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Portfolio Review: Though the Looking Glass

Gina Sanchez
Primary Consultant

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Agenda

I. Building a Risk Budget
II. Asset Class Landscape
III. Economic Regime Considerations
IV. Economic Scenario Review
V. Portfolio Observations

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Building a Risk Budget

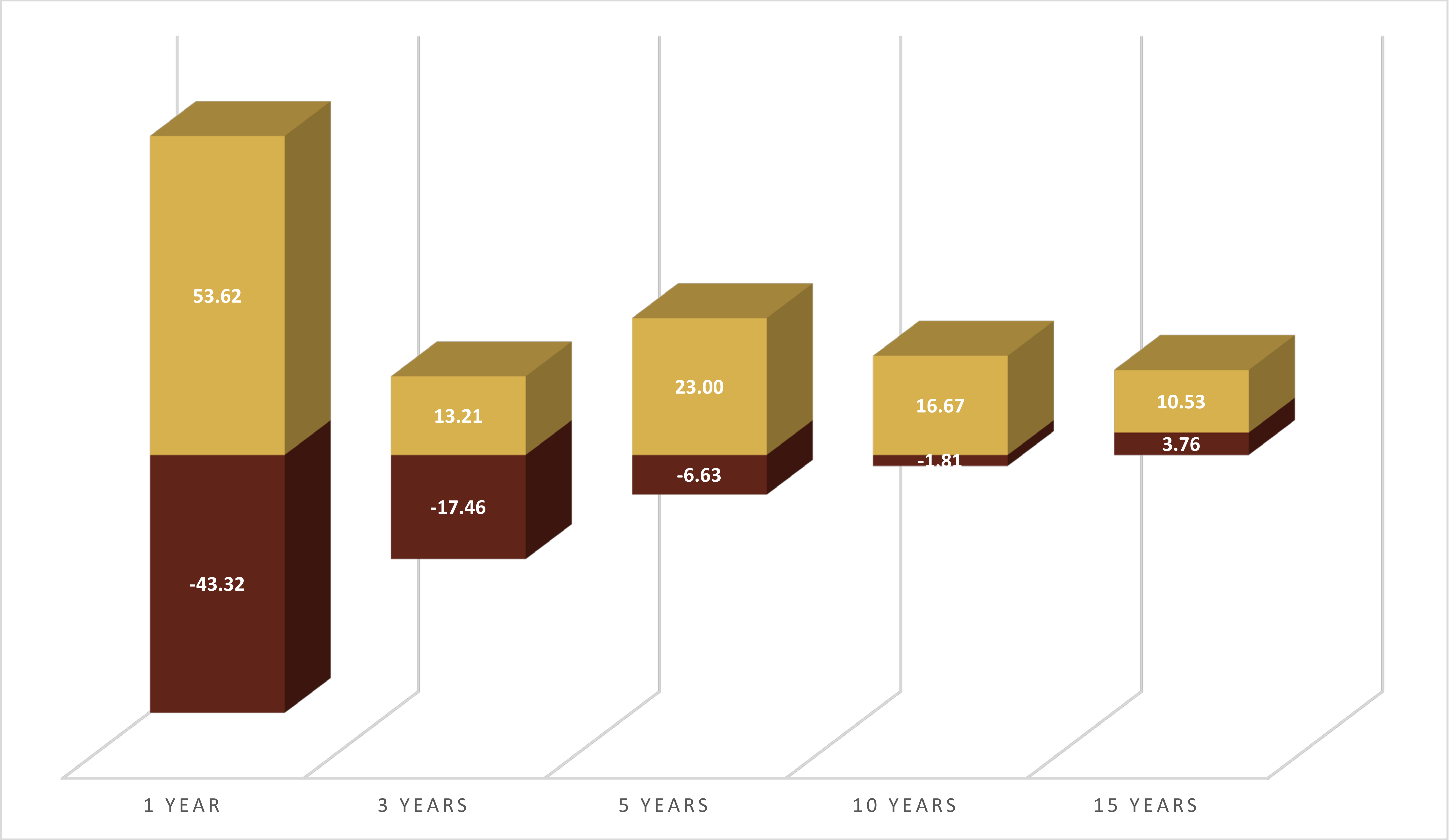
The Investment Roadmap Starts with Understanding Risk

Determining Risk Capacity

- Time Horizon
- Cashflow
- Mitigating Factors

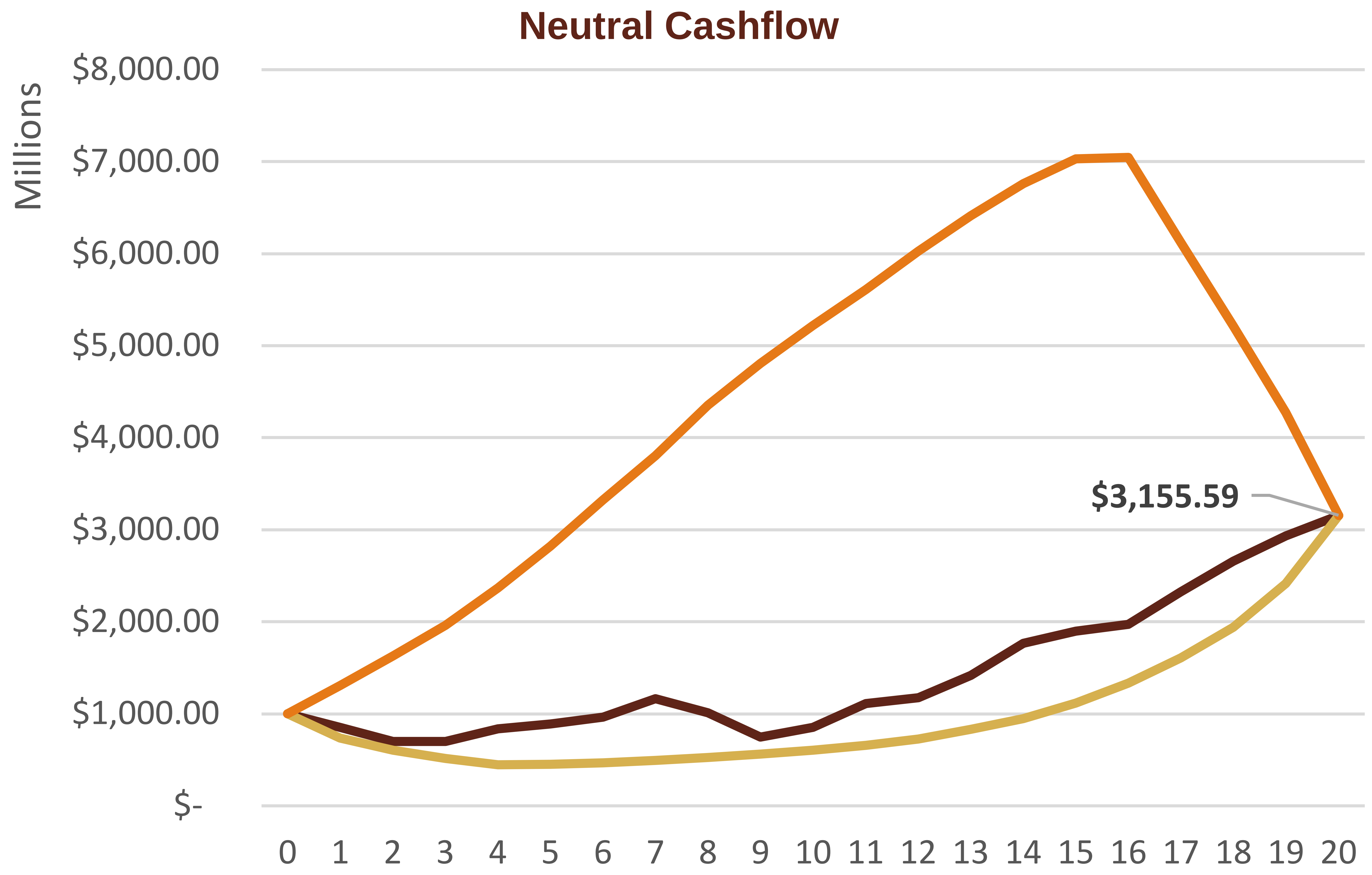
Time Horizon

➢ The longer the time horizon, the lower the observed volatility.



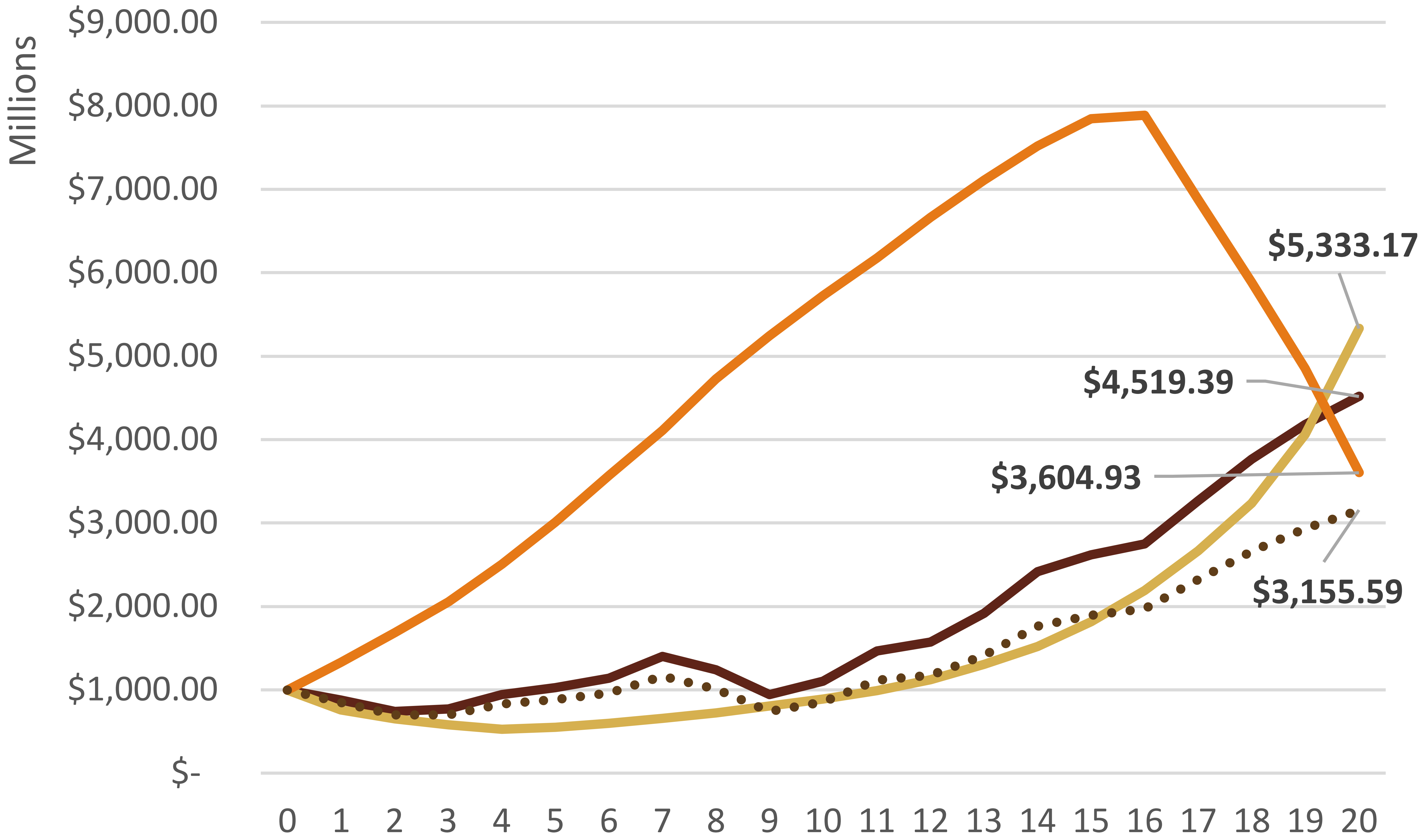
Direction of Cashflow

- Direction of cashflows exacerbate sequential risk.



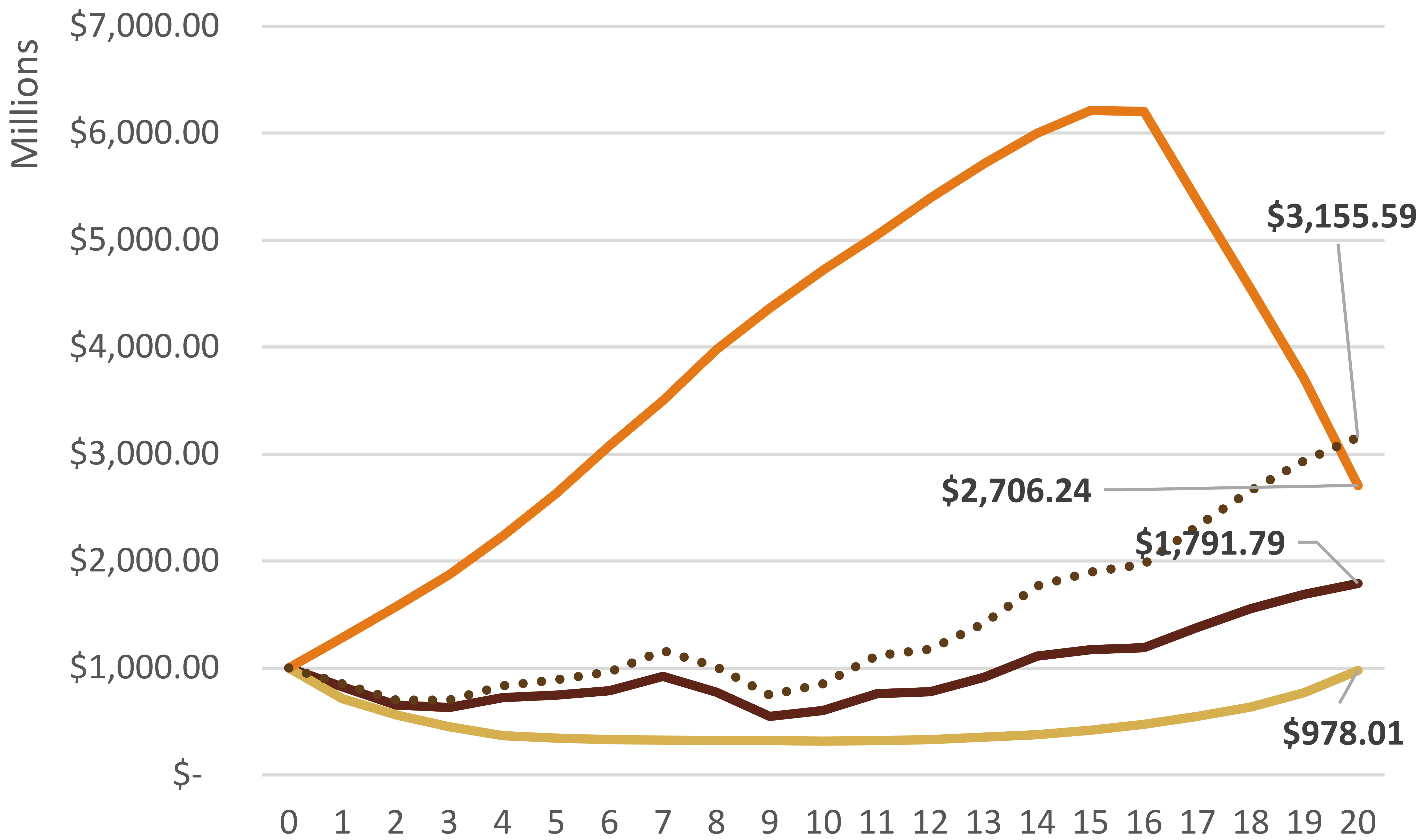
Positive Cashflow

- Positive Cashflows increase the ability to take risk.



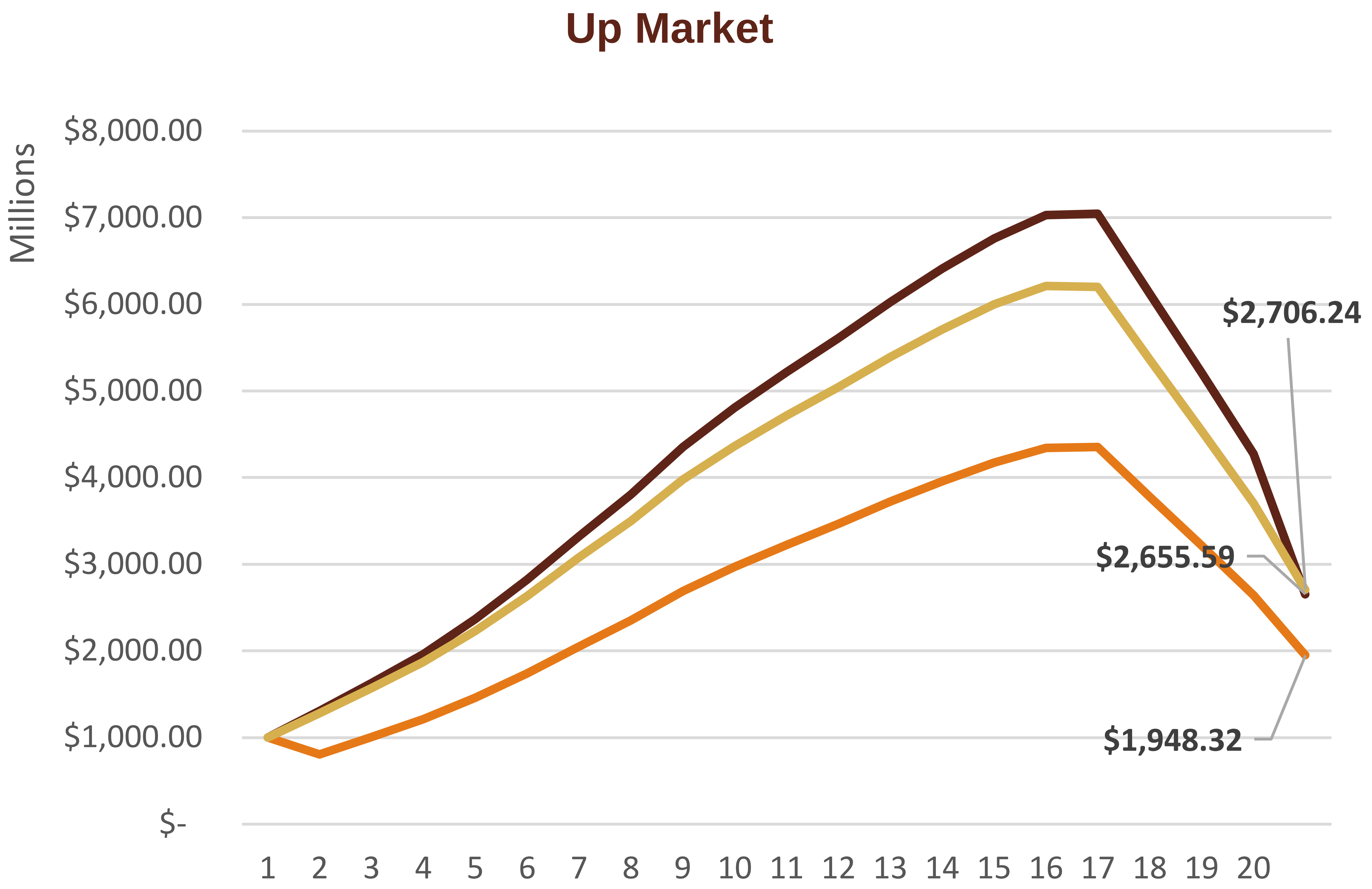
Negative Cashflow

- Negative Cashflows decrease the ability to take risk more than the positive helps.



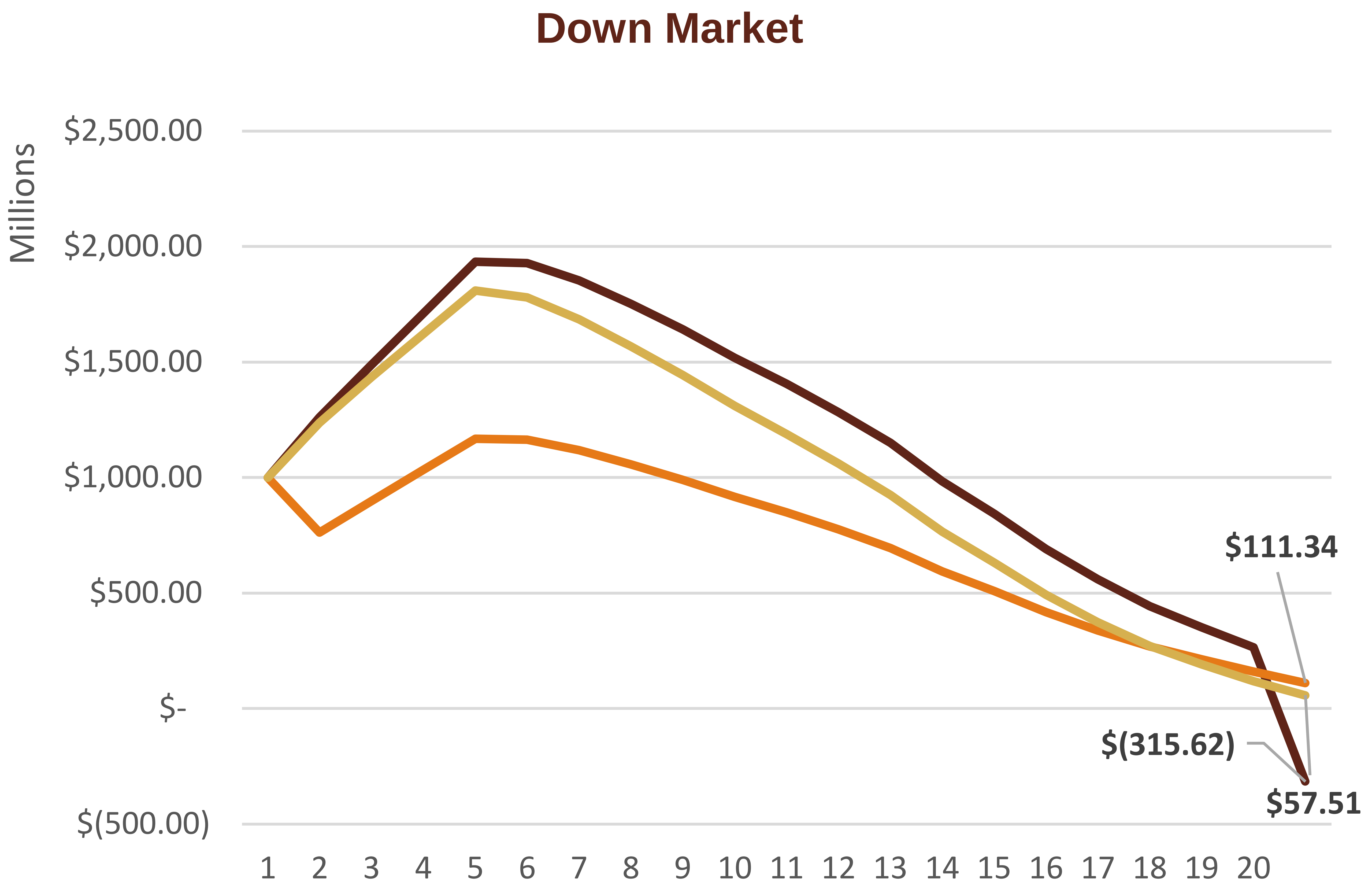
Rigidity of Cashflow

- ➢In an up market, it pays to delay cashflows to allow investments to grow.



Rigidity of Cashflow

- In down market, it pays to get the cashflows out as early as possible before the investment pool shrinks.



Mitigating Factors

- Diversification allows the CIO to sell higher priced assets to meet outflows and make investments into lower priced assets with inflows.
- The trade off toward illiquid assets boosts expected returns; however, it also reduces the ability to mitigate cashflow impacts through diversification as only the liquid pool is available.

Risk Capacity Scorecard

Time Horizon	+
Direction of Cashflow	−
Rigidity of Cashflow	−
Diversification	+
Liquidity	−

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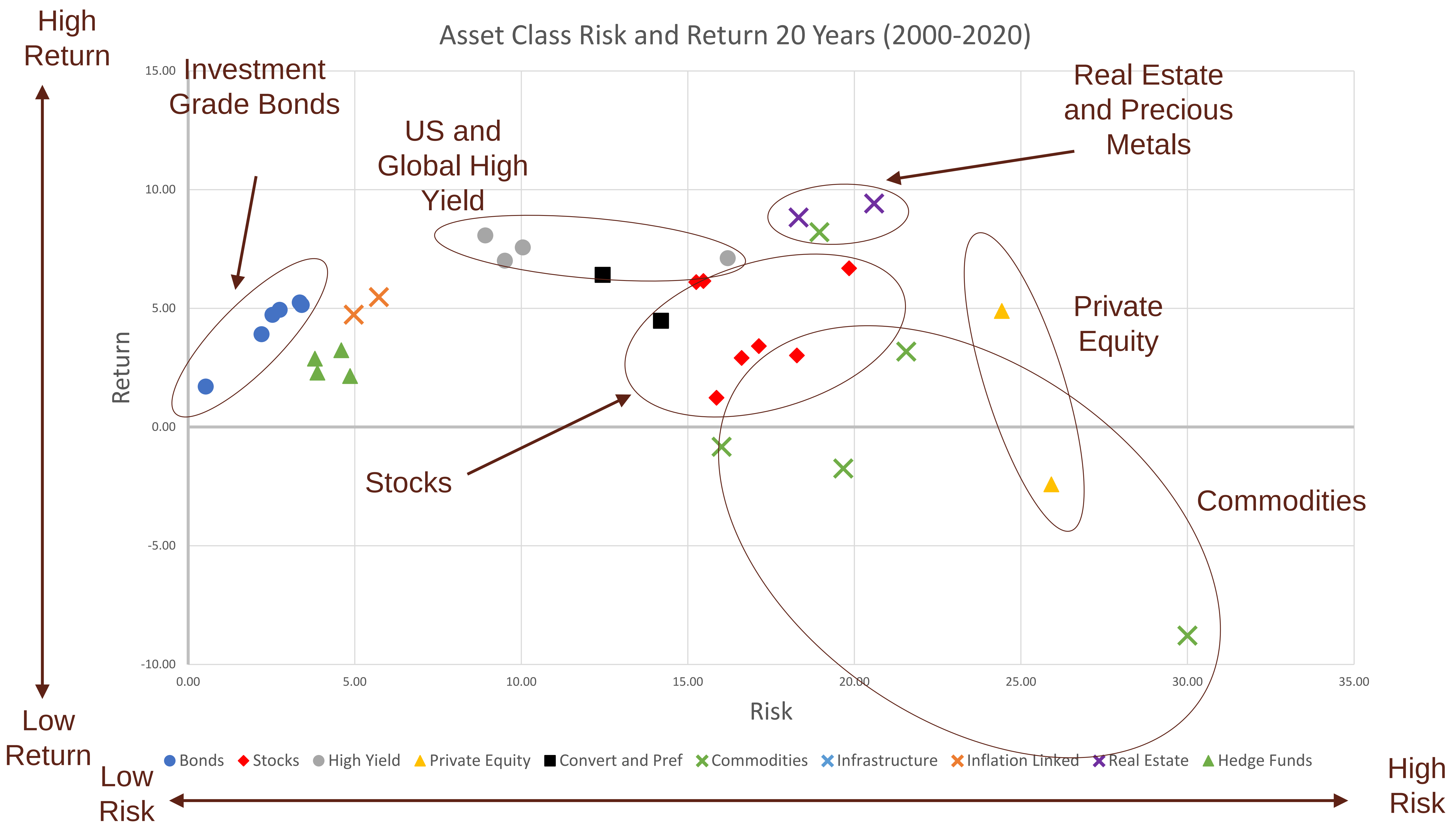
Asset Class Landscape

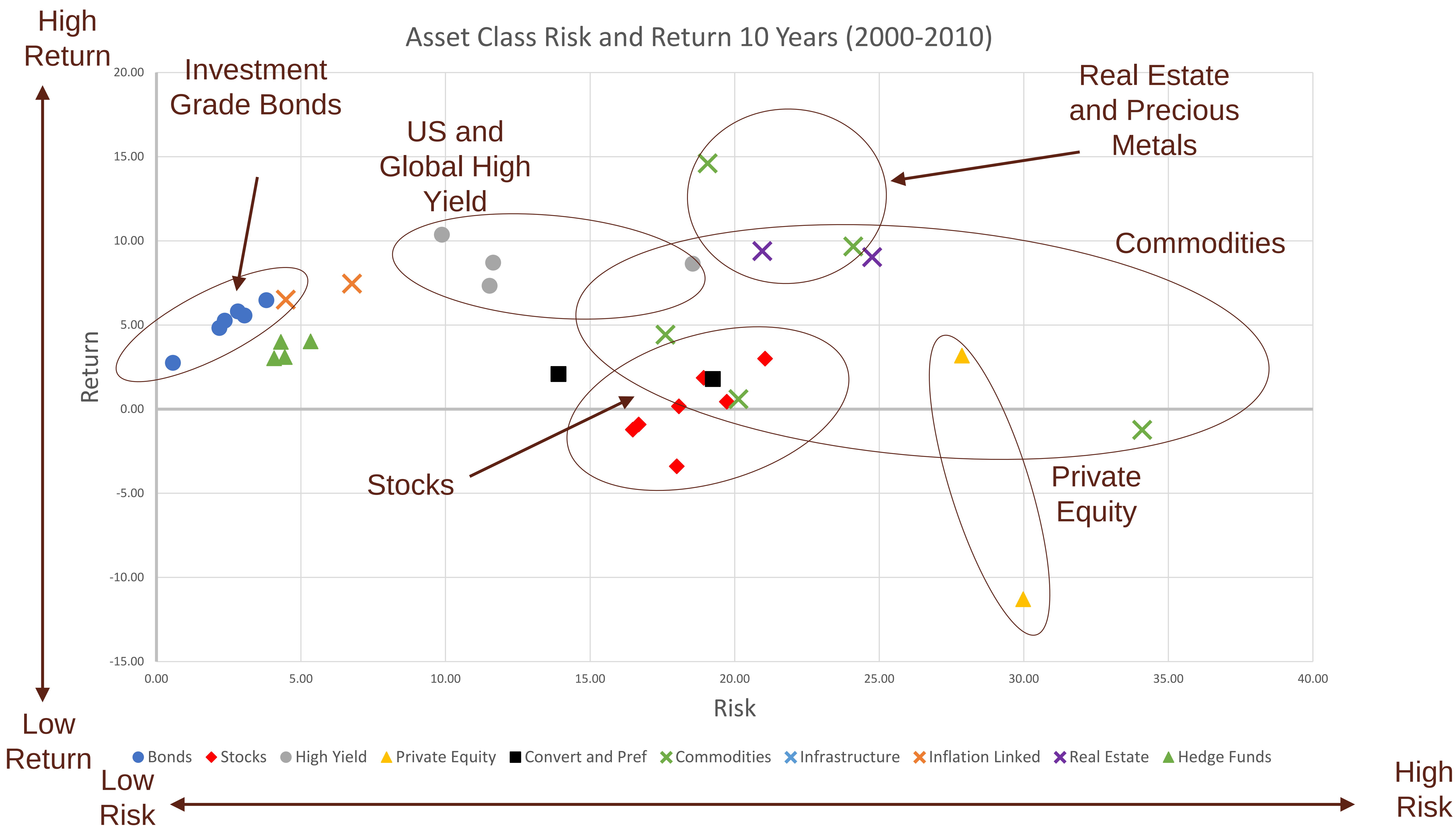
Reviewing Asset Class Risk Characteristics

Understanding the Risk Reward Landscape



The relationship between risk and return is complex. Not all risks are rewarded with high returns, but higher returns inevitably require higher risk. Diversification for diversification sake is not always a recipe for the most efficient portfolio. That said, sometimes, adding less efficient asset classes can yield a safer portfolio over time.

A Tale of Two Decades – Part I



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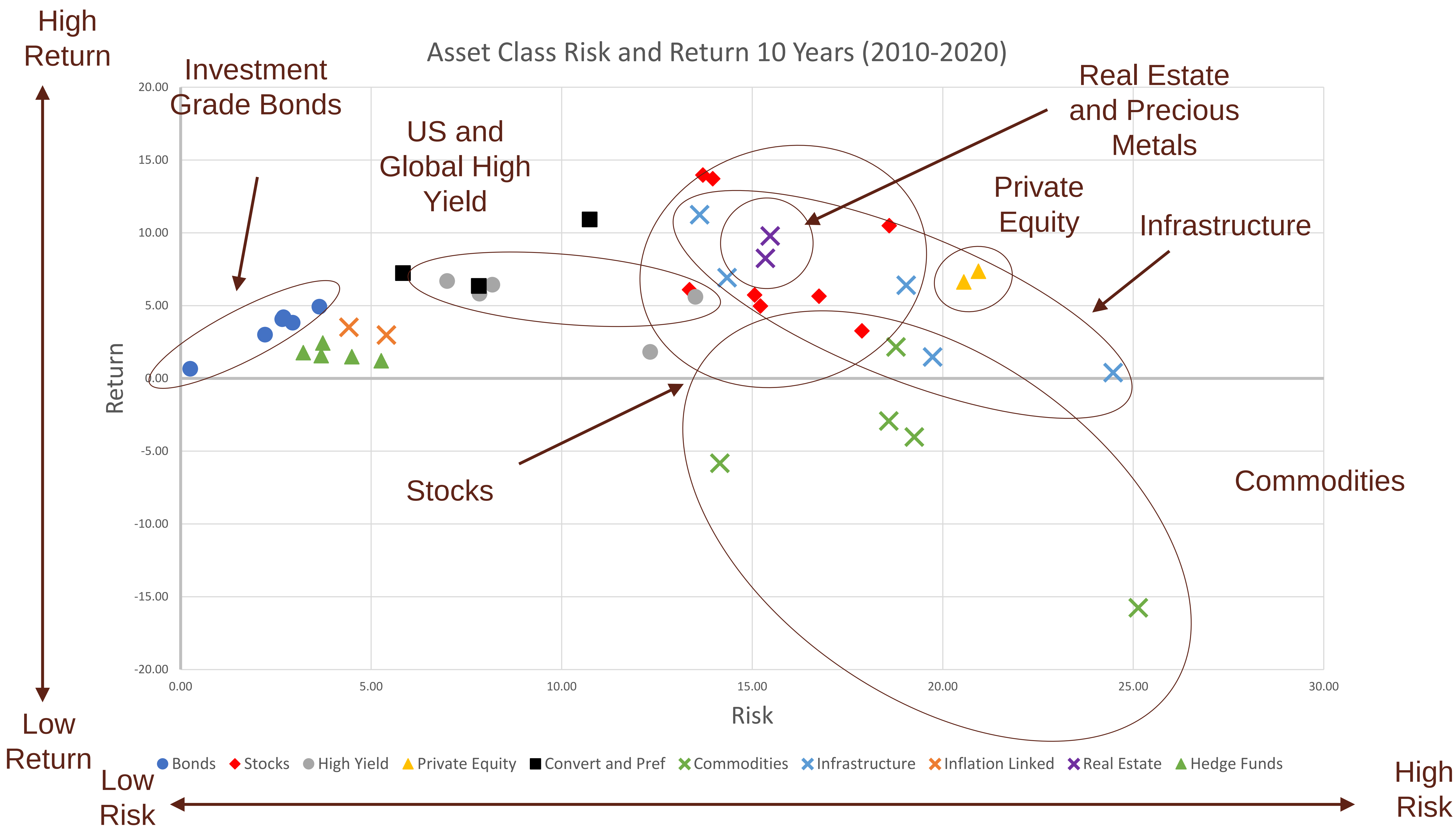
A Tale of Two Decades – Part II



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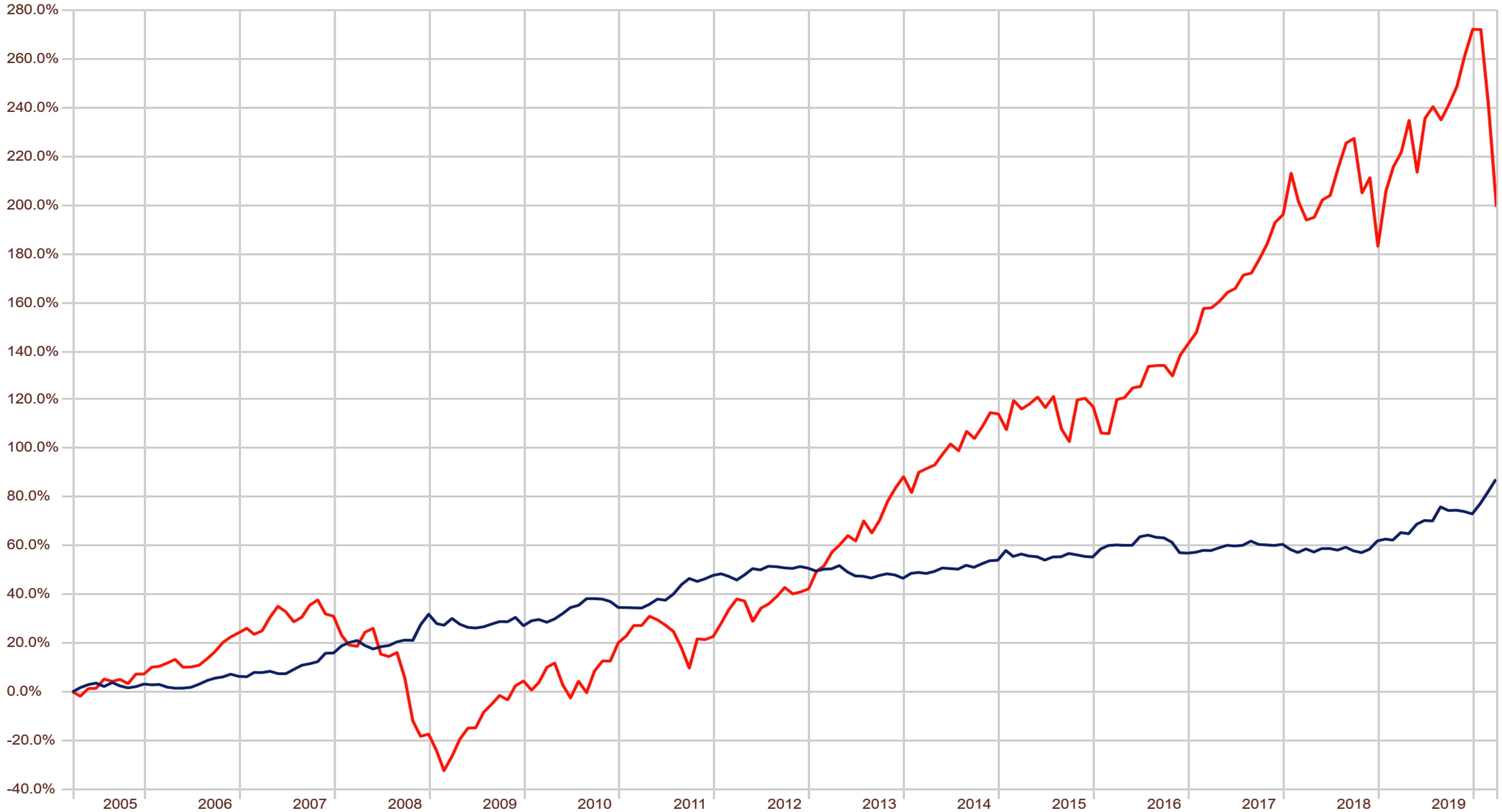
Good Portfolio Design Trades Off Growth for Stability

