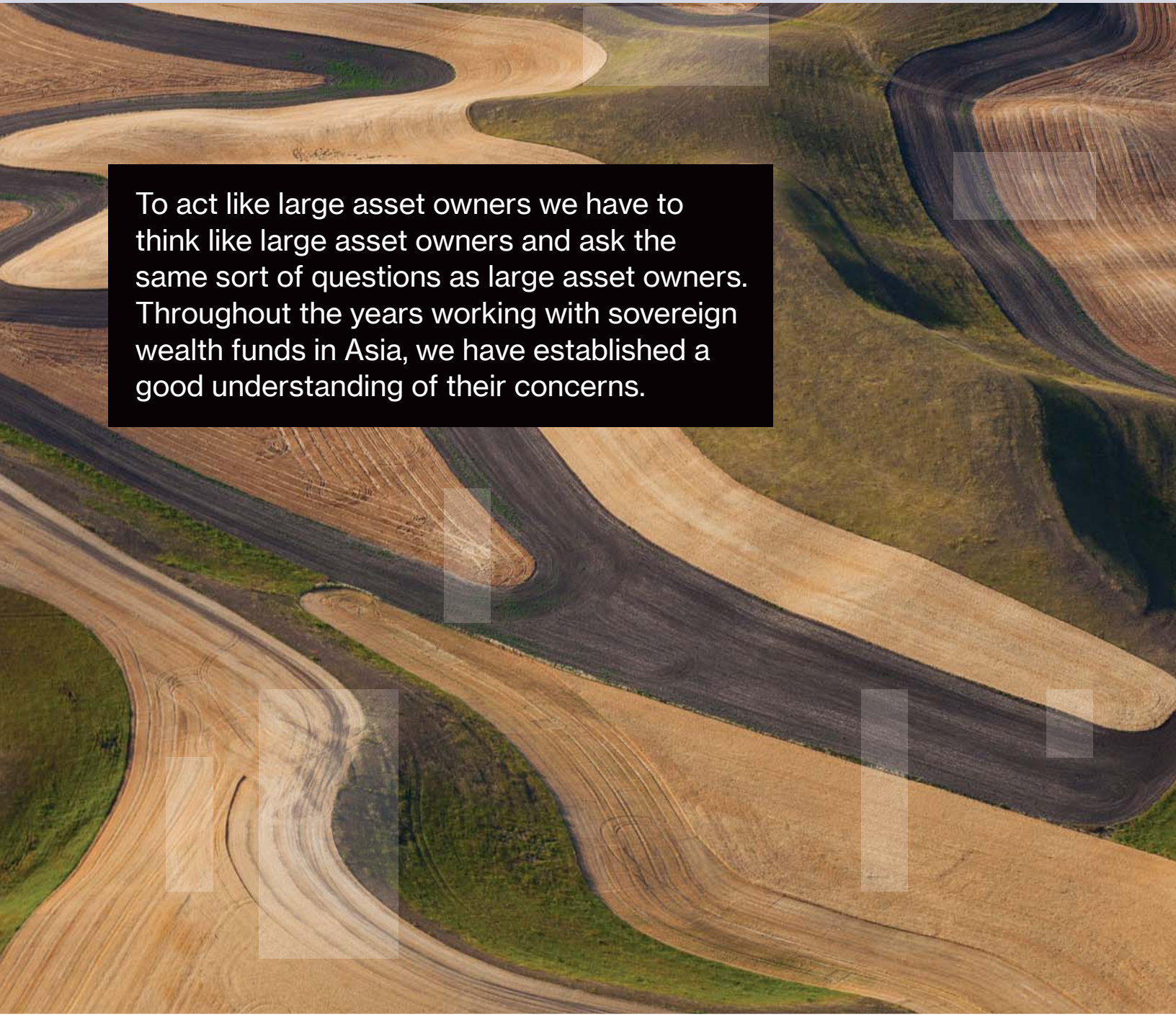
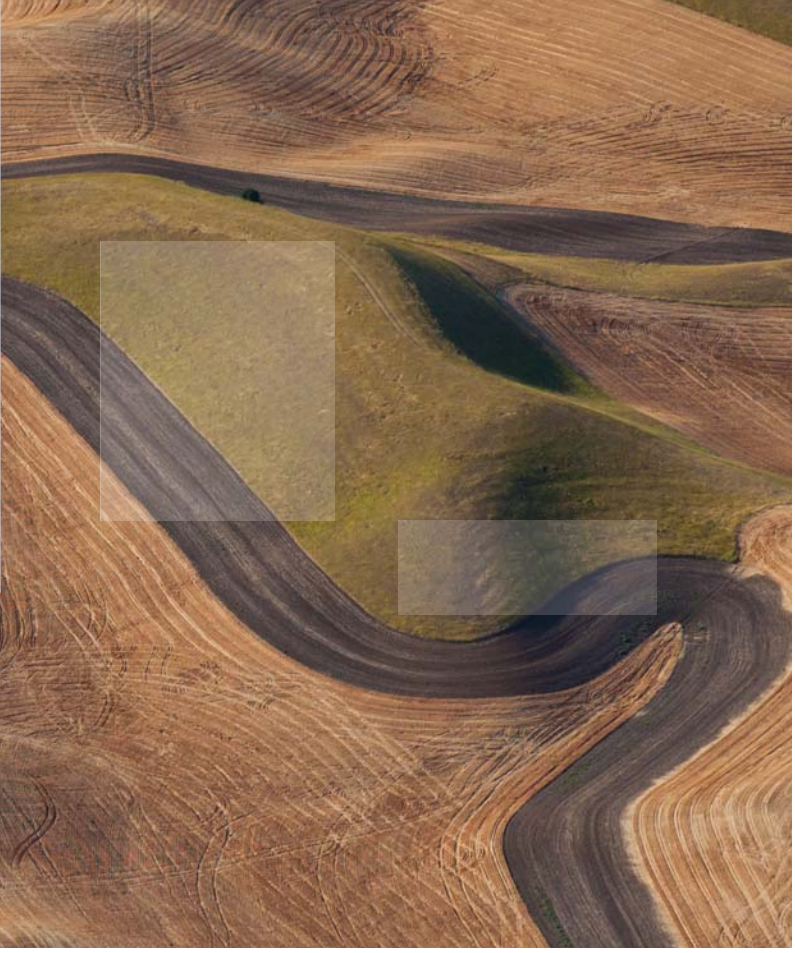
How bespoke modeling can help answer the what-if questions

