

QUANTITATIVE BOOTCAMP

OCTOBER 2025

CAIM QUANTITATIVE BOOTCAMP

No death by PowerPoint (but torture by Excel)



Learning **about** something vs.
learning **to do** something

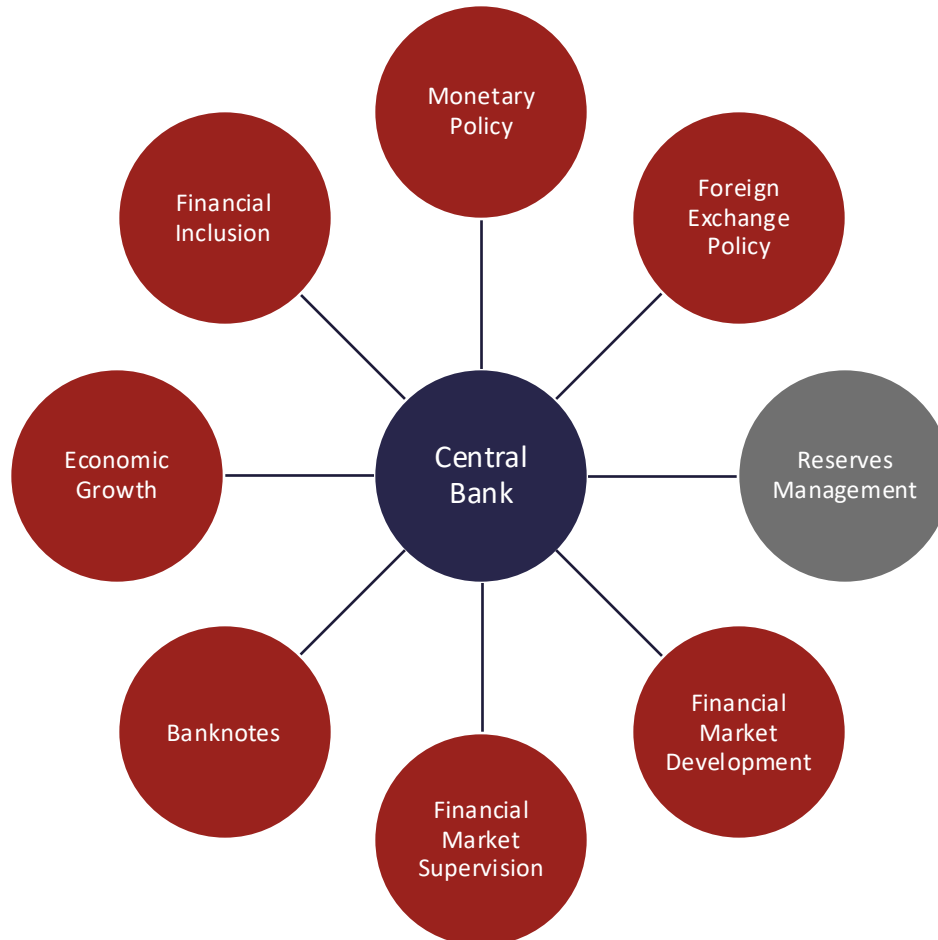
Images: LinkedIn (Jenny Jay Pollock via www.prdaily.com), canva.com



RESERVES MANAGEMENT

WHY TALK ABOUT RESERVES MANAGEMENT?

Balancing profitability and access to finance



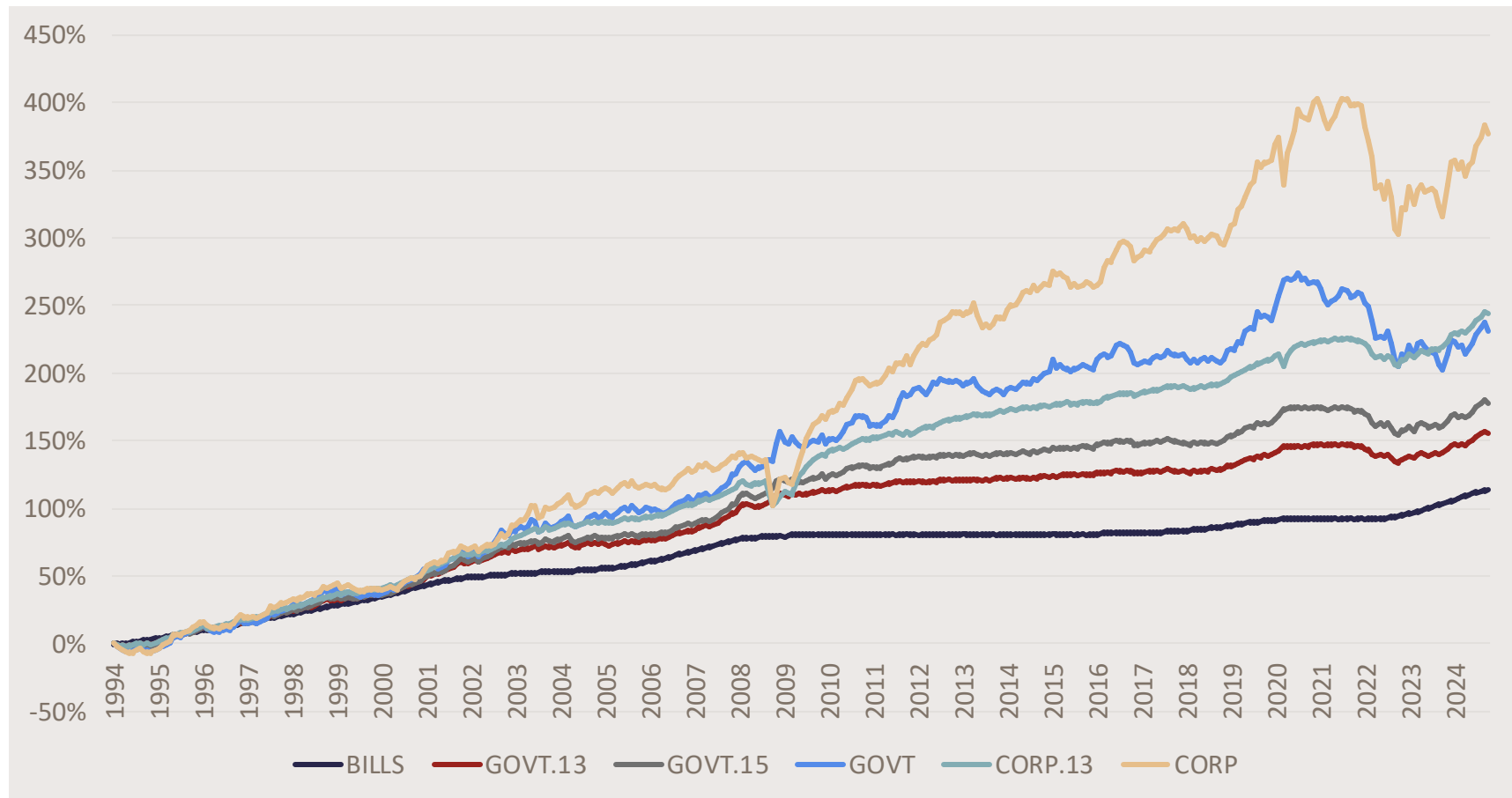
IMF Guidelines for Foreign Reserves Management:

