Cross-Asset Dispatches

A Guide to Our Cross-Asset Framework: 2021 Edition

We lay out the various quantitative models and analytical tools that facilitate the cross-asset strategy team to combine our top-down and bottom-up views to define and communicate our strategic and tactical asset class preferences.

The 2021 Institutional Investor (II) Global Fixed-Income Research poll is open. If you enjoy our work, please rate us five stars in Cross-Asset Strategy (Global, US & Europe) under the Fixed Income Research category. Link here to vote and thanks for your readership and support!

Our cross-asset framework: This is a note on how we approach cross-asset strategy, what we publish, and how we express and track our strategic and tactical views.

Estimating reward and risk: Our strategic framework combines the 'bottom-up' estimates of our asset class experts and 'top-down' estimates of cycle-adjusted returns. We estimate 'risk' by averaging long-term realised and shorter-term implied volatility.

What our strategic allocations mean: Because different investors operate under different constraints, we think that it is most useful to weight assets on a min-max range relative to a set benchmark. We revisit this benchmark, and outline how our individual asset class weights roll up to overall weights for global equities, rates, credit and commodities on a +10%/-10% scale. The weights always sum to zero.

Tactical versus strategic allocation – asset class weights and our 'top trades' portfolio: While our asset allocation framework operates on a 12m horizon, our systematic/tactical models operate in the 'under 12m' window. In addition to the strategic weights, we maintain a set of top cross-asset trades, which are aimed at showing how specific positions achieve overall exposures to markets that we like.

What does our framework say now? Our framework sees above-average risk-adjusted returns for DM equities, average risk-adjusted returns for credit and below-average risk-adjusted returns for government bonds. Our strategic allocation is OW equities, EW credit, UW government bonds and EW cash.

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Morgan Stanley appreciates our clients' participation in the 2021 North America Institutional Investor research poll

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Recent Research:

Global Volatility Playbook: Cycle Expansion vs. Third Wave (20 Jul 2021)

Cross-Asset Dispatches: Our Cycle Indicator: Fast and Furious Expansion (16 Jul 2021)

Cross-Asset Dispatches: Holiday Hedges (9 Jul 2021)
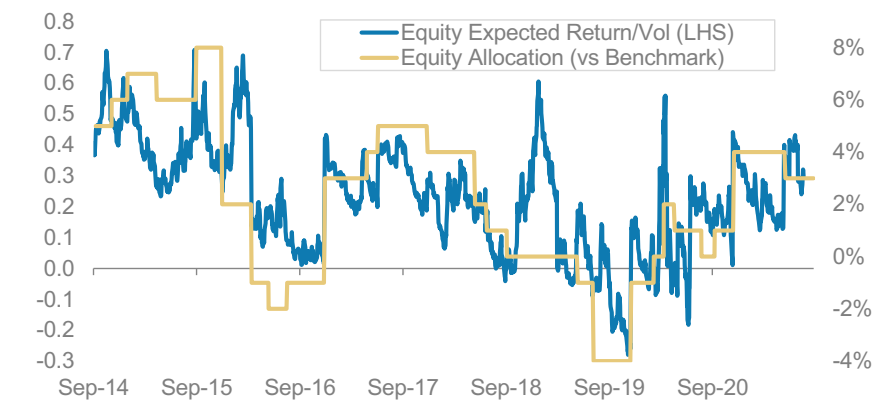
Cross-Asset Brief: Summer Seasonality (6 Jul 2021)

Exhibit 1: Our equity allocation is driven by our framework's expected return/risk

Source:: Morgan Stanley Research forecasts

A guide to our cross-asset framework: 2021 edition

Executive summary

Whether you're new to our cross-asset research or a long-time reader, this note provides a guide to our publications, frameworks and tools. We thank you for your support, and hope this gives better insight into our thinking.

Who is our research for and what do we publish?

Cross-asset strategy approaches the market as someone who can invest across asset classes and regions. This covers a wide array of actors, from pension funds, to hedge funds, to multi-asset funds, to anyone interested in broader market trends.

Because these groups have different time horizons and constraints, we try to provide a broad set of views, from the tactical to the strategic. But we feel that it is also essential for these views to be specific and quantifiable. Our 'call' broadly falls across two categories:

1. **Our strategic allocation (~12m horizon):** This represents our broad view on how to allocate between global equities, credit, government bonds, commodities and cash on a 12-month horizon. All the weights here need to sum to zero. Exhibit 2 shows our global equity and credit allocation over time.

2. **Our top trades portfolio (~3-6m horizon):** A multi-asset portfolio of specific trades we like, which in aggregate reflects our preferred exposures to equities, duration, USD and commodities. This tends to be more tactical, with higher turnover. Exhibit 3 shows the estimated beta of that portfolio to global stocks (MSCI ACWI) over time.

We run both to better serve a wide range of investor types, and while they can diverge every now and then, over time they have been more similar than different. This note will discuss how both our strategic views and tactical ideas are constructed.

How do we collaborate with other Morgan Stanley analysts?

Collaboration is central to our process, and the input of more than 100 strategists and economists around the globe is an important part of this. However, the ultimate allocations and trades are our responsibility. The buck stops here.

Exhibit 2: Equity and credit allocation over time
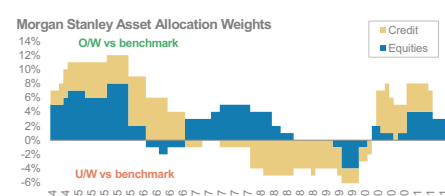
Source: Morgan Stanley Research

Exhibit 3: Top trades equity beta over time
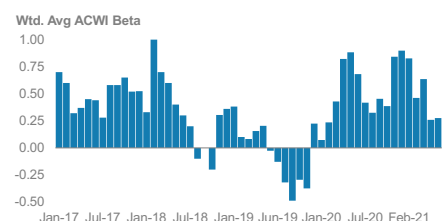
Source: Morgan Stanley Research; See Cross-Asset Playbook: Managing the Transition, June 29, 2021, for our current 'top trades' portfolio.

Our framework

Global multi-asset investing faces enormous scope and complexity. What we need is a process to distill the firehose that is the global market, and an output that is more specific than simply 'risk off/risk on'. We should also provide transparency on how to arrive at the decisions we make. In short, we need a framework.

Our goal is to recommend investments that have superior return relative to their risk (radical, right?). Broadly, 'return' can be estimated in one of two ways:

- **'Bottom-up',** through asset class experts. We'd called this the investment committee approach, where you ask your credit expert what to expect out of high yield, your FX expert what to expect from USD, and so on. This approach tends to be more qualitative, subjective and flexible. Organisationally, it requires collaboration.

- **'Top-down',** using models that (hopefully) show historical efficacy in explaining future returns. This approach tends to be more quantitative, objective and rigid. Organisationally, it can be done in isolation.

Neither approach is 'right'. We know of smart, successful investors who rely on one or the other. Our strategic framework aims to combine them.

Bottom-up: Leveraging Morgan Stanley forecasts

One of our competitive advantages is the expertise of Morgan Stanley's more than 100-strong economists and strategists working around the world. As such, incorporating these views is a key part of our approach.

We think that the best way to do so is via 12-month forecasts. When dealing with a range of qualitative market views from an investment team, a forecast distills and quantifies a view. It is a vector, with both direction and magnitude. It is flexible, able to take into account all manner of information about current markets (micro fundamentals, supply and demand, and what's in the price). And it can be tracked, providing a way to quantify success. As such, forecasts are extremely useful.

But they're only useful when based on roughly similar scenarios. After all, a bearish high yield forecast that assumes a deep recession and a bullish equity forecast that assumes a recovery don't give you a clear 'cross-asset trade' – they simply reflect wildly different macro expectations. As such, we follow a three-step process:

1. Morgan Stanley's economists set bull, base and bear case forecasts for the economy over the next 12 months, consistent with scenarios that they think have roughly 20%-60%-20% likelihood of occurring. This matches the bull-base-bear framework used across Morgan Stanley equity research.

2. Morgan Stanley strategists set bull-base-bear targets based on these economic scenarios, all to a similar (~12-month) horizon.

3. We provide transparency on these forecasts (see Morgan Stanley's macro forecast site) and regularly debate and review them to see if they remain on track.

In short, our forecasts should represent a best estimate of return over the next 12 months from our asset class experts, given our economists' expectations.

Exhibit 4: Morgan Stanley key market forecasts

	As of Jul 21, 2021	Q2 2022 Forecast		
		Bear	Base	Bull
Equities				
S&P 500	4,359	3,800	4,225	4,450
MSCI Europe	1,822	1,540	1,925	2,140
Topix	1,904	1,550	2,050	2,350
MSCI EM	1,312	1,010	1,330	1,560
FX				
USD/JPY	110	104	112	114
EUR/USD	1.18	1.14	1.18	1.26
GBP/USD	1.37	1.36	1.41	1.53
AUD/USD	0.74	0.68	0.75	0.78
USD/INR	74.6	71.0	75.4	78.0
USD/ZAR	14.6	14.8	15.3	16.9
USD/BRL	5.19	5.00	5.40	6.00
Rates (% percent)				
UST 10yr	1.29	2.20	2.00	1.70
DBR 10yr	-0.40	0.25	0.00	-0.45
UKT 10yr	0.60	1.35	1.10	0.25
JGB 10yr	0.01	0.25	0.20	0.15
Credit (bps)				
US IG	87	130	105	80
US HY	293	500	320	240
EUR IG	52	100	50	30
EUR HY	314	500	300	225
Italy 10yr	108	260	80	55
US CMBS AAA	67	95	75	55
Agency MBS	9	20	-5	-25
Commodities				
Brent	72.2	68	78	85

