MarketDesk

Quant Pack Leading Indicators

U.S. PMI Momentum Indicator

12-Month Forecast of U.S. Manufacturing Activity

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Key Topics Covered

Quant Pack Overview

The Quant Pack is a data subscription with access to 20+ proprietary leading indicators built to guide asset allocation decisions, eliminate guesswork, enhance investment returns, and decrease your research workload.

Research Coverage

- Equities Markets
- Global Economics
- Credit Markets
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- Market Trading Tools

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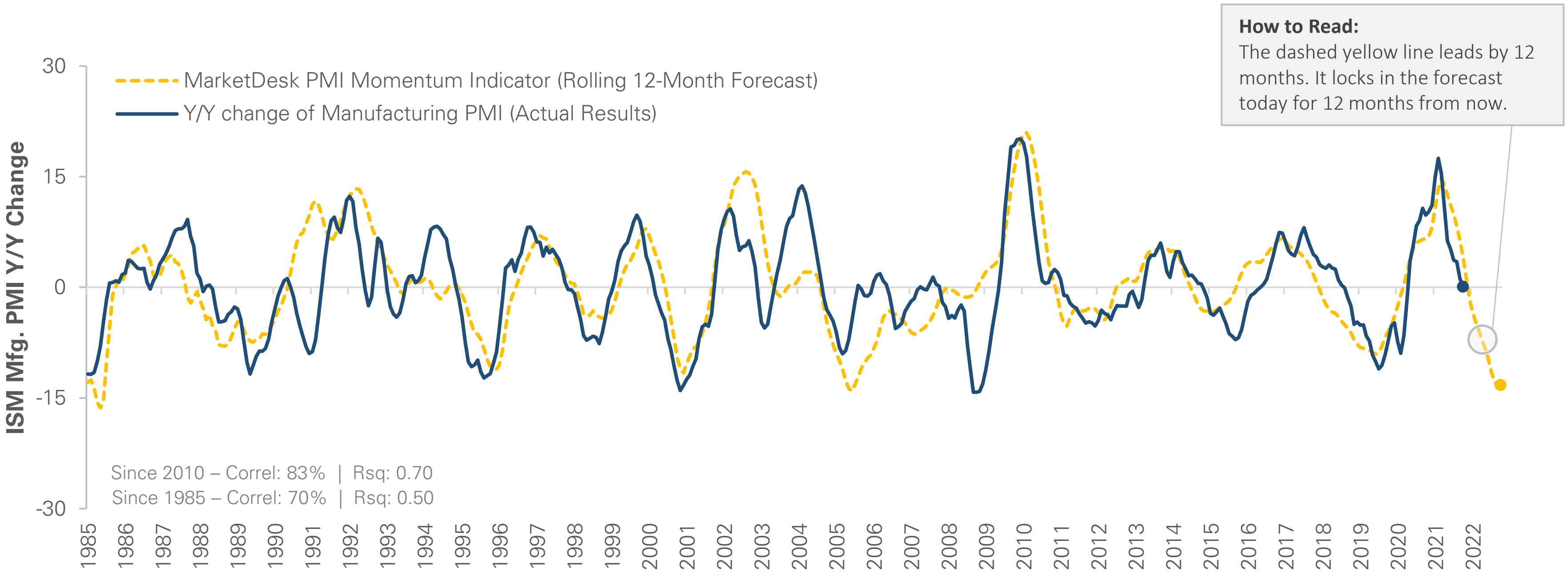
Indicator Overview

- The *U.S. PMI Momentum Indicator* forecasts U.S. manufacturing activity 12 months ahead
- Based on a composite of 14 macro inputs (regional Fed surveys, interest rates, commodity demand, monetary policy, business confidence, inflation, etc.) that exhibit a high statistical correlation with the year-over-year change in Manufacturing PMI.
- The leading indicator (1) provides a 12-month view into the overall direction of U.S. manufacturing activity, and (2) informs portfolio positioning across asset classes, sectors, industries, and bonds.



