



PERSPECTIVES THAT DRIVE ENTERPRISE SUCCESS



OCTOBER 2019

Risk Allocation Study

City of San Jose Federated City Employees' Retirement System

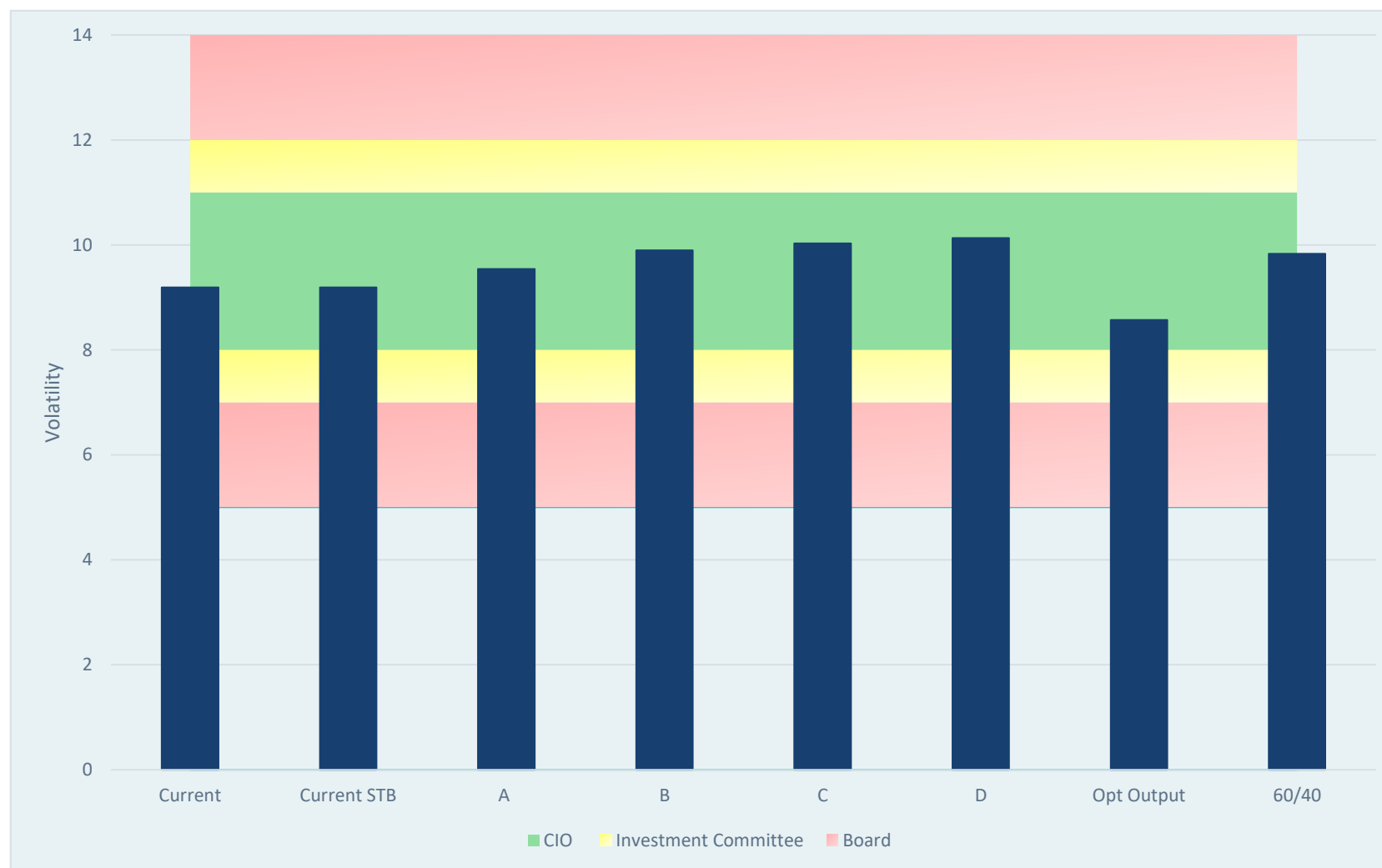
FCERS 10-17-19

Summary

The asset mixes considered marginally increase volatility relative to the current strategic asset allocation. Generally these higher risk mixes allocate more capital to growth assets and less to zero beta assets.