Investment Growth

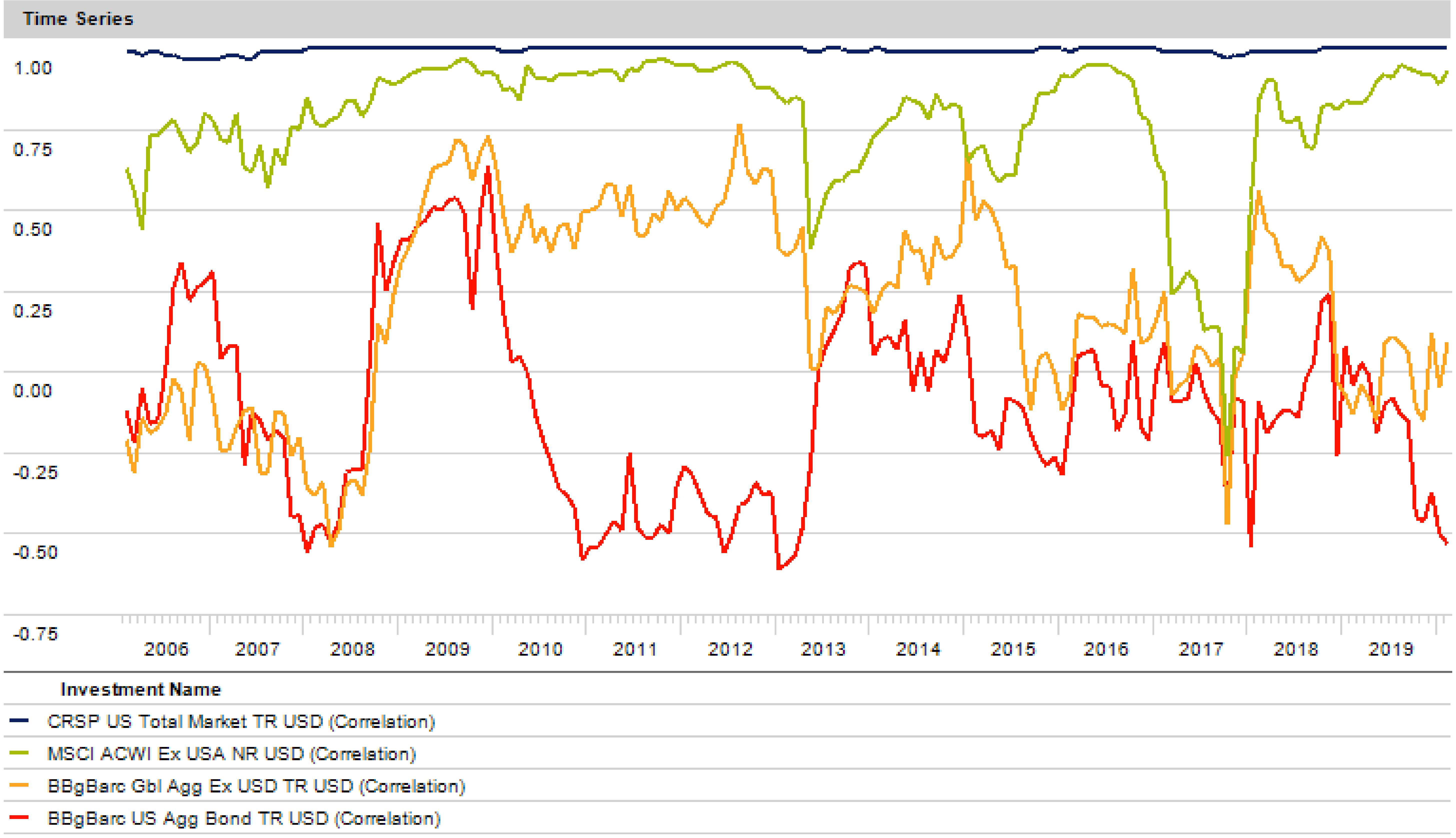
Time Period: 4/1/2005 to 3/31/2020



BBgBarc US Treasury TR USD(1987) 87.4% S&P 500 TR USD 199.2%

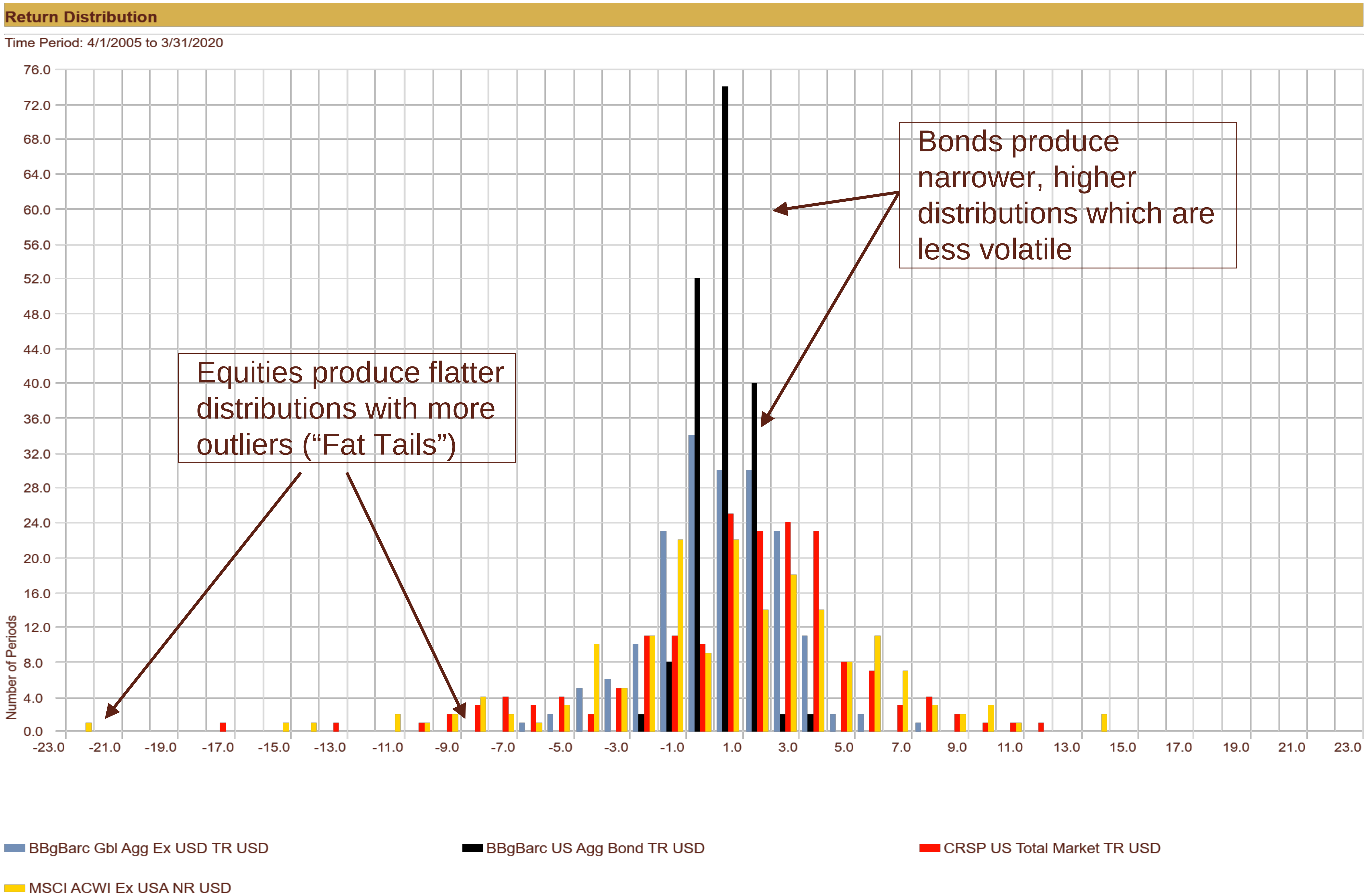
Source: Morningstar Direct

Correlations Are Not Dependable



- A single snapshot of correlation does not reveal the instability of this relationship over time.
- US bonds vary around a slightly negative correlation, but the experience suggests that the actual correlation ranges from 0.5 to -0.5, which are two very different portfolio impacts.
- Global bonds vary around a slightly higher correlation and skew more positively at times.
- International stocks are persistently high, providing little diversification benefit.

The Ultimate Goal Must Be To Avoid Fat Tails



Source: Morningstar Direct

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Economic Regime Considerations

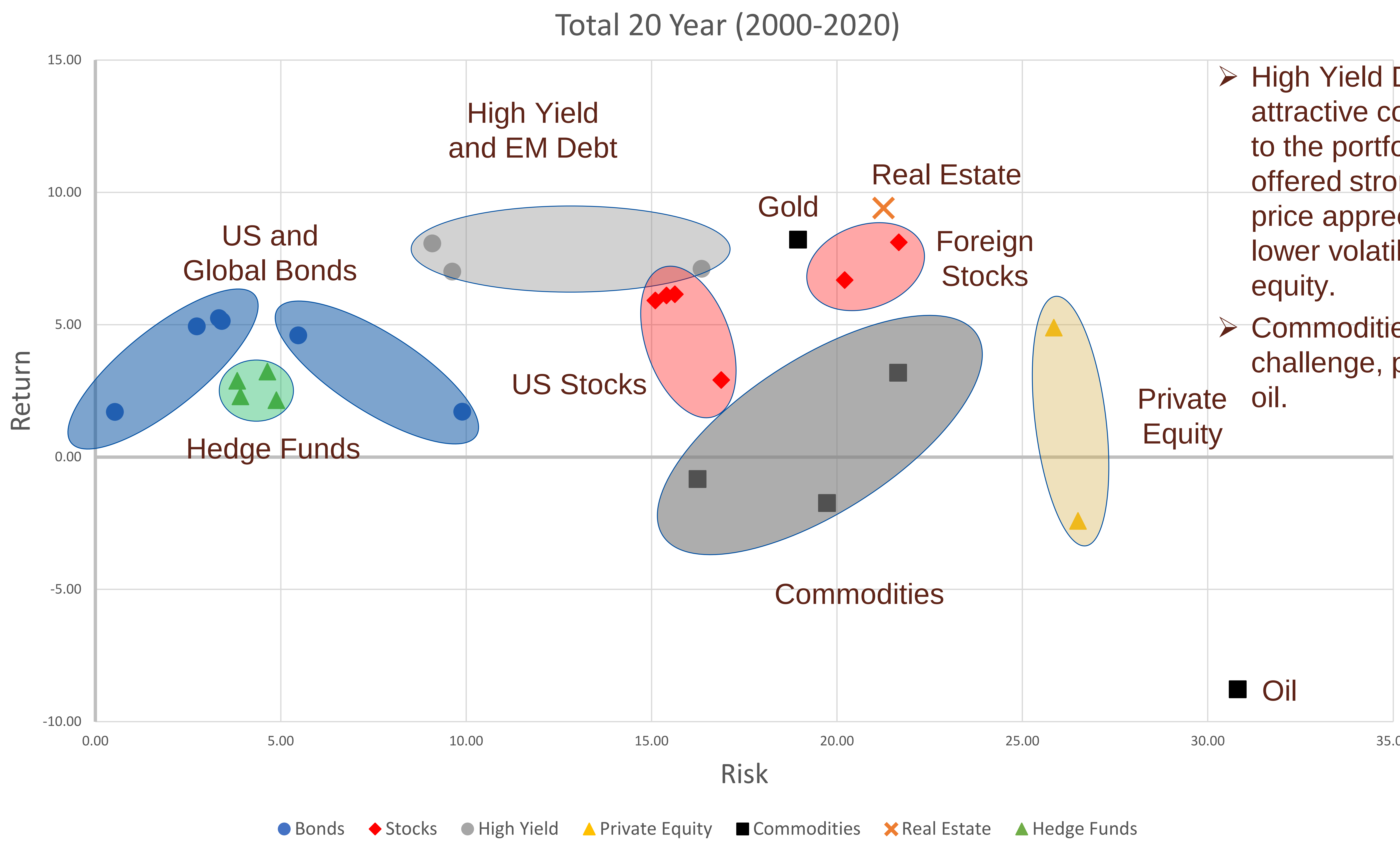
Headwinds and Tailwinds

Uncorrelated Economic Regimes

	GDP (Growing)	Trade Volume (Growing)	Earnings (Growing)	CPI (Increasing)	Oil (Above Average)	Dollar (Strengthening)	Rates (Rising)	Fed Balance Sheet (Expanding)	Asset Inflation (Positive)
GDP (Growing)	1.00								
Trade Volume (Growing)	0.25	1.00							
Earnings (Growing)	-0.05	0.02	1.00						
CPI (Increasing)	-0.02	0.02	-0.02	1.00					
Oil (Above Average)	-0.05	-0.17	0.00	-0.28	1.00				
Dollar (Strengthening)	-0.06	-0.14	-0.02	-0.07	0.36	1.00			
Rates (Rising)	-0.08	-0.01	0.03	0.08	0.06	0.21	1.00		
Fed Balance Sheet (Expanding)	0.00	0.00	0.05	0.01	-0.12	-0.06	-0.16	1.00	
Asset Inflation (Positive)	0.13	0.03	-0.03	-0.09	0.06	0.09	0.00	-0.03	1.00

- We evaluate the available asset classes under nine low to uncorrelated US economic regimes.
- The regimes are grouped into three broad groups: demand measures, cost measure and policy measures
- Each economic regime is measured monthly.
- Seven of the nine measures are directional. Directional measures measure the direction of the variable movement (ie rising, strengthening, growing, increasing, expanding) and do not differentiate regarding absolute measures (positive/negative, high/low, toward/away from mean, toward/away from trend).
- One measure, oil, is measured relative to the previous rolling three-year mean (above or below).
- The last measure, Asset Inflation, is measured as the change in money supply (M2) versus the change in CPI for the same month. This is an absolute measure (positive or negative).

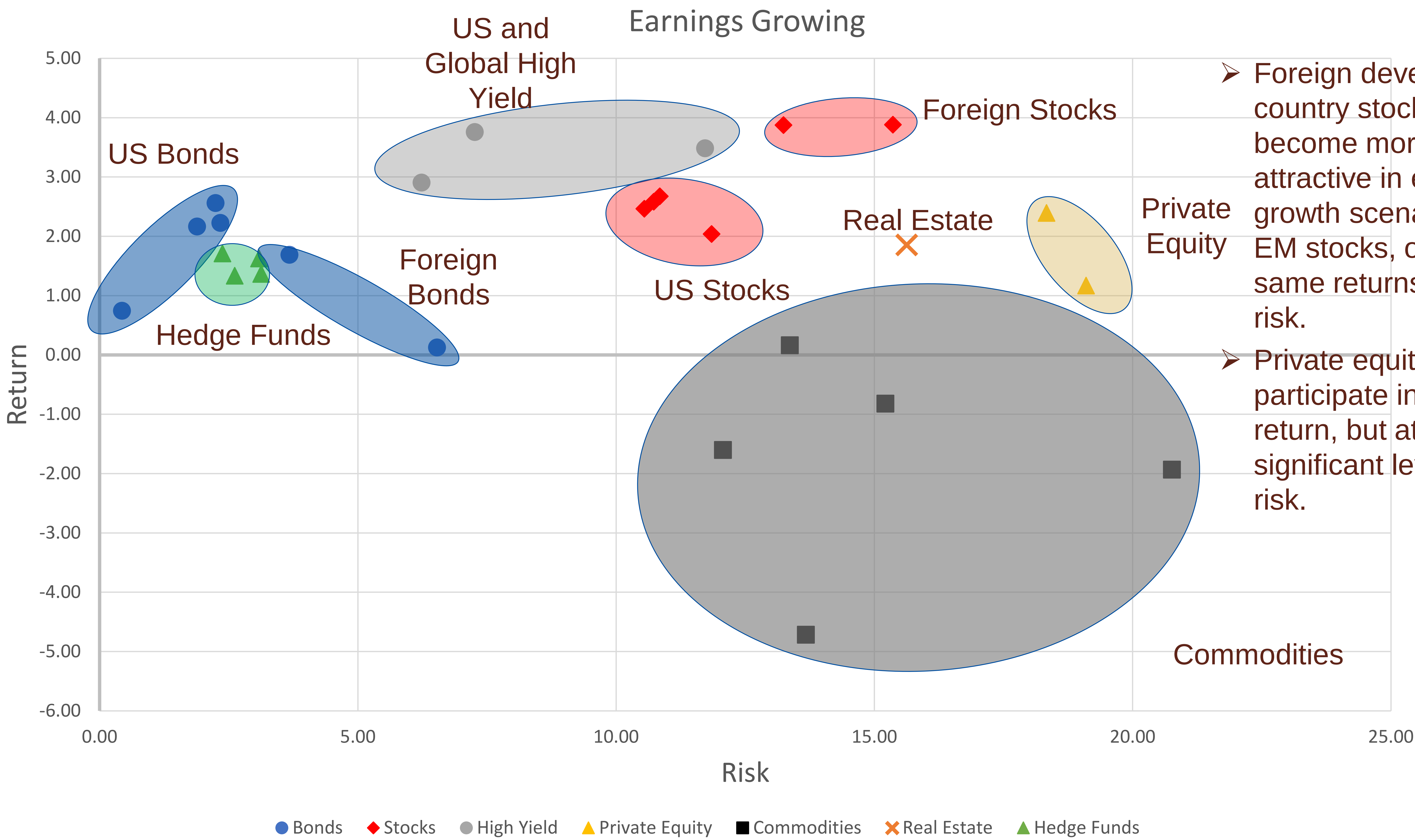
Unfiltered Data from June 2000 to June 2020



- High Yield Debt is an attractive component to the portfolio as it offered strong income, price appreciation and lower volatility than equity.
- Commodities is a challenge, particularly oil.

Strongest	Weakest
US Bonds Foreign Bonds High Yield Bonds	Foreign Stocks Private Equity Commodity

Demand – Earnings Growth



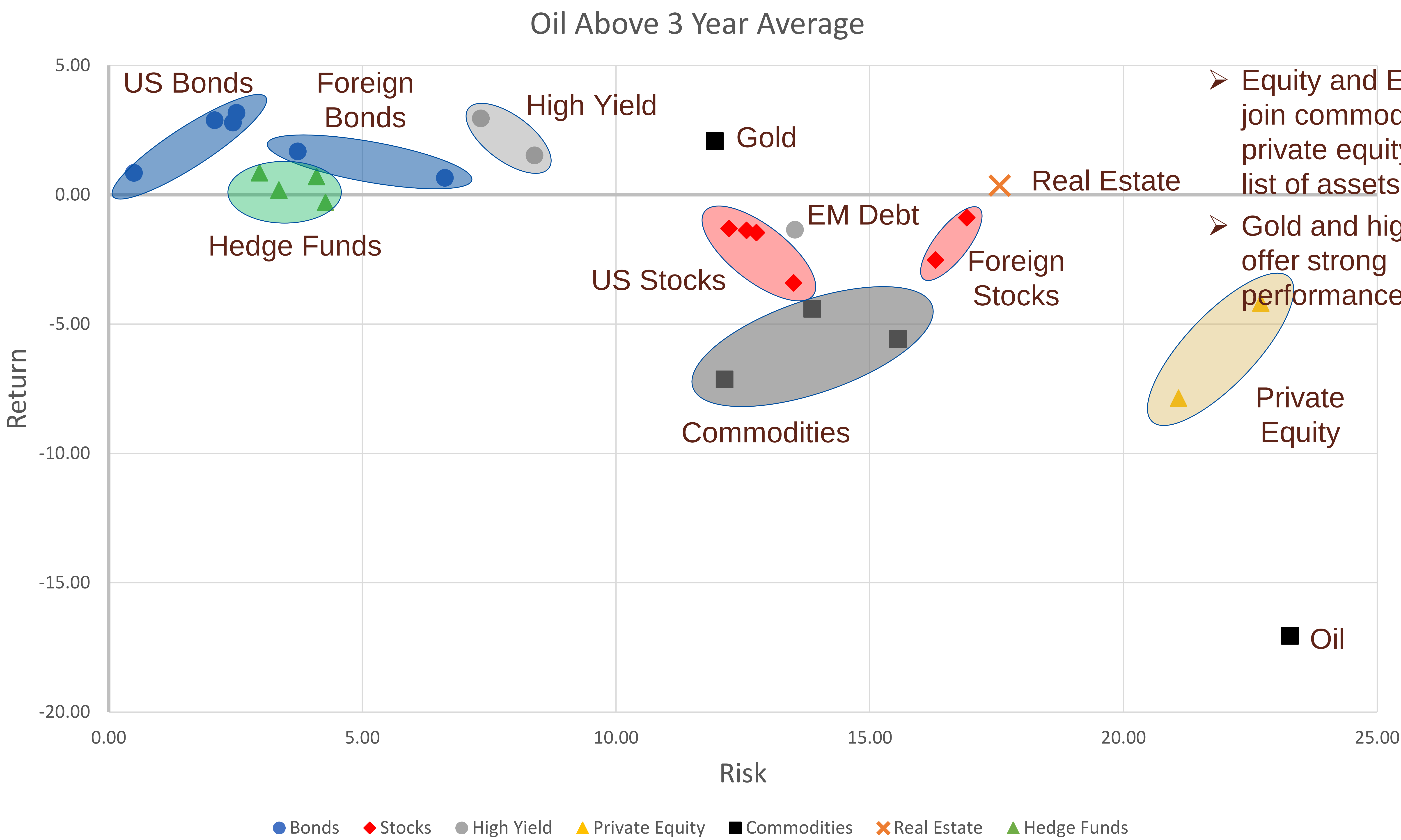
- Foreign developed country stocks become more attractive in earnings growth scenarios than EM stocks, offering the same returns for less risk.
- Private equity starts to participate in the return, but at significant levels of risk.

Strongest	Weakest
US Bonds	Private Equity
Foreign Bonds	Gold
Hedge Fund	Commodity

	Most Improved	Most Impacted
Risk Adj. Perf	US Stocks	Gold
Drawdown	Commodity	Foreign Stocks
Symmetry	Foreign Bonds	High Yield Bonds

Bias	Strongest	Weakest
Return	Foreign Stocks	Commodity
Risk	Real Estate	Hedge Fund
Inf Ratio	Hedge Fund	Commodity

Oil Above 3 Year Average



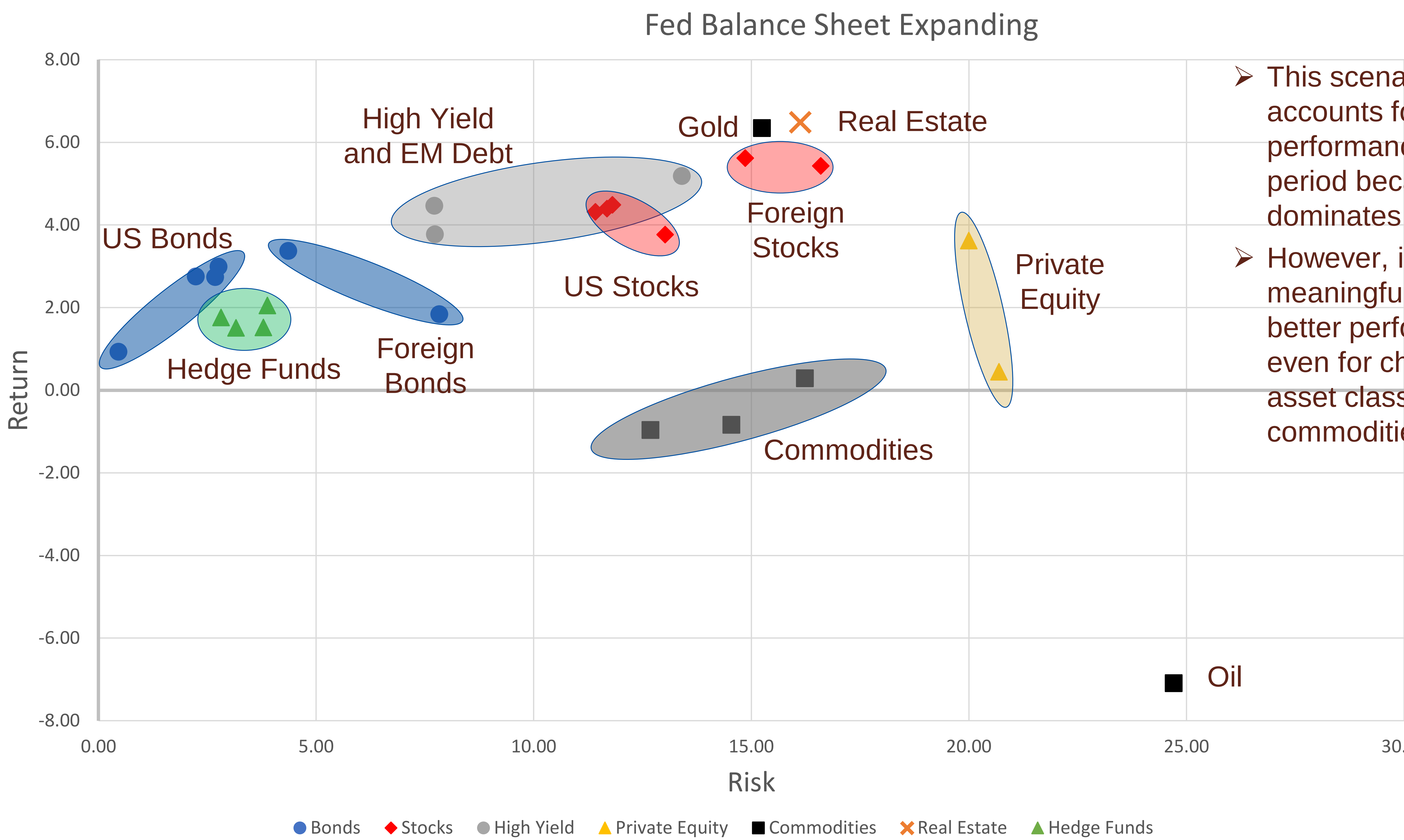
- Equity and EM Debt join commodities and private equity in the list of assets to avoid.
- Gold and high yield offer strong performance.

Strongest	Weakest
US Bonds	Foreign Stocks
Foreign Bonds	Private Equity
Gold	Commodity

	Most Improved	Most Impacted
Risk Adj. Perf	Gold	High Yield Bonds
Drawdown	US Bonds	US Stocks
Symmetry	US Bonds	Commodity

Bias	Strongest	Weakest
Return	US Bonds	Commodity
Risk	Hedge Fund	Gold
Inf Ratio	US Bonds	Commodity

Fed Balance Sheet Expanding



- This scenario accounts for most performance over the period because it also dominates the period.
- However, it meaningfully captures better performance, even for challenged asset classes like commodities.

Strongest	Weakest
US Bonds	Foreign Stocks
Foreign Bonds	Private Equity
Hedge Fund	Commodity

	Most Improved	Most Impacted
Risk Adj. Perf	Gold	High Yield Bonds
Drawdown	Commodity	US Stocks
Symmetry	US Bonds	Private Equity

Bias	Strongest	Weakest
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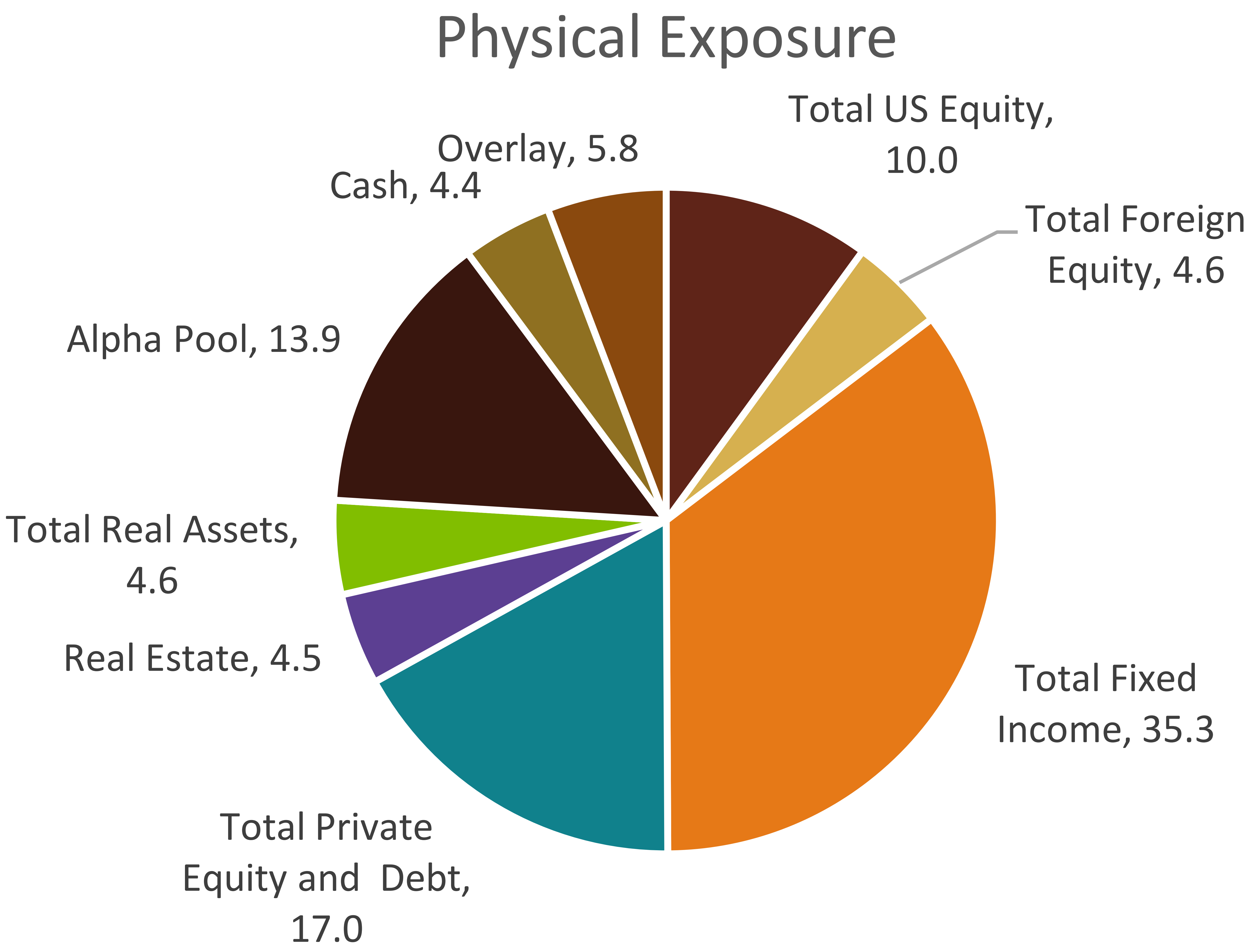
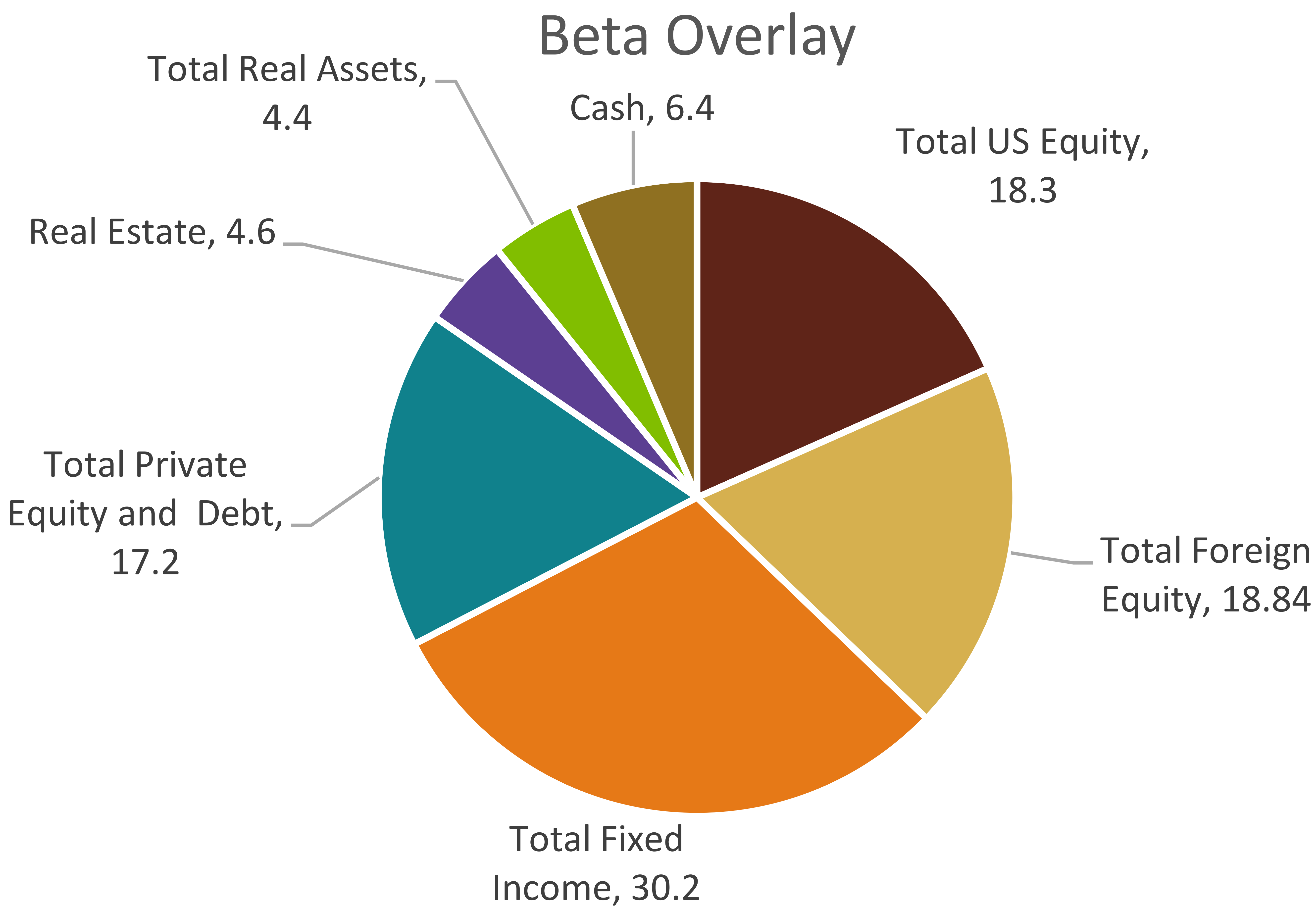
Inf Ratio	US Stocks	Foreign Bonds

