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Chapter 1 : The Yield Book: Products - The Yield Book

It is widely known that the Markowitz formulation of the portfolio optimization problem, based on maximizing expected return and minimizing risk, is the main pillar of the portfolio management.

Rowling, CPA Executive Summary This paper discusses an alternative to standard optimization techniques to determine the asset allocation and asset location for an investor with accounts with different tax treatments. While portfolio optimization approaches can be useful, optimization serves only as a starting point from which a financial adviser can model various scenarios and find which is most appropriate for a client given their considerations of risk, return, and taxes. This approach produces intuitive, practical, and robust results. The incorporation of financial planning techniques such as asset allocation, asset location, and the drawing down of assets in retirement are discussed in this paper. Cheap and fast computing power allow an adviser to consider different scenarios and present them to clients in terms of intuitive metrics such as returns, volatilities, draw downs, tax consequences, and ultimately their impact upon goals such as saving for retirement. This comprehensive approach is compared and contrasted with standard optimizations and those that consider taxes. Although the consideration of taxes is crucial for effective financial planning, results suggest that advisers should be wary of adjusting the value of tax deferred accounts downward based on assumed tax rates in retirement. This caution stems from practical considerations of client comfort level and perception, the impact of very uncertain assumptions about tax rates and future portfolio values, and the robustness of asset allocation decisions to input parameters. His research and experience have focused on providing quantitatively structured solutions for taxable and tax-exempt investors. He has a Ph. He is an academic with practical experience in the financial services industry where he has expertise in taxes in the investment management sector. Two important determinants of net returns are asset allocation and asset location decisions. The former refers to the target percentage of each asset class to be held in the portfolio while the latter refers to the tax treatment of the type of account in which the assets will be held. The standard academic approach to asset allocation is to run an optimization, choosing an appropriate utility function and defining parameters such as risk aversion. Taxes often are considered a complication and ignored, in part because much of the initial optimization research efforts often are aimed at tax exempt institutions such as pension funds. But for an individual with a mixture of taxable accounts, TDAs, and TEAs, the appropriate treatment of taxes in both asset allocation and asset location can have a material impact upon investment results Kitces ; Reichenstein An alternative and practical approach to achieve the important goal of after-tax optimization exists. The following discussion highlights this alternative. A Scenario Based Approach Optimization is a useful tool for an adviser, combining expected risks, returns, and correlations to obtain desired portfolios. However, the precise answer obtained is dependent on many imprecise assumptions. Therefore, the result from an optimization should not be considered the final answer, but rather one step in determining the ideal allocation for each client. Cheap and fast computing power allows an adviser to develop a number of scenarios, with each one giving the client a range of likely outcomes. Useful results include final dollar amounts, the probability of meeting a target, and drawdowns likely to be experienced. The discussion of these results with the client is an integral part of determining an allocation of portfolio assets. The next step would be to conduct analyses based on expected risks and returns for the assets based on client specifics, such as expected future cash flow needs and tax rates. Such analyses all can be completed in a straightforward and easy-to-understand fashion such that the adviser-client discussion unfolds as follows: This spending can be for retirement as well as other life events such as paying for college. As situations change in the future, so can the results of this process. Daryanani and Cordaro estimated that proper asset location boosts returns by 20 basis points after taxes, compared to keeping an identical allocation across multiple accounts. Typically, bonds are held in TDAs to defer tax on the income. While this tax will be at ordinary income rates upon withdrawal, this would have been the rate had they been held in a taxable account. As bonds tend to have lower returns,

