Macro Intelligence Report

November 2023

Gamma Global Macro Model Highlights

- **The S&P 500 and Nasdaq Models remained neutral (in cash) for November**. Stocks dropped for their third month in a row in October. Equities continue to be buffeted by conflicting economic and political forces which are keeping the Model on the sidelines for the time being.

- **The 10-year Treasury, Investment Grade Corporate, and High Yield Bond Models all remained neutral for October. The 30-year Treasury Bond Model remained long (lower yields) for the second month in a row.** While the Federal Reserve has chosen not to raise rates at its last two meetings, strong economic growth, above-target inflation, and relentless government borrowing are keeping upward pressure on yields.

- **The Gold Model remained neutral for November.** The Gold Model remained neutral as the geopolitical risk arising from Hamas' attack on Israel was more than offset by the prospect of additional Fed rate hikes.

- **The EUR/USD Model remained short the euro (long USD) for November.** The dollar continues to benefit from relatively stronger U.S. economic growth and higher interest rates. The prospect of no additional rate hikes by the Fed and ECB in the short term is keeping the exchange rate range-bound between 1.0500 and 1.0700.

I. Equity Index Outlook

After a strong summer, U.S. equities have now fallen three months in a row. The S&P 500 dropped -2.83% in October leaving it down -9.2% from its July close. The Nasdaq fell a larger -3.28% and was down almost -11% since July. Equities have been forced to deal with overvaluation, geopolitical uncertainty, and rising long-term interest rates due to the federal government's insatiable demand for new cash. In addition, uncertainty remains over Fed policy as the economy continues to surprise to the upside and inflation continues to run well above the Fed's target rate. The net effect is that the overall environment favors caution as evidenced by the Model's preference for remaining in cash (Chart 1).

Negative Factors

- **Liquidity remains weak**. The Gamma Composite Liquidity Indicator (CLI) has recently turned up slightly from its most extreme negative reading since 1982 (Chart 2). The improvement is deceptive, however, as it simply indicates that **the rate of deterioration has slowed.** Moreover, Chart 2 clearly illustrates that equity **PEAKS** have invariably occurred

Chart 1

USA: S&P 500 Model Forecast

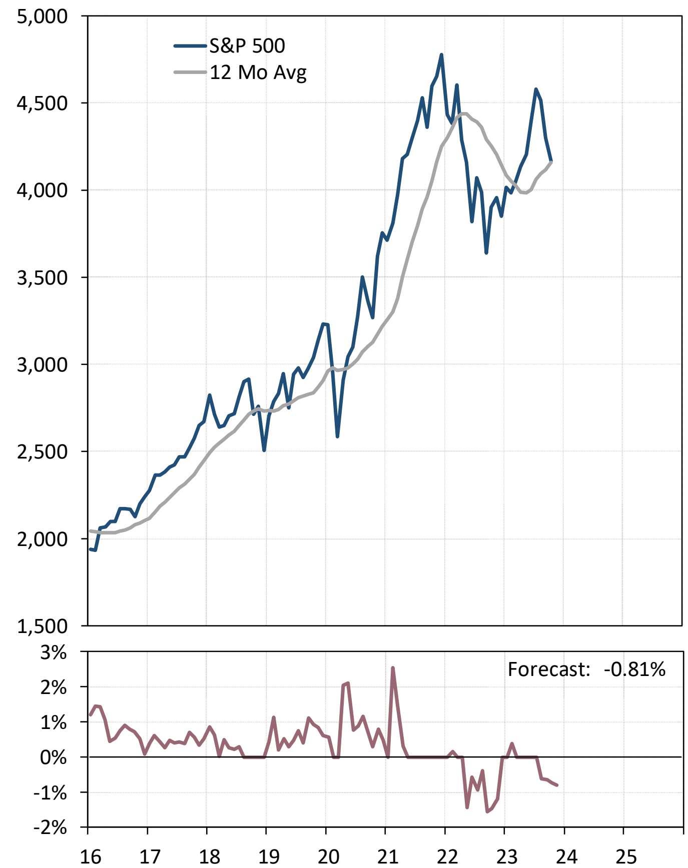
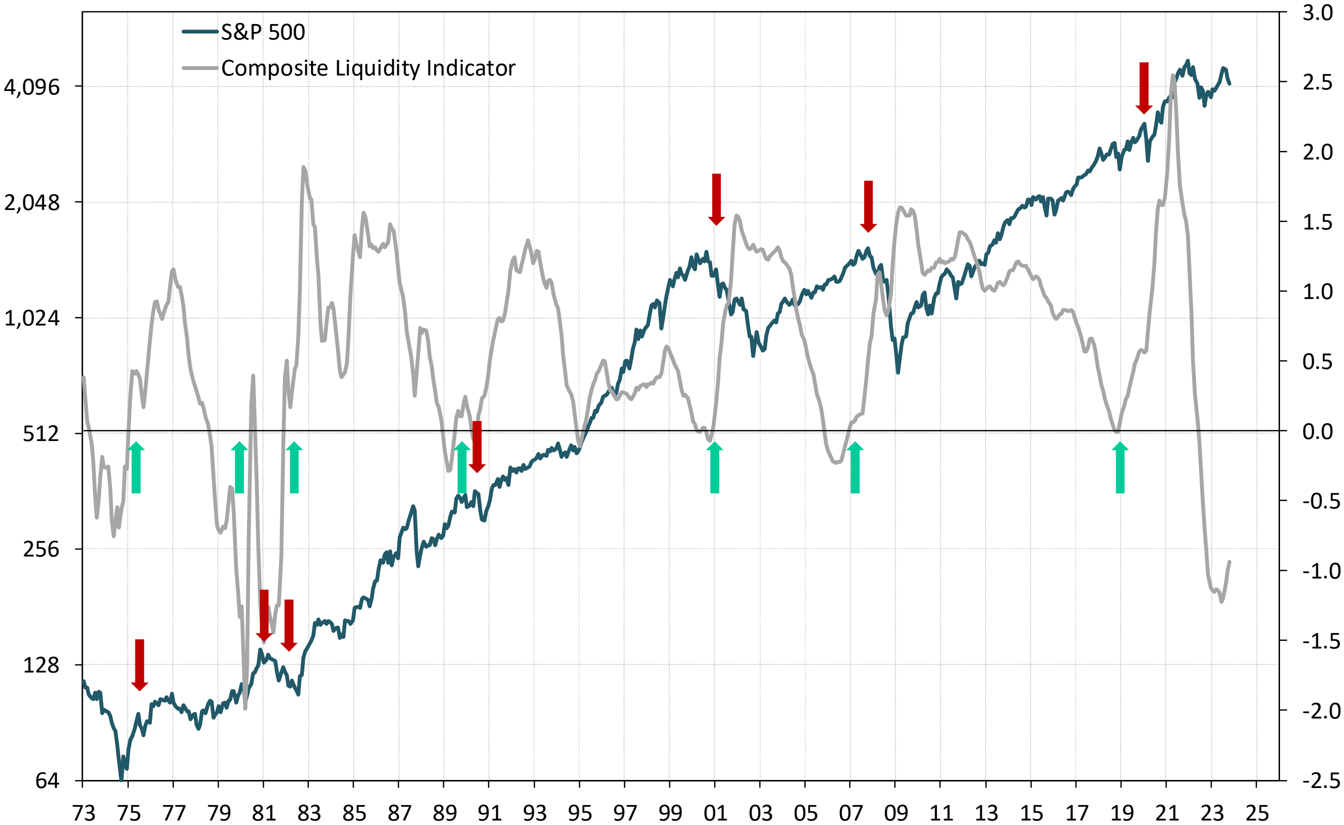


Chart 2

S&P 500



AFTER the CLI has turned positive from periods of contraction. The only major exception was in 1995 during the height of the dot com mania. Also, note that even though the CLI appears to have bottomed, it still has a long way to go before it turns positive. Movement in that direction will be constrained by multiple headwinds:

1) The Federal Reserve has not raised rates at its last two meetings, but rates nevertheless have risen 525 basis points over the last twenty months to their highest level since February 2001 (Chart 3). Given the unexpected strength of the economy and stubbornly high inflation, the central bank may still have additional tightening to do.

   Third quarter preliminary real GDP rose at a whopping 4.9% annual rate, far exceeding the consensus estimate of about 3%. Real consumer spending rose at an even higher 8.2% annual rate fueled by a decline in the personal savings rate to near the record lows hit between 2005-2008 during the height of the housing bubble. Nonfarm payrolls posted a solid +150k gain, though that was slightly less than expected due to strikes by the United Auto Workers union that reduced manufacturing jobs by about 35,000. The previous month's gain of +227k was revised down by 62,000 (note that because of annual benchmark revisions by the Bureau of Labor (BLS), the way the BLS reports revisions, and the relatively small sample sizes of monthly jobs reports, it is difficult to confidently know whether these numbers indicate persistent strength or emerging weakness.) We do know, however, that the persistent economic strength this year (including last month's moderate +150k increase in payrolls) has occurred despite the Index of Leading Indicators (LEI) posting its 18th consecutive monthly decline in a row that left the index down -7.7% yr/yr last month.

   While economic growth remains solid, inflation at both the wage and consumer price level appears to have stabilized at a rate well above the Fed's 2% target. Average hourly earnings of production and nonsupervisory employees in the private sector, the vast majority of private-sector employees, rose by 0.34% in October, the biggest increase in four months. This translates into an annualized increase of 4.2%. Compared to a year ago, average hourly wages rose by 4.4%. The rate of wage growth appears to be stabilizing at over 4%. This is far higher than the rate before the pandemic and presents a problem for the Fed since labor costs tend to be more difficult to bring down without a serious spike in the unemployment rate.

The personal consumption expenditure (PCE) deflator was up at a 3.4% yr/yr rate last month for the third month in a row (Chart 4). And that was up from a low of 3.2% in June. On a three-month basis, inflation has nearly doubled from a 1.9% annual rate in July to a 3.8% annual rate last month. On the plus side, PCE inflation excluding food and energy fell to a 3.7% annual rate last month from a 4.8% rate six months ago and a 5.5% rate a year ago. Like the broad measure, however, the three-month rate has now accelerated for the last two months. Of additional concern is that the University of Michigan's survey of one-year inflation expectations surged from 3.2% to 4.2% - a one percent increase in one month that marked the second biggest monthly increase in almost three years (Chart 5). The survey's five-year inflation expectation also rose from 2.8% to 3.0%. These numbers suggest that the Fed still has its work cut out in reaching its 2% target.

