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Multi-asset class portfolios during crisis

Selected Slides from July 9, 2020 RAMP Technical Webinar

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General Overview

Investor Type	FX Reserves		Pension Funds	Sovereign Wealth Funds	
	Core Reserves	Excess Reserves		Stabilization Funds	Savings Funds
Rationale for setting up	Liquidity/ Precautionary	Precautionary	Meet contractual obligations	Manage fiscal volatility	Intergenerational wealth management
Investment Objective	Capital preservation	Return enhancement/ Cost minimization	Satisfy liabilities while minimizing cost	Varies (e.g. capital preservation in real terms, positive real returns)	Strong positive real returns
Liability	Unpredictable contingent on volatile variables (e.g. interventions)	Low in the short-term, contingent on volatile variables in the medium term	Well defined benefit payments	Measurable interim payouts	Varies (e.g. real dividend payout)
Return Target	No negative return	Varies (Moderate returns)	Varies (Funding Ratio maximization, moderate to high real returns)	Low to moderate real returns	High real returns (e.g. 4-5%)
Investment Horizon	Short (1 year)	Longer (2-5 years)	Varies, mostly long (10+ years)	Short (1-3 years)	Long (10+ years)
Risk Measure	Probability of negative return	Volatility, shortfall probability over investment horizon	Volatility, Drawdown, Funded Ratio shortfall	Volatility, Probability of negative real return	Maximum drawdown, shortfall probability over investment horizon
Liquidity Needs	High	Moderate	Varies (typically low in the short term)	Moderate	Low