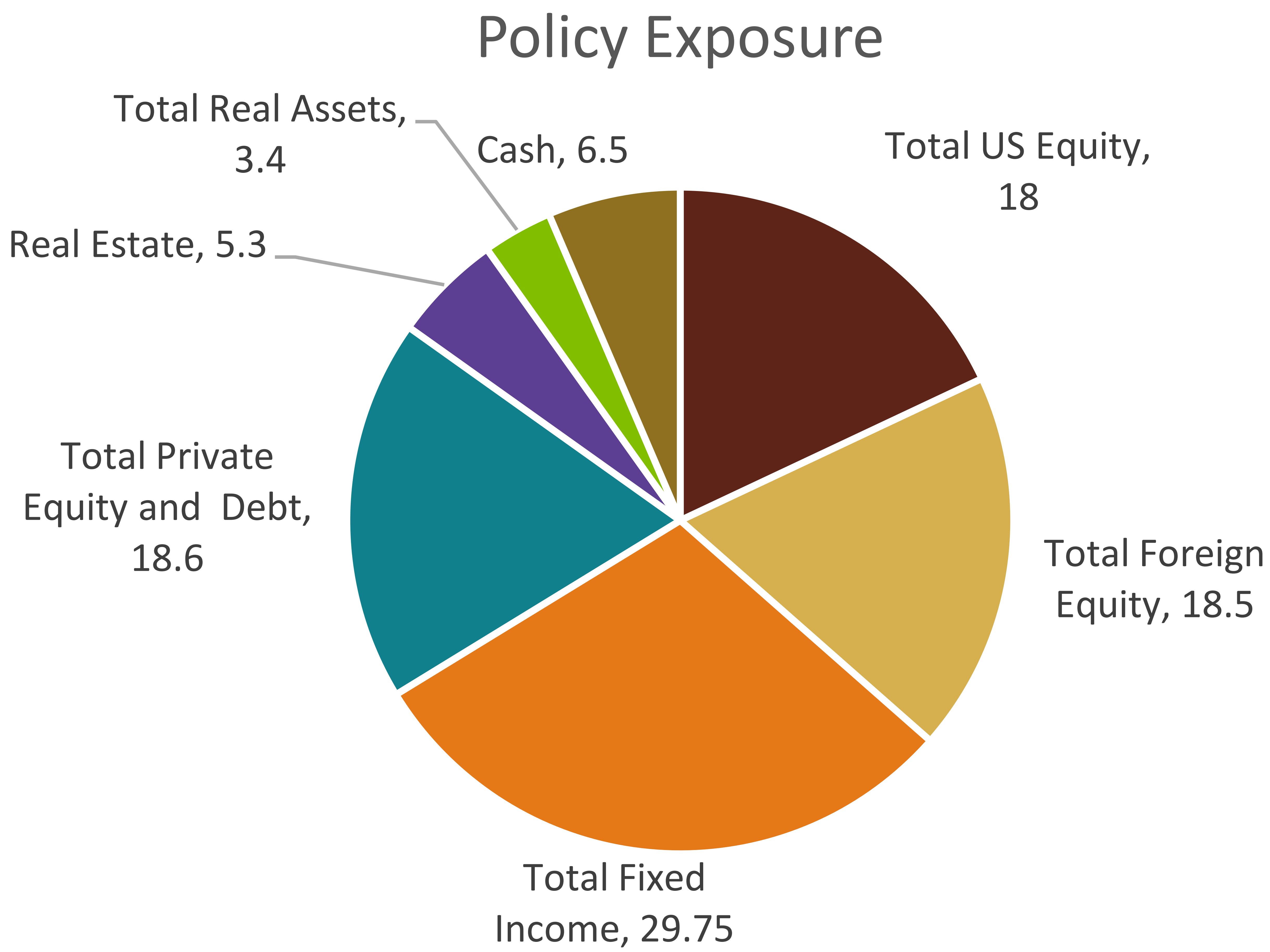
SBCERA Alpha Portfolio Exposures (as of 6/30/20)



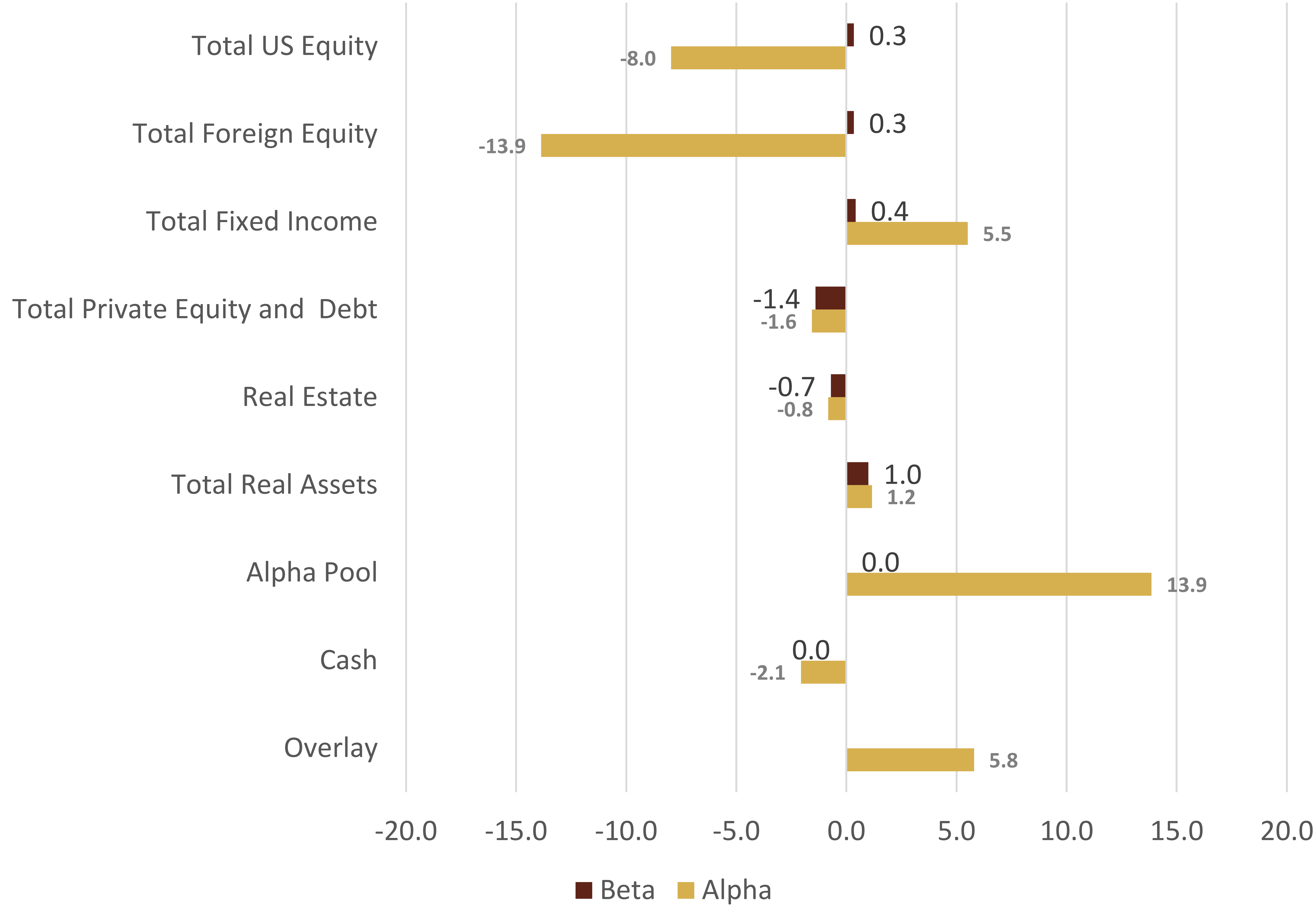
SBCERA Beta Portfolio Exposures (as of 6/30/20)



SBCERA Policy Portfolio Exposures (as of 6/30/20)



SBCERA Relative Exposures (as of 6/30/20)



SBCERA Portfolio Preference Scorecard

		GDP (Growing)	Trade Volume (Growing)	Earnings (Growing)	CPI (Increasing)	Oil (Above Average)	Dollar (Strengthening)	Rates (Rising)	Fed Balance Sheet (Expanding)	Asset Inflation (Positive)
Absolute Portfolio Exposure	Information Ratio Capture	0.2	0.2	0.4	0.0	-0.7	-0.8	0.8	0.6	0.7
Relative Portfolio Exposure	Information Ratio Rank Improvement	0.6	0.4	0.4	0.3	0.5	0.4	0.3	0.6	0.5
Absolute Portfolio Risk	Drawdown	-16.4	-16.4	-16.3	-9.9	-16.4	-16.4	-8.0	-16.4	-16.5
Absolute Portfolio Risk	Symmetry	2.7	2.7	3.0	6.4	3.0	2.9	3.9	3.7	2.9

- The current portfolio positioning shows no significant preference in various demand driven scenario. However, the portfolio does demonstrate market biases in policy and inflation scenarios.
- The portfolio design has a heavy preference for asset price inflation and economic recovery/rising rate scenarios.
- In recovery/rising rates scenarios, domestic and international equity along with private equity show strong performance.
- Meanwhile, asset price inflation benefits the broad portfolio except for real assets.
- Scenarios that feature rising oil prices or a strengthening dollar pose challenges to the current positioning.
- Rising oil hurts all public and private equity as well as real assets while the rising dollar only hurts international equity and European high yield.

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		GDP (Growing)	Trade Volume (Growing)	Earnings (Growing)	CPI (Increasing)	Oil (Above Average)	Dollar (Strengthening)	Rates (Rising)	Fed Balance Sheet (Expanding)	Asset Inflation (Positive)
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Relative Portfolio Exposure	Information Ratio Rank Improvement	0.6	0.4	0.4	0.3	0.5	0.4	0.3	0.6	0.5
Absolute Portfolio Risk	Drawdown	-16.4	-16.4	-16.3	-9.9	-16.4	-16.4	-8.0	-16.4	-16.5
Absolute Portfolio Risk	Symmetry	2.7	2.7	3.0	6.4	3.0	2.9	3.9	3.7	2.9

- In evaluating the relative positioning of the portfolio, we evaluated the beta positioning of the liquid portfolio as that determines the potential for value added in the portfolio overaly program.
- In this analysis, we evaluate the relative positioning of the liquid portfolio and dermine, under various scenarios, if the relative positioning will help or hurt the overall ranking versus the policy portfolio.
- In every scenario, we observe modest improvement in the ranking of the portfolio.
- The improvements are small commensurate with the size of the bets.
- The best results come in the growing GDP scenario as well as the expanding Fed Balance Sheet scenario.
- Perhaps the most persistent observations comes from the underweight in US Investment Grade Bonds, which tends to land at the top of the performance spectrum on a risk adjusted basis. However, this is mitigated by the desire for income, which investment grade bonds do not provide.

SBCERA Portfolio Preference Scorecard

		GDP (Growing)	Trade Volume (Growing)	Earnings (Growing)	CPI (Increasing)	Oil (Above Average)	Dollar (Strengthening)	Rates (Rising)	Fed Balance Sheet (Expanding)	Asset Inflation (Positive)
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Relative Portfolio Exposure	Information Ratio Rank Improvement	0.6	0.4	0.4	0.3	0.5	0.4	0.3	0.6	0.5
Absolute Portfolio Risk	Drawdown	-16.4	-16.4	-16.3	-9.9	-16.4	-16.4	-8.0	-16.4	-16.5
Absolute Portfolio Risk	Symmetry	2.7	2.7	3.0	6.4	3.0	2.9	3.9	3.7	2.9

- Given the portfolio sensitivity to adverse events, the ability to reduce the drawdown is considered a valuable feature.
- Most scenarios, however, feature roughly the same drawdown characteristics across the board, so considering these effects makes more sense by asset class than by scenario (see Appendix).
- Both domestic and global fixed income along with the alpha pool largely improve the drawdown profile of the portfolio.
- From a scenario perspective, the recovery scenarios reduce the tail risk of the portfolio along with rising inflation scenarios for the same reason.
- The remaining scenarios are largely similar in their lack of drawdown improvement.

SBCERA Portfolio Preference Scorecard

		GDP (Growing)	Trade Volume (Growing)	Earnings (Growing)	CPI (Increasing)	Oil (Above Average)	Dollar (Strengthening)	Rates (Rising)	Fed Balance Sheet (Expanding)	Asset Inflation (Positive)
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Absolute Portfolio Risk	Drawdown	-16.4	-16.4	-16.3	-9.9	-16.4	-16.4	-8.0	-16.4	-16.5
Absolute Portfolio Risk	Symmetry	2.7	2.7	3.0	6.4	3.0	2.9	3.9	3.7	2.9

- Symmetry impact measures the degree to which the upside improves or the downside is reduced across the portfolio in the scenarios.
- The symmetry is greatly impacted by the presence of cash, which is positively skewed asset class.
- Excluding the impact of cash, it is worth noting that international and emerging markets equity tend to add negative skew to the portfolio outcomes.
- Fixed income, both domestic and foreign, more than offset the equity impacts with more than twice the amount of positive skew.
- Looking across the scenario, the Fed Balance Sheet expansion scenario sets up the most potential for negatively skewed events across the portfolio and would be the scenario element to watch out for.
- Increasing inflation is the most balanced across the asset classes with little effects to any single asset classes.
- On balance, the portfolio is designed with strong symmetry characteristics to help manage risk across scenarios.

Economic Scenario Review

Possible Portfolio Paths

Base Case

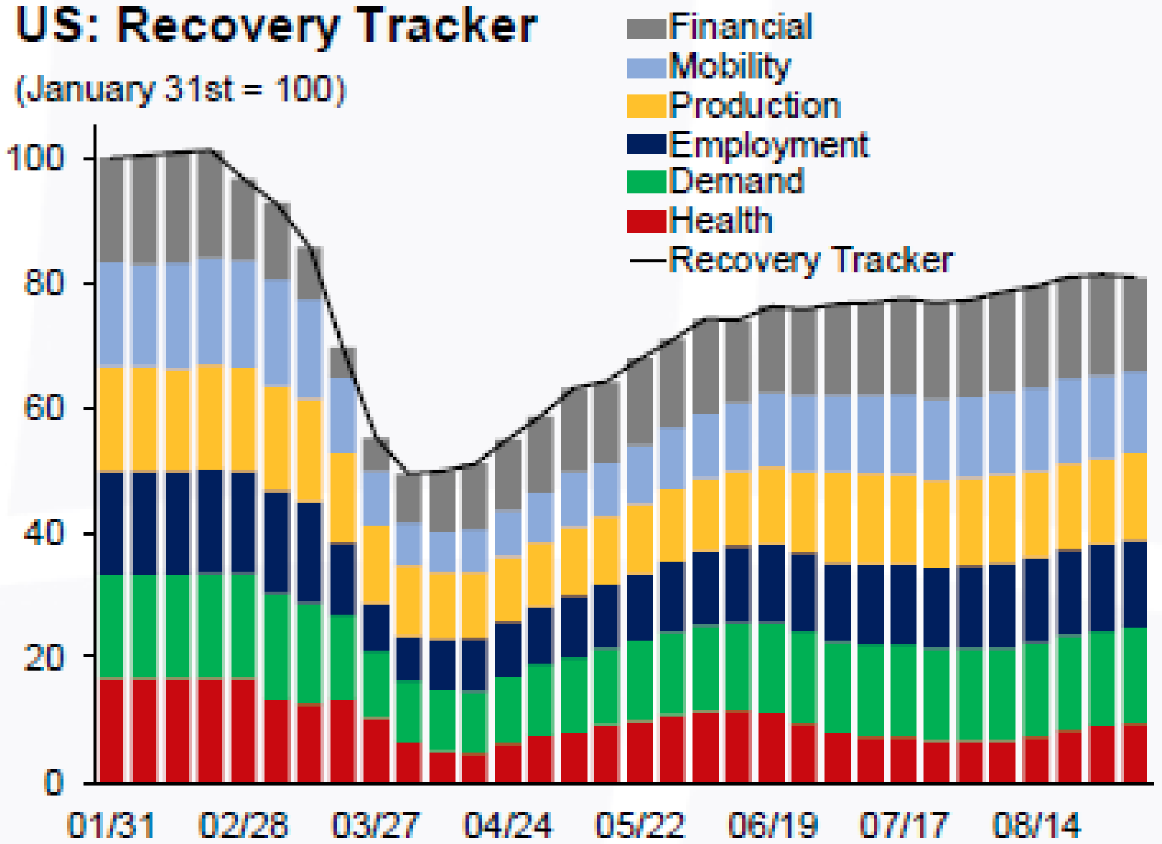
- **Economic Recovery**: The economic recovery is underway with some significant potential headwinds: stalled fiscal aid, flu season ahead and election uncertainty rising.
- **Signs of Slowing**: Slowing in apparent in the labor markets, consumer spending and business investment.
- **Lower for Longer**: The newly adopted flexible average inflation target means the Fed will keep rates low even with tighter labor markets.
- **Risks to Growth**: With vaccines still making their way through trials, testing still insufficient and cases back on the rise, without further stimulus, risks are tilted to the downside.

Base Case – Slow Recovery

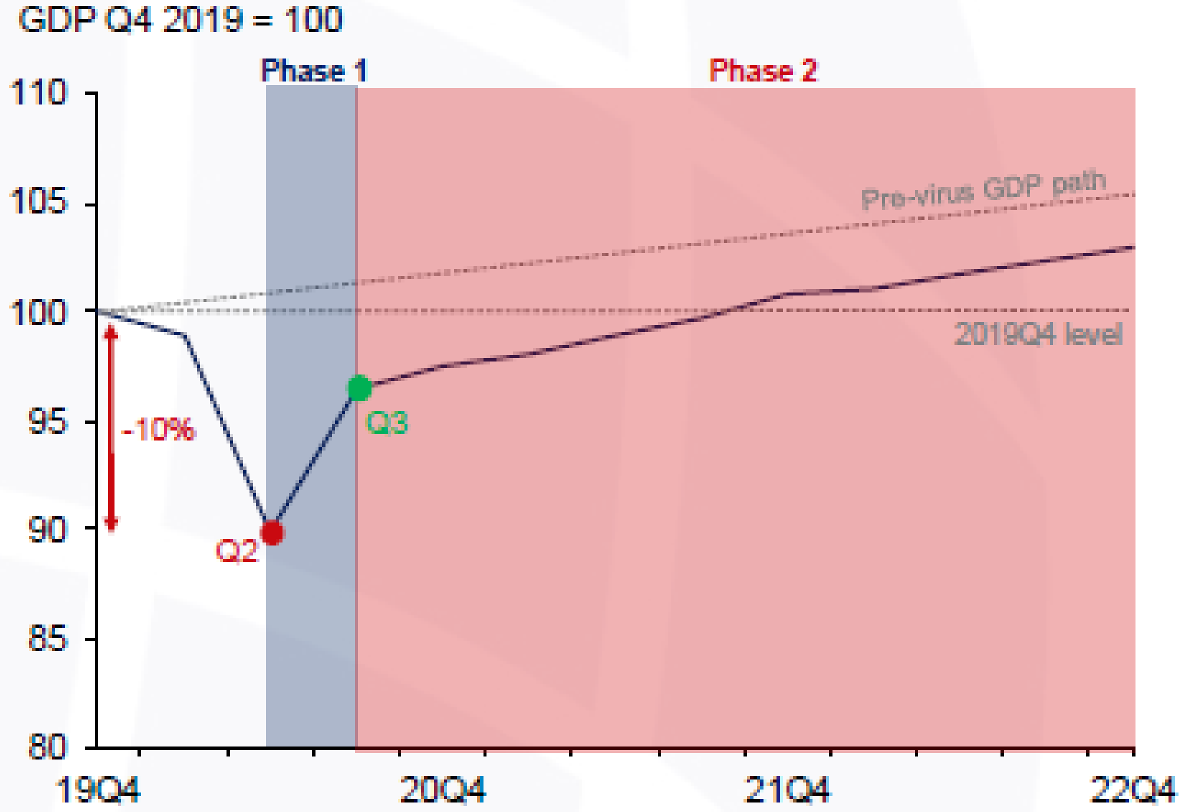
Forecast for United States

(Annual percentage changes unless specified)

	2018	2019	2020	2021	2022	2023
GDP	3.0	2.2	-3.7	3.7	2.9	2.3
Private Consumption	2.7	2.4	-4.2	4.7	3.7	2.7
Fixed Investment	4.8	2.3	-2.8	1.6	2.7	2.3
Government Consumption	1.5	1.8	1.8	-1.0	-1.1	0.0
Exports of Goods and Services	3.0	-0.1	-13.5	4.8	8.5	5.5
Imports of Goods and Services	4.1	1.1	-11.5	6.5	6.9	4.5
Stockbuilding (% of GDP)	0.3	0.3	-0.4	0.3	0.3	0.2
Industrial Production	4.0	0.9	-7.9	3.9	4.0	2.4
Consumer Prices, average	2.4	1.8	1.2	1.6	1.8	2.0
Current Balance (% of GDP)	-2.2	-2.2	-2.7	-2.7	-2.4	-2.3
Federal Budget (% of GDP)	-3.8	-4.6	-20.9	-10.2	-6.0	-5.3
Short-Term Interest Rates (%)	2.31	2.33	0.68	0.30	0.30	0.30
Long-Term Interest Rates (%)	2.91	2.14	0.87	1.12	1.54	1.81
Exchange Rate (US$ per Euro), average	1.18	1.12	1.13	1.18	1.19	1.20
Exchange Rate (Yen per US$), average	110.4	109.0	107.2	106.0	105.5	104.4



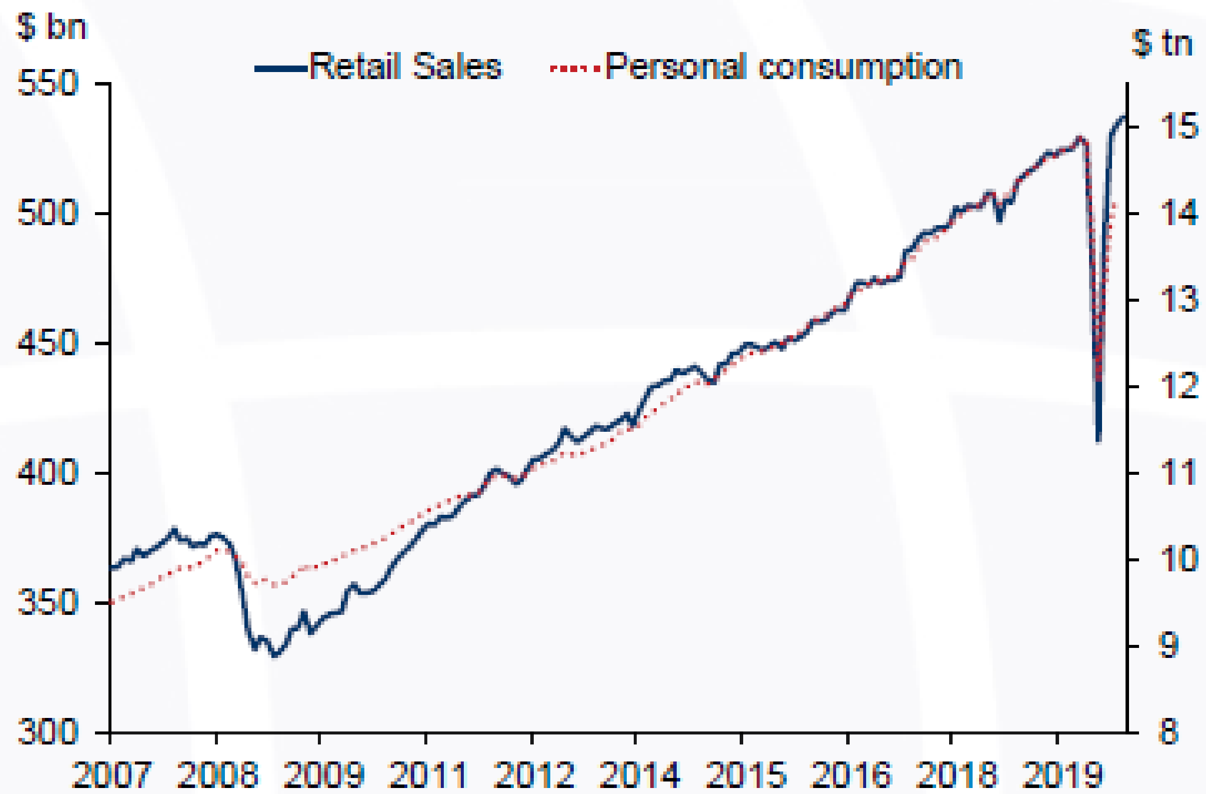
Sources: Oxford Economics



Source : Oxford Economics

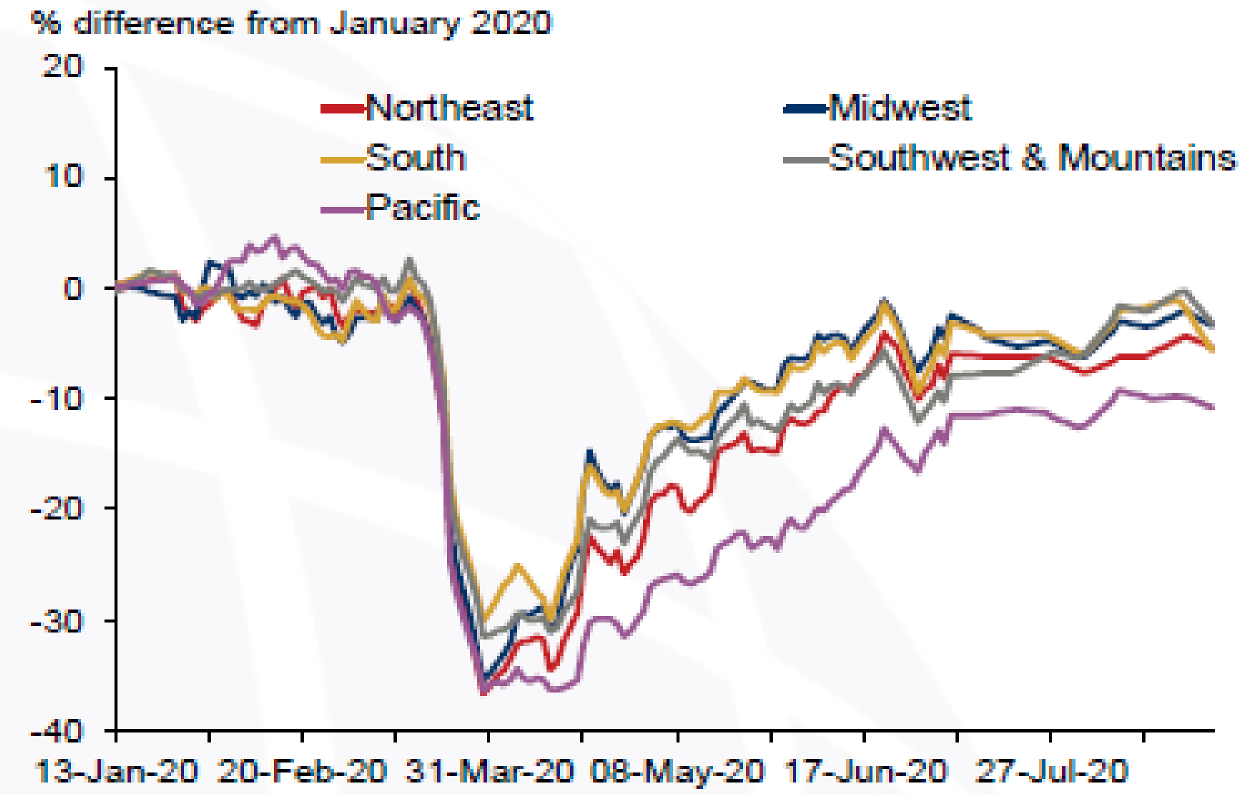
Base Case – Consumer Spending

US: Retail sales and consumer spending



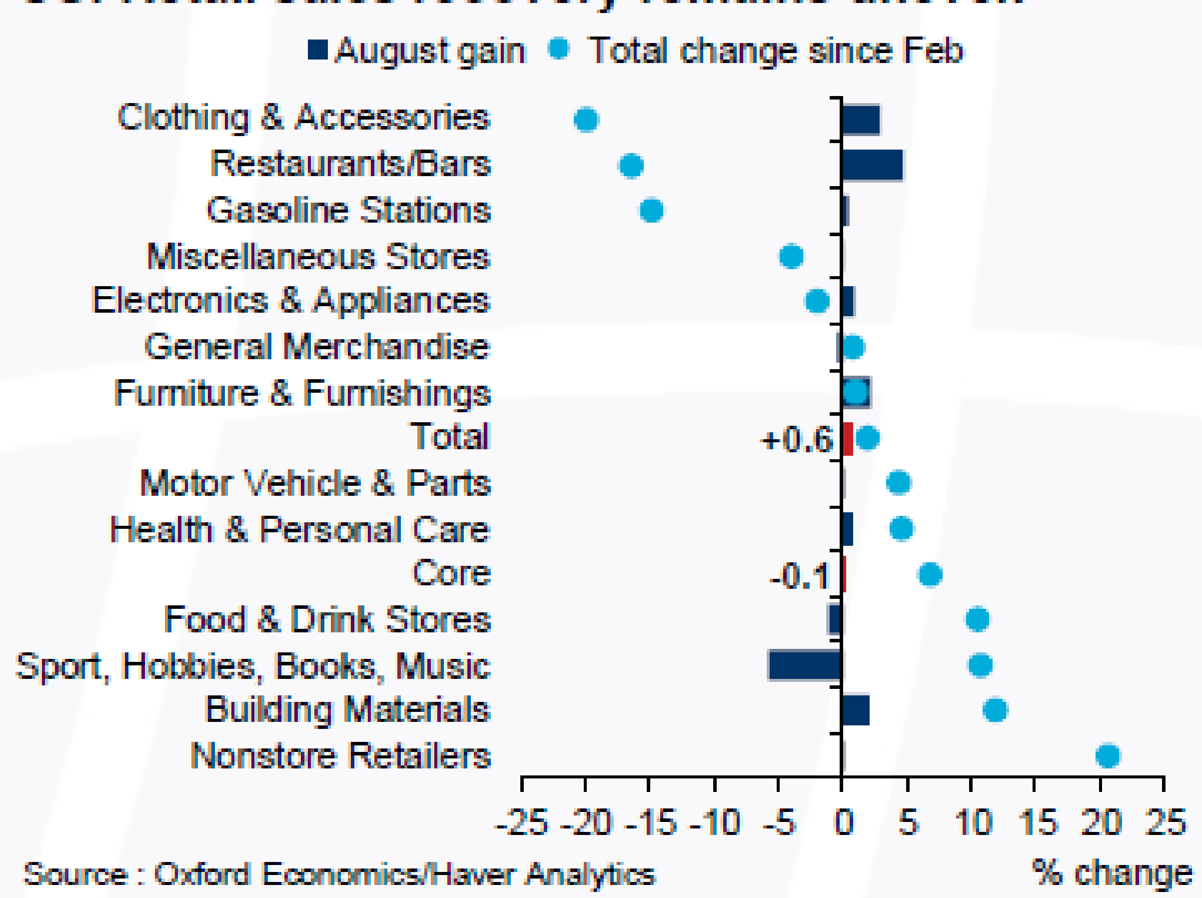
Source : Oxford Economics/Haver Analytics

US: Credit and debit card spending



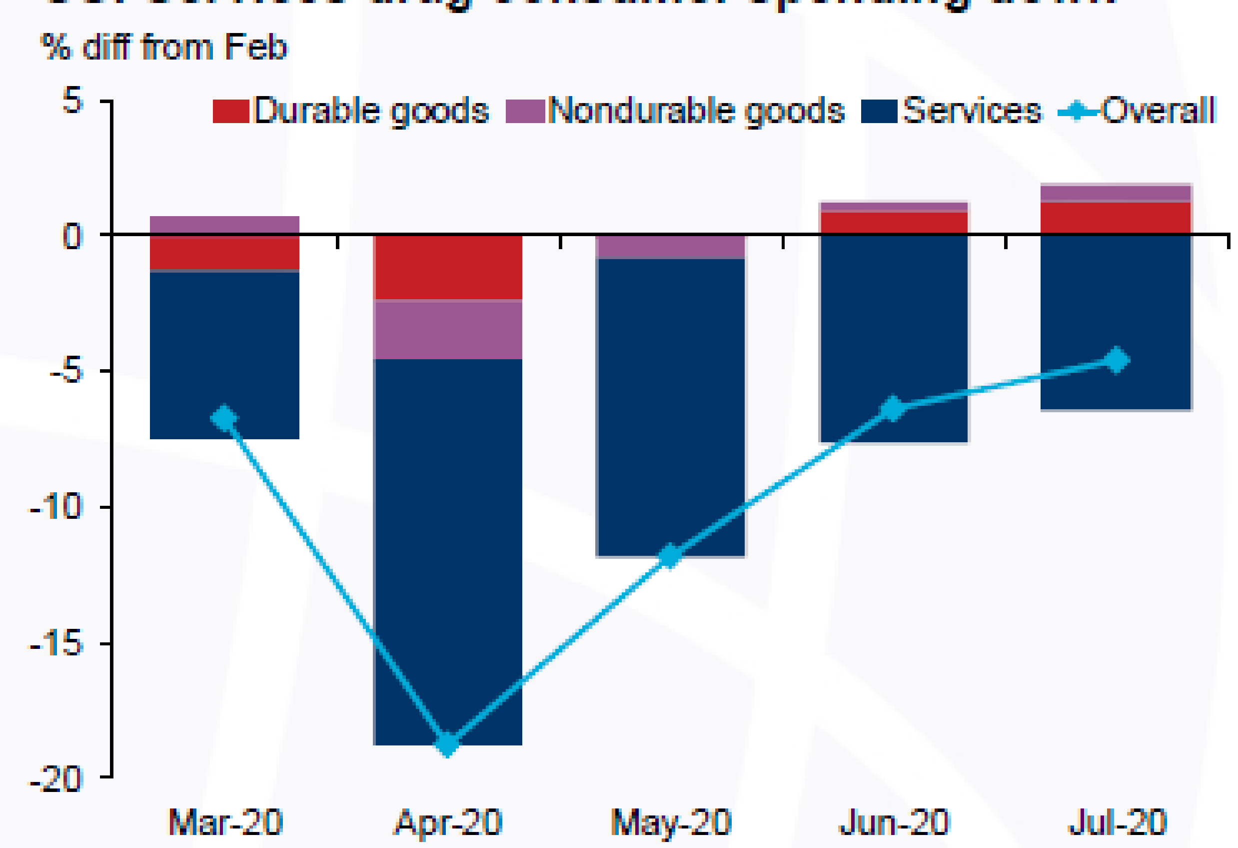
Note: Weighted by state contribution to regional spending
Source: Oxford Economics/Haver Analytics

US: Retail sales recovery remains uneven



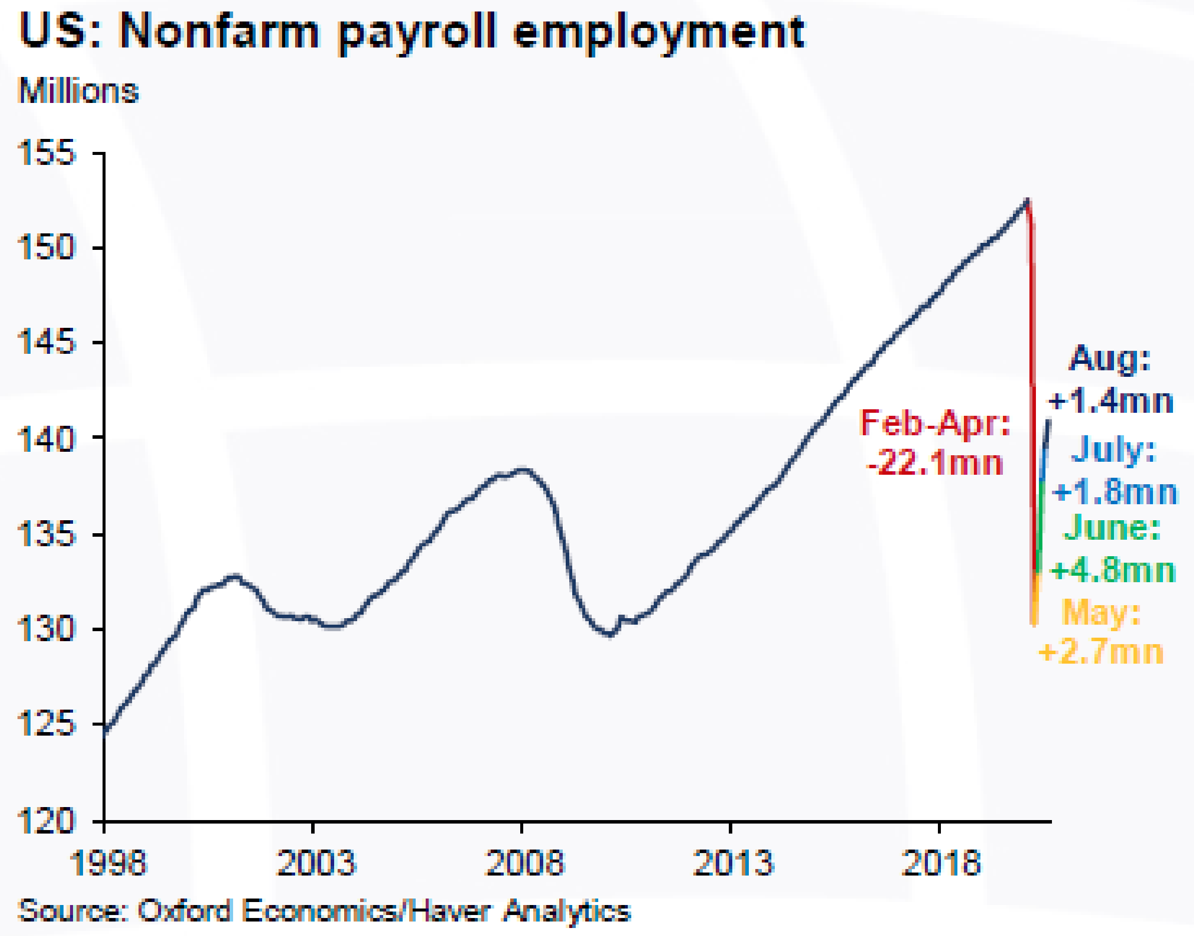
Source : Oxford Economics/Haver Analytics