Source: Bloomberg, Markit, Yieldbook, Morgan Stanley Research forecasts

Exhibit 5: 12-month return and risk forecasts

	12m Return			Average	Return/Risk
Asset	Bear Case	Base Case	Bull Case	Volatility	Base case Return/Vol
Equities					
S&P 500	-11%	-1.7%	3%	18%	-0.10
MSCI Europe	-15%	5.9%	18%	17%	0.35
Topix	-17%	9.7%	25%	19%	0.51
MSCI EM	-21%	3.4%	21%	19%	0.18
FX					
JPY/USD	-4%	-1.9%	6%	7%	-0.26
EUR/USD	-4%	-0.7%	6%	7%	-0.11
GBP/USD	-1%	2.8%	12%	8%	0.35
AUD/USD	-8%	1.8%	6%	10%	0.19
INR/USD	0%	3.5%	10%	7%	0.52
ZAR/USD	-9%	0.6%	4%	16%	0.04
BRL/USD	-8%	2.0%	10%	17%	0.12
Rates					
UST 10yr	-6%	-3.6%	-1%	6%	-0.59
DBR 10yr	-6%	-3.4%	1%	5%	-0.72
UKT 10yr	-6%	-3.3%	5%	6%	-0.57
JGB 10yr	-2%	-1.2%	-1%	2%	-0.61
Credit (Excess Return)					
US IG	-3%	-0.7%	1%	3%	-0.23
US HY	-8%	0.8%	4%	5%	0.16
EUR IG	-2%	0.6%	2%	2%	0.41
EUR HY	-5%	3.0%	6%	4%	0.69
Italy 10yr	-12%	3.7%	6%	7%	0.56
EM Sovs	-11%	1.4%	10%	6%	0.22
US CMBS AAA	-2%	-0.1%	2%	1%	-0.10
Agency MBS	-0.4%	0.8%	1.8%	1%	0.72
Commodities					
Brent	0%	14.6%	26%	33%	0.44

Source: Bloomberg, Markit, Yieldbook, Morgan Stanley Research forecasts; Vol is a simple average of 1yr implied vol where available (or 1yr realised otherwise), and 10yr realised vol. We show excess returns for credit, and total returns across other asset classes. Commodity returns are based on futures price, to account for carry.

Top-down: Cycle-adjusted returns

The other way to estimate returns is 'top-down', using a model-based approach. We see this as complementary to the 12-month strategist forecasts we've just discussed.

Our goal is to estimate an asset's return by its long-term trend line, and then adjust this for the economic environment.

Part 1 – the trend line: Using our long-run return framework, we generate a trend line for returns. We believe that, within limits, this is the most historically justifiable line for an asset to travel on, based on current valuations – think of this as the best possible estimate without taking a view on the cycle. See Cross-Asset Dispatches: What Will Markets Return? 2020 Edition, December 11, 2020, for more.

Part 2 – cycle boosts and drags: Assets will overshoot and undershoot this trend line based on swings in that economic cycle. Our cycle model aims to convert this into quantitative adjustments: based on current economic data, should the asset do better or worse than the estimated trend, and by how much? See Cross-Asset Dispatches: Improving the Cycle Indicator – Countdown to Downturn, March 31, 2019, for more.

Exhibit 6: Our stylised cycle-adjusted returns framework – long-run expected returns provide a trend line, cycle boosts and drags 'fine-tune' the forecast
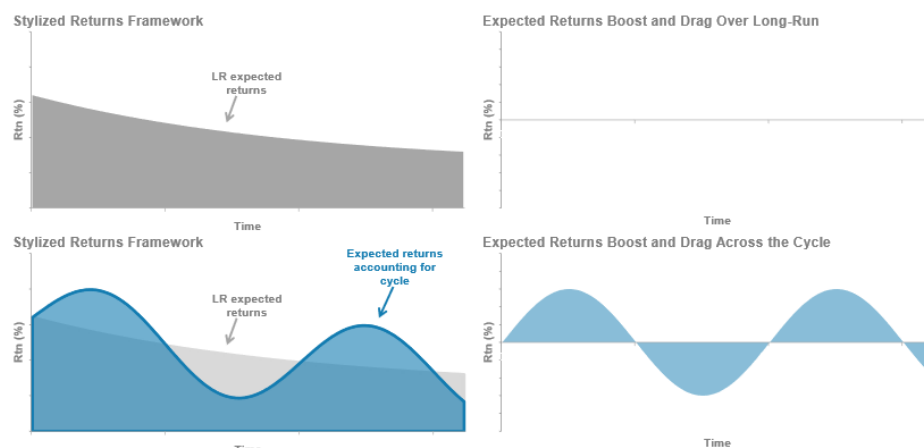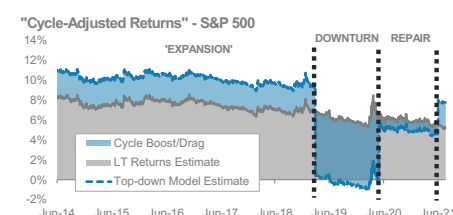

Source: Morgan Stanley Research

Exhibit 7: 'Trend line' return for the S&P 500 has been relatively range-bound...

Source: Morgan Stanley Research

Exhibit 8: ...and adding 'cycle boosts and drags' from the cycle fine-tunes the top-down forecast

Source: Morgan Stanley Research

Exhibit 9: Our top-down forecasts combine our 10y expected return forecasts and our cycle modifier

	LT Return Model		Cycle Model			
	10Y Exp Rtns	Risk Premium	Avg Fwd N12M Rtns vs Avg			
			Downturn	Repair	Expansion	Recovery
EQUITIES						
S&P 500	5%	3%	◆ -6%	▲ -1%	▲ 3%	▲ 2%
MSCI Europe	8%	7%	◆ -7%	◆ -4%	▲ 4%	▲ 4%
TOPIX	5%	5%	◆ -8%	◆ -7%	▲ 2%	● 12%
EM	6%	4%	◆ -3%	● 12%	◆ -5%	▲ 1%
GOV'T BONDS						
UST 10Y	2%	-	● 2%	● 1%	▲ 0%	◆ -3%
DBR 10Y	1%	-	● 2%	● 2%	▲ -1%	◆ -3%
JGB 10Y	1%	-	● 1%	● 2%	▲ -1%	◆ -2%
CREDIT (Excess Rtn)						
US IG	3%	0%	▲ -3%	▲ 3%	▲ 0%	▲ 1%
US HY	2%	0%	◆ -7%	● 8%	▲ -2%	▲ 2%
EU IG	0%	0%	▲ -2%	▲ 1%	▲ 0%	▲ 2%
EU HY	0%	1%	◆ -12%	● 12%	▲ -1%	▲ 3%
EM $ Credit	3%	1%	◆ -10%	● 6%	▲ 1%	▲ 0%

Source: Morgan Stanley Research

## Putting it all together, and adjusting for volatility

Whereas bottom-up strategist forecasts are qualitative, flexible and subjective, model-based forecasts are quantitative, rigid and objective. It's a match made in heaven, and our asset allocation framework balances both of these approaches to answer the simple question — taking into account both qualitative and quantitative approaches, which

assets offer the best return over the risk-free rate, adjusted for volatility?

Our framework follows these simple steps – for each asset, we first average the expected return from the bottom-up and top-down models, subtracting the 12-month cash rate to convert all returns into an excess return, and then dividing all returns by volatility. So which 'volatility' to adjust for? We prefer averaging 1-year implied with 10-year realised. The former is fast-moving and market-based. The latter is a slower-moving real-world anchor. We think they complement each other well.

Exhibit 10 and Exhibit 11 walk through this process for US equities. Our long-run risk premium estimate of 3.0%, combined with our cycle model's view that this part of the cycle ('expansion') boosts premiums by 2.6% per year, gets us to a top-down excess return forecast of 5.6% for the next 12 months. This compares to our strategists' 12-month total return forecast of -1.7%, which, subtracting the current cash rate, translates to a bottom-up expected premium of -1.8%. Balancing the qualitative and quantitative approaches, we arrive at a cross-asset framework expected excess return of 1.9%. Dividing this by the average of US equities implied 12-month and trailing 10-year volatility (18.0%), we estimate risk/reward for the asset to stand at 0.1x.

**Exhibit 10:** Example – how we arrive at our framework returns for US equities

Cross-Asset Framework Expected Returns - S&P 500
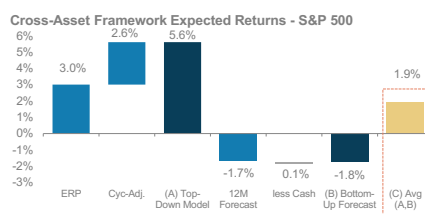
Source: Morgan Stanley Research forecasts

Exhibit 11: Example – how to compute risk/reward for US equities

Risk Adjusted Expected Returns - S&P 500
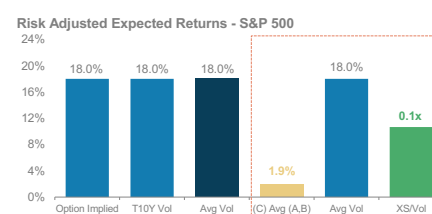
Source: Morgan Stanley Research forecasts

Exhibit 12: Combining bottom-up and top-down forecasts

S&P 500 Total Return
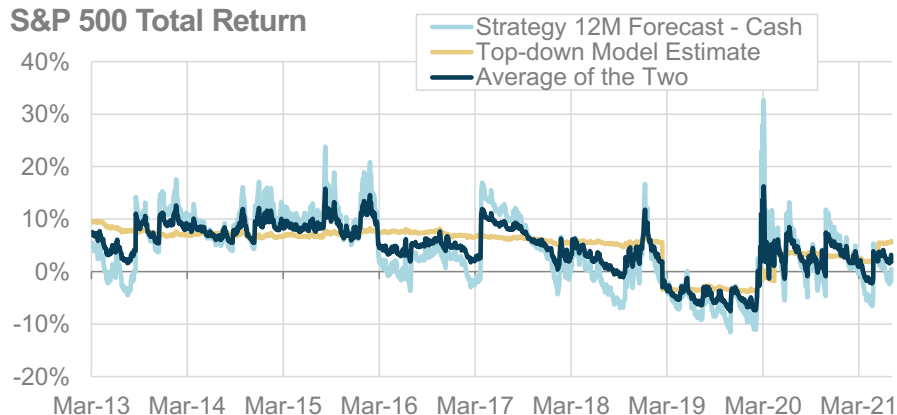
Source: Bloomberg, Morgan Stanley Research forecasts

In Exhibit 13, we repeat the process for every major market in our benchmark to get to a set of risk-adjusted returns that makes it possible to compare across assets apples-to-apples – or as close as one can anyway under the circumstances.

