MarketDesk U.S. Macro Regime Indicator (USMRI)

A Framework for Managing Portfolios Throughout Economic Cycles

Primer Report

What is a "Macro Regime"?

Macro regime refers to the prevailing set of macroeconomic trends within a particular time frame. It represents the broader market environment, which is characterized by factors such as economic growth, inflation, interest rates, fiscal and monetary policy, and global trade. Macro regimes hold significance for investment committees, as they influence how various asset classes perform and provide a roadmap to guide asset allocation decisions.

Understanding Macro Regimes is Key to Portfolio Management

Macro regimes are classified as either "Risk-On" (i.e., increase portfolio beta) and "Risk-Off" (i.e., decrease portfolio beta). The two regime styles impact markets in different ways, including which asset classes outperform, the degree of market volatility, and the risk of a major market sell-off. The MarketDesk U.S. Macro Regime Indicator (USMRI) allows investors to manage the portfolio beta exposure of their equity (i.e., large vs small, cyclical vs defensive) and credit (i.e., investment grade vs high yield corporate bonds) allocations in response to changes in the macro regime. Aligning portfolios with the correct macro regime improves risk-adjusted returns and decreases portfolio drawdown risk, while mismanaging betas produces lower risk-adjusted returns and is the equivalent of swimming against the current. This primer explains the USMRI, discusses how the two regime styles impact financial markets, and provides a portfolio guide for each regime.
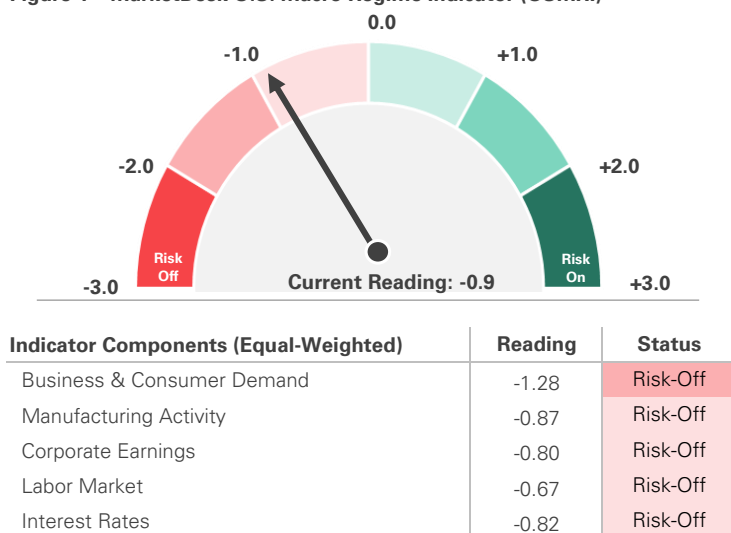
How is the USMRI Framework Different from my Current Process?

The reality is most investors incorporate data that (1) is already known by the majority of market participants, (2) and therefore largely already priced into markets, (3) which means its holds little to no explanatory power regarding future performance. Regardless of your investment style (i.e., Growth, Value, Momentum, Technicals), the USMRI framework is built to be additive to your process as it solves for the above flaws. USMRI is fundamentally different in that only uses 6- to 12-month leading indicators, which have a proven track record since 1980 of accurately forecasting the trajectory of the U.S. economy. History doesn't repeat, but it often rhymes, and the USMRI's data-driven approach provides a robust, repeatable framework to manage portfolios throughout business cycles.

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Figure 1 – MarketDesk U.S. Macro Regime Indicator (USMRI)

Indicator Components (Equal-Weighted)	Reading	Status
Business & Consumer Demand	-1.28	Risk-Off
Manufacturing Activity	-0.87	Risk-Off
Corporate Earnings	-0.80	Risk-Off
Labor Market	-0.67	Risk-Off
Interest Rates	-0.82	Risk-Off

Source: MarketDesk Quant Pack. As of 4/9/2023.

Figure 2 – Historical U.S. Macro Regime Indicator (USMRI)

Historical USMRI Since 1980 and Next 12-Month Forecast

MarketDesk U.S. Macro Regime = -0.9
12-Month Forecast = +0.4

March 2024 +0.4

April 2023 -0.9

↑ Risk-On Regime = Above 0.0
↓ Risk-Off Regime = Below 0.0
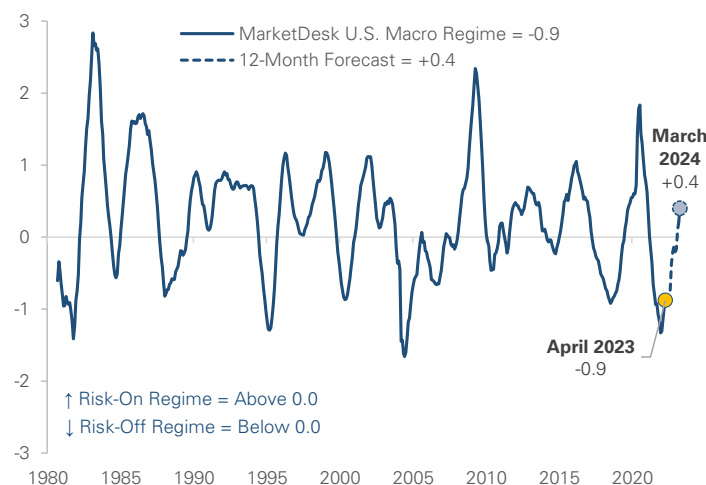
Source: MarketDesk Quant Pack. As of 4/9/2023. Refer to the next page for key dates.

Executive Summary – Implementing the USMRI Framework

Indicator Overview: What Inputs Are Included in USMRI?

The MarketDesk U.S. Macro Regime Indicator (USMRI) utilizes a data-driven process to (1) define the current macro environment and (2) forecast the trajectory of the U.S. economy over the next 12 months. USMRI aggregates 20+ *Quant Pack* indicators across U.S. economics, equities, and credit to produces one straightforward signal. (*Figure 3* shows a sample *Quant Pack* indicator, the MarketDesk S&P 500 Earnings Indicator.) USMRI's output, as shown in Figure 2, represents the indicator's forecast for the U.S. macro regime 12 months ahead based on current trends across Business & Consumer Demand, Manufacturing Activity, Corporate Earnings, Labor Market, and Interest Rates.