- All mixes analyzed fall within the risk operating zones defined in the IPS.
- Increases in volatility are consistent across both Verus and Meketa Capital market assumptions.
- Expected returns increase 50-70bps (from current) by moving to the higher risk mixes.
- Return per unit of risk (Sharpe Ratio) remains consistent across the mixes.
- Increases in volatility come from taking more equity risk. Equity factor risk contribution increases from 71% in the current SAA to 75% in Mix D. We also observe an increase in equity beta from 0.58 to 0.65 from current to Mix D.
- Duration is not a significant risk among the mixes considered.

Risk operating zones



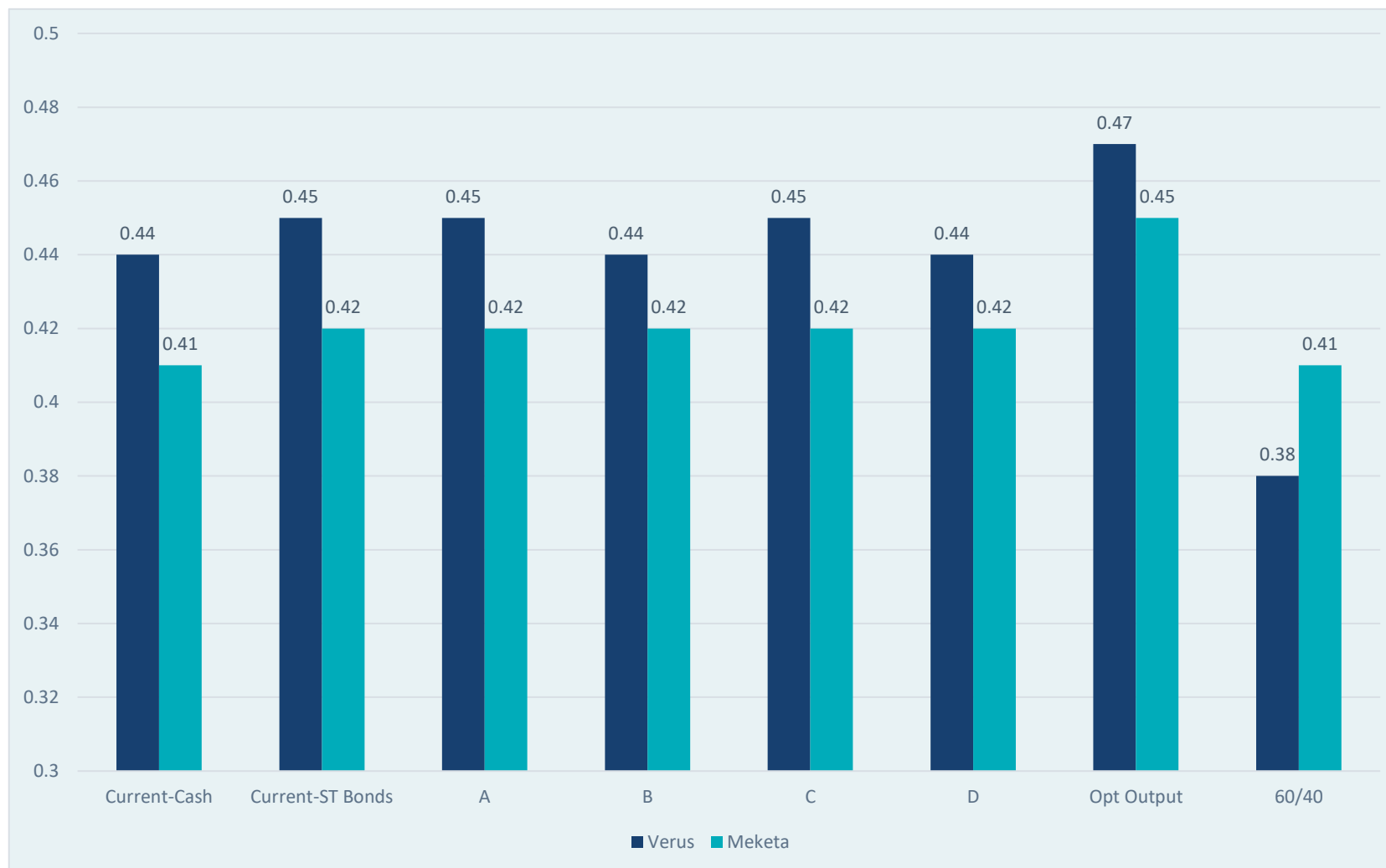
All the mixes considered fall within the CIO operating zone for portfolio volatility

