

HEDGEYE



# HEDGEYE'S CURRENT MARKET OUTLOOK

New Year; Same Process

Updated: February 5<sup>th</sup>, 2021



## MACRO THEMES

USA #Quad2

Global #Quad2

Short Deflation/Duration

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## [1] USA #Quad2

Aided by easy money from the Fed and generous fiscal support from Congress, the US economy is set to enter its third consecutive quarter of #Quad2 here in 1Q21E. While sequential momentum has waned in recent weeks due to covid restrictions, we don't believe GROWTH, INFLATION, and/or PROFITS can slow fast enough in JAN-FEB to offset the massive accelerations we're going to see in all three starting in MAR. In the presentation, we'll detail how investors should setup to take advantage of these trending **Positive RoC** realities.

## [2] Global #Quad2

The "cheap money + fiscal support + easy comps = #Quad2" equation is not just a US phenomenon. Indeed, #Quad2 represents the modal outcome for the 96% of the ~50 countries and economic blocs we maintain GIP Models for in 1Q21E. That setup is explicitly bearish for the US dollar and bullish for assets priced in US dollars, globally. In the presentation, we'll detail which geographies offer investors the best risk/reward setups from here.

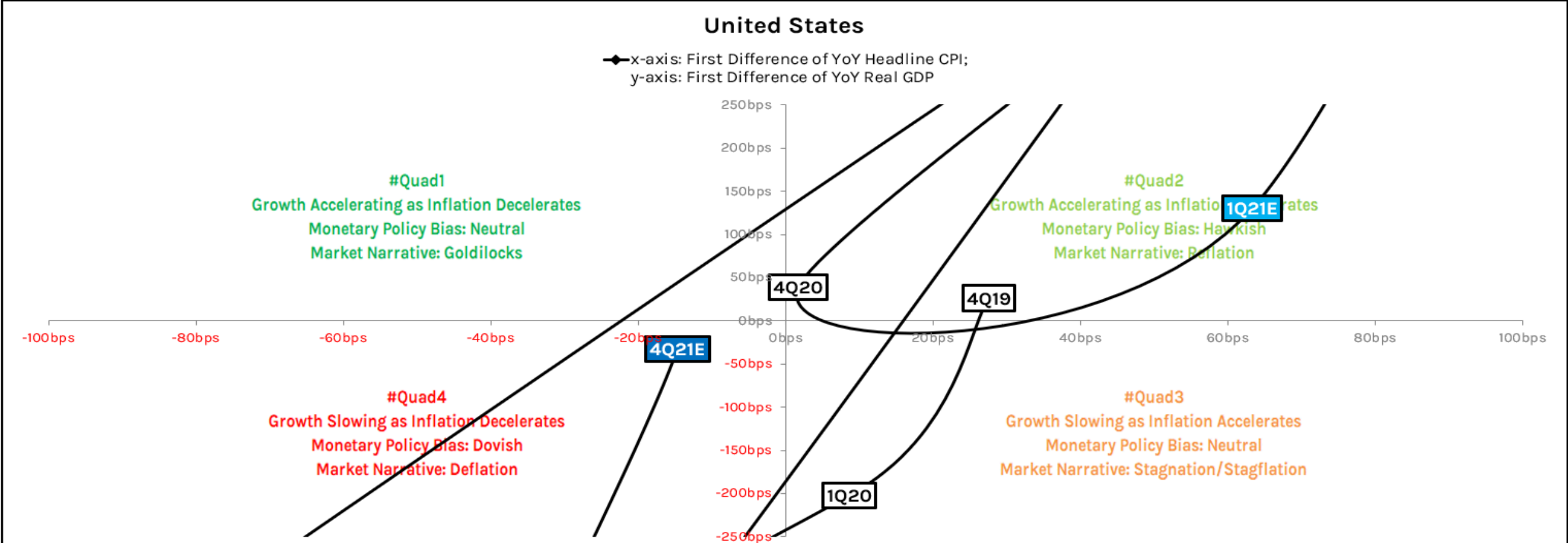
## [3] Short Deflation/Duration

While the Fed has no plans to tighten monetary policy (at the margins) anytime soon, that doesn't mean #TheMachine has no plans to sell duration risk in the coming months. Indeed, Global #Quad2 means the long ends of the Bund, OAT, Gilt, JGB, etc. curves all backing up simultaneously and we don't think the Treasury curve will be immune to such selling pressure. In the presentation, we'll show the evolving POLICY mix - both domestically and globally - is likely to contribute to the ongoing breakout in INFLATION expectations we anticipated all the way back in early June.

# What Are The Quads?

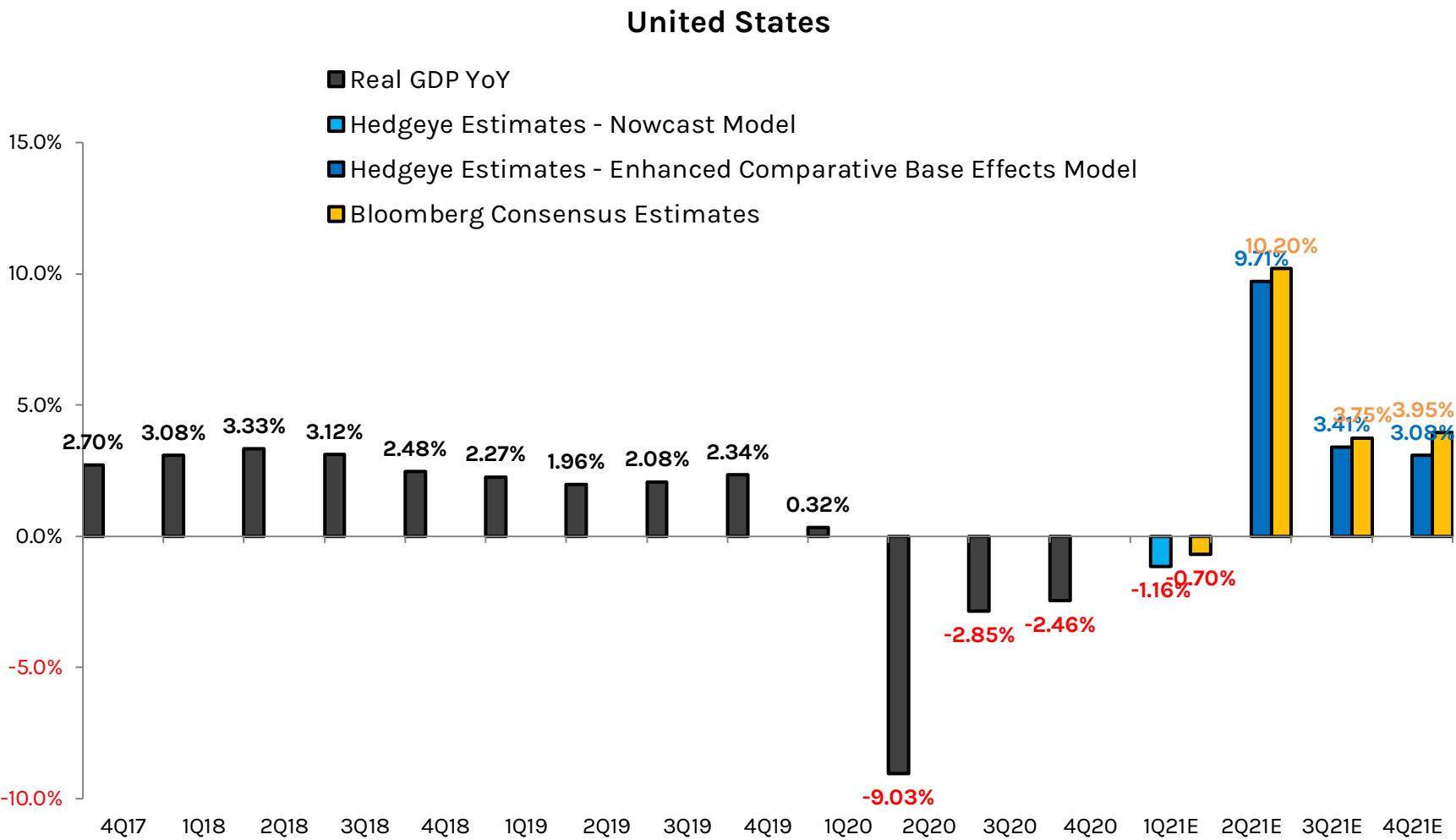
Our GIP Model is a quantitatively oriented, regime-based framework that helps investors proactively prepare for volatility phase transitions within and across asset classes by triangulating the three factors that matter most to Macro Risk Management – i.e. GROWTH, INFLATION, and POLICY.

United States	1Q18	2Q18	3Q18	4Q18	1Q19	2Q19	3Q19	4Q19	1Q20	2Q20	3Q20	4Q20	← Actuals   Estimates →	1Q21E	2Q21E	3Q21E	4Q21E
Real GDP QoQ SAAR	3.80%	2.70%	2.10%	1.30%	2.90%	1.50%	2.60%	2.40%	-5.00%	-31.40%	33.40%	4.00%	Real GDP QoQ SAAR	0.23%	4.06%	5.24%	2.68%
Real GDP YoY	3.08%	3.33%	3.12%	2.48%	2.27%	1.96%	2.08%	2.34%	0.32%	-9.03%	-2.85%	-2.46%	Real GDP YoY	-1.16%	9.71%	3.41%	3.08%
2yr Comparative Base Effects	1.92%	1.80%	1.98%	2.39%	2.52%	2.75%	2.74%	2.59%	2.62%	2.64%	2.60%	2.41%	2yr Comparative Base Effects	1.29%	-3.53%	-0.39%	-0.06%
Headline CPI YoY	2.21%	2.71%	2.64%	2.20%	1.64%	1.81%	1.76%	2.03%	2.12%	0.36%	1.22%	1.24%	Headline CPI YoY	1.87%	2.99%	2.59%	2.44%
2yr Comparative Base Effects	1.81%	1.48%	1.54%	1.98%	2.38%	2.31%	2.30%	2.18%	1.93%	2.26%	2.20%	2.13%	2yr Comparative Base Effects	1.88%	1.09%	1.49%	1.64%



Data Source: Bloomberg. Light Blue box = Hedgeye Nowcast Model estimates. Dark Blue boxes = Hedgeye Comparative Base Effects Model estimates. © Hedgeye Risk Management