How to Incorporate USMRI into Your Portfolio Construction Process?

The goal of the USMRI is to identify shifts in the broad macro regime so that investors can appropriately manage portfolio beta and generate superior risk-adjusted returns. There are two distinct USMRI regimes: Risk-On and Risk-Off. A reading above (below) zero forecasts a risk-on (risk-off) regime and indicates investors should increase (decrease) overall portfolio beta. It is important to note, 'Risk-On' does not necessarily forecast a smooth, steady climb higher or indicate investors should max out risk exposure. Likewise, 'Risk-Off' does not necessarily forecast doom and gloom or favor net short exposure. Furthermore, USMRI should not be interpreted as a near-term bull / bear market indicator, and it is not built to forecast 1- to 3-month market moves. Instead, the USMRI is built to guide strategic asset allocation (i.e., 6-18 month holdings periods).

Managing Portfolio Beta Exposure with USMRI

USMRI helps investment committees answer the following common portfolio questions:
- Is the risk / reward macro setup favorable for risk-taking?
- Does the current environment favor cyclical or defensive sectors and factors?
- Should the credit sleeve of portfolios accept a higher level of credit risk in exchange for higher yield?

The common thread in the questions above revolves around managing beta and understanding when to rachet up and down portfolio exposure to various 'betas'. Figure 4 provides high-level positioning ideas for U.S. equity style, sector, credit, and international markets during risk-on and risk-off regimes. Examples of equity market beta include the size factor and defensive vs cyclical exposure. Examples of credit beta include credit quality and interest rate risk (i.e., bond duration). Each of the various equity and credit betas work at different points in the macro regime, and understanding what betas work in each regime is a crucial step in constructing and managing portfolios. Mismanaging beta exposure produces lower risk-adjusted returns and is the equivalent of swimming against the current.

Timing the Transition Between Risk-On & Risk-Off Readings

The current USMRI regime and 12-month forecast may differ in terms of risk-on and risk-off, in which case it becomes important to develop a timeline to reposition portfolios. The USMRI's 12-month forecast is calibrated so that investors should start to increase (decrease) portfolio risk two months prior to the indicator crossing above (below) zero. For example, if USMRI forecasts the signal will cross above zero in April, investors should start to increase portfolio risk in February. Figures 22-27 on page 9 graph the results of this process since 2000 based on simple sector ETF, stock/bond, and credit rotation models that rotate between various equity and credit betas based on the USMRI reading.

Figure 3 – MarketDesk S&P 500 Earnings Leading Indicator
One of the 20+ *Quant Pack* Indicators Included in USMRI's aggregate signal

Since 2000 – Correl: 85% | Rsq: 0.72
Since 1990 – Correl: 82% | Rsq: 0.68
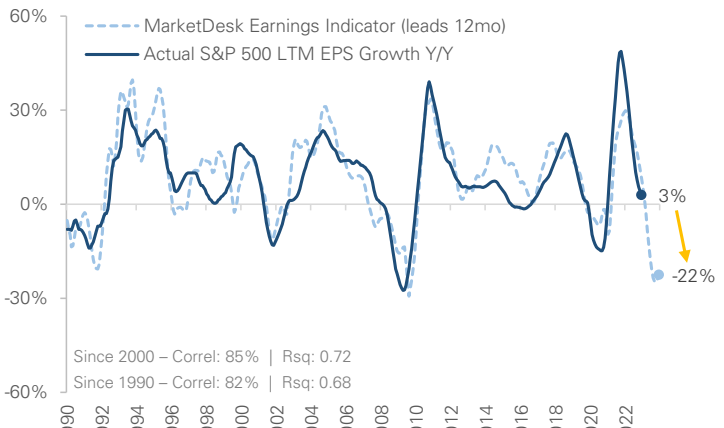
Source: MarketDesk Quant Pack. As of 4/9/2023.

Figure 4 – Positioning Ideas to Own During Each Regime

Asset Classes	Risk-On Regimes Preferred List	Risk-Off Regimes Preferred List
U.S. Equity Style Boxes	SMID Cap Growth	High Quality
	Cyclical Sectors	Low Volatility
	High Beta	High Dividend Yield
	Operating Leverage	Strong Balance Sheets
U.S. Sectors	Consumer Discretionary	Consumer Staples
	Industrials & Materials	Health Care
	Financials	Utilities
Credit	High Yield	Long-Duration
	Fallen Angels	Municipals
	Convertibles	MBS
International	Emerging Markets	Developed Markets
	Asia / Latin America	Low Volatility

Source: MarketDesk Quant Pack

History Lesson – Key Dates of Past Regimes, Asset Class Performance, S&P 500 Return Paths

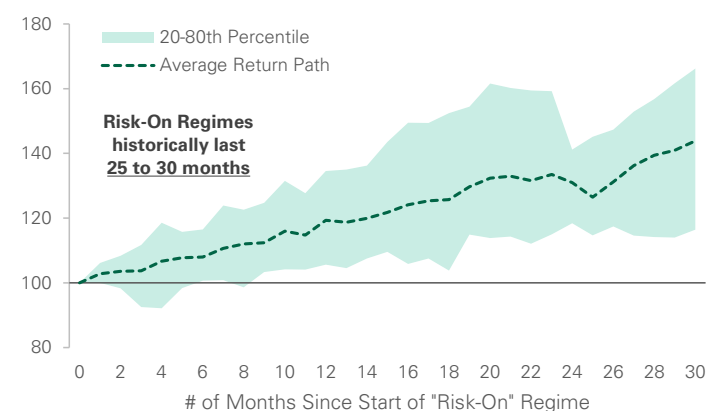## Figure 5 – Table of Historical Regime Dates Since January 1980
Risk-On vs Risk-Off Regime Dates

Risk-On Regimes				Risk-Off Regimes		
Start	Mos.	Return %		Start	Mos.	Return %
Jan-83	25	25%		Feb-85	8	5%
Oct-85	32	44%		Jun-88	23	32%
May-90	60	42%		Apr-95	15	24%
Jul-96	50	137%		Aug-00	14	-30%
Oct-01	35	4%		Aug-04	52	-19%
Nov-08	24	32%		Nov-10	10	-4%
Sep-11	4	16%		Jan-12	4	0%
May-12	31	57%		Dec-14	10	1%
Oct-15	27	36%		Jan-18	27	3%
Apr-20	21	55%		*Jan-22*	*14*	*-9%*
Average	**31mo**	**45%**		**Average**	**18mo**	**0%**

Source: MarketDesk Quant Pack. Current regime italicized. Data as of 4/9/2023.