Exhibit 13: Our cross-asset framework table: Combining top-down and bottom-up approaches

		Top-Down Risk Premium	Cycle Boost/Drag	(A) Top-Down Expected Returns — Cycle-Adj Returns	(B) Bottom-Up 12M Outlook** — MS Base Case Rtn Forecast	(C) Avg (A, B - Cash) — Forecast Excess Rtn	(D) (C)/Vol — Framework Expected Rtn/Vol	MS Asset Allocation vs Benchmark
Equities	US	◆	●	5.6%	-1.7%	1.9%	0.1	+0%
	Europe	●	▲	10.7%	5.9%	8.6%	0.5	+2%
	Japan	▲	▲	7.2%	9.7%	8.5%	0.4	+1%
	EM	●	◆	-0.6%	3.4%	1.4%	0.1	+0%
Bonds	Treasuries	◆	▲	1.2%	-3.6%	-1.3%	-0.2	-2%
	Bunds	◆	▲	-0.2%	-3.4%	-1.2%	-0.2	-1%
	JGBs	◆	▲	-0.1%	-1.2%	-0.5%	-0.3	+0%
	EM Local*	-	-	-	1.5%	1.4%	0.2	+0%
Credit	US IG	▲	▲	0.1%	-0.7%	-0.3%	-0.1	-1%
	US HY	◆	▲	-1.5%	0.8%	-0.3%	-0.1	
	EUR IG	▲	▲	0.3%	0.6%	0.4%	0.3	+1%
	EUR HY	◆	▲	-0.7%	3.0%	1.2%	0.3	
	EM $	▲	◆	-0.3%	1.4%	0.5%	0.1	+0%
	Securitised^	-	-	-	0.6%	0.6%	0.6	+0%
	Commodities	-	-	-	-2.0%	-2.1%	-0.1	+0%

Legend: ● (LT Rtns): LT Z-score > 0.5 (Cyc): Phase with best returns for the asset ◆ (LT Rtns): LT Z-score < -0.5 (Cyc): Phase with worst returns for the asset

Source: Morgan Stanley Research forecasts; Note: *EM Local is FX-hedged. ^Securitized is an average of agency MBS, CLO AAA and CMBS AAA. 'Cycle-Adj Returns' shows cycle-adjusted long-term expected returns during the current cycle phase (expansion). All returns for credit are excess returns. 12m cash rate is for the respective region. Our 12m commodity forecast is based on our commodity strategists MS RADAR Index (Bloomberg Ticker: MSCYRX0T Index).

Allocating to assets that have the best risk-adjusted expected return seems like a good starting point (see the final column in Exhibit 13). We allocate on a +10%/-10% range across broad asset classes, based on the cross-asset 'benchmark' shown in Exhibit 14, comprised of markets we cover within Morgan Stanley Research; baseline weights are roughly based on these markets' relative market caps.

Exhibit 14: What is our benchmark?

Asset	Sub-Asset	Weight	Returns Index	Sub-Weights
Equities	US Equities	25%	S&P 500	25%
	European Equities	10%	MSCI Europe	10%
	Japan Equities	5%	TOPIX	5%
	EM Equities	10%	MSCI EM	10%
Rates	US Rates	10%	UST 10yr	10%
	European Rates	10%	DBR 10yr	10%
	Japan Rates	5%	JGB 10yr	5%
	EM Local	5%	MS EM Local Index*	5%
Credit	US Corporates	6%	US Agg Corp (Bloomberg Barclays)	4%
			US HY Corp (Bloomberg Barclays)	2%
	European Corporates	3%	iBoxx EUR IG Corporate Index	2%
			iBoxx EUR HY Index	1%
	EM Sovereigns	3%	EMBI Global Index	3%
	Securitized Credit	3%	Agency MBS	0.75%
			Non-Agency MBS	0.75%
			CLO	0.75%
			CMBS	0.75%
Other	Commodities	2%	Bloomberg Commodity Index	2%
	Cash	3%	US Libor 1m	3%

Source: Morgan Stanley Research

We consider +/- 2% to be equal-weight, above and below this overweight and underweight, respectively. All our weights need to sum to zero. Obviously, investors' own benchmarks will likely vary from ours depending on region and asset class focus, but we think that our +10%/-10% underweight/overweight range, as well as the clear and transparent way we derive our relative allocation, offer value to our wide range of readers. Exhibit 15 shows our current allocation and how it has evolved over recent years.

Exhibit 15: Our current asset allocation
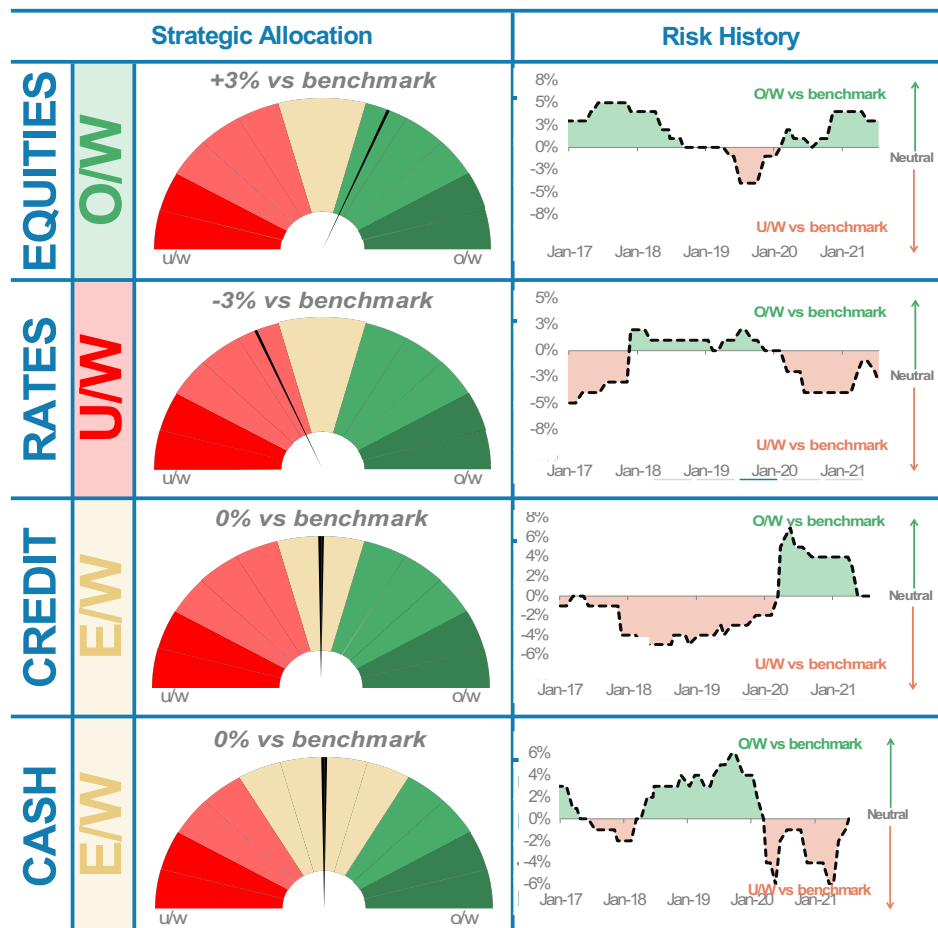
Our main publications

We publish our cross-asset views across several publications:

Global Strategy Outlook: Twice a year, the cross-asset team leads the collaborative effort across Morgan Stanley strategy teams to refresh our various price targets, best ideas and asset allocation for the next 12 months. See:

Global Strategy Mid-Year Outlook: Now the Hard Part (18 May 2021)

2021 Global Strategy Outlook: Keep Faith in the Recovery (16 Nov 2020)

Cross-Asset Dispatches: Published most weeks, covering topical cross-asset themes. See:

Cross-Asset Dispatches: Our Cycle Indicator: Fast and Furious Expansion (16 Jul 2021)

Cross-Asset Dispatches: Holiday Hedges (9 Jul 2021)

Cross-Asset Playbook: Our key cross-asset views and trades, all in one place, monthly. See:

Cross-Asset Playbook: Managing the Transition (29 Jun 2021)

Global Volatility Playbook: Key volatility views and trades, across assets, monthly. See:

Global Volatility Playbook: Cycle Expansion vs. Third Wave (20 Jul 2021)

Global In the Flow: Our comprehensive monthly datapack, covering cross-asset performance, valuations, supply and economic data. See:

Cross-Asset Strategy: Global In the Flow – First Half Recap (1 Jul 2021)

Cross-Asset Spotlights

Published daily, these spotlights – as the name suggests – provide latest updates from our various models and datasets, including the CROWDS model and CFTC positioning, summary of weekly ETF flows, COVA framework and cross-asset correlations, CAST and CANARI tactical indicators. See:
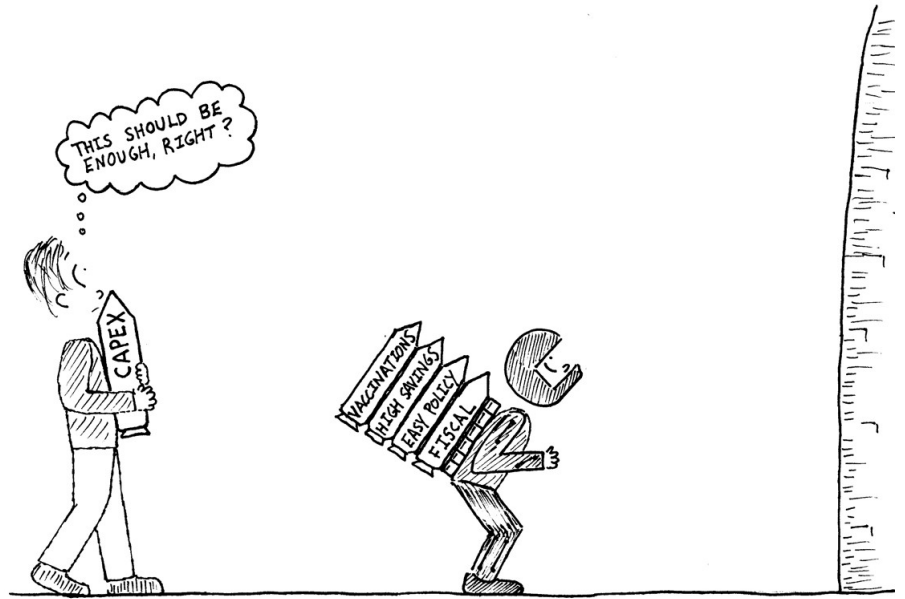
Cross-Asset Spotlight: What the CROWDS Say (19 Jul 2021)

Cross-Asset Spotlight: ETF Flows – Week of July 12 (19 Jul 2021)

Cross-Asset Spotlight: Correlations and Diversification (21 Jul 2021)

Cross-Asset Spotlight: Systematic Strategies (CAST & CANARI): The Expansion Phase (22 Jul 2021)

From time to time, we even draw some cartoons.