Despite the above-target inflation rate, weakness in leading economic indicators and the improvement in the core inflation rate has encouraged the Fed to take a cautious stance towards additional rate hikes. That suggests that, at best, interest rates will remain at current levels well into 2024 and could rise further if the recent pickup in inflation accelerates. Fed Chairman Powell noted after the last FOMC meeting that "the Committee is not thinking about rate cuts right now at all. We are not talking about rate cuts." Powell added that "we will keep policy restrictive until we are

Chart 3

Interest Rates: United States

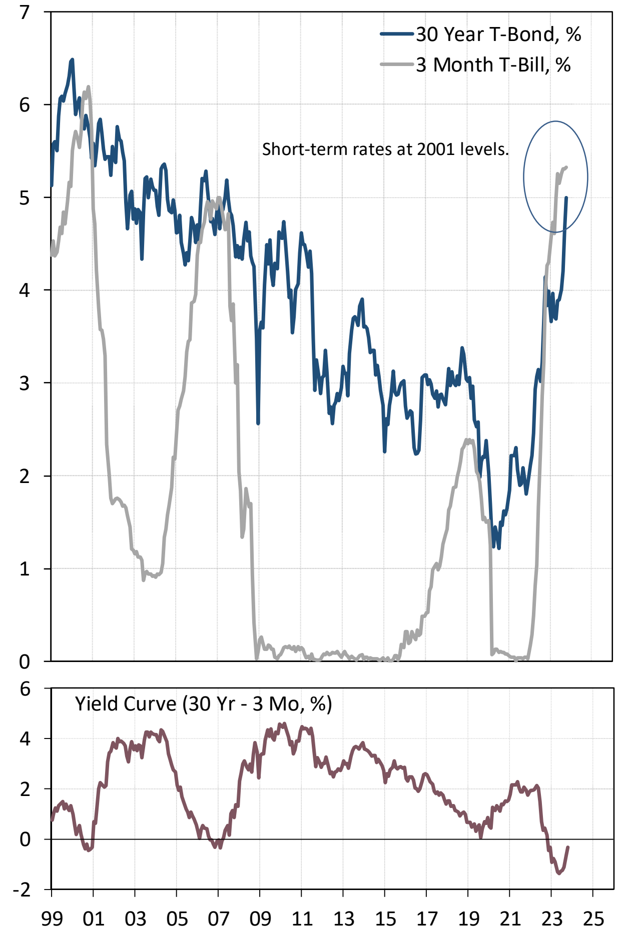
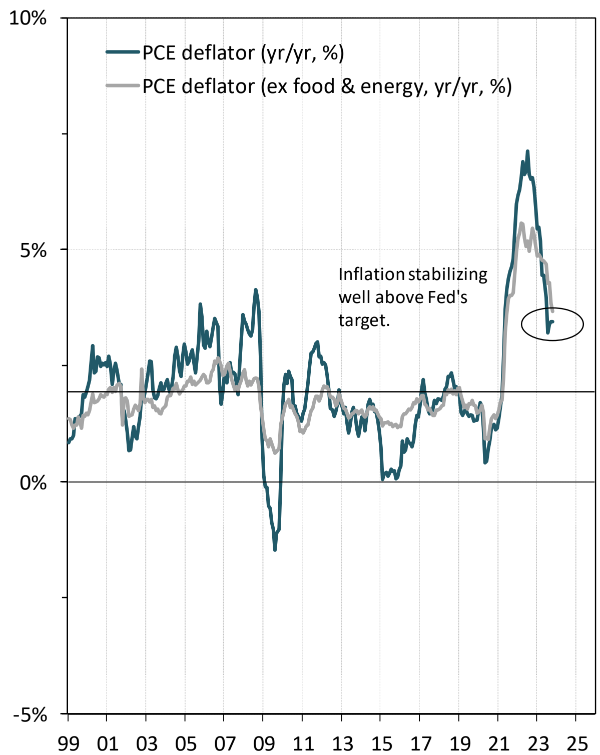


Chart 4

Inflation Measures



confident that inflation is on a sustainable path down to 2%." Powell noted that "evidence of growth persistently above potential, or that tightness in the labor market is no longer easing, could put further progress on inflation at risk and could warrant further tightening of monetary policy."

We put the odds of another Fed rate hike at 50-50. Even without another increase, however, we believe that interest rates at current levels will continue to reduce liquidity through lower bank lending that leads to additional weakness in the monetary aggregates.

2) Narrow and broad measures of money continue to decline though not as rapidly as six months ago. Yr/yr growth in real True Money Supply (TMS) improved to a -9.4% rate in October from -11.6% in September. While a modest improvement, real TMS growth is still at its weakest since 1981 (Chart 6). Moreover, much of last month's improvement was due to a build-up of cash balances in the Treasury's accounts, something that will likely be reversed in the next few months, which should put renewed downward pressure on money growth. Also, a major driver of money growth – bank lending – continues to slow as higher long-term interest rates have cut demand for mortgages and consumer loans. Annual growth in total bank credit fell to 4.4% last month compared to a 12.2% rate just nine months ago. Growth in the broader measure of money, real M2, slowed to a -7.3% yr/yr rate, its third consecutive drop. Real M2 growth remains just above its lowest level since WW II (Chart 6).

One further concern about money growth that has not generated much attention recently is the possibility of another banking crisis. The crisis earlier this year resulted in the failures of several larger regional banks that triggered billions of dollars in bank runs. Much of that money moved to large "money center" banks for their perceived safety. Since the end of February, however, the level of deposits at all commercial banks has dropped by 2% or $333 billion. This has occurred despite the Federal Reserve launching its Bank Term Funding Program (BTFP) to provide secured one-year loans to banks. The rationale for the BTFP was that

Chart 5

Univ of Michigan Inflation Survey

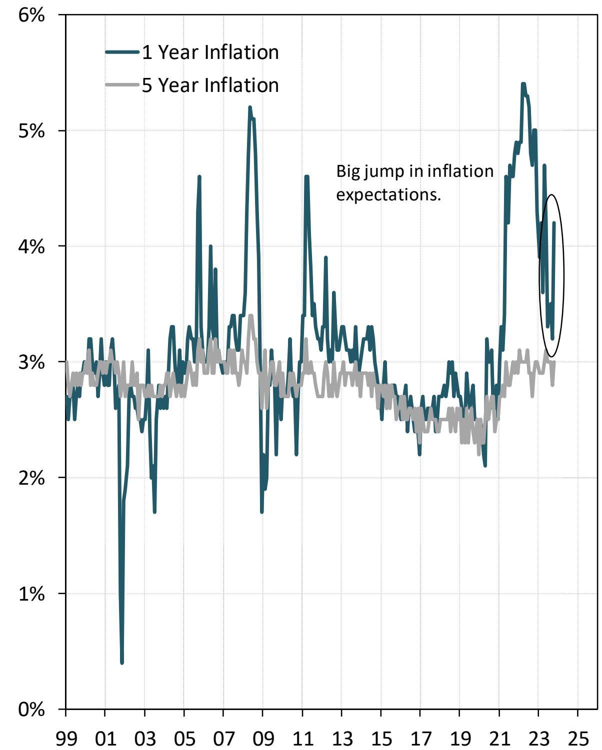


Chart 6

Real True Money Supply and M2

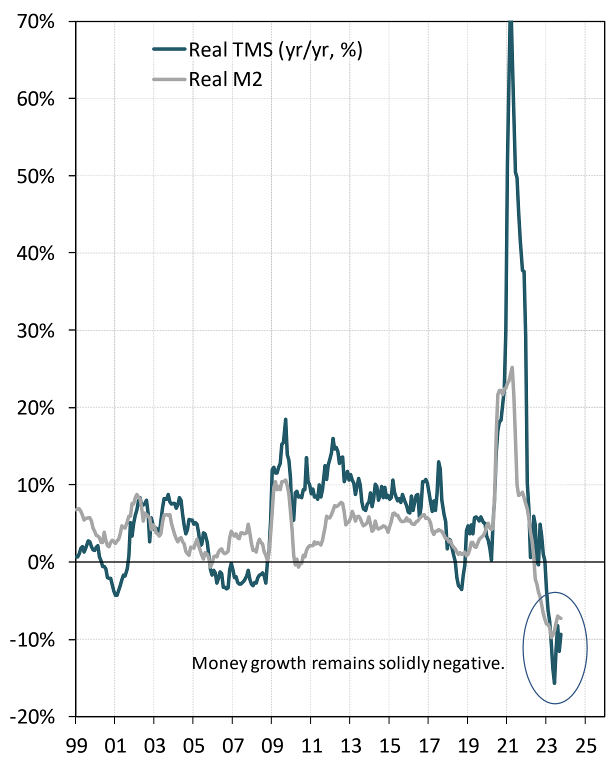
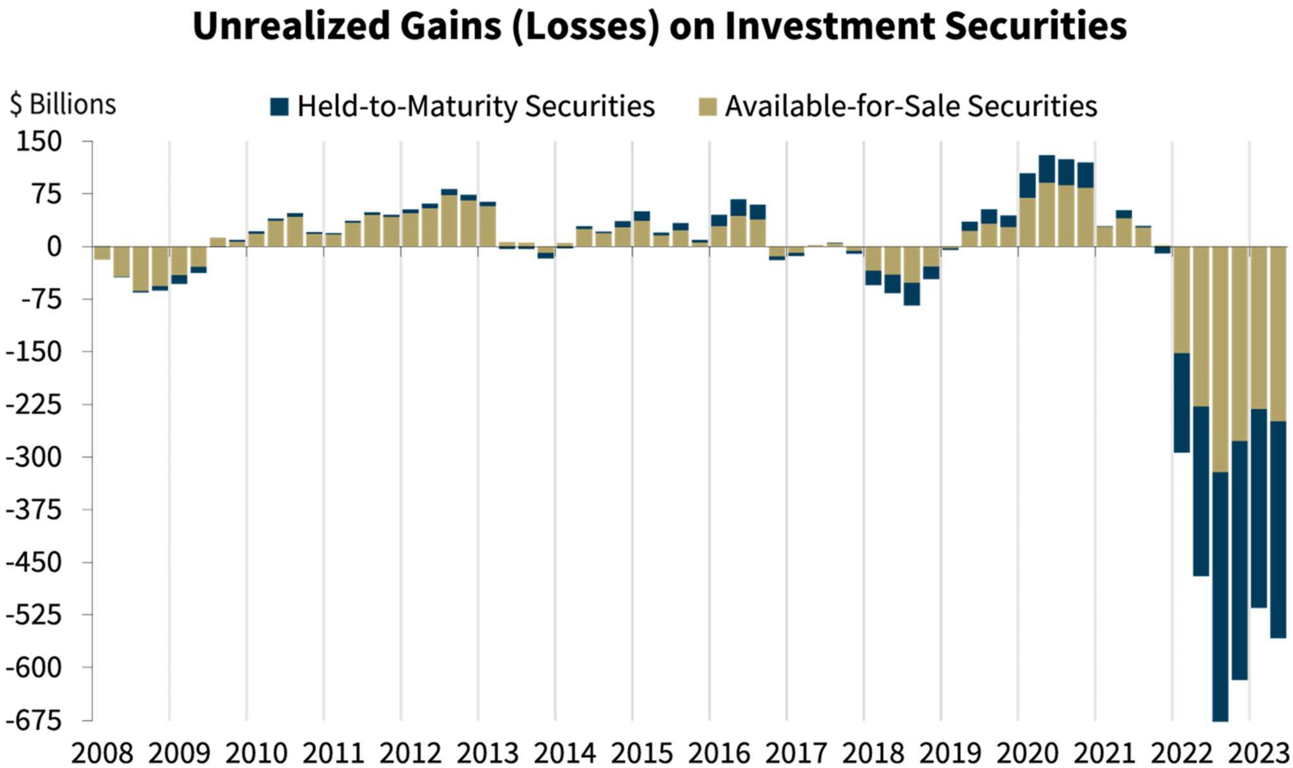