# US Real GDP YoY Projections

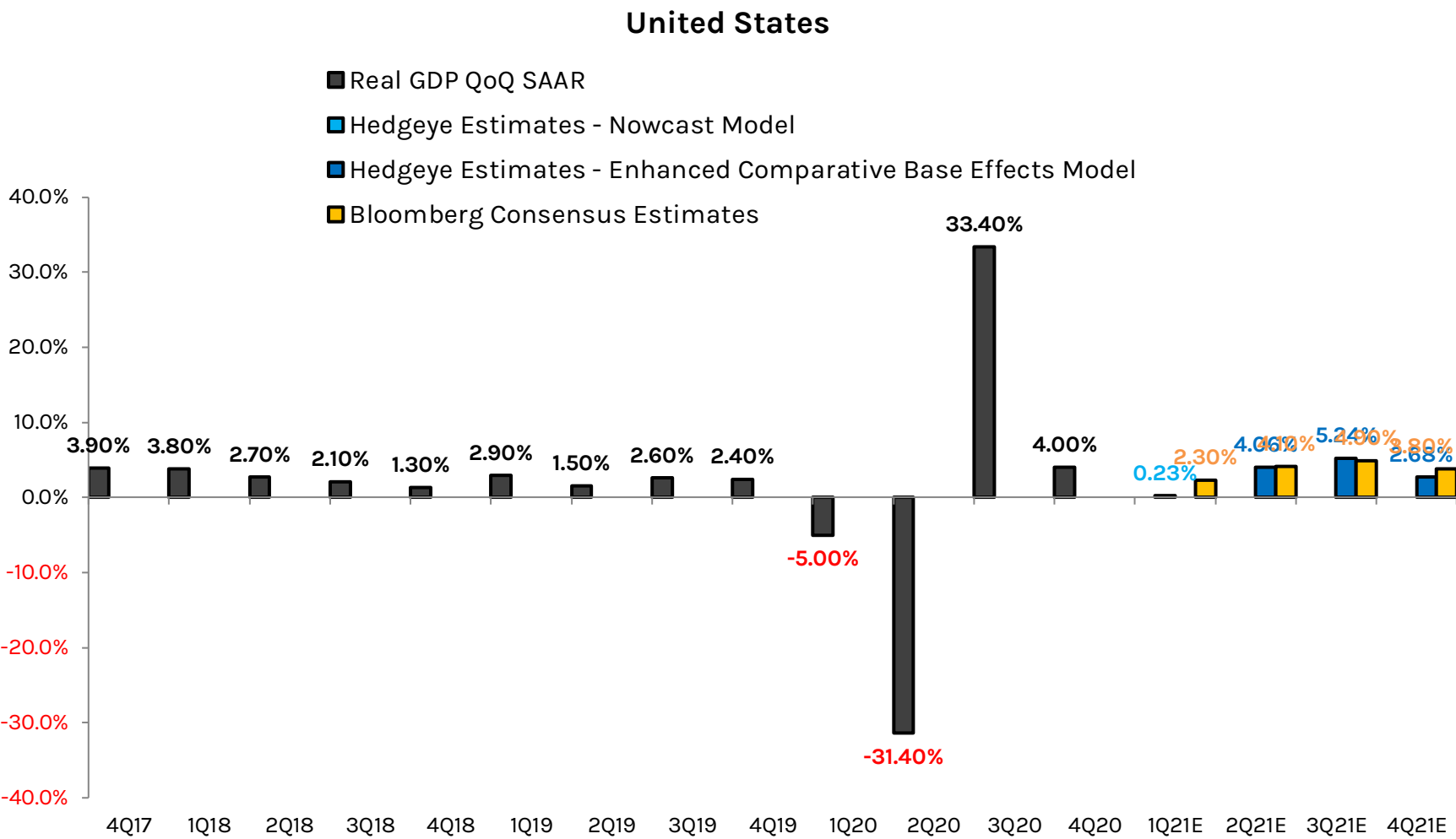


We use two distinct models to forecast the YoY growth rate of Real GDP and the combination of the two allows us to develop both a highly accurate real-time assessment of near-term economic momentum, as well as a high-probability scenario for where growth is likely to trend over the NTM.

Intra-quarter, we employ a stochastic nowcasting framework that anchors on nonlinear interpolation to relay rate of change signals from the individual features of the dynamic factor model to the base rate. In out-quarters where high-frequency data has yet to be reported, we employ a Bayesian Inference process that adjusts each of the preceding forecasted base rates inversely and proportionally to changes in the base effects.

All told, our US GDP nowcast model has an average absolute forecast error of 47bps and an 90% success rate in terms of accurately projecting the rate of change of GROWTH.

# US Real GDP QoQ SAAR Projections



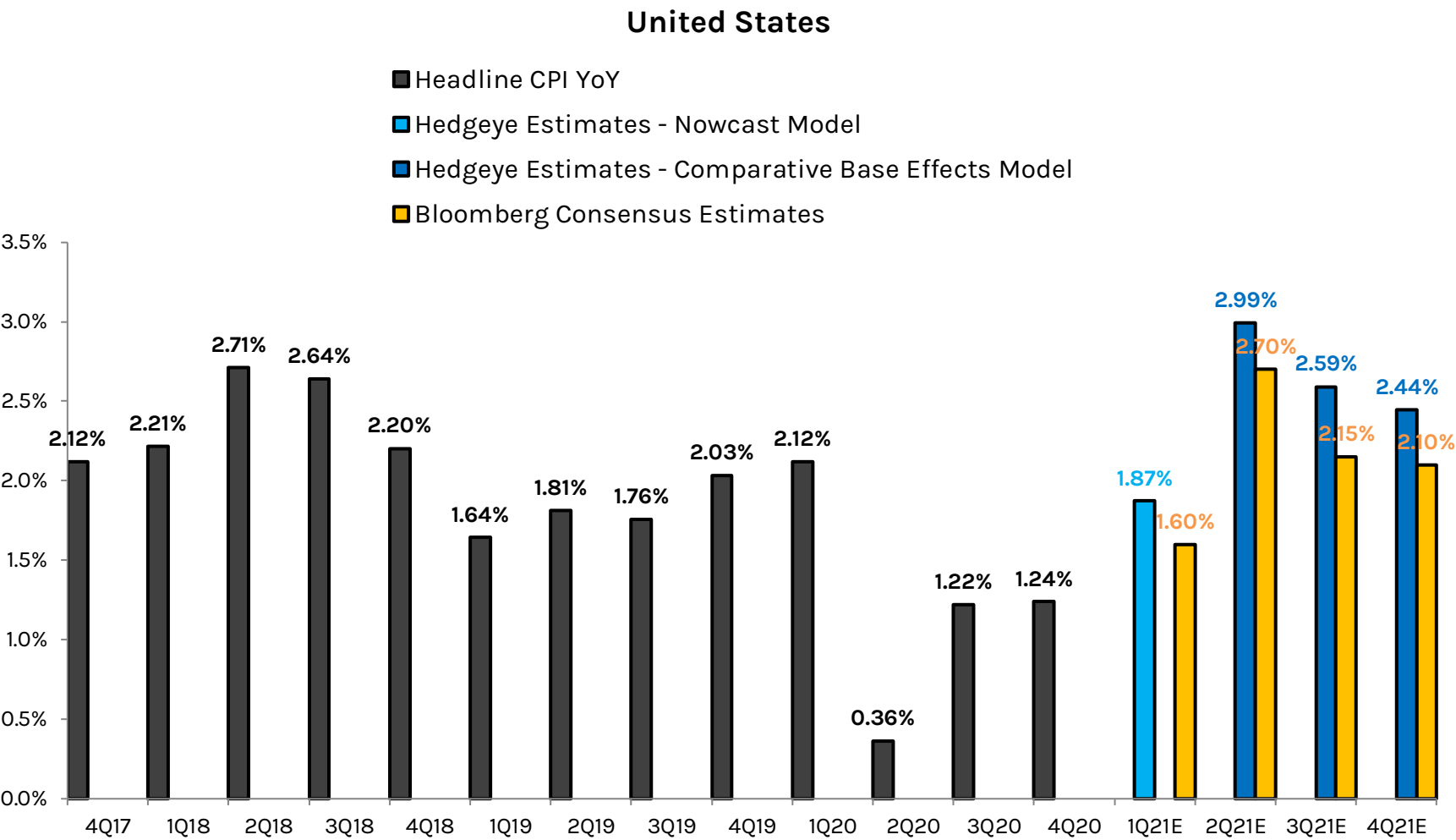
One differentiating factor of our forecasting process is that we aim to solve for where the economy is trending on a **Full Investing Cycle** basis, rather than trying to identify super short-term economic momentum.

Our rigorous study of financial market history suggests the latter to be little more than noise in the context of making accurate intermediate-to-long-term investment decisions.

As such, we are comfortable departing from the [perceived] “best” practices of economist consensus by interpolating our QoQ SAAR forecasts from our forecasted YoY growth rates. Macroeconomic Theory ≠ Macro Risk Management.



# US Headline CPI YoY Projections



We use two distinct models to forecast the YoY growth rate of Headline CPI and the combination of the two allows us to develop both a highly accurate real-time assessment of near-term inflation momentum, as well as a high-probability scenario for where inflation is likely to trend over the NTM.

Intra-quarter, we employ a stochastic nowcasting framework that anchors on nonlinear interpolation to relay rate of change signals from the individual features of the dynamic factor model to the base rate. In out-quarters where high-frequency data has yet to be reported, we employ a Bayesian Inference process that adjusts each of the preceding forecasted base rates inversely and proportionally to changes in the base effects.

All told, our US CPI nowcast model has an average absolute forecast error of 21bps and an 78% success rate in terms of accurately projecting the rate of change of INFLATION.

# US Real GDP Nowcast Model

Each of the following 30 features backtests as statistically significant with respect to predicting the rate of change of Real GDP growth and each feature's contribution to the overall signal is dynamically re-trained each quarter according to the relative strength of its first difference regression with the dependent variable.