Data as of 1/31/2022. Visit www.QuantPack.com/plans to see the indicator's latest forecast.

What is the Manufacturing PMI?

- PMI = Purchasing Managers' Index
- Monthly survey of data collected from hundreds of companies across various industries. The survey measures the overall health of the economy across a variety of factors: new orders, production levels, employment, and supplier deliveries.
- PMI reading above 50 = Economic Expansion
- PMI reading below 50 = Economic Contraction

Market Impacts

Figure 1 – Stock Markets Follow PMI Trends

- The chart graphs the year-over-year change in the S&P 500 against the Manufacturing PMI since 1990.
- Stock market performance tends to follow the path of PMI. As the PMI reading weakens and drops below 50, the probability of negative S&P 500 returns increases. As the PMI strengthens and rises above 50, the market tends to see stronger returns.

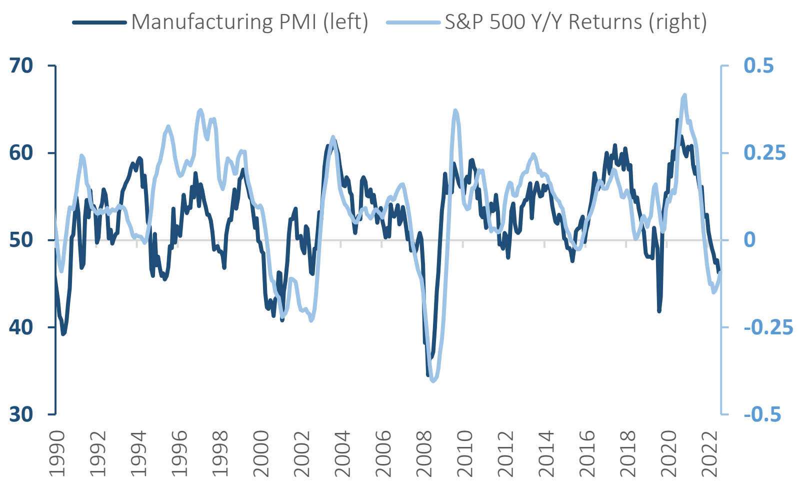
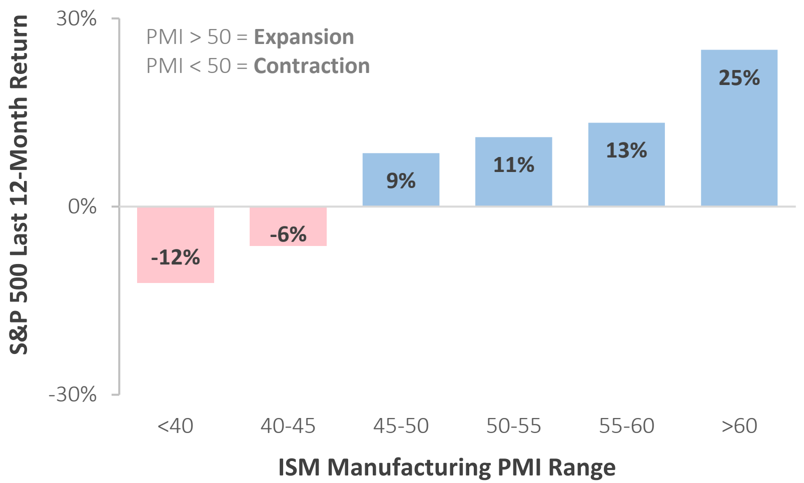


Figure 2 – S&P 500 Performance

- The chart graphs the S&P 500's average last 12-month (LTM) returns based on several PMI ranges.
- When the PMI rises to > 60, the average LTM return is +25%. When the PMI falls to < 40, the average LTM return is -12%.



Data as of 4/30/2023

Market Impacts (continued)

Figure 3 – Corporate Earnings

- The chart graphs the S&P 500 EPS Surprise Ratio vs the Manufacturing PMI since 2000. The EPS Surprise Ratio is calculated as actual earnings vs Wall Street's estimate 12-months ago. A reading below zero means earnings came in below Wall Street expectations.
- When PMI falls below 50, the EPS Surprise Ratio tends to be negative. When PMI rises above 50, actual earnings results tend to beat Wall Street expectations.