- support and maintain confidence in the policies for monetary and exchange rate management including the capacity to intervene in support of the national or union currency;
- limit external vulnerability by maintaining foreign currency liquidity to absorb shocks during times of crisis or when access to borrowing is curtailed and in doing so;
- provide a level of confidence to markets that a country can meet its external obligations;
- demonstrate the backing of domestic currency by external assets;
- assist the government in meeting its foreign exchange needs and external debt obligations; and
- maintain a reserve for national disasters or emergencies.

Source: IMF, 2001

MORE RESERVES = MORE BETTER

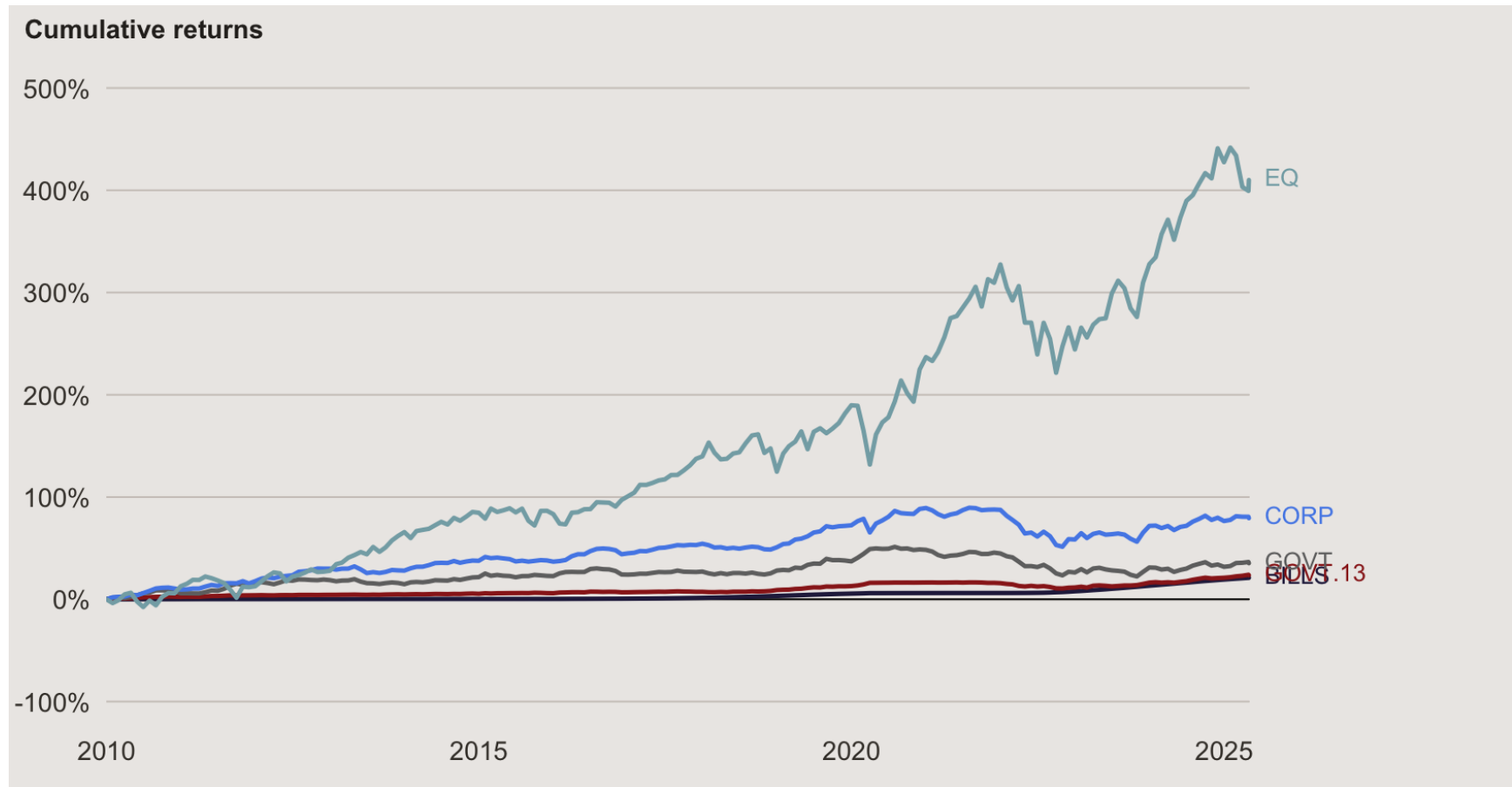
Investing only in the most “conservative” assets hurts income and balance sheet growth



Source: CAIM, Bloomberg, October 2024

WHAT ASSETS SHOULD BE CONSIDERED FOR RESERVES PORTFOLIOS?

