LGIMA's Multi-asset Market Update

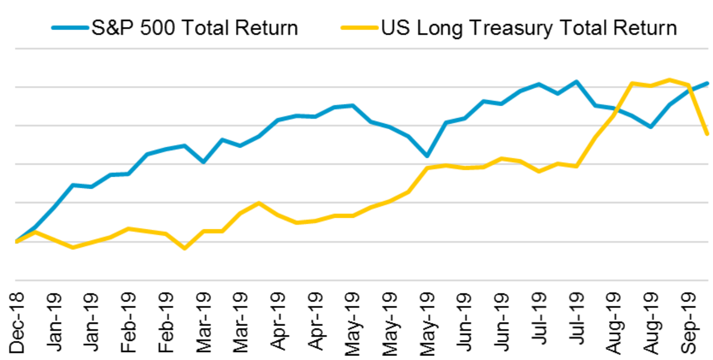
September 2019

Equity market

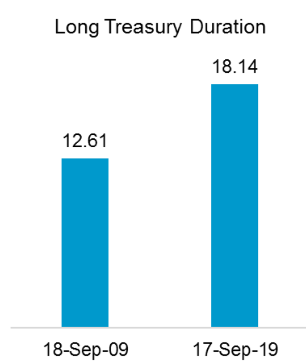
The equity market in August ended much more generously than it began. After the short bout of high realized volatility, we find ourselves at an S&P 500 price level right about where it was when we wrote two months ago. The price level hasn't changed much, but the demeanor of many of our clients has. The demand for creative hedging strategies continues to increase, as the pain of the 4Q18 drawdown has not fully dulled and we approach the close of another calendar and fiscal year. What stands out to us about our most recent conversations, though, is an added focus on the volatility of their total asset portfolio (as opposed to only the equities or a combined asset-liability portfolio). We have found these discussions on risk quite illuminating, and the analysis applies to institutional investors of all types. We hope to share some of those insights this month.

Many investors rely on some form of mean-variance optimization to determine a risk-efficient portfolio for their objectives, and this method relies on (typically long-term) assumptions of asset volatility and return plus assets' cross-correlations. Further, two risk factors still frequently dominate these portfolios: equity and interest rates. Our industry has also witnessed a trend toward utilizing long duration Treasury exposure as an offset to equity risk (commonly included in an asset group labeled "Crisis Risk Offset,""Risk Reduction & Mitigation," "Deflation/Diversification," etc.). Our example starts from here with a very simple portfolio of S&P 500 and Long Treasuries.

Most institutions rebalance their strategic portfolios according to some mix of time-based or allocation tolerance rules. Both S&P 500 and Long Treasuries have performed strongly this year, but the S&P 500 has outpaced Long Treasuries for most of it, which would imply regular equity selling and bond buying as part of a rebalance. Meanwhile, the long-term decline in interest rates also causes the duration of the bonds to increase—the duration of the Long Treasury index has increased nearly 50% over the past 10 years. To state the obvious, duration is a measure of bonds' sensitivity to changes in interest rates.



Source: Bloomberg



Source: Bloomberg

The recent changes in yield have about the same volatility as a long-term average (calculated using weekly changes in Treasury yields on rolling 1-year and 10-year scales). So, the volatility of yields hasn't changed measurably, but the ex ante volatility of your portfolio has.

This is simply a function of the duration extension—the same move in yields (in either direction) will affect your portfolio value significantly more. At the same time, equity volatility sits near its historic average and likely near many investors' long-term assumption, as does the correlation between equity and Treasuries. As a result, the proportion of volatility attributable to Treasuries in our example portfolio has increased meaningfully. Risk parity-like exposures are creeping into institutional portfolios everywhere, regardless of whether there is an explicit allocation to that strategy.

