring events that distort performance. For example, a sudden $20 million loss from a worker strike might skew the results, even though it's not reflective of normal operations. These anomalies can make trailing P/E less reliable. Analysts prefer forward P/E because it's based on earnings forecasts from the broader analyst community, which excludes one-time disruptions. While the price component stays the same in both ratios, the "E" in the forward P/E comes from normalized earnings expectations. At the time this screen was captured, the analyst notes JPMorgan's forward P/E. To provide further context, she uses the charting function to overlay the S&P 500's forward P/E. While she previously compared JPMorgan to its peers, this new view allows her to compare it against the broader market. The result shows JPMorgan's forward valuation in relation to the S&P 500, offering an additional lens through which to evaluate the stock.

The analyst goes back to the chart and selects the Relative Sector Index. At the top, she sees the forward P/E of JPMorgan. In the second chart, she highlights the line, right-clicks, and selects "Add Study," choosing the "Average Line" option. She then adds a deviation line and removes the lower chart. With this setup, she can now visualize one standard deviation above and below the historical average. By right-clicking on the deviation line, she configures it to display two standard deviations and updates the chart. Assuming

mean reversion, around 95% of forward P/E values fall within two standard deviations. The analyst believes that what goes up must come down—and vice versa. So, if a stock hits the bottom edge of the two-standard-deviation range, it may signal a buying opportunity. From a valuation perspective—focusing on forward P/E, not share price—she takes JPMorgan's forward P/E and divides it by the S&P 500's forward P/E. At the time of analysis, the index is trading at approximately 2940, and the relative forward P/E for JPMorgan falls along the 0.6734 standard deviation line. This indicates JPMorgan is trading about 34% below the S&P 500 on a forward P/E basis. Is JPMorgan really that distressed to be trading so cheaply compared to the broader S&P 500? The value analyst believes it's extremely undervalued. Despite JPMorgan's strong fundamentals, she's only paying $11.28 for every dollar of earnings—highlighting a significant discount. Historically, over five years, JPMorgan's forward P/E relative to the S&P 500 has hovered around 1, but it's now at 0.6734—34% below that baseline. This is nearly half a standard deviation under the average. Earlier, in the EQRV tool, she was comparing JPMorgan to its peer banks. Now, she's comparing it to the broader market. Both relative comparisons are valuable but offer different perspectives.

Is JPMorgan traded cheap or expensive? On the low end, JPMorgan has traded at just 0.57 times the P/E of the S&P 500—essentially half the market's valuation. That seems extreme. Could it really be that undervalued? Probably not. Then the stock rallied. At its recent high, JPMorgan traded at 0.79 times the S&P 500's forward P/E. That appears expensive when compared to the historical average of 0.6734. But the ratio doesn't stay constant; it fluctuates over time. Many value investors use this type of analysis to determine whether a stock is trading at a discount or premium relative to the broader market. Curious to compare another stock, the analyst selects Apple. She finds that Apple's forward P/E is 16.7x, placing it almost two standard deviations above the S&P 500, which trades at a forward P/E of 0.99. To preserve her work, the analyst saves the chart. She names it "My Relative Valuation Chart" and sets the shortcut to `RV`. Now, whenever she pulls up a new company, such as 3M, she can simply type `GF RV` to bring up her custom Relative Valuation chart.

The War Room

This research process is a mutual collaboration between the portfolio manager (PM) and the analysts. Analysts continually suggest and recommend ideas, and the PM regularly looks to them for fresh opportunities. Sometimes, these discussions occur daily or weekly in what is informally referred to as the "war room." During these meetings, everyone brings pitch decks and lays out their investment theses. Each analyst presents their case for why a company is a strong buy. These ideas are critiqued not only by their peers but also by the PM. Ultimately, the portfolio manager must decide which ideas to act on, selecting from a pool of thoroughly vetted pitches to identify and execute on the strongest opportunities. At the end of the year, the PM reviews performance to determine which analysts were more accurate in their forecasts. Analysts also track their own pitches to see if their ideas outperformed the PM's final selections. This tracking becomes especially important during performance reviews.

TMSG: Team Message

One tool used to track investment ideas is Trade Idea Messaging, or TMSG. This platform allows users to create networks and share trade ideas with one another. To start, the user clicks on "Compose." Suppose the analyst has an idea about 3M. They would select a strategy—such as "Long" for a buying recommendation, or "Short" for a sell idea. Next, the analyst inputs a target price (e.g., 215), indicating the price they believe the stock will reach. The idea is marked with a level of importance, such as "High Importance," and a time horizon is chosen—perhaps one month. A recipient is then entered, and the subject line might read something like "Buy 3M." An attachment can also be included to supplement the idea. Once the analyst clicks "Send," the recipient receives an email and can immediately review the idea. As the market opens and trades occur, the TMSG system begins populating real-time data to track how the idea performs. Everyone on the investment team can log their ideas in TMSG. It's a simple and efficient method for idea tracking. However, many clients prefer to use PORT, which provides enhanced features and deeper analytical capabilities. We will explore PORT in more detail once we've built our portfolio.