“Risk” is the fuel that drives long term returns

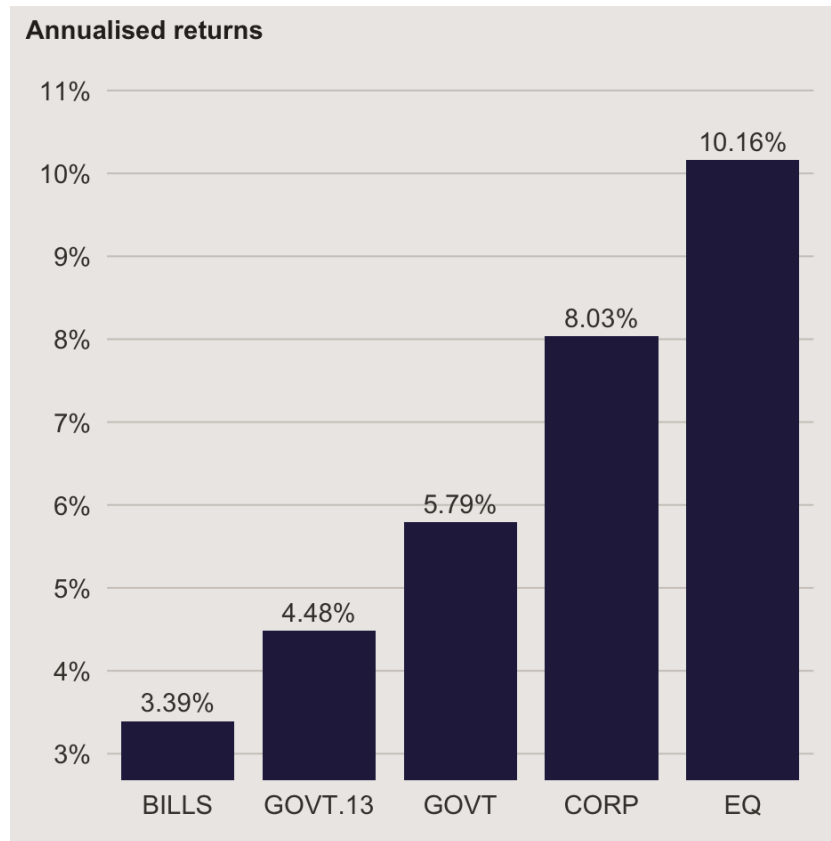


Source: CAIM, May 2025

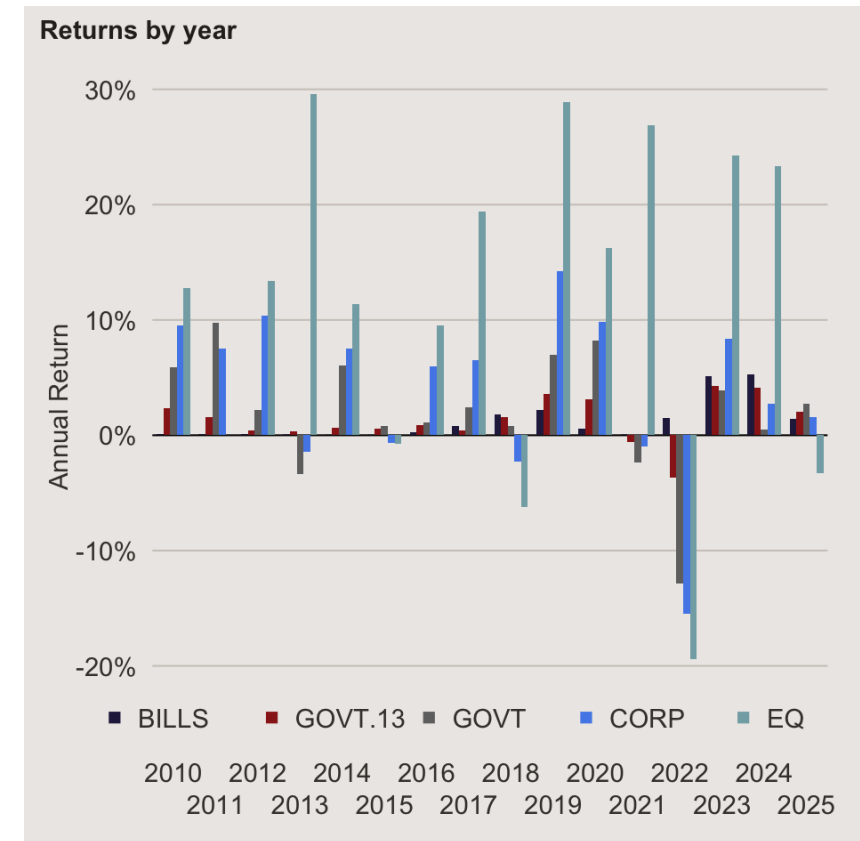
HISTORICAL ASSET RETURNS

Greater average income from “riskier” assets, but it can be a bumpy ride

2010-2025



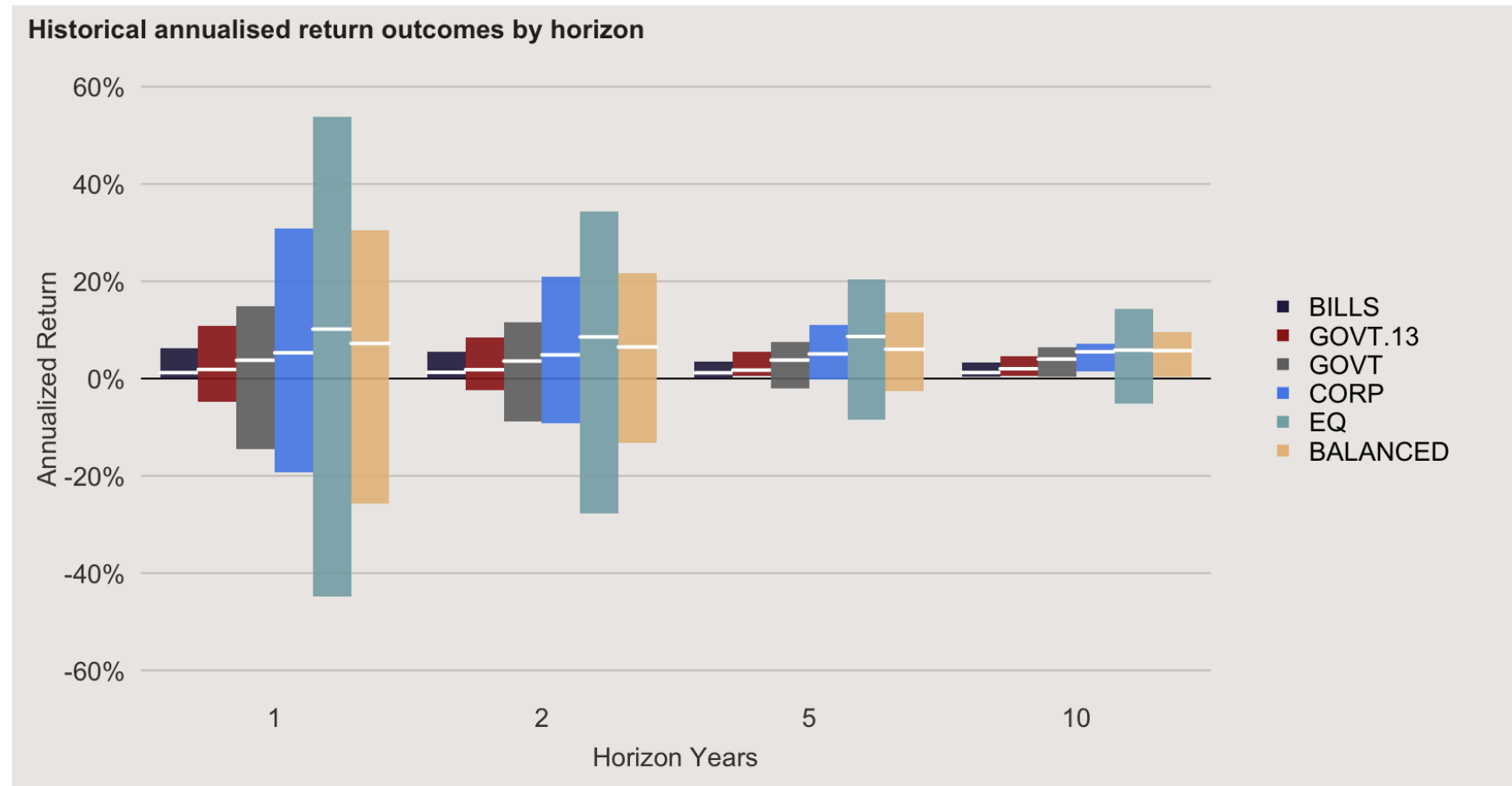
2010-2025



Source: CAIM, Bloomberg Finance LP, May 2025. Data from 2010

HOW SHOULD WE DEFINE “RISK”?

The least “risky” asset over a short horizon might be the most “risky” over a longer one



Source: CAIM, Bloomberg Finance LP, May 2025. Data from 2010

RESERVES MANAGEMENT OBJECTIVES

The traditional trinity is always subject to interpretation, dependent on institutional objectives

- **SAFETY**

- Capital preservation has traditionally been an important objective for strategic reserves management policies
 - *How to measure “safety”?*

- **LIQUIDITY**

- Central banks like to own freely marketable securities that can be liquidated quickly with minimal transaction costs if necessary