We think this highlights both strategic and tactical issues for investors. Strategically, it is worth considering whether the capital market assumptions on which you formed your current policy allocation still reflect your best estimates for risk, and would still support the current policy as best addressing the institution's objectives. We also draw from our discussion last month the potential for even lower interest rates and how that may continue supporting equity prices. In that case, somewhere between the strategic and the tactical, is the possibility that a view of lower-for-longer would favor an even more explicit risk parity-like approach. (We certainly would not advocate for this for every institution. However, we do strongly advocate evaluating total volatility net of your institution's objectives or liabilities, which often leads to reshaping allocations and bond portfolio composition.) Finally, on the tactical side, we are forced to recognize that the increase in Treasury-related risk also increases the asymmetry of total portfolio risk.

A sharp back up in rates, in our view, could spook equity markets. Returns of asset portfolios would therefore be hurt significantly by the rate increase given the ongoing duration extension of most bond markets, and this would be compounded by the equity drawdown. Equities down with rates up is not the expected case of most long-term capital market assumptions and the strategic portfolios built from them. Forecasting or timing such an event is incredibly difficult, and we are not calling for such an outcome imminently. However, it has been pointed out by a few others that, just since August, US rates, value and momentum equity factors, oil, and repo markets have all had moves of several standard deviations in magnitude. A coincidence of tail events is a strong motivator to reassess strategic and tactical positioning.

Our approach in this environment has been to increase our focus on and evaluation of portfolios' broad market betas (e.g., equity, rates, US Dollar, oil, etc.) to ensure that they are aligned with the risks we see in the current market. As we are potentially late cycle and markets remain sharply focused on political developments, we believe it is extremely difficult to have directional conviction. As a result, the previously mentioned conversations we've had with clients recently have focused less on hedging a specific outcome, like a bearish view on equity markets, and more on trade-offs that can be made in their portfolios. Put simply, many are willing to trade some upside to protect downside, and the range of asset classes where this is being explored is increasing. Implementations can include more strategic reviews or hedging structures. As always, we are happy to share our analysis and thoughts with all who are interested.

Equity volatility

Thus far in September, equity volatility conditions have moderated from August's unusually high realized volatility and large swings in implied volatility. Last month we highlighted sustained high single-day percentage moves in underlying stock prices and a tendency for implied volatility to exhibit unusually high variation. We described this as high volatility of volatility, broadly attributed by the dealing community to an excess of short VIX call positions.

These volatility dynamics were reminiscent of far more dramatic events, such as the "vol-maggedon' of February 2018 when retail short VIX products collapsed, or the entirety of 4Q18 when the S&P 500 had a 20% peak-to-trough decline. Yet despite the dramatic movement in the option market, the S&P itself experienced only a moderate total decline and has since recovered.

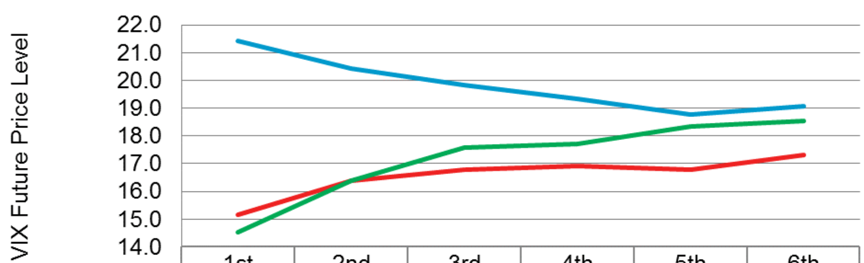
Howard Marks describes this phenomenon in Mastering the Market Cycle where markets adapt but have a tendency to overshoot and revert as they do so. Realized volatility, or the actual observed daily percent moves in prices, has converged to a standstill recently. In sharp contrast to the hair-trigger responses to tweets and news headlines that we saw in August, recent equity indices have been unfazed by a cornucopia of seemingly historic events: yield curve inversions, dramatic equity factor reversals, a 15% oil spike, repo market lock-ups, and a just-dovish-enough Fed.