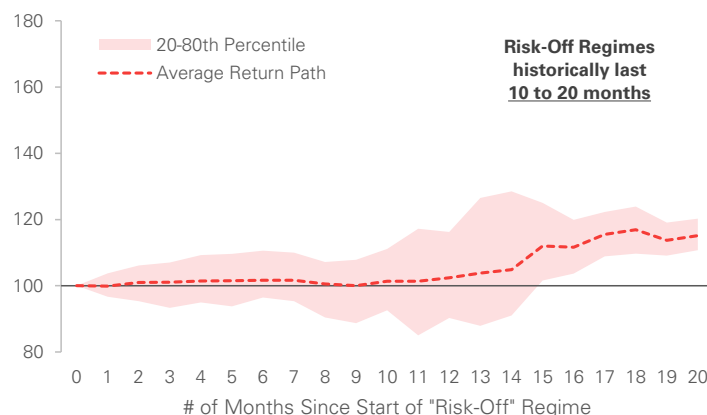## Figure 7 – Average S&P 500 Return Path During 'Risk-On' Regimes
Price Return Path Indexed to 100 for all "Risk-On" Regimes Since 1980

- 20-80th Percentile
- Average Return Path

Risk-On Regimes historically last 25 to 30 months

# of Months Since Start of "Risk-On" Regime

Source: MarketDesk Quant Pack

Figure 8 – Average S&P 500 Return Path During 'Risk-Off' Regimes
Price Return Path Indexed to 100 for all "Risk-Off" Regimes Since 1980

- 20-80th Percentile
- Average Return Path

Risk-Off Regimes historically last 10 to 20 months

# of Months Since Start of "Risk-Off" Regime

Source: MarketDesk Quant Pack

Figure 6 – Asset Class Performance During 'Risk-On' & 'Risk-Off' Regimes
Historical Returns Since January 1990

Market Segment	Risk-On Regimes		Risk-Off Regimes	
	Average	% Positive	Average	% Positive
Equity Styles				
S&P 500	16.0%	-	1.1%	-
Small Cap	16.0%	50%	1.4%	30%
Value	14.4%	20%	1.5%	30%
Growth	17.8%	70%	0.5%	70%
Low Beta	12.8%	14%	7.3%	75%
High Beta	26.5%	100%	-8.0%	13%
Momentum	17.9%	50%	4.4%	80%
High Quality	16.9%	50%	3.3%	90%
High Div. Yield	15.9%	50%	5.6%	63%
U.S. Sectors				
Comm Svcs	11.5%	0%	-0.6%	50%
Cons Disc	18.3%	57%	-0.1%	63%
Cons Stpls	12.7%	14%	7.8%	88%
Energy	14.2%	43%	6.5%	38%
Financials	17.7%	86%	-0.8%	38%
Health Care	15.5%	29%	6.3%	100%
Industrials	16.5%	86%	1.6%	38%
Materials	15.3%	71%	0.9%	38%
Real Estate	16.3%	50%	3.9%	50%
Tech	23.4%	71%	0.2%	50%
Utilities	10.3%	0%	6.5%	75%
Credit				
Bond Aggregate	6.0%	-	3.5%	-
+10Y US Treasuries	7.6%	38%	5.0%	78%
1-5Y US Treasuries	4.1%	40%	3.7%	30%
High Yield	12.3%	88%	0.4%	22%
Corp IG	8.2%	90%	1.9%	50%
Fallen Angels	14.2%	100%	1.7%	0%
Municipals	5.6%	86%	3.9%	63%
MBS	5.5%	56%	4.0%	56%
TIPs	6.4%	83%	2.5%	29%
Convertibles	15.6%	100%	-0.5%	56%
International Equity				
Emerging	24.4%	33%	5.3%	33%
Developed	9.3%	50%	-0.5%	50%
FX				
U.S. Dollar	0.0%	10%	2.1%	70%
Commodities				
Broad Cmdty.	4.2%	29%	-3.2%	38%
Gold	0.7%	20%	6.0%	60%
Crude Oil	17.9%	50%	-2.3%	20%

Source: MarketDesk Quant Pack. **Average** = Annualized total return for each market segment during "Risk On" and "Risk Off" periods. The return is calculated as the average monthly total return multiplied by 12. **% Positive** = The percentage of regimes each Equity, FX, and Commodity category outperformed the S&P 500 Index, and each Credit category outperformed the Bloomberg Bond Aggregate Index during each respective regime (% positive based on price returns).

Risk Management – Using USMRI to Generate Attractive Risk-Adjusted Returns

Avoiding Major Market Drawdowns

The chart below graphs the S&P 500 price index since the early 1980s and overlays USMRI-identified risk-on regimes (green) and risk-off regimes (red). As detailed in Figure 5, he average risk-on regime lasts 31 months and produces a +45% price return with a 100% win rate, while the average risk-off regime lasts 18 months and produces a 0% price return with a 60% win rate. The statistics are clear – risk-on regimes are more attractive from a risk / reward perspective. Refer to Figure 5 on the preceding page to see each regime's starting date, length in months, and S&P 500 price return.

Figure 9 – History of the MarketDesk U.S. Macro Regime Indicator (USMRI)

Source: MarketDesk Quant Pack. Data as of 4/9/2023.