Expected return (%)



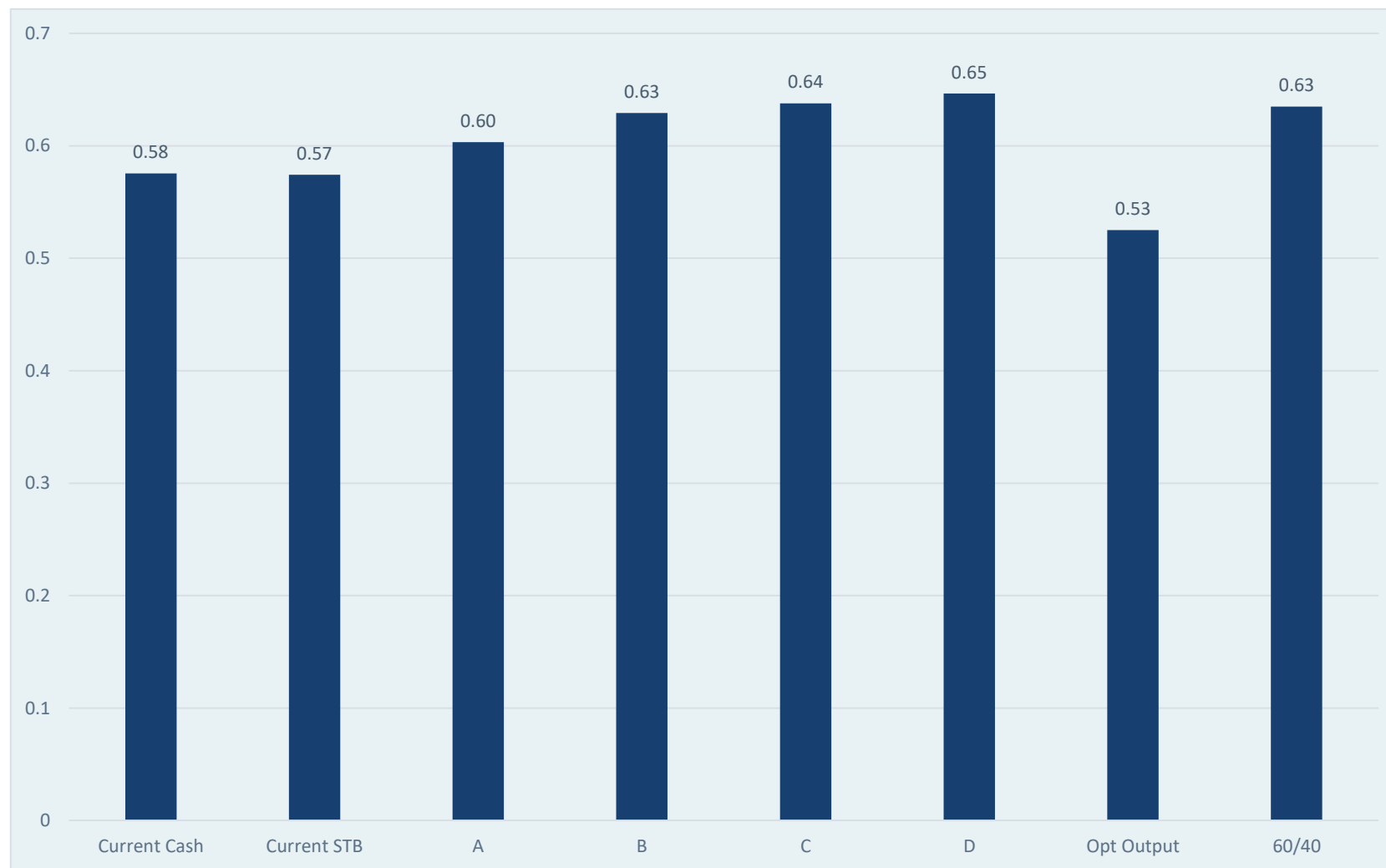
Expected returns are directionally consistent using both Verus and Meketa CMAs

Sharpe Ratio



The optimized mix provides the highest Sharpe ratio and 60/40 provides the lowest. We do not see a material difference across the other mixes