 - Central bank reserves assets are generally liquid – public market investment grade securities
 - Liquidity can degrade rapidly in times of market stress
 - Deposits are relatively illiquid instruments

- **RETURN**

- Often cited as only the third priority (after safety and liquidity), many central banks nonetheless rely on income from reserves management to support budgets

NUMBERS FOR RESERVES MANAGERS TO REMEMBER

"Traditional" reserves portfolio assets have return potential not seen since the Global Financial Crisis

1.07%

Annualised return of ICE US 1-3 year Treasury Index, 2009-2020

[CAIM: Capital protection unavailable]

-0.55%

Return of ICE US 1-3 year Treasury Index, 2021

-3.65%

Return of ICE US 1-3 year Treasury Index, 2022

4.26%

Return of ICE US 1-3 year Treasury Index, 2023

[CAIM: Sunny skies ahead]

4.09%

Return of ICE US 1-3 year Treasury Index, 2024

3.93%

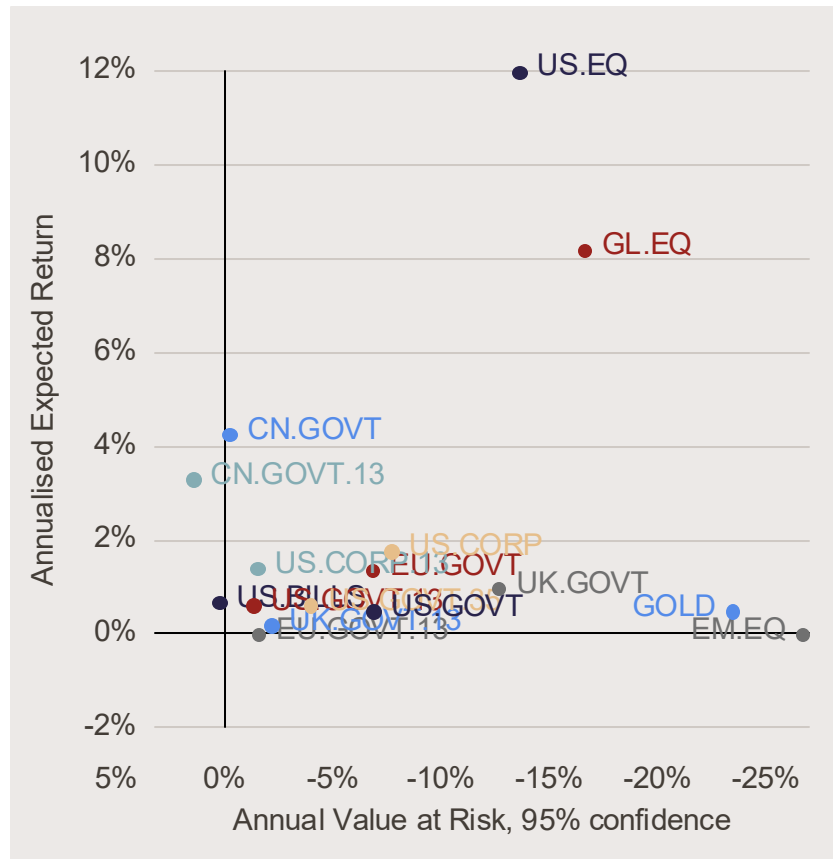
US 2-year Treasury yield, October 11, 2024