HEDGEYE US NOWCAST MODEL SUMMARY	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	4Q20	1Q21	Δ
Real PCE YoY (1)	2.43	2.34	2.55	2.44	2.33	2.58	2.30	2.06	3.02	2.69	2.61	-4.69	-16.53	-9.64	-4.58	-3.61	-2.94	-1.95	-1.90	-2.65	-3.28	-	-	-	-2.61	-	-
Real Disposable Personal Income YoY (14)	2.39	2.05	1.85	1.58	1.79	2.02	1.81	2.10	0.83	1.55	2.01	0.63	16.67	11.10	8.92	9.41	5.24	5.71	4.80	2.84	3.33	-	-	-	3.66	-	-
Personal Savings Rate % of DPI (6)	7.5	7.3	7.1	7.0	7.3	7.3	7.2	7.5	7.2	7.6	8.3	12.9	33.7	24.7	19.0	18.5	15.0	14.4	13.6	12.9	13.7	-	-	-	13.4	-	-
Headline Retail Sales YoY (9)	3.86	2.90	3.44	3.57	4.30	3.71	3.09	3.32	5.65	4.87	4.48	-5.59	-19.86	-5.55	2.23	2.70	3.61	6.09	5.44	3.68	2.90	-	-	-	4.01	-	-
Retail Sales Control Group YoY (13)	3.86	3.45	4.97	4.83	4.97	4.32	4.05	2.50	6.29	3.70	4.01	6.32	-7.46	1.50	7.01	7.76	8.66	10.29	9.55	8.71	6.36	-	-	-	8.20	-	-
Auto Sales YoY (11)	-3.93	2.91	-0.46	0.84	2.23	-1.21	-5.43	-1.78	-4.57	1.45	1.63	-35.03	-47.68	-29.42	-24.57	-13.67	-10.49	-4.94	-2.05	-9.01	-2.57	-1.25	-	-	-4.55	-1.25	3.30
MBA Mortgage Purchase Index YoY (24)	5.56	5.11	8.16	6.21	5.97	10.50	9.34	11.00	9.05	9.09	10.61	-2.10	-29.85	-1.13	15.98	17.46	26.46	22.26	22.95	20.54	24.68	14.18	-	-	22.72	14.18	-8.55
Total Employees On Nonfarm Payrolls YoY (7)	1.41	1.26	1.24	1.26	1.24	1.32	1.30	1.40	1.34	1.39	1.62	0.38	-13.50	-11.66	-8.55	-7.52	-6.59	-6.25	-5.93	-5.90	-6.15	-6.31	-	-	-5.99	-6.31	-0.32
Aggregate Hours Worked YoY (2)	1.11	0.97	0.94	0.68	0.95	1.32	1.01	1.10	0.75	0.80	1.62	-0.78	-14.01	-10.89	-8.01	-6.71	-5.78	-5.16	-4.83	-4.53	-5.05	-4.40	-	-	-4.80	-4.40	0.41
Aggregate Labor Income YoY (4)	4.46	4.30	4.38	4.09	4.43	4.43	4.26	4.42	3.72	3.87	4.66	2.72	-6.99	-4.94	-3.44	-2.29	-1.39	-0.62	-0.52	-0.21	0.10	0.75	-	-	-0.21	0.75	0.96
Monthly Initial Jobless Claims YoY (3)	-4.20	-2.23	2.48	-3.12	0.75	0.12	-0.82	-5.95	4.62	-7.12	-7.20	1075.85	2245.45	1024.38	574.43	509.26	373.87	382.26	293.17	231.63	203.60	228.08	-	-	242.80	228.08	-14.72
Bloomberg Consumer Comfort Index (12)	60.3	60.2	62.3	64.2	62.0	62.6	62.7	59.2	62.2	66.1	65.3	60.9	43.8	36.0	40.9	44.1	44.3	48.7	47.3	48.8	47.3	44.3	-	-	47.8	44.3	-3.5
Industrial Production YoY (8)	0.71	1.73	1.02	0.40	0.30	-0.18	-0.81	-0.42	-0.81	-0.85	-0.24	-4.70	-16.26	-15.72	-10.50	-6.58	-6.55	-6.28	-4.97	-5.41	-3.58	-	-	-	-4.65	-	-
Capacity Utilization (5)	77.8	77.8	77.7	77.4	77.8	77.4	77.0	77.6	77.2	76.9	76.9	73.6	64.2	64.8	68.9	71.8	72.3	72.3	73.0	73.4	74.5	-	-	-	73.7	-	-
Durable Goods New Orders YoY (22)	-1.66	-3.96	-4.41	0.38	-3.27	-5.73	-1.61	-3.95	-3.27	-3.62	1.62	-18.64	-30.29	-18.64	-12.42	-4.50	-4.54	-1.62	0.22	4.26	1.88	-	-	-	2.12	-	-
Core Capital Goods New Orders YoY (28)	2.25	0.84	0.49	-3.29	0.10	-0.12	-0.74	3.43	1.67	0.56	0.97	-2.63	-7.25	-4.34	-2.34	0.55	3.52	5.68	7.17	7.45	8.73	-	-	-	7.78	-	-
Factory Orders YoY (18)	0.84	-1.29	-2.25	0.48	-1.75	-3.28	-1.31	-1.16	0.29	-0.55	0.53	-12.43	-22.74	-16.08	-10.40	-6.01	-5.47	-3.74	-2.53	-0.18	-0.83	-	-	-	-1.18	-	-
Manufacturing & Trade Inventories YoY (26)	5.29	5.29	5.10	4.77	4.01	3.39	2.83	2.62	1.87	0.77	-0.16	-0.48	-2.25	-4.80	-5.75	-5.88	-5.45	-4.55	-3.88	-3.23	-	-	-	-3.56	-	-	
Nonresidential Construction Spending YoY (30)	4.93	4.38	5.12	5.85	5.24	8.88	8.34	11.18	9.05	7.75	5.78	4.30	-0.10	0.83	1.41	-0.17	-2.11	-4.40	-2.83	-4.21	-4.84	-	-	-	-3.96	-	-
Residential Construction Spending YoY (29)	-7.78	-7.49	-4.63	-2.27	0.99	1.66	4.00	6.33	9.80	11.72	13.40	12.15	6.10	1.81	3.34	6.24	11.67	11.94	16.93	18.30	20.75	-	-	-	18.66	-	-
ISM Manufacturing PMI (23)	53.6	52.2	51.3	51.0	48.4	48.3	48.3	48.2	47.7	51.1	50.3	49.7	41.7	43.1	52.2	53.7	55.6	55.7	58.8	57.7	60.5	58.7	-	-	59.0	58.7	-0.3
ISM Non-Manufacturing PMI (15)	55.6	56.2	55.0	54.2	55.8	52.9	54.6	53.9	55.6	55.9	56.7	53.6	41.6	45.4	56.5	56.6	57.2	57.2	56.2	56.8	57.7	58.7	-	-	56.9	58.7	1.8
NFIB Small Business Optimism Index (20)	103.5	105.0	103.3	104.7	103.1	101.8	102.4	104.7	102.7	104.3	104.5	96.4	90.9	94.4	100.6	98.8	100.2	104.0	104.0	101.4	95.9	-	-	-	100.4	-	-
Exports YoY (10)	-1.32	-1.01	-1.55	-0.07	-0.15	-1.87	-1.83	-0.42	1.22	-0.56	-0.65	-12.54	-28.86	-32.44	-24.77	-19.29	-17.51	-15.00	-13.60	-12.74	-10.18	-	-	-	-12.17	-	-
Imports YoY (16)	0.67	3.09	1.58	0.12	0.03	-2.87	-4.98	-3.63	-3.08	-2.39	-4.27	-11.03	-22.08	-24.26	-19.82	-11.31	-8.45	-6.41	-3.11	0.45	-0.23	-	-	-	-0.96	-	-
Rail Traffic YoY (17)	-2.42	-5.54	-4.59	-5.53	-5.04	-6.38	-7.91	-7.71	-9.38	-6.22	-6.74	-10.09	-20.91	-20.61	-14.29	-8.19	-5.95	-1.44	1.71	2.45	4.92	4.76	-	-	3.03	4.76	1.73
Headline CPI YoY (25)	2.00	1.79	1.65	1.81	1.75	1.71	1.76	2.05	2.29	2.49	2.33	1.54	0.33	0.12	0.65	0.99	1.31	1.37	1.18	1.17	1.36	-	-	-	1.24	-	-
PCE Deflator YoY (27)	1.62	1.49	1.46	1.53	1.52	1.39	1.43	1.44	1.64	1.88	1.84	1.34	0.48	0.54	0.92	1.01	1.24	1.35	1.19	1.12	1.28	-	-	-	1.20	-	-
Core PCE Deflator YoY (21)	1.69	1.60	1.71	1.74	1.87	1.72	1.74	1.58	1.62	1.75	1.87	1.65	0.93	1.01	1.14	1.26	1.43	1.53	1.41	1.37	1.45	-	-	-	1.41	-	-
M2 Money Supply YoY (19)	4.07	4.27	4.54	5.00	5.06	5.51	6.26	6.89	6.49	6.71	7.26	10.70	17.20	21.87	22.90	23.39	23.19	24.18	23.89	24.84	25.36	26.23	-	-	24.70	26.23	1.53

Data Source: Bloomberg, Intellectual Property of Hedgeye Risk Management. Nowcast feature rank shown in parenthesis.