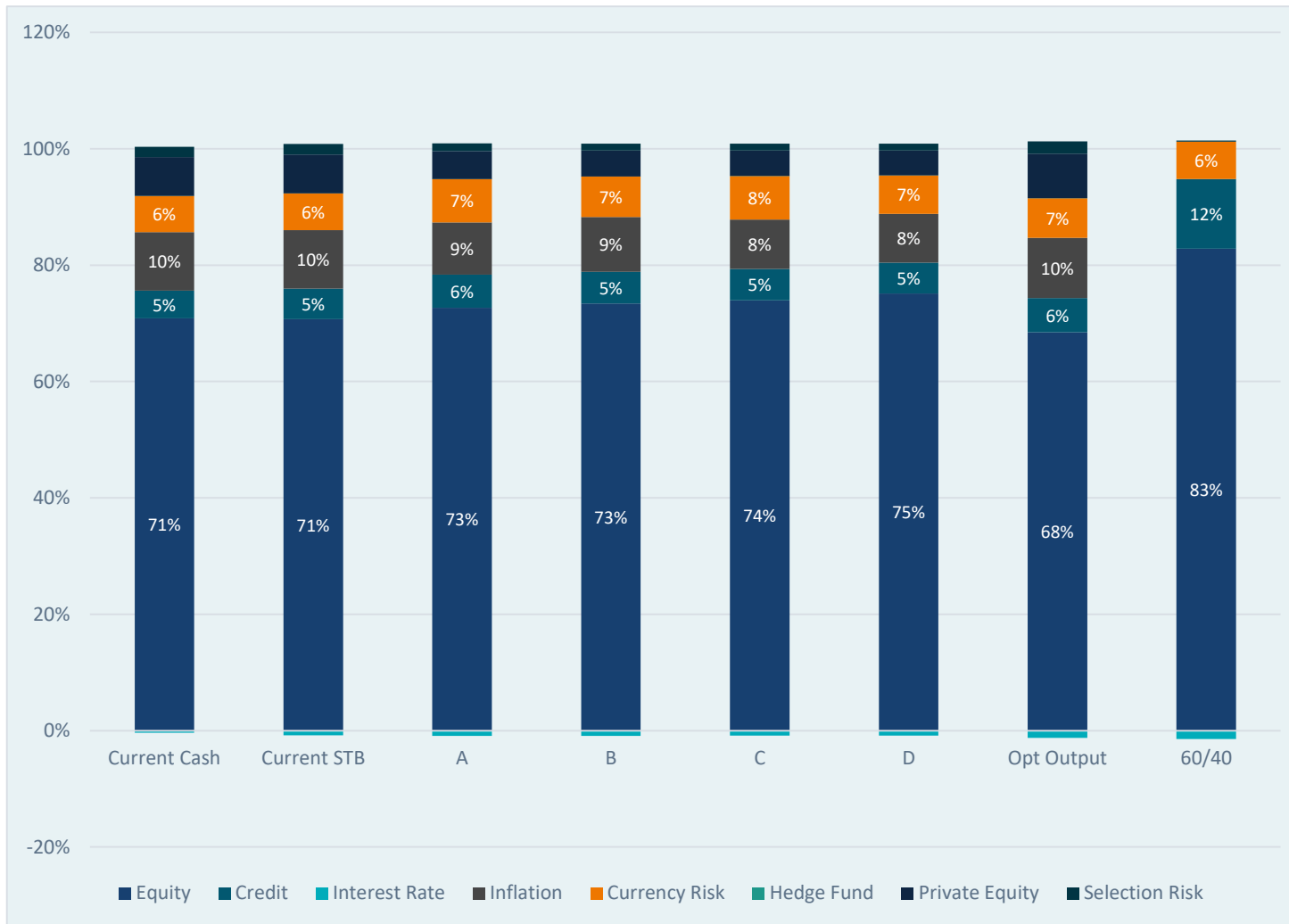
Equity beta



The higher risk mixes have greater sensitivity to broad equity movements

Data from MSCI BarraOne, 303XL model.