Summary

Portfolio managers and analysts dedicate hundreds of hours to researching sectors and companies before deciding whether to include them in a portfolio. Generating ideas for a portfolio and assessing their quality involves several key processes. First, they screen for stocks to determine their investable universe. Then, they explore historical performance through backtesting to see how the strategy would have played out in the past. They also review news, financial statements, and industry trends to understand the broader context and the company's positioning. Once these preliminary steps are complete, fund managers and analysts perform deeper analysis. Using both absolute and relative valuation methods, they determine how much a company is worth and whether it is fairly priced in the current market. Ultimately, the portfolio manager's goal is to identify the highest-quality investment ideas and execute on them effectively.

Portfolio Management: Building an Equity Portfolio

Introduction

Now that you and your team have strategized in the war room and generated ideas for your value fund portfolio, it's time to put the plan into action. By the end of this section, you will be able to create a multi-factor scoring model to rank companies based on their fundamentals, describe the different position types within a portfolio, and build a portfolio using both Excel and the PRTU function. Let's imagine you're building this portfolio as of December 31, 2017. This date is chosen so that you'll have a historical track record to review in the following submodules. What steps will you take to create it?

EQS: Comparing Company Fundamentals

Earlier, you began the idea generation process using the EQS function and created a stock screen. Now that you've completed backtesting, it's time to revisit that screen. Return to EQS, select "Value Screen," and click on "WATC" to run the updated results. From here, you'll navigate to the red Actions tab, select "EQS Report," and choose "Report Layout." This will reorganize the output into a format that allows you to sort companies by fundamentals and compare them. From this list, you want to choose your top candidates. To do this, you'll rank them based on their metrics. However, EQS only allows you to sort by one column at a time. To overcome this limitation, you'll create a multi-factor score that enables simultaneous evaluation across several criteria. To begin, right-click on the Dividend Yield header and choose "Insert Combined Column." Change the aggregation from "Sum" to "Sum of Percentile," then select the Dividend Yield, P/E, and Price-to-Book columns. For Dividend Yield, a higher value is better, so we'll sort by "Higher Value." Assign it a weight of 40%, or 0.4. For P/E, we prefer the lowest value (i.e., the cheapest stocks), so choose "Lowest Value" and also assign it a weight of 0.4. Lastly, for Price-to-Book, where a lower value is also better, assign a weight of 20%, or 0.2. Name this new column "My Score" and click "Insert." As with standardized test scores, higher percentages are better. You can now sort by the new "My Score" column and identify the stocks that rank highest overall—those most closely aligned with your value investment strategy.

Exporting to Excel

Now that you have a scoring mechanism in place, you can begin selecting stocks from your investable universe. Sorting the companies by the "My Score" column ranks them according to your criteria. To make the analysis easier, drag this column to the left so it appears next to the company names. When reviewing the scores and the assigned weights, you'll see that Ford Motor Company ranks the highest. This process is similar to evaluating a potential home purchase. When you tour houses, you naturally weigh certain features more heavily than others—such as outdoor space, natural light, or a newly renovated kitchen. Similarly, in your scoring model, you gave higher weights to more valuable features. The next step is to export this data to Excel. Click on "Export" and select "Excel: All Securities." You'll use this data to build a portfolio consisting of the top thirty ranked names.

Setting up a Portfolio with PRTU

There are several ways to set up a portfolio. One approach is to open the Portfolio Administration function (PRTU), click on the Create button, and fill in the required fields. Let's name your portfolio "Value Fund" and set the currency to U.S. dollars. Next, consider the Position Type. A Fixed Weight portfolio means that the weights of holdings remain constant. For example, if a stock is assigned a 10% weight and its market cap increases, you would sell some shares to keep the weight at 10%. Conversely, if the stock price falls, you'd buy more to restore the weight. This approach essentially involves buying losers and selling winners to maintain balance. A Drifting Weight portfolio, on the other hand, sets initial weights but does not maintain them. If a stock set at 10% grows in market cap, its weight in the portfolio will rise accordingly. If its value falls, the weight decreases. In this strategy, you end up buying winners and selling losers based on price movements. The third type, Shares / Par Amount, refers to holding a specific number of shares. For instance, if you buy ten shares of Apple on a given date, your position remains at ten shares, regardless of price changes. The market value of your position will vary as the share price fluctuates. This is the most commonly used position type, as it precisely reflects how many shares have been purchased and how the portfolio has evolved over time. Finally, under Analysis Defaults, retain the default Calculation Profile and PORT View settings. You'll be able to create custom views once you're inside the PORT tool. After completing these steps and clicking "Create," your portfolio shell will appear, ready for use. Give it a try!

Completing the Portfolio Setup

Remember, you are building your portfolio on the 31st of December 2017. So at this point, be sure to change your amber Date field to 12/31/17 and press Enter before you enter positions so that you have history to analyze in the next section. To add securities to the portfolio, you'll drag the top thirty securities from the Excel document you exported from the WATC page into the first Security box. You can also drag the companies from another Bloomberg screen, or simply type in the securities and select them from the dropdown. Based on the extensive research your team has done, you have determined how much to invest into each security. You'll also leave some cash on hand to spend if an opportunity arises. You are building this portfolio at the end of 2017. Next, you'll load this in PORT and jump forward a year to the end of 2018 in order to analyze how the portfolio performed over the 2018 calendar year.