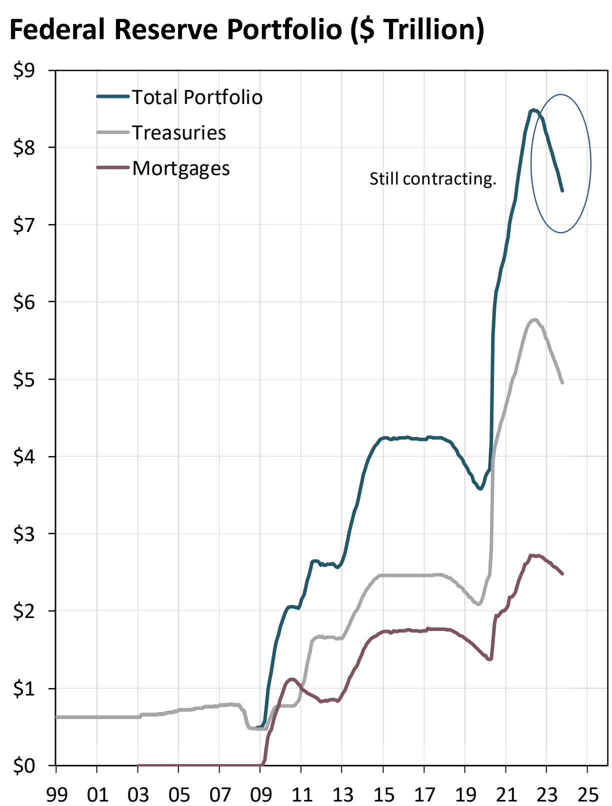
Chart 7



Source: FDIC.
Note: Insured Call Report filers only. Unrealized losses on securities solely reflect the difference between the market value as of quarter end and the book value of non-equity securities.

banks faced a liquidity squeeze. The Treasury securities that they purchased with near-zero yields in 2020-21 were considered extremely safe ***if held to maturity***. If liquidated before then, however, they would be sold at their market price which was a lot lower now that bond yields have soared 4% in reaction to the Fed's tightening. Those capital losses directly impacted bank capital which led to the collapse of several of these banks. The BTFP allowed banks to borrow money from the Fed in loans secured by their high-quality-but-underwater Treasuries rather than selling them at a loss. The fact that the BTFP balances have continued to rise despite moving on from the crisis suggests that there are potentially some landmines still out there. Chart 7 shows that unrealized losses on investment securities remain close to the levels at the time of the first round of bank failures. These figures indicate that banks are undercapitalized (their liabilities outweigh their assets) by about $550 billion overall, and they have enough cash to pay out 84% of uninsured deposits. Should another series of runs occur,

Chart 8



bank lending would likely dry up further which would maintain downward pressure on the monetary aggregates.

3) Stabilizing inflation, stronger-than-expected economic growth, and a massive increase in Treasury borrowing caused long-term rates to hit a cyclical high in October (Chart 3). 10- and 30-year Treasuries hit their highest levels in 16 years. The Treasury's insane borrowing program may, in a sense, be doing the Fed's inflation-fighting work for it. Since Treasuries are the benchmark for pricing other securities such as mortgages, car loans, and corporate bonds, a rise in Treasury yields spills over and affects borrowing costs throughout the economy. Inflation stabilizing at levels well above the Fed's 2% target rate, worsening inflation expectations, and a continued spending binge by the government financed by unprecedented borrowing are expected to keep long-term rates heading higher. The effect is likely to keep downward pressure on liquidity due to reduced borrowing.

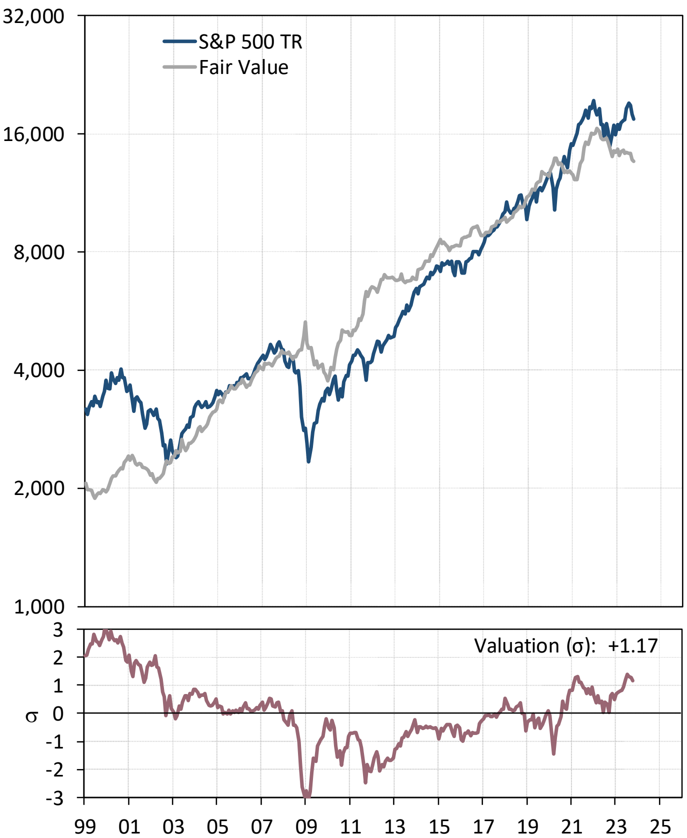
4) The yield steepened last month but remains inverted. The 3-30 yield spread narrowed to 32 basis points as the 30-year T-Bond yield surged to 5%. The curve has steepened from an extreme inversion of -36 basis points in May. A steeper yield curve has historically been associated with improved liquidity. As we noted last month, a steeper curve can occur due to either short-term interest rates falling faster than long-term rates or long-term rates rising faster than short-term rates. In this case, the steepening has occurred due to rising long-term rates. This is potentially a bearish sign for equities and the economy because higher long-term interest rates reflect an expectation of higher and/or higher for longer short-term interest rates. In other words, the rise in long-term rates (and the accompanying steepening of the curve) are likely due to market expectations that the Fed may raise rates further and keep them higher for longer to ensure that inflation returns to its 2% target rate (Chart 5).

- **The Federal Reserve's Balance Sheet continues to shrink.** Since the introduction of so-called Quantitative Easing (QE) following the 2007-2008 financial crisis, changes in the Fed's balance sheet have had a disproportionately large impact on asset prices. The current process of Quantitative Tightening (QT) has resulted in the liquidation of an average of $90 billion a month in assets from the Fed's investment portfolio. The Fed's portfolio has shrunk by $1.04 trillion since the central bank started raising interest rates in May 2022 (Chart 8). Fed Chairman Powell noted following the last FOMC meeting that "the Committee is not considering changing the pace of the Balance Sheet runoff. That is not something we are considering. I know there are many candidate explanations for why rates have been going up, and QT is certainly on that list, although it could be playing a small effect."

- **Equities remain highly overvalued by historical standards**. Valuation improved modestly last month on a combination of lower equity prices and improved earnings. The Gamma Valuation Model indicates that the

Chart 9

USA: S&P 500 Valuation

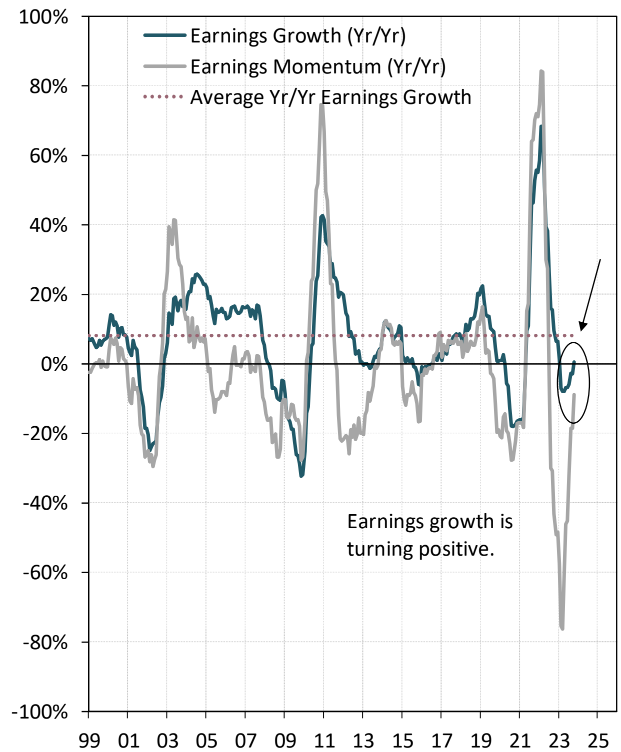


S&P 500 and Nasdaq remain 1.2 (25%) and 1.5 (41%) standard deviations above fair value – still near their highest levels since the collapse of the dot com bubble (Chart 9). **According to the Gamma Valuation Model, the S&P 500 has been trading above fair value for 39 months in a row – the longest such stretch since the dot com bubble.**

Earnings have been recovering, which has helped prevent a further worsening of valuation despite the jump in long-term interest rates. 12-month trailing earnings for the total U.S. market improved to +0.4% yr/yr (Chart 10). The S&P 500 improved to +2.0% last month after being down as much as -9.2% in June. Nasdaq earnings turned positive at +0.4% after bottoming at -15.5% in February. Despite this improvement, however, **according to the Gamma Valuation Model, it would require either 1) a 22% drop in stock prices, 2) a 55% increase in corporate earnings, or 3) a drop in interest rates to 2.2% (or a combination of the above) to bring equity valuation back to neutral.** For valuation to drop instantaneously to -1 standard deviations (a typical level for the beginning of a new bull market) would require either 1) a 37% drop in stock prices, 2) a doubling of earnings, 3) interest rates falling to 2.20%, or 4) some combination of the three. The problem is that sharply lower interest rates would likely require a recession which would cause earnings to contract. Conversely, if earnings growth surges due to a strong economy, the Fed will likely have to raise interest rates even more to keep inflation headed to its 2% target rate. Our experience has been that small to moderate overvaluation can be remedied by changes in earnings and/or interest rates. **Substantial overvaluations, however, have invariably required major market corrections to get prices back to fair value.**

Chart 10

US Total Market Earnings Growth



Positive Factors

- **Seasonals.** Following the last three down months, equities have now entered their historically strong stretch through next spring. November has historically been the second strongest month for the S&P 500, averaging a 1.78% monthly gain since 1973. Assuming the Fed makes no move to hike rates and earnings continue to recover, we could see a year-end rally despite the persistent weakness in liquidity.