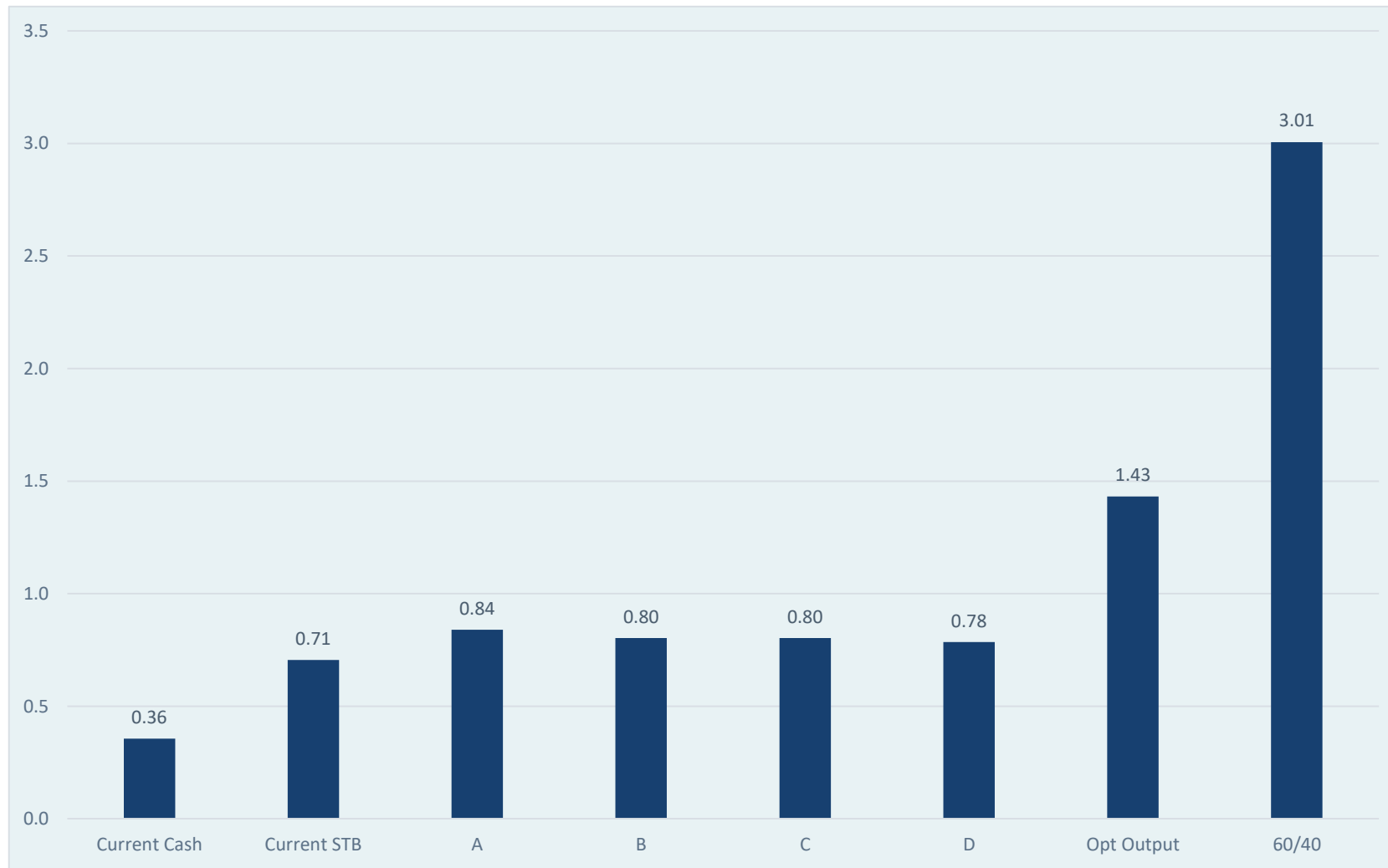
Risk decomposition



Equity factor risk remains the largest contributor to volatility across all the mixes considered. We see marginal differences in credit, inflation, and currency factors.

Data from MSCI BarraOne, 303XL model.