Summary

Multi-factor scoring models are used to rank companies based on multiple ratios at once, allowing portfolio managers to evaluate investment opportunities more comprehensively. When constructing a portfolio, managers can choose from several types of position structures. Fixed weight positions are specified as percentage weights of the total portfolio value and are rebalanced daily to maintain those exact weights, regardless of price fluctuations. Drifting weight positions are also specified as percentages but are allowed to adjust over time with market movements, meaning the weights of individual securities change as their values change. Shares or par amount positions, by contrast, are specified by the exact number of shares held and reflect actual units in the portfolio. To add securities to a portfolio, managers often begin by exporting the top thirty securities from a screening tool like WATC into Excel. These names can then be dragged directly into the portfolio construction interface. Alternatively, securities can be imported from other Bloomberg screens or manually typed and selected from dropdown menus. There are many flexible ways to construct a portfolio depending on the manager's approach and the available data.

Portfolio Management: Analyzing a Portfolio

Introduction

Did your hard work pay off? Let's find out. You created a portfolio at the end of 2017. Now let's leap forward a year in order to analyze how the portfolio performed over the course of 2018. In this section, we'll analyze how your portfolio performed historically in its first year of existence. Then, in the next section, we'll look towards the future to assess risk. By the end of this section, you'll be able to explain why portfolio

analysis is important to you as a portfolio manager, describe how you can use the tabs in the PORT function to analyze your portfolio's performance, and use your analysis to make decisions about a portfolio's positions.

Setup Options in PORT

Portfolio managers spend a lot of time reviewing the data in PORT to make decisions about their portfolios. After your portfolio has been active for a year, you want to look at how it performed historically. Let's start by entering the necessary settings. You type `PORT` into the command line and select the Portfolio & Risk Analytics function. First, you go to the top left amber field and select your portfolio from the dropdown. If it doesn't appear, you can select More Sources to find it. But in this case, you see it, so you select it. Note that it takes a moment to retrieve data from the portfolio. Next, you'll need to enter your benchmark into the second amber field. You are using the SPY, the S&P 500 exchange-traded fund, or ETF. So you click into the amber field and, if you don't see the SPDR listed, choose More Sources. You click Funds and then type in the ticker SPY to find the ETF you want, click it, and select it. The third amber field determines the way the stocks are classified or grouped together. GICS is the sector classification you decide to use. You are looking at your portfolio in U.S. dollars.

Holdings

Now that you've entered your settings, you can see what's inside your portfolio by clicking the Holdings tab. As we are envisioning it is December 31, 2018, adjust the date to match and press Enter. The Holdings tab shows your positions at a point in time, or how they had changed over a date range. The Trend functionality tends to be the most useful as it shows how much weight you've put in a particular sector and how it's changed over time. The weight you assign is your allocation. Click on Trend. In the Field amber box, choose Percentage Weight (% Wgt (Port)). Next, change Frequency to Monthly as there is a limit to the amount of periods you can load at once. Then set your date range from the end of 2017 to the end of 2018 via the Prior Calendar Year from the Time field. Finally, press Enter to load all the parameters. As a portfolio manager, you want to see how the weights have changed through time. Are you over allocated in a particular sector? Is your weight shrinking in a sector? Are you stable in most sectors? What's happening? This tab gives you a trend. Let's switch the radio button back to Date to see the Allocation subtab, which shows where you're overweight and underweight visually. You can use the amber dropdown menu in the top left of the chart to view just the portfolio, just the benchmark, or both.

Characteristics: Main View

In the Characteristics tab, you can take a look at key characteristics of the portfolio. You are a value manager, so let's examine what's important to you. How's your portfolio's dividend yield and P/E? Let's take a look. What's going on with the dividend yield? On December 31, 2018, you're much higher than the benchmark: 8.74 relative to the benchmark at 2.15. Remember, you want to have a higher dividend yield than the risk-free rate. At this time, the risk-free rate, or the yield on the 10-year government bond, is 2.6842. So you're receiving a much higher yield than the government bond. From a P/E perspective, you're below the threshold of being a value manager at 12.19. Remember, we established that a P/E below 15 is for a value stock. Above 15 is GARP, a combination of growth and value. And anything above 20, arguably, is growth. So regarding P/E, you are undervalued relative to the benchmark, but that's because the S&P is expensive. By clicking on the +/- column, more commonly referred to as the "active P/E" or the "difference between the portfolio and the benchmark," you can see where you're overvalued and undervalued. In this case, you're undervalued in everything. Notice, though, that you are undervalued in Real Estate because you don't have a position in it, so of course you're undervalued. Next, you scroll over to take a look at Price to Book. The portfolio is cheaper than the benchmark. Note that just like in the Holdings tab, we can also look at the data in Trend mode. All of these data points are helpful for a portfolio manager to assess important fundamentals at the portfolio level.

Next, you'll go back to the Date mode and then click on the Summary subtab to see the data visually. Here you see relative weight. You are overweight in Utilities and underweight in Information Technology. If you

want to look at dividend yield, you can click dividend yield and see what is undervalued—Real Estate—and overvalued—Consumer Staples. The same applies to the other fundamentals.