Two themes emerge from the chart above that further quantify the difference in risk levels during the two regimes. First, the probability of a significant market drawdown is higher during risk-off regimes. Second, the S&P 500 does not historically bottom until after the start of a new risk-on regime. The S&P 500's -20% or more drawdowns historically start either near the end of risk-on regimes, such as the dot-com bubble bursting in 2000 or start of Fed tightening in early 2022, or during risk-off regimes, such as the 2008 financial crisis and March 2020 Covid pandemic. The list below shows that during four of the last six risk-off regimes, the S&P 500 ultimately made a new low after the previous risk-off regime ended and the subsequent risk-on regime began. (Note: Each of the S&P 500 bottoms is marked on *Figure 9* above.)

S&P 500 Market Bottom	S&P 500 Drawdown Statistics			Notes on Bottoming Timeline
	Buy & Hold	w/ USMRI	Net Saved	
October 2002	-47%	-23%	**+24%**	Bottomed 12 months after Oct. 2001 risk-on regime started
March 2009	-56%	-30%	**+27%**	Bottomed 5 months after Nov. 2008 risk-on regime started
September 2011	-18%	0%	**+18%**	Bottomed 2 weeks prior to start of Sept. 2011 risk-on regime
June 2012	-18%	-9%	**+9%**	Bottomed 1 month after May 2012 risk-on regime started
February 2016	-12%	-3%	**+9%**	Bottomed 5 months after Oct. 2015 risk-on regime started
March 2020	-32%	0%	**+32%**	Bottomed 2 weeks prior to start of April 2020 risk-on regime

Source: MarketDesk Quant Pack. Note: "w/ USMRI" column assumes you move to 100% cash at the start of each Risk-Off regime and then repurchase the S&P 500 after the next Risk-On regime starts.

It can be tempting to predict the end of a risk-off regime and position for a mean-reversion trade ahead of the market. However, history indicates investors are better off waiting until the later stages of risk-off regimes to reposition portfolios in anticipation of a risk-on regime. In summary, calling the market bottom and buying the dip 4-5 months before the forecasted end of a risk-on regime has historically proven unattractive from a risk/reward perspective.

U.S. Equity Markets – Market Volatility & Managing Beta Exposures

Equity Market Volatility Increases in Risk-Off Regimes

The two figures below chart the average path of the VIX Index during risk-on and risk-off regimes and overlay the 20th-80th percentile range. In general, equity markets experience more volatility in risk-off regimes than risk-on regimes. Figure 10 shows the VIX Index historically declines as risk-on periods progress. While the 20-80th percentile range indicates there are periods of elevated volatility, the volatility is usually brief and the VIX does not rise materially above its regime starting point. In contrast, Figure 11 shows the VIX Index historically remains above its starting point throughout risk-off periods with occasional volatility spikes.

The difference in regime volatility is also apparent in the S&P 500's monthly returns. The S&P 500's average monthly return in risk-on regimes is +1.2% with a 67% win rate and a standard deviation of 4.3%. In contrast, the S&P 500's average monthly return in risk-off regimes is +0.1% with a 57% win rate and a standard deviation of 4.5%. In summary, risk-off regimes produce a lower average monthly return and win rate with more volatility.

Figure 10 – Equity Market Volatility Declines In Risk-on Regimes & …
CBOE VIX Index During Risk-on Regimes
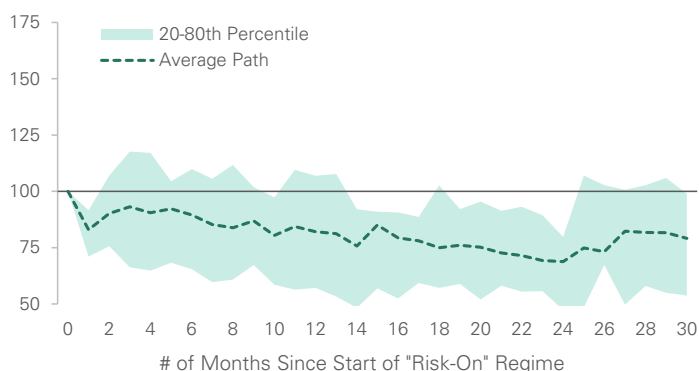
Figure 11 – … Increases During Risk-off Regimes
COBE VIX Index During Risk-off Regimes

Source: MarketDesk Quant Pack
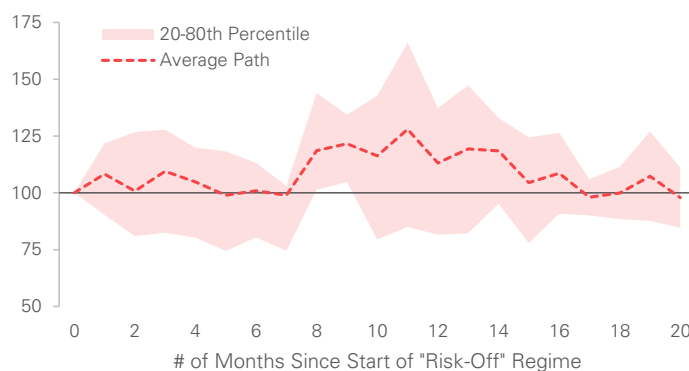
Source: MarketDesk Quant Pack

Managing Equity Beta with Sectors & Factors

Using USMRI to identify the macro regime and manage equity market exposure helps investors position portfolios to take advantage of the two regimes' differing beta and volatility profiles. As an example, Figure 6 on page 3 shows equity factors and sectors with higher betas historically outperform during risk-on regimes. The higher betas and increased cyclical sensitivity allow investors to capture more of the upside that typically occurs in risk-on regimes and generate attractive risk-adjusted returns as volatility declines (*Figure 10*). In contrast, lower beta factors and sectors generally outperform in risk-off regimes. The lower betas and defensive exposure protect against increased market volatility (*Figure 11*) and risk of a significant market drawdown (*Figure 9*) during risk-off regimes. The following list highlights the equity market factors and sectors that historically outperform in each regime:

Risk-On Regimes
● Equity Factors: High Beta, Small Cap
● U.S. Sectors: Financials, Industrials, Materials, Technology, Consumer Discretionary

Risk-Off Regimes
● Equity Factors: Large Cap, Low Beta, High Quality, High Dividend Yield
● U.S. Sectors: Consumer Staples, Utilities, Health Care

The dispersion in sector performance during risk-on and risk-off regimes can serve as the foundation of a sector rotation model. Figures 22-23 compares the return generated by a sector rotation model that uses USRMI as a signal against a buy-and-hold strategy for the S&P 500. The sector rotation model generates a higher average return with a higher win rate, smaller maximum drawdown, higher net capture ratio, and superior risk/reward ratio.

