STATE SUPER
SAS Trustee Corporation

FOR A FEW DOLLARS MORE

29th Colloquium on Pensions and Retirement Research

Financing Retirement in the 2020s and Beyond
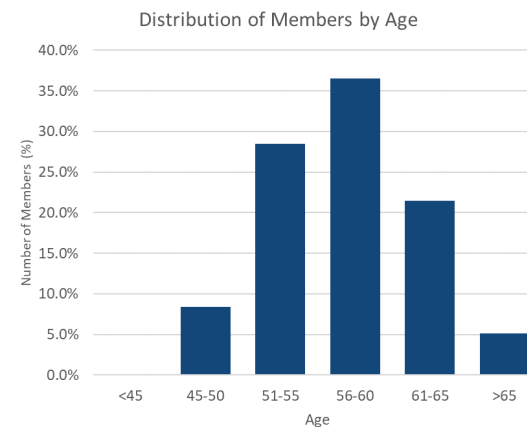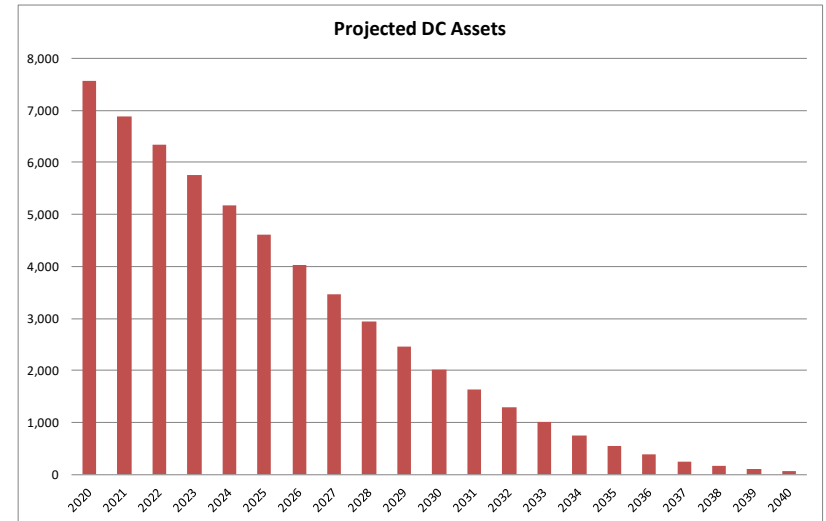
01 December 2021

John Livanas, Charles Wu

1. SUMMARY

- Conventional wisdom is that timing the market creates significant risks, and that maintaining an investment strategy over multiple market periods, is the preferred option

- Conventional wisdom is wrong; CASHFLOWS matter as funds move into outflows

  1. Show that DOLLAR outcomes can vary for the same portfolio dependant on cashflows

     - Volatility is your friend in a cashflow positive portfolio and your enemy in a negative cashflow portfolio