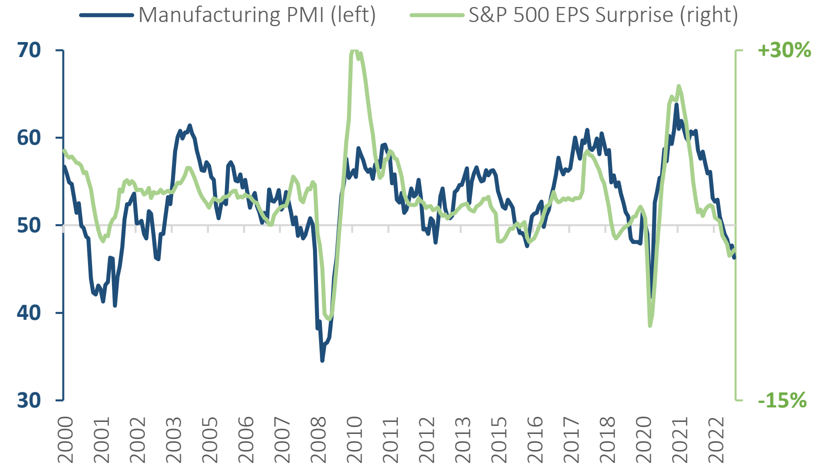
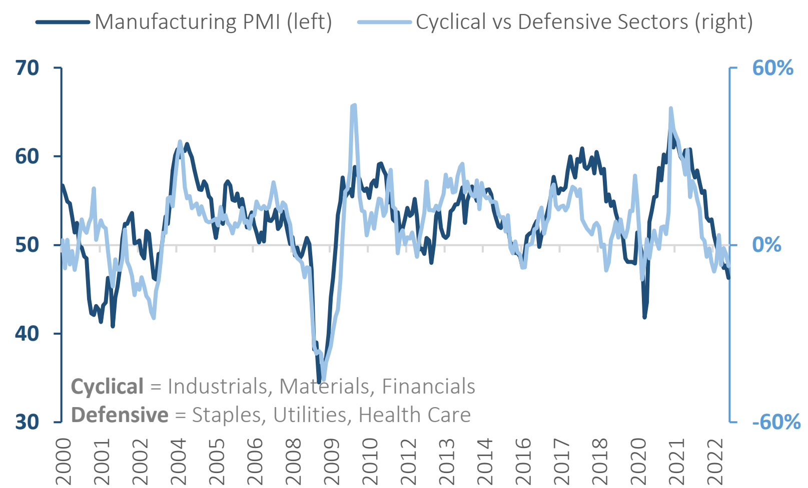


Figure 4 – Sector Rotation (Cyclical vs Defensive)

- History shows PMI data has implications for various asset classes, such as individual sectors and industries.
- The chart graphs the rolling 1-year relative performance gap between cyclical sectors and defensive sectors. When PMI falls below 50, defensive sectors tend to outperform. When PMI rises above 50, cyclical sectors tend to outperform.