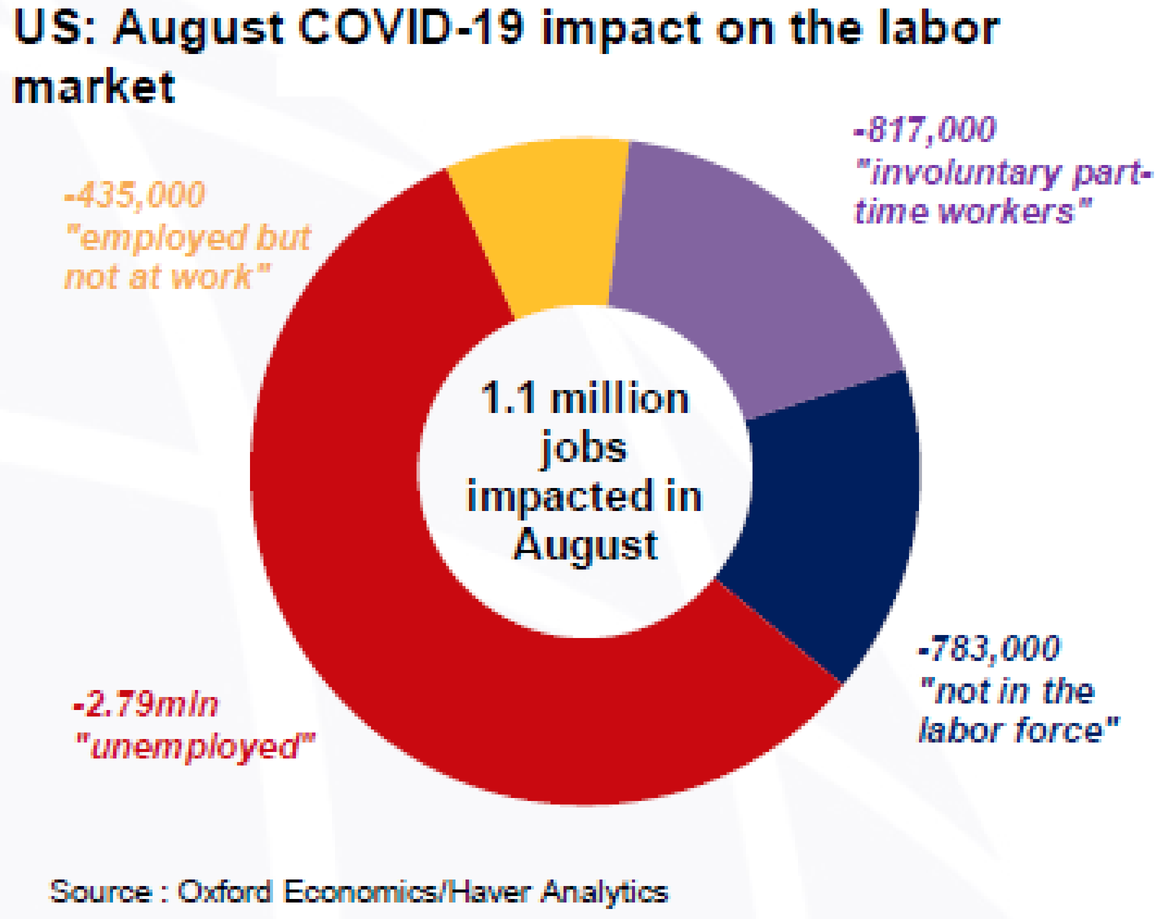
US: Services drag consumer spending down

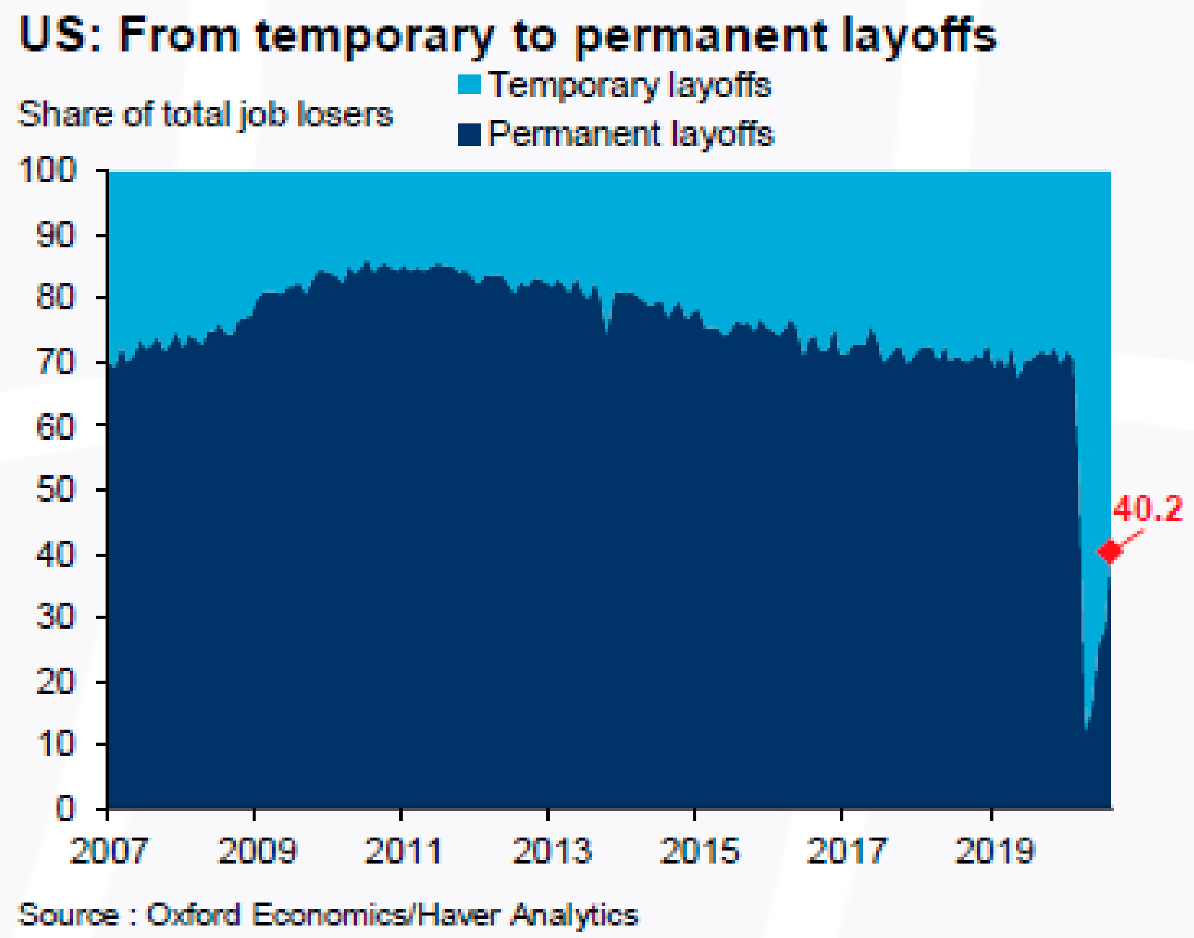


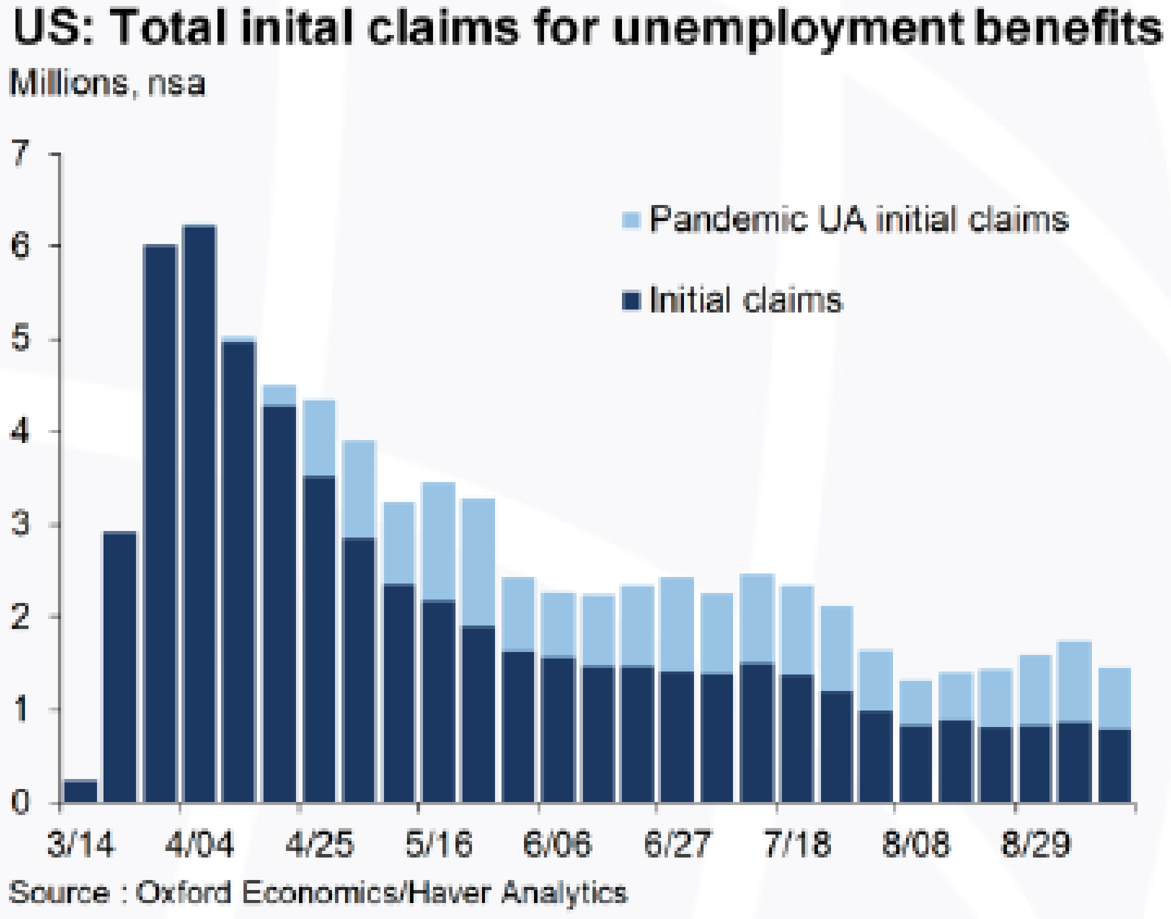
Source : Oxford Economics/Haver Analytics

Base Case – Labor Markets

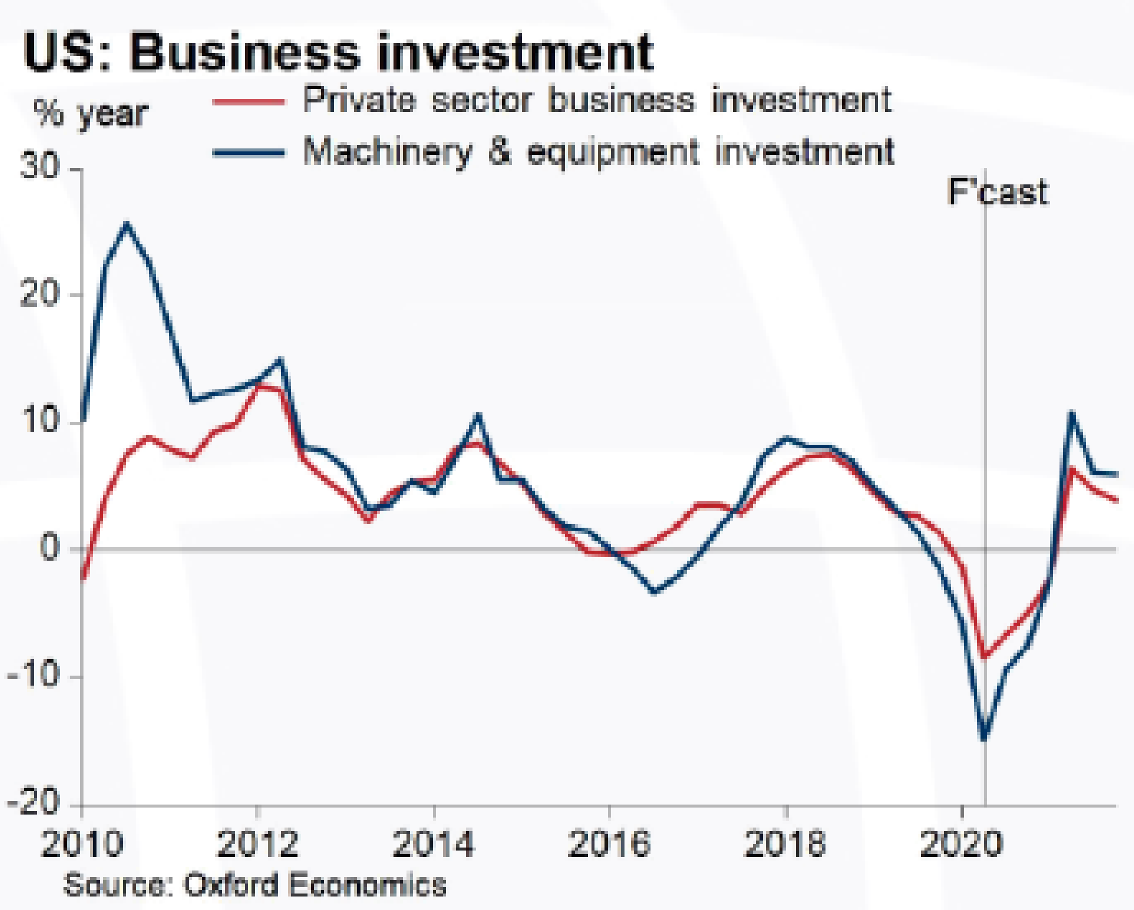


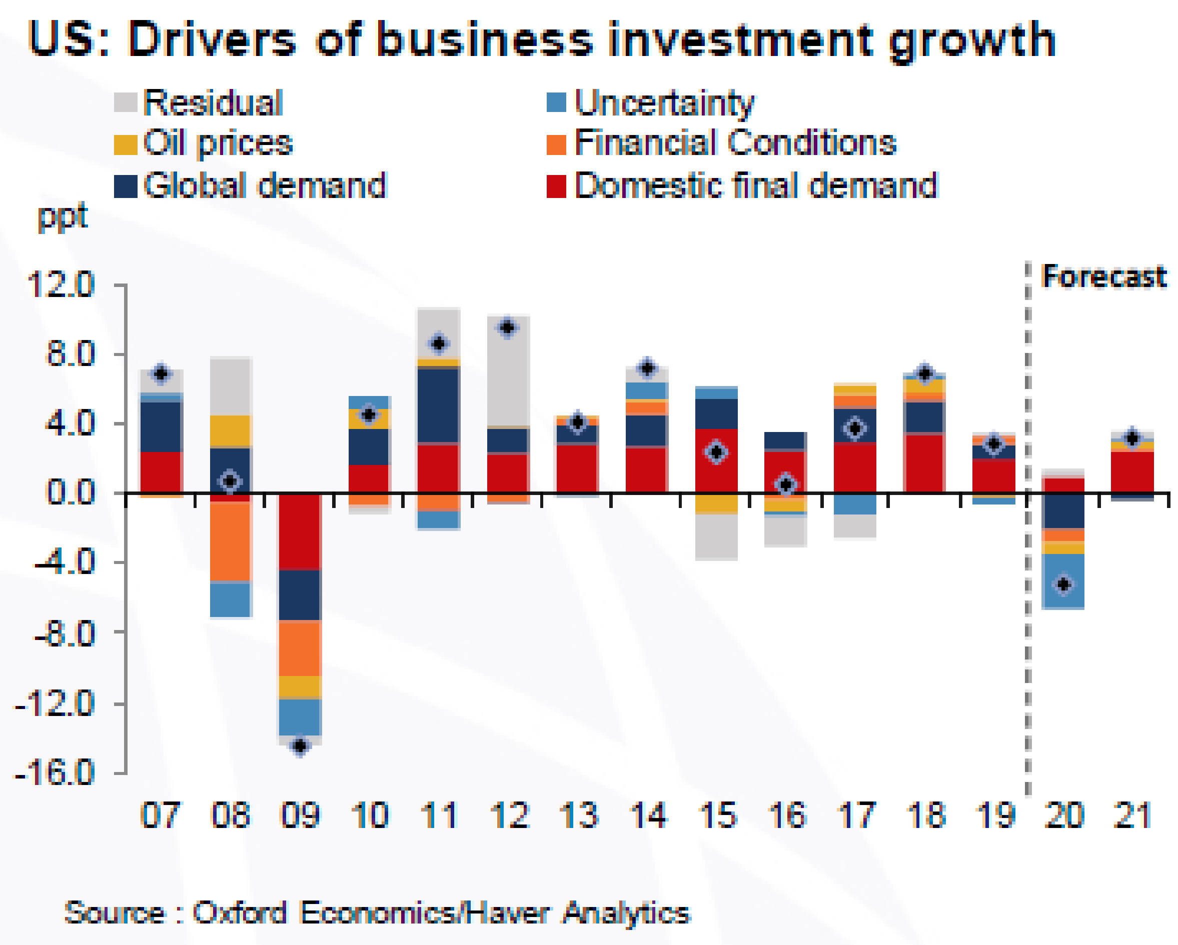


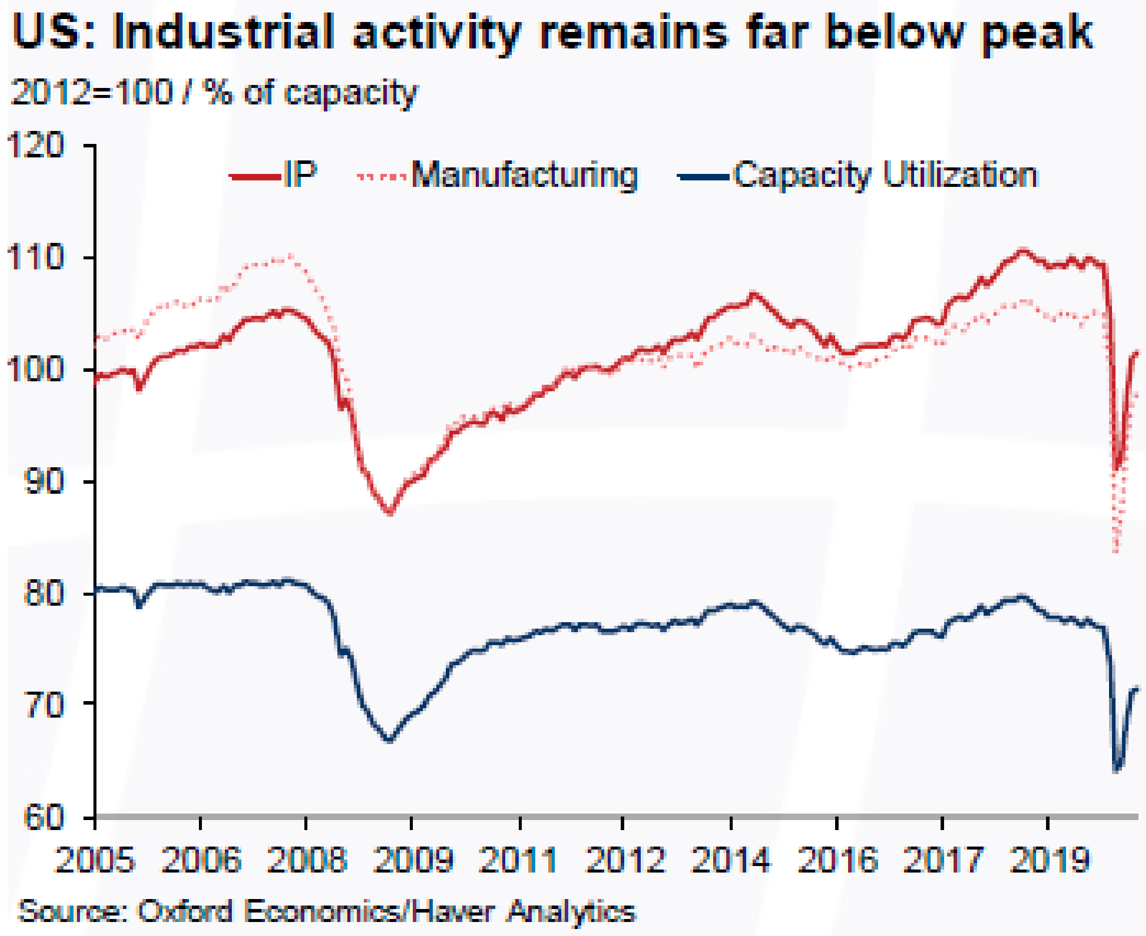


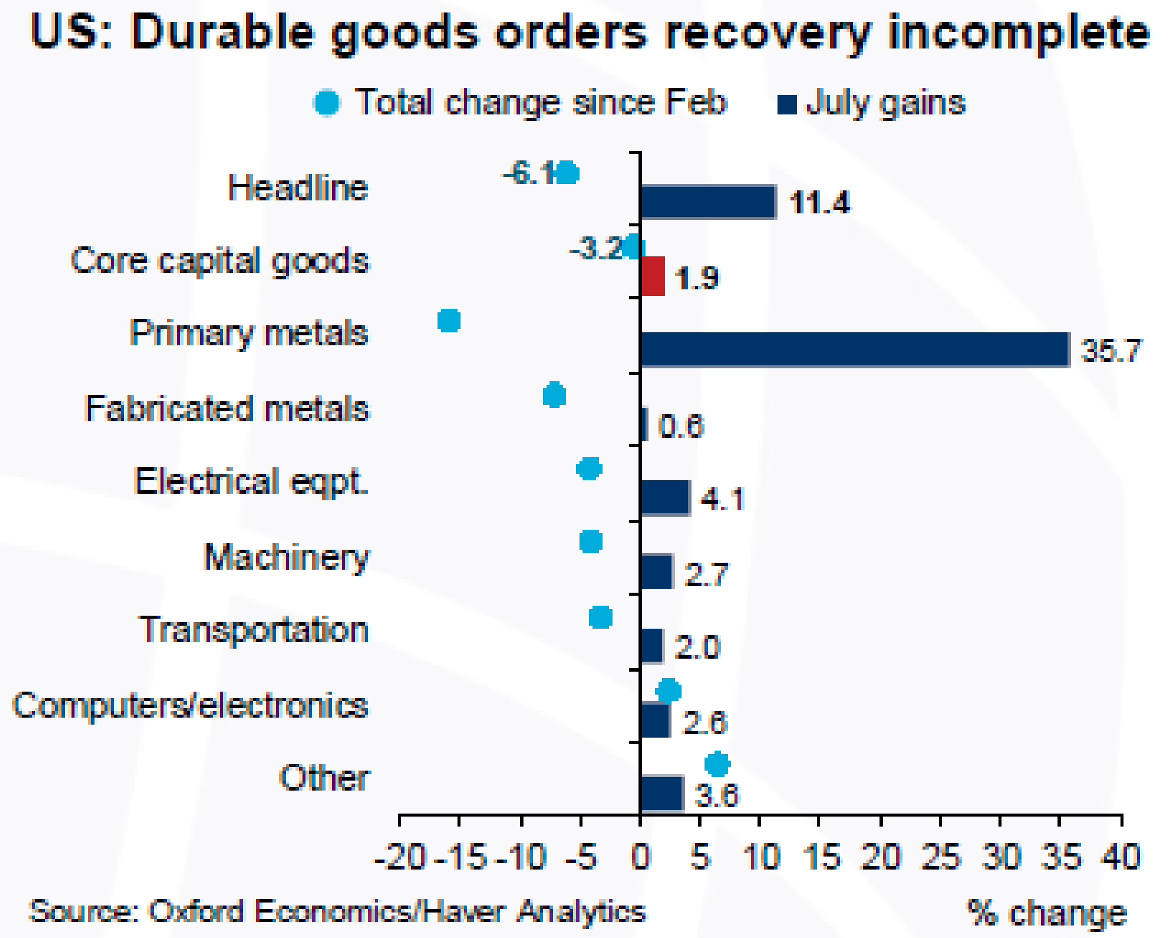


Base Case – Business Investment



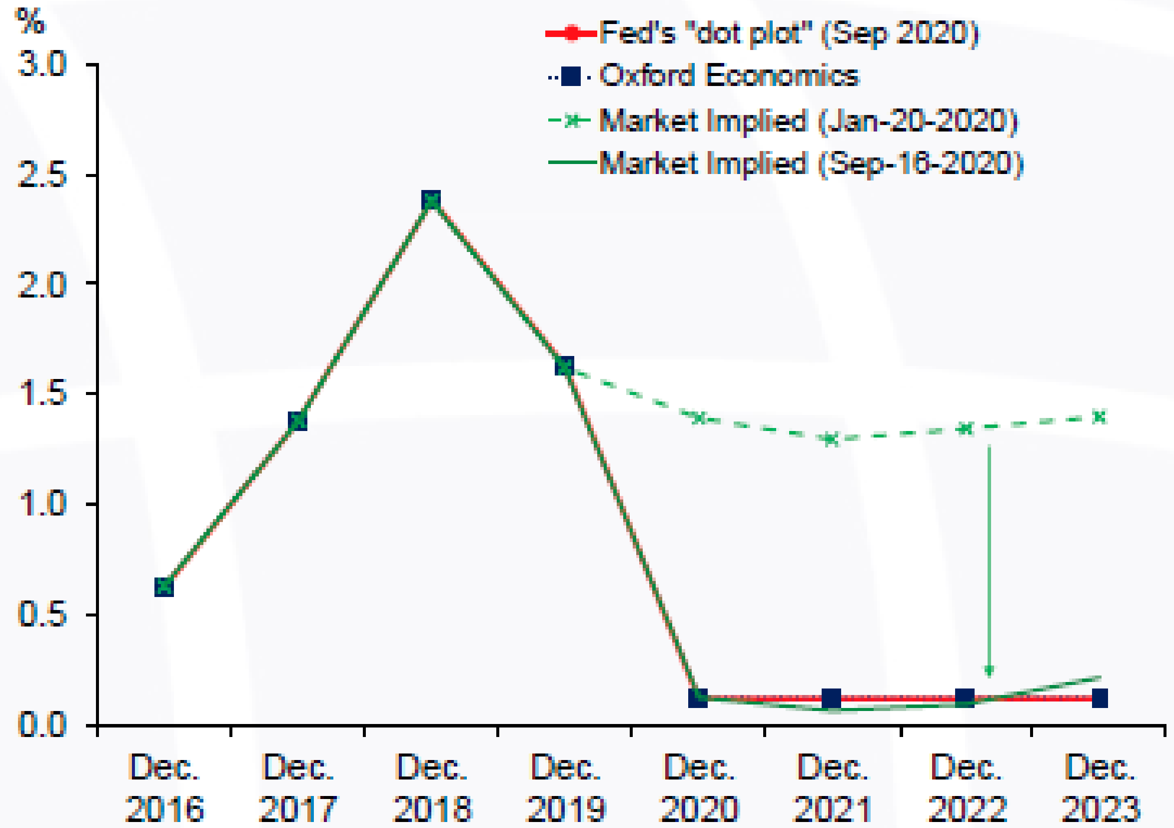






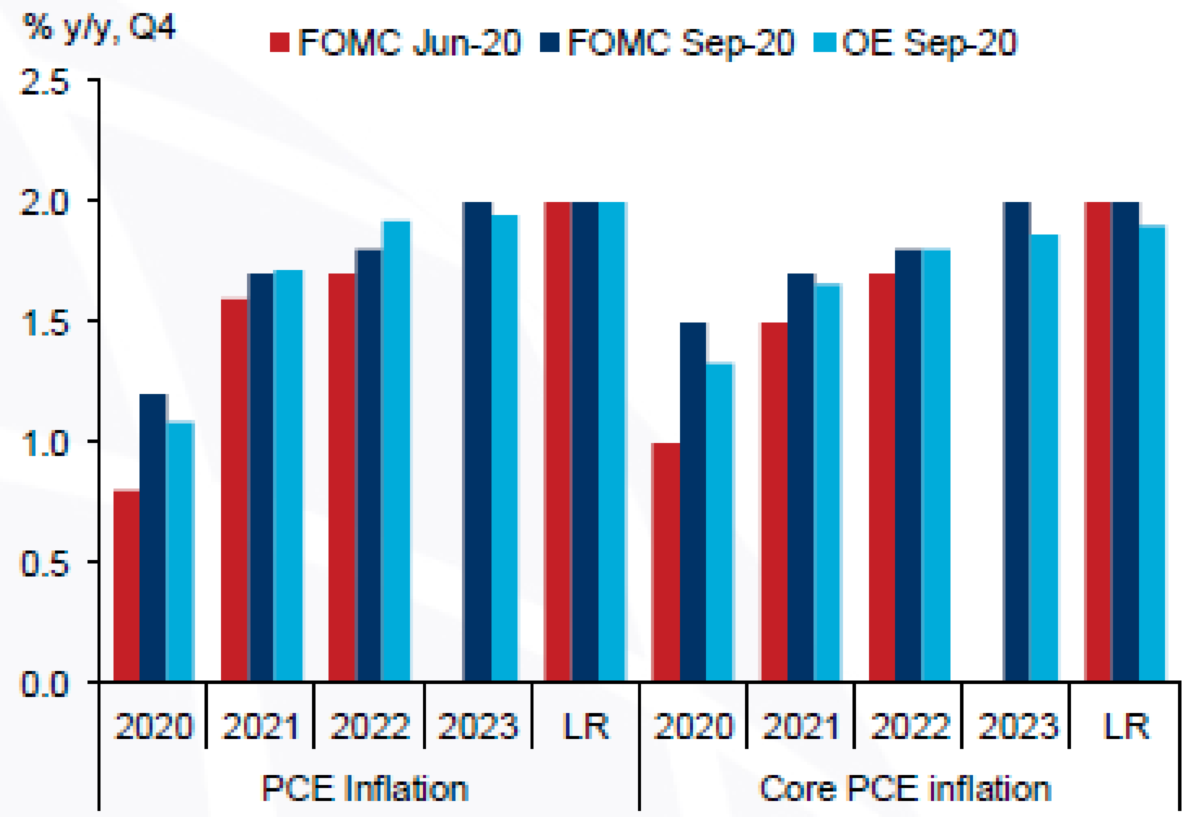
Base Case – Monetary Policy

US: Federal funds rate expectations



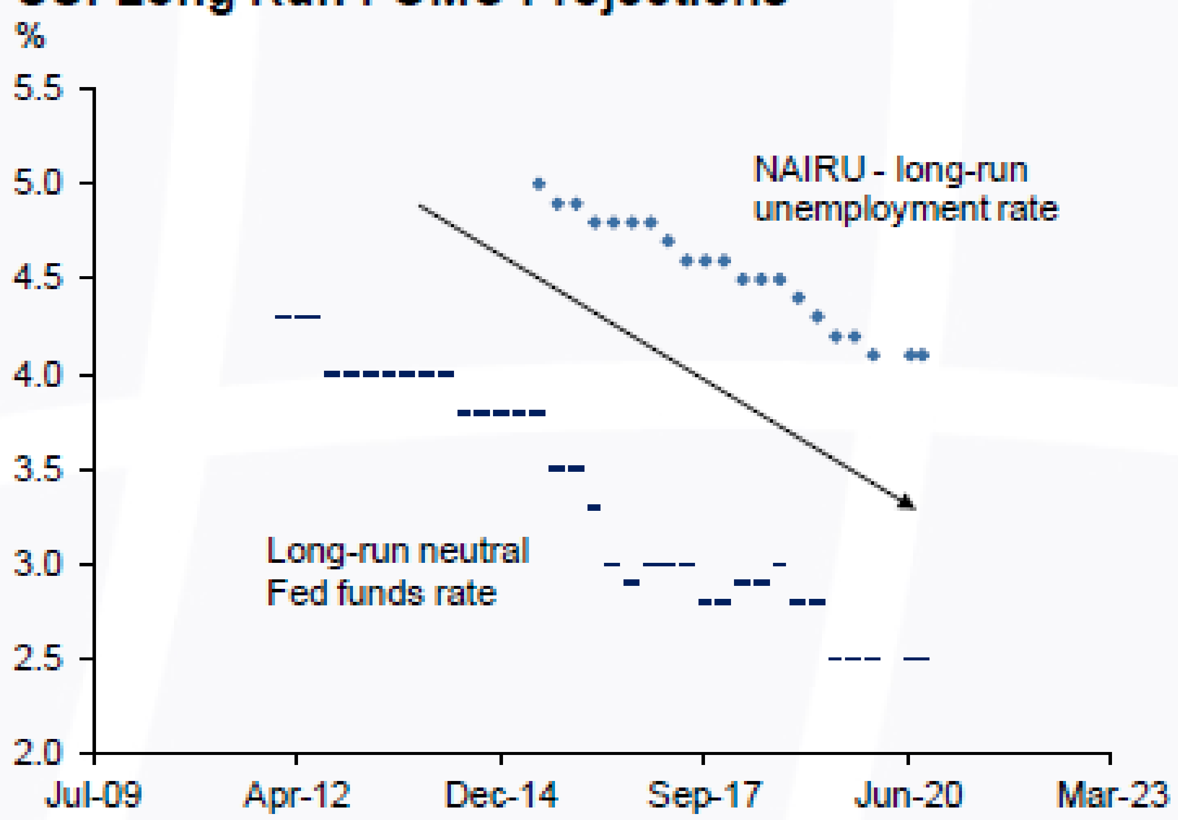
Source: CME/Federal Reserve/Oxford Economics

US: Federal Reserve Economic Projections



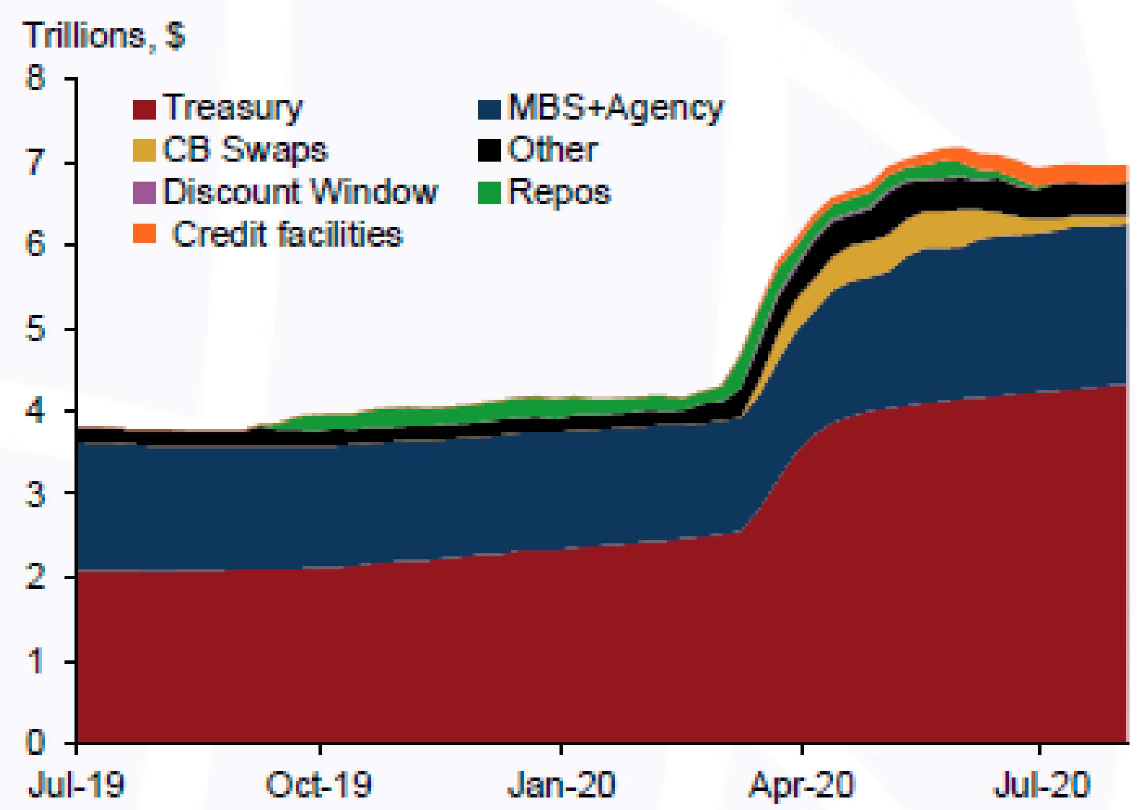
Source : Oxford Economics/Federal Reserve

US: Long Run FOMC Projections



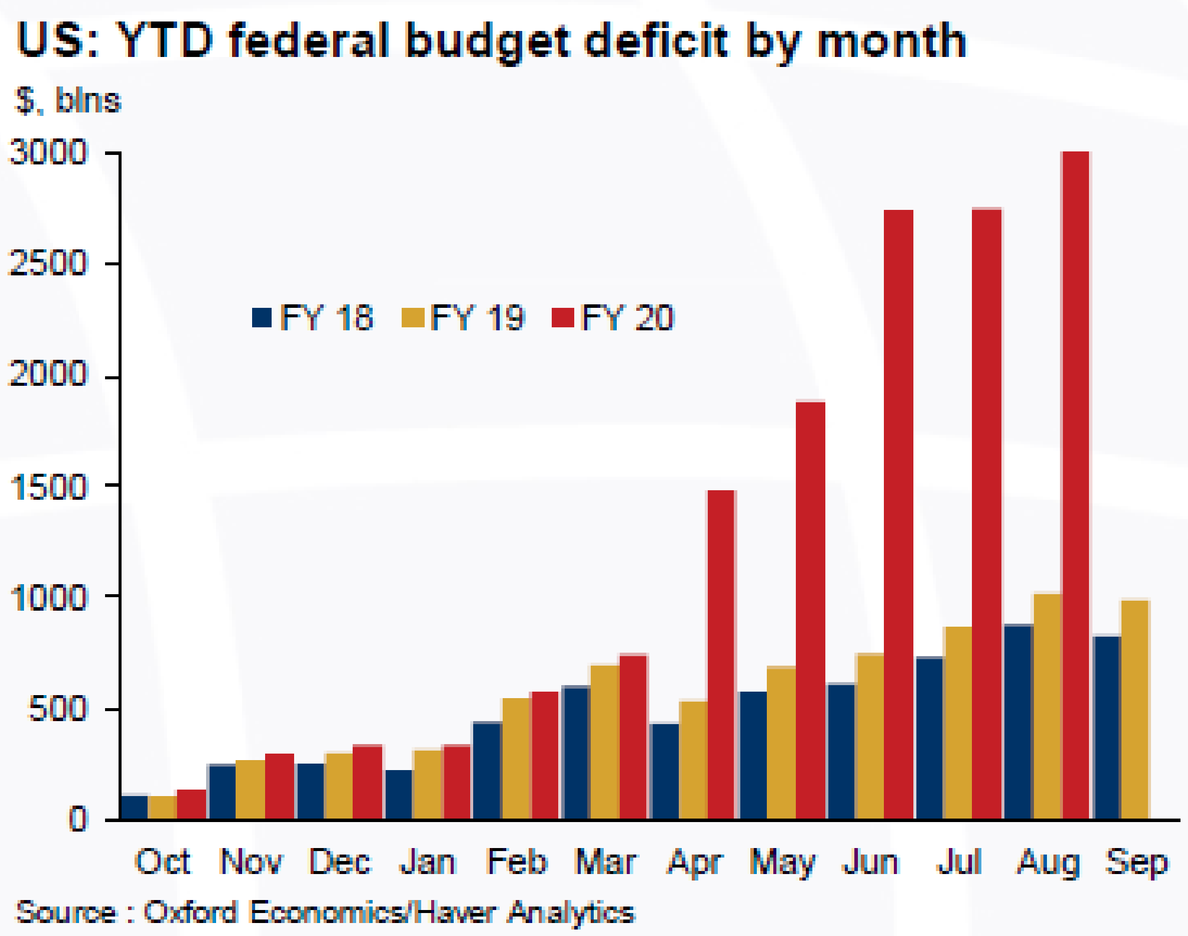
Source: Oxford Economics/Haver Analytics