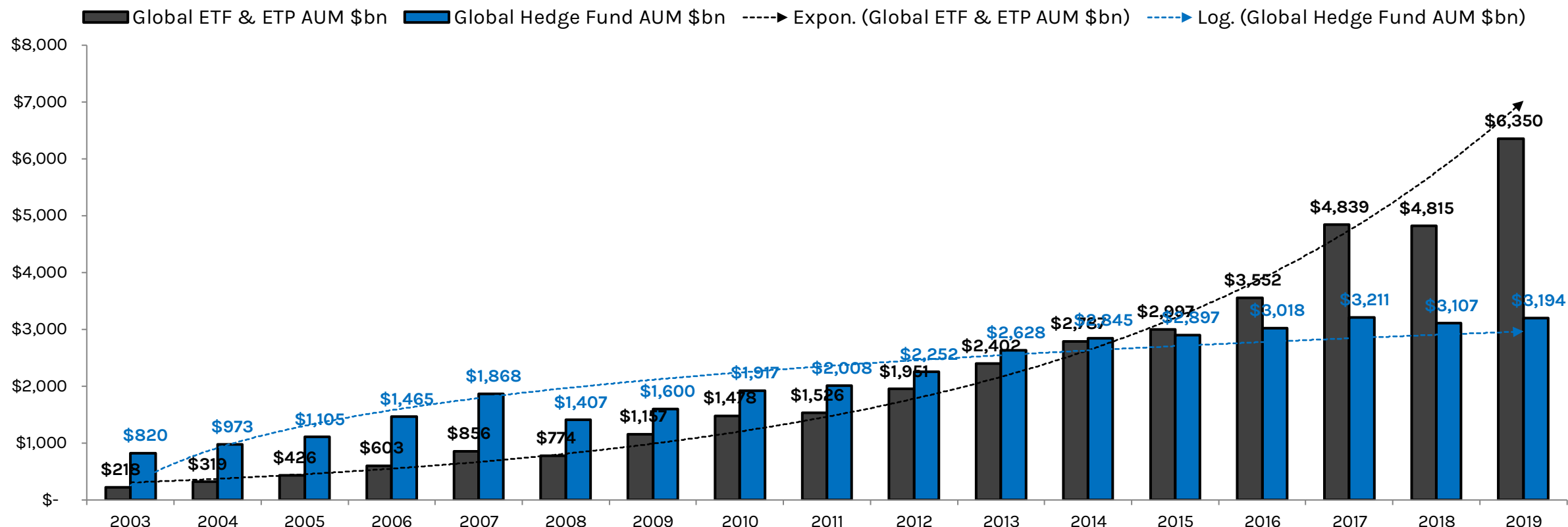
# OUR MACRO PROCESS



# The Investment Landscape Has Evolved Tremendously

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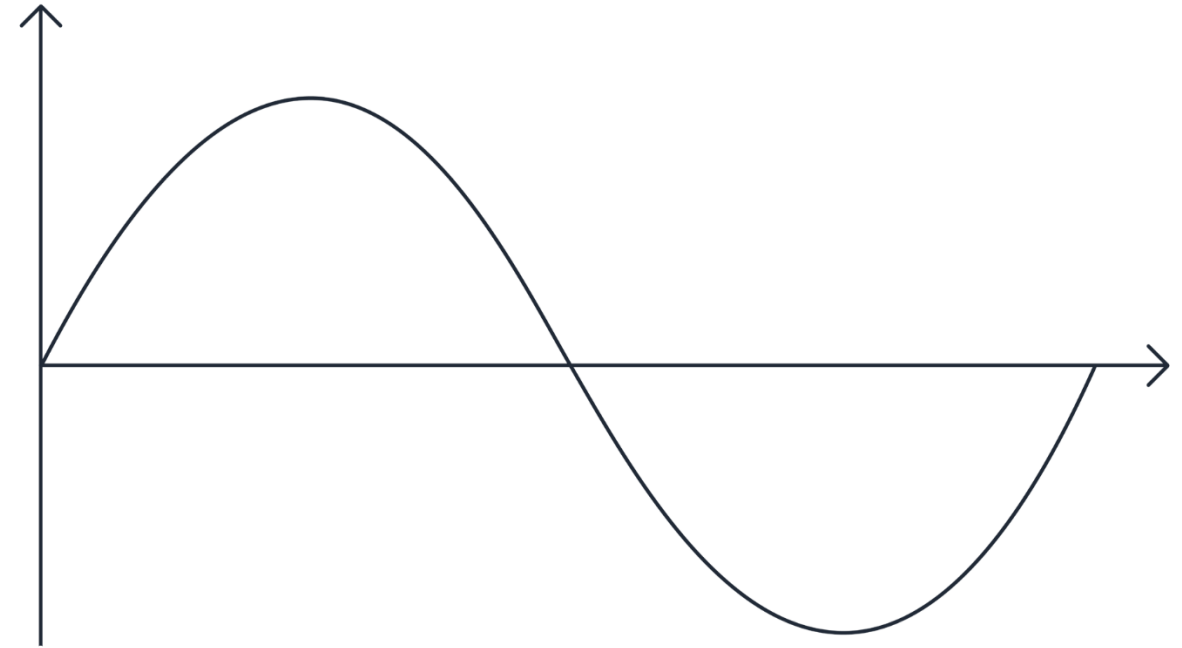
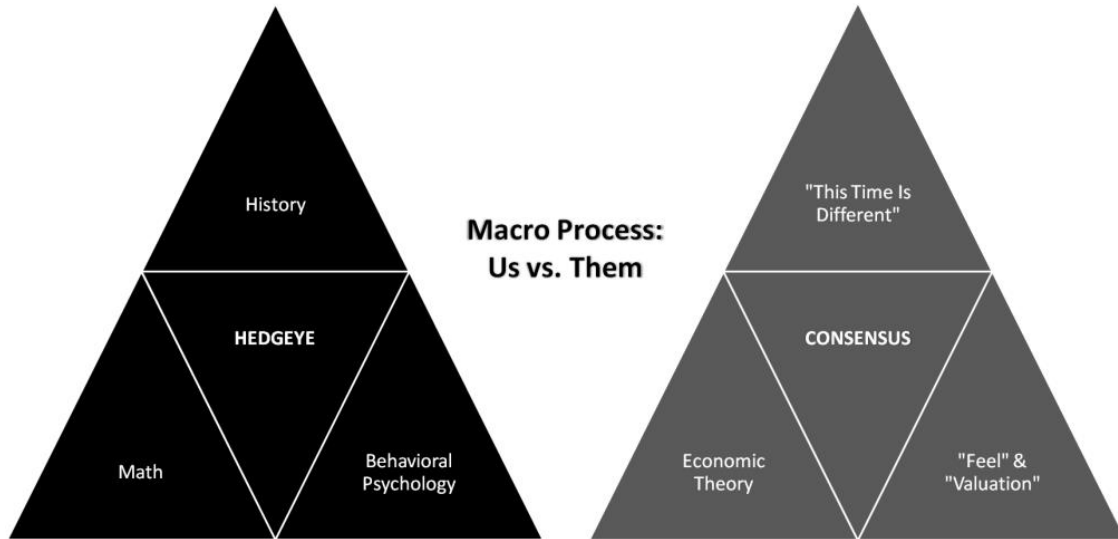
Stock-picking has given way to factor-picking and it's our job as investors to embrace this sea change, rather than fight it.



## Skate To Where The Puck Is Going Within Asset Management

AUM in listed ETFs and ETPs surpassed \$6 trillion globally as of YE 2019, topping global hedge fund assets by over \$3 trillion. Moreover, BlackRock anticipates ETF/ETP AUM to double to \$12 trillion over the next 5 years. Regardless of whether you agree with this projection, you must agree that **the proliferation of factor-based index investing and the concentration of hedge fund AUM at market-neutral platforms has made financial markets more sensitive to Macro risks than ever before.** For example, JPM estimates systematic trading accounts for over 90% of US equity trading volume. **Are your research and risk management processes equipped to compete for alpha in this new regime?**

# ... So We Evolved Alongside It



## WE ARE DIFFERENTIATED FROM THE HERD

**Macroeconomic Research** and **Global Macro Risk Management** are two very different fields. We specialize in the latter, incorporating key lessons from behavioral finance such as Prospect Theory and Bayesian Inference into our analysis. **We don't "feel" anything with regards to the markets or the economy; if we can't contextualize it with math, we don't have a view on it.**

## ...BECAUSE WE FOCUS ON THE FACTS

**Rate of change** accelerations and decelerations are facts, not opinions, and our process is focused on contextualizing these facts, rather opining on the validity of **absolute levels** of growth, inflation, and/or policy. **This focus helps us consistently spot inflections in the performance of key factor exposures, across asset classes, 3-6 months ahead of investor consensus.**