- **Market breadth is nearing short-term reversal levels.** Market breadth based on the number of outperforming stocks has dropped to a -1.2 standard deviation level. While not at the -1.5 standard deviation level historically associated with sustained rallies, a reading at this level suggests that sentiment is bearish enough to trigger a short-covering rally into year-end.

II. Fixed Income Outlook

The fixed income Model signals were unchanged for November. The 10-year Treasury Note, Investment Grade Corporate, and High Yield Corporate Models remained neutral. Bucking the trend (and possibly acting as a long-term leading indicator for the sector) was the 30-year T-Bond Model which remained long (lower yields, Charts 11, 12).

Chart 11

USA: 10 Yr T-Note Model Forecast

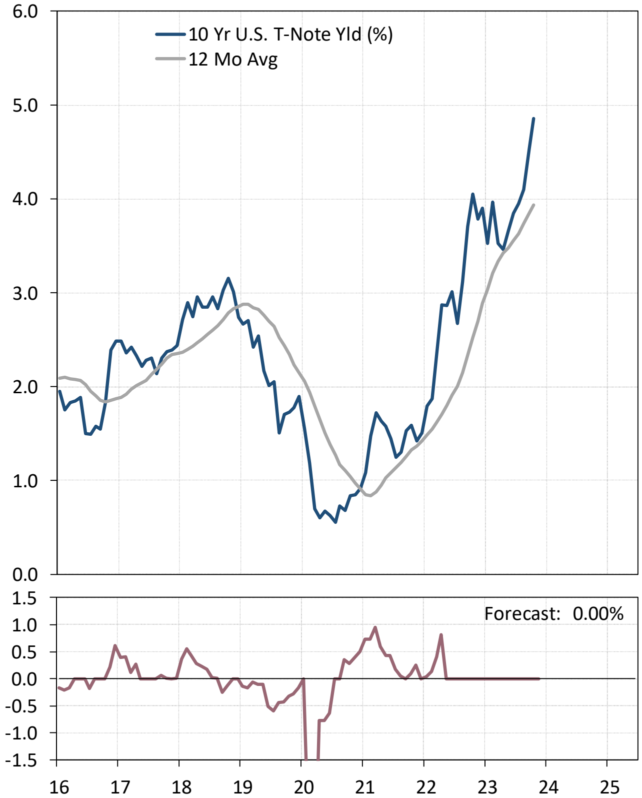
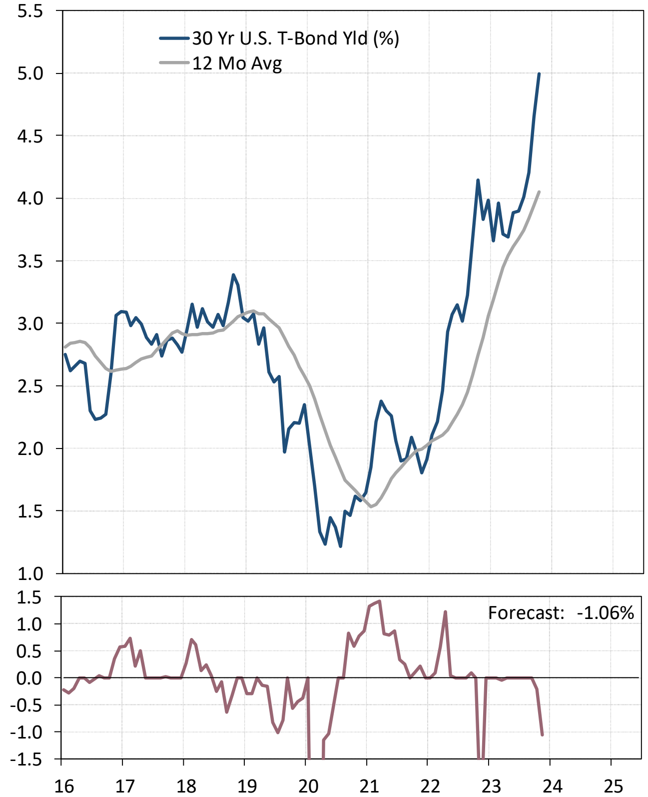


Chart 12

USA: 30 Yr T-Bond Model Forecast



Yields in general have surged since April due to a perfect storm of stronger-than-expected growth, little additional improvement in the inflation rate, and an avalanche of borrowing by the Treasury Department. Since April, the 10-year T-Note yield has surged 1.39%, while the 30-year T-Bond yield has climbed 1.31%. Long-term yields ended October at their highest level since the middle of 2007.

Negative Factors

- **More Treasury borrowing is coming**. The Treasury Department raised over $1.7 trillion in new money during the first two quarters of the current fiscal year. That propelled total debt outstanding to a record $33.2 trillion. To avoid a full-blown rout at the long-end of the Treasury curve (off of which 30-year fixed mortgages are based) the Treasury announced plans to raise more money at the (more expensive) front end of the curve (less than seven years). The Treasury Borrowing Advisory Committee (TBAC) announced that they will be selling an additional net $776 billion in Q4 2023 and $816 billion in Q1 2024. The TBAC also announced that of the $1.6 trillion in new debt, the amount of T-bills outstanding will balloon by $460 billion in Q4 and by an additional $586 billion in Q1 - a combined $1.05 trillion in just two quarters (Chart 13)! How that works out will, of course, depend on where interest rates are when these T-Bills are rolled over. Clearly, it's a bet by the Treasury that interest rates will be heading lower within the next year.

What makes this surge in borrowing so difficult to swallow for those of us who favor even modest fiscal sanity is that all this borrowing is due to completely out-of-control spending. As we noted last month, "prior to the Covid pandemic, federal government spending for the fiscal year 2019 was running at about \$4.4 trillion. The government's massive fiscal and monetary response to the pandemic caused spending to swell to \$6.5 trillion 2022. By 2022, any modestly rational individual would have said "look, the crisis is over, we have to get spending back to where it was before the pandemic." That, of course, is not how Washington works. The Biden Administration took advantage of the pandemic to push through additional Covid stimulus plus the so-called "Inflation Reduction Act" to establish the \$6.5 trillion as the new baseline for spending. That has effectively institutionalized an additional \$3 trillion a year in borrowing into the foreseeable future."

Chart 13

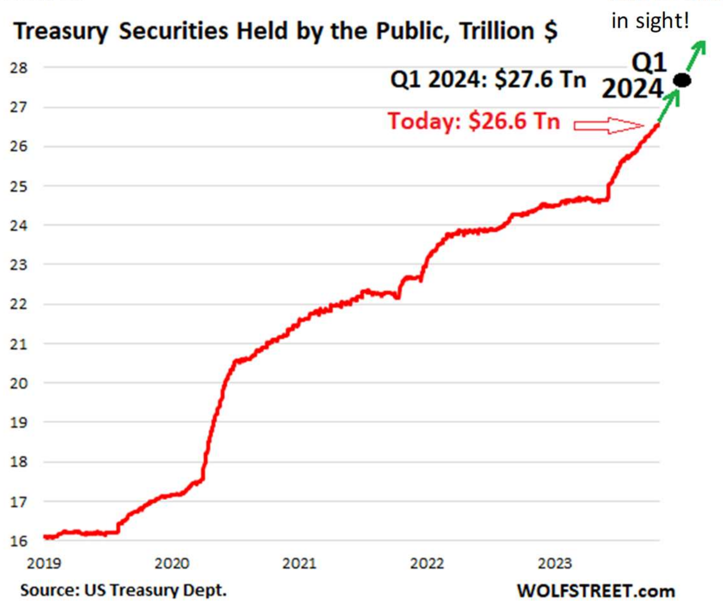
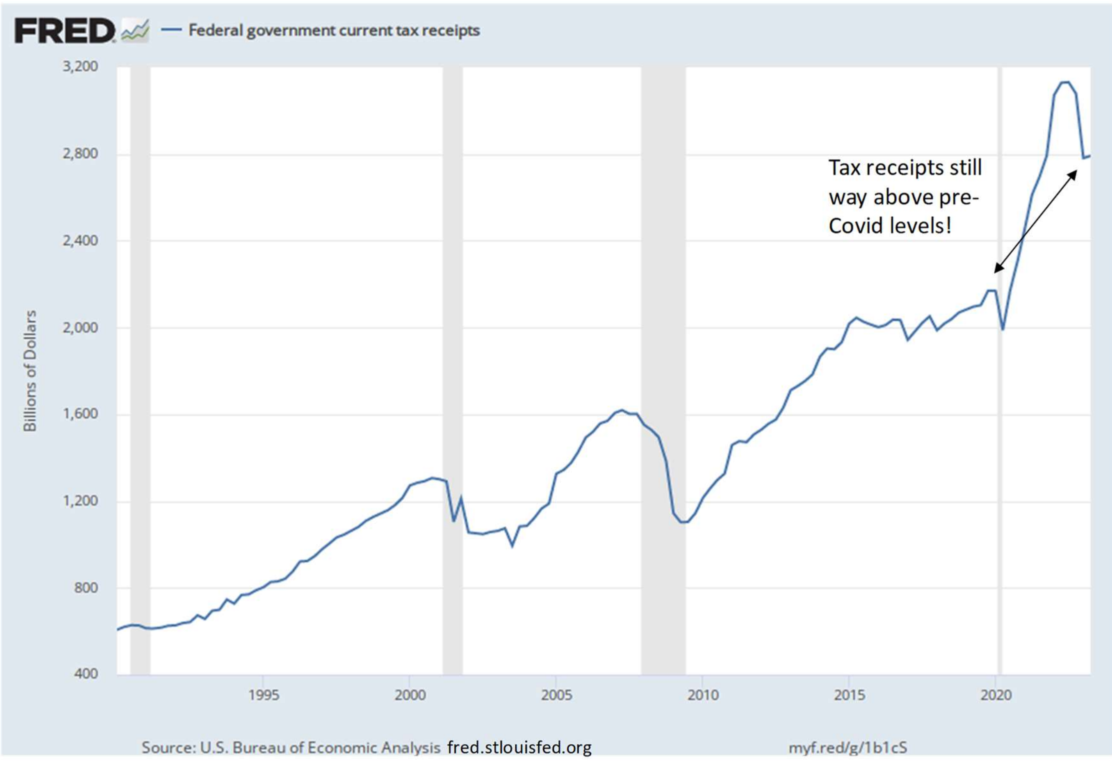


Chart 14



And just to emphasize that this is a spending problem, not a revenue problem, consider that federal government tax revenues are currently only down slightly from their record peak in 2022 (Chart 14) and are almost a third higher from their 2019 peak. In fact (and this a discussion for another day), the tax increases in the Biden Administration's "Inflation Reduction Act" have actually reduced revenues! To highlight the insanity of the current situation, consider the proposed funding package for Israel. The new Speaker of the House, Mike Johnson, proposed a $14.2 billion package that would be paid for by reallocating part of the $80 + billion (!) of new money for the IRS in the Inflation Reduction Act (i.e., NOT with additional borrowed money). That proposal was immediately met with cries of "irresponsible" from Senate President Chuck Schumer. If an expenditure that amounts to less than 0.02% of total spending (effectively a rounding error) can't be paid for without issuing new debt, expect the announced $1.6 trillion of upcoming borrowing to continue to swell.