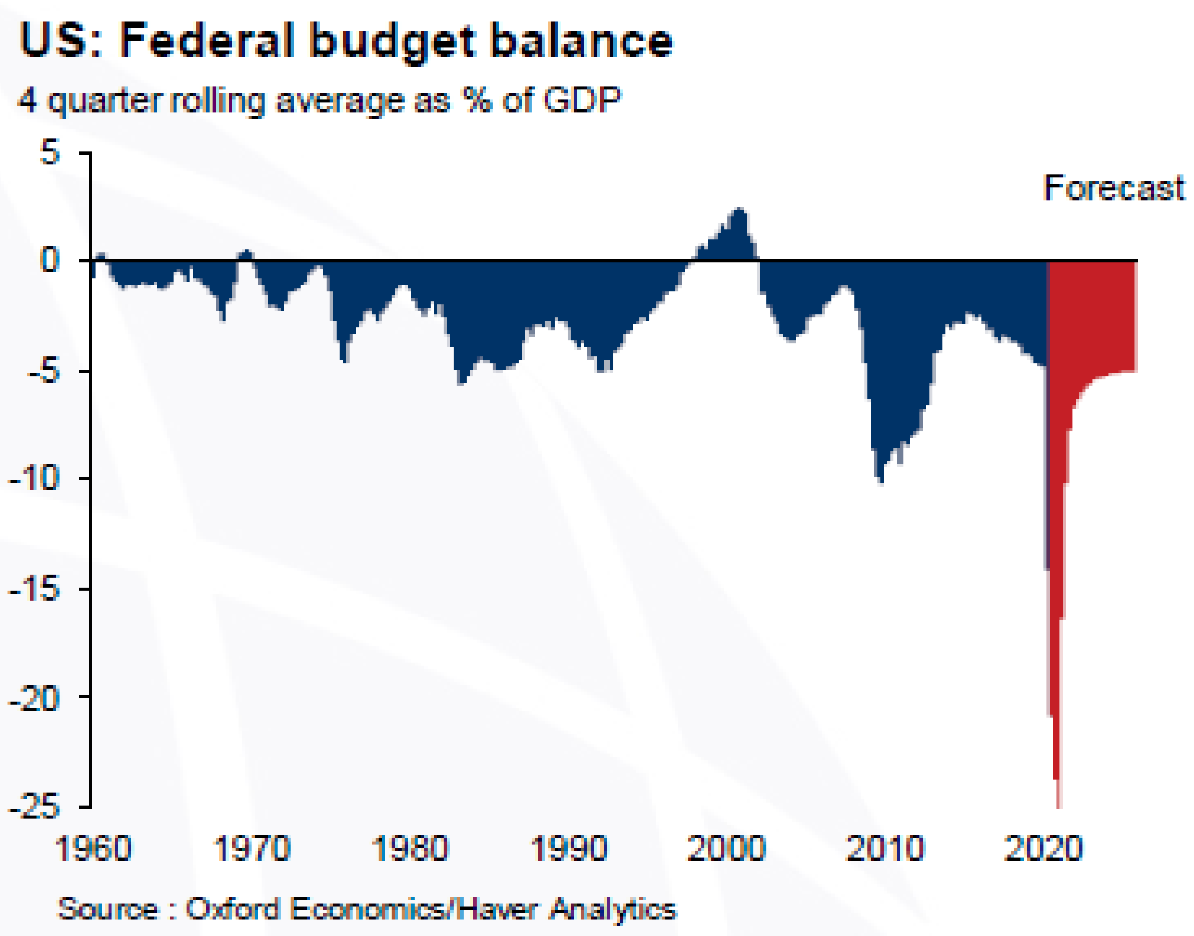
US: Fed balance sheet

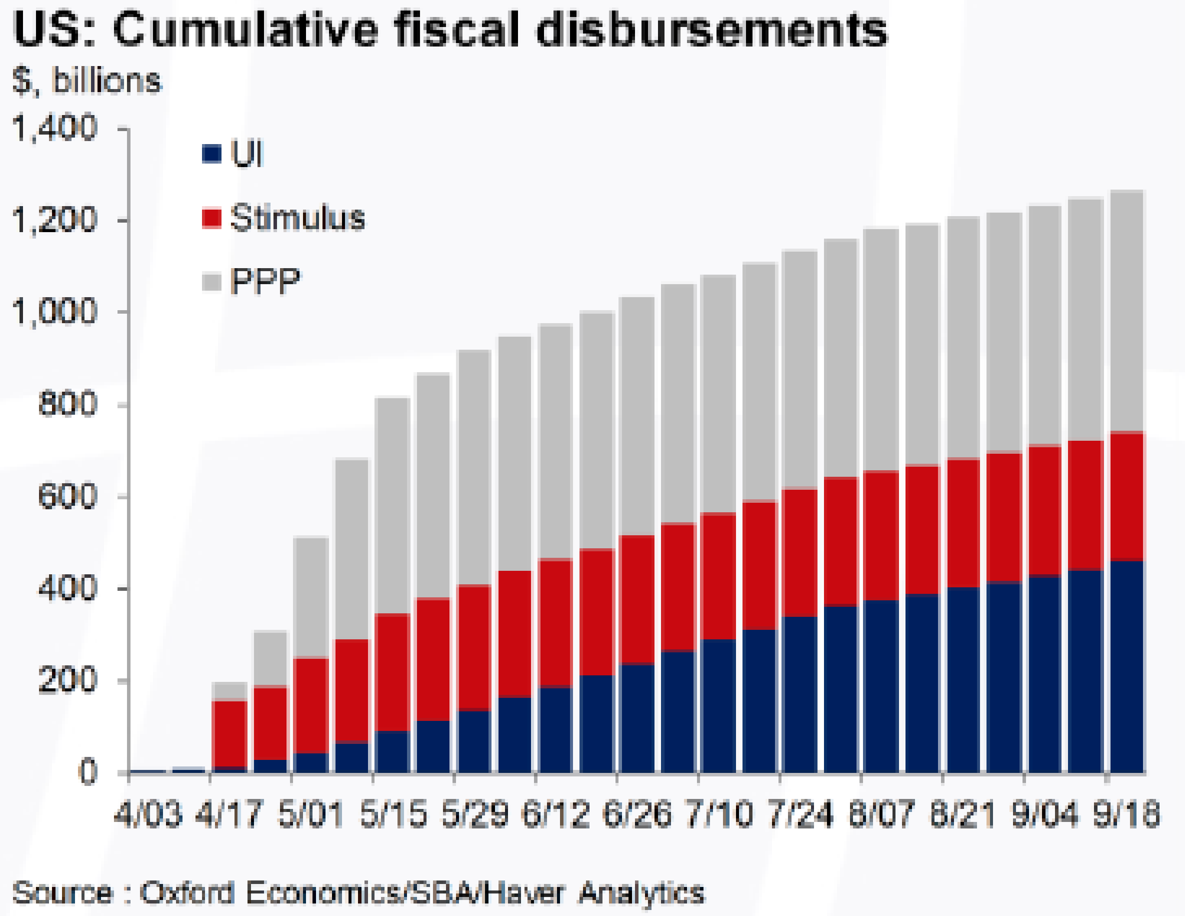


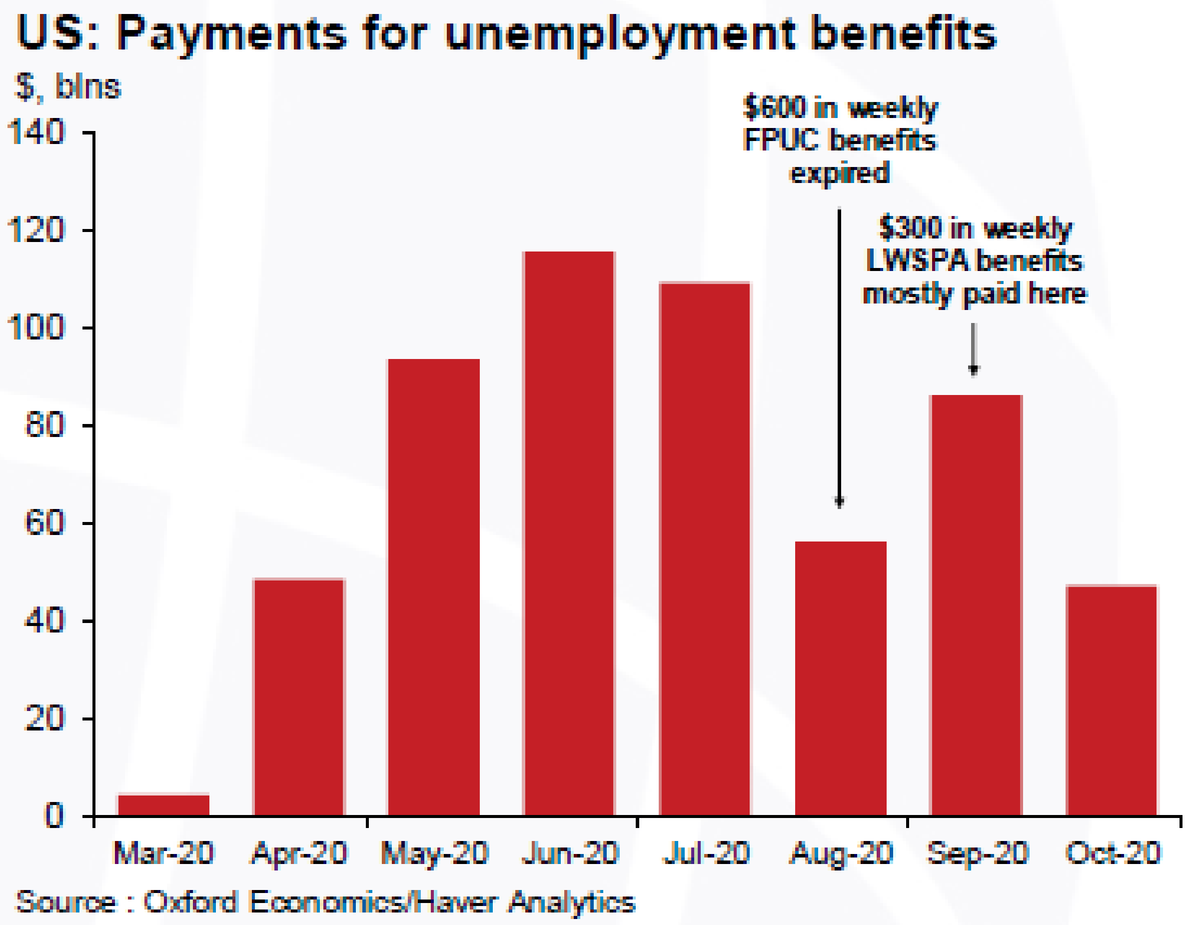
Source : Oxford Economics/Haver Analytics

Base Case – Fiscal Policy





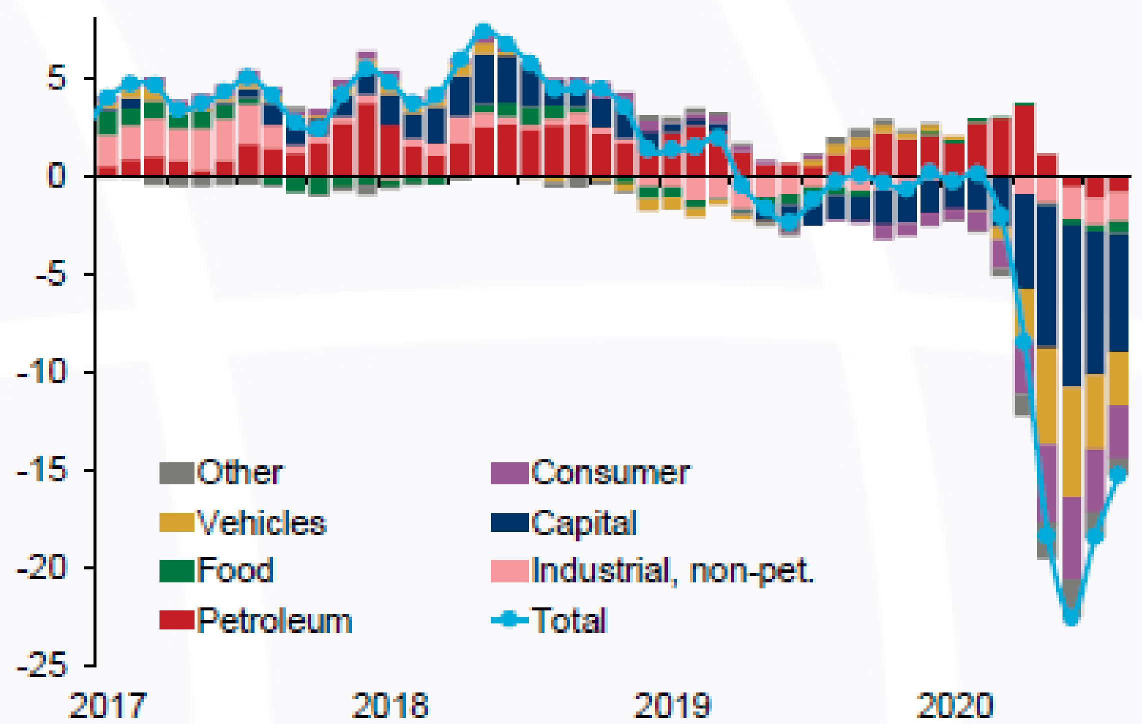




Base Case – International Trade

US: Real exports recovering, but still depressed

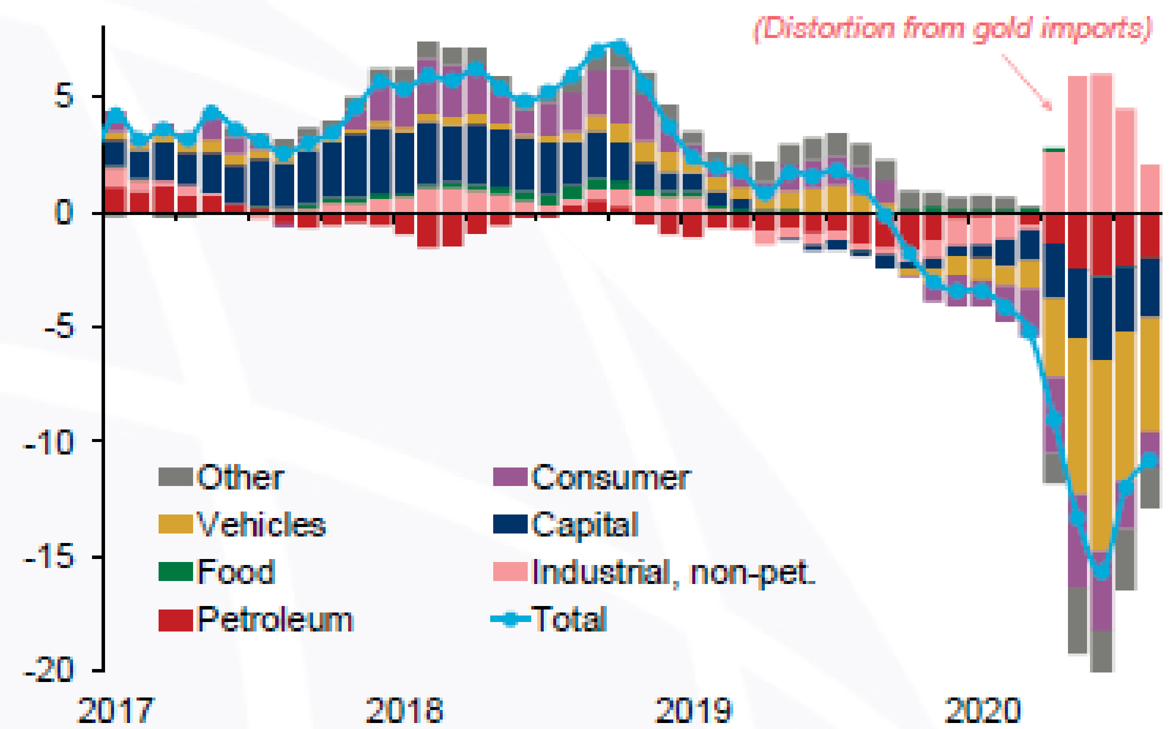
% y/y (3m ma)



Source : Oxford Economics/Haver Analytics

US: Real import trough flattered by gold influx

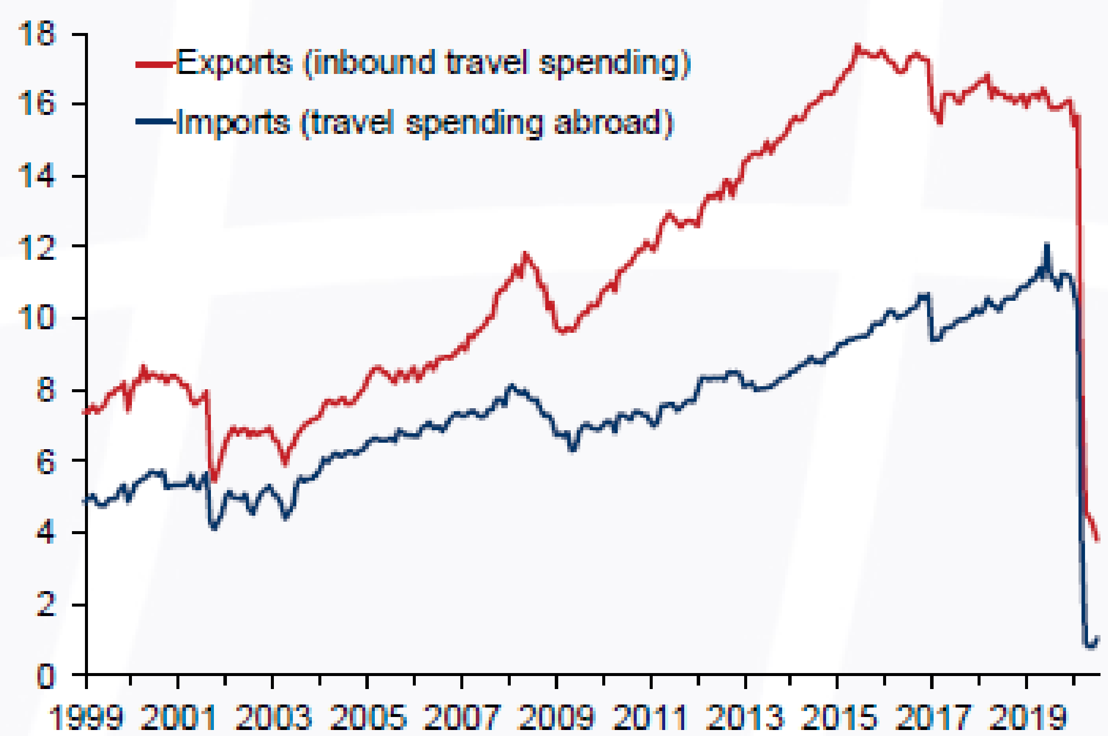
% y/y (3m ma)



Source : Oxford Economics/Haver Analytics

US: Travel spending still crushed at record lows

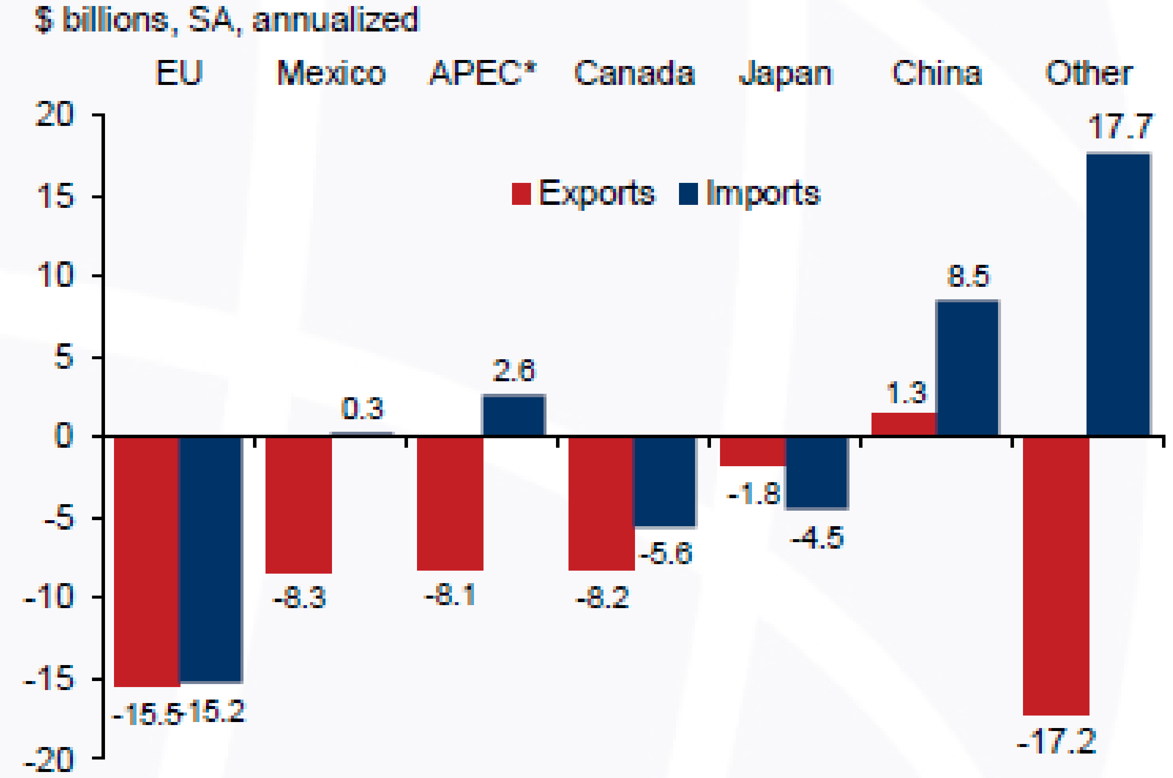
$ billions



Source : Oxford Economics/Haver Analytics

US: Changes in exports and imports since Jan

$ billions, SA, annualized



Source : Oxford Economics/Haver Analytics

* (excluding countries separately shown)

Scenario Set

I. **Premature easing**: Pandemic accelerates where economy prioritized over health (probability =25%): As lockdown fatigue leads to an early relaxation of social distancing measures in some countries, infections surge once more and severe public health restrictions return in the latter part of 2020.

II. **Second wave**: W-shaped recovery as global infections spike again in early 2021 (probability =15%): A second coronavirus wave results in renewed lockdowns globally, peaking in early 2021, and a further period of severe economic weakness.

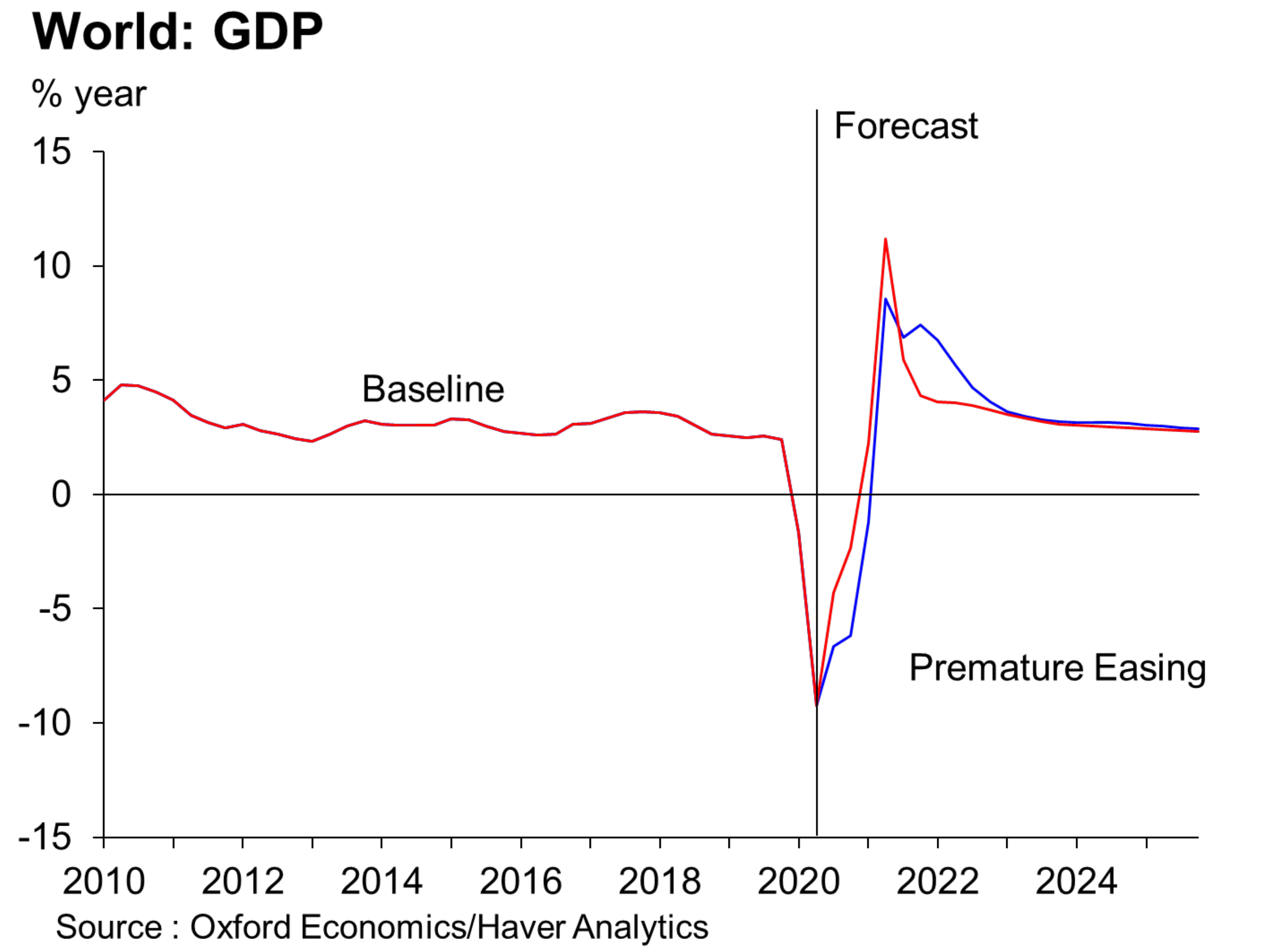
III. **Financial crisis**: Deep downturn creates credit crunch (probability =5%): The post-pandemic period is characterized by limited credit supply, private sector deleveraging and public sector austerity, resulting in tepid productivity growth and anemic growth.

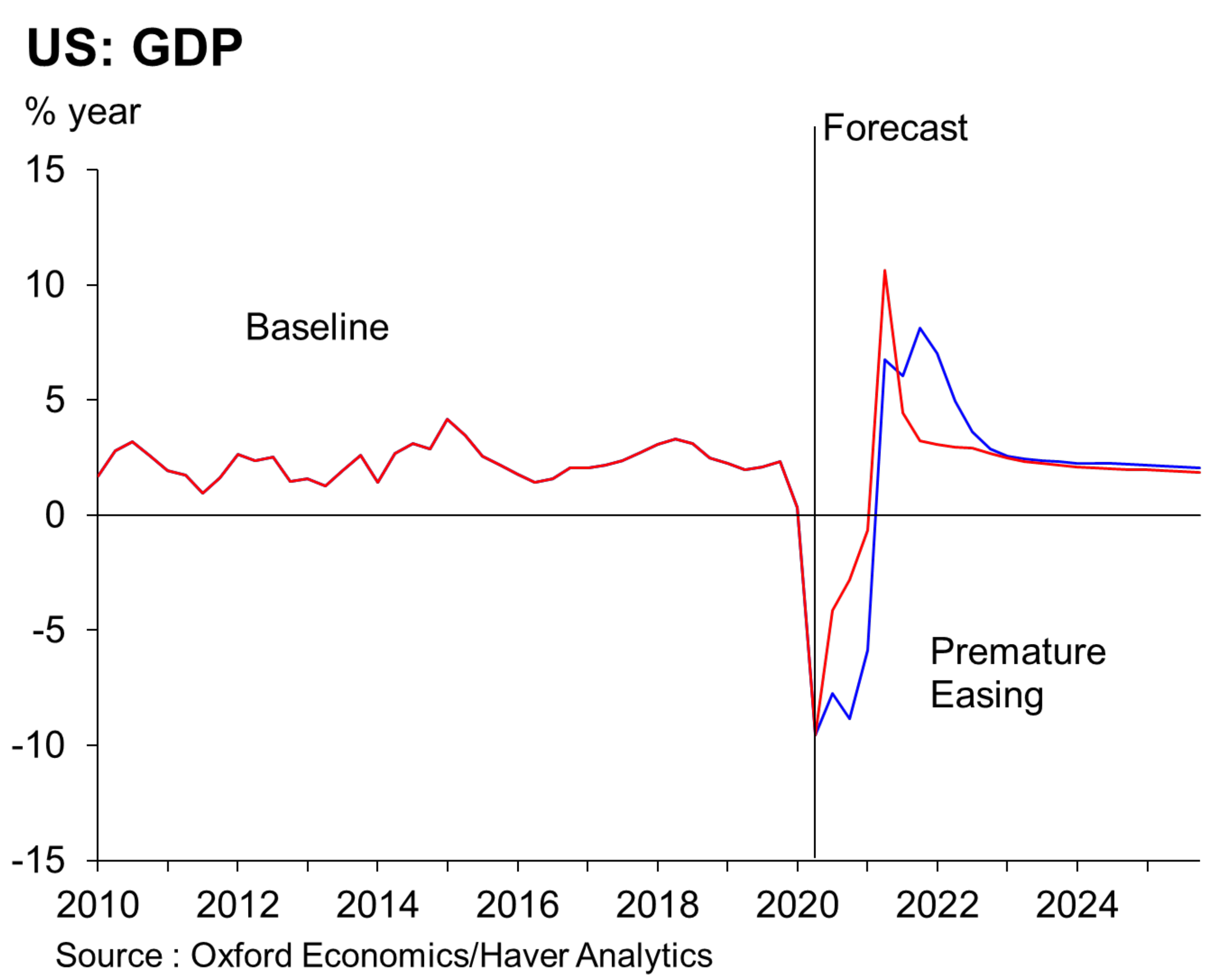
IV. **Rapid upturn**: Scientific advances mean reduced social distancing this year (probability =15%): A more optimistic upside for the global economy in which recovery is more rapid and less permanent damage is inflicted on the global economy.

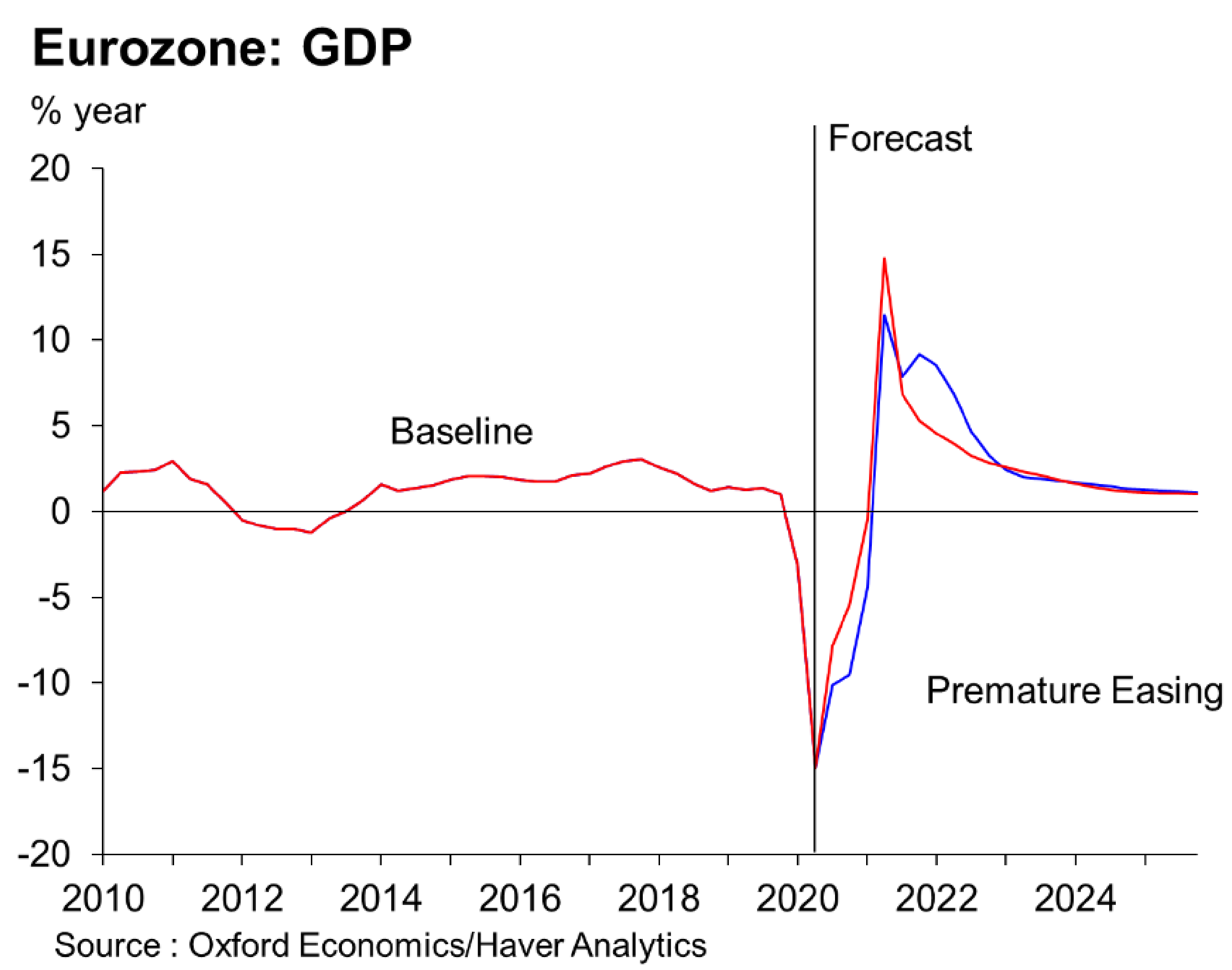
Premature Easing

Trigger: Restrictions relaxed too early in vulnerable economies, driving surge in infections and renewed lockdowns. Localised lockdowns elsewhere.

Transmission: (i) Domestic demand recovery falters amid reintroduction of lockdowns, amplified by (ii) further rises in unemployment and (iii) renewed financial market weakness; (iv) world trade is hit, (v) weighing again on commodity prices. But 2021 recovery is robust as social distancing relaxes in Q1 as per baseline.