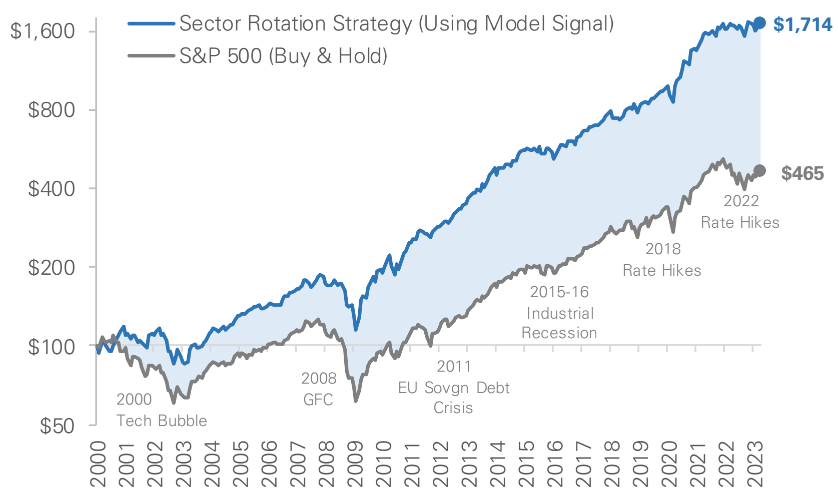


Data as of 4/30/2023

Model Signal #1 – Sector Rotation Strategy

- **Model Signal** – When *U.S. PMI Momentum Indicator* is above zero (page 3), own Defensive Sector ETFs (XLU, XLV, XLP). When the indicator is below zero, own Cyclical Sector ETFs (XLB, XLI, XLY). The portfolio is rebalanced monthly to equal weight.
- Compared to a buy and hold S&P 500 strategy, the model signal produces a higher average annual return, higher percentage of positive returns, higher up capture ratio, lower down capture ratio, and higher max risk / reward ratio.

Total Returns – U.S. Sector Rotation Model



Source: MarketDesk Quant Pack. Defensive Sector ETFs: XLU, XLV, XLP. Cyclical Sector ETFs: XLB, XLI, XLY. The portfolio is rebalanced monthly.

Performance Statistics – U.S. Sector Rotation Model

Annual Statistics of Returns & Risks	S&P 500 (Benchmark)	U.S. Sector Rotation Model
Average Return	8.2%	14.3%
Strategy CAGR	**6.8%**	**13.0%**
Max Drawdown	-51%	-38%
% of Positive Years	**74%**	**83%**
Up Capture	100%	124%
Down Capture	100%	27%
Net Capture	**-**	**+98%**
Max Positive Year	32%	40%
Max Negative Year	-37%	-22%
Max Risk / Reward	**0.88**	**1.84**

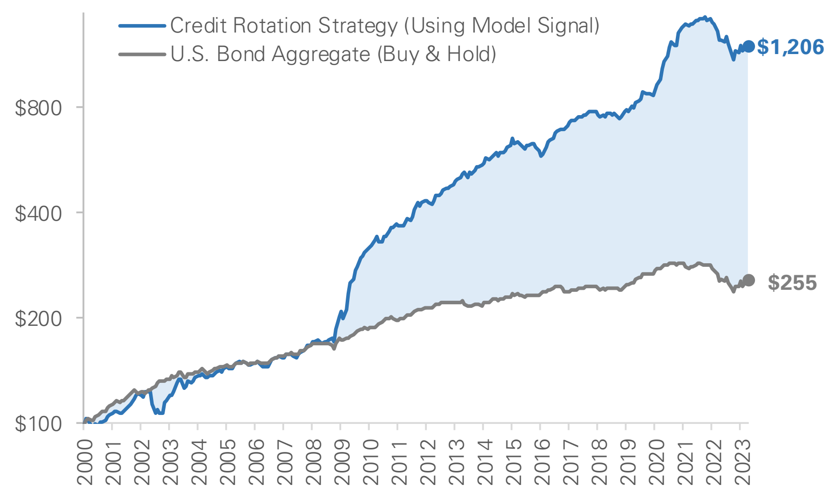
Source: MarketDesk Quant Pack. Based on annual calendar year returns.

Data as of 4/30/2023. Past performance does not guarantee future results. The performance information shown herein does not reflect the deduction of advisory and/or other fees normally incurred in the management of a portfolio. Hypothetical performance results are presented for illustrative purposes only.

Model Signal #2 – Credit Rotation Strategy

- **Model Signal** – When *U.S. PMI Momentum Indicator* is above zero (see page 3), own High-Quality Credit Sectors (MBS and U.S. Treasuries). When the indicator is below zero, own Low-Quality Credit Sectors (High Yield, Fallen Angels, and Convertible Bonds). The portfolio is rebalanced monthly to equal weight.
- Compared to a buy and hold Bond Aggregate strategy, the model signal produces a higher average annual return, higher percentage of positive returns, higher up capture ratio, lower down capture ratio, and higher max risk / reward ratio.