- **Inflation is stabilizing above the Fed's 2% target rate.** As noted above, inflation for both wages and prices appears to have stabilized at a rate well above the Fed's 2% target Chart 4). The personal consumption expenditure (PCE) deflator was up at a 3.4% yr/yr rate last month for the third month in a row. On a three-month basis, inflation has nearly doubled from a 1.9% annual rate in July to a 3.8% annual rate last month. Of particular concern is that this deterioration in inflation is becoming imbedded in inflationary expectations. The University of Michigan's survey of one-year inflation expectations surged from 3.2% to 4.2% last month. The concern is that higher inflationary expectations will also influence wage demands as seen with the recent UAW strike. Such increases tend to be "stickier" and more difficult to slow without a substantial increase in unemployment. The worse the situation gets, the more likely it is that long-term rates will remain elevated on the expectation that the Fed has no choice but to maintain high rates for longer.

- **Inverted yield curves**. The 3-30 and 2-10 yield curves remain inverted which translates into negative carry on long positions. (Chart 3). The inverted curves create an incentive to hold higher-yielding, shorter-term maturities over long-term securities which should keep upward pressure on long-term interest rates.

- **"Quantitative Tightening" meets out-of-control government borrowing.** Total Federal Reserve assets dropped by another $134 billion in October as the Fed continues to liquidate its investment holdings. Holdings of Treasuries and MBS dropped $67 billion as the total decline from the May 2022 peak topped $1.04 trillion (Chart 8). The Fed also appears to have no plans to slow the pace of its liquidation. That will keep the central bank out of the market as a buyer of the $1.6 trillion in new debt scheduled to be auctioned in the

Chart 15

USA: 10 Yr T-Note Valuation

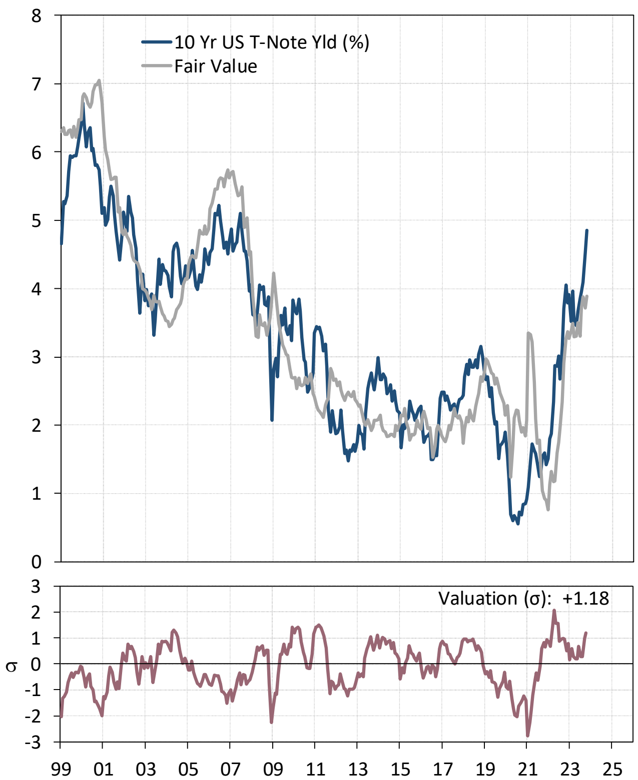
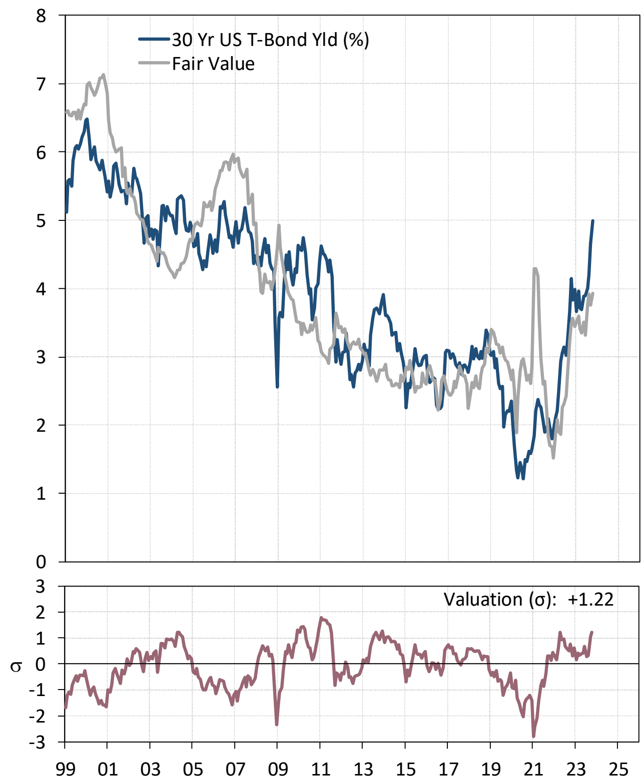


Chart 16

USA: 30 Yr T-Bond Valuation



next six months. The result is likely to be further upward pressure on bond yields, though the announcement by the Treasury that it will focus on issuing shorter term debt may offset some of this effect by shifting to shorter-term maturities.

Positive Factors

- **Valuation improved on last month's rise in long-term yields**. Last month's sharp jump in yields caused valuations of long-term bonds and notes to climb to their most attractive levels in 16 months (Charts 15, 16). 30-year T-Bond undervaluation improved from 0.28 standard deviations three months ago to 1.22 standard deviations in October, the most attractive valuation since April 2022. 10-year T-Note valuation improved from 0.30 to 1.18 standard deviations. Investment grade corporate valuation worsened slightly from 1.33 to 1.13 standard deviations. **In contrast to equities, bonds remain very attractive from a valuation perspective.**

- **Leading inflation indicators have improved.** Energy and food prices appeared to have bottomed out during the summer, but both (along with raw industrial materials prices) sold off convincingly last month. Energy prices tumbled 8.5% despite concerns over oil supply interruptions due to rising tensions in the Middle East. Food prices fell 2.6% to a new cycle low. Industrial materials price fell 2.6% as the percentage of purchasing managers reporting higher commodity input prices remained below 50% for the sixth month in a row. Preliminary third quarter real GDP rose a surprisingly strong 4.9%. The index of leading economic indicators has been down for 18 months in a row, however, so lower commodity prices may be a sign that the long-expected weakening in the economy is actually starting to happen. If that's the case, bonds will benefit especially given their current attractive valuation levels.

- **Seasonal factors.** 10-year Treasuries have historically fallen an average of 8 basis points in November and another 0.5 basis point in December before climbing steadily from January through May.

III. Gold and Precious Metals Outlook

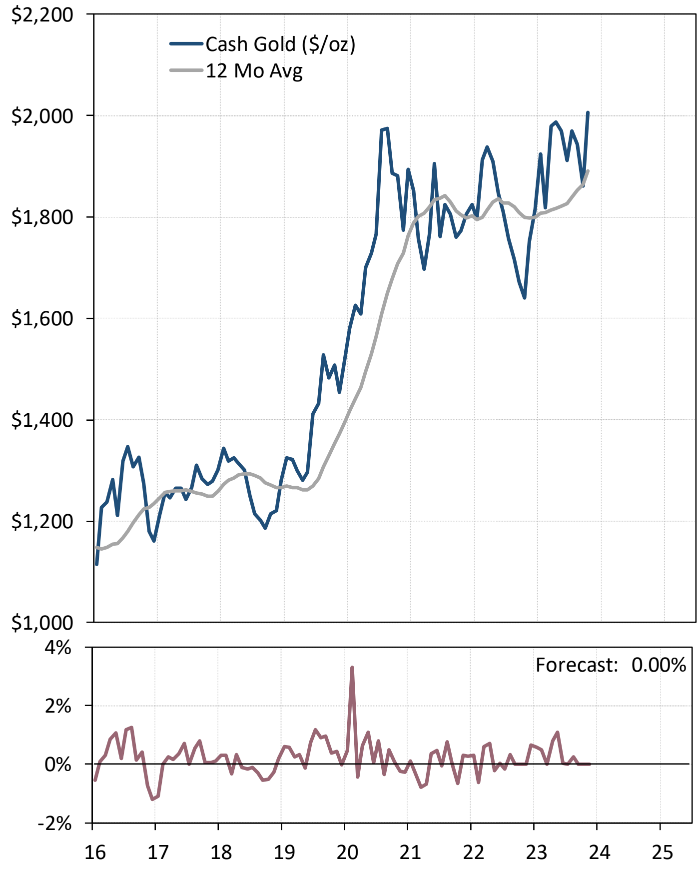
The Gamma Gold Model remained neutral for November despite extreme volatility in October that saw gold prices initially collapse before rallying strongly at month-end on the Hamas attack on Israel (Chart 17). Gold ended the month up 7.75%, the biggest one-month gain since March.

