The new normal

A sophisticated approach to stress testing (July 2024)

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A sophisticated approach to stress testing

As any investment history buff will tell you, market stress periods occur more frequently than standard economic models predict. Be it the COVID-19 pandemic or the black swan financial crisis of 2008, investors need to build portfolios that are resilient to these market crashes.

As part of SPS530, APRA requires superannuation funds to have a comprehensive investment stress testing program that is approved by the Board. This program must include adverse stress scenarios covering a range of factors that can create extraordinary losses. The testing program must be undertaken at least annually and needs to have clearly articulated stress testing objectives, methodology, assumptions, frequency and risk factors, including the rationale for the severity of the adverse stress scenarios.

Frontier Advisors helps our clients to stress test their portfolios by undertaking:

Historical stress testing

What losses would been incurred during a historical market crash, such as the GFC and 1987 stock market crash.

Forward-looking stochastic analysis

Simulating future possible returns and examining the stressed outcomes.

Forward-looking scenarios modelling

Based on Frontier's proprietary forecasts we have developed five market-based scenarios and six macroeconomic scenarios.

In recognition of the changing investment environment and the implications of regime turbulence for expected portfolio outcomes, we have made a number of major enhancements to our Portfolio Analytics modelling capability. Thanks to the dedicated efforts of our capital markets team on regime risk client-driven projects, our in-house quantitative work on regimes and our commitment to developing a user-friendly interface, we are pleased to announce several new enhancements:

- A new historical stress scenario was added this year, the 2020 COVID-19 pandemic stressed scenario.
- The addition of non-normal modelling capability to our stochastic analysis to more easily reflect the real-world behaviour of capital markets. Frontier's skew and kurtosis parameters are now pre-loaded. Users can easily rely on the parameter estimates from our Capital Markets and Asset Allocation Team (CMAAT). One click will load these estimates across all available asset class, allowing for more immediate modelling that considers non-normality in investment market distributions.
- Multi-regime path modelling has been added as a completely new capability within our Portfolio Analytics simulator. Users can now undertake advanced scenario analysis by considering shifting macroeconomic regimes over forecast horizons and visualise multiple regime paths in the same view, for strategic, actual or potential asset allocations.

Multiple assumption set modeling is now available across the entire Portfolio Analytics application. Additionally, usability and reliability have been enhanced by reducing user complexity in configuration. This more seamless configuration process provides efficiency benefits for users.

Historical stress testing

New stress scenario

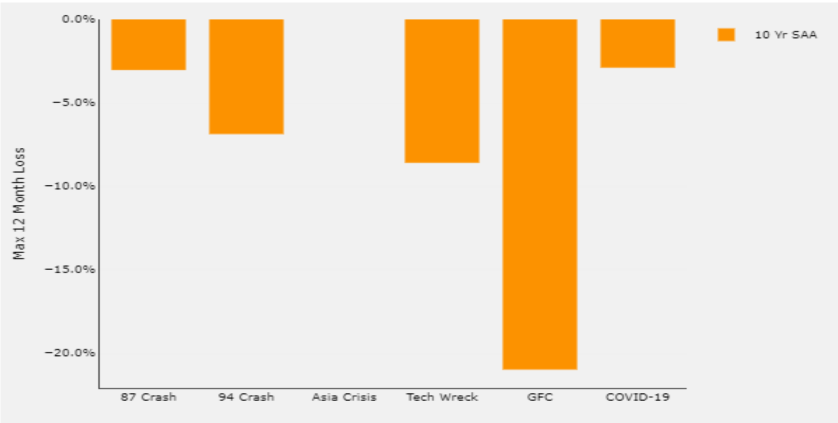
We use six historical stress periods where there were extraordinarily large losses in markets. These stress periods are considered by Frontier to be appropriate periods in which to measure and test the suitability of the investment strategy.

The historical stressed scenarios are:

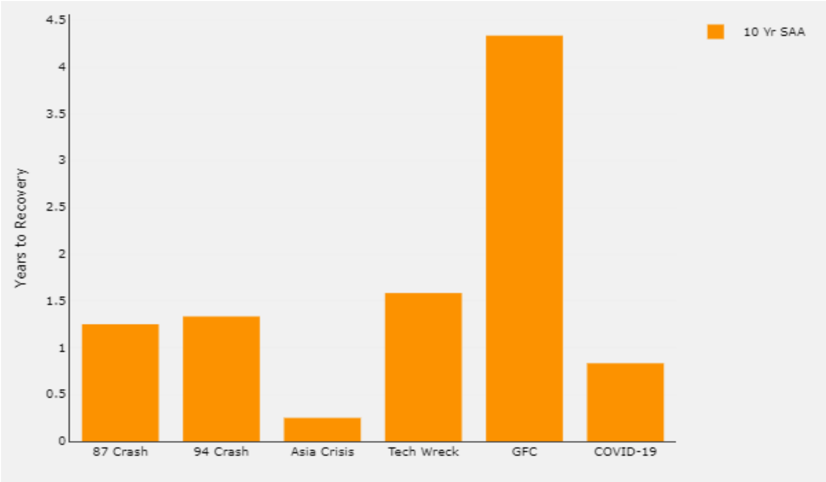
- The 1987 stock market crash
- The 1994 market correction
- The 1997 Asia crisis
- The 2000-2003 bear market crisis
- The 2008-2009 global financial crisis (GFC)
- The 2020 COVID-19 pandemic.