# Quarterly Expected Values By GIP Model Quad Regime

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Hedgeye Macro US GIP Model Backtest	EV by Quadrant				Shallow GDP Δ				Deep GDP Δ				Fed Easing				Fed On Hold				Fed Tightening				Quad 1 Prior				Quad 2 Prior				Quad 3 Prior				Quad 4 Prior				Global Quad			
Exposure	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	11	12	13	14	21	22	23	24	31	32	33	34	41	42	43	44	1	2	3	4
S&P 500 INDEX (SPY)	6.8%	2.9%	1.0%	-1.4%	4.8%	2.3%	3.1%	5.0%	9.2%	1.2%	-3.7%	-6.6%	9.1%	7.2%	1.2%	-3.8%	3.7%	-0.4%	-0.8%	-0.2%	6.7%	2.9%	3.8%	0.9%	15.1%	2.3%	1.8%	-1.7%	3.7%	3.5%	4.0%	-19.6%	3.6%	0.7%	-2.0%	-1.1%	7.9%	6.5%	4.7%	1.2%	4.6%	2.5%	4.0%	-0.9%
Communication Services (XLC)	7.0%	-1.4%	0.7%	0.1%	8.7%	-1.7%	4.5%	6.8%	6.3%	-4.8%	-6.2%	-3.7%	10.0%	4.2%	2.6%	-2.6%	2.0%	-5.2%	-2.2%	3.5%	7.9%	-1.8%	3.2%	1.0%	17.1%	-2.3%	0.5%	1.1%	5.0%	-0.9%	5.4%	-17.0%	4.0%	-2.4%	-1.6%	1.9%	6.8%	1.7%	2.7%	-0.3%	1.7%	1.9%	2.9%	0.2%
Consumer Cyclical (XLY)	8.4%	3.2%	1.1%	-0.3%	4.8%	2.1%	2.1%	6.0%	13.2%	2.1%	-2.0%	-5.4%	10.8%	7.2%	-0.2%	-1.5%	5.9%	-0.9%	1.3%	-0.3%	7.3%	4.6%	2.5%	1.2%	20.2%	3.9%	2.6%	-2.0%	2.7%	5.4%	0.4%	-19.3%	2.4%	-2.5%	-1.1%	-1.3%	11.7%	3.7%	4.4%	4.8%	5.8%	2.4%	5.1%	-0.1%
Consumer Non-Cyclical (XLP)	4.9%	1.3%	0.8%	1.8%	1.4%	-1.8%	1.6%	8.2%	7.3%	4.3%	0.4%	-1.0%	6.2%	4.4%	1.1%	-0.3%	3.4%	-1.1%	0.9%	8.0%	4.7%	1.3%	0.2%	0.0%	12.8%	2.2%	0.7%	2.2%	3.5%	0.3%	-1.9%	-12.7%	1.2%	2.1%	0.7%	4.3%	5.3%	0.4%	3.8%	0.8%	2.2%	0.6%	4.3%	1.6%
Energy (XLE)	6.3%	3.0%	1.8%	-3.8%	3.9%	3.3%	6.4%	1.5%	7.0%	-2.5%	-6.9%	-9.6%	7.1%	9.5%	5.9%	-9.8%	2.8%	1.7%	-4.2%	2.0%	9.0%	-1.6%	6.7%	-0.4%	5.9%	-0.9%	3.7%	-6.7%	2.1%	3.7%	2.8%	-50.5%	6.4%	7.2%	-2.0%	-0.3%	9.2%	3.9%	6.9%	0.8%	4.7%	2.7%	3.8%	-3.1%
Financials (XLF)	6.2%	3.0%	0.1%	-1.4%	3.3%	0.5%	-0.9%	4.5%	10.2%	-0.2%	-1.1%	-8.4%	8.3%	7.8%	-2.4%	-6.2%	3.4%	2.7%	0.3%	2.1%	5.8%	-1.5%	3.1%	2.2%	16.2%	1.0%	1.7%	-0.7%	1.9%	6.5%	9.0%	-31.9%	1.1%	-3.4%	-5.7%	-0.3%	8.4%	7.5%	3.6%	1.2%	6.1%	1.5%	1.8%	-1.4%
Health Care (XLV)	6.3%	2.4%	0.8%	0.6%	5.7%	-0.4%	2.0%	4.8%	6.6%	4.9%	-1.9%	-1.6%	7.8%	7.7%	1.7%	-1.7%	4.0%	-2.7%	0.6%	5.8%	6.5%	3.8%	0.1%	-0.2%	10.9%	0.7%	2.1%	0.8%	4.6%	0.7%	3.3%	-12.7%	5.2%	5.7%	-1.8%	3.1%	6.5%	7.7%	2.7%	-0.6%	1.5%	1.8%	3.6%	2.6%
Industrials (XLU)	7.2%	3.4%	1.1%	-1.8%	4.7%	0.1%	2.9%	5.2%	9.2%	2.9%	-3.3%	-6.8%	9.6%	8.7%	1.2%	-3.8%	3.5%	0.5%	-1.3%	-0.8%	7.4%	1.8%	5.1%	-0.1%	14.6%	3.5%	1.2%	-3.7%	5.2%	3.6%	4.5%	-27.0%	4.2%	1.9%	-2.0%	-0.8%	7.7%	4.8%	6.1%	2.0%	4.9%	3.4%	3.9%	-1.5%
Information Technology (XLK)	9.0%	5.4%	2.5%	-2.6%	6.8%	8.3%	6.6%	4.0%	12.5%	1.1%	-5.4%	-10.0%	13.6%	8.7%	2.1%	-4.1%	3.7%	0.2%	0.6%	-7.4%	7.7%	9.0%	6.3%	2.8%	23.2%	3.8%	1.9%	-3.9%	5.6%	5.6%	8.6%	-11.9%	4.5%	3.2%	-1.0%	-6.8%	9.1%	13.6%	7.1%	4.5%	6.8%	4.4%	6.1%	-1.5%
Materials (XLB)	7.3%	2.8%	0.6%	-0.5%	3.7%	2.9%	5.2%	1.2%	10.3%	-0.3%	-7.0%	-3.5%	7.9%	7.8%	4.7%	-5.4%	6.5%	1.2%	-4.4%	3.9%	7.3%	-0.2%	3.9%	2.5%	10.8%	6.9%	3.4%	-5.9%	4.0%	1.9%	-0.3%	-26.1%	3.8%	-2.6%	-2.9%	1.8%	10.3%	5.0%	4.8%	4.3%	6.6%	2.9%	3.6%	-1.9%
REITS (XLRE)	4.0%	0.2%	0.2%	0.9%	3.0%	-1.1%	-1.1%	9.1%	6.7%	4.3%	0.4%	-6.3%	4.6%	4.4%	0.3%	-3.8%	2.9%	-2.1%	-1.0%	6.0%	4.4%	-0.8%	2.1%	3.4%	5.9%	2.5%	-2.2%	6.3%	-0.6%	-0.1%	1.9%	-24.6%	1.5%	-1.5%	0.7%	-0.4%	7.9%	-1.6%	2.3%	2.2%	5.2%	-0.1%	1.6%	-0.6%
Utilities (XLU)	3.5%	-1.1%	4.0%	1.3%	5.5%	-3.7%	5.3%	9.7%	1.7%	0.1%	3.3%	-2.2%	4.4%	3.2%	3.1%	-2.5%	2.8%	-5.3%	3.1%	5.7%	2.8%	0.4%	6.6%	3.2%	4.4%	-0.2%	1.8%	7.1%	1.2%	-3.0%	12.9%	-13.5%	8.4%	2.0%	1.9%	3.7%	1.9%	-2.6%	5.4%	-3.4%	1.2%	1.8%	2.2%	2.9%
Growth (IWF)	7.4%	4.2%	1.2%	-2.2%	4.9%	4.2%	3.5%	4.8%	10.4%	2.4%	-4.5%	-8.5%	10.3%	8.0%	1.8%	-4.2%	3.7%	-0.4%	-0.7%	-4.0%	7.0%	6.5%	3.8%	1.8%	18.1%	3.4%	2.1%	-2.4%	4.0%	5.3%	4.5%	-14.1%	3.3%	1.4%	-2.0%	-3.9%	8.4%	7.6%	4.9%	1.7%	4.9%	3.2%	4.9%	-1.5%
Value (IWD)	6.4%	1.8%	1.0%	-0.7%	4.7%	0.3%	2.7%	5.2%	8.5%	0.0%	-2.8%	-5.4%	8.1%	7.3%	1.2%	-3.9%	3.9%	-0.2%	-1.2%	3.0%	6.6%	-0.9%	4.5%	0.7%	12.6%	1.7%	1.5%	-0.4%	3.1%	2.5%	5.2%	-26.7%	4.0%	-1.1%	-2.3%	1.1%	7.9%	5.4%	4.7%	1.0%	4.3%	2.1%	3.1%	-0.5%
Cyclical (RSP)	8.0%	3.9%	1.2%	-2.8%	5.3%	3.8%	4.1%	4.1%	11.9%	0.7%	-5.3%	-10.6%	11.0%	9.6%	2.3%	-6.0%	3.9%	-0.1%	-1.9%	-3.3%	7.7%	3.4%	5.2%	1.8%	18.8%	2.5%	2.9%	-3.0%	3.3%	5.8%	6.6%	-23.4%	3.9%	-1.1%	-3.5%	-4.1%	9.8%	9.7%	5.2%	1.9%	6.1%	3.3%	4.2%	-2.2%
Defensives (DEF)	6.0%	2.3%	1.0%	-0.1%	4.4%	1.1%	2.2%	5.9%	7.4%	1.9%	-2.3%	-3.7%	7.7%	5.6%	0.7%	-2.0%	3.6%	-0.6%	0.0%	2.1%	6.0%	2.9%	3.1%	0.9%	12.6%	2.6%	0.8%	-3.0%	3.7%	2.1%	3.0%	-17.0%	3.6%	1.8%	-0.9%	1.1%	6.7%	3.4%	4.5%	1.3%	6.4%	2.1%	3.9%	0.2%
High Beta (SPHB)	9.6%	5.0%	1.2%	-4.0%	8.2%	3.6%	4.9%	2.8%	14.1%	0.2%	-6.9%	-15.6%	15.9%	13.7%	2.7%	-7.6%	2.8%	-1.1%	-3.3%	-6.9%	7.1%	4.3%	6.9%	2.6%	19.8%	-0.6%	2.8%	-5.2%	3.2%	9.3%	12.1%	-36.2%	6.3%	0.9%	-6.7%	-7.8%	12.3%	12.8%	8.3%	5.7%	8.0%	4.2%	3.7%	-3.3%
Low Beta (SPLV)	4.5%	1.1%	1.6%	2.2%	3.8%	-1.6%	2.3%	8.4%	5.5%	3.0%	0.3%	-1.1%	4.8%	4.2%	0.7%	0.0%	4.4%	-0.8%	1.1%	6.8%	4.2%	0.6%	1.9%	8.0%	3.4%	-0.4%	2.8%	2.7%	0.0%	3.7%	-19.0%	3.6%	0.9%	1.5%	4.0%	5.1%	-0.5%	4.2%	2.8%	2.7%	1.7%	3.4%	1.7%	
Momentum (MTUM)	8.1%	4.1%	1.7%	-3.0%	5.2%	5.4%	4.3%	5.8%	10.5%	2.4%	-4.1%	-10.0%	9.7%	6.0%	1.5%	-5.1%	5.3%	0.1%	-0.4%	-3.2%	8.7%	7.6%	5.5%	-0.3%	19.5%	4.2%	3.0%	-1.5%	4.6%	6.0%	3.4%	-13.8%	5.0%	0.4%	-1.7%	-4.2%	8.4%	3.7%	6.3%	-1.3%	5.2%	3.7%	4.7%	-1.3%
Quality (QUAL)	7.3%	3.3%	1.4%	0.0%	6.0%	1.3%	3.7%	6.0%	9.2%	3.4%	-2.8%	-4.1%	9.3%	7.0%	2.0%	-2.0%	4.3%	0.2%	-0.5%	2.2%	7.3%	3.7%	3.6%	1.1%	14.9%	2.6%	1.7%	-1.9%	4.8%	2.9%	4.1%	-17.6%	5.3%	3.7%	-1.3%	0.7%	7.5%	5.7%	5.2%	3.2%	3.6%	3.1%	4.4%	1.1%
Dividend Yield (SDY)	6.8%	1.8%	0.8%	1.7%	4.5%	-0.3%	1.7%	6.9%	9.2%	1.6%	-1.1%	-2.0%	8.2%	6.7%	0.5%	-0.4%	4.7%	-0.2%	0.1%	5.9%	6.8%	-0.5%	2.4%	1.3%	13.3%	3.2%	0.1%	0.6%	3.4%	1.8%	1.5%	-23.3%	4.0%	-1.0%	0.0%	3.7%	8.4%	3.4%	4.0%	3.7%	4.2%	1.7%	4.2%	1.0%
Size (OEF)	6.9%	3.1%	1.1%	-1.7%	4.8%	3.1%	3.1%	4.4%	8.9%	1.2%	-3.8%	-5.8%	9.4%	6.8%	0.7%	-3.8%	3.3%	-0.3%	-0.2%	-0.2%	6.9%	3.8%	3.8%	0.0%	15.5%	2.0%	2.0%	-2.3%	4.1%	3.8%	3.8%	-17.2%	3.4%	1.3%	-1.7%	-1.3%	7.8%	7.0%	3.8%	0.6%	4.7%	2.4%	4.3%	-1.2%
Secular Growth (QQQ)	7.8%	6.0%	2.6%	-2.7%	8.0%	9.5%	6.2%	3.8%	9.6%	1.0%	-6.0%	-9.0%	12.6%	9.7%	2.2%	-4.4%	1.2%	-0.8%	-0.4%	-7.4%	7.9%	11.3%	7.5%	2.7%	18.2%	3.2%	0.3%	-3.6%	6.0%	8.7%	11.0%	-10.3%	5.1%	1.8%	-1.0%	-6.3%	7.8%	11.8%	8.0%	3.0%	7.0%	4.7%	5.4%	-2.9%
Mid-Caps (MDY)	7.5%	4.0%	1.7%	-0.9%	4.1%	2.6%	3.1%	5.7%	12.2%	1.5%	-2.8%	-8.2%	9.3%	9.7%	3.2%	-3.5%	5.1%	1.0%	-2.1%	-0.2%	7.2%	2.3%	6.4%	1.8%	18.3%	3.1%	1.2%	-1.3%	1.8%	6.4%	8.7%	-29.7%	3.5%	-0.4%	-1.6%	-1.5%	9.8%	5.6%	5.3%	4.1%	5.4%	3.6%	4.2%	-0.8%
Small-Caps (IWM)	6.8%	4.9%	0.5%	-1.2%	5.3%	5.2%	2.5%	6.2%	10.6%	0.5%	-4.8%	-8.6%	8.1%	11.0%	2.0%	-3.2%	4.9%	1.3%	-3.5%	0.0%	6.9%	3.5%	5.6%	0.4%	13.3%																			