Total Returns – Credit Sector Rotation Model



Source: MarketDesk Quant Pack. High-Quality Credit Sectors: 10Y U.S. Treasuries and Mortgage Backed Securities (MBS). Low-Quality Credit Sectors: High Yield, Fallen Angels, and Convertibles. The portfolio is rebalanced monthly.

Performance Statistics – Credit Sector Rotation Model

Annual Statistics of Returns & Risks	Bond Aggregate (Benchmark)	Credit Sector Rotation Model
Average Return	4.1%	12.3%
Strategy CAGR	**4.1%**	**11.3%**
Max Drawdown	-17%	-24%
% of Positive Years	**87%**	**83%**
Up Capture	100%	254%
Down Capture	100%	1%
Net Capture	**-**	**+253%**
Max Positive Year	12%	57%
Max Negative Year	-13%	-20%
Max Risk / Reward	**0.92**	**2.81**

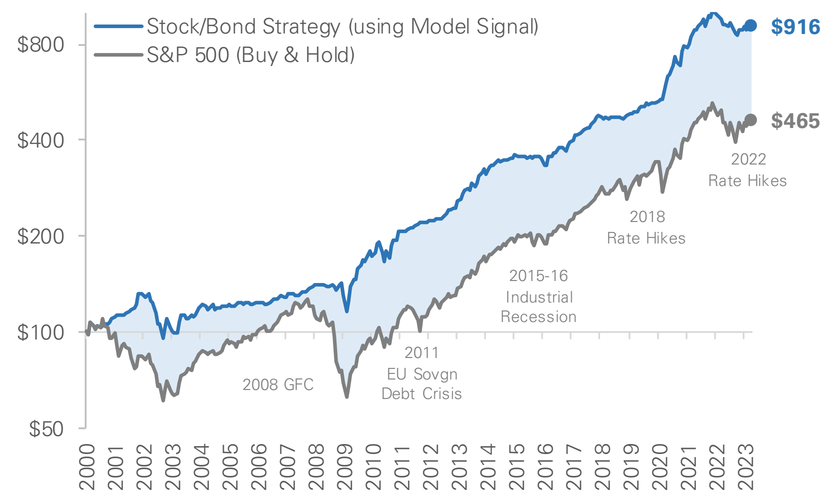
Source: MarketDesk Quant Pack. Based on annual calendar year returns.

Data as of 4/30/2023. Past performance does not guarantee future results. The performance information shown herein does not reflect the deduction of advisory and/or other fees normally incurred in the management of a portfolio. Hypothetical performance results are presented for illustrative purposes only.

Model Signal #3 – Stock / Bond Rotation Strategy

- **Model Signal** – When *U.S. PMI Momentum Indicator* is above zero (see page 3), own 100% Stock Exposure (SPY ETF). When the indicator is below zero, own 100% Bond Exposure (AGG ETF). The portfolio is rebalanced monthly to equal weight.
- Compared to a buy and hold S&P 500 strategy, the model signal produces a higher average annual return, higher percentage of positive returns, higher up capture ratio, lower down capture ratio, and higher max risk / reward ratio.

Total Returns – Stock/Bond Rotation Model



Source: MarketDesk Quant Pack. Stock exposure: S&P 500 (SPY ETF). Bond exposure: U.S. Bloomberg Bond Aggregate (AGG ETF). The portfolio is rebalanced monthly.

Performance Statistics – Stock/Bond Rotation Model

Annual Statistics of Returns & Risks	S&P 500 (Benchmark)	Stock / Bond Rotation Model
Average Return	8.2%	10.9%
Strategy CAGR	**6.8%**	**10.0%**
Max Drawdown	-51%	-28%
% of Positive Years	**74%**	**87%**
Up Capture	100%	89%
Down Capture	100%	3%
Net Capture	**-**	**+86%**
Max Positive Year	32%	52%
Max Negative Year	-37%	-22%
Max Risk / Reward	**0.88**	**2.35**

Source: MarketDesk Quant Pack. Based on annual calendar year returns.