  2. Downside protection allows portfolios to be more aggressive

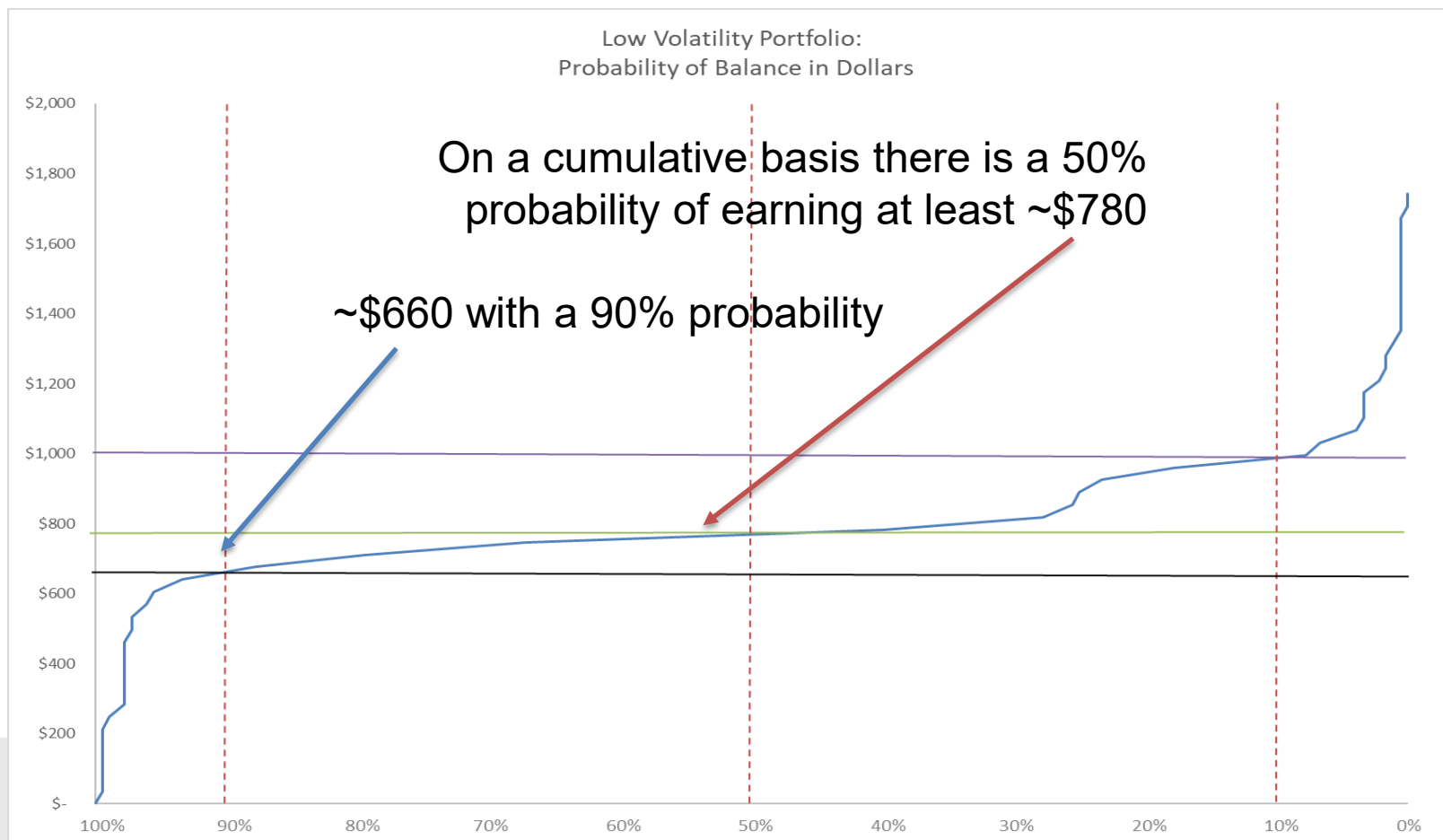 3. Machine Learning can help avoid the worst routs

2. PROBLEM

- State Super Pensions funds have significant negative cashflows. As will Super funds over the next 10 – 15 years.

- In outsourced investment management, funds' managers are measured on Time-Weighted Rate of Return (TWRR).

- Member's realised wealth is in DOLLARS

- Timing is unknown, but there is a 50% probability that it will occur INSIDE 7 years (half-life)

- Require "Growth" portfolio targeting CPI+3-3.5% over 7 years with > 50% probability

Projected DC Assets

Distribution of Members by Age

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Return %	Vol %
Portfolio A	1%	1%	1%	1%	1%	1%	1%	-1%	-1%	-1%	-1%	-3%	0.0%	1.3%
Portfolio B	2%	2%	2%	2%	2%	-2%	-2%	-2%	-2%	1%	-1%	-2%	0.0%	1.9%