Return Expectations need to be revisited in the pandemic aftermath

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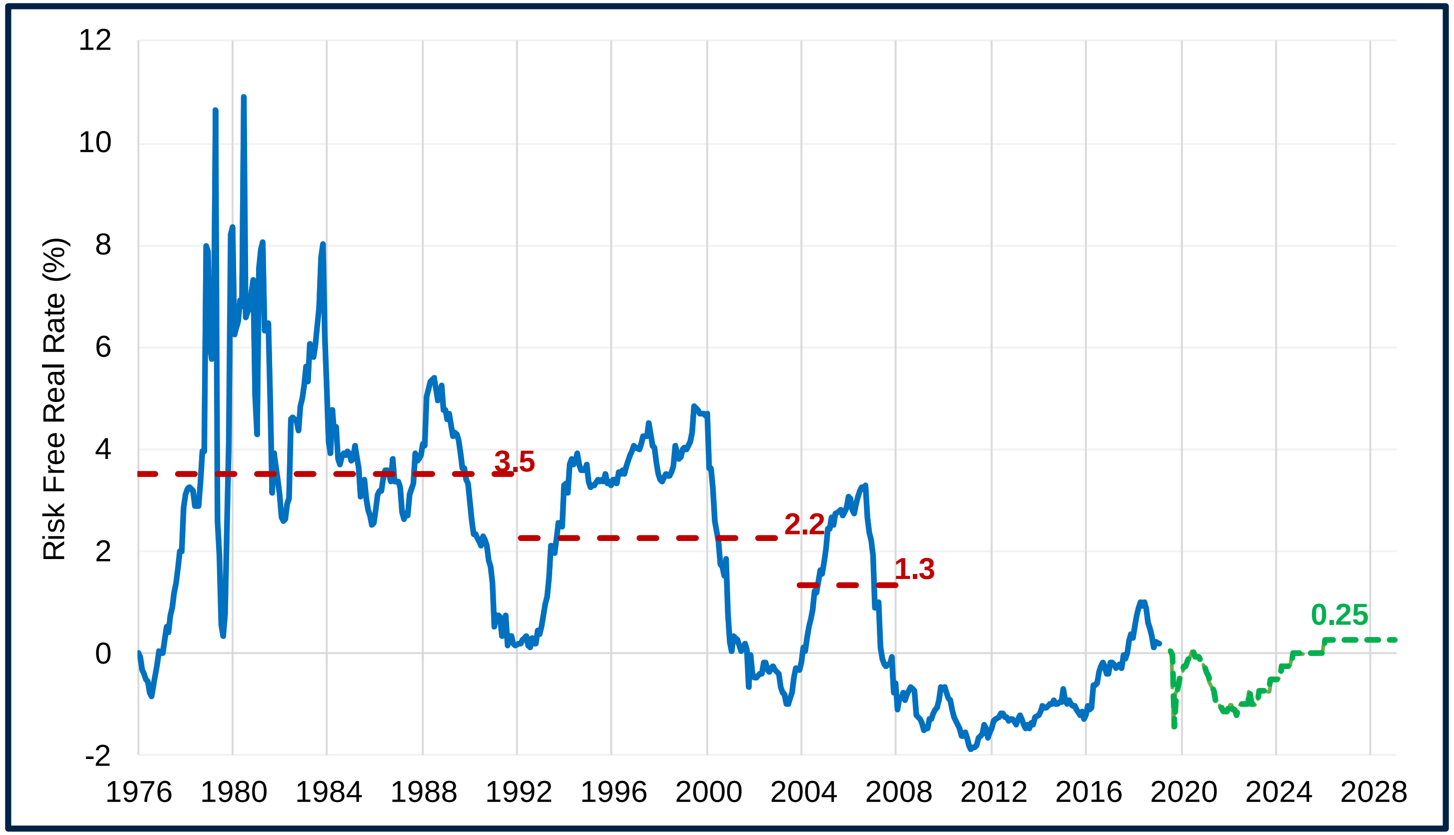
- Institutional investors use forward-looking return expectations as a main tool to:
  - ✓ Understand risk-return trade-offs in the future
  - ✓ Set appropriate investment objectives
  - ✓ Adjust the strategic asset allocation of their portfolios
- Fundamentally, return expectations for financial assets can be thought of as a function of current and expected cash rates (risk free rates) and a risk premia component which may be impacted by fair value considerations over various investment horizons that are relevant for long-term investors (7-15 years).
- Both the risk free rate and the risk premia component provide a link between the real economy and financial assets
- The impact on COVID-19 global pandemic on expectations could be material and manifest itself through various channels:
  - ✓ Risk free rates may remain below equilibrium for an extended period;
  - ✓ Future cash-flows of assets (which feeds into the valuation component) may be significantly impaired
  - ✓ Fair values may be distorted due to on-going monetary and fiscal policy support

Fundamental Assumption – Equilibrium real risk free rate

Equity risk premium is typically 3 - 4% over the long-term bond real yield

- Since all assets are priced as a risk-premium over cash, the real expected risk free rate impacts significantly the expected returns.
- Historically in the US the real risk free rate has been positive, but coming down over time.
- A lower real risk free rate translates, all else equal, into lower expected returns in real terms for all asset classes

US Real Fed Funds Rate
(deflated using Core PCE Index)