Positive Factors

- **Precious metals are cheap**. Last month's nearly 8% rise in the price of gold caused undervaluation to improve to one standard deviation below fair value (Chart 18). That still leaves gold about 25% undervalued. Also, many times when the metal has hit over 1.5 standard deviation undervaluation extremes, gold has rallied to the opposite extreme. For example, gold in October 2001 hit a -1.98 standard deviation low before rallying through 2011 to 1.75 standard deviation overvaluation. **We have been encouraging long-term**

Chart 17

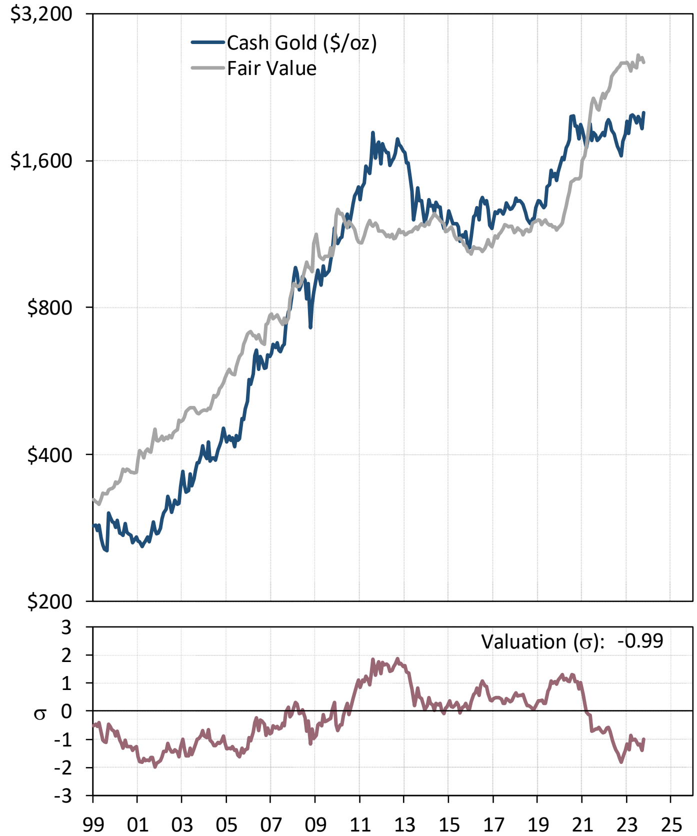
Gold Model Forecast



investors to take advantage of weakness in the sector to add to long positions in both metals and gold mining shares since gold hit a -1.52 standard deviation level of undervaluation in August 2022. Since then, the metal has risen about 17%, and we believe that that rally will continue until gold reaches at least $2,500/oz.

Chart 18

Gold Valuation



Neutral Factors

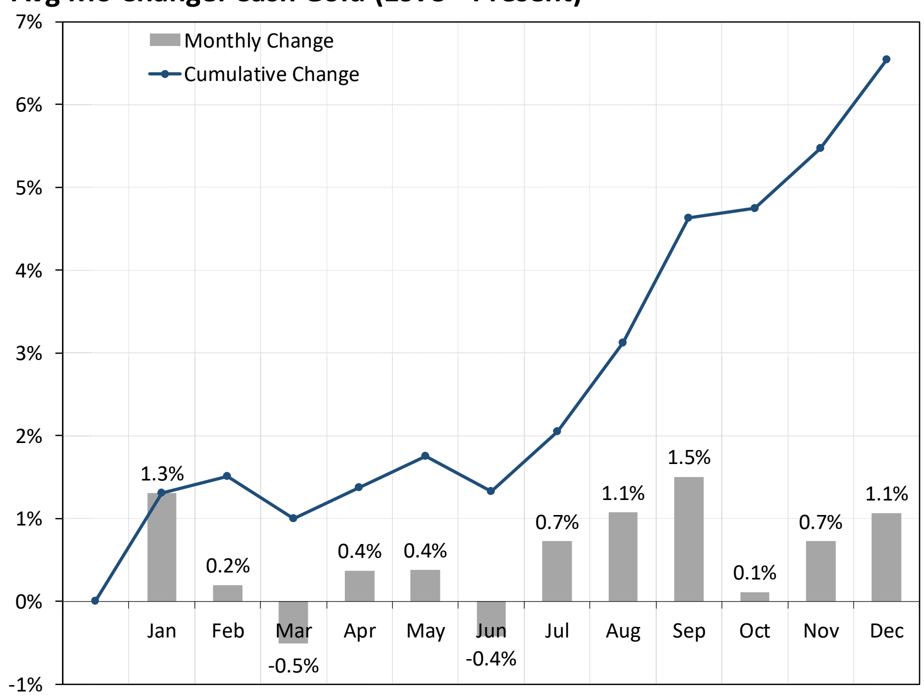
- **<u>Positive seasonals</u>**. Precious metals have historically performed strongly in the second half of the year with gold averaging a 0.7% gain in November and a 1.1% rise in December (Chart 19).

Negative Factors

- **<u>Rising interest rates</u>**. While the Federal Reserve may be in "hold" mode, the reality is that interest rates are now at their highest level since February 2001. Moreover, real interest rates (adjusted for the inflation rate) over the last six months have been positive for the first time since mid-2019. Periods of positive real interest rates have often historically been associated with gold underperformance. Gold's primary financial role is as a store of value during uncertain times and as an inflation hedge over the long term. Unlike stocks, bonds, and cash, however, gold pays no dividend, coupon, or interest. With interest rates likely to remain steady or even rise further, gold must still deal with this headwind until investors believe that the Fed is embarking on a sustained series of rate cuts.

Chart 19

Avg Mo Change: Cash Gold (1975 - Present)

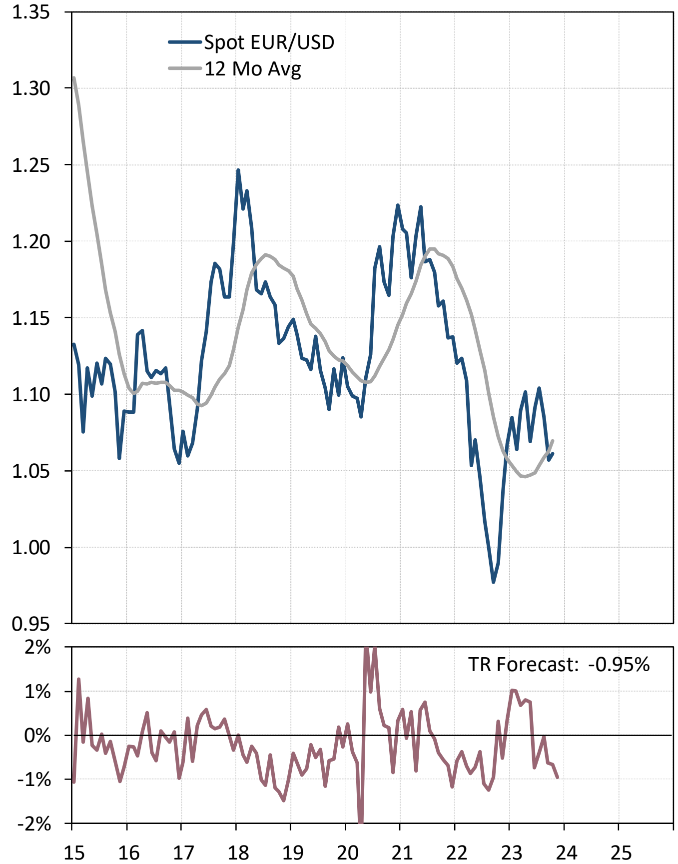


IV. Foreign Exchange Outlook

The Gamma EUR/USD Model remained short the euro (long USD) for November for the sixth month in a row (Chart 20). Relative growth, inflation, and interest rate developments continue to benefit the U.S. currency, though a pause in rate hikes by both the Fed and ECB is likely to keep the exchange rate range-bound.

Chart 20

EUR/USD Model Forecast



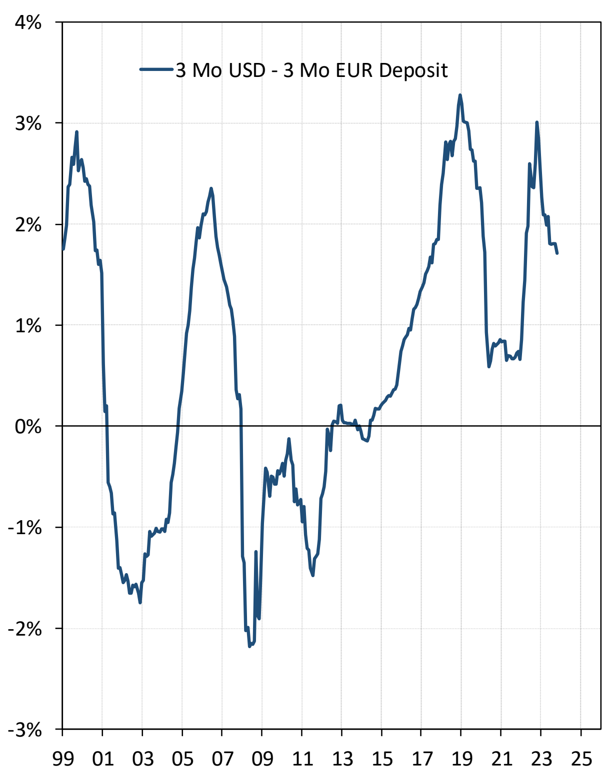
Positive USD Factors

- **Stronger relative U.S. economic growth.** U.S. real GDP expanded at a 4.9% annual rate in the third quarter which Euro zone growth was down -0.1%. German industrial production was down -1.7% yr/yr compared to up 0.1% for the United States. The OECD's index of leading economic indicators, while negative for both regions, was up for the U.S. compared to a year ago while the Eurozone measures just hit a new low for this cycle. The outperformance of the U.S. economy will likely result in a relative widening of the interest rate differential in favor of the dollar (Chart 21, 22).

- **The ECB is unlikely to match any additional Fed rate hikes.** Euro zone inflation in October dropped to a two-year low of 2.9% yr/yr, well below economists' expectations of 3.1% and significantly below 4.3% in September. The European Central Bank (ECB) recently announced that "based on its current assessment, the Governing Council considers that the key ECB interest rates have reached levels that, maintained for a sufficiently long duration, will make a substantial contribution to the timely return of inflation to target." The region's negative outlook for economic growth and inflation appearing to converge to the ECB's 2% target strongly suggests that the central bank is done tightening for this cycle. In contrast, the Federal Reserve, while on pause, still has to deal with inflation growth stabilizing well above 2% and a stronger than expected economy that may make further inflation improvements impossible without higher interest rates.