Data as of 4/30/2023. Past performance does not guarantee future results. The performance information shown herein does not reflect the deduction of advisory and/or other fees normally incurred in the management of a portfolio. Hypothetical performance results are presented for illustrative purposes only.

Key Takeaways

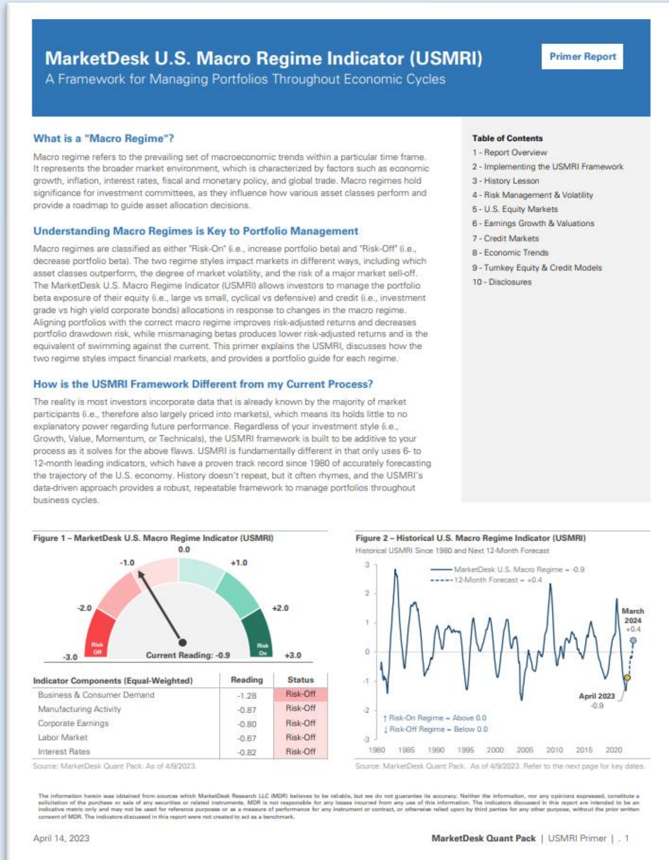
- PMI is a monthly survey of manufacturing activity and provides insight into the overall health of the economy

- Key Market Impacts:
  1. Stock market performance tends to follow the path of PMI (i.e., PMI ↓ = S&P 500 ↓)
  2. PMI informs positioning across sectors, industries, and bonds
  3. Corporate earnings tend to follow manufacturing PMI activity

- Model Signals Average Annual Returns:
  1. Sector Rotation Strategy +14.3% (vs S&P 500 8.2%)
  2. Credit Rotation Strategy +12.3% (vs Bond Aggregate +4.1%)
  3. Stock/Bond Rotation Strategy +10.9% (vs S&P 500 8.2%)

- The *U.S. PMI Momentum Indicator* provides a 12-month forecast of Manufacturing PMI, allowing you to proactively manage risk and optimize portfolio positioning. The *Quant Pack* is a data subscription with access to 20+ proprietary leading indicators built to guide asset allocation decisions, eliminate guesswork, enhance investment returns, and decrease your research workload.

[BONUS] Free Copy of the U.S. Macro Regime Indicator



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 is already known by the majority of market participants (i.e., therefore also largely priced into markets), which means its holds little to no explanatory power regarding future performance. Regardless of your investment style (i.e., Growth, Value, Momentum, or 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

Source: MarketDesk Quant Pack. As of 4/9/2023. Refer to the next page for key dates.

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April 14, 2023 — **MarketDesk Quant Pack** | USMRI Primer | . 1

Report Overview

This primer provides an overview of the macro regime indicator and how to implement it into your portfolio management process.

MarketDesk U.S. Macro Regime Indicator

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. It aggregates 20+ Quant Pack indicators to produce one straightforward signal to increase or decrease your portfolio risk.

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