The tendency for cyclical sectors to outperform in risk-on regimes also applies at the industry and sub-industry levels, as well as the individual stock level. Certain industries historically outperform in risk-on regimes, such as Semiconductors, Regional Banks, Homebuilders, and Industrial REITs. In contrast, defensive industries, including Pharma, Property & Casualty Insurance, and Food & Staples Retailers, typically outperform in risk-off regimes. Furthermore, investors can use USMRI's risk-on / risk-off regime classification to guide individual stock selection.

Corporate Fundamentals – Earnings Growth & Valuation Changes

Trends in U.S. Earnings & Valuation Multiples

Equity valuations are a function of earnings and price-to-earnings (P/E) multiples, which makes understanding the drivers of S&P 500 returns during the two regimes an important step in constructing portfolios. The two charts below break down performance drivers of the S&P 500's average price return path between earnings growth and multiple expansion. The data shows the two regimes display contrasting behaviors. Figure 12 shows risk-on regimes historically benefit from a double tailwind of P/E multiple expansion and positive earnings growth. In contrast, Figure 13 shows risk-off regimes initially experience P/E multiple contraction followed by slowing earnings growth. Below is a comparison of the two regime styles:

Risk-On Regimes = Double Tailwind (Valuation multiples lift equity prices early, followed by earnings growth)

- +26% Price Return
- +8% NTM P/E Multiple Expansion
- +17% NTM Earnings Revisions

Risk-on regimes benefit from a double-dose of P/E multiple expansion and earnings growth. P/E multiples usually expand early during risk-on regimes as investors bid up equity valuations in anticipation of improving macro conditions and rising earnings. As the risk-on period progresses and the equity market grows into its valuation, P/E multiples drift sideways and earnings growth becomes the primary driver of positive returns. Figure 12 shows this earnings boost historically appears a few months into the risk-on regime, which raises an important point. In every risk-on regime since the October 2001 cycle, forward 12-month earnings estimates did not bottom until after the previous risk-off regime ended and the new risk-on regime started. As page 4 shows, this often translates into elevated volatility early during risk-on regimes.

Risk-Off Regimes = Headwinds for Equity Prices (Earnings growth fades, while P/E multiples decline)

- -7% Price Return
- -11% NTM P/E Multiple Expansion
- +3% NTM Earnings Revisions

Fundamentally, the drivers of S&P 500 returns in risk-off regimes are the opposite of risk-on regimes. Whereas P/E multiples generally expand early in risk-on regimes, P/E multiples historically contract throughout risk-off periods as economic uncertainty decrease the multiple investors are willing to assign companies. From a corporate earnings perspective, profits often continue to grow early in risk-off regimes as momentum from the previous risk-on regime carries forward into the early phases of risk-off periods. However, earnings growth eventually slows and earnings revisions start to trend lower as risk-off periods progress. The result is negative price returns, primarily driven by declining valuation multiples with an added headwind from negative earnings revisions.

**Figure 12 – Double-Tailwind of P/E Multiple Expansion & EPS Growth**
Average Changes in Multiples & Earnings During Risk-On Regimes Since 2000
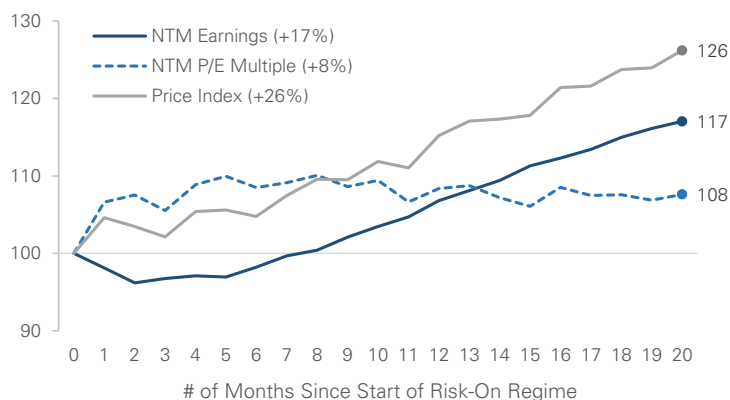
Figure 13 – P/E Multiple Compression Outweighs Positive EPS Growth
Average Changes in Multiples & Earnings During Risk-Off Regimes Since 2000

Source: MarketDesk Quant Pack

Source: MarketDesk Quant Pack

Credit Markets – Balancing Yield & Credit Quality
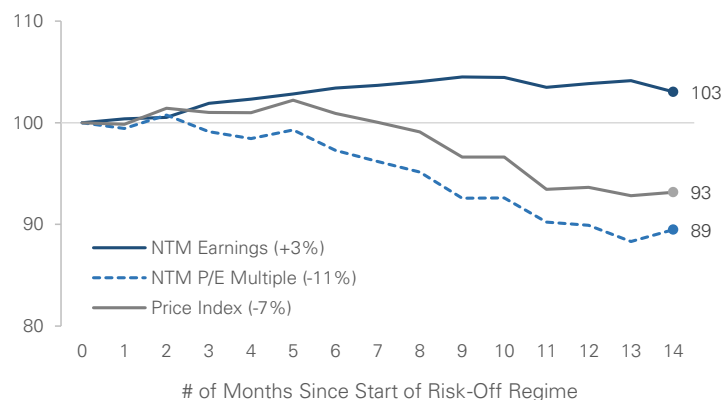
Corporate & Government Bond Allocations: Focus on Quality

Credit quality is our primary focus when comparing risk-on and risk-off regimes. Bonds with lower credit ratings generally outperform in risk-on regimes as improving corporate fundamentals and macro conditions lead to tighter credit spreads. The tendency for lower quality credits to outperform in risk-on periods extends to hybrid securities, which benefit from rising equity prices. In contrast, bonds with higher credit ratings historically outperform in risk-off regimes as macro conditions deteriorate and seek out companies with better fundamentals.