Ten-day realized volatility that spiked to a crisis-like 30% on August 15 is now below 5%. That translates to average daily moves of nearly +/- 2% per day then to +/- 0.3% per day now; the historical average is around +/- 1%.

As an example of markets' tendency to overshoot, participants who held short VIX call positions, exacerbating market movements with their daily hedging with futures, now are seemingly long volatility, putting mean-reverting pressure on the markets with their hedging activity. Therefore, just as in August when we highlighted an unusually high churn in the option market and large day-to-day moves in the S&P despite perhaps a more benign macro environment, today we see a relatively calm option market and spot prices that trend to unchanged on a daily basis, undeterred by the rather striking macro events mentioned above.

Currently, we view the opportunity set in options as neutral. Short-dated implied volatility is relatively low with at-the-money strikes priced at around 12-14%. Near-the-money put implied volatility is around 15-16%. Longer dated put term structure steepens towards 17-18%. We characterize these implied volatility levels as relatively low versus the high realized volatility of August, but not an unequivocal bargain; there may be room to drift even lower if we continue to have low day-to-day moves in spot and well hedged market participants.

VIX Futures Term Structure (CBOE Volatility Index)



	1st Month	2nd Month	3rd Month	4th Month	5th Month	6th Month
07/22/2019	15.2	16.4	16.8	16.9	16.8	17.3
08/14/2019	21.4	20.4	19.8	19.3	18.8	19.1
09/18/2019	14.5	16.4	17.6	17.7	18.3	18.5

Source: Bloomberg

Rates market

Over the past two weeks, long end rates have been just as volatile in a selloff as they had been during the rally in August. To recap the movements this year, the 30-year Treasury rate started the year at 3% and hovered around that level until March. From March to the end of July, the long end rallied to 2.60. By the end of August, the 30-year rate traded at an all-time low of 1.90, but sold off to 2.38 in the first two weeks of September.

US Rate Environment

Index	09/18/2019	One-month ago	Three-months ago	One-year ago
Fed Funds Rate	2.00	2.25	2.50	2.00
2y	1.76	1.48	1.86	2.78
5y	1.68	1.42	1.83	2.89
10y	1.80	1.55	2.06	2.99
30y	2.24	2.03	2.55	3.13

Source: Bloomberg

The 30-year Treasury rate hit its lowest level intraday on August 28 as the UK government began discussing suspending parliament amidst internal turmoil over the ongoing Brexit negotiations. Rates moved off these lows by the close as Treasury Secretary Mnuchin once again expressed his interest in issuing an ultra-long Treasury with a maturity beyond 30 years. After the long Labor Day weekend, September started with a selloff as ADP and ISM non-manufacturing data came in higher than expected. More importantly, a phone conversation between China's Vice Premier Liu, US trade rep Lighthizer, and Mnuchin showed progress in the continuing tariff negotiation, and they set a meeting for October in Washington, D.C.. The following week Mnuchin stated in an interview that the ongoing discussions with China continued to be positive, and the South China Morning Post printed an article indicating that China was ready to start buying US agriculture products. Reuters would later confirm that China had purchased "at least 10 boatloads" of soybeans. By September 10 the long end rate had sold off to 2.18.

On September 12, at one of his final meetings, President Draghi unveiled the ECB's latest round of stimulus. They cut their deposit rate by 10 basis points to -0.50%, announced the resumption of the asset purchase program (starting at 20€bln/month in November), expanded their TLTRO program, and created a two-tier deposit system. Draghi also emphasized, several times, that fiscal stimulus is also needed, which many interpreted as a signal that he thinks this is as far as monetary stimulus can go. Although Draghi claimed to have unanimous support, reports were leaked that France, Germany, and the Netherlands (among others) did not support resuming QE at this point, while other representatives said they would support further QE if conditions continued to deteriorate. In the wake of the ECB announcement, Germany's best-selling newspaper, Bild, ran an article headline that translated to"Count Draghila is sucking our accounts dry," accompanied by a picture of Draghi doctored to look like a vampire. While rates initially rallied somewhat in sympathy with Europe per the announcement of the ECB stimulus, a tweet from President Trump saying he is willing to discuss an interim deal with China led rates to selloff on the day. The following day retail sales came in at +0.4% month-over-month compared to a +0.1% consensus forecast, leading to a 10 basis point selloff in the long end and the 30-year Treasury rate to close at 2.38.