# Highest/Lowest Expected Values By Quad Regime

HEDGEYE

## Quad 1: Goldilocks

### Best Asset Classes:

Equities, Credit, Commodities, FX

### Worst Asset Classes:

Fixed Income, USD

### Best Equity Sectors:

Tech, Consumer Discretionary, Materials, Industrials, Telecom

### Worst Equity Sectors:

Utilities, REITS, Consumer Staples, Financials, Energy

### Best Equity Style Factors:

High Beta, Momentum, Leverage, Secular Growth, Mid Caps

### Worst Equity Style Factors:

Low Beta, Defensives, Value, Dividend Yield, Small Caps

### Best Fixed Income Sectors:

BDCs, Convertibles, HY Credit, EM \$ Debt, Leveraged Loans

### Worst Fixed Income Sectors:

TIPS, Short Duration Treasuries, MBS, Treasury Belly, Long Bond

## Quad 2: Reflation

### Best Asset Classes:

Commodities, Equities, Credit, FX

### Worst Asset Classes:

Fixed Income, USD

### Best Equity Sectors:

Tech, Consumer Discretionary, Industrials, Energy, Financials

### Worst Equity Sectors:

Telecom, Utilities, REITS, Consumer Staples, Health Care

### Best Equity Style Factors:

Secular Growth, High Beta, Small Caps, Cyclical Growth, Momentum

### Worst Equity Style Factors:

Low Beta, Dividend Yield, Value, Defensives, Size

### Best Fixed Income Sectors:

Convertibles, BDCs, Preferreds, Leveraged Loans, HY Credit

### Worst Fixed Income Sectors:

Long Bond, Treasury Belly, Munis, MBS, IG Credit

## Quad 3: Stagflation

### Best Asset Classes:

Gold, Commodities, Fixed Income

### Worst Asset Classes:

Credit

### Best Equity Sectors:

Utilities, Tech, Energy, Industrials, Consumer Discretionary

### Worst Equity Sectors:

Financials, REITS, Materials, Telecom, Consumer Staples

### Best Equity Style Factors:

Secular Growth, Momentum, Mid Caps, Low Beta, Quality

### Worst Equity Style Factors:

Small Caps, Dividend Yield, Value, Defensives, Size

### Best Fixed Income Sectors:

Munis, EM \$ Debt, Long Bond, TIPS, Treasury Belly

### Worst Fixed Income Sectors:

BDCs, Preferreds, Convertibles, Leveraged Loans, HY Credit

## Quad 4: Deflation

### Best Asset Classes:

Fixed Income, Gold, USD

### Worst Asset Classes:

Commodities, Equities, Credit, FX

### Best Equity Sectors:

Consumer Staples, Utilities, REITS, Health Care, Telecom

### Worst Equity Sectors:

Energy, Tech, Industrials, Financials, Materials

### Best Equity Style Factors:

Low Beta, Dividend Yield, Quality, Defensives, Value

### Worst Equity Style Factors:

High Beta, Momentum, Leverage, Secular Growth, Cyclical Growth

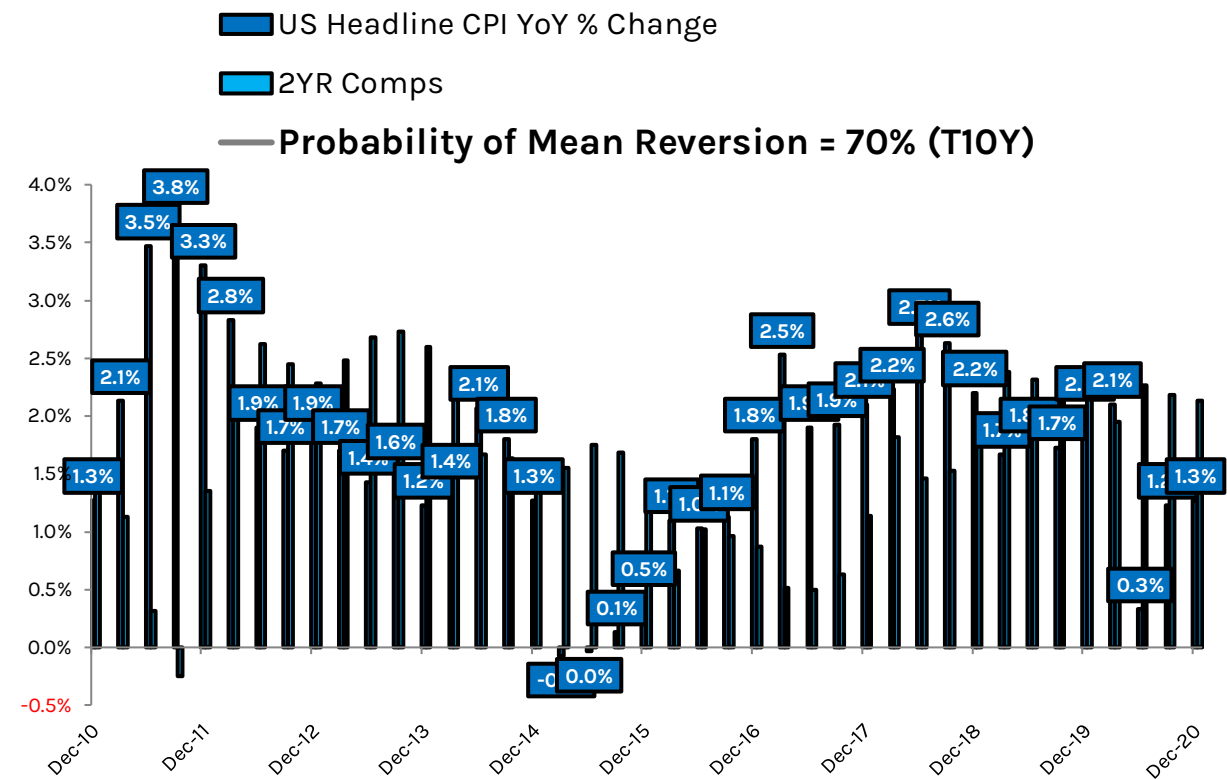
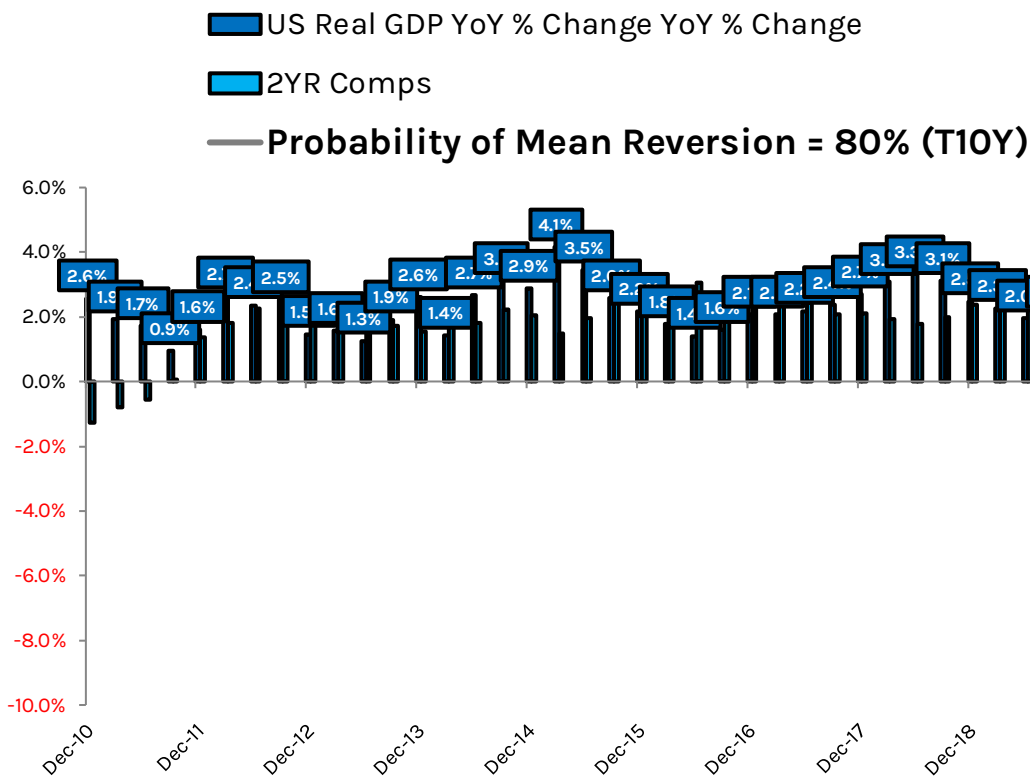
### Best Fixed Income Sectors:

Long Bond, Treasury Belly, IG Credit, Munis, MBS

### Worst Fixed Income Sectors:

Preferreds, EM Local Currency, BDCs, Leveraged Loans, TIPS

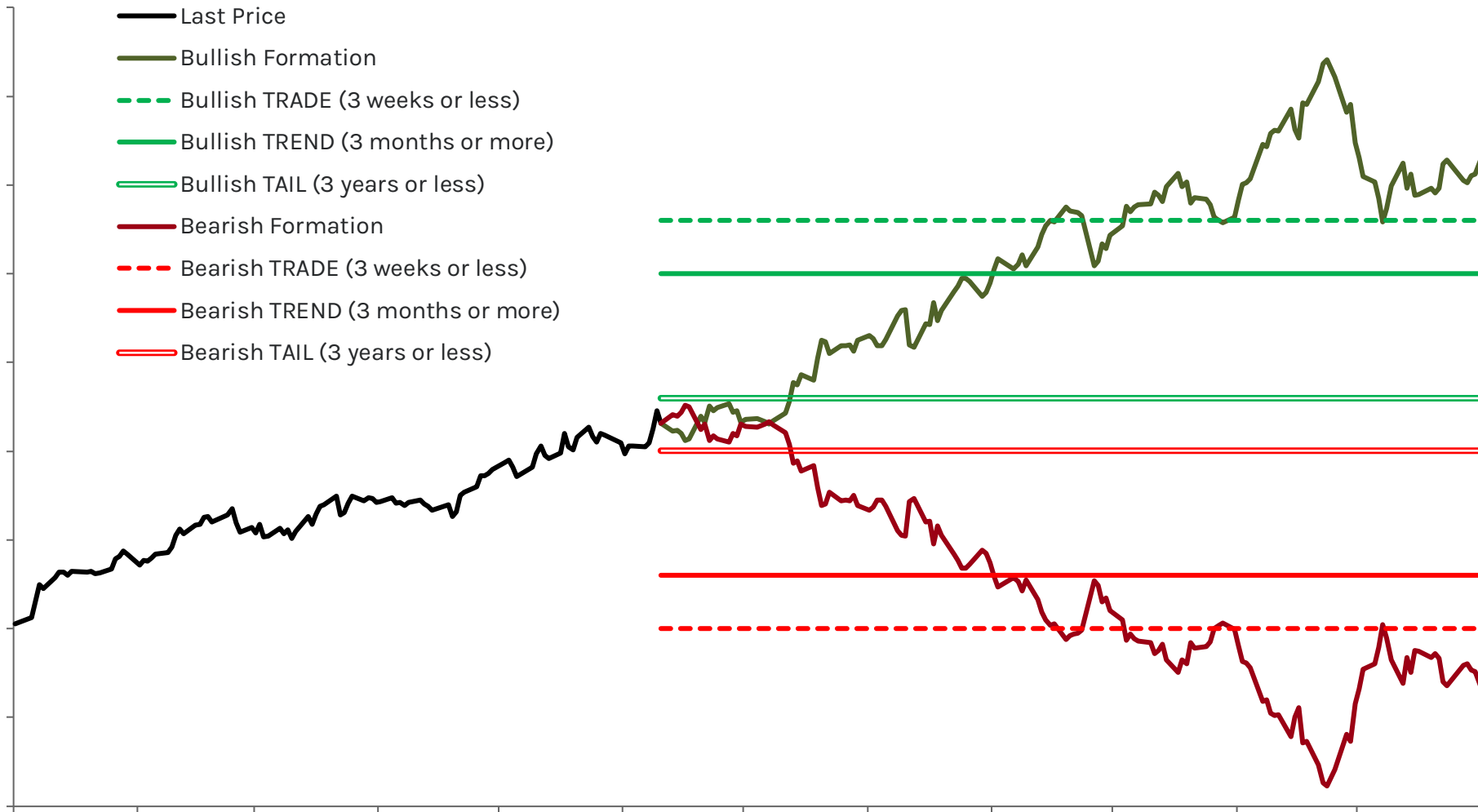
# Base Effects Matter Because GDP and CPI Are More Or Less Stationary Processes When Analyzed On A YoY Rate Of Change Basis



Using the US economy as an example, the sign of the first difference of 2yr base effects explains INFLECTIONS in GROWTH and INFLATION 80% and 70% of the time, respectively. Moreover, easing or steepening base effects perpetuate MOMENTUM in GROWTH and INFLATION 80% and 76% of the time, respectively. These figures are near the modal outcomes of the GROWTH and INFLATION backtests across the near-50 economies we maintain detailed GIP Models for – which means base effects matter a lot to projecting the probable path forward for any economy.



# The Quads Provide A Reliable Starting Point For Asset Allocation And Keith's Quantitative Signaling Overlay Confirms Market Direction And Helps Risk Manage Core Exposures



Core to the process of selecting our core exposures is determining whether the ticker screens well from the perspective of Keith's proprietary risk management process, which employs PRICE, VOLUME and VOLATILITY as discrete factors in the calculus of levels that backtest well as critical momentum thresholds.

Assets where last price is greater than all three (in ascending order) are said to be in a "Bullish Formation" and all dips should be bought, inasmuch that assets in the converse "Bearish Formation" should be repeatedly shorted on strength.