Performance: Main View

Let's look at the Performance tab to see your portfolio's historical performance with various total return periods. The first section of the Main View shows your portfolio's weightings. Click on the active weight, which is the difference between the portfolio and the benchmark. On December 31, 2018, we can see that you were overweight in Utilities year-to-date. We've seen that in the Characteristics tab, too. However, this Performance Main View subtab is used mostly to explore performance by sectors. Let's see if the sectors you put the most emphasis on performed as well as you hoped. To see the data over a longer timeframe, you'll need to add more fields. If this is the first time you're using PORT, you'll have to set up a Personal View so you can make changes to the columns. You can do that by going to View on the top left red bar. Select Create New View and name it "My Value View." Choose Equity View Settings and Create. Then adjust the date in the top right back to December 31, 2018, and run it. Now you can add more fields. Right click on one of the headers and choose Add/Remove Fields. You have 1D, MTD, and YTD showing. If you click Show All Fields and open the Return category, you can add fields so you have all the most commonly viewed ones. Click on Total Return QTD (Quarter to Date) and WTD (Week to Date), and then put them in time order using the drag and drop icon on the left. Click Close. Check all the boxes so everything populates correctly. We'll click Save and then Run to reload the page. This is the view that most portfolio managers have: 1 day, 1 week, month to date, quarter to date, and year to date. So what happened overall year-to-date as of December 31, 2018? You underperformed by 1.55%. How did you perform in your heaviest weighted sector, Utilities? You underperformed 5.11%. This tab is a quick way to see how your portfolio performed in certain sectors.

Performance: Total Return

Next, let's click on the Total Return subtab for a graphical depiction of your total return. It tells when you did well (in green) and your underperformance (in red). Your portfolio is the white line and the benchmark is the orange line. As you can see, your portfolio underperformed the benchmark over the entirety of 2018 with the exception of a brief spike in late December. For comparison, the S&P 500 lost 6% over 2018. It was a challenging year for equities, the worst in a decade.

Active vs. Passive Management

Earlier, we spoke about active and passive management. They are two approaches to investing. How are they different? Active management looks to beat the benchmark. In order to stay in business, an active manager must consistently earn higher returns than the benchmark. To do so, the active manager has to make some different investment choices than the benchmark. Often, active managers have to take on more risk for the potential of a greater reward. In contrast, a passive strategy looks to track a benchmark, to match its strategy and returns. The SPY, the S&P 500 SPDR, is a passive strategy as it tracks the S&P 500. Passive managers take on the same risk as the benchmark, and go up and down alongside it.

In our example, you are an active manager, so you are trying to beat the benchmark. As you can see, it can be difficult, especially in years where the market as a whole is not performing well.

Performance: Period Analysis

Let's return to the Performance tab in PORT. The Period Analysis subtab shows the amount of time our portfolio is Up or Down—this tab is popular with sports fans who love stats. This view looks at the data on a daily basis. So our portfolio was up 142 days out of 261, or 54% of the time. If you don't know what a term is, you can hover over it. For example, what does Best 1 mean?

Now you know that the best performing day in this period (Best 1) was December 26, 2018. The worst (Worst 1) was on February 5, 2018.

Performance: Seasonal Analysis

Let's move to the Seasonal Analysis subtab and adjust the settings and dates. Seasonal Analysis tells you how you did, for example, month by month. January was your best month and December was your worst. Incidentally, you can also change your portfolio inception date in PRTU if you want to get an understanding of how your portfolio performed month by month over the years. You can find instructions in the PRTU Help page by pressing F1 or the Help key on that function. Let's go back to the Seasonal Analysis screen. If you want to look at portfolio performance relative to the benchmark, click Relative Total Return %. You can see where you outperformed and underperformed. Our best outperformance was in October and our worst underperformance was in May. Next, let's click on the Statistical Summary subtab.

Performance: Statistical Summary

In PORT, the Statistical Summary subtab analyzes risk and return measures. These measures are "ex post," or historical, as they look at realized return and volatility. Later, in the next submodule, we'll take a look at "ex ante" risk, or forward-looking volatility. Here, you'll see three submenus: Return, Risk, and Risk/Return. Return focuses on the total return (and similar metrics) of your portfolio over the given period. You can click into the white submenu headers to see additional statistics. As before, you can also hover over the terms to learn what they indicate. For example, hovering over Mean Excess Return (Annualized) defines it as the average relative return over the stated time frame. As you might expect, the Risk submenu shows risk statistics.

Let's jump to the most intriguing section: Risk/Return. This section is the one investors find the most useful. The Sharpe Ratio is arguably one of the best ways to measure performance. It looks at returns relative to the risk-free rate divided by the volatility of the portfolio, or its standard deviation. It's basically the outperformance or underperformance relative to the risk-free rate, that is, the 3-month U.S. government bond. The U.S. government doesn't default very often because it doesn't have to—it can just raise taxes. So it's the performance relative to the risk the portfolio manager takes. Volatility means moving up and down—so that's your risk. Some fund managers just post their returns, but they don't say their volatility relative to something else. For example, say you invested a million dollars, and the fund made you 20%, but the portfolio's volatility was 40%. A 20% return sounds good until you realize that the highest amount it *could* have made you was $400,000, but it only made you $200,000. So for the risk you paid for, you didn't actually get what you wanted. A fund manager simply saying he had a 20% return isn't enough information. The other ratios are pretty much derivative of the Sharpe Ratio. For example, the Information Ratio is similar to the Sharpe Ratio, but it's relative to the benchmark rather than the risk-free rate.