30yr Treasury rate

Source: Bloomberg

A weekend drone attack on Saudi Aramco oil infrastructure caused rates to reverse course on Monday, when the markets opened during UK hours (markets were closed during Japan trading hours for a holiday). The bigger story in the rates market this week has been the lack of liquidity and funding in the repo market. A combination of technical factors – settlement of ~$52bln of new Treasury issuance, corporate tax day, corporate bond supply, constrained dealer balance sheets, and balance sheet pressure going into quarter end - all helped exacerbate the lack of cash available in the repo market. Repo rates gapped higher and traded at 10% at one point on Tuesday (compared to repo trading at 2.19 on Friday). There was enough uncertainty in the market that the NY Fed stepped in and opened a temporary repo operation (the first since 2008) to add up to $75bln to the repo market on Tuesday. It drew subscriptions of $53.2bln, but there is some speculation that the number was low because the operation started later in the morning than anticipated due to technical difficulties, and many accounts were anxious to lock in funding before the operation. Fed funds set at 2.30 – 5 basis points above the upper limit – while SOFR set at 5.25. Another repo operation on Wednesday was oversubscribed and the full $75bln was added to the market, helping stabilize repo rates.

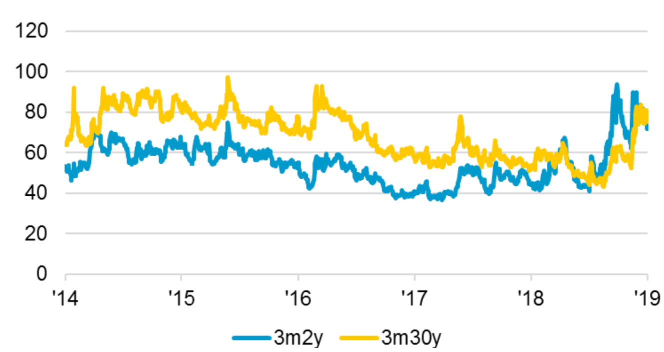
The FOMC meeting on Wednesday produced another hawkish cut as the Fed cut their target rate range 25 basis points to 1.75-2.00, and lowered IOER 30 basis points to 1.80, perhaps in response to the funding issues in the repo market this week. Many anticipated the Fed announcing a permanent repo facility, but when this failed to materialize, swap spreads gapped lower as the 2-year spread went from 0 to -4.25 basis points, its lowest level ever. The statement changed little from last month, as the Fed acknowledged that job growth remains solid and household spending is up, but business investment has weakened while inflation remains below target. More notable, however, was that while Bullard dissented in favor of a 50 basis point cut, George & Rosengren dissented in favor of no rate change. This is the first time in recent memory (possibly ever) that there have been dissenting opinions in opposing directions on a day the Fed took action. While the median dot for 2019 has been lowered 50 basis points to 1.875 since June (representing the 50 basis points in cuts since that meeting), 5 members support rates increasing by 25 basis points by the end of the year and 7 members support lowering rates by 25 basis points. The 2020 and 2021 median dots lowered 25 basis points to 1.875 and 2.125, respectively, while the long run rate remained unchanged at 2.50.

While the Fed did not open a permanent repo facility this week, they did announce they will continue with their temporary repo facility on Thursday, and most likely for the near term, until stability and reserves return to the system. In the past, issues like this would typically resolve on their own in a few days, so we'll have to wait and see if that's the case here or if further intervention from the Fed is needed. It's not hard to draw comparisons between the dissent in the ECB's stimulus package and dissent within the Fed about what path to take. It highlights the sentiment that markets and central banks are still deeply entrenched in uncharted territories. Considering that job growth is continuing at a healthy pace, unemployment remains historically low, and the stock market is still hovering near the all-time highs, it's not hard to see why some members of the Fed would support higher rates. However, economic slowdown abroad does serve as a harbinger for a potential recession on the horizon. Any progress with the China tariff negotiations in Washington next month could certainly help alleviate a lot of pressures the Fed is currently worried about.