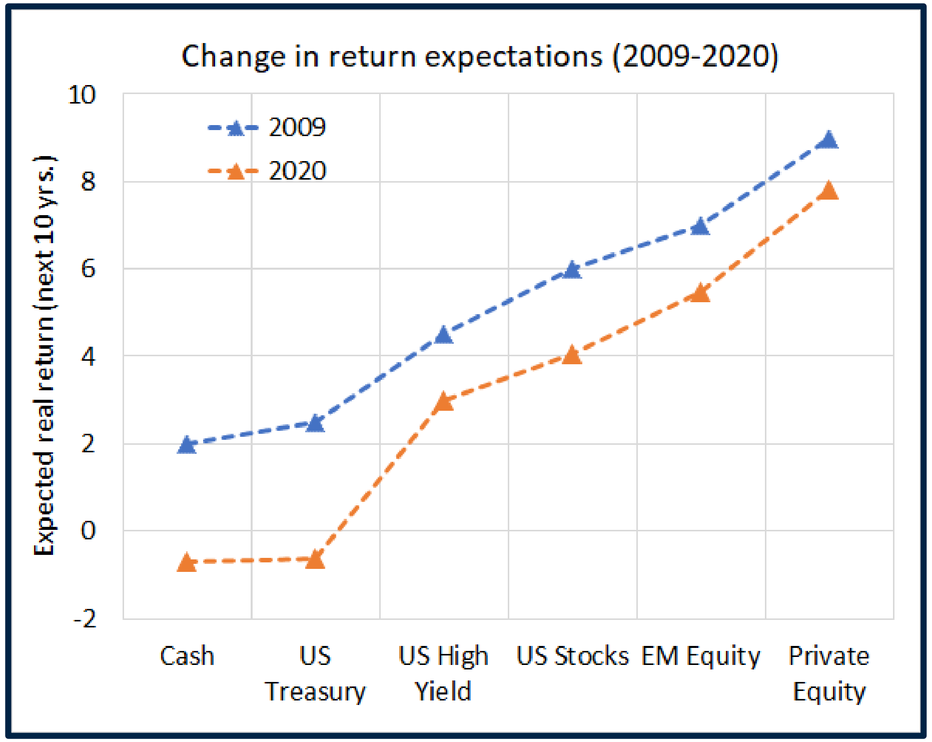


Source: Bloomberg, Oxford Economics, PEN calculations

Long-Term Expected Returns (USD, nominal)