CHART 21

3 Month Interest Rate Differential

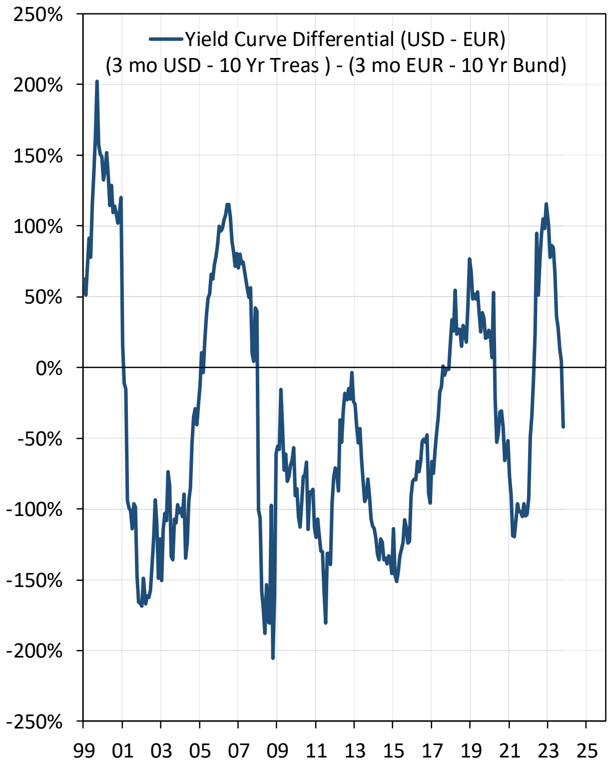


Negative USD Factors

- **Yields curves indicate that European monetary policy is tighter than U.S.** The ECB seems unlikely to match any additional Fed rate hikes, but its aggressive rate hikes over the past year have caused the euro yield curve to sharply invert. The spread between 10-year Bunds and 3-

CHART 22

USD - EUR Yield Curve Differential



month euro deposit rates widened to 133 basis points last month. The relative yield curve between the dollar and euro has narrowed dramatically from 115 basis points last December to 5 basis points last month.

- **The U.S. inflation rate has climbed back above that of Europe.** The spread on the yr/yr change in producer prices (PPI, a proxy for relative purchasing power parity) between the U.S. and Europe has steadily moved against the dollar since March. Back in March, U.S. producer price inflation was running almost 5% below that of the Euro zone. By last month, U.S. producer prices were rising 1% faster than Europe.

\- Karl Chalupa

Mr. Chalupa is the CIO and Co-Founder of Gamma Investment Consulting and Editor of the Gamma Intelligence Reports. He is also President of Gamma Capital LLC, a quantitative global macro investment firm. Mr. Chalupa developed the Gamma Investment Program used for previously trading the firm's $400 million global macro program. He was previously Director of Risk Management at Titan Advisors LLC, a $4.5 billion alternative investments firm. Mr. Chalupa was also Managing Director of the Currency and Alternative Investment Strategies Groups at State Street Global Advisors (SSGA) where he developed a $9 billion currency overlay program and launched SSGA's first hedge fund based on his Gamma Model. Mr. Chalupa spent 13 years at ABN Amro Bank where he traded interest rate and currency derivatives and was Manager of the Proprietary Trading and Economic Research Desk. He began his career as an economist for the Federal Reserve Bank of Chicago. Mr. Chalupa holds an MA in Economics from Brown University, graduated magna cum laude from Northern Illinois University with BAs in Economics and Political Science, and is Series 3 registered.

Gamma Macro Model Forecasts for November 2023

1 MONTH STOCK INDEX MODEL FORECASTS (%)

Country	Stock Index	Price	1 Mo Forecast	Previous Forecast	Position	Trade	Updated
USA	S&P 500	4,166.82	-0.81%	-0.74%	Short	Hold	10/31/23
USA	Nasdaq	12,720.25	-1.68%	-1.92%	Short	Hold	10/31/23
USA	Russell 2000	1,646.46	-0.41%	-0.37%	Short	Hold	10/31/23
Canada	S&P/TSX 60	1,131.88	0.00%	0.00%	Neutral	Hold	10/31/23
Mexico	IPC	48,945.55	0.00%	0.00%	Neutral	Hold	10/31/23
Brazil	Bovespa	112,834.98	0.00%	0.00%	Neutral	Hold	10/31/23
Japan	TOPIX	2,253.72	+0.16%	+0.72%	Long	Hold	10/31/23
China	Hang Seng CEI	5,861.74	0.00%	0.00%	Neutral	Hold	10/31/23
Hong Kong	Hang Seng	14,781.66	0.00%	0.00%	Neutral	Hold	10/31/23
S. Korea	KOSPI	2,277.99	0.00%	-0.83%	Neutral	Cover Short	10/31/23
India	Nifty 500	16,801.10	+1.57%	+1.19%	Long	Hold	10/31/23
Australia	S&P/ASX 200	6,780.70	0.00%	0.00%	Neutral	Hold	10/31/23
Europe	STOXX 600	433.14	0.00%	0.00%	Neutral	Hold	10/31/23
UK	FTSE 100	7,336.05	0.00%	+0.50%	Neutral	Cover Long	10/31/23
Germany	DAX	14,781.66	0.00%	0.00%	Neutral	Hold	10/31/23
France	CAC 40	6,880.75	-0.15%	-0.38%	Short	Hold	10/31/23
Italy	FTSE/MIB 30	27,682.32	0.00%	0.00%	Neutral	Hold	10/31/23
Switzerland	Swiss Market	10,370.97	0.00%	0.00%	Neutral	Hold	10/31/23
Russia	RTS 50	1,077.65	0.00%	0.00%	Neutral	Hold	10/31/23
S. Africa	FTSE/JSE 40	64,086.96	+2.18%	+3.33%	Long	Hold	10/31/23

1 MONTH FIXED INCOME MODEL PRICE CHANGE FORECASTS (%)

Country	Debt Instrument	Current Yield (%)	Price Change Forecasts (%) 1 Month	Previous	Bond Position	Trade	Updated
USA	2 Yr T-Note	5.07	-0.04%	-0.19%	Short	Hold	10/31/23
USA	5 Yr T-Note	4.80	-0.15%	-0.31%	Short	Hold	10/31/23
USA	10 Yr T-Note	4.85	0.00%	0.00%	Neutral	Hold	10/31/23
USA	30 Yr T-Note	5.00	+1.06%	+0.21%	Long	Hold	10/31/23
USA	IG Corporate	6.36	0.00%	0.00%	Neutral	Hold	10/31/23
USA	HY Corporate	9.51	0.00%	0.00%	Neutral	Hold	10/31/23
Canada	10 Yr Govt	4.00	0.00%	-0.20%	Neutral	Cover Short	10/31/23
Mexico	10 Yr Cetes	10.25	0.00%	0.00%	Neutral	Hold	10/31/23
Brazil	10 Yr Govt	11.99	-1.17%	0.00%	Short	Sell	10/31/23
Japan	10 Yr JGB	0.95	0.00%	0.00%	Neutral	Hold	10/31/23
Australia	10 Yr Govt	4.92	0.00%	0.00%	Neutral	Hold	10/31/23
S. Korea	10 Yr Govt	4.33	0.00%	0.00%	Neutral	Hold	10/31/23
China	10 Yr Govt	2.71	0.00%	-0.15%	Neutral	Cover Short	10/31/23
India	10 Yr Govt	7.35	0.00%	-0.06%	Neutral	Cover Short	10/31/23
Germany	10 Yr Bund	2.78	0.00%	0.00%	Neutral	Hold	10/31/23
France	10 Yr OAT	3.40	-0.04%	-0.09%	Short	Hold	10/31/23
Italy	10 Yr BTP	4.70	-0.15%	-0.01%	Short	Hold	10/31/23
Switzerland	10 Yr Conf	1.10	0.00%	-0.01%	Neutral	Cover Short	10/31/23
UK	15 Yr Gilt	4.80	+0.30%	0.00%	Long	Buy	10/31/23
Russia	10 Yr Govt	12.72	0.00%	0.00%	Neutral	Hold	10/31/23
S. Africa	10 Yr Govt	10.66	0.00%	-0.22%	Neutral	Cover Short	10/31/23

Gamma Macro Model Forecasts for November 2023

1 MONTH FX MODEL FORECASTS (%)

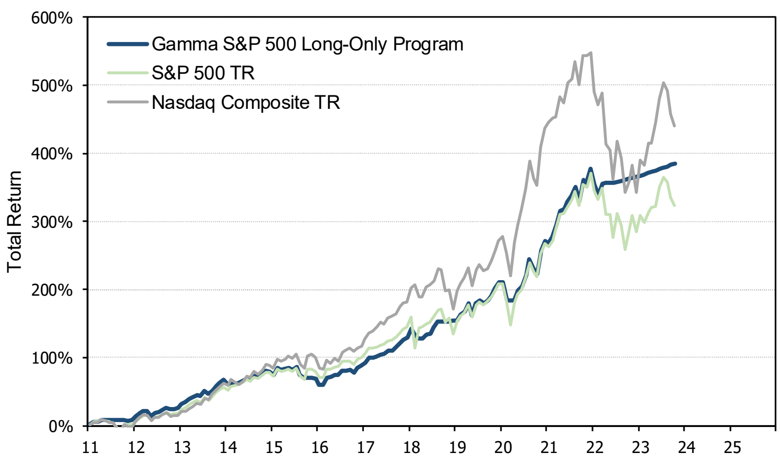
Currency	Spot FX Rate	1 Mo Forecast	Previous Forecast	Position	Trade	Updated
EUR/USD	1.0613	-0.95%	-0.66%	Short	Hold	10/31/23
GBP/USD	1.2151	-0.13%	-0.21%	Short	Hold	10/31/23
USD/CHF	0.9065	+0.72%	+0.61%	Long	Hold	10/31/23
USD/NOK	11.1682	+0.64%	+0.07%	Long	Hold	10/31/23
USD/SEK	11.1372	+1.21%	+0.47%	Long	Hold	10/31/23
USD/JPY	151.04	0.00%	0.00%	Neutral	Hold	10/31/23
AUD/USD	0.6343	-0.16%	+0.09%	Short	Cover Long & Sell	10/31/23
NZD/USD	0.5826	-0.58%	+0.06%	Short	Cover Long & Sell	10/31/23
USD/KRW	1,350.71	+0.47%	+0.47%	Long	Hold	10/31/23
USD/CNY	7.3172	+0.73%	+0.63%	Long	Hold	10/31/23
USD/INR	83.24	+0.37%	+0.40%	Long	Hold	10/31/23
USD/SGD	1.3680	+0.22%	0.00%	Long	Buy	10/31/23
USD/CAD	1.3866	+0.26%	+0.00%	Long	Hold	10/31/23
USD/BRL	5.0440	0.00%	0.00%	Neutral	Hold	10/31/23
USD/MXN	18.04	0.00%	0.00%	Neutral	Hold	10/31/23
USD/RUB	93.33	-2.86%	-1.34%	Short	Hold	10/31/23
USD/ZAR	18.69	+0.96%	+0.14%	Long	Hold	10/31/23
BTC/USD	34,305	+6.37%	-2.56%	Long	Cover Short & Buy	10/31/23