Our key cross-asset models and tools

## Long-Term Capital Markets Assumptions

Analyst: *Serena Tang*

What is it/how is the model used? Our long-run capital markets assumptions form the basis of our cycle-adjusted returns used in our asset allocation framework. This set of expected returns is cited frequently in our reports as valuation metrics (e.g., are equity risk premiums elevated versus history?), and used in our portfolio optimisation exercises.

Methodology: Our long-run expected return for equity indices decomposes return into three components:

$$Next10YReturn = Income + EarningsGrowth + Repricing$$

The first, 'Income', represents the return from dividends and is estimated as long-run payout x earnings yield. The second, 'Earnings Growth', measures the return to investors due to an increase in earnings for a given multiple and is broken down into inflation, real earnings trend growth and earnings trend reversion. Drilling down further, for inflation, we use 10Y breakevens as a proxy; real earnings trend growth is calculated from regression on log real earnings; and earnings reversion is estimated from the gap between trend and today's real earnings. Last but not least, the 'Repricing' component comprises the return to investors from multiple expansion or contraction and is estimated by assuming that in every period trailing P/E will end up at some long-run sector-adjusted P/E level over time.

Exhibit 16: Long-run expected return breakdown example – S&P 500
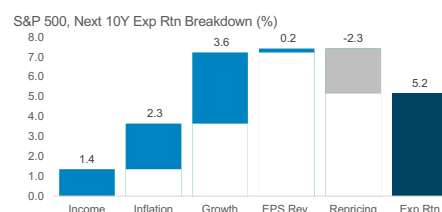
Source: Bloomberg, Morgan Stanley Research

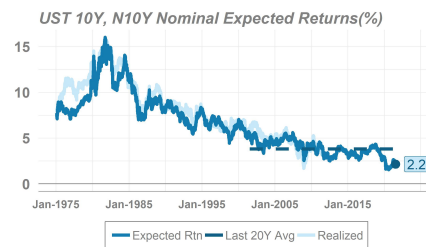**Exhibit 17:** Equity long-run expected return – S&P 500
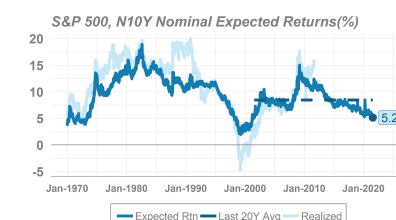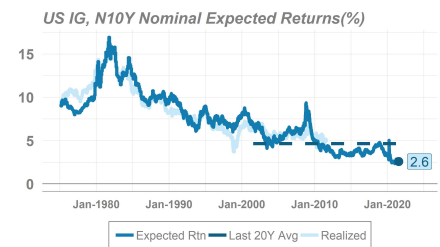

Source: Bloomberg, Morgan Stanley Research

Our long-run expected return for fixed income is based on the 'rolling yield' framework introduced by Martin Leibowitz (see Portfolio Strategy: Rolling Yields and Return Convergence, March 4, 2014), which posits:

$$Next10YReturn = StartingYield + RolldownReturn - AverageCreditLoss$$

The main difference between the models for government bonds and credit is the 'Credit Loss' component; for risk-free government bonds, we assume no credit loss, while for bonds with a credit component, we assume expected credit loss to be similar to what's been realised through history, based on the asset's current ratings mix and time to maturity.

Exhibit 18: Fixed income long-run expected return – UST 10Y

UST 10Y, N10Y Nominal Expected Returns(%)

Source: Bloomberg, Morgan Stanley Research

Exhibit 19: Fixed income long-run expected return – US IG corporate credit

US IG, N10Y Nominal Expected Returns(%)

Source: Bloomberg, Morgan Stanley Research

Exhibit 20: Morgan Stanley 10-year expected return forecasts across asset classes

| Market | 10Y Nominal Expected Returns | | | | | | Risk Premium | | |
| | Latest | | Components | | | vs History | Latest | | vs History |
	Exp Rtn (ER)	ER	(A) Income	(B) Earnings	(C) Repricing	ER Z-Score	Risk Prem. (RP)	RP	RP Z-Score
EQUITIES									
S&P 500	5.2		1.4	6.2	-2.3		3.0		
MSCI Europe	7.9		2.1	6.9	-1.1		7.1		
MSCI UK	10.1		2.2	9.6	-1.7		8.4		
MSCI JP	5.3		1.5	3.5	0.2		4.7		
MSCI EM	6.3		1.9	6.2	-1.8		4.1		

| Market | 10Y Nominal Expected Returns | | | | | | Risk Premium | | |
| | Latest | | Components | | | vs History | Latest | | vs History |
	Exp Rtn (ER)	ER	(A) Initial Yld	(B) Roll-down	(C) Credit Loss	ER Z-Score	Risk Prem. (RP)	RP	RP Z-Score
GOVERNMENT BONDS									
UST 10Y	2.2		1.3	0.9	0.0		-0.1		
DBR 10Y	0.8		-0.4	1.2	0.0		-0.5		
JGB 10Y	0.6		0.0	0.6	0.0		0.5		
FIXED INCOME & CREDIT (USD)									
USD Agg	1.7		1.4	0.4	0.1		-0.3		
USD IG	2.6		2.0	0.9	0.3		0.4		
USD HY	1.9		3.9	0.1	2.0		0.2		
USD BBB	2.5		2.2	0.7	0.4		0.4		
USD BB	2.0		3.1	0.0	1.1		0.2		
USD B	1.9		4.4	0.1	2.5		0.2		
FIXED INCOME & CREDIT (EUR)									
EUR Agg	-0.2		-0.0	0.0	0.2		-0.9		
EUR IG	0.3		0.2	0.3	0.2		0.3		
EUR HY	0.4		2.3	0.0	1.8		0.6		
EUR BBB	0.3		0.3	0.3	0.3		0.3		
EUR BB	0.5		1.7	0.0	1.1		0.7		
EUR B	0.7		3.4	0.0	2.6		0.9		
EM $ CREDIT									
Global	3.5		3.9	0.6	0.9		1.3		
Asia	3.2		3.5	0.4	0.7		1.4		

Note:
Data as of Thu 22 July 2021

Source: Bloomberg, Morgan Stanley Research

Update frequency: *Weekly*

Where to find it: *Cross-Asset Dispatches, Cross-Asset Playbook*

Related report(s):

Cross-Asset Dispatches: What Will Markets Return? 2020 Edition (11 Dec 2020)

Cross-Asset Dispatches: Where Are Cross-Asset Risk Premiums? (9 May 2021)

Podcast: Cross-Asset Conversations: Ep. 31 | Where Are Cross-Asset Risk Premiums? (12 May 2021)

US Cycle Model

Analysts: Serena Tang, Naomi Poole

What is it/how is the model used? The Morgan Stanley US cycle indicator combines metrics across macro, the credit cycle and corporate aggression to pinpoint where we are in the market cycle.

Exhibit 21: The US cycle indicator
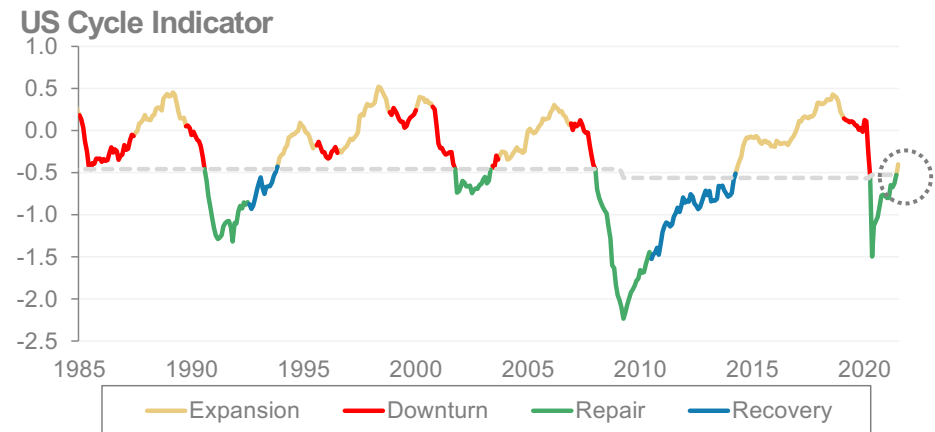
US Cycle Indicator

Source: Bloomberg, Haver Analytics, Datastream, Morgan Stanley Research

The phase of our cycle indicator informs us how assets may perform, and which market segment investors should rotate to. For example, our cycle indicator has recently switched from 'repair' to 'expansion' where equities tend to see returns overshoot long-run valuations while government bonds and US HY underperform significantly.

Exhibit 22: US equities returns versus average across the cycle

S&P 500 12m Fwd Rtns vs LT Avg
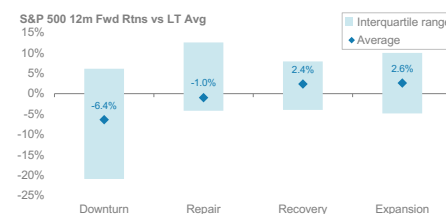
Source: Bloomberg, Morgan Stanley Research; Note: Data from 1985.

Exhibit 23: US HY excess returns versus average across the cycle

US HY XS 12m Fwd Rtns vs LT Avg
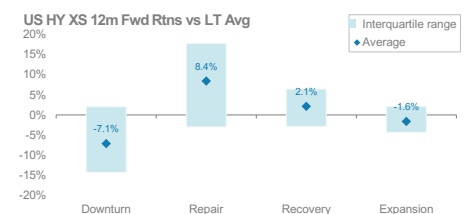
Source: Bloomberg, Morgan Stanley Research; Note: Data from 1985.

This is backed up by the analysis of the actual optimal portfolio allocation which would have maximised risk-adjusted returns for an unlevered, long-only, USD-focused investor, as we show in Exhibit 24. There is a clear cyclical pattern in the optimal allocation – allocation to risk assets (equities and US HY) tends to run up to a peak, and then collapse in favour of increased allocation to bonds and cash.