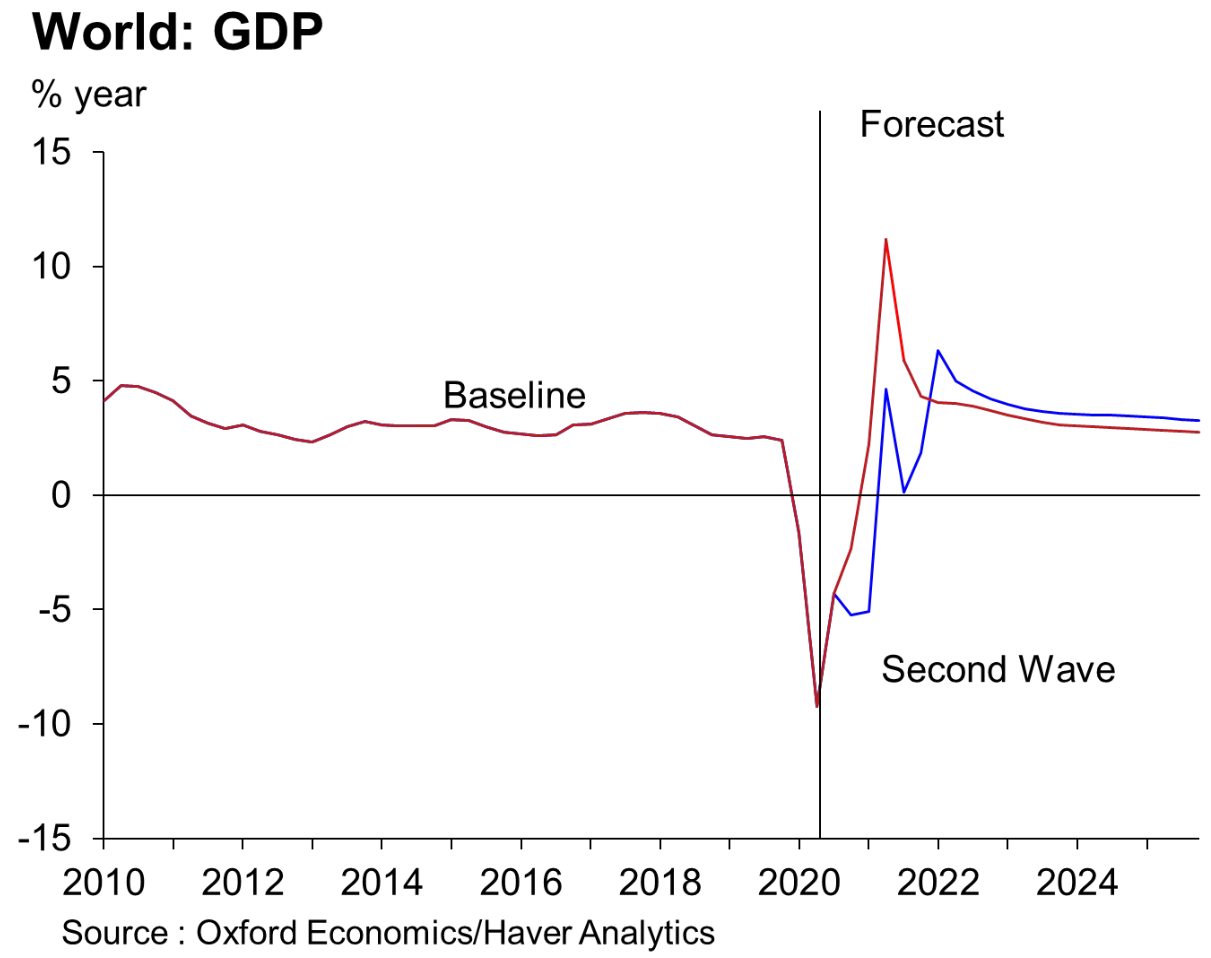


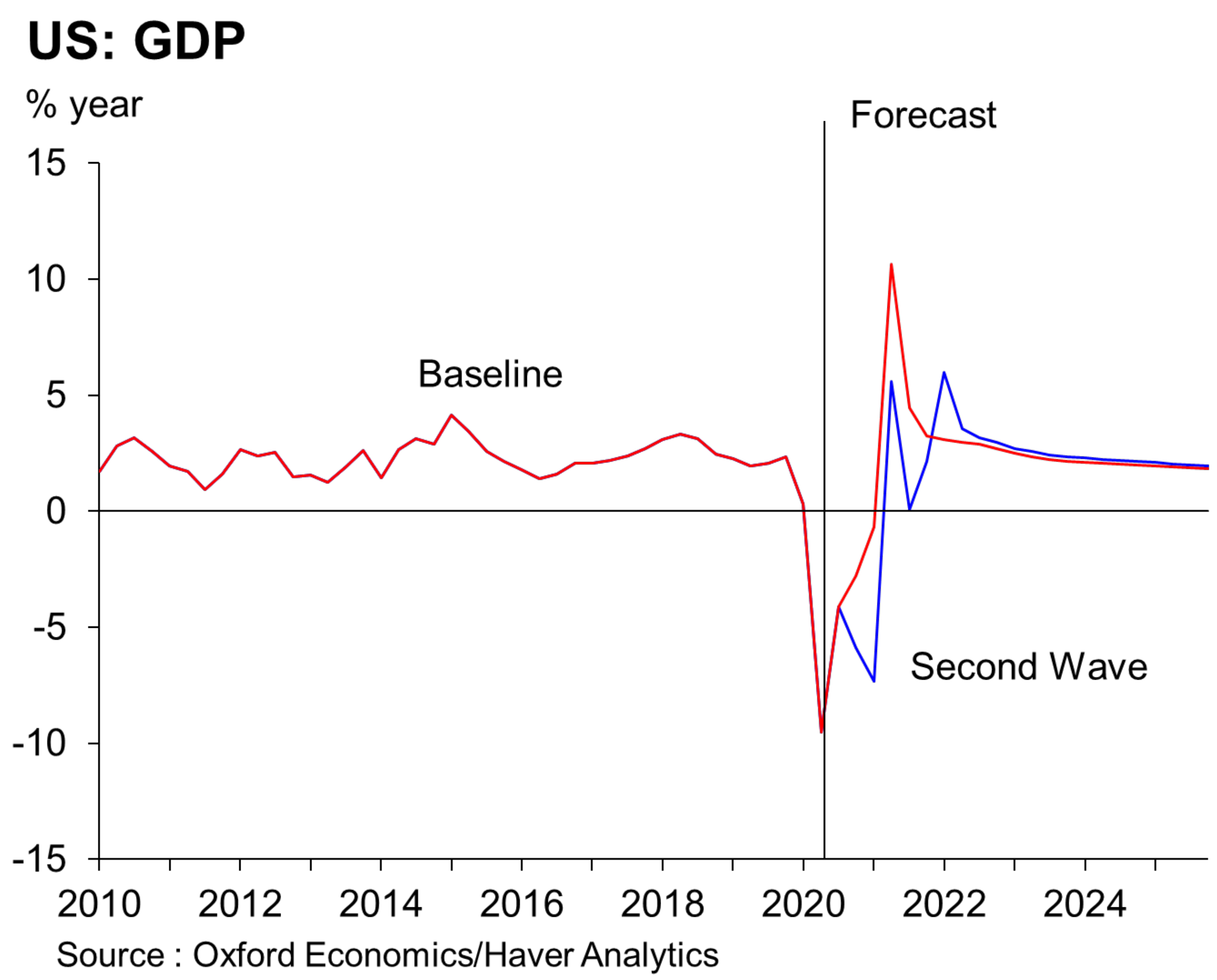


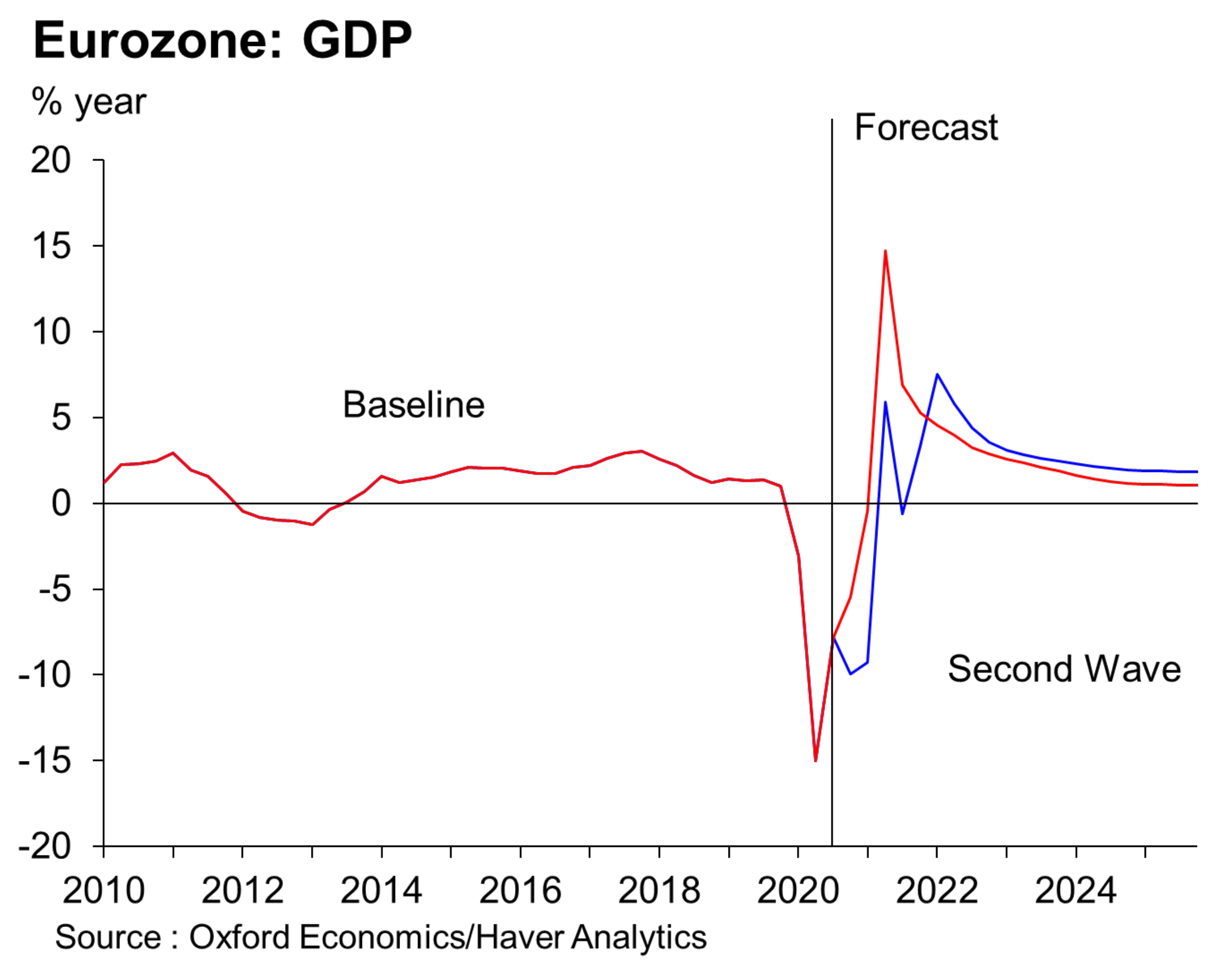
Second wave: W-shaped recovery

Trigger: Lockdowns return o/a 2nd wave in Q4/Q1.

Transmission: (i) Domestic demand recovery falters amid reintroduction of lockdowns, amplified by (ii) further rises in unemployment and (iii) renewed financial market weakness; (iv) world trade shrinks once more, (v) weighing again on commodity prices. Recovery is relatively sluggish, reflecting (vi) risk aversion among households and businesses and (vii) more limited and less effective government support than in first wave.





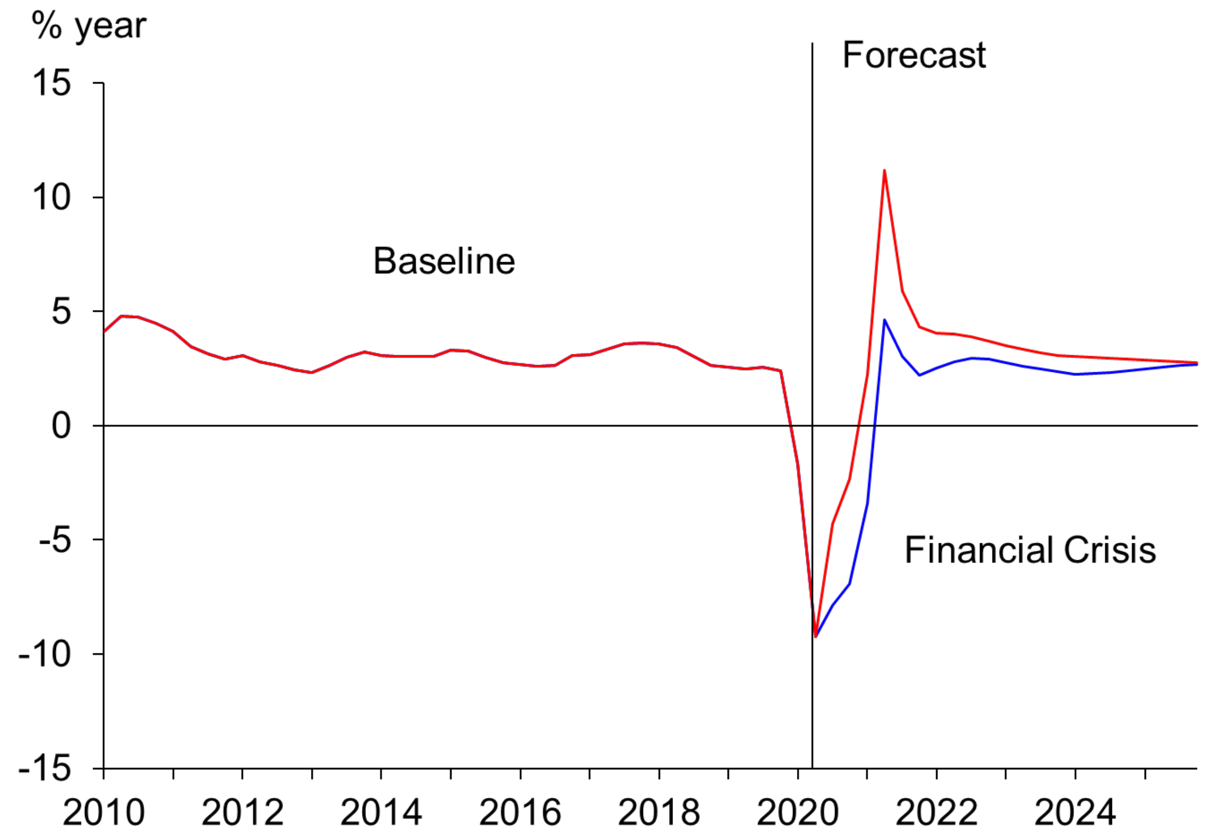


Financial crisis: Deep downturn creates credit crunch

Trigger: Financial crisis at the same time as governments undertake austerity measures.

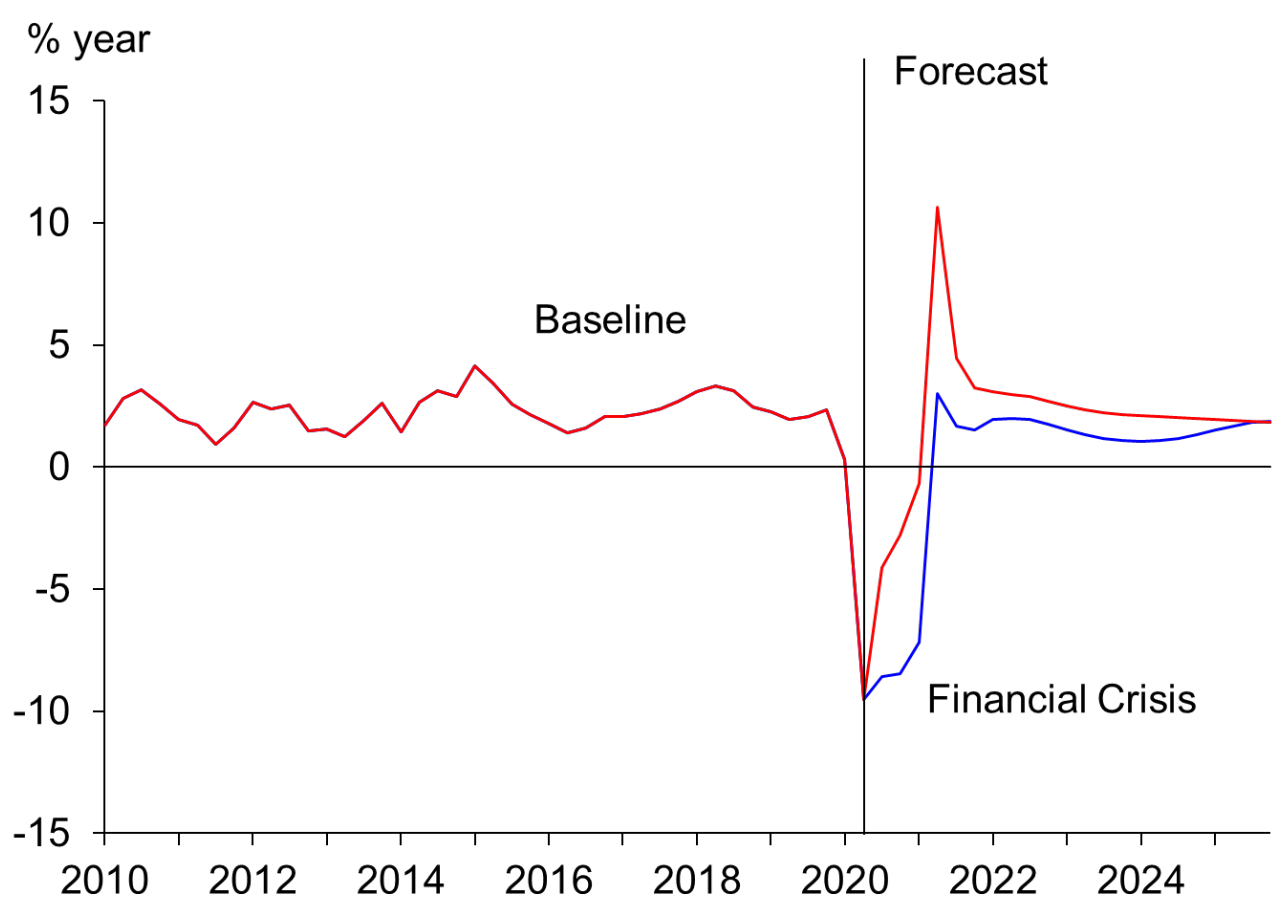
Transmission: (i) Deeper recession than in the baseline, (ii) triggering financial crisis. (iii) More limited credit supply (iv) amplifies private sector deleveraging. (v) Public sector austerity exacerbate demand impacts. Recovery anaemic, partly reflecting (vi) continued household and business risk aversion and (vii) tepid productivity growth.

World: GDP



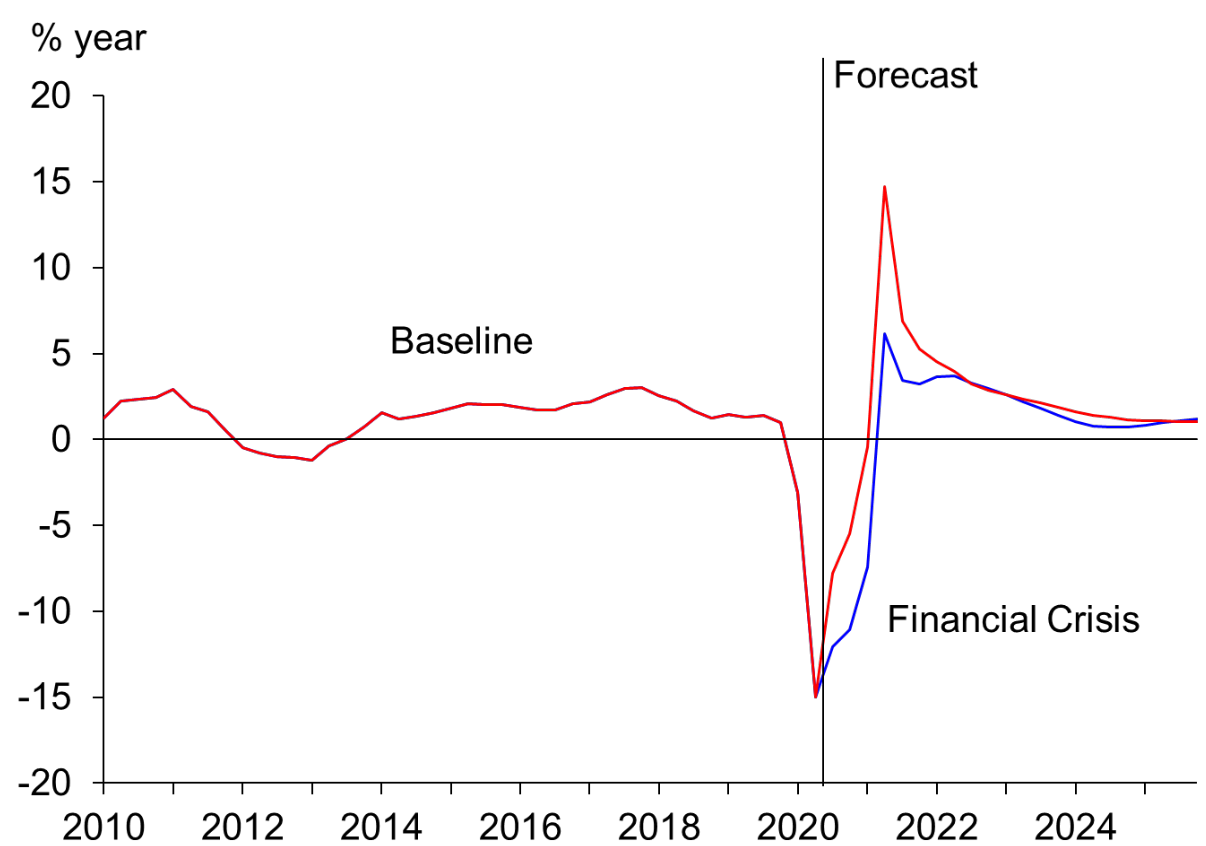
Source : Oxford Economics/Haver Analytics

US: GDP



Source : Oxford Economics/Haver Analytics

Eurozone: GDP

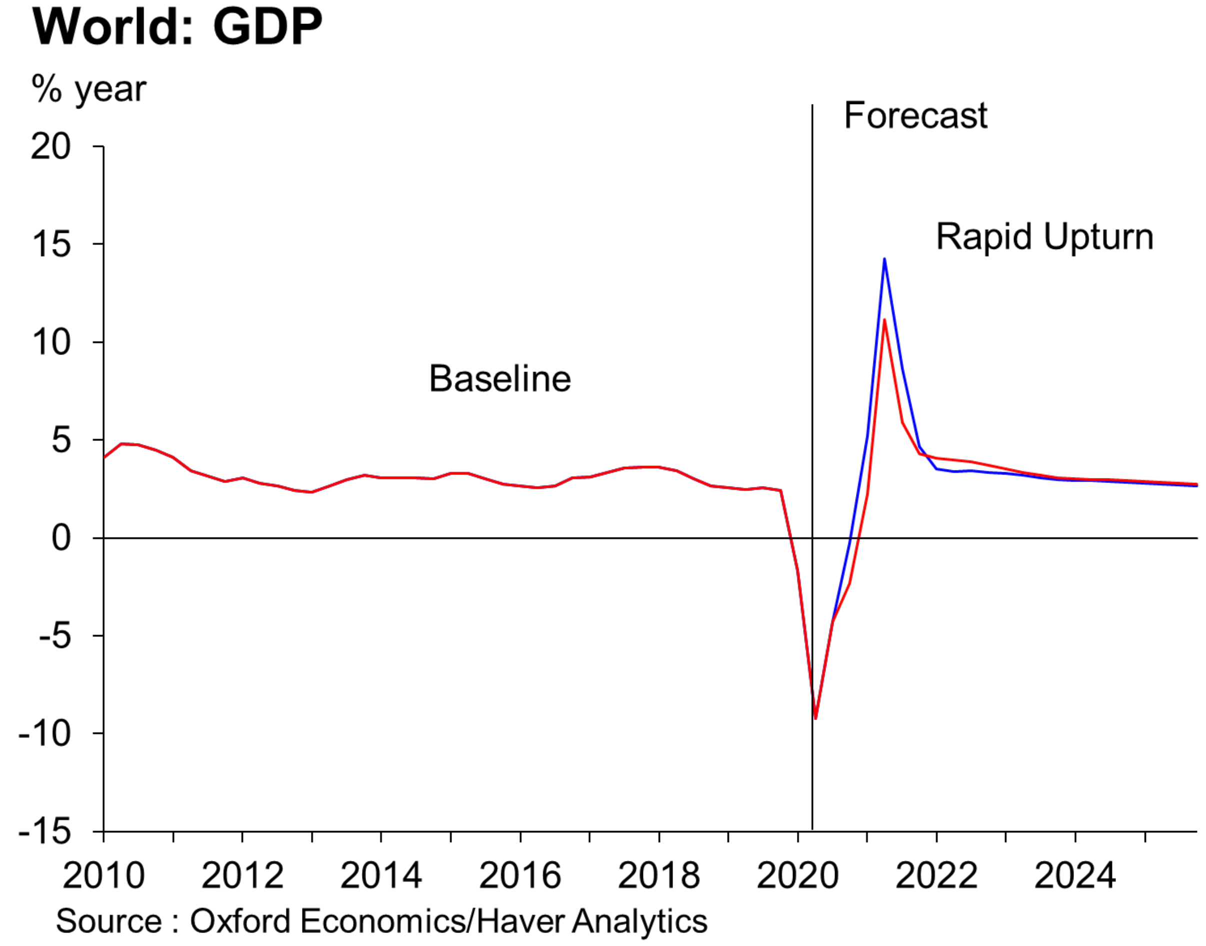


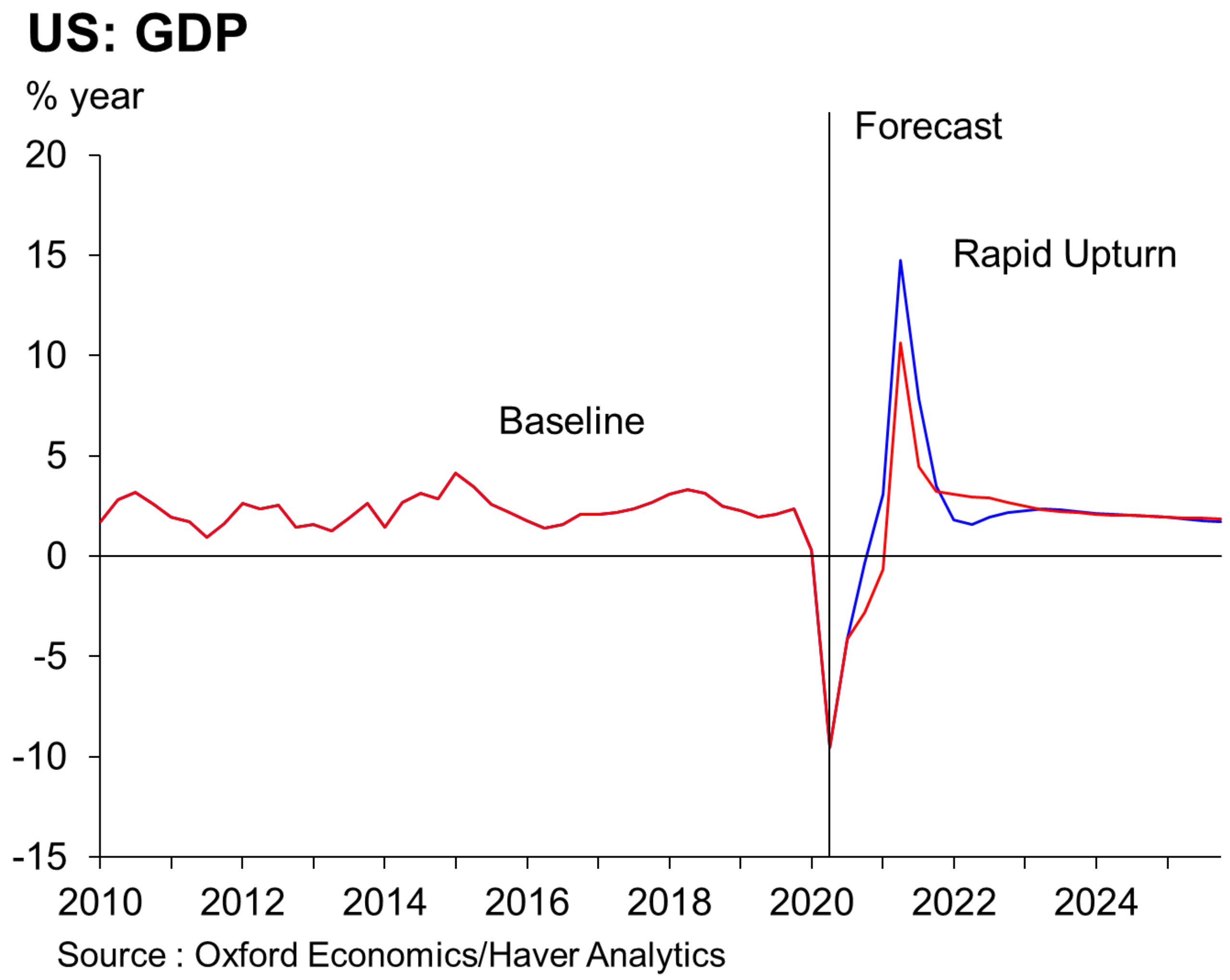
Source : Oxford Economics/Haver Analytics

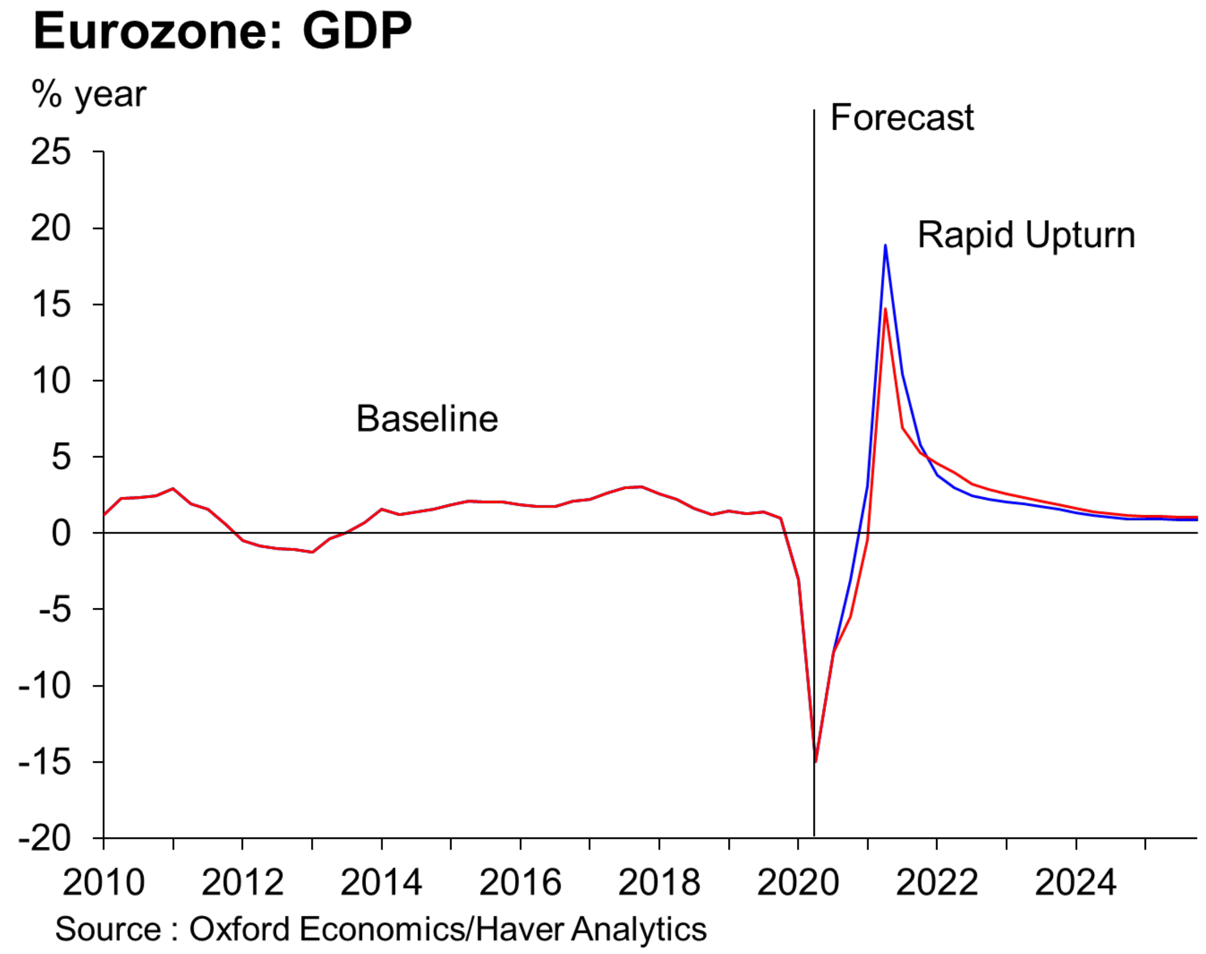
Rapid upturn: Scientific advances mean reduced social distancing

Trigger: Confidence restored as advances allow early, full relaxation of social distancing.

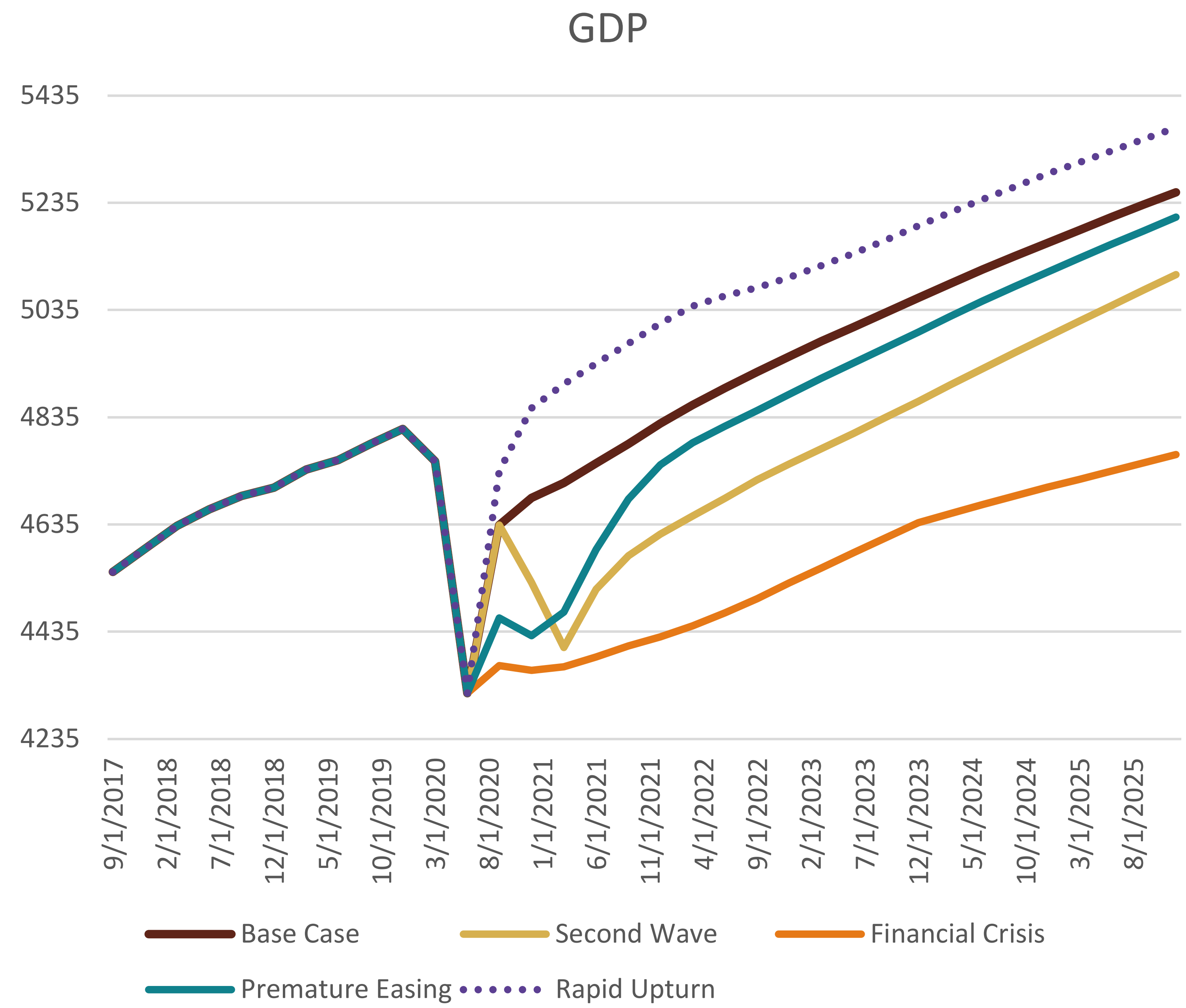
Transmission: (i) Domestic demand recovers as restrictions ease, (ii) financial markets recover and (iii) governments with fiscal space provide fiscal stimulus from early 2021. (iii) World trade bounces back, fueling (iv) commodity price recovery. (v) Permanent damage to the global economy is less marked than in the baseline, with GDP marginally above Jan baseline in 2025.