Source: CAIM, October 2024

THEN VS. NOW

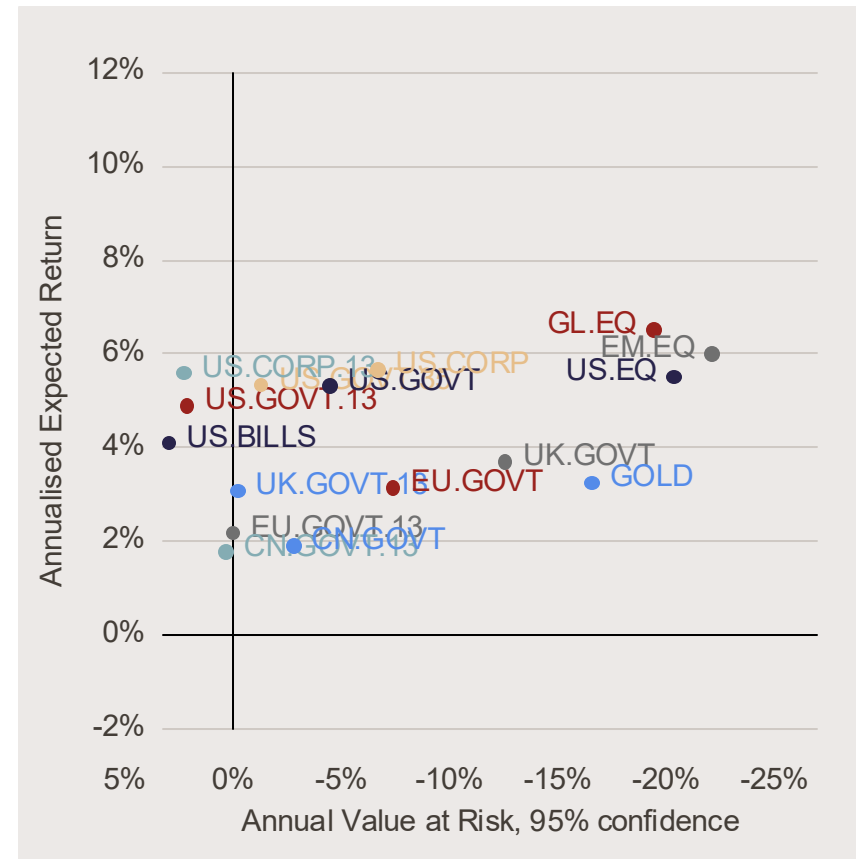
**Expectations for income and capital preservation – unavailable in 2021,
now returned since 2023**

Historical local annualised return and risk (2012 - 2023)



Source: CAIM, January 2023. Please see appendix for asset class abbreviations

Forward-looking local annualised return and risk from 2023

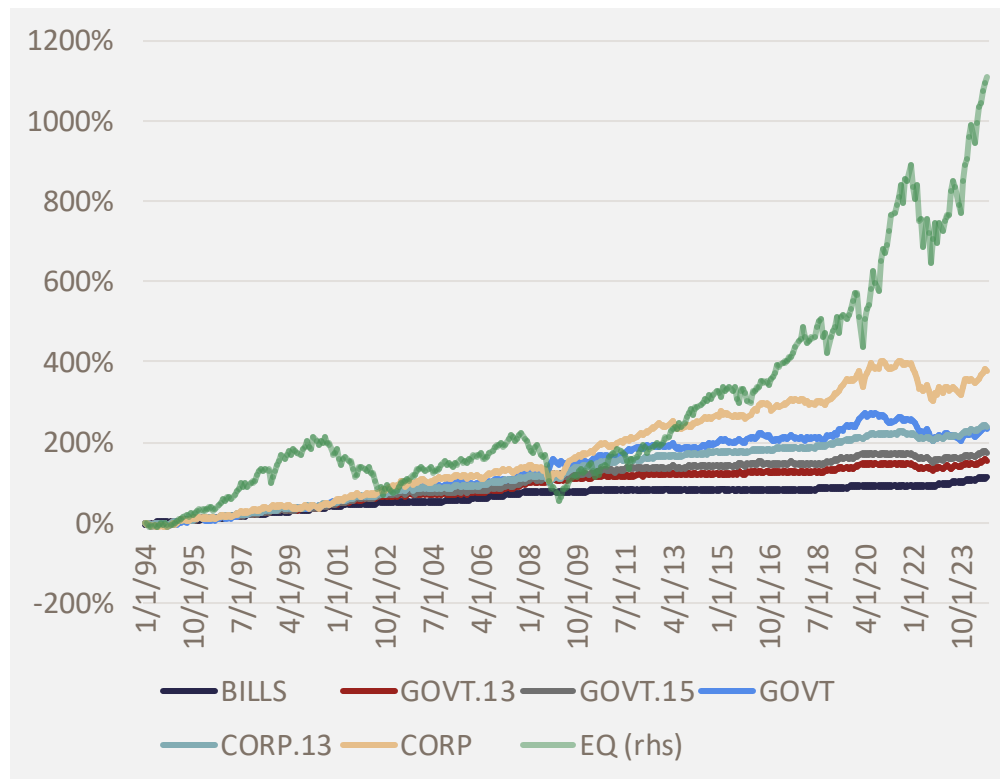


Source: CAIM, January 2023. Calculated using 5000 simulations based on current market conditions and forward-looking expectations. Please see appendix for asset class abbreviations.