Low Volatility Portfolio:
Probability of Balance in Dollars

On a cumulative basis there is a 50% probability of earning at least ~$780

~$660 with a 90% probability

B: ILLUSTRATION : THE EFFECTS OF VOLATILITY

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Return %	Vol %
Portfolio A	1%	1%	1%	1%	1%	1%	1%	-1%	-1%	-1%	-1%	-3%	0.0%	1.3%
Portfolio B	2%	2%	2%	2%	2%	-2%	-2%	-2%	-2%	1%	-1%	-2%	0.0%	1.9%

High Volatility Portfolio:
Probability of Balance in Dollars

A probability of 50% of over $600

A 90% probability of ~$300

A 10% probability of $1,400
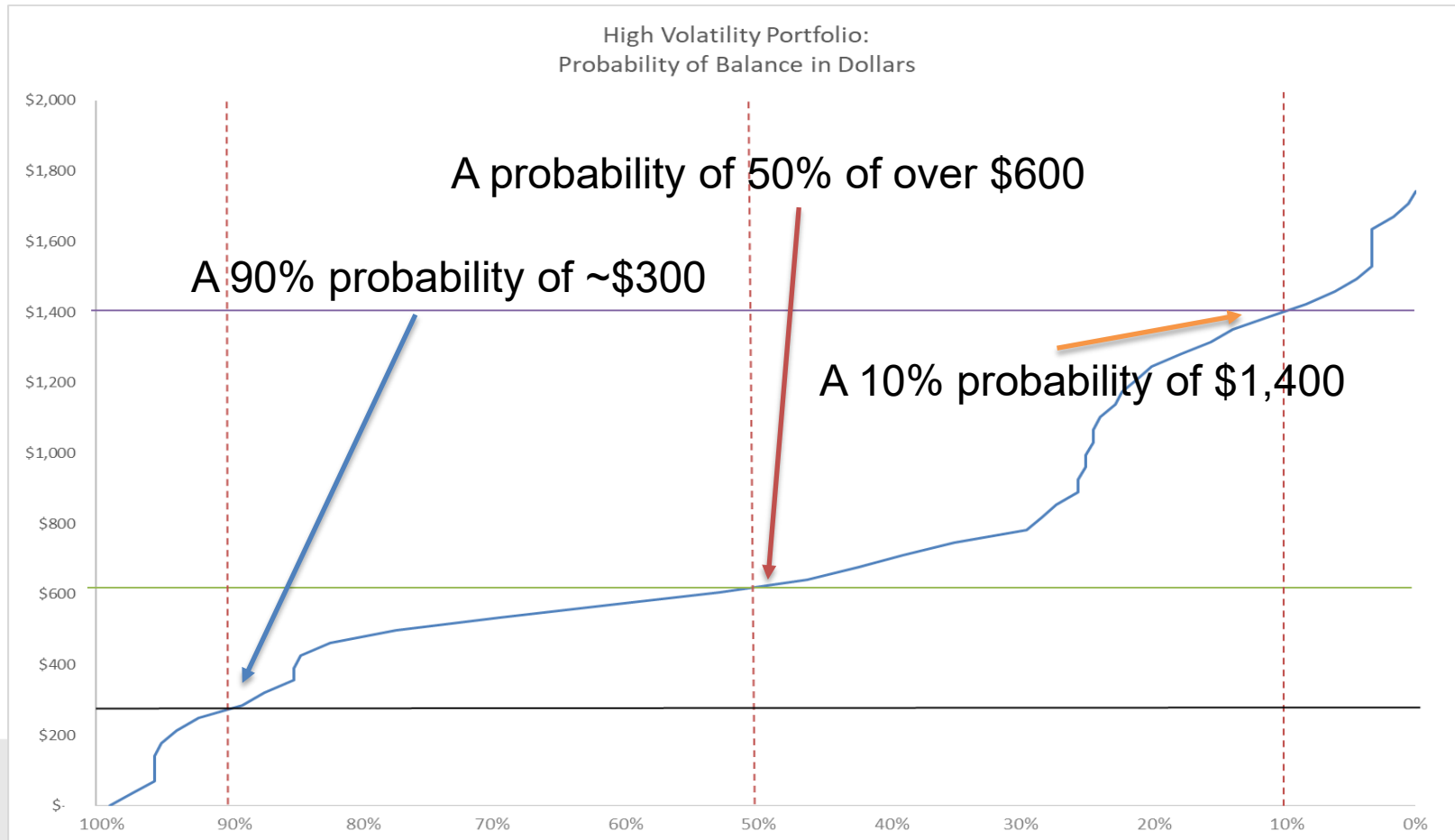
3. PORTFOLIO CONSTRUCTION TO 7 YEAR HALF-LIFE