Rates volatility

Although looking at the month-over-month change would show that implied volatility is down across all expiries, the path lower has been extremely bumpy. As bond prices reached their highest levels near the end of August, 3m30y volatility reached 84abpv, a more than 2y high. With rates trading negative across the entire term structure in Germany and the Fed openly discussing the possibility of negative rates in the US, many real money accounts were worried about losing funding status if the rally continued.

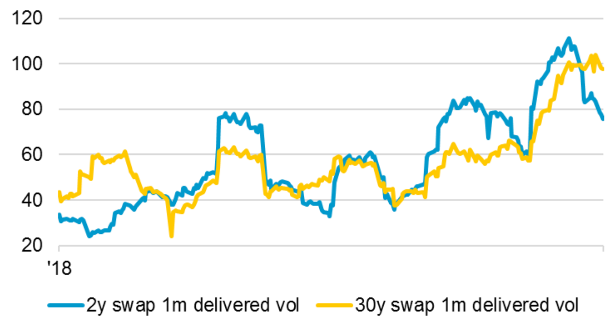
3m2y and 3m30y implied volatility



Source: Citi

As the selloff began the first week of September that volatility quickly retreated back to 74abpv as the panic over "how low can rates go?" subsided. However, as the selloff began to pick up steam – particularly after a 10 basis point move higher on September 13 on the back of strong retail sales – implied volatility shot back up and 3m30y closed at 81abpv. While rate volatility had up to this point been trading inversely correlated to rate movements – volatility went up when rates went down – it's hard to ignore the realized volatility in a 60 basis point rally followed by a 40-50 basis point selloff in a period of only six weeks. By the end of August the 1m realized volatility on the 2y swap rate had reached 111apbv, but has fallen sharply to 74abpv as large market moves lately have been led by the long end.

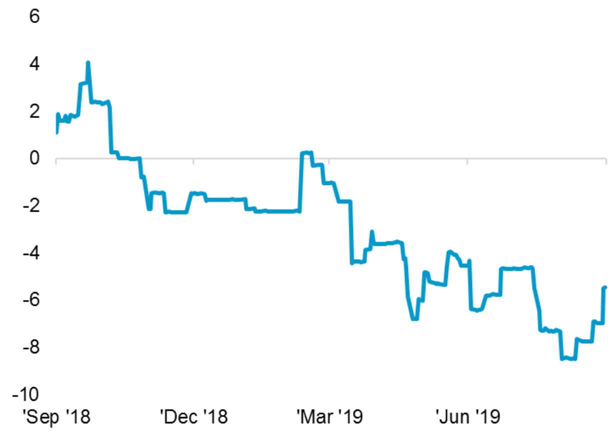
Realized swap volatility



Source: Citi

Realized volatility on the 30y rate is still at 94abpv – equivalent to a 5.9 basis point movement every day for the past month. The market seems to think rates have calmed down somewhat as implied volatilities are trading below this one month realized. Now that the FOMC has passed without any significant surprises, volatility is starting to drift lower, but implied volatility on shorter dated options still remains elevated compared to longer dated options. The volatility ratio of 5y30y/1y30y of 0.90 is at its lowest point since 2016, which has led to several hedge funds putting on calendar spreads and buying forward volatility outright to take advantage of how flat the expiry curve has become. In skew, low strike receivers had richened relative to high strike payers and end user buying focused on buying lower rate protection. In the selloff the receivers have cheapened back to July levels, but still trade higher than payers.