We examine the impact of these events on each investment option in terms of the maximum loss and measure the time it takes for a portfolio to recover back to its previous levels.

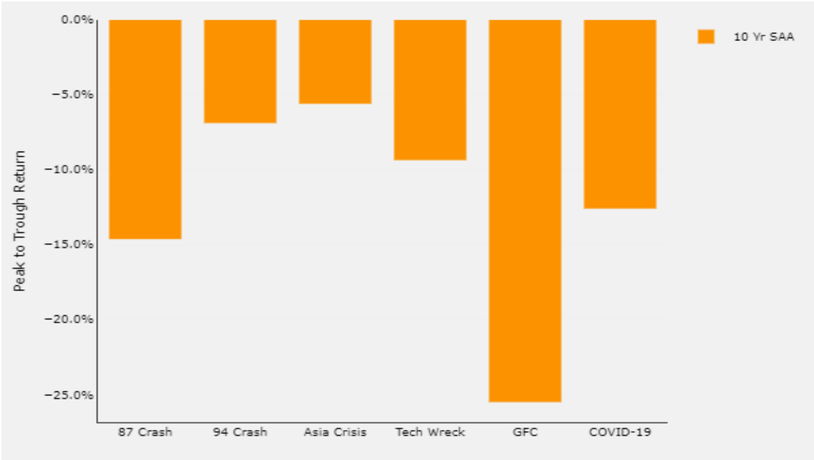
Maximum 12 month rolling loss



Years to recover losses



Peak to trough portfolio return



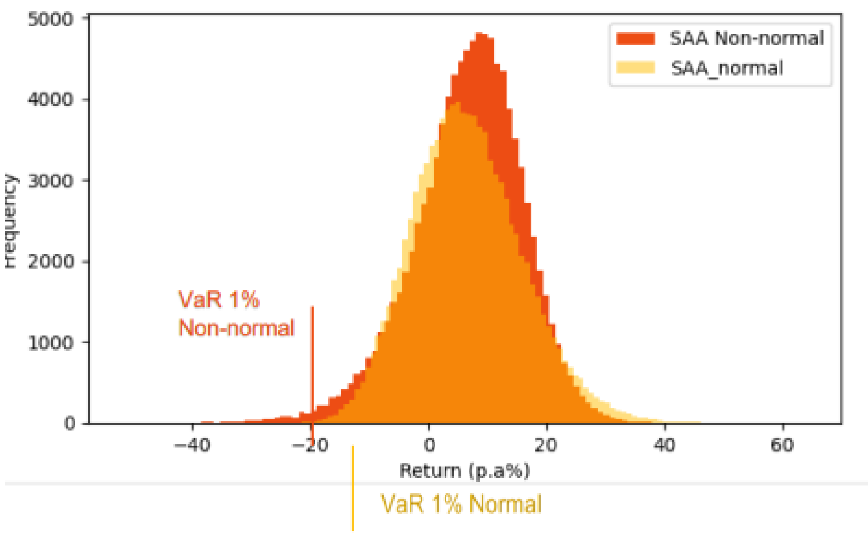
Forward-looking stochastic analysis

Non-normal modelling

The traditional approach to portfolio modelling assumes asset returns are normally distributed. However, we know from history that returns are seldom 'normal'.

Normal distributions assume that extreme events are rare and that returns are symmetrically distributed around the mean. However, financial markets are known to experience occasional tail events, such as market crashes or unexpected booms, which can result in significant deviations from normality. These extreme returns can introduce fat tails and make the historical distribution of a portfolio appear different from a normal distribution. Specifically, asset class returns usually exhibit what is referred to as 'skew' and 'kurtosis'.