1. Project asset returns by asset class (Capital Market Assumptions or CMA's) over 7 years:

    a. CMA's are market aware: understand the position of each asset class in their valuation cycle with reference to the contemporary market

    b. Long term steady state assumptions are used with caution when shaping the end values only

    c. CMA's may change significantly each year, to suit the investment environment

    d. Asset class correlations and risk parameters are allowed to vary between contemporary market and end state

    e. Momentum plays a significant role

2. Downside events are catastrophic

    a. Identify what will kill you (Risk Appetite), and develop **downside protection**

    b. Require the portfolio to pay for protection costs

    c. Monitor and use contemporary information to reposition portfolio

A. DOWNSIDE PROTECTION FRAMEWORK

SAA/DAA	Active DAA decisions, defensive positioning and relative value positions	0.01%
Diversification	Diversification as a result asset responding to different market environments	1.25%
Derivatives	Derivative protection strategies	0.48%

At the Asset Class Level
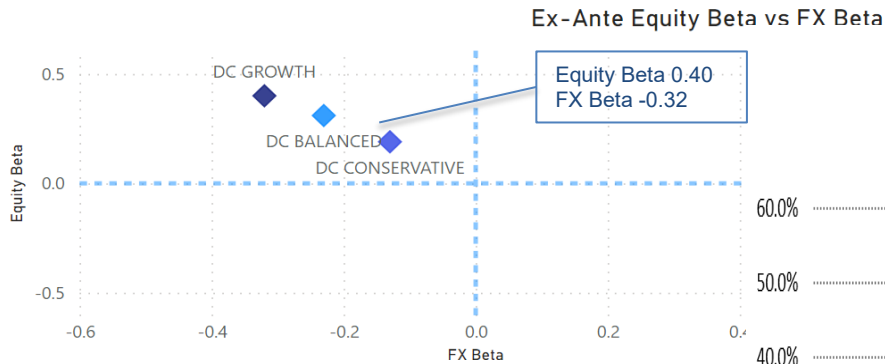
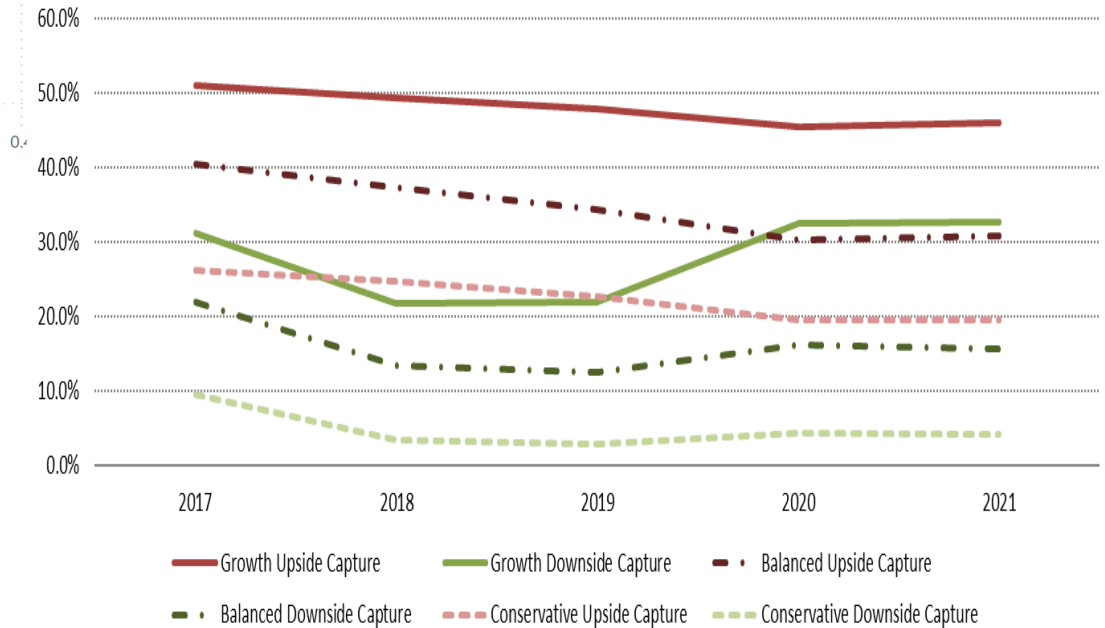|		
Liquid Growth	Manager configurations incorporate low volatility, low beta strategies, derivatives overlay	0.70%
Property & Infrastructure	High yield, low leverage.	1.46%
Liquid Defensive	Duration and convexity	0.87%
Alternatives	Asset allocation and idiosyncratic risk between and within asset classes.	0.88%
Currency	Portfolio level currency exposure management	0.94%