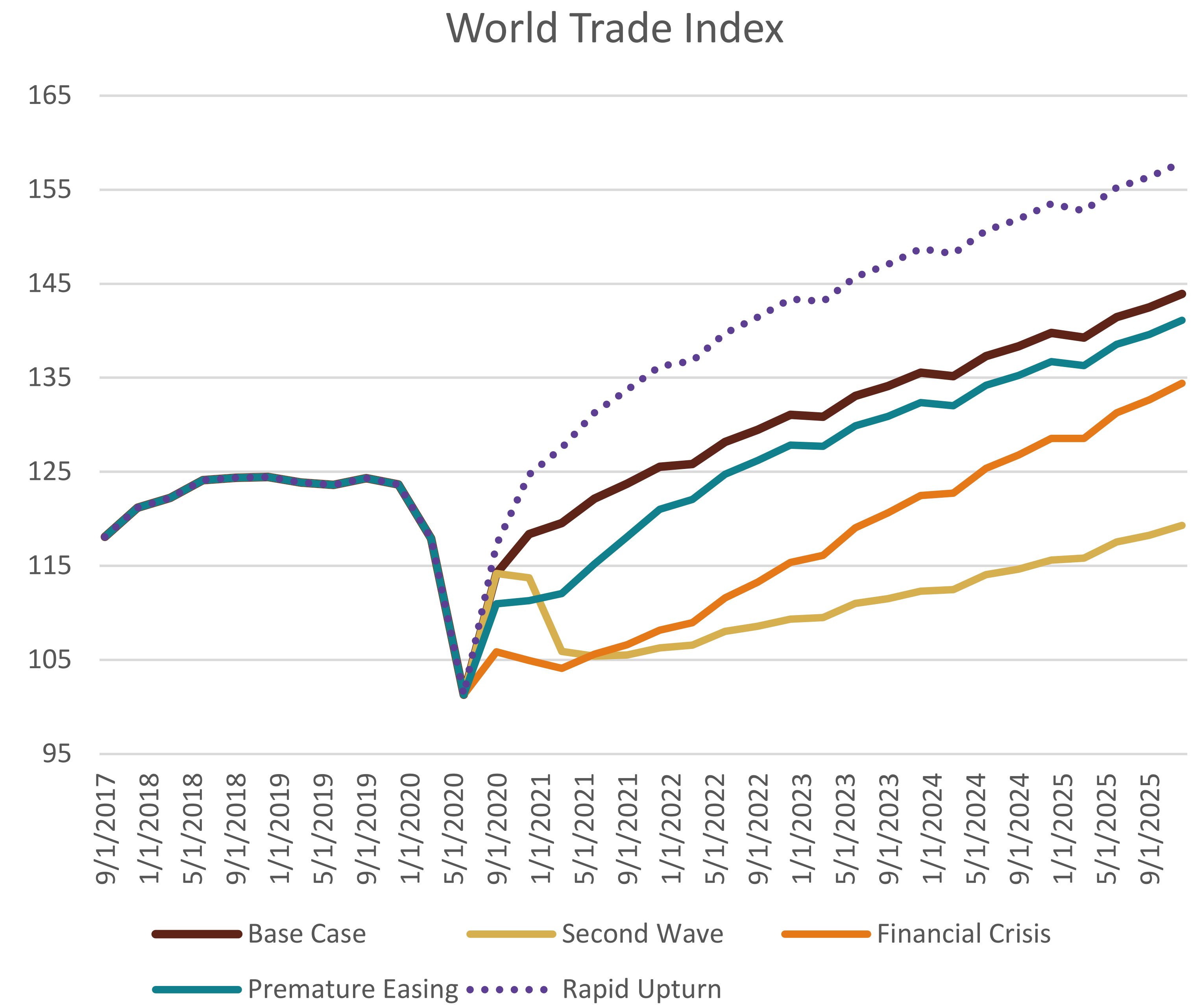






Scenario Results – Demand Factors

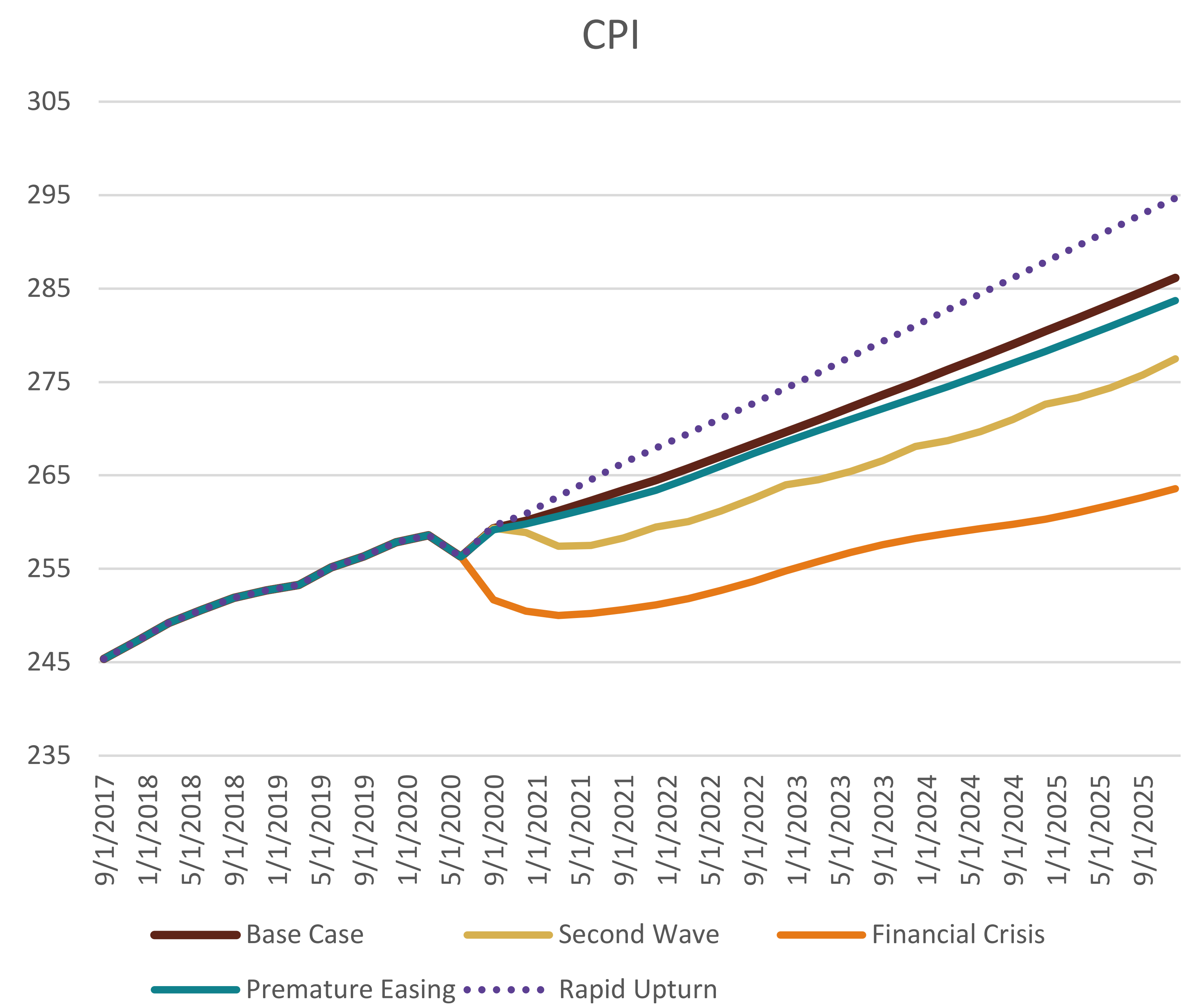


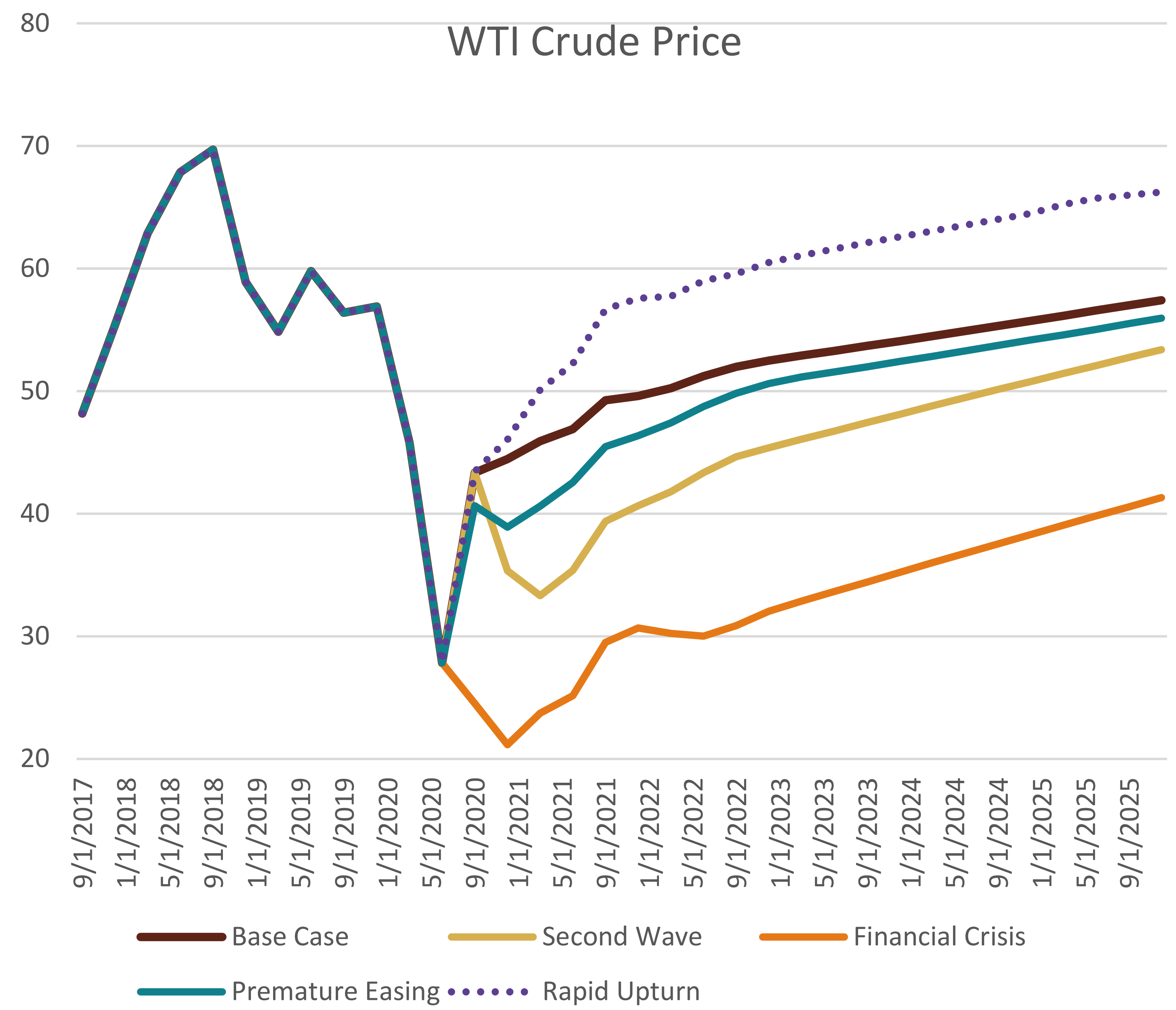


	Base Case	Premuature Easing	Second Wave	Financial Crisis	Rapid Upturn
GDP (Growing)	0.63	0.50	0.50	0.75	0.50
Trade Volume (Growing)	0.50	0.50	0.63	0.63	0.50
Earnings (Growing)	0.63	0.38	0.50	0.75	0.63

	GDP (Growing)	*Trade Volume (Growing)*	*Earnings (Growing)*
Absolute Portfolio Exposure	0.2	0.2	0.4
Relative Portfolio Exposure	**0.6**	**0.4**	**0.4**
Absolute Portfolio Risk	-16.4	-16.4	-16.3
Absolute Portfolio Risk	**2.7**	**2.7**	**3.0**

Scenario Results – Inflation Factors

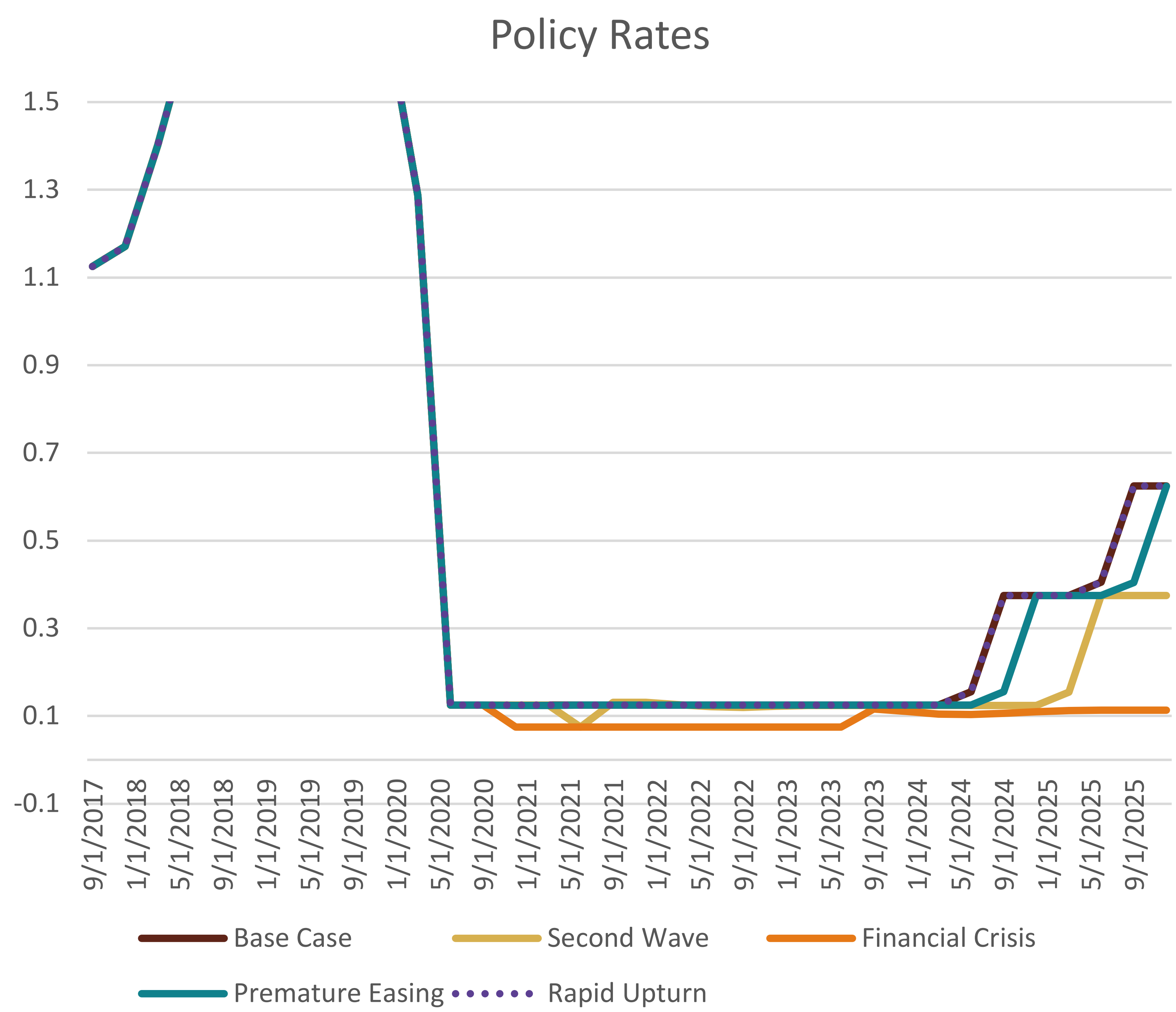


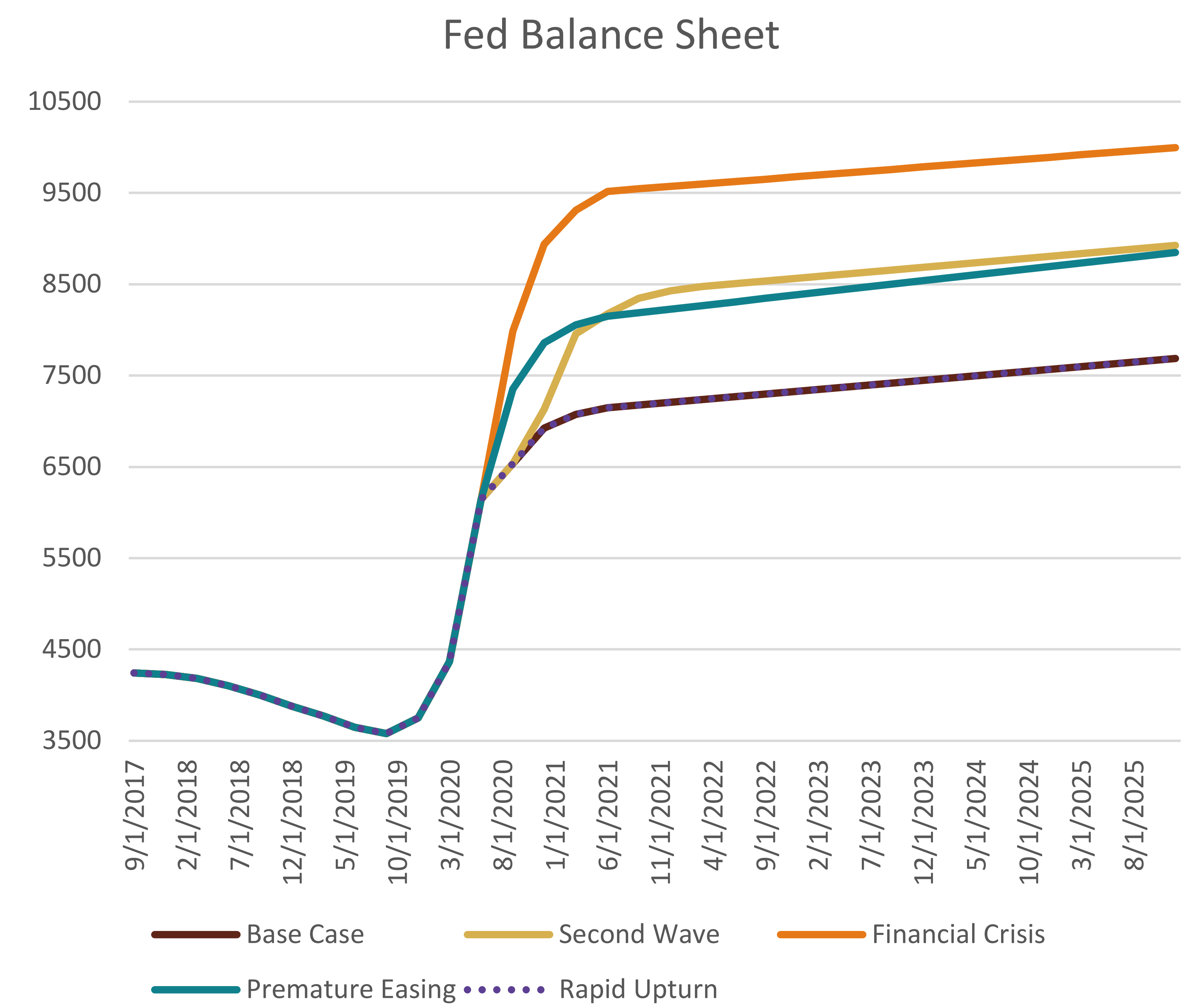


	Base Case	Premuature Easing	Second Wave	Financial Crisis	Rapid Upturn
CPI (Increasing)	0.75	0.75	0.63	0.63	0.50
Oil (Above Average)	0.38	0.25	0.13	0.00	0.50
Dollar (Strengthening)	1.00	0.38	0.50	0.63	1.00

	CPI (Increasing)	*Oil (Above Average)*	*Dollar (Strengthening)*
Absolute Portfolio Exposure	**0.0**	**-0.7**	**-0.8**
Relative Portfolio Exposure	**0.3**	**0.5**	**0.4**
Absolute Portfolio Risk	-9.9	-16.4	-16.4
Absolute Portfolio Risk	**6.4**	**3.0**	**2.9**

Scenario Results – Policy Factors





	Base Case	Premuature Easing	Second Wave	Financial Crisis	Rapid Upturn
Rates (Rising)	0.63	0.50	0.25	0.00	0.50
Fed Balance Sheet (Expanding)	1.00	1.00	1.00	1.00	1.00
Asset Inflation (Positive)	0.13	0.25	0.25	0.25	0.13

	Rates (Rising)	*Fed Balance Sheet (Expanding)*	*Asset Inflation (Positive)*
Absolute Portfolio Exposure	**0.8**	0.6	**0.7**
Relative Portfolio Exposure	**0.3**	**0.6**	**0.5**
Absolute Portfolio Risk	-8.0	-16.4	-16.5
Absolute Portfolio Risk	**3.9**	**3.7**	**2.9**

Portfolio Scenario Preferences

	Base Case	Premuature Easing	Second Wave	Financial Crisis	Rapid Upturn
Absolute Portfolio Exposure	4.0	1.0	2.0	3.0	5.0
Relative Portfolio Exposure	1.0	4.0	5.0	3.0	2.0
Drawdown Risk	5.0	1.0	2.0	3.0	4.0
Symmetry Risk	1.0	3.0	5.0	4.0	2.0
Scenario Preference	2.8	2.3	3.5	3.3	3.3

Portfolio Observations

- The SBCERA portfolio is designed to endure a slow recovery and or a reverse into economic lockdown well.
- However, the portfolio tail risk characteristics favor a slight down-turn. The current base case scenario as well as a rapid up turn invite the potential for more volatility and larger drawdowns.
- The relative positioning of the current overlay portfolio provides some offset to the absolute positioning, providing some avenues for participation through the overweight in US, international and emerging market equity, which perform well is strong demand environments.
- The scenarios currently under consideration also generally assume weak oil prices and some positive inflation, both of which benefit the portfolio from an absolute as well as a relative perspective.
- Moreover, the positive inflation context provides some tail protection and very positive skew to the portfolio, which also favors the premature easing scenario over the base case.
- From a symmetry perspective, the worst scenarios are the second wave, which ranks as the worst overall scenario for the portfolio, and the financial crisis. Though, cash provides plenty of cushion to protect against these scenarios.

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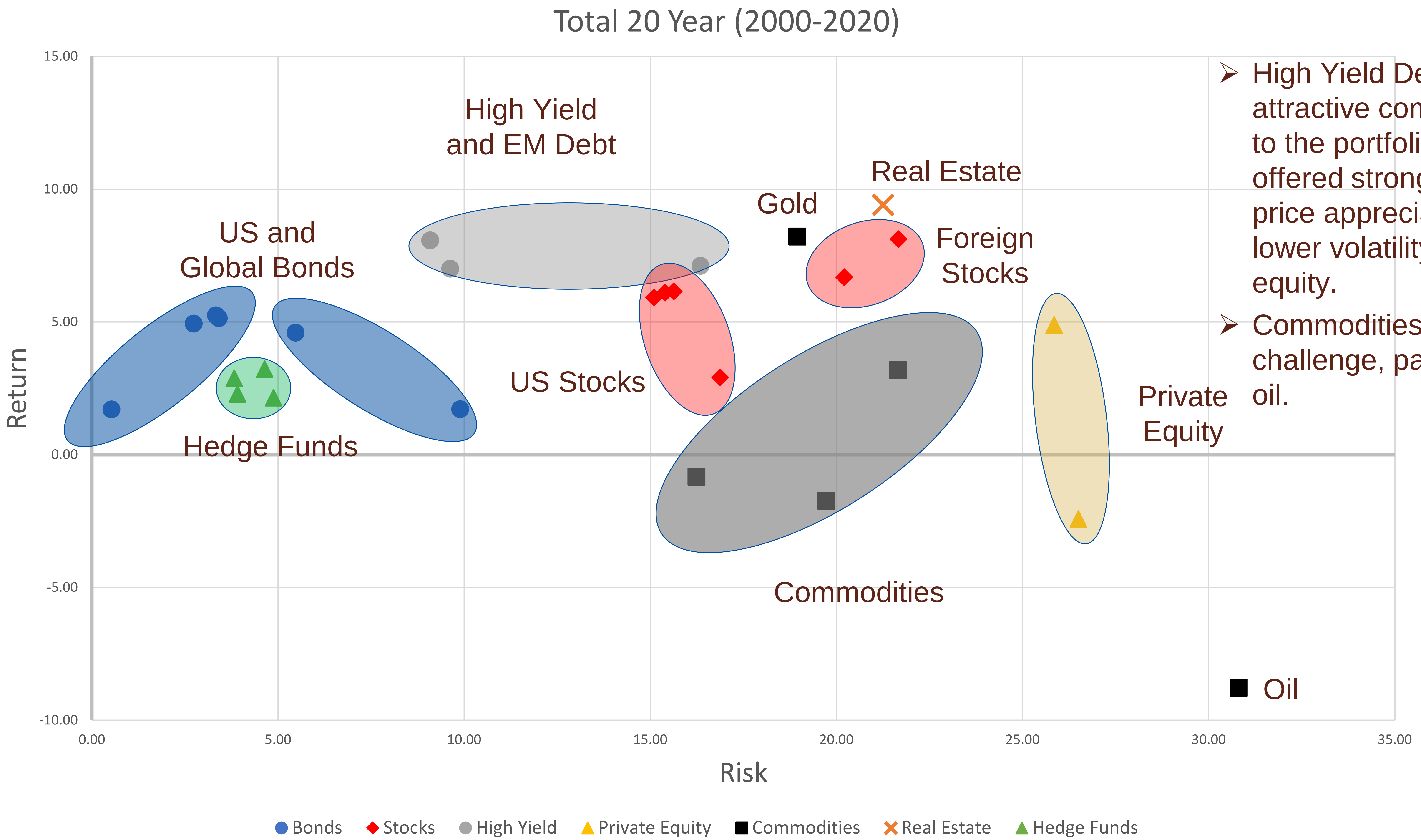
Appendix

Detailed Analysis

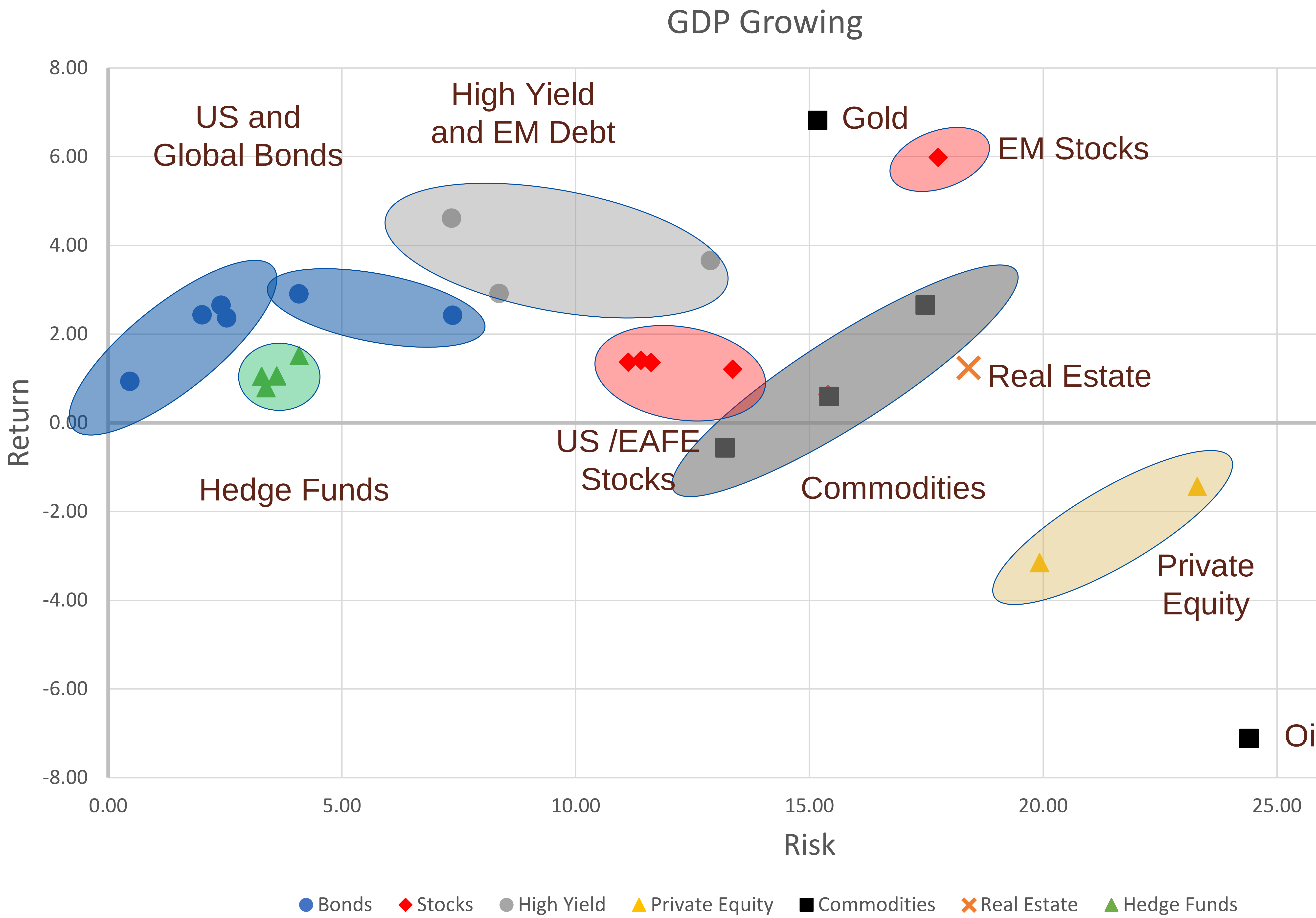
Unfiltered Data from June 2000 to June 2020



- High Yield Debt is an attractive component to the portfolio as it offered strong income, price appreciation and lower volatility than equity.
- Commodities is a challenge, particularly oil.

Strongest	Weakest
US Bonds	Foreign Stocks
Foreign Bonds	Private Equity
High Yield Bonds	Commodity

Demand – GDP Growing



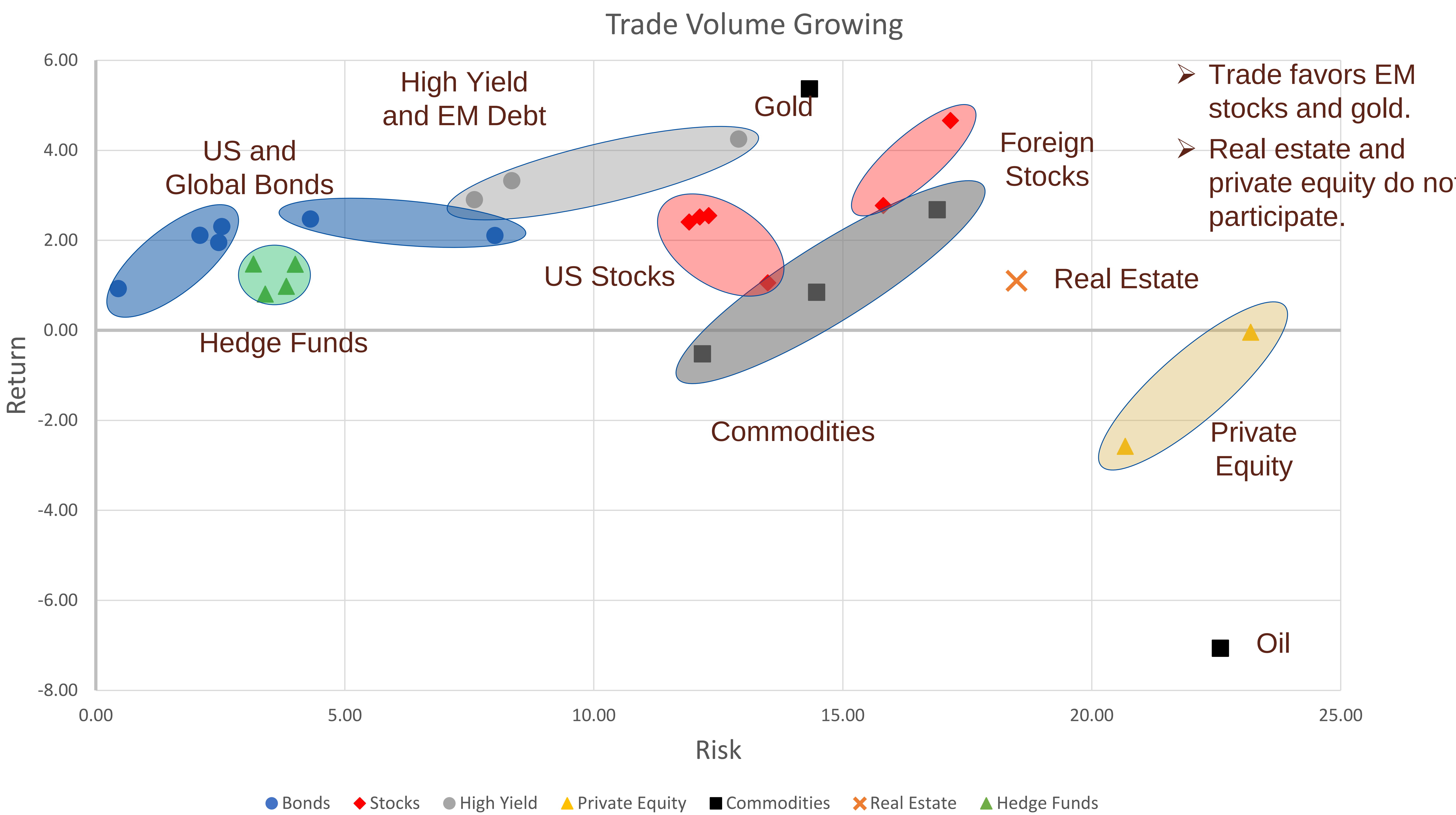
- EM Equity emerges as a strong portfolio exposure when GDP rises.
- Commodities improve their performance, but are still not a strong contributor to performance.
- Real Estate and US equities do not keep up when only economic growth is factor at play.
- Private Equity does not participate in economic growth, lacking any other driving factor.

Strongest	Weakest
US Bonds	Real Estate
Foreign Bonds	Commodity
Gold	Private Equity

	Most Improved	Most Impacted
Risk Adj. Perf	Gold	Real Estate
Drawdown	US Bonds	US Stocks
Symmetry	Foreign Bonds	US Bonds

Bias	Strongest	Weakest
Return	Gold	Private Equity
Risk	Real Estate	Foreign Bonds
Inf Ratio	Gold	Private Equity

Demand – Trading Volume Growing

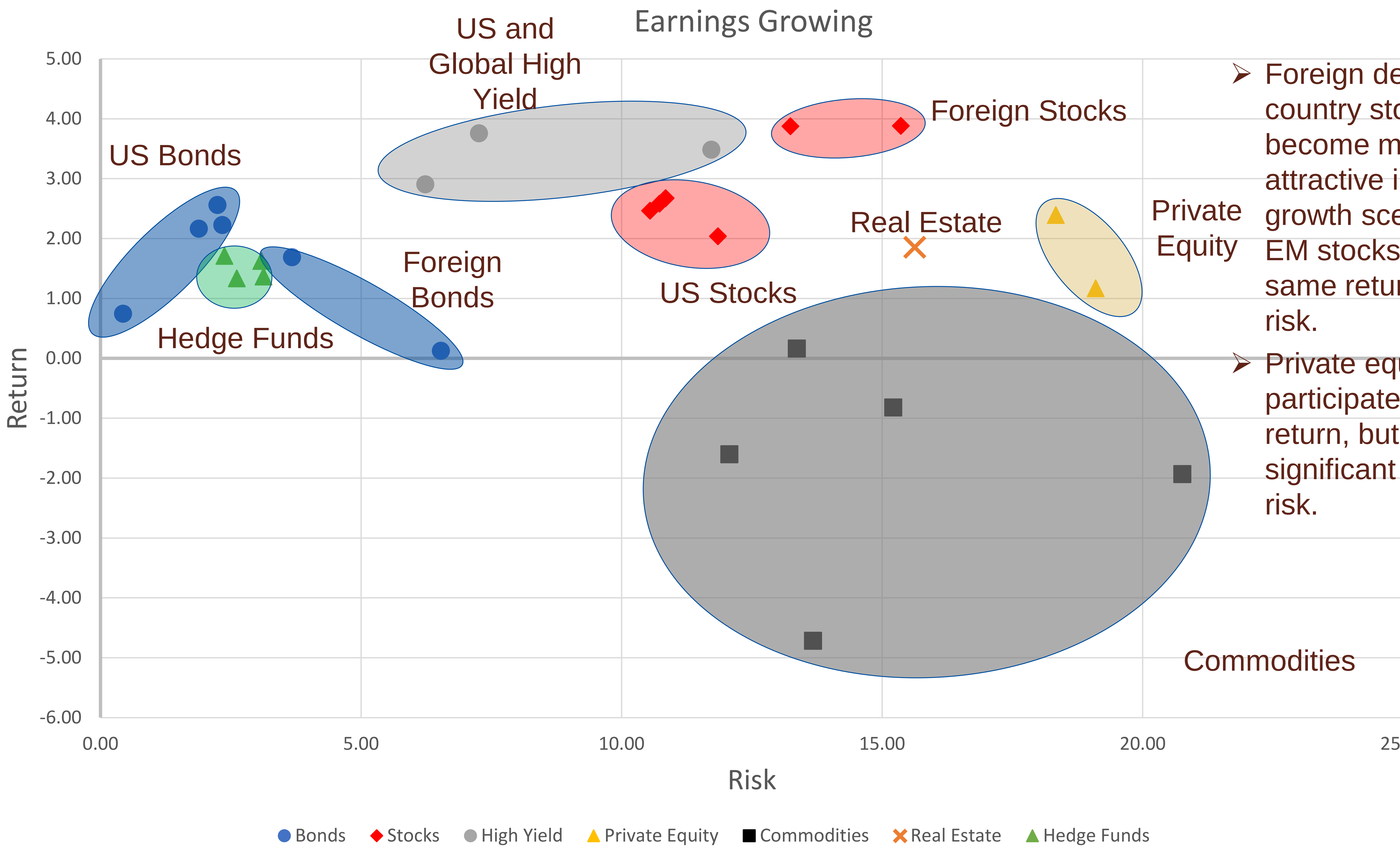


Strongest	Weakest
US Bonds	Real Estate
Foreign Bonds	Commodity
Gold	Private Equity

	Most Improved	Most Impacted
Risk Adj. Perf	Gold	Real Estate
Drawdown	Commodity	US Stocks
Symmetry	Foreign Bonds	US Bonds

Bias	Strongest	Weakest
Return	Commodity	Private Equity
Risk	Real Estate	Commodity
Inf Ratio	Commodity	Private Equity

Demand – Earnings Growth



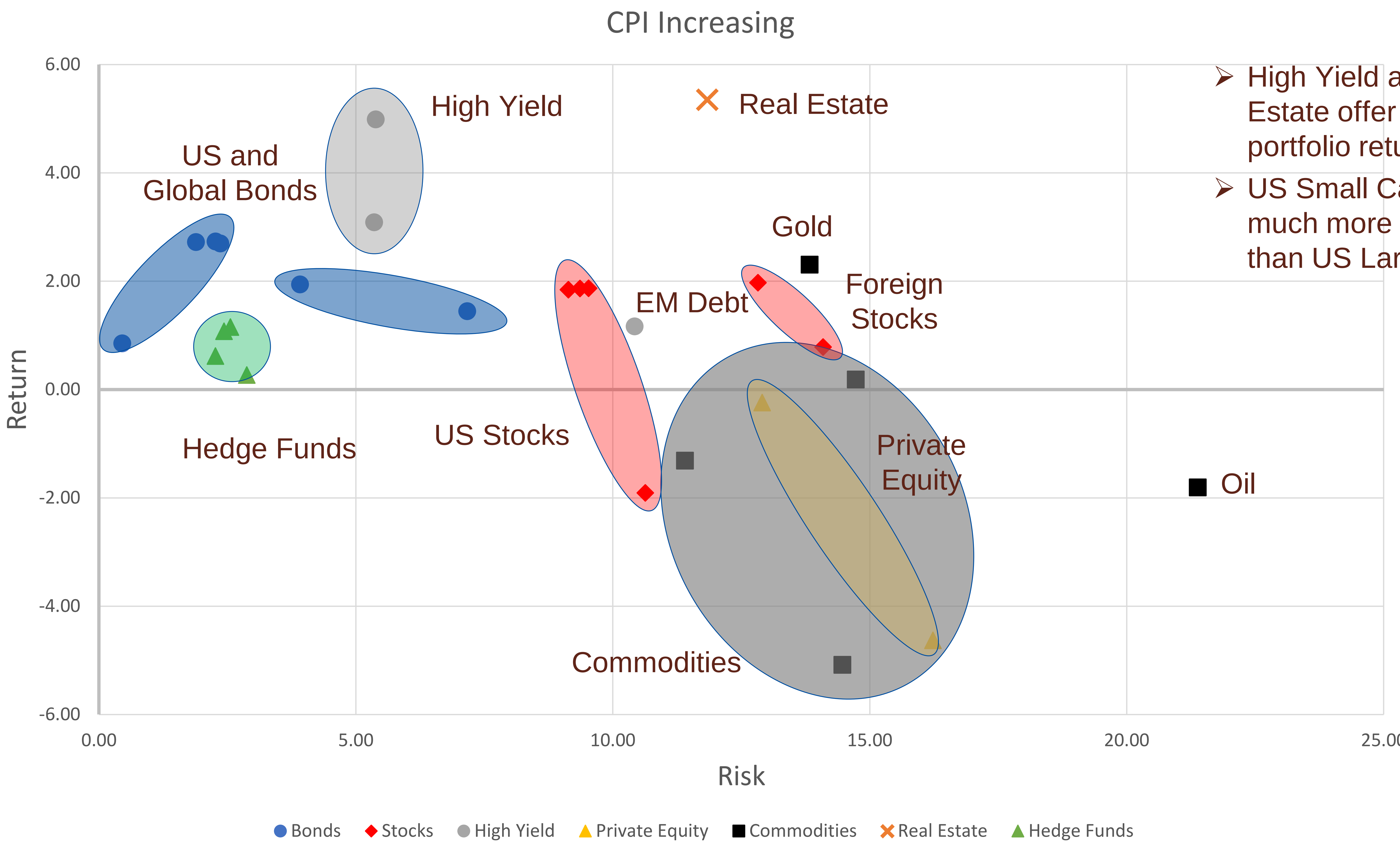
- Foreign developed country stocks become more attractive in earnings growth scenarios than EM stocks, offering the same returns for less risk.
- Private equity starts to participate in the return, but at significant levels of risk.