1 MONTH COMMODITY PRICE FORECASTS (%)

Commodity	Cash / Futures Price ($)	1 Month Forecast	Previous Forecast	Position	Trade	Updated
Gold	$2,005.39	0.00%	0.00%	Neutral	Hold	10/31/23
Silver	$23.21	+0.37%	0.00%	Long	Buy	10/31/23
Platinum	$941.36	0.00%	0.00%	Neutral	Hold	10/31/23
Palladium	$1,134.08	-3.15%	-1.17%	Short	Hold	10/31/23
Aluminum	$2,251.51	0.00%	+0.51%	Neutral	Cover Long	10/31/23
Copper	$8,103.00	0.00%	0.00%	Neutral	Hold	10/31/23
Lead	$2,064.75	0.00%	0.00%	Neutral	Hold	10/31/23
Nickel	$20,865.50	0.00%	0.00%	Neutral	Hold	10/31/23
Tin	$25,867.00	0.00%	0.00%	Neutral	Hold	10/31/23
Zinc	$2,287.77	0.00%	+1.05%	Neutral	Cover Long	10/31/23
LME COMPOSITE	---	0.00%	0.00%	Neutral	Hold	10/31/23
WTI Crude Oil	$82.91	0.00%	+0.28%	Neutral	Cover Long	10/13/23
HH Natural Gas	$2.960	-1.09%	-1.01%	Short	Hold	10/20/23

Gamma Model Performance Summary – October 2023

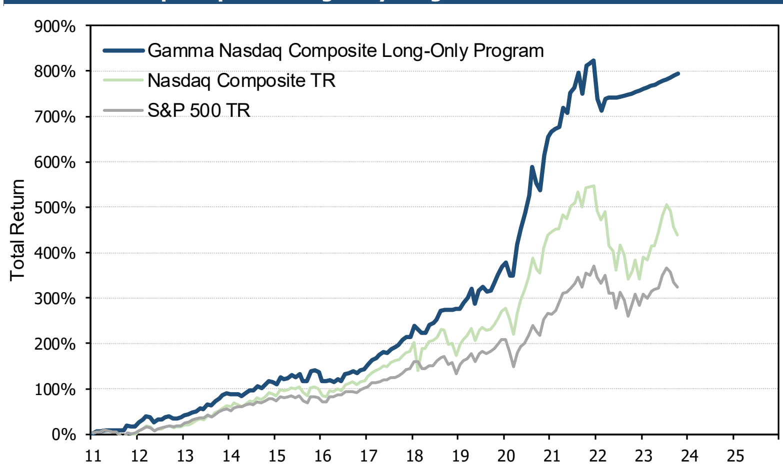
Gamma S&P 500 Long-Only Program Jan 2011 - Oct 2023



Historical Performance	Program	BM1	BM2
Compound ROR	13.1%	11.9%	14.0%
Cumulative Return	485.4%	323.8%	439.5%
Cumulative VAMI	$4,854	$4,238	$5,395
Best Month	10.9%	13.9%	20.7%
Worst Month	-8.2%	-17.7%	-20.9%
% Positive Months	79.2%	69.5%	64.9%
Historical Risk	**Program**	**BM1**	**BM2**
Standard Deviation	9.8%	15.7%	18.7%
Sharpe Ratio (1.0% RFR)	1.24	0.70	0.70
Sortino Ratio (1.0% RFR)	1.68	1.08	1.17
Downside Deviation	7.2%	10.1%	11.1%
Maximum Drawdown	-14.1%	-23.8%	-31.8%
Months In Maximum Drawdown	18	22	22

BM1: S&P 500 Total return
BM2: Nasdaq Composite Total Return

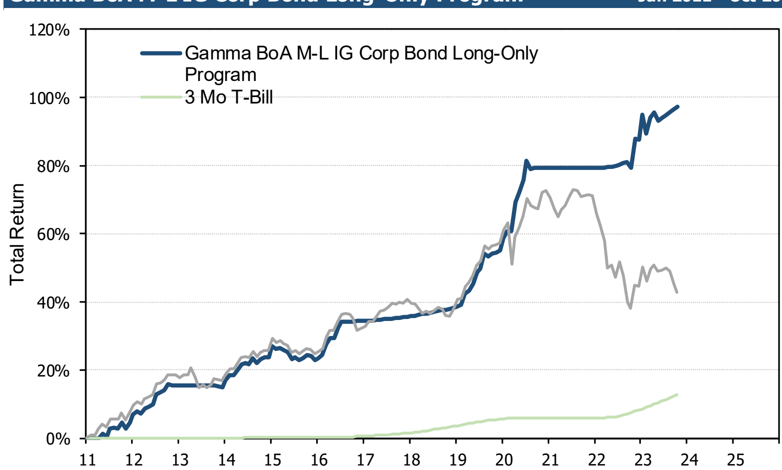
Gamma Nasdaq Composite Long-Only Program Jan 2011 - Oct 2023



Historical Performance	Program	BM1	BM2
Compound ROR	18.6%	14.0%	11.9%
Cumulative Return	893.6%	439.5%	323.8%
Cumulative VAMI	$8,936	$5,395	$4,238
Best Month	15.5%	20.7%	13.9%
Worst Month	-9.0%	-20.9%	-17.7%
% Positive Months	77.9%	64.9%	69.5%
Historical Risk	**Program**	**BM1**	**BM2**
Standard Deviation	12.8%	18.7%	15.7%
Sharpe Ratio (1.0% RFR)	1.38	0.70	0.70
Sortino Ratio (1.0% RFR)	2.10	1.17	1.08
Downside Deviation	8.4%	11.1%	10.1%
Maximum Drawdown	-12.0%	-31.8%	-23.8%
Months In Maximum Drawdown	22	22	22

BM1: Nasdaq Composite Total Return
BM2: S&P 500 Total Return

Gamma BoA M-L IG Corp Bond Long-Only Program Jan 2011 - Oct 2023



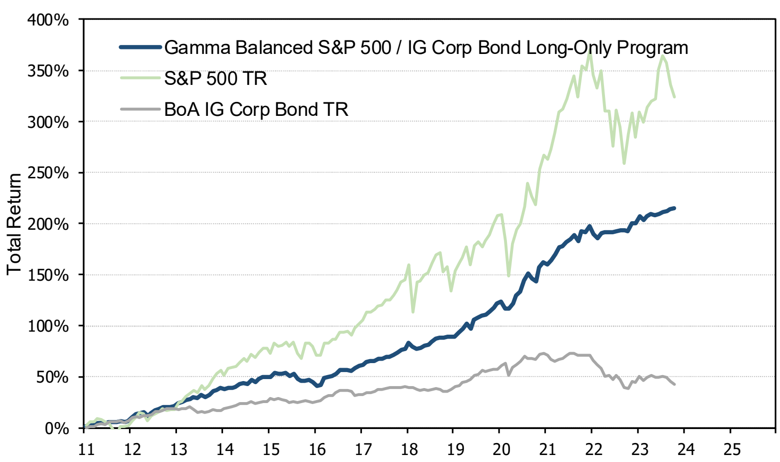
Historical Performance	Program	BM1	BM2
Compound ROR	5.4%	0.9%	2.8%
Cumulative Return	197.4%	12.9%	42.7%
Cumulative VAMI	$1,974	$1,129	$1,427
Best Month	5.3%	0.4%	5.3%
Worst Month	-2.9%	0.0%	-7.5%
% Positive Months	83.8%	100.0%	60.4%
Historical Risk	**Program**	**BM1**	**BM2**
Standard Deviation	3.8%	0.4%	6.0%
Sharpe Ratio (1.0% RFR)	1.16	---	0.30
Sortino Ratio (1.0% RFR)	1.86	---	0.37
Downside Deviation	2.4%	---	4.9%
Maximum Drawdown	-3.3%	0.0%	-20.1%
Months In Maximum Drawdown	27	0	27

BM1: 3 Mo T-Bill
BM2: BofA M-L Investment Grade Corp Bond Index

Past performance is not indicative of future results

Gamma Model Performance Summary – October 2023

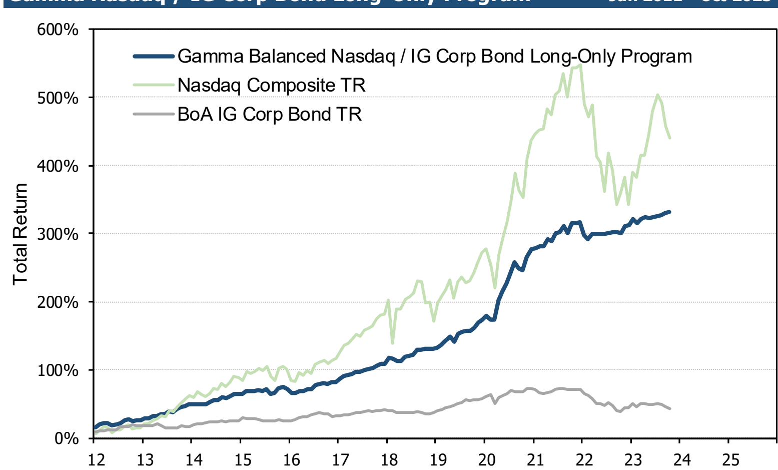
Gamma S&P 500 / IG Corp Bond Long-Only Program Jan 2011 - Oct 2023



Historical Performance	Program	BM1	BM2
Compound ROR	9.4%	11.9%	2.8%
Cumulative Return	315.1%	323.8%	42.7%
Cumulative VAMI	$3,151	$4,238	$1,427
Best Month	5.5%	13.9%	5.3%
Worst Month	-3.5%	-17.7%	-7.5%
% Positive Months	79.2%	69.5%	60.4%
Historical Risk	**Program**	**BM1**	**BM2**
Standard Deviation	5.2%	15.7%	6.0%
Sharpe Ratio (1.0% RFR)	1.60	0.70	0.30
Sortino Ratio (1.0% RFR)	2.56	1.08	0.37
Downside Deviation	3.3%	10.1%	4.9%
Maximum Drawdown	-7.8%	-23.8%	-20.1%
Months In Maximum Drawdown	13	22	27

BM1: S&P 500 Total Return
BM2: BofA M-L Investment Grade Corp Bond Index Total Return

Gamma Nasdaq / IG Corp Bond Long-Only Program Jan 2011 - Oct 2023



Historical Performance	Program	BM1	BM2
Compound ROR	12.6%	16.6%	3.5%
Cumulative Return	422.2%	444.7%	49.0%
Cumulative VAMI	$4,222	$5,447	$1,490
Best Month	10.4%	20.7%	5.3%
Worst Month	-4.5%	-20.9%	-7.5%
% Positive Months	77.9%	65.8%	61.1%
Historical Risk	**Program**	**BM1**	**BM2**
Standard Deviation	7.0%	18.8%	6.0%
Sharpe Ratio (2.0% RFR)	1.68	0.84	0.44
Sortino Ratio (2.0% RFR)	2.79	1.40	0.54
Downside Deviation	4.2%	11.4%	4.9%
Maximum Drawdown	-6.1%	-31.8%	-20.1%
Months In Maximum Drawdown	12	17	22

BM1: Nasdaq Composite Total Return
BM2: Bank of America Merrill Lynch Investment Grade Corporate Bond Index Total Return

Past performance is not indicative of future results