By Andy Siu and Paul Colwell



To act like large asset owners we have to think like large asset owners and ask the same sort of questions as large asset owners. Throughout the years working with sovereign wealth funds in Asia, we have established a good understanding of their concerns.



The questions they ask are very specific to their individual fund, reflecting their specific objectives, their own investment approach, their own views of the markets and investment exposure. These are questions only a bespoke modeling framework can answer, and that is what we have built.

We believe this framework is particularly helpful when making strategic decisions as well as understanding the concentration of risks in case of a stress event. A number of our sovereign wealth clients find the framework useful to evaluate if they are positioned suitably to make regular payments to the government or to fund social programs for a long period of time. Often these are critical elements of their mission. We feel the framework is also beneficial in weighing up the pros and cons of different portfolio mixes in each fund's individual specific context.

Figure 1. **Some of the questions we have encountered include:**

Budgeting and liability related

- What dividends can the portfolio contribute annually to the budget in a sustainable manner? What is the risk to these dividends? Is the source of dividend income concentrated or broadly diversified?
- What is the risk of not being able to meet interest and principal payments related to debt financing?
- What is an appropriate mix of investments to meet our target returns so that we can cover our spending needs?

Strategic-decisions related

- How are changes in strategic allocations expected to impact on the portfolio risk and return profile in the short term and long term?
- What is the impact of large domestic concentrations in the portfolio? Should these be diversified and, if so, how?
- What are the key and/or unique sources of value add arising from the investment process? How well are we expected to be rewarded for the risk taken?
- What value are we expected to generate relative to a broad passive benchmark, such as the global equity index?