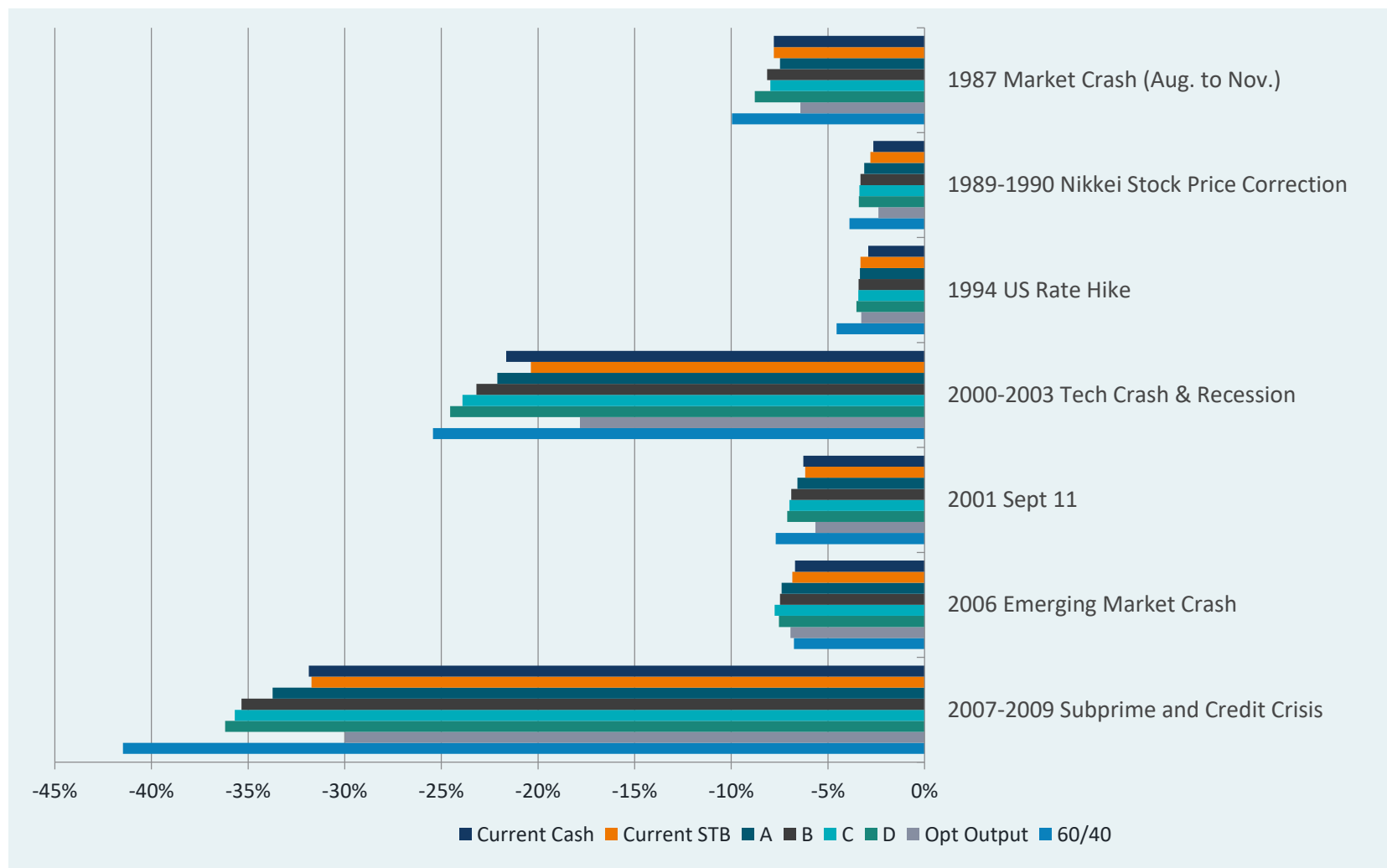
Effective duration



Excluding the optimized output and 60/40, all the mixes have durations of less than one year

Data from MSCI BarraOne, 303XL model. As of 7-31 the average peer (defined as DB plans >\$1B IF Universe) have a duration of 1.3 years.