ASSET ALLOCATION CONSIDERATIONS

“Riskier” assets have provided compelling returns over the long term

Cumulative total return, 1992 – 2023. The ICE 1-3 year US investment grade corporate index has performed as well as the *full duration* ICE US government bond index over this time period



Source: Bloomberg Finance LP. October 2024. ICE fixed income indices and US.EQ = S&P500 total return index.

Dimensions to increase central bank reserves portfolio returns (and ideally to diversify risk):

- **Duration:** increase interest rate risk
- **Credit:** Agencies, Supras, Corporates, High Yield
- **Market:** International diversification, EMD
- **Equities:** Developed markets, EM
- **Alternatives:** Real estate, hedge funds, private markets

It's important for a central bank to define its income objectives and risk tolerance

NEW RESERVES MANAGEMENT OBJECTIVES?

Generate Income for the
Central Bank

Manage Investments
Efficiently

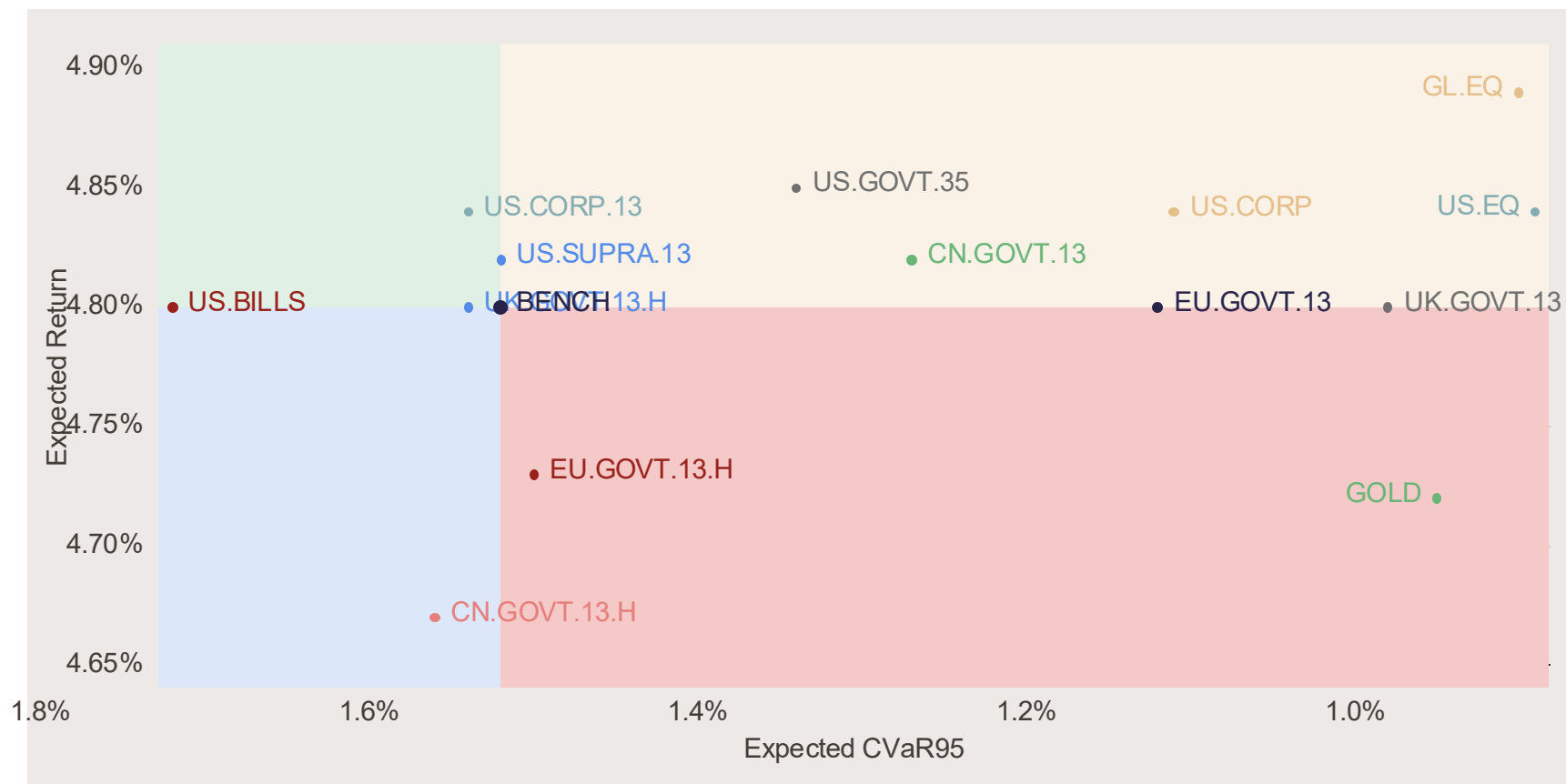
Manage Investments
Prudently

Ensure well-qualified
staff

MARGINAL RISK AND RETURN CONTRIBUTION OF ASSET CLASSES

It's possible to find asset classes for various portfolio design goals

5% allocations to individual asset classes included with benchmark in portfolio, USD base currency