Note:
- Asset class level: The above figures represent the expected outperformance vs ASX200 and MSCI World ex Australia by each asset class given a 10% market drawdown.
  - Calculations based on trailing 3 years equity beta.
  - Australian Equities calculated against ASX200 accumulation index.
  - All other asset class calculated against MSCI World ex-Australia.

Source: State Super, Bloomberg

Positions based on 30 April 2021

Ex Ante Beta vs Hedged MSCI World XXX & USD spot

Ex-Ante Equity Beta vs FX Beta

Equity Beta 0.40
FX Beta -0.32

DC GROWTH
DC BALANCED
DC CONSERVATIVE

Upside/Downside Capture (vs MSCI ACWI (AUD))
Average Monthly Returns in Rolling 3 year

Growth Upside Capture — Growth Downside Capture — Balanced Upside Capture
Balanced Downside Capture — Conservative Upside Capture — Conservative Downside Capture

Source: Bloomberg
**(MC) = Monte Carlo Simulation Method

Purpose: to parse information for Human Decision making

Information Dense

Check relationships in the increasing data, variety, volume and richness

Noisy
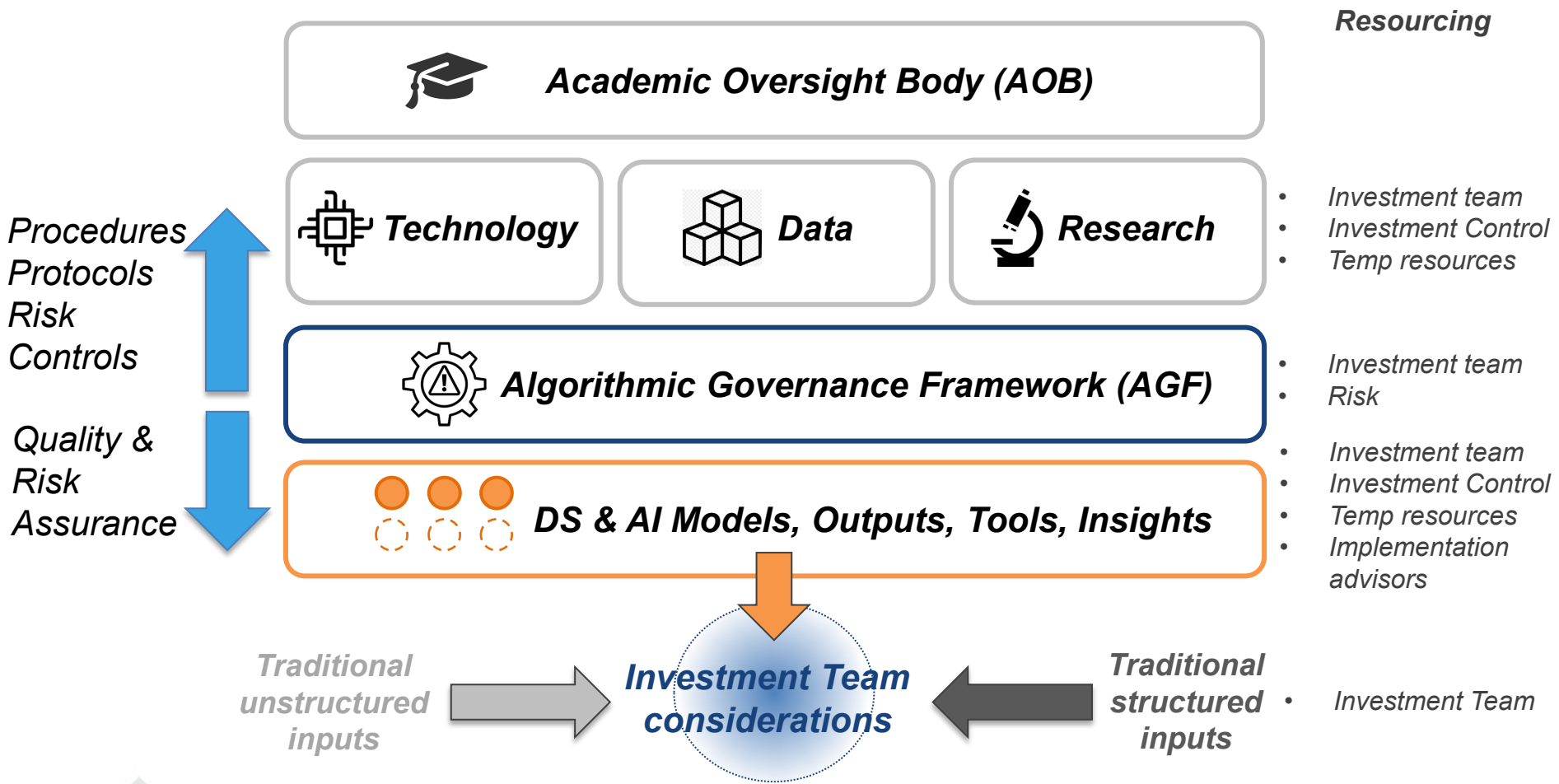
Mitigate the impact of biased or misleading data

Complex

Apply scientific methods for forming and testing hypotheses

AGF Impact: Quality & Risk Assurance by Protocol for DS & AI use

Resourcing

Academic Oversight Body (AOB)

Technology **Data** **Research**

- Investment team
- Investment Control
- Temp resources

Algorithmic Governance Framework (AGF)

- Investment team
- Risk

DS & AI Models, Outputs, Tools, Insights

- Investment team
- Investment Control
- Temp resources
- Implementation advisors

Procedures
Protocols
Risk
Controls

Quality &
Risk
Assurance

Traditional unstructured inputs → **Investment Team considerations** ← Traditional structured inputs

- Investment Team

CONCLUSION

1. Achieved all our investment objectives over a rolling 5- and 7-year basis

2. Portfolio NEVER went negative on a YTD basis throughout Covid crisis

   – not even for end April 2020

3. Superior risk adjusted performance – top decile plus median – top quartile percentage return

4. Time-in-the market is dead

…for a fistful of dollars