Exhibit 24: Optimal multi-asset allocation displays a cyclical pattern

Optimal Next 1Y Allocation
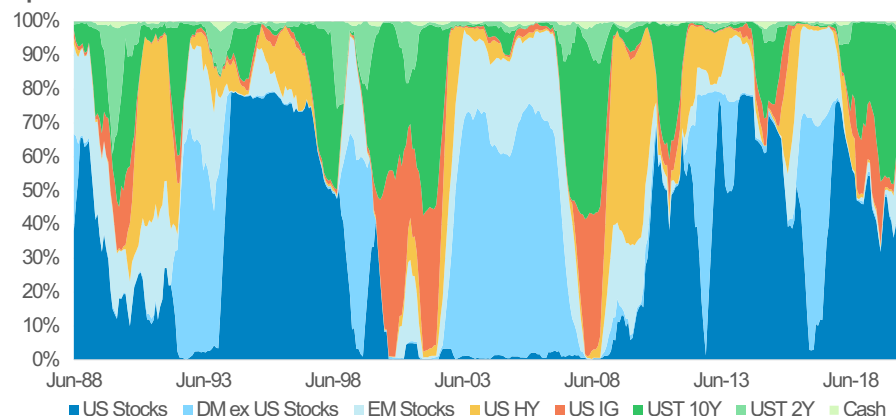
Source: Bloomberg, Morgan Stanley Research; Note: Based on realised next 1Y nominal returns, correlations and volatility, with min 0% and max 60% asset weight constraints, 7.5% vol target. 6M smoothed. 'Cash' proxied by 2Y UST. Based on monthly returns since 1985..

Exhibit 24 shows how the optimal allocation has varied across the cycle phases over the last 30-odd years. These allocations form the basis of how we think about our own asset allocation. For example, when the US cycle indicator announced 'downturn' in mid-2019, which suggested elevated market and recession risk over the following 12 months, this framework led us to cut exposure to equities to underweight, and allowed us to be better prepared for the volatility that was to come. Similarly, when the indicator switched to repair in April 2020, it motivated us to upgrade risk, especially in credit, where historically this part of the cycle has lifted returns. And most recently, we've moved UW government bonds on the back of the switch to 'expansion'.

Methodology: The indicator is calculated as a weighted average of various metrics' long-run Z-scores – this gives us the level which tells us how strong or weak the data are versus history, a proxy for how stretched or slackened the cycle is. We then use a rules-based approach to determine the phase of the cycle – if data are stronger than average and improving, it's expansion, if they are stronger than average but deteriorating, it's downturn, etc.

Exhibit 25: US cycle indicator components

	Today	Z Score 1M Ago	6M Ago	Trend
2s10s Yield Curve	-0.3	-0.7	0.1	↓
Conference Board Cons. Confidence, 3MMA	1.1	0.1	-0.1	↑
Initial Jobless Claims 4W MA, 3MMA	-0.9	-2.2	-2.1	↑
ISM Manufacturing Production Index	0.3	1.6	1.1	↑
Personal Income YoY, 3MMA	-1.1	-0.5	-1.7	↑
Unemployment Rate	0.0	-0.1	-0.5	↑
Consumer Loans 12M Chg, 3MMA	-1.5	-2.1	-1.9	↑
Real Estate Loans 12M Chg, 3MMA	-1.6	-1.4	-1.2	↓
Mergers and Acquisitions	-0.8	-1.0	-1.2	↑
Fin Bond Issue 12M Chg, 3MMA	0.1	-0.2	-0.1	↓

Source: Bloomberg, Datastream, Haver Analytics, Morgan Stanley Research

Exhibit 26: US cycle indicator phase rules
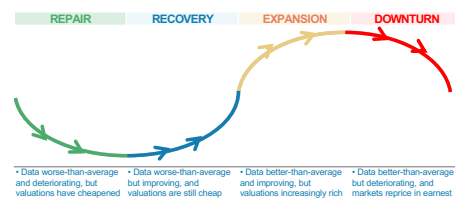
Source: Morgan Stanley Research

Update frequency: *Monthly*

Where to find it: *Global In the Flow*

Related report(s):

Cross-Asset Dispatches: Improving the Cycle Indicator – Countdown to Downturn (31 Mar 2019)

Cross-Asset Dispatches: Our Cycle Indicator: Welcome to 'Downturn' (2 Jun 2019)

Cross-Asset Dispatches: Our Cycle Indicator: Don't Despair, We're in Repair (24 Apr 2020)

Cross-Asset Dispatches: Our Cycle Indicator: Fast and Furious Expansion (16 Jul 2021)

Cross-Asset Systematic Trading Strategy (CAST)

Analyst: Phanikiran Naraparaju

What is it/how is the model used? CAST looks at the world through the lens of systematic factors. CAST (Cross-Asset Systematic Trading strategy) is an all-weather multi-asset combination we have created from 1,500+ systematic cross-sectional and time-series factors across 15 asset groups.

Methodology: Factor combinations have more reliable return characteristics than single assets: for example, the G10 FX carry factor is more reliable, and less prone to idiosyncratic risk, than AUD. Furthermore, a family of 'value' factors (price/earnings, price/sales, price/book, forward P/E, earnings yield - bond yield) will be collectively more reliable than a single value factor (price/earnings, etc.). Finally, combining diverse factor clusters ('value family', 'carry family', 'momentum family', 'fundamental trends', etc.) results in more consistent returns across different market regimes. CAST does exactly this — it's an all-weather multi-asset combination we have selected from building blocks of 1,500+ systematic cross-sectional and time-series factors, across 15 asset groups (see Cross-Asset Strategy: CAST Cookbook — Which Factors Work, and When, June 21, 2021).

Exhibit 27: The CAST approach
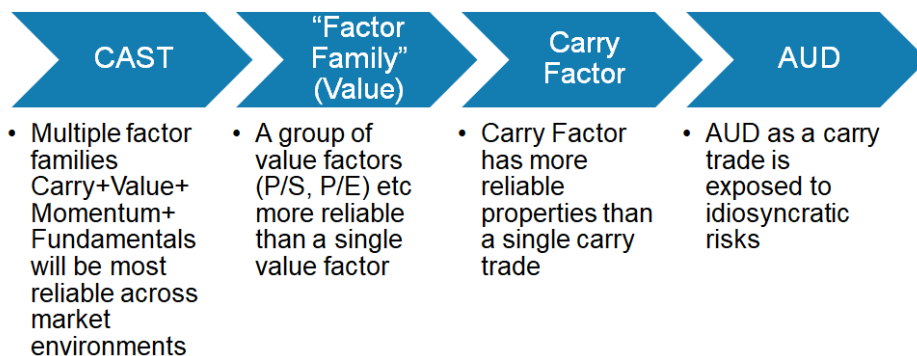
Source: Morgan Stanley Research

However, CAST is just one combination of the many that can be constructed from this universe of factors. We show how the recipe can be tailored to better suit specific market environments, e.g., 'inflation CAST', by choosing the best-performing factors for a rising inflation backdrop. The CAST cookbook can offer insight into:

#1 The 'personality' of the asset class: Every asset class is dominated by different factors/factor family. Beware when you are going 'against the grain' of the asset class.

#2 Which metrics are useful and which aren't: We identify best-performing factors by asset class and show detailed performance stats on the 1,500+ factors.

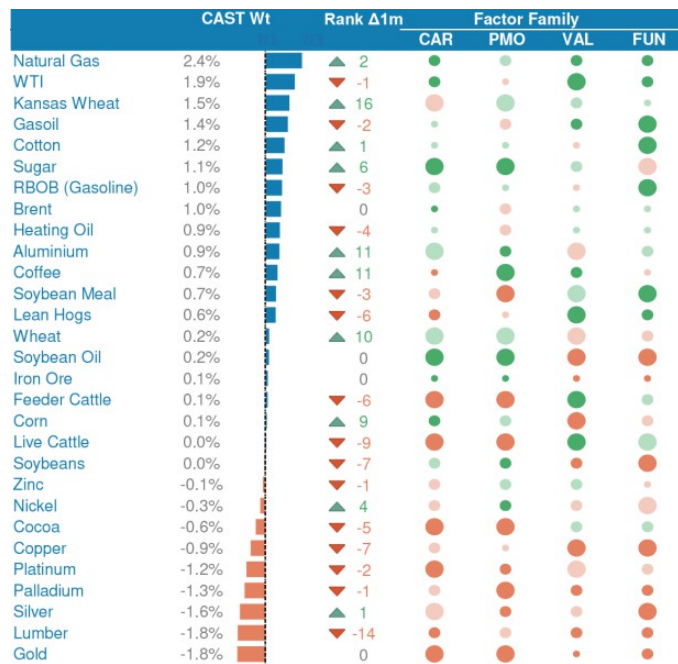**Exhibit 28:** CAST scorecard for commodities

Asset	CAST Wt	Rank Δ1m	Factor Family (CAR, PMO, VAL, FUN)
Natural Gas	2.4%	▲ 2	
WTI	1.9%	▼ -1	
Kansas Wheat	1.5%	▲ 16	
Gasoil	1.4%	▼ -2	
Cotton	1.2%	▲ 1	
Sugar	1.1%	▲ 6	
RBOB (Gasoline)	1.0%	▼ -3	
Brent	1.0%	0	
Heating Oil	0.9%	▼ -4	
Aluminium	0.9%	▲ 11	
Coffee	0.7%	▲ 11	
Soybean Meal	0.7%	▼ -3	
Lean Hogs	0.6%	▼ -6	
Wheat	0.2%	▲ 10	
Soybean Oil	0.2%	0	
Iron Ore	0.1%	0	
Feeder Cattle	0.1%	▼ -6	
Corn	0.1%	▲ 9	
Live Cattle	0.0%	▼ -9	
Soybeans	0.0%	▼ -7	
Zinc	-0.1%	▼ -1	
Nickel	-0.3%	▲ 4	
Cocoa	-0.6%	▼ -5	
Copper	-0.9%	▼ -7	
Platinum	-1.2%	▼ -2	
Palladium	-1.3%	▼ -1	
Silver	-1.6%	▲ 1	
Lumber	-1.8%	▼ -14	
Gold	-1.8%	0	