Risk-management related

- Given current market conditions and our outlook for the next five years, what is the most likely portfolio outcome? And what is the range of possible outcomes?
- If there is a stress event similar to the Global Financial Crisis, or some future scenarios either articulated by the client, or developed by Willis Towers Watson; what would be the expected drawdown and the implications on our ability to meet objectives?
- How exposed is the portfolio to currency risk, liquidity risk and refinancing risk?

What are the key components of this bespoke framework?

Economic scenario forecasting
Different investors worry about different types of stress events, and these could be very specific like hard landing in China or global deflation. Hence we first work with them to understand their concerns, their views and the types of environments that will be most damaging to their portfolios and determine the stress scenarios to be considered. We then develop projections of economic and other variables that characterize each specific scenario, taking account of their input. From this we seek to model the impact on different asset classes factoring in economic and fundamental forecasts for various geographies, sectors and investment segments. For most Asian investors, the key focus is on understanding the possible drawdowns in the short term.

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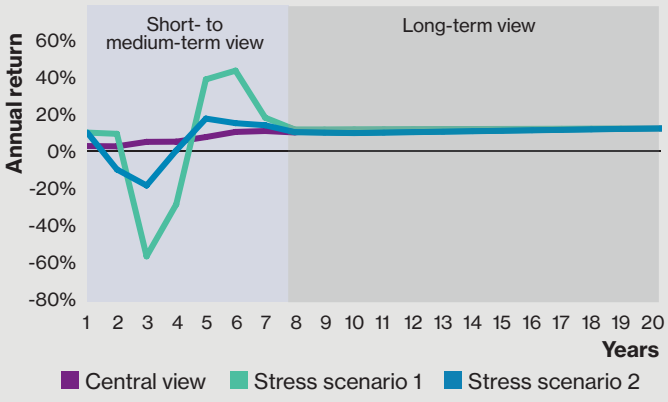
Figure 2. **Economic scenario forecasting**



Stochastic return projections

Using our stochastic asset model we are able to translate the deterministic outputs from the economic scenarios work into a set of simulated returns for assets across different geographies and sectors. This is then put into our portfolio modeler, which seeks to enable investors to understand the likelihood of returns based on a range of possible outcomes. Our modeling factors in tail risks in accordance with historical return distributions as well as our forward-looking views, where appropriate. Through the use of likelihood measures, the investor understands how robust the portfolio is or if they are exposed to specific scenarios due to certain concentration of risks.

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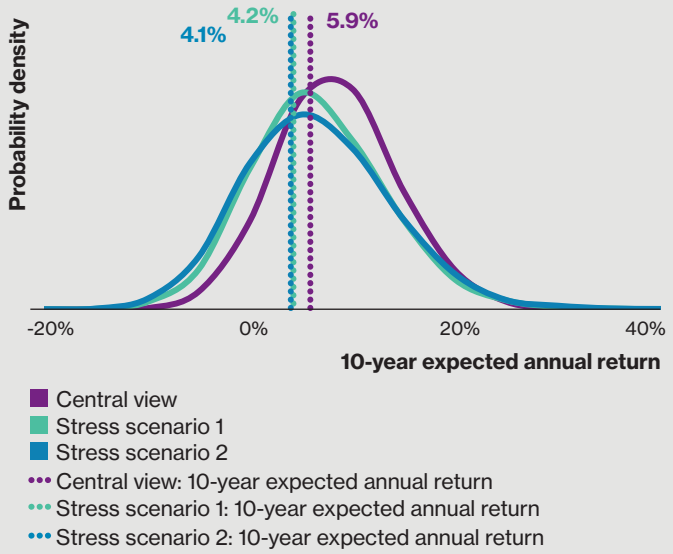
Figure 3. **Asset class 10-year expected annual return**



Portfolio modeler

Different investors have different ways to invest. To reflect this, we develop frameworks to reflect their specific investment approach. In particular, the models take into account different segments of their portfolio and characterize each line item in their portfolio in a way that is more granular than the standard asset model. This allows investors to estimate the forward-looking portfolio risk and return in a bottom-up manner and to better characterize the nature of their underlying investments. For example, we can model a private equity investment in the health care sector in Brazil where the investor holds a majority stake or a legacy-listed equity investment in the domestic technology sector. In addition, the portfolio model can also consider the use of leverage and different capital recycling approaches.