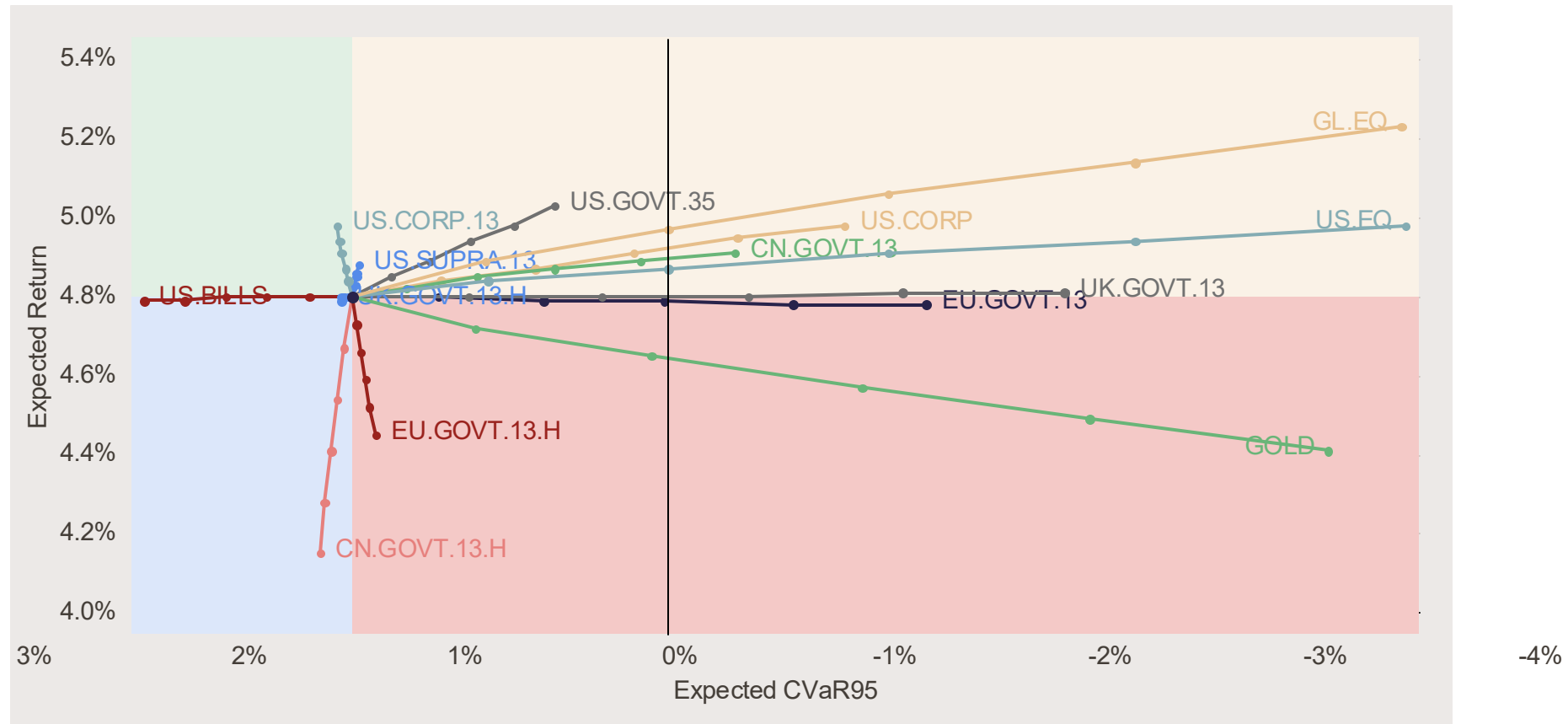


Source: CAIM, May 2023. Please see appendix for asset class abbreviations

MARGINAL RISK AND RETURN CONTRIBUTION OF ASSET CLASSES

Plenty of leeway to add diversifying assets *and* achieve expectations of capital preservation

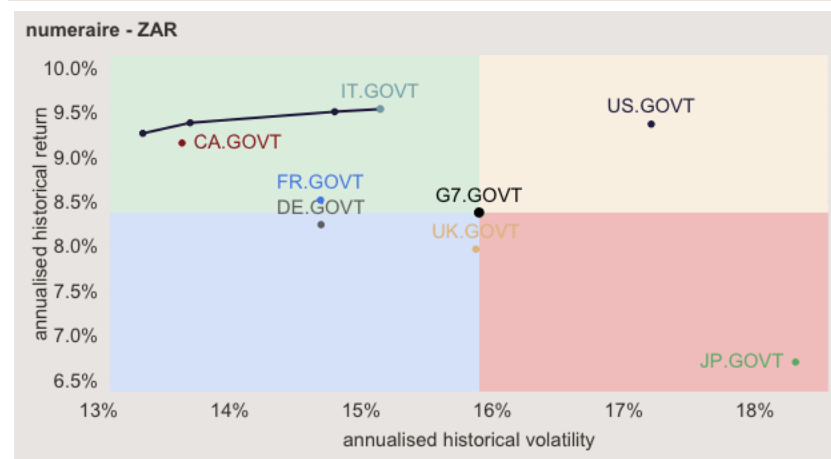
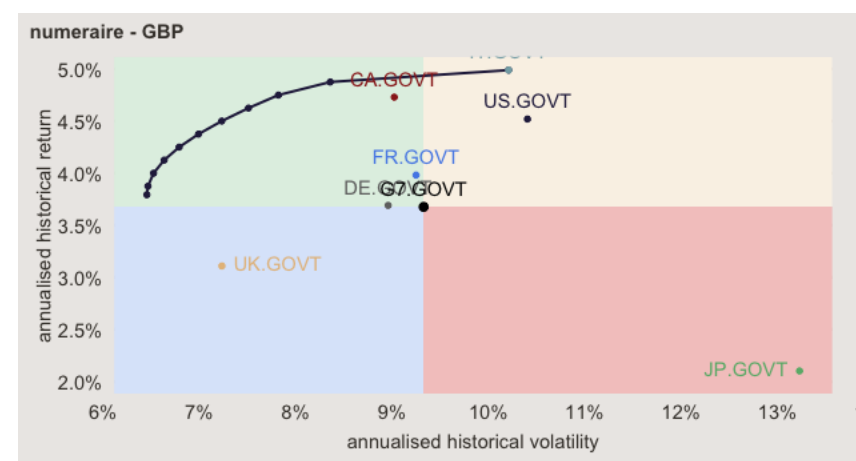
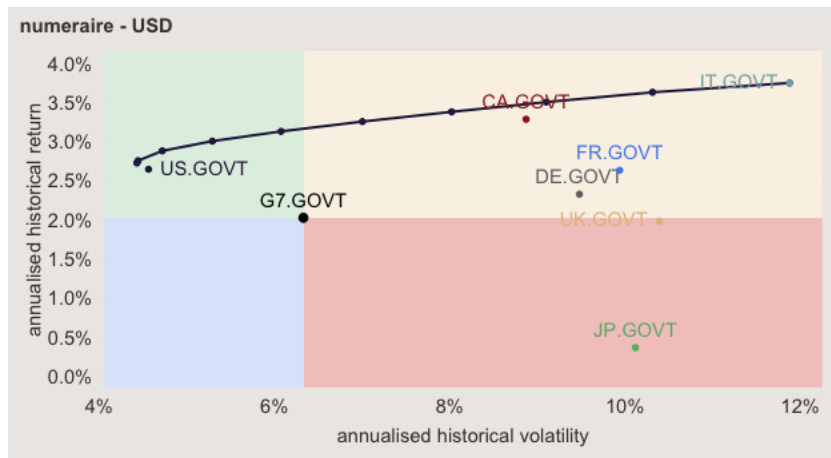
Adding up to 25% of individual asset classes to benchmark portfolio, in 5% increments