Source: Morgan Stanley Research

Exhibit 29: CAST exposures summary

Asset Class	Aggregate Exposure %-tile	Net Long?	CAST Current Weights Most Long	Most Short	Rank Changes (Δ1m) Asset	Δ1m	CAST Returns MTD	YTD
CAST	N/A	N/A	TWD 2yr, CAD 30yr, JPY 2yr	US MBS, EM Utilities, EURUSD	Kansas Wheat, US Corp 10Y+	+93, -115	-0.9%	10.7%
Global Equities	20%	Y	Nikkei, S. Africa, Brazil	Spain, Switzerland, Singapore	India, ChinaH	+7, -7	-0.9%	3.4%
DM Equities	13%	Y	Canada, S&P 500	Spain, Netherlands	Canada, Nasdaq	+4, -2	-0.1%	2.7%
Global Credit	33%	Y	US HY BB, US HY B	US MBS, US Corp 10Y+	US HY BB, US Corp 10Y+	+3, -5	-1.3%	3.9%
Commodities	87%	Y	Natural Gas, WTI, Kansas Wheat	Gold, Lumber, Silver	Kansas Wheat, Lumber	+16, -14	0.4%	19.9%
G10 FX	49%	Y	NOKUSD, CADUSD	EURUSD, JPYUSD	NZDUSD, SEKUSD	+4, -4	-1.9%	-3.6%
EM FX	51%	Y	TRYUSD, BRLUSD	PHPUSD, THBUSD	MXNUSD, SGDUSD	+6, -6	-0.5%	1.4%
G10 Swaps 30yr	57%	Y	CAD 30yr, JPY 30yr	USD 30yr, GBP 30yr	JPY 30yr, NOK 30yr	+7, -5	3.5%	0.4%
G10 Swaps 10yr	16%	Y	JPY 10yr, AUD 10yr	USD 10yr, GBP 10yr	JPY 10yr, NOK 10yr	+8, -5	1.9%	-5.0%
G10 Swaps 2yr	5%	Y	JPY 2yr, CHF 2yr	USD 2yr, GBP 2yr	JPY 2yr, USD 2yr	+9, -6	0.1%	-0.3%
EM Local 10yr	38%	Y	TWD 10yr, CNY 10yr	TRY 10yr, CZK 10yr	CNY 10yr, PHP 10yr	+6, -6	0.8%	0.9%
EM Local 2yr	12%	Y	TWD 2yr, CNY 2yr	CZK 2yr, CLP 2yr	INR 2yr, HUF 2yr	+9, -5	0.0%	1.4%
US Sectors	62%	Y	US Staples, US Healthcare	US Real Estate, US Utilities	US Energy, US Discretionary	+3, -4	-0.6%	5.2%
EU Sectors	71%	Y	EU Staples, EU Tech	EU Real Estate, EU Utilities	EU Healthcare, EU Financials	+3, -3	-0.2%	5.8%
JP Sectors	98%	Y	JP Energy, JP Staples	JP Comm Services, JP Utilities	JP Staples, JP Financials	+2, -2	-1.7%	6.3%
EM Sectors	38%	Y	EM Materials, EM Financials	EM Utilities, EM Industrials	EM Financials, EM Staples	+3, -3	-1.9%	1.4%

Source: Morgan Stanley Research

#3 Which is the most/least attractive asset to own across asset classes? CAST reduces a lot of data into a single signal for all asset classes.

#4 How much beta versus alpha exposure to run in different asset classes: CAST can be used to guide when to run more beta exposures and when to run more RV or alpha exposure.

#5 Which factors perform in different environments? The factor almanac discusses best-performing factors in different regimes. We can construct a portfolio of factors for specific environments, e.g., 'inflation CAST', 'defensive CAST'.

Update frequency: *Weekly. Although it is rebalanced weekly, we find CAST is more like 2-3-month model in terms of the horizon of the views.*

Where to find it: *We publish weekly exposures in Cross-Asset Spotlight: Systematic Strategies (CAST & CANARI): Third Wave, July 15, 2021.*

Related report(s):

Cross-Asset Strategy: CAST Cookbook – Which Factors Work, and When (21 Jun 2021)

Cross-Asset Dispatches: CAST: Our Cross-Asset Factor Model (6 Oct 2020)

Cross-Asset Spotlight: Systematic Strategies (CAST & CANARI): The Expansion Phase (22 Jul 2021)

Fixed Income Rotation Model (FIRM)

Analyst: Serena Tang

What is it/how is the model used? The US Fixed Income Rotation Model (FIRM) seeks to answer the question – what is the optimal asset allocation for an investor aiming to beat the USD Bloomberg Barclays Aggregate Bond benchmark ('US AGG')? It uses Morgan Stanley strategists' expected return targets as primary inputs to come up with optimal portfolio allocation recommendation.

Currently, the model favors short-duration and low-quality; the optimal portfolio targeting the same vol as US AGG is EW UST, EW IG EM sovereigns, UW securitized products (covering MBS and CMBS), OW corporate credit and OW off-benchmark assets. In particular, it holds a large UW in MBS and large OW in HY and leveraged loans, mirroring some of the recommendations from our Mid-Year Outlook.

Methodology: Using Morgan Stanley's next 12M expected returns and trailing 10Y covariance, we perform Markowitz mean-variance portfolio optimisation, attempting to solve for a set of asset weights which maximises portfolio expected returns, subject to a target volatility level and weight constraints. The optimal portfolio with annualised volatility similar to USD AGG (~3%) is considered the FIRM portfolio.

Exhibit 30: US AGG and components risk/reward and efficient frontier based on Morgan Stanley forecasts
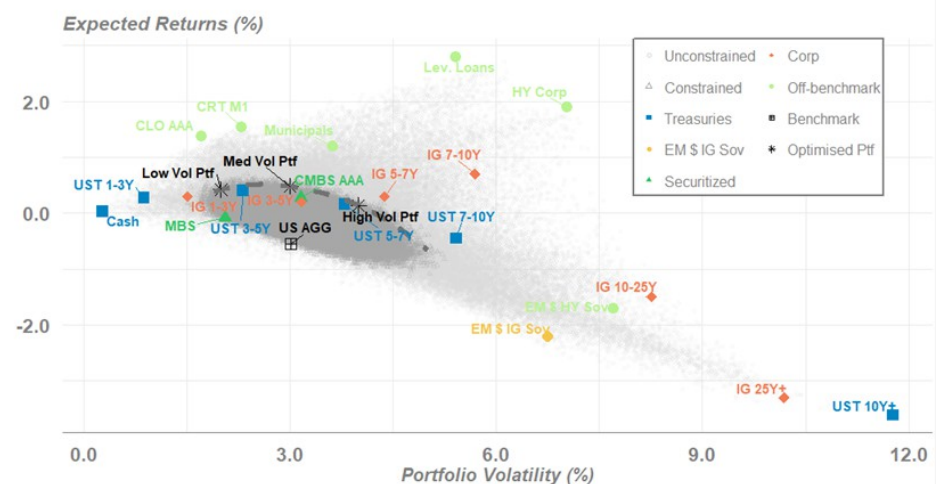
Source: Bloomberg, S&P LCD, Morgan Stanley Research forecasts; Note: Optimisation seeks to maximise risk/reward, based on Morgan Stanley N12M expected total returns, trailing 10Y volatility and correlations, and constraints on weights based on current share of market value of assets. Light grey shows feasible portfolios, darker grey shows portfolios with weight constraints. As of June 3, 2021.

Exhibit 31: Morgan Stanley US fixed income asset allocation

ALLOC. vs MV	Wght Opt Pf	Wght AGG	MS N12M Exp Rtn (%)	MS N12M Risk Reward	Trail 10Y Avg Rtn (%)	Trail 10Y Risk Reward	vs AGG Corr.	vs AGG Beta+	vs AGG Beta-
US TREASURY	29%	39%	0.1	0.0	2.7	0.7	0.9	1.3	1.0
UST 1-3Y	11%	13%	0.3	0.3	1.2	1.4	0.7	0.3	0.1
UST 3-5Y	10%	9%	0.4	0.2	2.3	1.0	0.8	0.8	0.5
UST 5-7Y	5%	6%	0.2	0.0	3.0	0.9	0.9	1.2	1.1
UST 7-10Y	3%	4%	-0.5	-0.1	3.7	0.7	0.9	1.8	1.6
UST 10Y+	1%	8%	-3.6	-0.3	6.1	0.5	0.9	3.0	3.2
EM $ IG SOV	2%	1%	-2.2	-0.3	4.8	0.7	0.7	1.1	2.5
EM $ IG SOV	2%	1%	-2.2	-0.3	4.8	0.7	0.7	1.1	2.5
SECURITIZED	12%	31%	0.0	0.0	2.7	1.3	0.9	0.6	0.7
MBS	9%	29%	-0.1	0.0	2.7	1.3	0.9	0.6	0.7
CMBS AAA	3%	2%	0.3	0.1	3.9	1.2	0.8	0.7	0.9
IG CORPORATES	25%	28%	-0.1	-0.1	4.9	0.9	0.8	1.1	1.3
IG 1-3Y	4%	4%	0.3	0.2	2.3	1.5	0.5	0.3	0.2
IG 3-5Y	5%	4%	0.2	0.1	3.7	1.2	0.7	0.6	0.6
IG 5-7Y	4%	4%	0.3	0.1	5.0	1.1	0.7	0.9	1.0
IG 7-10Y	7%	5%	0.7	0.1	5.3	0.9	0.8	1.2	1.6
IG 10-25Y	4%	6%	-1.5	-0.2	7.0	0.8	0.8	1.8	2.1
IG 25Y+	1%	5%	-3.3	-0.3	7.1	0.7	0.8	2.4	2.7
OFF-BENCHMARK	28%	0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a
HY	10%	0%	1.9	0.3	6.4	0.9	0.2	-0.4	0.5
Lev. Loans	8%	0%	2.8	0.5	4.3	0.6	0.0	-0.4	0.1
CRT M1	2%	0%	1.5	0.7	2.2	1.0	0.1	-0.1	0.0
CLO AAA	2%	0%	1.4	0.8	2.6	1.5	0.1	0.0	0.1
EM $ HY Sov	1%	0%	-1.7	-0.2	5.3	0.7	0.5	0.2	2.1
Municipals	5%	0%	1.2	0.3	4.3	1.2	0.7	0.6	1.2
CASH	4%	0%	0.0	0.1	0.7	2.6	0.2	0.0	0.0

ALLOCATION VS MARKET VALUE — Duration x Ratings

Note: Numbers show model portfolio weights less market value weights as %.