Attribution

Let's explore the Attribution tab. Attribution breaks down the Performance tab. It is a way to deconstruct the portfolio's outperformance or underperformance relative to the benchmark. **Why** did your portfolio underperform? Was it due to bad luck or poor skill? The Performance tab tells you how you performed and the Attribution tab tells you why. Portfolio managers care about attribution because it reflects their own performance and they can use it to make decisions going forward. Their livelihood depends on it. We'll break down the Attribution tab by GICS Industries and ensure the time is set to the Prior Calendar Year to explore the whys of 2018. Let's sort by Active Weight, the plus-minus sign, to see the highest overweight in a sector. Here we can see that you put a significant emphasis on the Utilities sector: 34.19% of the portfolio is in Utilities versus 2.87% of the benchmark's. You are 31.32% overweight. This is a big bet on the sector. Has it paid off? This is one of the biggest questions that consultants and institutional investors will ask. Attribution will help us find answers. CTR, or Contribution to Return, is the weighted total return of each security in the portfolio. If we add up each security's individual CTR, we arrive at the Total Return of –1.55, relative to the benchmark. Our portfolio returned –5.94%, which means that the portfolio lost 5.94% over 2018. The benchmark lost 4.38%. This means we underperformed (or did worse than) the benchmark. Let's deconstruct this underperformance to see where it's coming from. We'll click on the +/- Ctr header to sort. Consultants and institutional investors have hard questions for the portfolio manager. Is success due to luck or skill? If the PM claims to be a stock picker, that is noted. If the PM claims to be a sector

allocator (placing macro bets on countries or sectors), that is noted. Then, when the review comes, a stock picker must do better on stock selection than on sector allocation and vice versa.

Attribution: Allocation and Selection Effects

The Main View subtab of the Attribution tab breaks down performance into Allocation Effect, or sector allocation, and Selection Effect, or stock picking. You generated a positive effect from sector allocation, meaning you picked the right sectors relative to the benchmark. Good job! However, you have a negative Selection Effect, meaning you picked the wrong stocks relative to the benchmark. Remember, you said you were a stock picker, but these columns are showing you're a sector allocator. So the consultant is going to deduce you don't know what you're doing. You're not good at what you said you were good at, and you are good at something you weren't trying to be good at. You can go to HELP PORT to see how we calculate these numbers. We can click on Calculations and Return Attribution to see, for example, the Allocation Effect's formula. It is the weight of the sector in the portfolio (wp) minus the weight of the same sector in the benchmark (wb). You multiply that by the return of the benchmark (rb) in your sector minus the overall return of the benchmark top line (rB). Bloomberg does these calculations every day and links them geometrically over time.

Attribution: Summary

Let's go to Attribution's Summary subtab. As we discussed, you're underperforming by 1.55%. You're overweight in Utilities and underweight in Information Technology. We can also see Total Attribution, Allocation, and Selection. Since it's a U.S. portfolio, we're not going to get any Currency Effect. The sum of Allocation, Selection, and Currency adds up to Attribution. In the case of the Utilities sector, you were overweight versus the benchmark. The sector performed well, so you have a high Allocation Effect, 2.35%. However, you didn't pick the right stocks in that sector, so your Selection Effect is negative, –1.61%. You can drill down by clicking into Utilities to see which stocks have given you headaches and which have let you sleep well at night. Attribution will show you historical performance. If you want to see real-time performance, you can click on the Intraday tab.

Intraday

An investor uses the Intraday tab to view the portfolio's current performance in terms of basis points. An asset manager explores this tab to answer these questions throughout the day: What trades should I be considering? Is there any news on my names? Is anything blowing up? Are there any opportunities? Is everything status quo? This tab only shows today's performance, so we won't backdate it to 2018. You can see that today, your portfolio is slightly outperforming. If you sort by the CTR +/- column, you can see which sector is having a good day and driving the outperformance. Where is it coming from at this moment in time? Financials contribute about 7.5 basis points out of the overall 24.5 basis points. The units here are basis points, which are 1/100 of a percent, so 24.5 basis points are about a quarter of a percent. So it's a slight outperformance, relative to the benchmark in an intraday perspective. You can put it in percentages too, but if you look at it with percentages, you're going to end up with a value of 0.0245, and no one wants to think about numbers that small. Markets generally don't move that massively on an intraday basis. You can see the intraday outperformance tracked at the bottom of the page.

Another way to look at intraday performance is through P&L, or profit and loss. A portfolio manager asks, how much money are we making on this day? First, how much do you have to start with? Every stock has a price and you own a number of shares in the stock. You multiply the price by the number of shares to end up with the market value for that stock. And when you sum up all the values in your portfolio, you get a market value for the whole portfolio. On the top row, we see a portfolio value, or market value, of almost $400 million. We use this value to calculate P&L, which is yesterday's closing market value relative to today's market value, or the value right this second minus the market value last night. So, if you had $10 yesterday, and you have $12 right now, what's your P&L? Two dollars. Today's market value is constantly changing with new prices while the market is open. At the moment this screen was captured, the P&L of

your portfolio is about $1,500,000.

As a portfolio manager, you want to see what's happening daily in the news. Looking at news through the Intraday tab shows what is helping or hurting you right this second and why. By knowing what's happening with a stock's performance, you can respond quickly and, for example, put forth a trade before you lose too much. You can right-click on the white portfolio name and see News, Research, and SALT, which is a daily summary alert. We'll click News. After it loads, we'll see the most recent news explaining the biggest changes in our portfolio. News happens overnight. How do you stay on top of it? Portfolio managers check this every morning and throughout the day. Let's say you want to see what has had the biggest impact on your portfolio. You can change the Sort dropdown to Biggest. Here you see that PG&E has dropped because fire investigators determined it was to blame for California's biggest wildfire of 2018. However, you also see that Hewlett Packard is doing well due to a supercomputer purchase. This is great, but maybe you'd like to see the news from a Worst Performance perspective. Other than PG&E, where are you getting hurt? So you change your Sort again. If you go back and select Research from the dropdown menu, you can review the most recent research available on the stocks in your portfolio. Portfolio managers spend so much of their time analyzing their portfolios in an effort to reduce risk. As we will see shortly, risk can make or break a portfolio.