3m30yp+25 vol minus r-25 vol



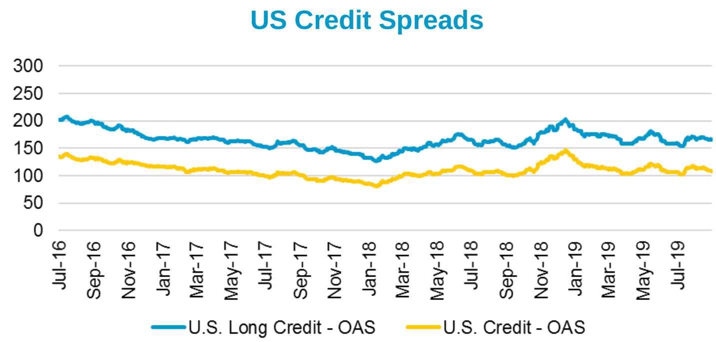
Source: Citi

Current implied volatility levels and change over 1 month

P/TAIL	1Y	CHANGE	2Y	CHANGE	5Y	CHANGE	10Y	CHANGE	30Y	CHANGE
1M	67.3	*-19.5*	77.2	*-17*	84.5	*-7.4*	84.2	*-4.5*	85.8	*-5.6*
3M	68.9	*-12*	74.7	*-7.4*	76.8	*-3.6*	76.1	*-1.7*	77	*-0.9*
6M	67.6	*-9.8*	70.8	*-6.6*	70.9	*-3.8*	71.2	*-1.6*	70.4	*-1.5*
1Y	65.8	*-8*	66.6	*-6.3*	67.6	*-2.9*	67.3	*-1.2*	65.8	*-0.5*
2Y	69.2	*-0.5*	66	*-3.2*	65.7	*-3.3*	65.5	*-2.2*	62.8	*-1.1*
3Y	65.7	*-1.8*	65.5	*-2.6*	65.6	*-2.6*	64.8	*-2.2*	60.4	*-2*
4Y	65.1	*-1.8*	64.9	*-2.4*	65.2	*-2.5*	64	*-2.4*	58.7	*-2.5*
5Y	65.4	*-1.6*	64.6	*-2.2*	64.7	*-2.4*	63.4	*-2.6*	57.5	*-3*
7Y	63.8	*-2.6*	63.2	*-2.4*	63.2	*-2.6*	61.5	*-3.2*	55.9	*-3.6*
10Y	62.1	*-2.3*	61.5	*-2.4*	61.3	*-2.8*	59.4	*-3.6*	53.8	*-3.7*