SUMMARY COMPS

vs. US AGG	Ptf	Agg
QUALITY	A2	Aa2
DURATION	4.5	6.5
VOL	3.0%	3.0%
DOWN. DEV	0.5%	0.5%
BETA to US AGG	0.8	1.0
BETA to UST 10Y	0.2	0.4

vs UST 5Y	Ptf	UST 5Y
DURATION	4.5	4.9
VOL	3.0%	3.1%
DOWN. DEV	0.5%	0.5%
BETA to US AGG	0.8	0.9
BETA to UST 5Y	0.2	1.0

vs UST 10Y	Ptf	UST 10Y
DURATION	4.5	9.1
VOL	3.0%	6.3%
DOWN. DEV	0.5%	1.0%
BETA to US AGG	0.8	1.8
BETA to UST 10Y	0.2	1.0

Source: Bloomberg, S&P LCD, Morgan Stanley Research. Note: Shows breakdown of portfolio targeting 3.0% annualised vol. Optimisation seeks to maximise risk/reward, based on Morgan Stanley N12M expected total returns, trailing 10Y volatility and correlations, and constraints on weights based on current share of amount outstanding of market segments. For the 'dials', each segment represents 5% allocation, ranging from -12.5% to +12.5% vs. market weight; similarly allocation 'bars' range from -10% to +10% for all assets except Sovereign (EM), EM Sovereign (HY), CRT M1 and CLO AAA, which range from -5% to +5% versus market weight due to smaller market cap.. As of June 3, 2021.

Update frequency: *Quarterly*

Where to find it: *Cross-Asset Dispatches*

Related report(s):

Cross-Asset Strategy: Introducing the US Fixed Income Rotation Model (FIRM) (4 Jun 2021)

Cross-Asset Diversifiers (COVA)

Analyst: Wanting Low

What is it/how is the model used? Our COVA scorecard comprises five components which we think that an investor needs to care about when looking for a good diversifier:

- **Does it diversify?** The asset needs to have a low/negative correlation to global equities.

- **Can it diversify consistently?** We look at the stability of that correlation across time, rewarding assets with a more stable correlation to global equities.

- **Does it work when it needs to?** The level of correlation only tells you half the story. The downside beta, which is the beta to global equities when stocks are falling, gives us a better picture of whether the diversifier is able to 'work' in market stress scenarios. We reward assets with a low/negative downside beta to equities.

- **Does it have good value?** A common perception is that assets which help to diversify are rarely cheap. This component rewards assets which are cheap relative to their own history.

- **Does it cost a lot to hedge?** Buying a hedge is like buying insurance — it comes with a cost. To ensure that we are not overpaying for our hedge, this component aims to sieve out assets which have a low cost of carry versus their own history.

Our COVA scorecard ranks different assets in a consistent way across these five metrics, enabling us to screen for good, reliable and cheap diversifiers every week. We make use of this scorecard in deciding hedges for our top trades portfolio. Additionally, a COVA portfolio which is systematically long the top five assets based on the scorecard every month has historically fared better as a diversifier than just buying vol.

Exhibit 32: Current top diversifiers based on COVA

Long/ Short	Asset	Corr.	Stability	Downside Beta	Valuation	Cost of Carry	Overall COVA score	Hedge Ratio ($mn per $1mn of equity risk)
Short	US HY (Spread)	82	100	70	97	98	87	4.6
Long	Cons Staples vs Mkt	83	85	68	97	96	85	2.3
Short	US IG (Spread)	77	100	57	97	97	83	9.5
Long	Utilities vs Mkt	72	82	67	98	86	80	3.0
Long	Telecom vs Mkt	78	64	65	99	84	79	2.5
Long	US HY vol	82	100	56	88	70	77	32.0
Long	USDJPY vol	67	70	55	98	81	73	12.2
Long	Healthcare vs Mkt	71	71	58	78	89	73	3.4
Long	SX5E vol	86	100	59	55	74	72	12.3
Long	Topix vs S&P 500	58	47	52	99	99	72	1.8
Long	USDKRW vol	71	92	52	84	69	71	11.0
Long	Real Estate vs Mkt	62	58	59	90	79	70	1.3
Short	EM Credit XS	71	91	68	62	62	69	4.1
Short	BTP Spread 10y	68	72	54	92	62	69	12.1
Long	JPYUSD	51	63	60	86	82	68	2.4

Source: Morgan Stanley Research; Note: Overall score is a weighted average of correlation score (60%) and valuation score (40%). We show 'long' for assets with <10% average 20y correlation to MSCI ACWI, and 'short' for assets with average correlation of >10%. Scores are based on the direction of trade. Hedge ratio is computed using the inverse of historical beta to global equities over the last 1 year. For hedge ratios of long vol strategies, we express the notional in terms of how much an investor would need to do to get a 8% vol equivalent of risk.

Methodology:

Correlation score (60% weighting)

- **Level of correlation to global equities:** We take an average of 6-month and 10-year correlations to global equities, with the former more representative of the current market relationship and the latter a slower-moving anchor.

- **Downside beta to global equities:** This is the beta of the asset to global equities only in 'down' periods. We use a 10-year average of 3-year downside beta.

- **Stability of over time:** We use a 10-year interpercentile range (5th versus 95th percentile) of rolling 6-month correlations as a proxy for correlation stability, giving more credit to assets with stable and reliable correlation to equities.

Valuation score (40% weighting)

- **Valuation versus its own history:** We look at a 10-year percentile of specific valuation metric for each asset class, such as price-to-book ratio for equities, REER for FX, real yields for rates, loss-adjusted spread for credit and inflation-adjusted price for commodities.

- **Cost of hedging (carry) versus its own history:** We use carry of each asset relative to the last 10 years, assigning a higher score to assets which have a lower cost of hedging versus its history. This ensures that we are not constantly penalising assets which have a higher cost of hedging relative to other assets, even if its cost of hedging is the lowest it has been across its own history.

Based on the five components above, we compute an overall COVA score and use this to rank assets and identify good diversifiers every week. While this score is run on the global equities index, MSCI ACWI, this clear and systematic approach can be easily applied to any portfolio benchmark.

Update frequency: Weekly

Where to find it: Cross-Asset Spotlight, Cross-Asset Playbook

Related report(s):

Cross-Asset Dispatches: Finding Diversification in a Low-Yield World (8 Jun 2020)

Cross-Asset Spotlight: Correlations and Diversification (21 Jul 2021)

Cross-Asset Normalized Risk Indicators

Analyst: Serena Tang, Phanikiran Naraparaju

What is it/how is the model used? CANARIs attempt to answer the very simple question of are the latest data good or bad for the outlook of this market over the next few months? by distilling proven buy and sell signals for each asset over specific time horizons into one metric.

CANARIs give clear signals on whether the tactical outlooks for various assets are positive, neutral or negative, and inform us of the timing and potential risks of our asset allocation recommendations. For example, if our cycle-adjusted models are constructive on credit strategically, but the CANARIs are flashing warning signals over the next one-month horizon for the asset, we may wait it out before adding exposure. Additionally, where an asset's CANARI outlook differs significantly from our strategists' views, it could very well be that there are interesting structural/thematic changes that our systematic model which is based on historical relationships can't pick up, but are worth highlighting; CANARIs would help us to pick up these inconsistencies more easily.

Exhibit 33: ACWI 3M 'buy' versus 'sell' signal count
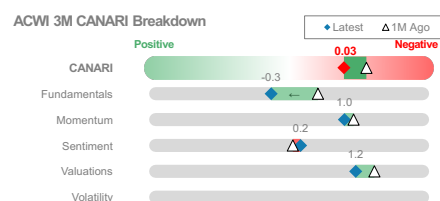
Source: Morgan Stanley Research

Exhibit 34: ACWI 3M CANARI
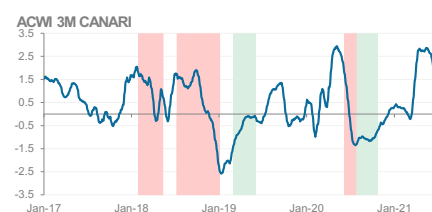
Source: Morgan Stanley Research

Exhibit 35: USD AGG 3M 'buy' versus 'sell' signal count
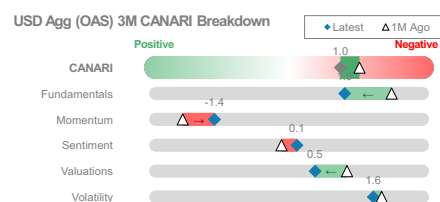
Source: Morgan Stanley Research

Exhibit 36: USD AGG 3M CANARI
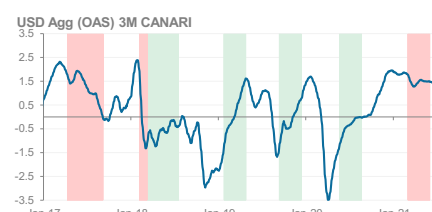
Source: Morgan Stanley Research

Methodology: The model systematically examines ~2,500 metrics across fundamentals, valuations, sentiment, momentum and volatility to determine what has been historically relevant for gauging forward returns, then measures the net share of positive and negative signals at each point in time. In general, a higher CANARI reading (more sell signals versus buy signals compared to history) is deemed as being worse for forward performance, on a rolling basis, and a lower reading (fewer sell signals versus buy signals compared to history) as being better for future returns.

Exhibit 37: CANARIs methodology

Morgan Stanley CANARI Methodology

| Fundamentals | Valuations | Sentiment | Momentum | Volatility |

STEP 1: INDICATOR TESTS & CATEGORIZATION
We test metrics in our data pool to see which have historically been reliable indicators of future performance, checking asset returns at metrics' extremes.

CANARI Components

STEP 2: METRIC TRIGGER TEST
At each point in time, we check whether metrics are triggering 'buy' or 'sell' signal by breaching their extreme thresholds. For out-of-sample periods, we continue to use in-sample thresholds.

STEP 3: UNIFIED SIGNAL EXTRACTION
For CANARI, we calculate the net percentage of signals that have been flagging 'sell' versus those which have been flagging 'buy'. The last step is calculating a Z score for the final indicator reading.