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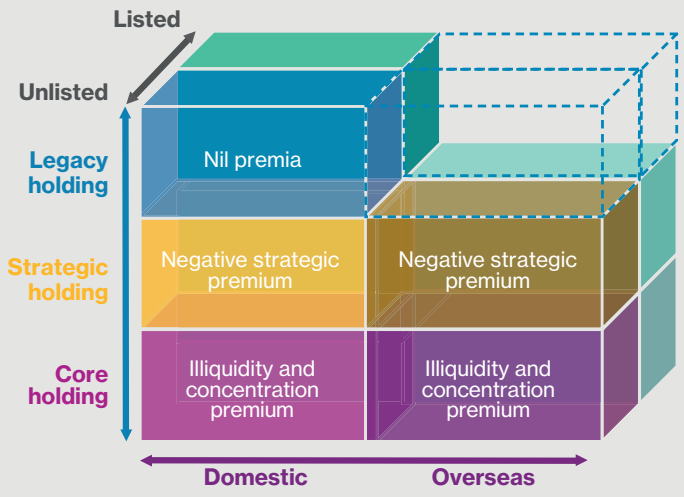
Figure 4. **Portfolio segmentation for premium application**

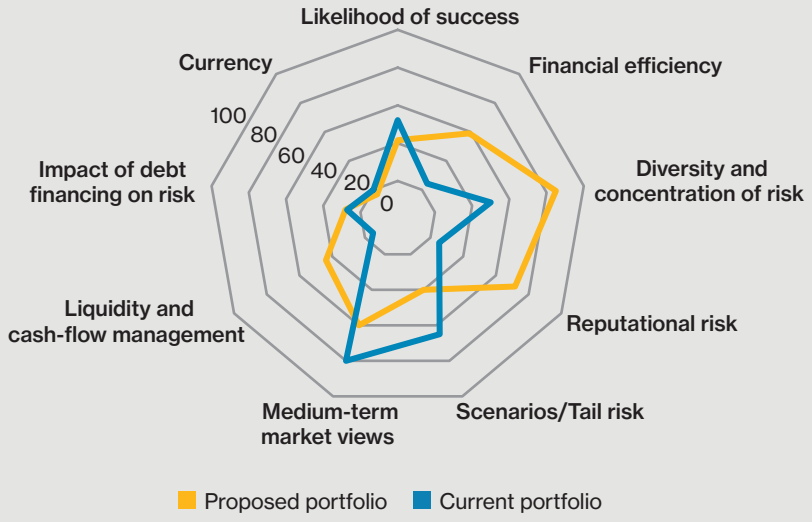


Portfolio scorecard

The final step is to help the investor compare the "what ifs" for different portfolios and help them assess the relative merits of each. To inform this discussion, a portfolio construction tool has been developed that seeks to enable investors to evaluate different portfolios in the context of portfolio efficiency, diversification, exposure to tail risk, medium-term market views, as well as other investor-specific risk and liability measures.

The "scorecard" is developed in conjunction with the investor based on a detailed understanding of both their stated and "soft" objectives. It provides a portfolio score and enables comparison across different portfolios against objectives and relevant criteria. In this way, new ideas can be supported and verified quantitatively when building the portfolio.

Figure 5. **Portfolio scorecard: proposed portfolio versus current portfolio**



We believe the key key benefit is that this framework, while built on Willis Towers Watson intellectual capital, provides significant flexibility to tailor to each large asset owner's specific situation, reflecting their investment process, concerns and views.

Conclusion

We believe the key benefit is that this framework, while built on Willis Towers Watson intellectual capital, provides significant flexibility to tailor to each large asset owner's specific situation, reflecting their investment process, concerns and views. It seeks to help them to map out their risk exposures more clearly, to understand the likelihood of meeting their objectives, and to answer their "what if" questions, thereby enabling more informed decision making. Because of this, a number of investors have subsequently repositioned their portfolios. In addition, we have seen our bespoke modeling framework being utilized by investors to communicate the overall risk and return profile of their investment strategy, as well as proposed portfolio changes to both internal and external stakeholders.