Summary

To summarize, portfolio managers spend most of their time assessing their portfolios' performance. Whether they can outperform their benchmarks in a predictable way defines their success. The PORT function offers a number of tabs to help with portfolio analysis. Holdings shows a portfolio's positions at a point in time, or how they have changed over a date range. Characteristics shows the fundamental characteristics of a portfolio as of a specific date or as a time series trend. Performance provides the historical performance of a portfolio with multiple total return periods as of a specific date. Attribution allows managers to deconstruct the sources of their portfolios' historical return. Intraday allows for the tracking of intraday performance—weights, returns, contribution to return, performance attribution, and P&L—of an equity portfolio. Portfolio managers can use their deep portfolio analysis to make decisions about their positions, and whether or how to adjust them.

Portfolio Management: Assessing Portfolio Risk

Introduction

Risk is uncertainty about the future. Just like you don't know what's going to happen tomorrow, portfolio managers don't know what will happen to their portfolio positions. Making riskier trades is a double-edged sword: you leave nothing on the table, but you also might lose it all. Portfolio managers want to find a balance between the risks they take and the returns they earn. In the last section, we analyzed how your portfolio performed historically in its first year of existence. This analysis is called "*ex post*," which means "after the fact." Now, in this section, we'll look towards the future to assess risk. It's called "*ex ante*," which translates to "before the event." Bloomberg's PORT function uses a multi-factor model to explain sources of risk and return in the market. This helps portfolio managers identify opportunities or find potential problem areas where they have taken on too much risk. Three tabs on PORT reveal potential future risk: Tracking Error, VaR, and Scenarios. By the end of this section, you'll be able to determine how much your portfolio's return deviates from the benchmark's return so that you can monitor and adjust your exposure to risk, identify the riskiest securities in your portfolio in order to make investment decisions with a clear understanding of how much you could lose, and analyze how your portfolio would perform in times of stress or change by looking at the impact a market event would have on it.

Tracking Error / Volatility

Tracking error is how much a portfolio's return deviates from the benchmark's return. Many clients have a tracking error budget, so to speak, to limit their deviation from the benchmark. What do we mean by that?

The institutional investor asks you, the PM, "What's your benchmark?" The investor wants you to outperform, but not by too much because then you aren't following the benchmark. It's important to stay close to the benchmark in order to proclaim that you're actually following the benchmark. In this case, as an active manager, you created the portfolio to reflect the benchmark generally. However, within that portfolio, you put more or less emphasis on certain sectors or individual companies in hopes of achieving a higher return. The difference between the portfolio and the benchmark is encapsulated in this Tracking Error/Volatility tab.

So how do we look at this page? It's a projected tracking error. Tracking error is calculated by first graphing the difference between the portfolio's returns and the benchmark's returns, and then running a regression, or a line of best fit, through those points. The PORT function does all these calculations behind the scenes and just presents the final tracking error numbers. Remember, this tab shows predictive tracking error. To calculate this, you need a predictive risk model. There's no crystal ball to predict what the volatility is really going to be. So we study the history of volatility for a number of influencing factors in order to make a predictive model. Factors are characteristics of the market or of an individual company that can drive risk. PORT looks at these factors and how they relate to each other in a factor model to determine future risk. In this case, we have a factor model that tries to project your tracking error for the following year from the date of this screen capture. Your pension plan's consultant expects you to have a tracking error of about 8.99, which we'll come back to in a few minutes. It's important to note that the factors can be anything: natural gas, yields, currencies—anything. So what you're trying to do here is find a common set of factors to explain the market. PORT will show you your exposure to these factors. So every week, you click on the Exposures subtab to see how susceptible you are to this risk.

Tracking Error / Volatility: Exposures

Let's look at momentum, for example. Momentum separates stocks that have outperformed and underperformed over the past year. It is roughly the price change for the past year. Using this data, we rank the stocks where they stand relative to the average universe so as to compare apples to apples. The values that you see are the company's exposure to that factor. If we click on the Momentum header to sort highest to lowest, we can see that Advanced Micro Devices is three standard deviations relative to the average of all the stocks in this risk model universe. Advanced Micro Devices has the highest exposure in your portfolio to this factor. The companies at the other end of the list are not momentum stocks. Nektar Therapeutics isn't a momentum stock. Neither is Halliburton. These non-momentum companies barely move. Each factor is created using observable data points. You can see them in the financial statements of the companies or, as with momentum, in the price movement.

Let's click into a factor: US Size for JPMorgan. When you select 2.04, a window will open. On the left-hand side under Descriptor Name, you can see that size is made up of total assets, sales, and market cap. These are weighted and standardized for all companies so we can compare them. Close this box and go back to the list. You can click into the exposure values for each company and for different factors to see what descriptors make up each factor.