Morgan Stanley Cross-Asset Normalized Risk Indicators (CANARIs)

Source: Morgan Stanley Research

Update frequency: *Weekly*

Where to find it: *Cross-Asset Spotlight, Global In the Flow*

Related report(s):

Cross-Asset Dispatches: CANARIs – A Tool for Systematic Tactical Asset Allocation (22 Sep 2019)

Cross-Asset Crowding Strategy (CROWDS)

Analyst: Wanting Low

What is it/ how is the model used? CFTC data are a valuable resource for cross-asset positioning, existing across asset classes and regions, have a long history, are computed in a consistent, timely basis and come from a reliable, public source. Our systematic Cross-Asset Crowding Strategy (CROWDS) leverages this positioning data, combining positioning factors across asset classes to look for cheap, less crowded alternatives which may outperform in the short term, while avoiding assets where positioning looks more extreme.

Exhibit 38: Our current CROWDS scorecard

Asset	Current CROWDS Weight	CROWDS Weight %ile	Rank Δ1m	Asset Managers*	Dealers/Swap Counterparties	Leveraged Fund	Others (Corporates/ Central Banks etc.)	Producers (Commodities Only)
RUBUSD	78%		2					
AUDUSD	78%		▲ 6					
US 2yr	75%		▲ 31					
Soybean Oil	71%		▲ 5					
Copper	68%		-3					
Wheat	59%		▲ 21					
JPYUSD	44%		▼ -6					
WTI	42%		-1					
Nikkei	42%		▼ -5					
MSCI EM	42%		▲ 13					
Soybeans	39%		4					
Soybean Meal	39%		▲ 9					
EURUSD	22%		▲ 24					
Platinum	19%		1					
Natural Gas	19%		-1					
Russell 2000	17%		3					
Corn	16%		▲ 22					
Kansas Wheat	16%		▲ 6					
Cocoa	13%		-2					
RBOB (Gasoline)	13%		▼ -8					
Lumber	10%		▼ -16					
Palladium	4%		0					
US 10yr	0%		▼ -11					
Nasdaq	0%		▼ -14					
BRLUSD	-11%		2					
CHFUSD	-11%		▼ -20					
ZARUSD	-11%		3					
NZDUSD	-22%		4					
Gold	-25%		▲ 13					
Cotton	-25%		▼ -18					
Feeder Cattle	-25%		▼ -13					
US 5yr	-25%		▼ -14					
US 20yr	-25%		▼ -8					
MSCI EAFE	-25%		-1					
US 30yr	-25%		-2					
Live Cattle	-28%		▼ -5					
S&P 500	-33%		▲ 10					
Coffee	-33%		▲ 7					
Sugar	-39%		-4					
DJIA	-42%		▼ -14					
GBPUSD	-44%		▼ -5					
Lean Hogs	-51%		2					
Silver	-51%		▼ -5					
MXNUSD	-56%		-4					
CADUSD	-67%		1					
Heating Oil	-74%		▼ -5					
Brent	-80%		-4					

Source: CFTC, Morgan Stanley Research; Note: Overall CROWDS weight is a simple average of the weights in each of the relevant market participant groups. These are based on normalised weights and range from -100% to 100%. Green dot represents a buy signal, red dot represents a sell signal and yellow dash represents neutral. Pie charts show current CROWDS weight as a percentile of its entire history (including in-sample period). *We use non-commercial as a proxy for asset managers for commodities.

Methodology: The model ranks assets based on the 1Y Z-score of net positioning (as a % of open interest) across different market participant groups (asset managers/managed money funds, leveraged funds, dealers/swap counterparties, others and non-reportables) and constructs long/short cross-sectional portfolios which go long/short assets with the most extreme long/short positioning relative to the past one year.

Based on its in-sample performance (from 2007 to end-2015), we define the direction (momentum/contrarian) of each positioning factor for each asset class. Exhibit 39 shows

a summary of signals of different market participants' positioning in different asset markets. For example, asset manager positioning works as a contrarian signal for equities while dealer positioning works as a momentum indicator. CROWDS then aggregates the signals for each market participant group (based on the current 1Y Z-score and the direction of the signal) into an overall CROWDS weighting.

Exhibit 39: Are the positioning signals contrarian or momentum?

Market Participants	Equities	Rates	G10 FX	EM FX	Commodities
Asset Mgr*	Contrarian	Contrarian	Contrarian	Momentum	Contrarian
Leveraged Funds	Contrarian	Momentum	Contrarian	Contrarian	-
Dealer	Momentum	Momentum	Momentum	Momentum	Momentum
Other Reportables	Momentum	Contrarian	-	-	-
Producers (Commod)	-	-	-	-	Momentum

Source: Morgan Stanley Research; *For commodities, we use non-commercial as a proxy for asset managers' positioning.

Update frequency: *Weekly*

Where to find it: *Cross-Asset Spotlight*

Related report(s):

Cross-Asset Dispatches: Wisdom of the Crowds (11 Mar 2021)

Podcast: Cross-Asset Conversations: Ep. 29 | Positioning: Wisdom of the Crowds (16 Mar 2021)

Cross-Asset Dispatches: Futures Positioning – Expanding CROWDS (26 Apr 2021)

Cross-Asset Spotlight: What the CROWDS Say (19 Jul 2021)

Cross-Asset ETF Flows Tracker

Analysts: Serena Tang, Zlatko Hadzibegovic

What is it/how is it used? Our database captures data for ~6,000 top exchange-traded products by assets, focused on equities, fixed income, commodities and other markets like currency and volatility. Given how concentrated assets are within the biggest ETFs – the top 10 biggest ETFs hold 20% of the US$9.3 trillion total assets in our coverage – we are relatively confident that the funds in our dataset are broadly representative of the overall ETF universe. The tracker provides a gauge of demand across assets and regions, allowing us to better analyse cross-asset sentiment and positioning.

The trends in equity ETF flows in 2021: US flows to equity ETFs at US$350 billion are now higher than what was seen in the whole of 2020 by about US$124 billion, while European flows to stock ETFs at US$68 billion have also been exceptionally strong compared to prior years. The strength of inflows into ex-US equity ETFs has been particularly remarkable. Year-to-date, of the US$350 billion that has gone into equity ETFs in the US, nearly 40% went into funds focused on ex-US equities, compared to an average of less than 25% over the last two years.

The trends in fixed income ETF flows in 2021: Year-to-date, inflation-protected ETFs have added US$18 billion in new cash from the US, roughly equivalent to the total net inflows seen over the last three years combined. On the other hand, year-to-date US flows into unlevered government bond-focused ETFs stand at just US$3 billion, significantly below the run-rate of prior years. Flows to credit ETFs have lagged in both the US and Europe, especially for IG.

Exhibit 40: Year-to-date cumulative US flows to equity ETFs have been record-breaking

US YTD Cuml Flows to Equities ETFs (US$bn)

Source: Bloomberg, Morgan Stanley Research
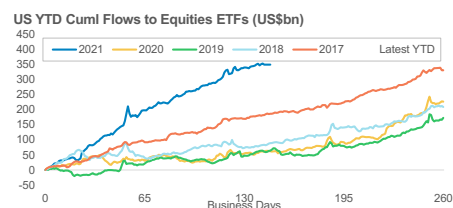
Exhibit 41: European flows to equity ETFs at the fastest run-rate in the last five years

European YTD Cuml Flows to Equities ETFs (US$bn)

Source: Bloomberg, Morgan Stanley Research
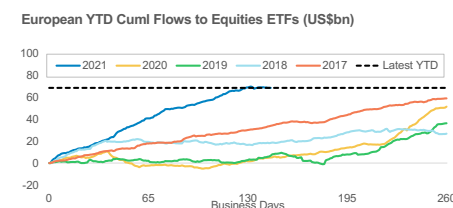
Exhibit 42: Flows to US government ETFs have been lower than in the last five years

US YTD Cuml Flows to Government ETFs (US$bn)

Source: Bloomberg, Morgan Stanley Research
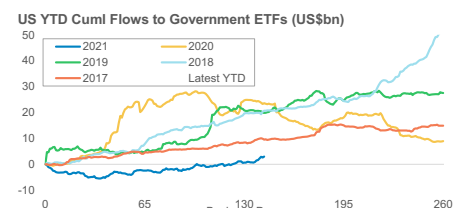
Exhibit 43: US year-to-date flows to TIPs ETFs at all-time highs
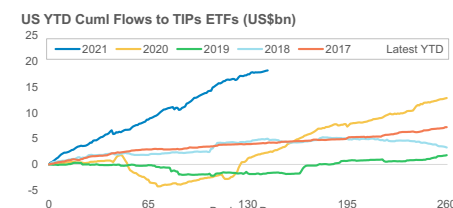
US YTD Cuml Flows to TIPs ETFs (US$bn)

Source: Bloomberg, Morgan Stanley Research

Update frequency: *Weekly*

Where to find it: *Cross-Asset Spotlight, Global In the Flow*

Related report(s):

Cross-Asset Spotlight: ETF Flows – Week of July 12 (19 Jul 2021)

Cross-Asset Dispatches: Equity ETF Flows Are the Big 1H21 Story (1 Jul 2021)

Cross-Asset Dispatches: Cross-Asset ETF Flows (11 Sep 2020)

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(as of June 30, 2021)

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STOCK RATING CATEGORY	COVERAGE UNIVERSE		INVESTMENT BANKING CLIENTS (IBC)			OTHER MATERIAL INVESTMENT SERVICES CLIENTS (MISC)	
	COUNT	% OF TOTAL	COUNT	% OF TOTAL IBC	% OF RATING CATEGORY	COUNT	% OF TOTAL OTHER MISC
Overweight/Buy	1530	44%	416	48%	27%	675	44%
Equal-weight/Hold	1439	41%	362	42%	25%	657	43%
Not-Rated/Hold	1	0%	0	0%	0%	0	0%
Underweight/Sell	529	15%	91	10%	17%	206	13%
TOTAL	3,499		869			1538	

Data include common stock and ADRs currently assigned ratings. Investment Banking Clients are companies from whom Morgan Stanley received investment banking compensation in the last 12 months. Due to rounding off of decimals, the percentages provided in the "% of total" column may not add up to exactly 100 percent.

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