Figures 14 and 15 below illustrate this dynamic. Figure 14 shows two numbers for the corporate high yield spread during each risk-on and risk-off regime: (1) the maximum increase from the start of the period (i.e., max credit spread expansion) and (2) the maximum decrease from the start of the period (i.e., max credit spread tightening). Figure 15 shows the average maximum credit spread expansion in risk-on regimes is +133 basis points, while the average maximum tightening is -468 basis points. Credit spread movement is skewed toward tightening with a limited risk of expansion. Looking at risk-off periods, the average maximum credit spread expansion is +349 basis points, while the average maximum tightening is only -47 basis points. The data highlights both the limited potential for credit spreads to tighten and the increased risk of credit spread expansion in risk-off regimes. The differing credit spread profiles explain why lower quality credits outperform in risk-on regimes and higher quality credits outperform in risk-off regimes.

Figure 14 – Corporate High Yield Credit Spreads Tighten in Risk-On Regimes
Corporate High Yield Credit Spread Movement in Risk-On vs Risk-Off Regimes

Risk-On Regimes				Risk-Off Regimes		
Start	**Max**	**Min**		**Start**	**Max**	**Min**
May-90	288	-673		Jun-88	300	0
Jul-96	251	-136		Apr-95	1	-97
Oct-01	89	-580		Aug-00	214	-14
Nov-08	103	-1409		Aug-04	1391	-71
Sep-11	56	-164		Nov-10	146	-90
May-12	21	-231		Jan-12	17	-47
Oct-15	245	-182		Dec-14	141	-60
Apr-20	13	-368		Jan-18	524	-32
				Jan-22	*409*	*-14*
Average	**+133bps**	**-468bps**		**Average**	**+349bps**	**-47bps**

Source: MarketDesk Quant Pack. Current regime italicized. Data as of 4/9/2023.

Figure 15 – Max BPS Change by Regime Type

Source: MarketDesk Quant Pack

<u>Risk-On Regime Top Performing Credit Classes</u>
#1 Convertible Bonds
- Average Total Return: +15.6%; 100% win rate vs U.S. Bond Aggregate.
- Catalyst: Equity-like returns generated by the bonds' conversion options.

#2 Fallen Angels
- Average Total Return: +14.2%; 100% win rate vs U.S. Bond Aggregate.
- Catalysts: Rating upgrades & tighter spreads as fundamentals improve and the market's risk appetite increases.

#3 Corporate High Yield
- Average Total Return: +12.3%; 88% win rate vs U.S. Bond Aggregate.
- Catalyst: Credit spread tightening as corporate fundamentals strengthen and macro conditions improve.

<u>Risk-Off Regime Top Performing Credit Classes</u>
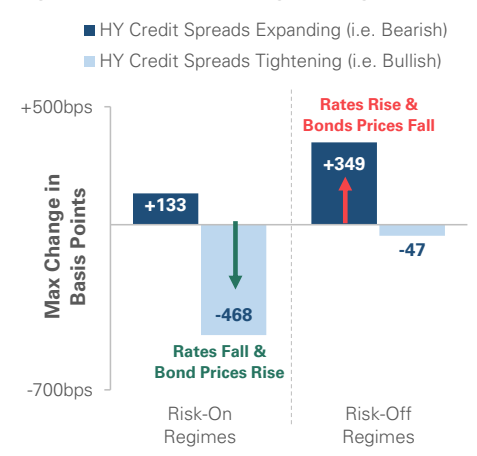#1 +10Y U.S. Treasuries (i.e., Long Duration U.S. Treasuries)
- Average Total Return: +5.0%; 78% win rate vs U.S. Bond Aggregate.
- Catalyst: Highly rated debt backed by the full faith of U.S. gov't. No exposure to corporate credit spreads.

#2 Agency Mortgage-Backed Securities (MBS)
- Average Total Return: +4.0%; 56% win rate vs U.S. Bond Aggregate.
- Catalyst: Issued by U.S. gov't sponsored entities with an implicit or explicit guarantee, which reduces credit risk.

Figures 26-27 on page 9 compares the total return of a credit sector rotation model that uses USMRI as a signal against a buy-and-hold strategy for the U.S. Bond Aggregate Index. The credit rotation model generates a higher average total return with a slightly lower win rate but significantly higher net capture and risk/reward ratios.

Economic Trends – ISM Manufacturing PMI, Industrial Production, & GDP Growth

Economic Activity Typically Slows During Risk-Off Regimes

In general, economic activity is stronger in risk-on regimes. Figures 16-17 track the absolute change in the ISM Manufacturing (Mfg) PMI during risk-on and risk-off regimes. Figure 16 shows the ISM Mfg PMI historically rises during the first 10-12 months of risk-on regimes before drifting sideways, an indication manufacturing activity is expanding. In contrast, Figure 17 shows the ISM Mfg PMI steadily declines during risk-off regimes. Figures 18-19 track industrial production indexed to 100 during risk-on and risk-off regimes, providing a similar takeaway to ISM Mfg PMI. Industrial production exhibits stronger and steadier growth during risk-on regimes but flatlines in risk-off regimes. Figures 20-21 graph the average % quarter-over-quarter (q/q) growth in Real GDP during risk-on and risk-off regimes. Risk-on regimes average +3.2% q/q GDP growth (SAAR), more than double the +1.5% quarterly growth rate in risk-off regimes. Risk-on regimes' weaker data and slower growth explain the trends discussed on prior pages, including increased volatility and risk of a major market sell-off (*pages 4-5*), defensive sector and factor outperformance (*page 5*), P/E multiple compression and negative earnings revisions (*page 6*), and outperformance of higher rated debt (*page 7*).