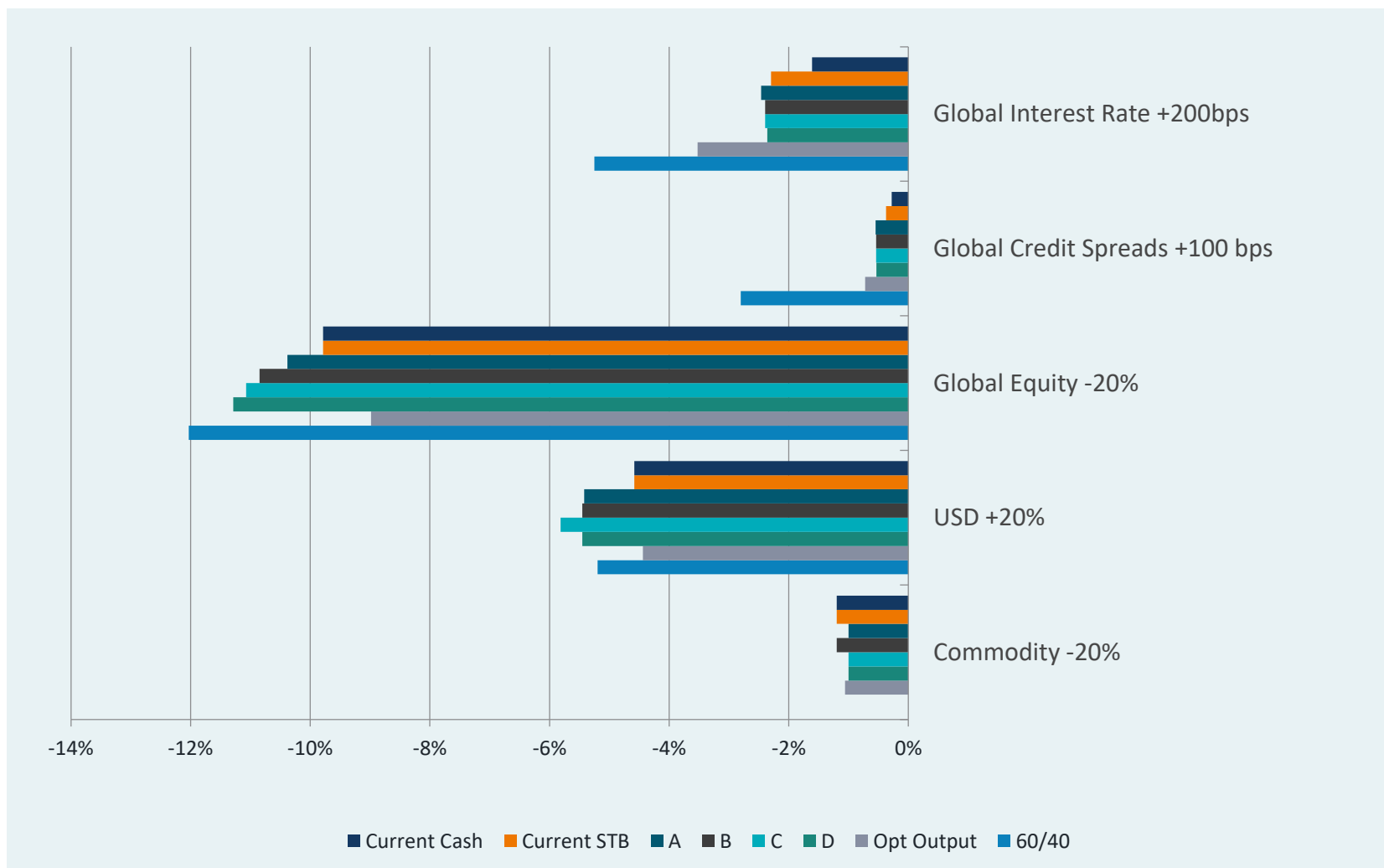
Scenario analysis



We see the largest differences in tail risk in the tech crash and subprime crisis.

Data from MSCI BarraOne, 303XL model.

Stress tests



Of the stress tests considered, global equities falling 20% is the most severe, followed by the US Dollar appreciating 20%.

Data from MSCI BarraOne, 303XL model.

Asset mixes

	Current-Cash	Current-ST Bonds	A	B	C	D	Opt Output	60/40
Cash	25	5	5	5	5	5	0	0
US Large	10	10	10	12	11	13	7	0
US Small	3	3	3	4	4	6	2	0
International Developed	8	8	10	12	12	12	5	0
Emerging Markets	10	10	13	10	13	10	13	0
Global Equity	0	0	0	0	0	0	0	60
Private Equity	12	12	12	13	13	13	15	0
US TIPS	2	2	2	2	2	2	8	0
Global Sovereign ex-US	3	3	3	3	2	2	0	0
Core Plus Fixed Income	0	0	0	0	0	0	5	40
Short-Term Gov't/Credit	0	20	15	13	13	12	25	0
Emerging Market Debt (Hard)	1.5	1.5	1.5	1.5	1.5	1.5	0	0
Emerging Market Debt (Local)	1.5	1.5	1.5	1.5	1.5	1.5	0	0
Private Credit	4	4	4	4	4	4	4	0
Commodities	2	2	2	2	0	0	0	0
Hedge Fund	7	7	7	5	5	5	4	0
Core Real Estate	8	8	8	9	10	10	10	0
Value Add Real Estate	2	2	2	2	2	2	2	0
Opportunistic Real Estate	1	1	1	1	1	1	0	0