Simulated return distribution normal versus non-normal



What is the effect on results

Summary statistics of simulated distribution

	SAA normal	SAA non-normal	Change
Mean	6.74%	6.78%	➡
Standard deviation	9.34%	9.29%	➡
50%	6.15%	7.49%	⬆
75%	12.66%	13.02%	⬆
99%	31.09%	26.23%	⬇
Skew	0.38	-0.51	⬇
Kurtosis	0.27	0.93	⬆
-VaR (5%)	-7.64%	-9.54%	⬇
-CVaR (5%)	-10.60%	-15.34%	⬇
-VaR (1%)	-12.49%	-18.74%	⬇
-CVaR (1%)	-14.79%	-24.57%	⬇
Probability of negative return	24.35%	21.1%	⬇
Probability of exceeding CPI + 3%	52.89%	59.07%	⬆
Probability of exceeding 5%	55.09%	61.09%	⬆

As expected, the mean and standard deviation are unchanged when using a non-normal distribution.

However, the VaR and CVaR results do show noticeably different outcomes, quantifying the potential losses in extreme scenarios.

Forward-looking scenario analysis

Regime modelling

Frontier's proprietary forecasting has five forward looking market scenarios:

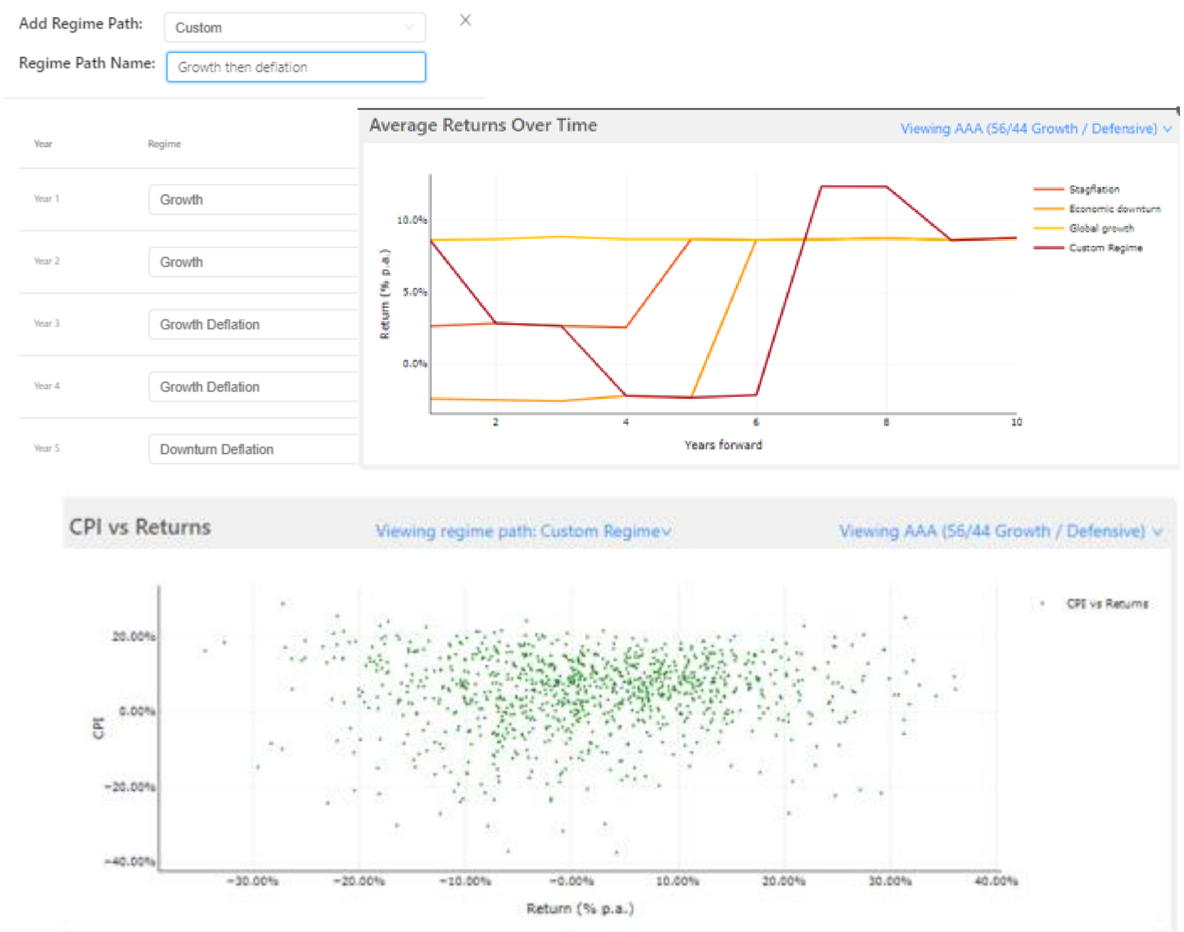
- Base – our most likely outcome
- Positive and negative – 'normal' range of outcomes
- Bull and crash – 'extreme' range of outcomes.