Source: Citi

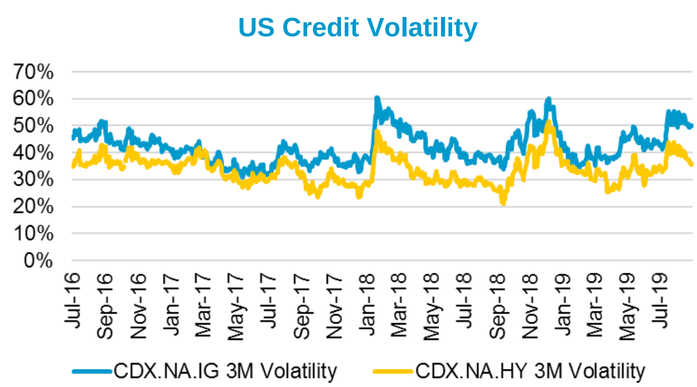
Credit market



Source: Citi

Long duration credit spreads remained range-bound the past month after a 17 basis point widening in the first two weeks of August. While intra-month spreads traded in a 7 basis point range, the US Long Duration credit index tightened 5 basis points over the past four weeks. Interestingly enough, the move in credit was relatively muted compared to a 25 basis point increase in ten-year Treasury yields and significant oil price volatility. Furthermore, credit spreads still managed to tighten with $116bln of new issuance hitting the market post Labor Day. September is seasonally the busiest month of the year for the primary market, however, even more supply than expected has been issued into the marketplace. An apparent theme amongst some deals is the transition from issuing bonds to support re-leveraging activities, to refinancing existing debt in the current low interest rate environment. Such behavior is evident in high-quality single A and double AA rated issuers taking advantage of low rates without significant funding needs. In the face of the abundance of supply, deals are clearing the market as investors appeared armed with cash entering September. According to recent credit investor surveys, trade whiplash was evident as market participants seemed to reduce risk in August after having re-risked in July. Additionally, even though overseas demand has slowed, US investment grade credit saw the third largest inflow on record, $6.94bln, to mutual funds and ETFs during the second week of September. From a macroeconomic perspective, the Fed's 25 basis point cut was widely expected, and their messaging remained consistent to "act as appropriate" to sustain the expansion going forward. Geopolitical volatility continues to be in the spotlight with the drone attacks on two major Saudi Arabian oil facilities, Brexit uncertainty, and ongoing US/China trade headlines.

Credit volatility



Source: Citi

After a volatile August, credit derivative indices have grinded tighter in line with other risk assets. The on-the-run CDX index is re-approaching one-year tights at approximately 50 basis points, and much of the strength can be attributed to the upcoming index roll. Historically, the semi-annual roll drives strong seasonal performance for both IG and HY indices. Furthermore, CDX.IG on-the-run index tends to trade roughly 5x the average daily volume on roll day and 2.3x the average daily volume in the first week after the roll. The CDX.IG series 33 roll is on Friday, September 20 and there is only one change in the index. Outside of the roll, there has been a notable trend in credit derivative indices of HY/IG decompression where the CDX HY/IG ratio is trading at the highs. Higher beta high yield names have driven the decompression, as lower beta issuers have tightened on arb activity in the marketplace. However, it appears this trend may continue as the current CDX.HY constituent spread distribution remains unappealing from a bottoms-up perspective with 57 issuers trading inside of 200 basis points. In credit volatility, August CDX.IG realized volatility surpassed levels seen last year, keeping implied elevated. While implied volatility is exhibiting a nervousness amongst investors, the underlying strength of the index is apparent by the dislocation between volatility and spot in the CDX indices.

Scenario Based Asset Allocation

SCENARIO SUMMARIES

Name	Description	Risk Assets	Inflation	Rates	USD	Probability (last month)
Global Recession	• Dominated by fears of imminent recession, US growth below 1%, China faltering and below 5%, Europe in recession • US & UK rates near 0 • Commodities drop, political uncertainty contributes to recession	▼	▼	▼	—	25% (25%)
Manageable Slowdown (Roadmap)	• Inflation print stays below central bank targets • US unemployment similar to current level and growth follows trend. Central banks increase accommodation • Trade tensions simmer • 3-4 rate cuts in the US • China growth close to c.6.1% for 2018, 5.5% for 2020	—	▼ / —	▼	▼ / —	20% (20%)
Economic Stabilisation	• US gradually slows but is above trend • Steady Europe growth and inflation • China stimulus helps stabilize growth given trade war uncertainty • Fed cuts 1-2 and inflation back to target	▲	▲	▲	▲	15% (20%)
Global Growth	• US growth remains strong, buoyed by 2-3 early cuts, strong consumer consumption and no material trade war escalation • China stimulus leads to an overshoot of 6.5%+ • Europe rebounds with EM growth • Other economic data does not point to material overheating	▲	▲	▲	▼ / —	10% (10%)
Rates Rebound Risk Off	• US inflation picks up rapidly, forcing the Fed to hike within the coming 12 months • Global government bond yields rise fuelled by rising rate and future expectations • Equity markets sell off on the back of higher yields	▼	▲	▲	▲	10% (10%)
Trumpilocks	• 2-3 rate cuts, in part for insurance against trade and slowing global growth • Trade tensions have less impact than expected and stimulus efforts reaccelerate growth	▲	▼ / —	▲	▼ / —	20% (15%)

Contributors

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