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keeping them in the TDA means lower required minimum distributions RMDs in retirement, creating extra flexibility. If the desired allocation to fixed income is large enough that taxable accounts must be used, then tax-free municipal bonds typically would be preferred. Tax efficient appreciating assets should be placed in the taxable account. Typically, this means low turnover equities, so that capital gains can be deferred and possibly avoided if the assets are held to death. Tax loss harvesting can further lower the effective tax rate of stocks Arnott, Berkin, and Ye ; Berkin and Ye In contrast, holding equities in a TDA effectively turns long-term capital gains into higher taxed income, and is thus tax inefficient. Finally, TEAs should be used to hold assets with the highest expected return, as they will never be taxed. Because these accounts do not have RMDs, there is added flexibility for the client in retirement. When drawing down from a taxable account, advisers and their clients should do so in a tax efficient manner. This involves generally first drawing on those assets with the highest cost basis and at long-term capital gains rates. Accumulated losses can be used to offset gains. Taxes potentially can be deferred for extended periods, possibly until death, when the heirs get a step-up in cost basis. Crucially as well, the utilization of such distribution techniques influences the validity of assumptions made in the accumulation phase. One cannot precisely know the future, and assumptions must be made. But again, a discussion and understanding of these assumptions and potential scenarios needs to be undertaken. Such discussions and actions are part of the overall wealth proposition that an adviser brings to clients. Armed with the results of a variety of potential scenarios, the adviser can then discuss the range of potential outcomes before, at, and after retirement. Included in these discussions should be likely cash available from all sources for spending and potential deviations depending on differing parameters such as taxes and returns. From this discussion comes the understanding to set an appropriate allocation and location for each client. The authors made two specific points, illustrated with examples. One is that the expected returns and risks of taxable assets should be adjusted for taxes. The other point is that, for purposes of asset allocation, TDA target dollar amounts should be reduced by the projected tax rate at the time retirement withdrawals are expected to begin. We strongly agree that taxes need to be considered in investment decisions and, therefore, asset location is an important tool. We further agree that the effect of taxes on money available for retirement should be considered. When money is eventually withdrawn from the TDA, the investor receives a smaller amount reflecting the taxes paid. This is equivalent to adjusting the amount in the TDA now and assuming no taxes when withdrawn. Consider a further illustration of this concept, based on one from Reichenstein et al. Column B shows the same allocation but now with a more tax efficient asset location. The taxable account holds only stocks. If these are managed in a tax efficient manner, then capital gains can be delayed, and if realized, then only at favorable long-term capital gains rates. In this example, bonds are held exclusively in the TDA, so the investor avoids paying taxes on the yield at ordinary income rates. Should equities have higher returns over time as expected, then the taxable account will grow more quickly. Over time, the equities in the TDA can be rebalanced into bonds to keep the targeted allocation. Column C in Table 1 comes from Reichenstein et al. Data demonstrate their approach. This investor is assumed to be in a 28 percent tax bracket upon retirement some years in the future. The TDA is not taxed until retirement at which time the distributions will be taxed at that marginal tax rate. Hence, one major difference in Column C is that the future and current value of the TDA is reduced by this 28 percent rate. The second major difference in Column C concerns the asset allocation. The returns and volatilities of the taxable account have been reduced by their effective tax rates. For example, an investor in the 28 percent tax bracket would see returns on taxable bonds diminished by 28 percent, which also decreases the volatility by the same amount. For stocks, the effective tax rate depends on how much of the return comes from qualified and nonqualified dividends versus capital gains, and how long the stocks are held before gains are realized Reichenstein et al. The new after-tax values for the TDA, and returns and volatilities of the taxable account, have been input into an optimizer. This new optimization produces a Column D reflects the actual dollars invested, as shown on the custodian statements. We strongly agree with the overall philosophy of Reichenstein et al. Taxes do matter and need to be accounted for by the responsible financial adviser. This includes both taxable assets, as well as those in a

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TDA that will be taxed upon withdrawal in retirement. The approach applied by Reichenstein et al. Where we diverge is on its use in practice. These differences can be broken into three categories: Each of these is discussed below, compared and contrasted with our scenario based approach. Client Perception and Comfort For advisers to build healthy relationships with their clients, investment strategies need to be well understood. However, adjusting TDA values affects allocations across the full portfolio. This has the strong potential to confuse clients, because amounts shown on their investment statements will not match what their adviser has told them. Consider again the example from Table 1. In the Reichenstein et al. These values are given in Column D, where the TDA amounts have been readjusted to reflect what is in the portfolio today. Instead of the For an observant client, this is quite a difference. This divergence between what the adviser says and what the investment statement shows becomes even more problematic when explaining performance. The client will see statements with returns reflecting a different allocation than what the adviser is claiming. Consider the example of Table 1 in a period where stocks strongly outperform bonds. The portfolio returns on the statement reflect a How happy and understanding will the client be? This question is important for advisers to consider before embarking on such an approach. Trying to report this performance based on the proposed after-tax methodology of Reichenstein et al. Standards exist for reporting after-tax performance Price

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Scenario-Dependent Portfolio Optimization users will be able to specify levels of 'regret', minimum return or maximum underperformance, for each of the risk scenarios separately.