Strongest	Weakest
US Bonds	Private Equity
Foreign Bonds	Gold
Hedge Fund	Commodity

	Most Improved	Most Impacted
Risk Adj. Perf	US Stocks	Gold
Drawdown	Commodity	Foreign Stocks
Symmetry	Foreign Bonds	High Yield Bonds

Bias	Strongest	Weakest
Return	Foreign Stocks	Commodity
Risk	Real Estate	Hedge Fund
Inf Ratio	Hedge Fund	Commodity

CPI Increasing



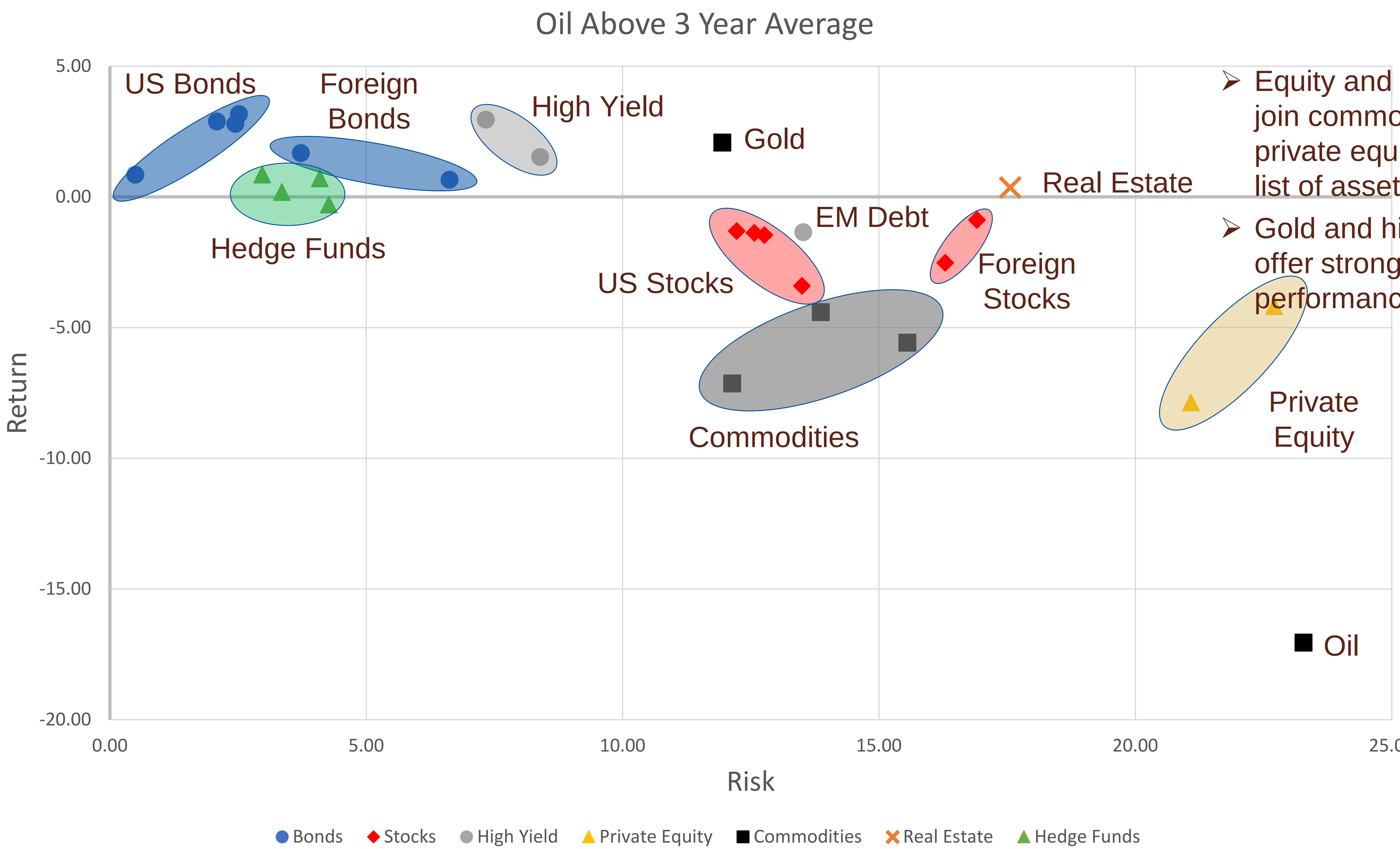
- High Yield and Real Estate offer strong portfolio returns.
- US Small Caps are much more impacted than US Large Caps

Strongest	Weakest
US Bonds	Foreign Stocks
Foreign Bonds	Commodity
High Yield Bonds	Private Equity

	Most Improved	Most Impacted
Risk Adj. Perf	US Stocks	Private Equity
Drawdown	Real Estate	Foreign Bonds
Symmetry	US Bonds	Private Equity

Bias	Strongest	Weakest
Return	Foreign Bonds	Private Equity
Risk	Gold	Real Estate
Inf Ratio	Foreign Bonds	Private Equity

Oil Above 3 Year Average



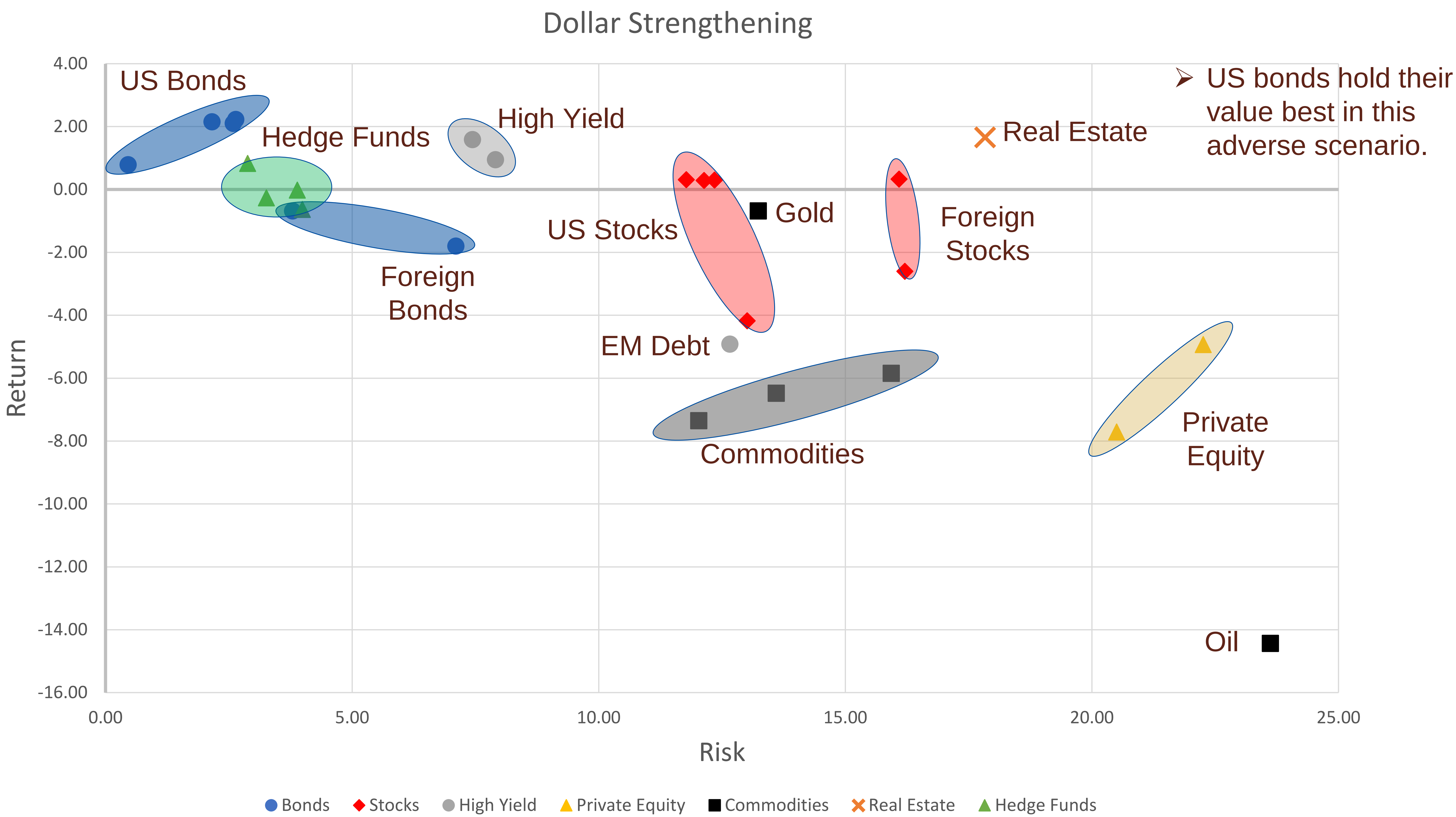
- Equity and EM Debt join commodities and private equity in the list of assets to avoid.
- Gold and high yield offer strong performance.

Strongest	Weakest
US Bonds	Foreign Stocks
Foreign Bonds	Private Equity
Gold	Commodity

	Most Improved	Most Impacted
Risk Adj. Perf	Gold	High Yield Bonds
Drawdown	US Bonds	US Stocks
Symmetry	US Bonds	Commodity

Bias	Strongest	Weakest
Return	US Bonds	Commodity
Risk	Hedge Fund	Gold
Inf Ratio	US Bonds	Commodity

Dollar Strengthening

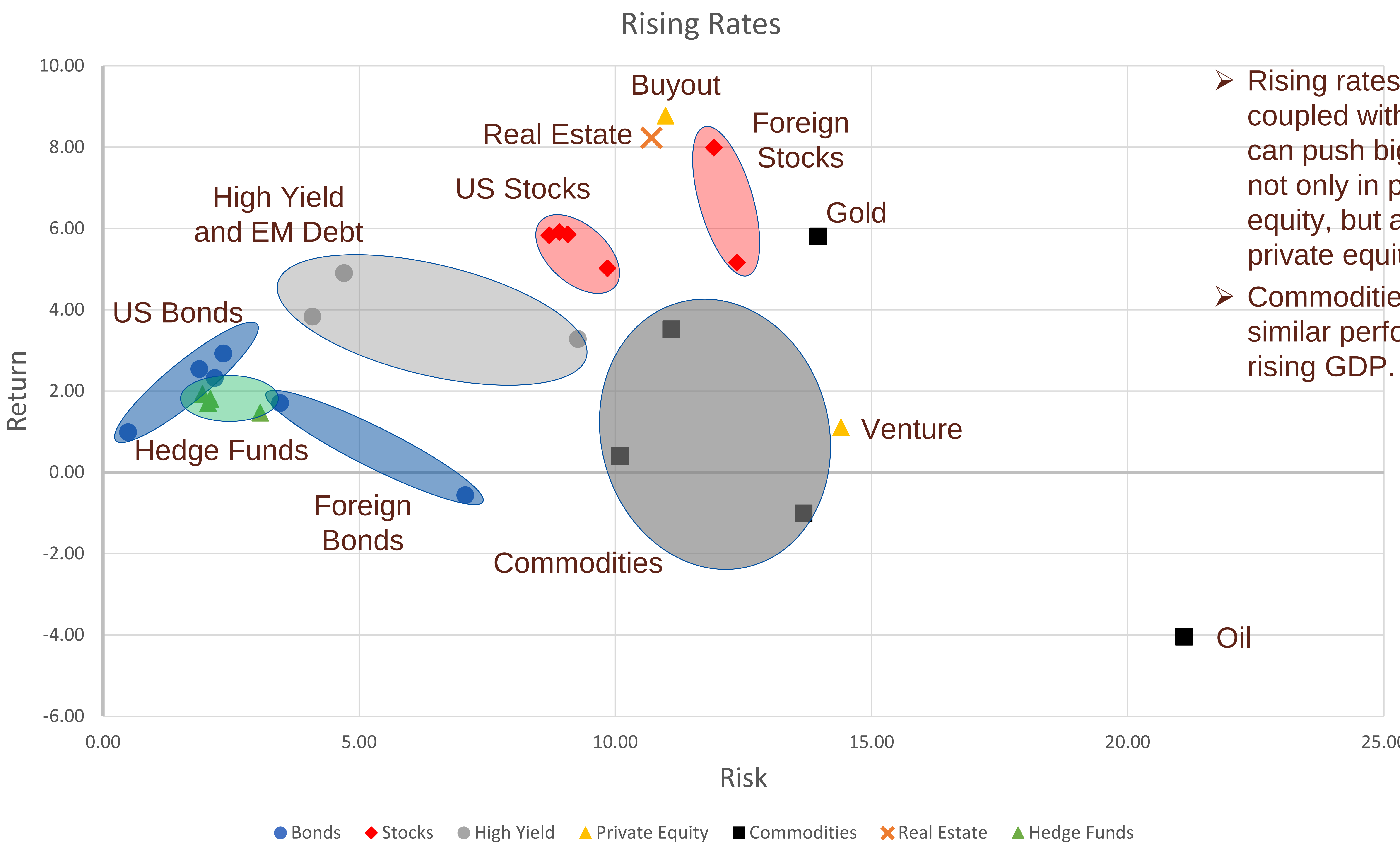


Strongest	Weakest
US Bonds	Foreign Stocks
Foreign Bonds	Private Equity
Real Estate	Commodity

	Most Improved	Most Impacted
Risk Adj. Perf	US Stocks	High Yield Bonds
Drawdown	US Bonds	US Stocks
Symmetry	US Bonds	Commodity

Bias	Strongest	Weakest
Return	US Bonds	Commodity
Risk	Real Estate	Gold
Inf Ratio	US Bonds	Commodity

Rising Rates



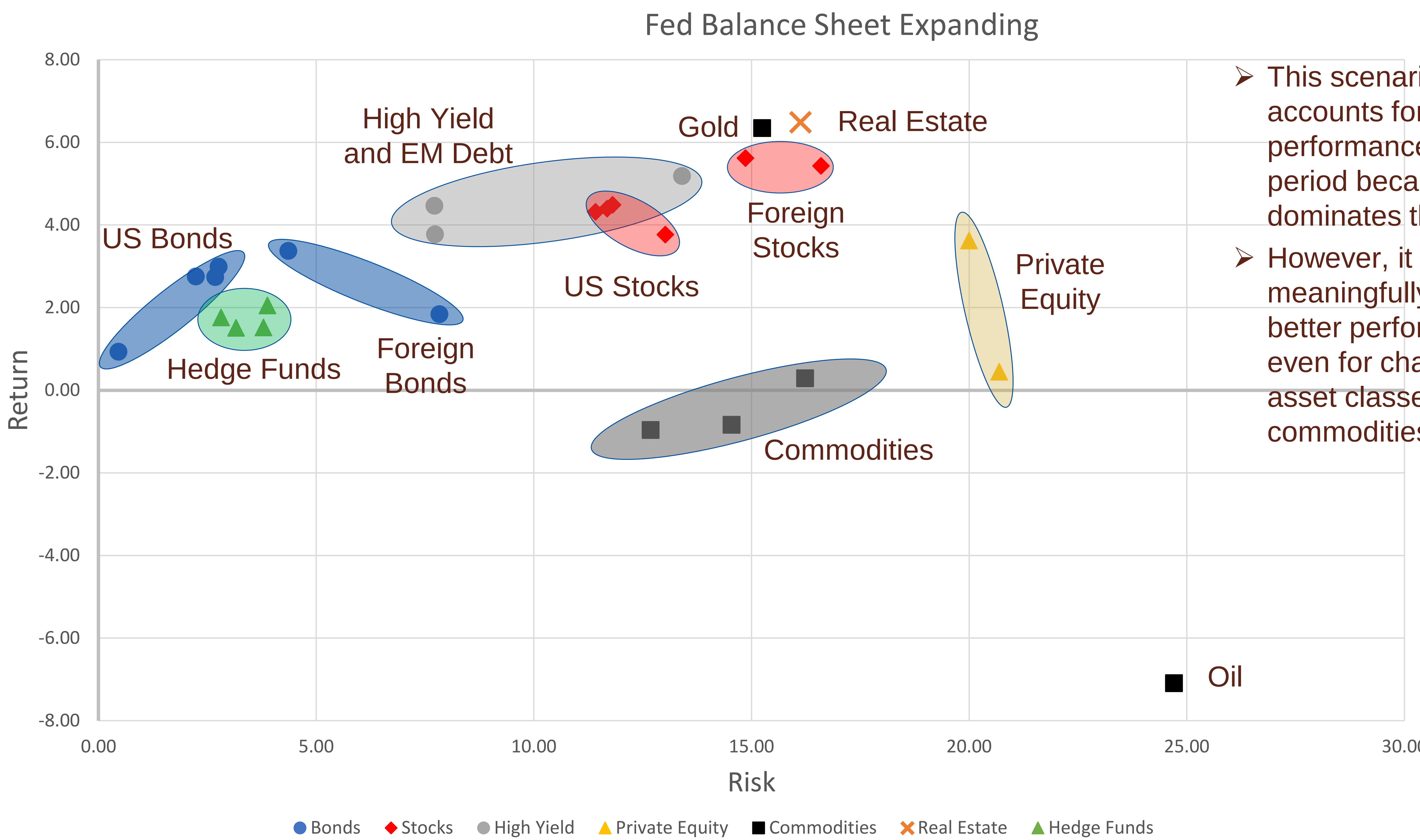
- Rising rates when coupled with growth can push big returns, not only in public equity, but also in private equity.
- Commodities show a similar performance to rising GDP.

Strongest	Weakest
US Bonds	Private Equity
Hedge Fund	Gold
High Yield Bonds	Commodity

	Most Improved	Most Impacted
Risk Adj. Perf	Hedge Fund	Foreign Bonds
Drawdown	Real Estate	Foreign Bonds
Symmetry	US Bonds	Foreign Bonds

Bias	Strongest	Weakest
Return	US Stocks	Private Equity
Risk	Foreign Bonds	Private Equity
Inf Ratio	Foreign Stocks	Private Equity

Fed Balance Sheet Expanding



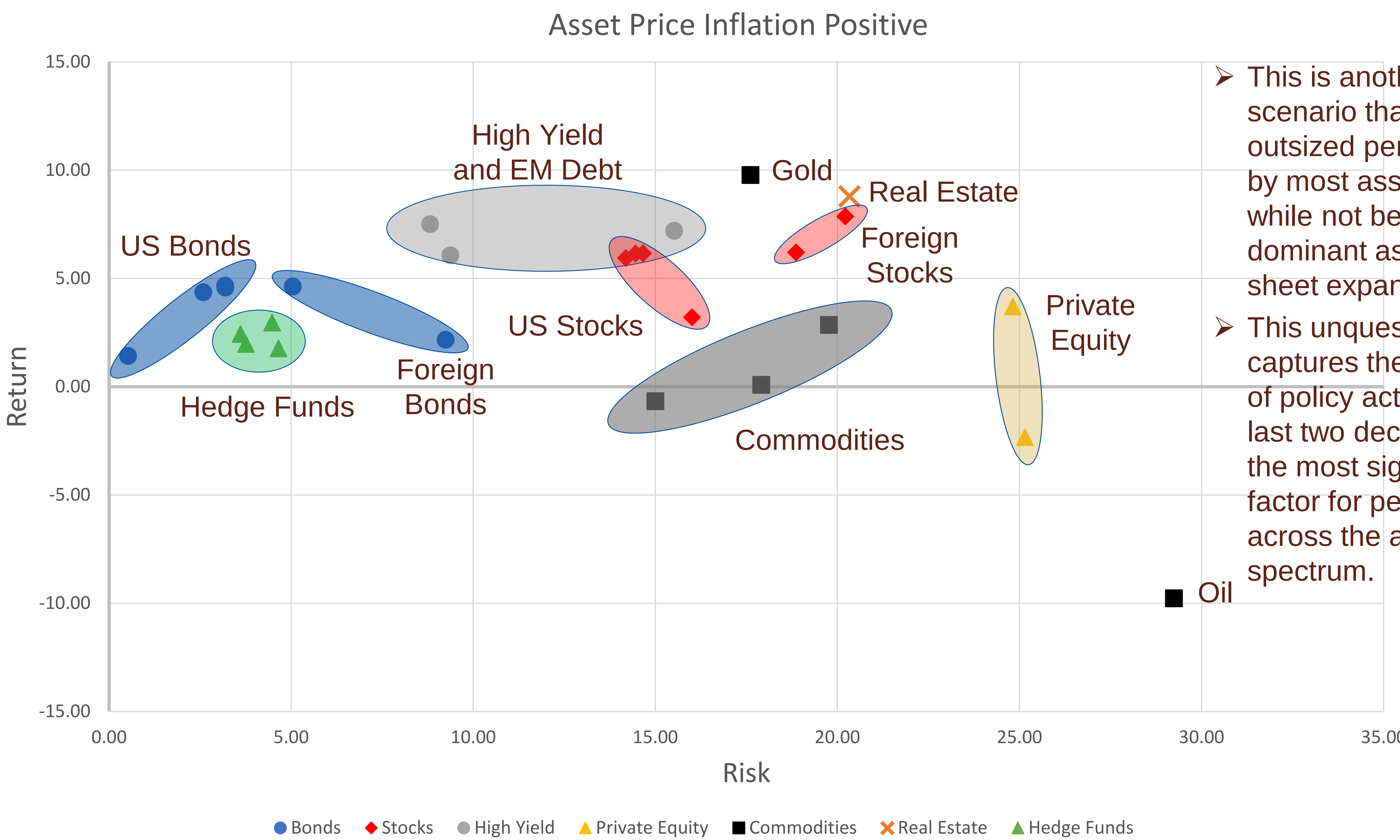
- This scenario accounts for most performance over the period because it also dominates the period.
- However, it meaningfully captures better performance, even for challenged asset classes like commodities.

Strongest	Weakest
US Bonds	Foreign Stocks
Foreign Bonds	Private Equity
Hedge Fund	Commodity

	Most Improved	Most Impacted
Risk Adj. Perf	Gold	High Yield Bonds
Drawdown	Commodity	US Stocks
Symmetry	US Bonds	Private Equity

Bias	Strongest	Weakest
Return	Gold	Foreign Bonds
Risk	High Yield Bonds	US Stocks
Inf Ratio	US Stocks	Foreign Bonds

Asset Price Inflation Positive



- This is another scenario that captures outsized performance by most asset classes while not being as dominant as balance sheet expansion.
- This unquestionably captures the impacts of policy action for the last two decades as the most significant factor for performance across the asset class spectrum.

Strongest	Weakest
US Bonds	Foreign Stocks
Foreign Bonds	Private Equity
High Yield Bonds	Commodity

	Most Improved	Most Impacted
Risk Adj. Perf	Gold	Real Estate
Drawdown	Commodity	US Stocks
Symmetry	Commodity	US Stocks

Bias	Strongest	Weakest
Return	Private Equity	US Stocks
Risk	High Yield Bonds	Commodity
Inf Ratio	Private Equity	US Stocks

SBCERA Portfolio Absolute Preference

	SBCERA Portfolio	Policy Portfolio	Relative Exposure	GDP (Growing)	Trade Volume (Growing)	Earnings (Growing)	CPI (Increasing)	Oil (Above Average)	Dollar (Strengthening)	Rates (Rising)	Fed Balance Sheet (Expanding)	Asset Inflation (Positive)	Total
US Large Cap Equity	14.7	14.5	0.2	0.2	0.4	0.4	0.3	-0.2	0.0	1.0	0.7	1.0	1.0
US Small Cap Equity	3.6	3.5	0.1	0.1	0.4	0.6	0.3	-0.4	0.0	0.8	0.8	0.9	1.0
International Equity	10.9	10.8	0.2	0.4	0.4	0.7	-0.7	-1.2	-1.4	1.7	1.3	1.1	1.0
Emerging Markets Equity	7.9	7.8	0.2	0.7	0.6	0.5	0.1	-0.1	-0.3	1.0	0.7	1.0	1.0
Global ex-US Fixed Income	15.2	15.0	0.2	0.5	0.4	0.4	0.6	0.6	0.4	0.5	0.6	0.9	1.0
US Aggregate Fixed Income	5.3	9.5	-4.2	0.5	0.4	0.4	0.5	0.6	0.4	0.5	0.6	0.9	1.0
US High Yield Fixed Income	9.6	5.3	4.4	0.4	0.5	0.5	0.4	0.2	0.1	0.5	0.5	0.9	1.0
European High Yield	0.0	0.0	0.0	0.5	0.6	0.5	0.2	-0.2	-0.7	0.5	0.7	1.0	1.0
Emerging Markets Fixed Income	0.0	0.0	0.0	0.6	0.4	0.4	0.6	0.4	0.2	0.6	0.6	0.9	1.0
Diversified Venture	10.5	9.3	1.2	-1.3	-1.1	1.0	-1.9	-3.3	-3.2	0.5	0.2	-1.0	1.0
Buyout	0.7	9.3	-8.6	-0.3	0.0	0.2	0.0	-0.9	-1.0	1.8	0.7	0.8	1.0
Secondaries	1.2	0.0	1.2	-0.3	0.0	0.2	0.0	-0.9	-1.0	1.8	0.7	0.8	1.0
Direct Lending	2.6	0.0	2.6	0.4	0.5	0.5	0.4	0.2	0.1	0.5	0.5	0.9	1.0
Opprtunistic Debt	2.1	0.0	2.1	0.4	0.5	0.5	0.4	0.2	0.1	0.5	0.5	0.9	1.0
Real Estate	4.6	5.3	-0.7	0.1	0.1	0.2	0.6	0.0	0.2	0.9	0.7	0.9	1.0
Total Real Assets	4.4	3.4	1.0	-0.7	-0.6	-1.9	-1.6	-8.6	-8.8	0.5	-1.2	-0.8	1.0
Alpha Pool	0.0	0.0	0.0	0.5	0.5	0.5	0.4	0.6	0.4	0.5	0.5	0.8	1.0
Cash	6.4	6.5	0.0	0.5	0.5	0.4	0.5	0.5	0.5	0.6	0.5	0.8	1.0
Portfolio	0.0	0.0	0.0	0.2	0.2	0.4	0.0	-0.7	-0.8	0.8	0.6	0.7	1.0

SBCERA Portfolio Relative Preferences

	SBCERA Portfolio	Policy Portfolio	Relative Exposure	GDP (Growing)	Trade Volume (Growing)	Earnings (Growing)	CPI (Increasing)	Oil (Above Average)	Dollar (Strengthening)	Rates (Rising)	Fed Balance Sheet (Expanding)	Asset Inflation (Positive)	Total
US Large Cap Equity	14.7	14.5	0.2	21	20	20	18	22	15	18	22	18	19
US Small Cap Equity	3.6	3.5	0.1	26	23	17	21	24	16	23	21	23	23
International Equity	10.9	10.8	0.2	24	25	22	29	26	25	20	24	25	25
Emerging Markets Equity	7.9	7.8	0.2	14	16	18	24	18	21	16	23	21	22
Global ex-US Fixed Income	15.2	15.0	0.2	3	3	2	2	3	3	3	3	3	3
US Aggregate Fixed Income	5.3	9.5	-4.2	4	4	5	5	4	5	6	4	5	5
US High Yield Fixed Income	9.6	5.3	4.4	13	11	11	10	12	11	10	13	13	12
European High Yield	0.0	0.0	0.0	18	15	16	22	20	28	25	18	16	17
Emerging Markets Fixed Income	0.0	0.0	0.0	8	12	13	7	10	10	7	11	10	9
Diversified Venture	10.5	9.3	1.2	30	30	23	30	29	27	27	27	30	30
Buyout	0.7	9.3	-8.6	29	28	25	26	25	23	13	26	26	24
Secondaries	1.2	0.0	1.2	29	28	25	26	25	23	13	26	26	24
Direct Lending	2.6	0.0	2.6	13	11	11	10	12	11	10	13	13	12
Opprtunistic Debt	2.1	0.0	2.1	13	11	11	10	12	11	10	13	13	12
Real Estate	4.6	5.3	-0.7	25	26	24	12	17	12	15	16	17	15
Total Real Assets	4.4	3.4	1.0	28	29	30	28	30	31	28	30	29	28
Alpha Pool	0.0	0.0	0.0	9	7	7	8	7	7	2	8	6	6
Cash	6.4	6.5	0.0	1	1	1	1	1	1	1	1	1	1
Portfolio Rank Difference	0.0	0.0	0.0	0.6	0.4	0.4	0.3	0.5	0.4	0.3	0.6	0.5	0.4

Overlay Portfolio	0.0	0.0	0.0	0.6	0.4	0.4	0.3	0.5	0.4	0.3	0.6	0.5	0.4

SBCERA Portfolio Drawdown Preferences

	Policy Portfolio	Beta Exposure	Beta Portfolio	GDP (Growing)	Trade Volume (Growing)	Earnings (Growing)	CPI (Increasing)	Oil (Above Average)	Dollar (Strengthening)	Rates (Rising)	Fed Balance Sheet (Expanding)	Asset Inflation (Positive)	Total
US Large Cap Equity	14.7	14.5	0.2	-17.5	-17.5	-17.5	-9.5	-17.5	-17.5	-9.1	-17.5	-17.5	-17.5
US Small Cap Equity	3.6	3.5	0.1	-21.7	-21.7	-20.8	-11.2	-21.7	-21.7	-11.9	-21.7	-21.7	-21.7
International Equity	10.9	10.8	0.2	-20.2	-20.2	-20.2	-14.5	-20.2	-20.2	-11.5	-20.2	-20.2	-20.2
Emerging Markets Equity	7.9	7.8	0.2	-27.4	-27.4	-27.4	-17.5	-27.4	-27.4	-11.2	-27.4	-27.4	-27.4
Global ex-US Fixed Income	15.2	15.0	0.2	-1.7	-1.7	-1.4	-1.7	-1.6	-1.7	-1.7	-1.6	-2.1	-2.1
US Aggregate Fixed Income	5.3	9.5	-4.2	-2.4	-2.4	-2.4	-2.6	-2.4	-2.4	-2.4	-2.6	-3.4	-3.4
US High Yield Fixed Income	9.6	5.3	4.4	-15.9	-15.9	-15.9	-8.0	-15.9	-15.9	-4.0	-15.9	-15.9	-15.9
European High Yield	0.0	0.0	0.0	-24.2	-24.2	-24.2	-12.0	-24.2	-24.2	-11.5	-24.2	-24.2	-24.2
Emerging Markets Fixed Income	0.0	0.0	0.0	-14.9	-14.9	-14.9	-6.8	-14.9	-14.9	-4.2	-14.9	-14.9	-14.9
Diversified Venture	10.5	9.3	1.2	-28.4	-28.4	-28.4	-18.6	-28.4	-28.4	-18.6	-28.4	-28.4	-28.4
Buyout	0.7	9.3	-8.6	-34.2	-34.2	-34.2	-17.0	-34.2	-34.2	-13.4	-34.2	-34.2	-34.2
Secondaries	1.2	0.0	1.2	-34.2	-34.2	-34.2	-17.0	-34.2	-34.2	-13.4	-34.2	-34.2	-34.2
Direct Lending	2.6	0.0	2.6	-15.9	-15.9	-15.9	-8.0	-15.9	-15.9	-4.0	-15.9	-15.9	-15.9
Opprtunistic Debt	2.1	0.0	2.1	-15.9	-15.9	-15.9	-8.0	-15.9	-15.9	-4.0	-15.9	-15.9	-15.9
Real Estate	4.6	5.3	-0.7	-31.4	-31.4	-31.4	-15.1	-31.4	-31.4	-9.0	-31.4	-31.4	-31.4
Total Real Assets	4.4	3.4	1.0	-21.3	-21.3	-21.3	-14.7	-21.3	-21.3	-10.6	-21.3	-21.3	-21.3
Alpha Pool	0.0	0.0	0.0	-5.9	-5.9	-5.9	-2.6	-5.9	-5.9	-1.0	-5.9	-5.9	-5.9
Cash	6.4	6.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Portfolio	0.0	0.0	0.0	-16.4	-16.4	-16.3	-9.9	-16.4	-16.4	-8.0	-16.4	-16.5	-16.5

SBCERA Portfolio Symmetry Preferences

	Policy Portfolio	Beta Exposure	Beta Portfolio	GDP (Growing)	Trade Volume (Growing)	Earnings (Growing)	CPI (Increasing)	Oil (Above Average)	Dollar (Strengthening)	Rates (Rising)	Fed Balance Sheet (Expanding)	Asset Inflation (Positive)	Total
US Large Cap Equity	14.7	14.5	0.2	0.8	0.8	0.8	1.2	0.8	0.8	1.0	0.8	0.8	0.8
US Small Cap Equity	3.6	3.5	0.1	0.7	0.7	0.7	1.4	0.7	0.7	1.0	0.6	0.7	0.7
International Equity	10.9	10.8	0.2	0.6	0.6	0.6	0.7	0.6	0.6	0.9	0.6	0.6	0.6
Emerging Markets Equity	7.9	7.8	0.2	0.6	0.6	0.6	0.8	0.6	0.6	1.2	0.6	0.6	0.6
Global ex-US Fixed Income	15.2	15.0	0.2	1.6	1.6	1.9	1.2	1.7	1.6	1.2	1.7	1.3	1.3
US Aggregate Fixed Income	5.3	9.5	-4.2	1.6	1.6	1.4	1.0	1.6	1.6	0.9	1.4	1.1	1.1
US High Yield Fixed Income	9.6	5.3	4.4	0.8	0.8	0.8	0.9	0.8	0.8	1.1	0.5	0.8	0.8
European High Yield	0.0	0.0	0.0	0.9	0.9	0.9	1.1	0.9	0.5	1.2	0.9	0.9	0.9
Emerging Markets Fixed Income	0.0	0.0	0.0	0.5	0.5	0.4	0.9	0.5	0.5	1.1	0.5	0.5	0.5
Diversified Venture	10.5	9.3	1.2	1.0	1.0	1.0	0.8	1.0	1.0	0.8	0.6	1.0	1.0
Buyout	0.7	9.3	-8.6	1.0	1.0	1.0	0.8	1.0	1.0	1.0	0.5	1.0	1.0
Secondaries	1.2	0.0	1.2	1.0	1.0	1.0	0.8	1.0	1.0	1.0	0.5	1.0	1.0
Direct Lending	2.6	0.0	2.6	0.8	0.8	0.8	0.9	0.8	0.8	1.1	0.5	0.8	0.8
Opprtunistic Debt	2.1	0.0	2.1	0.8	0.8	0.8	0.9	0.8	0.8	1.1	0.5	0.8	0.8
Real Estate	4.6	5.3	-0.7	1.0	1.0	1.0	0.9	1.0	1.0	1.3	0.5	1.0	1.0
Total Real Assets	4.4	3.4	1.0	0.6	0.6	0.6	0.8	0.6	0.5	1.0	0.6	0.6	0.6
Alpha Pool	0.0	0.0	0.0	1.1	1.1	1.1	0.7	1.1	1.1	2.0	0.9	1.1	1.1
Cash	6.4	6.5	0.0	28.0	28.0	31.9	84.9	31.9	31.9	46.0	46.0	31.9	31.9
Portfolio	0.0	0.0	0.0	2.7	2.7	3.0	6.4	3.0	2.9	3.9	3.7	2.9	2.9

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