Long-term return expectations have been revised downward in recent months

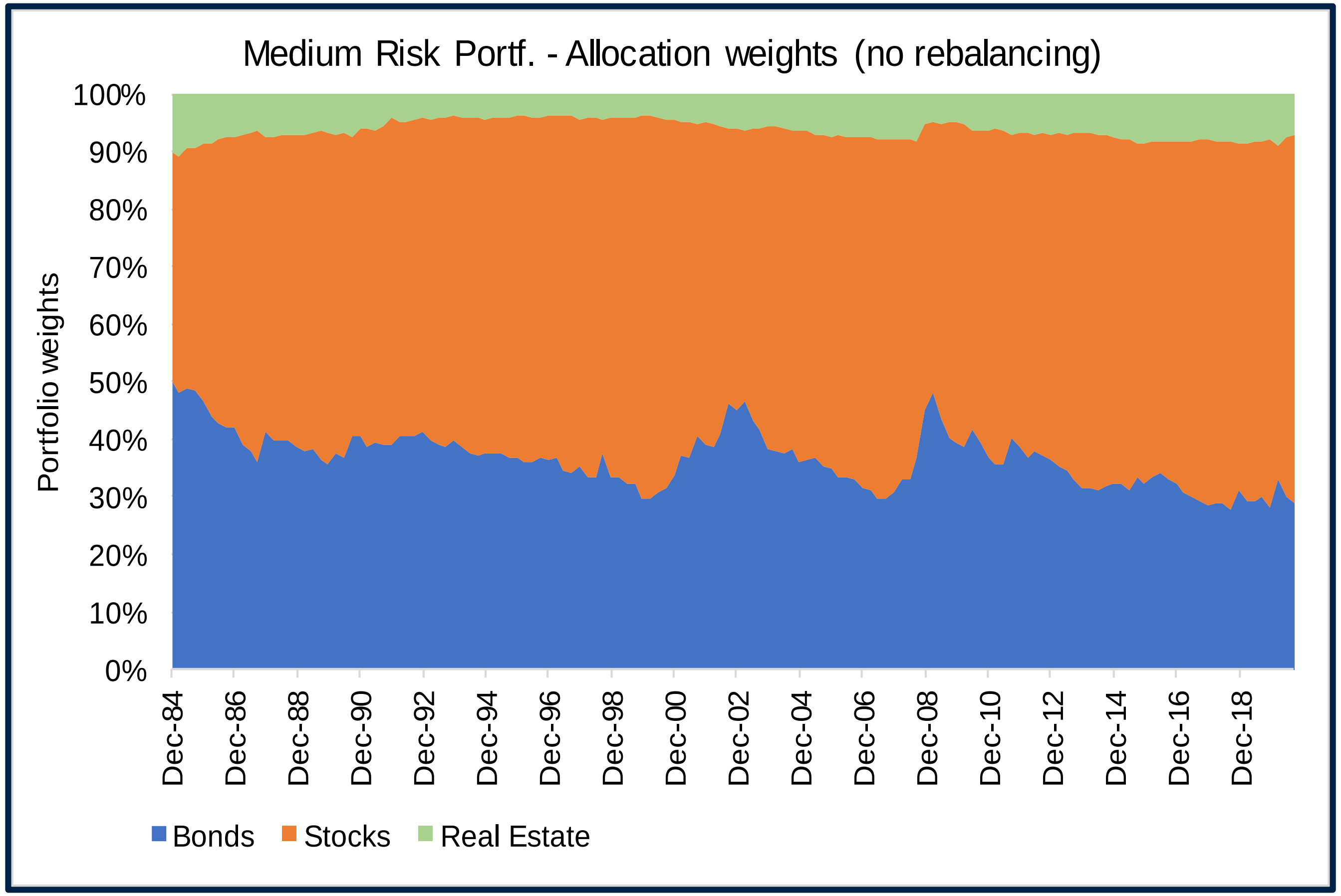
		10Y Nominal Return Expectations (arithmetic, annualized)						
		Research Affiliates	Capital Economics	Cliffwater	KKR (next 5yrs)	PMC	Goldman Sachs	BlackRock
Fixed Income	Cash	1.4	1.6	1.8	0.2	0.6	1.7	1.2
	US Treasury Index	1.7	1.4	1.9	0.1	1.4	1.9	0.5
	US TIPS Index	1.6	1.7	2.2	0.2	1.3	2.3	1.7
	US Corporate IG	2.1	1.8	2.9	2.0	3.7	2.4	1.9
	US Corporate HY	4.0	4.6	4.6	5.0	6.0	3.8	6.1
Equity	US	5.2	6.2	6.5	3.8	6.5	6.5	6.9
	Developed (exUS)	6.6	6.6	6.6	5.0	7.3	5.8	8.2
	Emerging	8.0	3.6	7.0	7.0	8.1	9.8	8.2
Alternatives	Hedge Funds	5.0	5.0	4.6	3.0	4.0	3.5	6.3
	Private Equity	7.0	9.5	10.0	10.0		10.4	11.3
	Real Estate	5.1	8.4	6.2	6.1		6.9	6.5
	Direct Lending	5.0	6.5	7.0	6.5		6.5	10.4



* US inflation assumption - 1.9% for Research Affiliates, 2% for PMC and Capital Economics, 1.9% inflation for KKR, BlackRock, Goldman Sachs, and 1.8% inflation for Cliffwater. Source: WB Pension, Research Affiliates website (May 2020), GSAM: Global Portfolio Solutions (March 2020), KKR Global Macro Trends Volume 10.1 January 2020, BlackRock Investment Institute: Capital Market Assumptions as of April 2020, Cliffwater Asset Allocation Report 2020, PMC website as of April 2020.

Why rebalance the portfolio?

- Starting with the Medium Risk Portfolio (40% Stocks) in 1985, one can observe that with no rebalancing, the actual Stocks weight by 2008 gets to 60%, which implies a much higher risk profile



Portfolio Allocation	Medium Risk Portfolio	Actual Portfolio in 2008 (no rebalancing)
Bonds	50%	31%
Stocks	40%	61%
Real Estate	10%	8%
Risk (Volatility)	**7.5%**	**10.8%**
Average Return (Since 1985)	**8.6%**	**9.4%**
Worst Return in a year (2008)	**-19%**	**-28%**

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