Furthermore, even within a company, each department may interpret the strategic goals uniquely for their organization. Any organization that manages a portfolio of projects needs to define and communicate what kinds of project work is of highest value. Portfolio Management Lifecycle The Scoring Model is the Prioritization Tool The tool for assessing project value is a scoring model, which includes the criteria in the model, the weight importance of each criterion, and a way of assessing a low, medium, or high score for each criterion in the model. A good scoring model will align the governance team on the highest value work and measure the risk and value of the portfolio. A poor scoring model will not adequately differentiate projects and can give the governance team a false precision in measuring project value. In the context of the portfolio lifecycle, assessing project value is particularly important in the first two phases: Define Portfolio Value and Optimize the Portfolio. Once there is an established portfolio, the same value scores can be used to prioritize work within the portfolio. Unfortunately, this approach does not result in an optimal portfolio, but is acceptable for lower maturity organizations. Strictly speaking, we should distinguish portfolio selection from project prioritization and for the purposes of this post we will focus strictly on using the scoring model for prioritization. Without a clear and shared picture of what matters most, lower-value projects can move forward at the expense of high-value projects. Even though experienced leaders understand the need to focus on a select group of projects, in practice it becomes very difficult. It enables the governance team to navigate critical resource constraints and make the best use of company resources. Higher priority projects need the best resources available to complete the work on time and on quality. Resources that work on multiple projects need to understand where to focus their time. When competing demands require individuals to make choices about where to spend their time, the relative priorities need to be obvious so that high-value work is not slowed down due to resources working on lower-value work. You have to be sure that your most important people are working on the most important projects so that you can get the most important work done within existing capacity constraints. Furthermore, when resources are not available to staff all of the approved projects, lower priority projects should be started later once enough resources are freed up to begin the work. However, not all projects can be initiated immediately. Understanding relative priorities can help direct the timing and sequencing of projects. In some cases, high priority projects may have other dependencies or resource constraints that require a start date in the future. In other cases, lower priority projects get pushed out into the future. Therefore, building a good scoring model is integral to prioritizing work. In fact, as we will see, prioritizing the criteria in the scoring model is a major component of the prioritization exercise. Step 1 – Define the Scoring Criteria The first step in building the scoring model is to identify and define the criteria in the model. In the past, expected financial benefits would be a singular way of measuring project value. Although this is a tangible and quantitative way to measure value, experience shows that merely selecting and prioritizing work based on financial benefits fails to yield optimal strategic results. In high performing organizations, value can include intangible qualitative factors such as the degree of strategic accomplishment, customer impact, and organizational benefits. Therefore, we recommend a combination of quantitative and qualitative criteria. At the very least, your scoring model should include three categories of criteria: Why are two tiers of criteria needed? Some organizations simply want to evaluate the degree of strategic alignment, but since nearly all organizations have two or more strategic objectives, for the purposes of assessing project value, you should evaluate the degree of alignment across all of your strategic objectives. Projects that positively impact multiple strategic objectives are generally more valuable. In addition, having a discrete understanding of which strategic objectives each project supports will further enable the governance team to prioritize work. Each strategic objective is a sub-criterion tier 2 used to assess project value. The three

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recommended scoring model categories are defined below. Portfolio management is focused on strategic execution, so measuring strategic alignment as part of your scoring model is important. All for-profit companies should incorporate financial benefit into the scoring model such as net present value NPV , return on investment ROI , payback, earnings before interest and taxes EBIT , etc. Finally, a good scoring model takes into account the risk factors of the project. Just like a stock portfolio, each investment carries a different level of risk. Remember, if you could only choose one of two investments that each have the same return, you will always go with the least risky option. This is best done using pair-wise evaluations, a simple method of comparing two criteria against each other also known as the Analytic Hierarchy Process, or AHP. This is easily accomplished in one on one sessions with each decision maker. For example, when evaluating strategic criteria, the governance team will be asked to compare strategic objective 1 against strategy objective 2. On paper, everyone probably understands why each strategic objective is important but has probably not considered the relative importance of one strategic objective compared to another. Using AHP will force each person to really consider whether the two strategic objectives are equally important or whether one is truly more important than another when making comparisons using AHP, a criterion can be equal to, twice as important, three times as important, four times as important, etc. In the example below, Decision Maker 1 believes that strategic objective 1 is three times more important than strategic objective 2. This exercise really highlights what is most important to each member of the governance team and affords a way for the governance team to have a common understanding of value. It is necessary to highlight where the biggest gaps are between the members of the governance team and discuss why each person holds their view. Based on experience, the strategic alignment discussion is of critical importance and can surface divergent views that would never have come to light without the pair-wise exercise. An example of a single comparison is shown below. In this example Decision Makers 1 and 2 believe that the first strategic objective is three times as important as the second objective. However, Decision Makers 3 and 4 believe that the second objective is four times and two times as important respectively. This governance team needs to come back together to discuss the discrepancies. The true benefit of this exercise is in the discussion that helps align the team to a common view of strategic value. It is tempting to skip these steps by arbitrarily picking scoring weights in order to quickly score and prioritize projects. One large company wasted hours in weekly steering committee meeting debating the weighting of each criterion. In the end, the excessive discussion wore down the committee; it did not produce the right discussion. Rather, focus on the relative value of each criterion compared to other criteria; the weighting will be a mathematical output of the pair-wise comparisons. Additionally, if the governance team does not share a common understanding of value, the benefits of going through any prioritization exercise are greatly diminished and can cause more churn in the long-run. Based on experience with Fortune companies, the pair-wise discussions are not only more effective but also more efficient a single person can complete their evaluations in 15 minutes. The benefit is in the discussion among the governance team members to align on the criteria for evaluating project value. By this point, the result of prioritizing the criteria is: A governance team that has been calibrated around how to define value A scoring model with criteria and weighting that has been validated by the governance team and can be accurately used to assess project value. The simple example below shows what the weighting could look like after prioritizing the criteria. Scoring Model Summary In this post we have covered how to purposefully build a scoring model. The next post will cover the remaining steps in order to evaluate and score projects.