# A | B Testing Process: Quantify Investor Consensus

Monitoring Sector and Style factor Performance allows us to quantitatively track the evolution of our Macro Themes. Additionally, MEASURING and MAPPING key data sets within the CFTC COT report removes the qualitative guesswork from the process of tracking and ultimately FADING crowded positioning.

STYLE FACTOR PERFORMANCE\*

	FACTOR	1D	1W	1M	3M	6M	YTD
		% Chg	% Chg	% Chg	% Chg	% Chg	% Chg
Debt	High Debt/EV	0.6%	5.4%	3.3%	29.4%	33.4%	6.9%
	Low Debt/EV	0.4%	4.2%	2.3%	10.6%	18.8%	1.9%
SI	High Short Interest	0.7%	5.1%	4.5%	29.6%	29.5%	7.3%
	Low Short Interest	0.6%	4.5%	1.2%	8.9%	17.0%	1.5%
BETA	High Beta	0.7%	8.0%	4.5%	35.2%	46.8%	8.0%
	Low Beta	0.3%	2.0%	1.5%	5.5%	6.9%	1.2%
YIELD	High Yield	0.4%	4.5%	2.5%	22.3%	19.9%	4.9%
	Low Yield	0.5%	5.6%	3.7%	18.7%	30.2%	4.4%
MKT CAP	MCAP Bottom 25%	0.5%	5.0%	2.2%	25.6%	28.5%	5.5%
	MCAP Top 25%	0.4%	4.7%	2.4%	13.4%	20.3%	2.7%
Sales	Top 25% Sales Growth	0.7%	7.3%	4.1%	27.1%	32.1%	5.2%
	Bottom 25% Sales Growth	0.4%	3.1%	1.1%	15.7%	18.3%	3.8%
EPS	Top 25% EPS Growth	0.6%	6.5%	3.4%	26.0%	30.7%	5.2%
	Bottom 25% EPS Growth	0.7%	5.0%	2.7%	23.1%	26.6%	5.6%

\*Mean Performance of Top Quartile vs. Bottom Quartile, S&P500 Companies

Key SUSD Correlations\*

METRIC	*Days = Trading Days					52-Wk Rolling 30D Correlation			
	15D	30D	90D	120D	180D	High	Low	% Time Pos	% Time Neg
SPX	0.08	0.48	-0.88	-0.91	-0.94	0.48	-0.93	6%	94%
BRENT Oil	0.80	0.76	-0.84	-0.85	-0.75	0.76	-0.92	14%	86%
CRB Index	0.62	0.74	-0.85	-0.85	-0.90	0.74	-0.99	20%	80%
GOLD	-0.75	-0.84	0.26	0.38	-0.47	0.54	-0.98	22%	78%
BTC	0.73	0.35	-0.80	-0.84	-0.76	0.35	-0.95	6%	94%

CFTC NON-COMMERCIAL NET LONG POSITIONING

	METRIC	Latest	W/W Chg	3M Ave	6M Ave	1Y Ave	3Y		Z-Score	
							Max	Min	1Y	3Y
EQUITIES	SPX (Index + E-mini)	(24,440)	(2,000)	(18,220)	14,355	(61,700)	247,179	(318,257)	0.34X	-0.51X
	VIX	(116,510)	20,138	(108,355)	(100,854)	(78,667)	92,913	(218,362)	-1.22X	-0.53X
	Russell 2000 (mini)	2,440	6,622	18,293	22,340	11,143	72,749	(88,708)	-0.42X	0.07X
	Dow Jones (mini)	(5,669)	9,598	(12,809)	(9,143)	(9,422)	54,635	(28,732)	0.30X	-1.04X
	Nasdaq (mini)	29,906	(13,477)	18,522	(5,774)	7,670	47,085	(133,005)	0.66X	0.74X
	Nikkei Index	(4,499)	(1,376)	(944)	(295)	(3,968)	14,214	(16,298)	-0.12X	0.01X
RATES	10Y UST	150,257	47,828	67,262	73,886	43,121	165,292	(758,490)	1.15X	1.65X
	2Y UST	(211,121)	25,985	(234,144)	(248,699)	(230,282)	67,767	(421,551)	0.27X	-0.07X
	5Y UST	(86,171)	(11,904)	(225,260)	(264,407)	(196,076)	65,383	(866,140)	0.93X	0.90X
	UST Bonds	(208,340)	(22,295)	(192,311)	(198,517)	(147,328)	80,340	(241,003)	-0.94X	-1.96X
	30D Fed Funds	(105,103)	(76,953)	43,487	119,715	237,138	488,558	(222,037)	-2.43X	-1.15X
	Eurodollar	335,235	(111,919)	529,905	553,881	262,991	2,134,274	(3,110,209)	0.12X	0.49X
CURRENCIES	USD	(14,848)	(110)	(11,720)	(7,473)	(630)	43,033	(15,000)	-1.20X	-1.87X
	JPY	41,632	(4,143)	46,170	34,441	27,575	52,239	(117,731)	0.64X	1.30X
	EUR	130,034	(33,787)	147,878	160,958	125,943	212,535	(123,765)	0.05X	1.12X
	GBP	11,085	213	6,314	(926)	(3,451)	49,216	(107,406)	0.97X	0.96X
	AUD	(3,647)	(3,385)	(4,671)	(803)	(12,394)	19,398	(74,181)	0.46X	1.21X
	CAD	14,151	2,142	301	(10,972)	(17,251)	53,332	(67,121)	2.05X	1.10X
	MXN	3,229	3,794	4,332	12,161	15,365	170,379	(21,903)	-0.30X	-1.07X
	NZD	11,656	(3,110)	12,531	8,931	(256)	27,603	(42,544)	1.08X	1.29X
COMMODITIES	CHF	14,410	4,277	12,063	13,163	9,751	17,848	(47,216)	0.92X	1.40X
	CRUDE OIL	536,642	(4,660)	545,784	522,107	521,099	769,743	332,714	0.31X	0.22X
	GOLD	105,841	(9,875)	120,446	127,805	153,362	292,066	(103,009)	-1.08X	-0.13X
	COPPER	67,481	(3,816)	72,367	65,648	32,225	80,564	(60,135)	0.85X	1.67X
	Natural Gas	29,814	17,942	17,056	34,286	(17,214)	71,340	(262,534)	0.57X	1.24X
	RBOB Gasoline	69,141	(18,850)	73,977	65,037	66,971	129,000	40,626	0.11X	-0.66X
	ULSD Heating Oil	19,019	1,193	16,789	12,019	5,448	50,485	(27,674)	1.06X	0.62X
	Silver	51,838	(2,726)	52,661	47,751	40,478	80,646	(30,158)	0.92X	0.81X
	Platinum	29,994	686	25,908	18,790	19,256	69,306	(11,540)	0.96X	0.55X
	Aluminum	163,475	(2,043)	159,713	159,128	159,128	165,518	153,927	0.91X	0.91X
	Nickel	42,230	(365)	42,664	42,658	42,658	44,048	41,250	-0.56X	-0.56X
	Corn	513,216	(19,770)	476,347	358,193	110,672	557,581	(270,560)	1.51X	2.21X
	Soybeans	206,532	377	230,072	232,519	139,819	270,935	(148,817)	0.64X	1.49X
	Wheat	36,833	(3,276)	29,015	34,707	19,155	63,219	(69,231)	0.72X	0.96X
	Live Cattle	99,862	3,741	73,981	69,999	54,355	183,134	19,421	2.23X	0.65X
	Lean Hogs	58,882	6,984	49,189	50,569	39,608	97,769	(11,151)	1.53X	0.91X
	Sugar	239,872	(11,414)	262,372	264,464	171,338	316,046	(205,161)	0.66X	1.55X
	Cotton	80,366	(3,900)	82,849	76,571	44,076	127,052	(37,827)	1.03X	0.94X
	Coffee	45,031	1,042	39,264	39,485	24,197	60,402	(106,651)	0.99X	1.50X
	Cocoa	40,657	2,372	39,778	35,710	21,340	81,269	(31,483)	0.76X	0.64X
	Orange Juice	810	(1,369)	2,149	610	472	5,540	(9,416)	0.13X	0.82X

# A | B Testing Process: Measure & Map The Volatility of Volatility

HEDGEYE

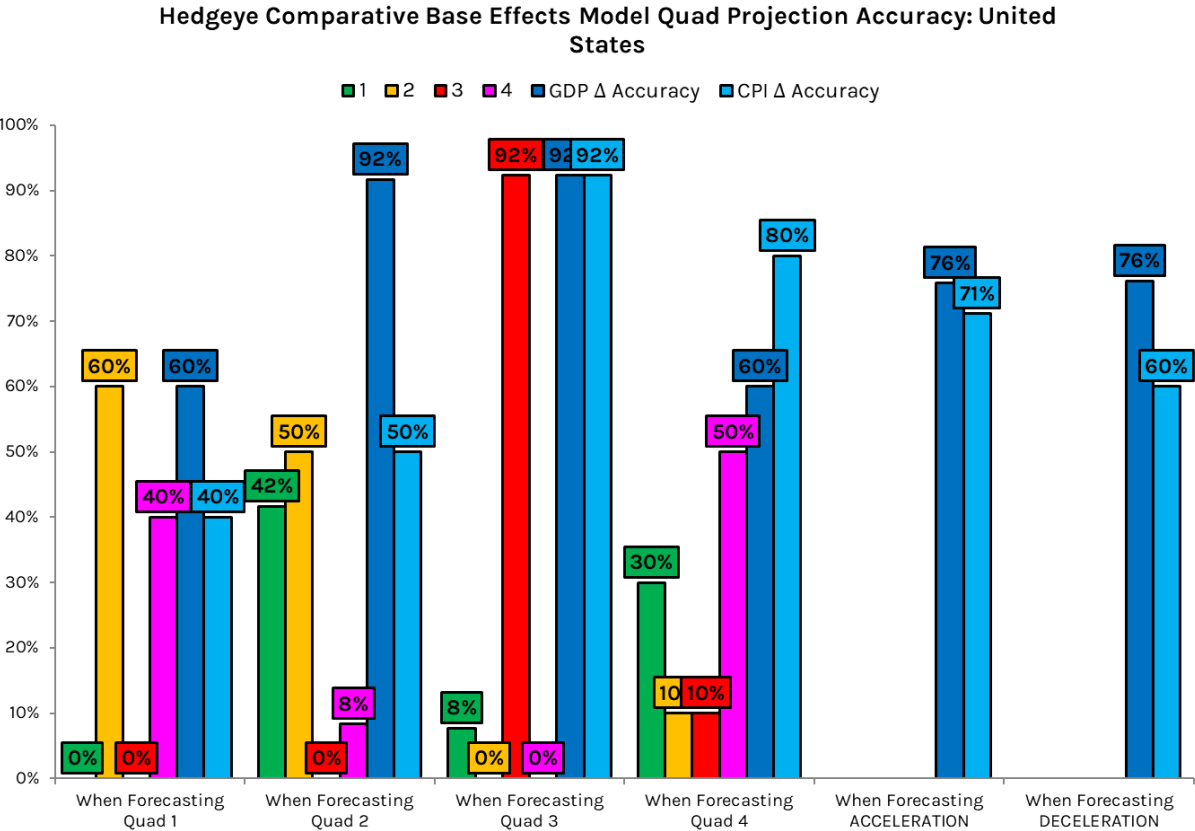
Deliberately studying the VOLATILITY OF VOLATILITY leads to high-probability decision-making opportunities. TIMING matters.