Tracking Error / Volatility: Factors

Let's click on the Factors subtab. This screen allows you to analyze risk factors within your portfolio. This tab takes the Exposures subtab and weights it. The Exposure section considers your positions in your portfolio and how exposed they are to your factors. You can see in the Active column that you've made different decisions than your benchmark. You are overexposed or underexposed to certain factors. Your active exposure will help you understand your contribution to risk. Let's sort the Contribution % column. This column shows the factors that contribute the most to your overall portfolio risk. You can see here that Utilities has the highest contribution to risk at 43% and a high active exposure of 0.33 standard deviations. As a portfolio manager, you may want to consider carefully any future trades that may increase your risk in the Utilities factor. Instead, you may choose to diversify and increase your exposure to factors that contribute less to your risk.

Tracking Error / Volatility: Summary

The Summary tab shows you the projected volatility of your portfolio, your benchmark, and your projected tracking error. The top of the screen shows you values and standard deviations. The bottom half shows your risk and contribution percentage. Portfolio managers will focus on the active risk number. This shows them how much their portfolio could deviate from their benchmark over the time horizon in the top right. This active volatility of your portfolio is broken down into factor and non-factor risk. Factor risk is what is explained by our factor model. Non-factor risk is risk that can't be explained by a model. An example would be a CEO tweeting huge company news instead of releasing it through official SEC-sanctioned channels. At the bottom, we can see in chart form the factor that is most exposed to risk—in this case, Industry—and the one least exposed to risk—in this case, Country. This matches what we saw in the Factors tab.

VaR: VaR Comparison

Let's move on to the VaR, or Value-at-Risk, tab and return to the end of 2018. This tab quantifies the maximum loss you expect to experience with your portfolio in a worst-case scenario, or "black swan" event. As a portfolio manager, you have a certain threshold for risk. The VaR tab helps you understand your riskiest securities or how much you could stand to lose. Let's click into the VaR Comparison subtab to get an overview of VaR. The screen defaults to the Unit P&L, or Profit and Loss, and will help us understand how much money you might lose over a time horizon. Let's look at the first one, the Monte Carlo simulation. We can see that, as of December 31, 2018, the most you could lose from your portfolio in a single day, with 95% confidence, is roughly $4.7 million. There is a 5% chance that you could lose more than this. In the top section, you can further assess risk by changing fields like confidence level (CLvl) and horizon.

VaR: VaR Simulations

VaR is calculated using three different methodologies: Monte Carlo, historical, and parametric. Let's look at Monte Carlo. Monte Carlo runs 10,000 random simulations of factor returns to determine potential loss. Let's click into the VaR Simulations tab to see them. The Terminal adjusts the factors and plugs them back into the multi-factor regression formula, resulting in a new P&L for the stock. So we run 10,000 scenarios and come up with 10,000 P&Ls, or "outcomes" of their scenarios. You look at these from the biggest loss to the biggest gain. Here, back in the VaR Comparison subtab, you see that at 95% we'd lose $4.6 million or, if we change the Unit to Returns %, 1.3% of the portfolio. Monte Carlo is a versatile methodology as it can handle non-linear instruments such as derivatives, options, and futures, along with linear instruments like stocks and corporate bonds. It's very difficult to calculate this and it takes a lot of computing power. The historical methodology uses historical factor returns to create a distribution. This method assumes that history could repeat itself. But as we all know, that doesn't always happen! Past performance is not indicative of future returns. The parametric methodology assumes a normal distribution of returns. However, actual portfolio returns don't tend to fall in a neat, normal distribution. This method often underestimates how much you could lose.

As we just saw, you can use the VaR Simulations subtab to see the different methodologies' returns for each simulation. Here you can see each Monte Carlo simulation and its P&L. To see the other methodologies, you'd need to change your Calculation Profile, which is located under View, Edit Current View, and Calculation Profile. VaR is important because different investors have different risk tolerances. Your VaR might be too high for your liking, but you can change it! If you click on the Returns header, you can see all the returns from the worst case to the best case. On the graph, 95% of the line will be to the right of the worst 5% of simulations on the left.

VaR: VaR Comparison

Now let's revert to P&L and go to the VaR Comparison tab. The Conditional VaR section in the bottom right tells you how much you could lose on average if the next day is one of the top 5 out of 100 days with the worst performance. If your confidence level is surpassed, your expected loss is $6.4 million, or 1.77% of the portfolio. You, the investment manager, have to decide if you can stomach that possible loss. Let's look

at the Partial VaR column next. It tells you how much your VaR could go down if you remove a specific sector from your portfolio. So if you sell every single bank in your portfolio, your VaR is going to go down by 0.19%, or $695,000. The Marginal VaR tells you the change in total portfolio VaR from taking an additional dollar of exposure. So if you invest $100 more into Financials, your VaR is going to go up by $1.29. It's a dollarized amount.

Scenarios: Main View

The Scenarios tab shows us the impact of a market event on our portfolio. This tab has arguably become even more popular than Value at Risk. More and more institutional investors and clients are looking for ways to implement their strategies, their risk views, on a particular portfolio. What kind of views? Interest rate scenarios are one kind of risk view. What would happen if they go down by 2%, or 200 basis points? If they go down, any bond portfolios you manage will do well. Another risk view is shocking, or shifting, factors. What would happen if oil went down 10%? What would happen if the equity market shot up 10%? What would happen to your portfolio if the financial crisis of 2008 happened again? How about if the S&P 500 went down almost 10%, like it did in December 2018? These kinds of scenarios show how your portfolio would perform in times of stress or change.