In addition, we have six different macroeconomic scenarios:

- Base case
- Acceleration of global growth
- Global economic downturn
- Domestic economic downturn
- Acceleration of global inflation
- Stagflation.

We have now added the ability to simulate a multi-regime path. Users can undertake advanced scenario analysis by considering shifting macroeconomic regimes over forecast horizons and visualise multiple regime paths in the same view, for strategic, actual or potential asset allocations.

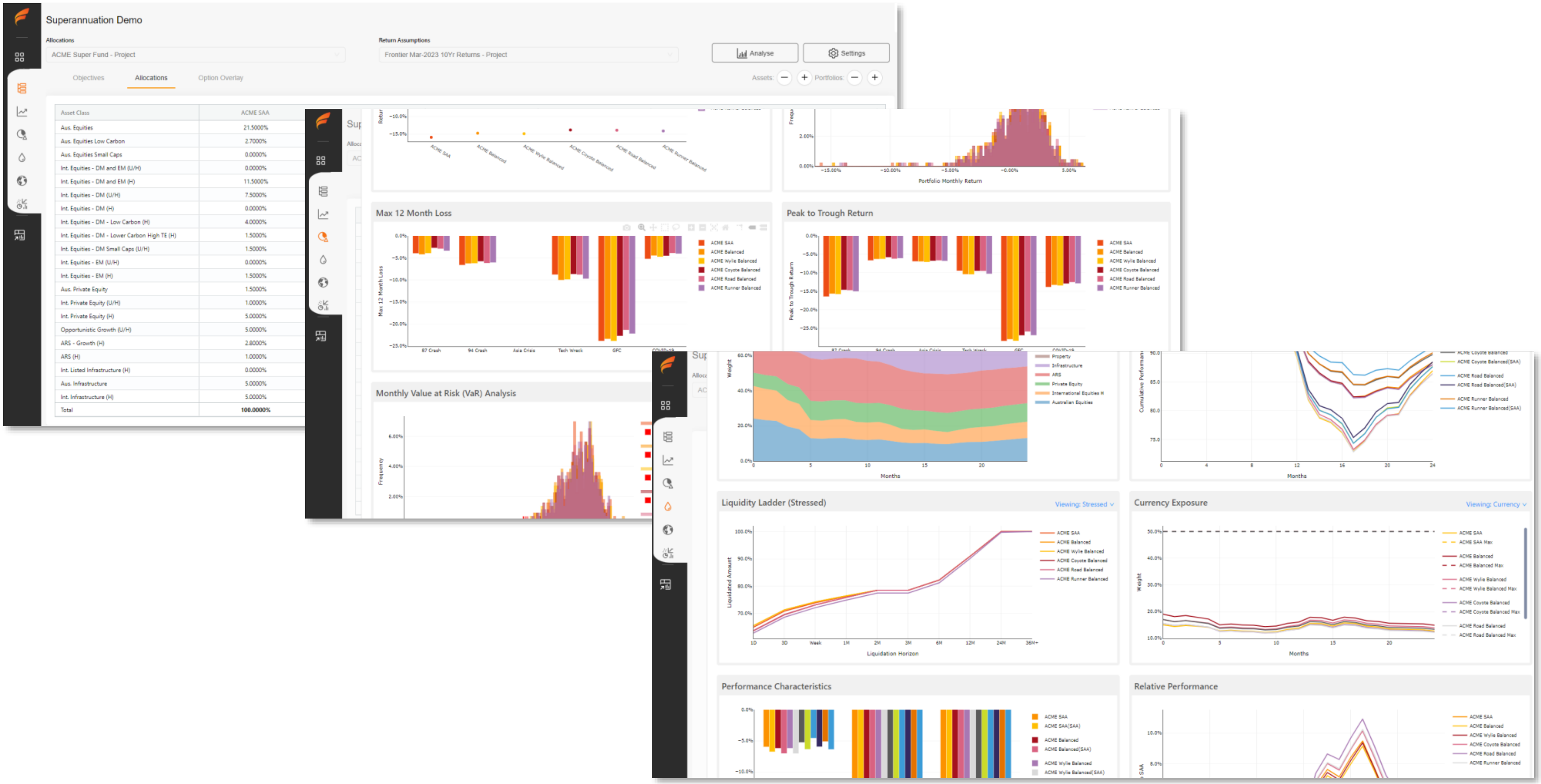
Multi-regime modelling



Enquiries

Get in touch for a discussion or demo

Contact your consulting team or Daman Grewal, Senior Relationship Manager at dgrewal@frontieradvisors.com.au



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