Source: CAIM, May 2023. Please see appendix for asset class abbreviations

ONE SIZE DOES NOT FIT ALL

An investor's base currency influences the attractiveness of individual markets and portfolios



- There's no reason to consider a "global market cap" portfolio as a benchmark if more customised market mixes make better sense

Source: CAIM, September 2023. Annualised historical return data from September 2004 – September 2023

VARIOUS INTERNAL STAKEHOLDERS



THERE IS A DIRECT TRADE-OFF BETWEEN RISK AND RETURN

Diversification improves the trade-off at the portfolio level

The level of expected return is driven by an institution's **ability** and **willingness** to accept risks

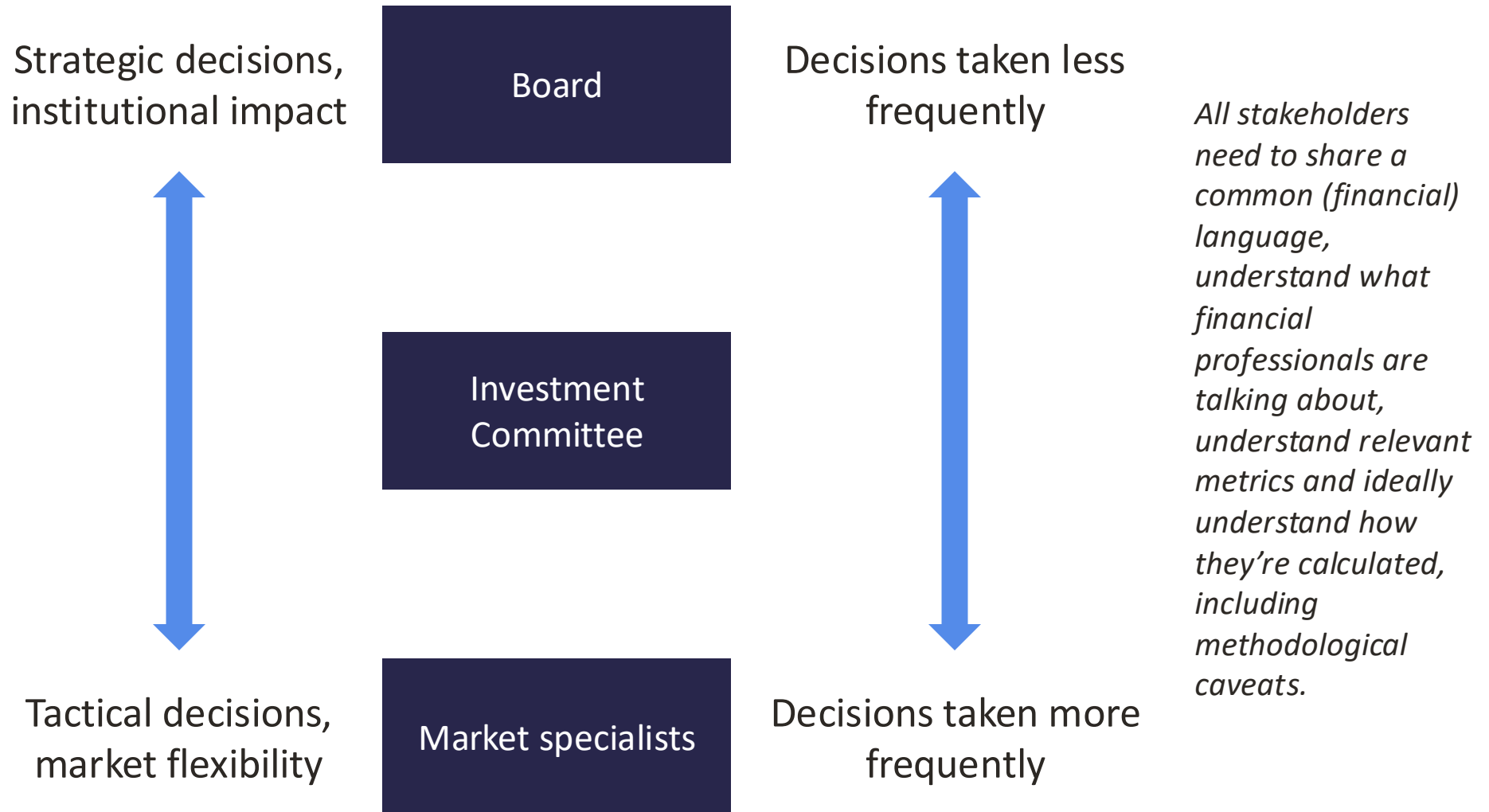
- **Ability to accept risk** is a function of reserves adequacy (central banks) or funded ratio (national pension funds)
- **Willingness to accept risk** is a function of internal technical/operational capacity and corporate culture

DEFINING RISK

Institutional culture informs investment policy decisions

- What are bad outcomes?
 - Exposure to an issuer or counterparty named in the press
 - Low returns in a low-yield environment
 - Reporting a mark-to-market loss
 - Asking parliament/finance ministry for operational budget, due to low investment returns

GOVERNANCE: WHO MAKES WHICH DECISION?



MY SYSTEM CAN'T CALCULATE X

- Do it yourself!
- Raw data + knowledge = power / insight

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