Scenarios: Scenario Summary

In the Scenarios amber dropdown, we see a list of scenarios. You can apply these changes to your current portfolio to see how it would react. For example, you see that if the Greek Financial Crisis of 2015 were to happen again, your portfolio would do better than the benchmark. If you go into the Scenario Summary subtab, you see a list of scenarios looking at your positions as of December 31, 2018. The P&L column will tell you what will happen to your portfolio, loss or gain, relative to the benchmark. Let's continue looking at the Greek example. Here you can see your portfolio's reaction to the Greek Crisis, if it were happening now, compared to your benchmark in dollar value, percent, and stress market value.

Scenarios: Main View

Although Bloomberg has these pre-canned scenarios, most of the time people want to build their own. Let's return to the Main View and create our own. We'll go to the Model drop down and choose US Equity Fundamentals because your Value Fund is a U.S.-based fund. Then we'll go to Scenario, select Create New. There are two choices: Factor Model or Full Valuation. Full Valuation is geared towards fixed income and derivatives managers. Factor Model-based scenarios are more applicable for equity or balanced portfolios. You would choose Factor Model (because you're an equity portfolio manager) and click Create New. We'll look at two scenarios: (1) an index down 10% and (2) rates increasing by 100 bps.

Let's look at interest rates first by clicking the IR tab and then Treasury and BVAL Curves. We'll choose USD for U.S. dollar curve and choose a parallel shock to move the entire curve up 100 basis points. Let's give the scenario a name in the upper left corner: *USD Rates up 100 bps*. Then we'll click Actions and Save. Here, we can share it with other people if we want. And then click Save. Finally, we click Analyze in PORT.

Here, we have one custom scenario. We add that to the list by clicking on the plus sign. It shows up at the bottom of our list in Selected Scenarios. We can move it up using the drag and drop icon. In the Selected Fields category, we'll look at Profit and Loss percent. We have checked Benchmark and the difference between the portfolio and the benchmark during that event. Now let's create another scenario. We'll shock the MSCI World Index down 10%. This is a rare event, but it could happen. We go to Create New and the Macrofactor tab. In the Indices tab, we'll find MSCI World and add it with the double arrow. In the amber % change field, we'll say it's down 10%, which translates to –10%. Finally, we'll name it *MSCI World down 10%*. As before, we'll go to Actions and Save it. Then we'll Analyze in PORT. Let's click on My Custom Scenarios and add *MSCI World down 10%*, add them both from Custom Scenarios, and put them at the top as before. Then Save and Run.

Let's look at the P&L. If interest rates go up by 100 basis points, our portfolio could go up by 6.56%. And the benchmark could go up by 9.19%. Why would our portfolio go up if rates go up? That means there's bullish sentiment in the market about the state of the economy. If the economy is doing well, the Fed is going to increase rates to cool down the economy. Our portfolio goes up but we don't beat our benchmark, as we can see by the +/- column. It's a negative number. If MSCI World goes down 10%, we could go down 7.53%. We're less sensitive to this movement than the benchmark, which goes down 10.52%. We can look at the sectors to see which is most sensitive to the scenarios. You can also drill down into the sectors to see how each company performs in the portfolio and in the benchmark. By using the Scenarios tab to assess their portfolio's exposure to risk on a number of dimensions, you as an investor are better poised to judge whether each risk is worth it. If you are concerned a certain event might happen, you can, for example, swap out an over-exposed security for another, or buy more of a less-affected security.

Summary

To summarize, to be successful, portfolio managers must find a balance between the risks they take and the returns they earn. To manage risk, fund managers use three tabs on the PORT function. The first is Tracking Error/Volatility, which helps them determine how much a portfolio's return deviates from the benchmark's return. This allows them to monitor and adjust their exposure to risk accordingly. The second is VaR, or Value at Risk, which helps them identify the riskiest securities in a portfolio. They use this to make investment decisions with a clear understanding of how much money they could lose. The third is Scenarios, which allows them to analyze how a portfolio would perform in times of stress or change by looking at the impact a market event would have on it. Portfolio managers tweak their positions based on this risk assessment and on their fund's appetite for risk.

Conclusion

As we have seen, the role of a portfolio manager requires a lot of thought, planning, and time. In this module, we've explored the process a portfolio manager goes through to build and maintain a portfolio. You should now be able to describe the role of a portfolio manager, generate ideas and perform extensive research on investment ideas for a portfolio, create a portfolio using screening tools, use PORT to analyze historical performance and risk metrics, and use PORT to evaluate future risk and opportunities for your portfolio. After you've generated ideas, selected your securities and investments, and created your portfolio, you need to manage it by analyzing its performance and assessing potential future risk. This is not a static process. Things change every day, every minute, so you have to constantly check your profit and loss, news on the portfolio, and characteristics because if your P/E goes out of whack, you're no longer a value manager and the money you've been given to manage might be taken away. You need to stick to your mandate above all. It's called a mandate for a reason. Your asset owners chose you because you're a value manager. They also have money with other managers. If you change your strategy, you mess up their entire asset mix. The asset owners can't have their managers correlated with one another. They need to be diversified so as not to have all their eggs in one basket. Understanding the outcome of portfolio analytics means you can prove yourself as an asset to a portfolio manager, to a firm that is looking to measure risk and performance. Every firm in the world is looking to manage its exposure, its risk, and performance. And technology, like Bloomberg's Portfolio and Risk Analytics, is the driver for doing this. The only way to be more efficient, sharper, and smarter than others in the market is to know how to use tools like PORT better than they do.