Figure 16 – ISM Manufacturing PMI Rises During Risk-On Regimes ...
Absolute Change in ISM Manufacturing PMI During Risk-On Regimes
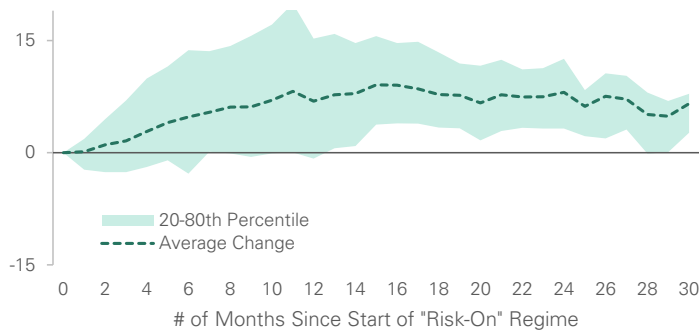
Source: MarketDesk Quant Pack

Figure 17 – ... But Steadily Declines During Risk-Off Regimes
Absolute Change in ISM Manufacturing PMI During Risk-Off Regimes
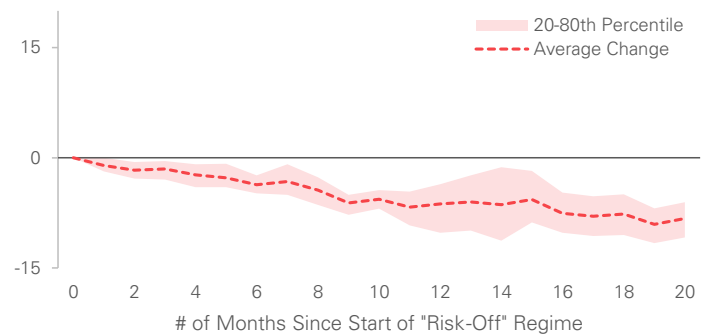
Source: MarketDesk Quant Pack

Figure 18 – U.S. Industrial Production Grows During Risk-On Regimes ...
Industrial Production Indexed to 100 at Start of Risk-On Regimes
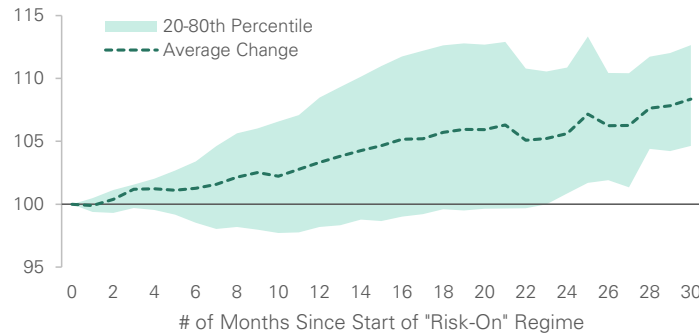
Source: MarketDesk Quant Pack

Figure 19 – ... But Typically Flatlines During Risk-Off Regimes
Industrial Production Indexed to 100 at Start of Risk-Off Regimes
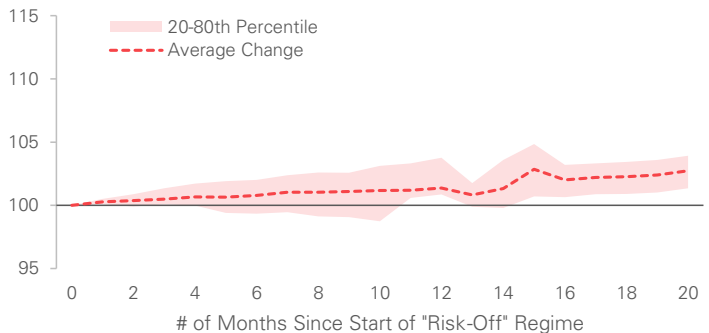
Source: MarketDesk Quant Pack

Figure 20 – GDP Growth is Historically Stronger in Risk-On Regimes ...
Real GDP Growth (% Q/Q SAAR) During Risk-On Regimes
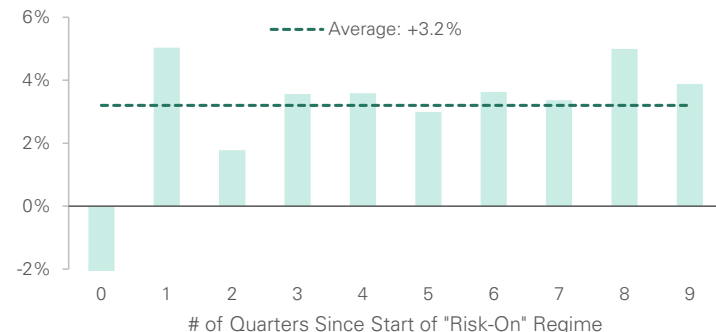
Source: MarketDesk Quant Pack

Figure 21 – ... & Slower During Risk-Off Regimes
Real GDP Growth (% Q/Q SAAR) During Risk-Off Regimes
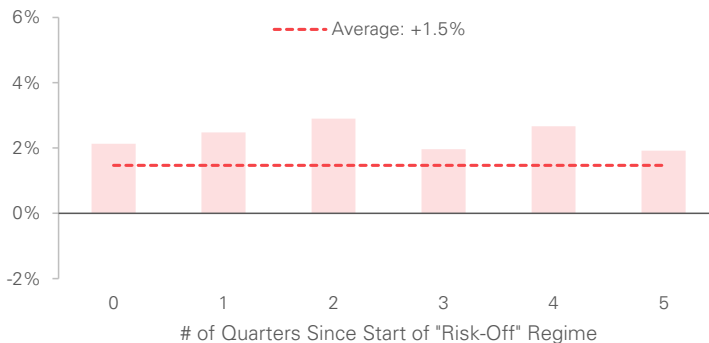
Source: MarketDesk Quant Pack