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gramming (QP) model for portfolio optimization in a way that balances risk and expected for the expected return of the portfolio is also scenario-dependent.

Scenario analysis in Excel involves switching different sets of input values into the same set of formulas to compare the differences in outcome. This article will demonstrate in detail how to implement this set of scenarios with both the options buttons and with the What-If Scenario Manager. Here is a brief description of each: This quite commonly used to perform scenario analysis. Both of these techniques will be demonstrated in this article. Switching between different scenarios is as simple as selecting a different option button. An example using options buttons to implement scenario selection is shown as follows: The Scenarios are created and stored within the Scenario Manager. When an individual scenario is selected within the Scenario Manager, the value in the output cell is changed to the value specified by the scenario as follows: Option buttons are always visible making them a more convenient option to switch between scenarios. By default the Developer tab does not appear in the ribbon. The Developer tab must be configured to be one of the tabs permanently displayed in the ribbon. This can be quickly implemented with the following steps: The checkbox next to Developer will initially be unchecked. Simply check that checkbox and the Developer tab will become a permanently visible part of the ribbon as long as that checkbox remains checked. This is shown in the following images. This is shown as follows: The option button is creating by clicking the option button icon in the Form Controls menu as follows: Click On Image To See a Larger Version When the option button icon is clicked, the cursor become the tool to place the option button on the Excel worksheet. The outline of the option button is created by clicking and then dragging the cursor. The location and dimensions of the option button can be changed at any time after the initial option button has been created. The initial option button will appear as follows: This is accomplished by right-clicking anywhere in the option button to bring up the following short-cut menu. Format Control is selected from the short-cut menu. This brings up the Format Control dialogue box. The cell which will hold the output of the option button must now be specified. In this case that cell is A4. Each new option button that is created will be part of the initial group of option buttons. All option buttons in the same group will collectively send their output to the same cell. Only one option button in a group can selected at any time. The output cell, A4 in this case, will contain the number that is associated with and unique to the specific option button that has been selected. This second options button will be part of the same group that contains the first options button. The Format Control dialogue box that will appear when the second dialogue box is right-clicked as follows. By default the value of the second options buttons will initially be Unchecked and the output will be linked to the same output cell of the first options box, which is A4. Changing the output cell in the Format Control of an options button will change the location of the output cells for all options buttons in the same group. Click On Image To See a Larger Version The labels associated with each options button can be renamed by right-clicking on the original label and then typing in the new label. The result might be as follows: The outline of the group box is created by clicking and then dragging the cursor. The location and dimensions of the check box can be changed at any time after the initial check box has been created. Any options buttons that are inside the group box are part of one group. Any options buttons that are outside of the group box are part of a different group. The initial group box will appear as follows: An example of each of the two methods are shown as follows: When an individual scenario is selected within the Scenario Manager, the value in the output cell is changed to the value specified by the scenario. This brings up the following Edit Scenario dialogue box, which has been filled in with the basic information about the first scenario titled Best Case. The output cells for this scenario is A4. In this case, the output cell, A4, will display a 2 when this scenario is selected. This will also be linked to cell A4 and will produce the value of 3. Excel Master Series Blog Directory.