TIME WINDOW SETTING: VOLATILITY_30D PUT_IMP_VOL_30D			TOTAL RETURN PERFORMANCE	IVOL PREMIUM/DISCOUNT IVOL PREM %						REALIZED VOLATILITY TRENDS			IMPLIED VOLATILITY TRENDS		
		TICKER	YTD %	IVOL / RVOL	Yesterday	1W Ago	1M Ago	TTM Z-Score	3Yr Z-Score	RVOL CURRENT	PERCENTILE MM %	PERCENTILE 10YR	IVOL CURRENT	PERCENTILE MM %	PERCENTILE 10YR
US EQUITIES		CURRENT													
I-Shares Russell 2000 ETF	IWM US EQUITY	13.05%	10%	10%	63%	26%	0.0	0.1	23.3	12%	83%	25.7	-2%	84%	
Energy Sector SPDR ETF	XLE US EQUITY	12.30%	3%	3%	26%	-3%	0.3	0.2	34.4	-13%	85%	35.4	-8%	87%	
Consumer Discretionary Sector SPDR ETF	XLY US EQUITY	7.12%	-8%	-8%	55%	124%	-0.7	-0.6	21.3	90%	83%	19.5	-22%	77%	
Communication Services SPDR ETF	XLC US EQUITY	5.82%	-13%	-13%	48%	88%	-0.8		22.0	68%	57%	19.2	-22%	40%	
Power Shares QQQ Trust ETF	QQQ US EQUITY	5.62%	-1%	-1%	70%	70%	-0.3	-0.3	20.9	46%	77%	20.7	-15%	77%	
Financials Sector SPDR ETF	XLF US EQUITY	4.78%	-3%	-3%	35%	26%	-0.3	-0.3	23.5	17%	80%	22.9	-9%	78%	
Technology Sector SPDR ETF	XLK US EQUITY	4.08%	15%	15%	73%	52%	0.2	0.2	20.6	31%	77%	23.7	-1%	82%	
Vanguard Real Estate REIT ETF	VNQ US EQUITY	3.74%	-5%	-5%	23%	20%	-0.1	-0.1	18.0	5%	71%	17.2	-17%	69%	
SPDR S&P 500 ETF Trust	SPY US EQUITY	3.70%	3%	3%	82%	63%	-0.2	-0.1	15.7	50%	71%	16.2	-6%	72%	
Health Care Sector SPDR ETF	XLV US EQUITY	1.97%	22%	22%	60%	66%	0.3	0.4	14.3	27%	58%	17.5	-7%	77%	
Materials Sector SPDR ETF	XLB US EQUITY	1.57%	-7%	-7%	53%	41%	-0.4	-0.4	22.9	15%	80%	21.4	-24%	73%	
Utilities Sector SPDR ETF	XLU US EQUITY	1.42%	-30%	-30%	10%	13%	-0.9	-1.0	19.3	8%	86%	13.6	-33%	52%	
Industrials Sector SPDR ETF	XLI US EQUITY	0.50%	12%	12%	94%	62%	0.1	0.1	18.8	25%	73%	21.0	-14%	78%	
Consumer Staples Sector SPDR ETF	XLP US EQUITY	-2.51%	1%	1%	47%	74%	-0.4	-0.3	12.1	21%	60%	12.1	-30%	58%	
INTERNATIONAL EQUITIES															
I-Shares China Large-Cap ETF	FXI US EQUITY	11.33%	-23%	-23%	-3%	6%	-0.7	-1.1	27.7	31%	79%	21.4	-4%	46%	
I-Shares MSCI Emerging Markets ETF	EEM US EQUITY	8.84%	-17%	-17%	23%	17%	-0.7	-0.9	22.0	21%	73%	18.3	-14%	40%	
Euro Stoxx 50 Index	SXSE INDEX	3.17%	11%	11%	45%	23%	0.4	0.4	15.1	9%	41%	16.8	-1%	46%	
I-Shares MSCI Japan ETF	EWJ US EQUITY	2.50%	-6%	-6%	35%	11%	-0.4	-0.3	16.1	3%	59%	15.2	-12%	36%	
CURRENCIES															
PowerShares US Dollar Index ETF	UUP US EQUITY	1.20%	16%	16%	19%	50%	-0.4	-0.2	6.1	10%	38%	7.0	-15%	35%	
Currency Shares British Pound ETF	FXB US EQUITY	0.45%	-14%	-14%	-10%	-11%	-0.5	-0.9	7.9	-16%	43%	6.8	-19%	17%	
Currency Shares Euro Trust ETF	FXE US EQUITY	-1.47%	-13%	-13%	-8%	8%	-1.0	-1.1	6.5	4%	31%	5.7	-17%	10%	
Currency Shares Japanese Yen ETF	FXJ US EQUITY	-2.11%	38%	38%	92%	63%	0.6	0.9	4.8	3%	9%	6.6	-13%	18%	
COMMODITIES															
United States Oil Fund ETF	USO US EQUITY	15.69%	25%	25%	37%	34%	0.5	0.8	23.6	1%	35%	29.5	-6%	48%	
PowerShares DB Agriculture Fund ETF	DBA US EQUITY	3.28%	79%	79%	73%	111%	0.3	1.1	10.7	17%	40%	19.2	-1%	85%	
PowerShares DB Base Metals Fund ETF	DBB US EQUITY	0.52%	499%	499%	328%	20%	0.4	0.3	17.7	1%	59%	106.0	406%	89%	
SPDR Gold Shares ETF	GLD US EQUITY	-4.79%	-11%	-11%	6%	23%	-0.6	-0.7	18.1	19%	77%	16.2	-14%	64%	
FIXED INCOME															
I-Shares IBOXX HY Corporate Bond ETF	HYG US EQUITY	0.62%	26%	26%	76%	72%	0.0	0.3	3.4	4%	15%	4.3	-24%	13%	
I-Shares J.P. Morgan USD EM Bond ETF	EMB US EQUITY	-1.15%	19%	19%	23%	62%	-0.3	0.1	5.1	21%	35%	6.0	-11%	30%	
I-Shares 7-10 Year Treasury Bond ETF	IEF US EQUITY	-1.70%	39%	39%	56%	387%	-0.3	0.1	3.5	-7%	9%	4.9	-73%	20%	
I-Shares IBOXX IG Corporate Bond ETF	LQD US EQUITY	-2.23%	14%	14%	27%	38%	-0.1	0.0	5.1	-2%	57%	5.8	-19%	55%	
I-Shares 20+ Year Treasury Bond ETF	TLT US EQUITY	-6.04%	33%	33%	24%	3%	0.8	1.3	10.6	-12%	30%	14.0	14%	67%	
MEGA-CAP TECH															
Alphabet	GOOGL US EQUITY	19.18%	-34%	-34%	27%	64%	-1.2	-1.1	37.5	88%	92%	24.9	-24%	58%	
Microsoft	MSFT US EQUITY	8.89%	-8%	-8%	29%	49%	-0.3	-0.4	26.1	32%	70%	24.0	-19%	69%	
Apple	AAPL US EQUITY	3.22%	-13%	-13%	26%	29%	-0.5	-0.5	34.9	14%	84%	30.3	-23%	74%	
Amazon	AMZN US EQUITY	2.92%	-6%	-6%	67%	74%	-0.5	-0.5	29.2	33%	55%	27.6	-28%	44%	
Facebook	FB US EQUITY	-1.85%	-8%	-8%	25%	69%	-0.3	-0.3	34.1	38%	60%	31.3	-25%	47%	
Data Source: CBOE, CME, Bloomberg															

Data Source: CBOE, CME, Bloomberg

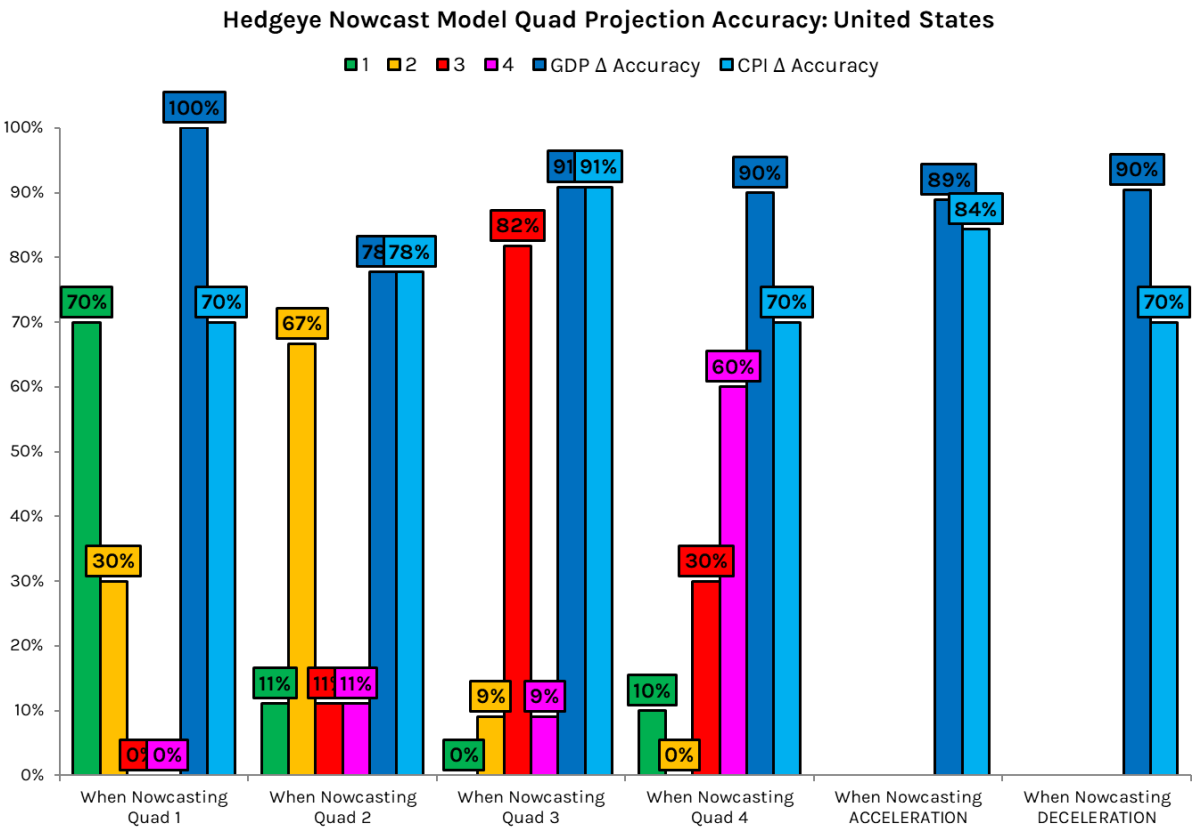
# Measuring And Mapping The Quads With Precision Ex Ante Matters To Driving Ex Post Returns

US Comparative Base Effects Model Backtest



Data Source: Bloomberg

US Nowcast Model Backtest



Data Source: Bloomberg

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