Turnkey Equity & Credit Models Portfolios Based on USMRI Signal

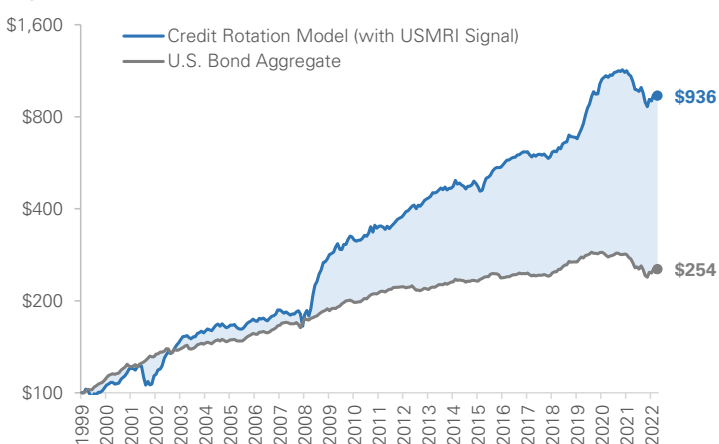**Figure 22: Total Returns – U.S. Sector Rotation Model**
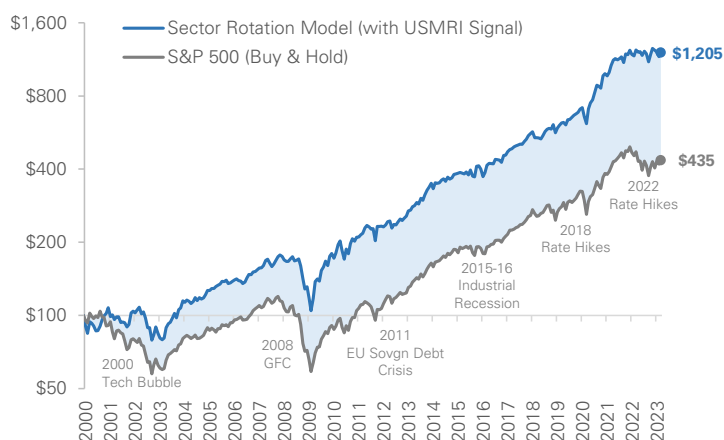
Source: MarketDesk Quant Pack. Own Defensive Sector ETFs during "Risk-Off" Regimes (XLU, XLV, XLP) and Cyclical Sector ETFs during "Risk-On" Regimes (XLB, XLI, XLY). The portfolio is rebalanced monthly.

Figure 23: Performance Statistics – U.S. Sector Rotation Model

Annual Statistics of Returns & Risks	S&P 500 (Benchmark)	U.S. Sector Rotation Model
Average Return	7.9%	12.8%
Strategy CAGR	**6.5%**	**11.3%**
Max Drawdown	-51%	-41%
% of Positive Years	**73.9%**	**87.0%**
Up Capture	100%	116%
Down Capture	100%	38%
Net Capture	**-**	**+79%**
Max Positive Year	32%	40%
Max Negative Year	-37%	-25%
Max Risk / Reward	**0.88**	**1.59**

Source: MarketDesk Quant Pack

Figure 24: Total Returns – Stock/Bond Rotation Model
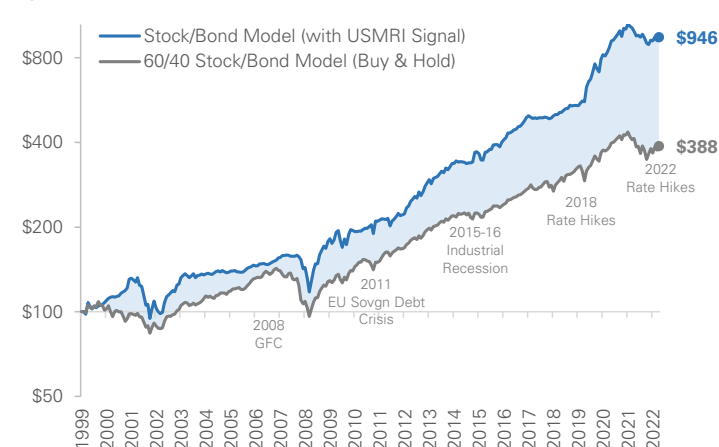
Source: MarketDesk Quant Pack. Own 100% Bond Aggregate ETF (AGG) during "Risk-Off" Regimes and 100% S&P 500 ETF (SPY) during "Risk-On" Regimes. The portfolio is rebalanced monthly.

Figure 25: Performance Statistics – Stock/Bond Rotation Model

Annual Statistics of Returns & Risks	60/40 Model (Benchmark)	Stock / Bond Rotation Model
Average Return	6.4%	11.2%
Strategy CAGR	**6.0%**	**10.1%**
Max Drawdown	-33%	-28%
% of Positive Years	**78.3%**	**87.0%**
Up Capture	67%	95%
Down Capture	50%	13%
Net Capture	**-**	**+82%**
Max Positive Year	22%	52%
Max Negative Year	-22%	-22%
Max Risk / Reward	**1.01**	**2.35**

Source: MarketDesk Quant Pack

Figure 26: Total Returns – Credit Sector Rotation Model

Source: MarketDesk Quant Pack. Own High-Quality Credit Sectors during "Risk-Off" Regimes (10Y U.S. Treasuries & MBS) and Low-Quality Credit Sectors during "Risk-On" Regimes (High Yield, Fallen Angels, Convertibles). The portfolio is rebalanced monthly.

Figure 27: Performance Statistics – Credit Sector Rotation Model

Annual Statistics of Returns & Risks	Bond Aggregate (Benchmark)	Credit Sector Rotation Model
Average Return	4.1%	11.2%
Strategy CAGR	**4.1%**	**10.1%**
Max Drawdown	-17%	-24%
% of Positive Years	**87.0%**	**78.3%**
Up Capture	100%	231%
Down Capture	100%	1%
Net Capture	**-**	**+230%**
Max Positive Year	12%	57%
Max Negative Year	-13%	-20%
Max Risk / Reward	**0.92**	**2.81**

Source: MarketDesk Quant Pack

Important Notices & Disclaimer