



# MARKET NOTE

August 2021



**Independent** Trustee Services

## INTRODUCTION

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In this research note, we consider current and relevant factors influencing the United States (U.S.) economy and capital markets. The U.S. is the largest economy - measured by gross domestic product - in the world and therefore has a significant influence on the risk and returns to investors around the globe. In particular, we consider the influence of U.S. specific data on the risk and returns to the SPDR S&P 500 ETF Trust (SPY), the worlds largest exchange-traded fund by market capitalisation, which is traded on the world's largest stock exchange, the New York Stock Exchange.

While we do not attempt to forecast future market returns or time market movements, we are cognisant of the fundamental drivers of long-term returns and most importantly, systematic risk. We believe markets are in fact inefficient, in contrast to the commonly quoted efficient market hypothesis. That being said, markets do exhibit long-term mean-reverting properties that can be analysed in an attempt to form data-driven insights and capital market assumptions.

Our consensus view is that there are significant systematic risks in the current market regime and that investors should be wary of the possibilities of market drawdowns, especially considering the historic bull market returns that investors have become accustomed to over the past year. We believe the combination of possible higher longer-term inflation, negative earnings surprises, unsustainable levels of financial leverage and historically over-valued equity markets pose significant risks to long-term investors and should be met with prudent de-risking tactical asset allocations.

## SUPPLY & DEMAND, LABOUR AND INFLATION

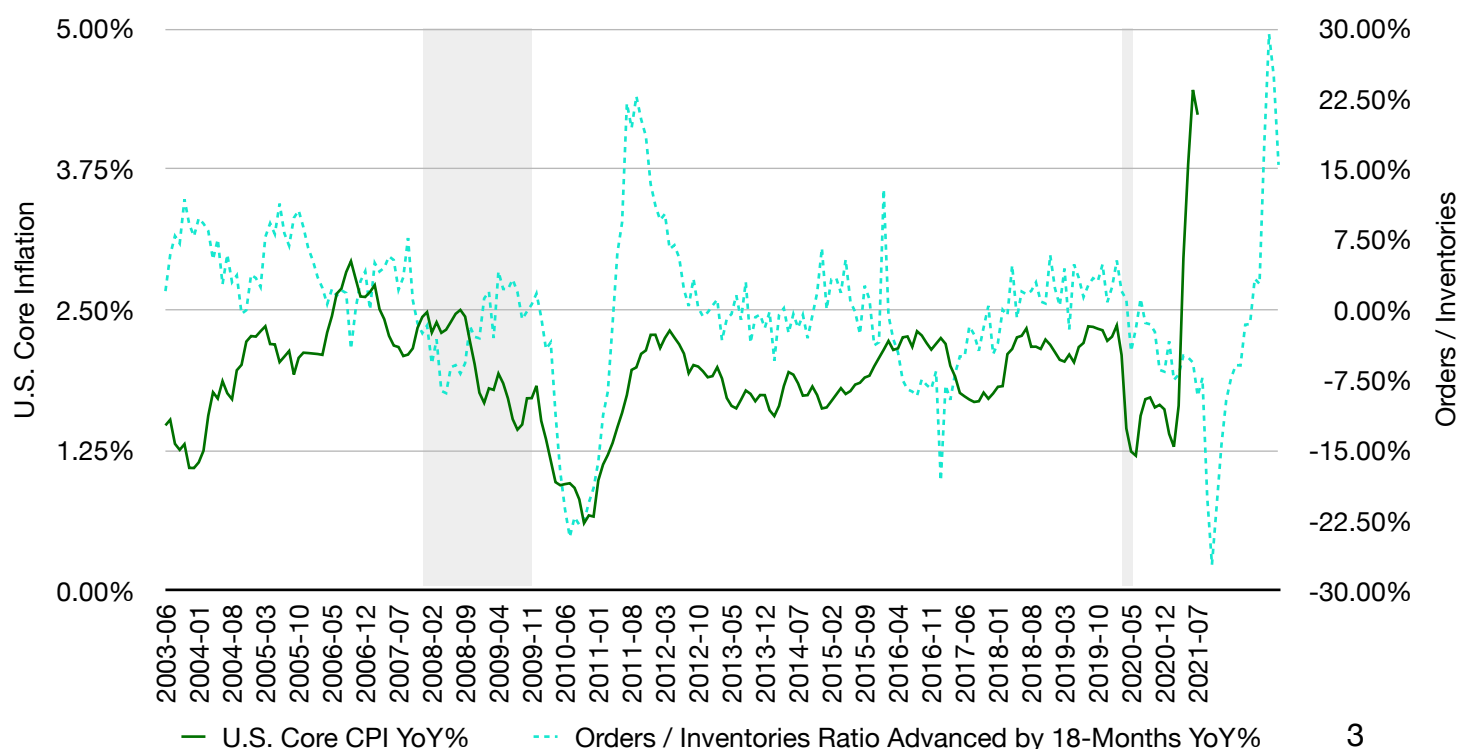
Figure 1. depicts the relationship between the effects of total manufacturing demand and supply conditions on core year-over-year (YoY) inflation in the U.S.. Core inflation<sup>1</sup> excludes the food and energy sectors which tend to exhibit greater price volatilities and are considered to be more transitory through time. Core inflation, therefore, represents long-term price trends and is more suitable for the analysis of long-term aggregate inflation.

The demand-supply metric used below is constructed by calculating the ratio between total manufacturing orders<sup>2</sup> (demand) to inventories<sup>3</sup> (supply) on hand (O/I ratio) and is advanced by 18-months to represent it as a leading indicator of core inflation. The 18-month period is chosen because there is sufficient evidence in numerous economic studies that indicate a 12-24 month lag between monetary policy actions and inflation<sup>4</sup>. We, therefore, extrapolate that average lag into the relationship between the prices of goods, wages and inflation.

Decreases in the forward O/I ratio are consistent with decreases in core inflation throughout the period 2007 to 2010, which coincides with the Global Financial Crisis (GFC). This was due to significant negative demand and supply shocks as a result of the crisis. Federal stimulus efforts in response to the crisis included the lowering of interest rates and quantitative easing programmes which encouraged lending and investment activities. These monetary and fiscal responses supported consumer demand and thereby encouraged aggregate manufacturing activities which were followed by a rebound in core inflation back towards the federal reserve target of 2%.

Peaks of the O/I ratio are realised due to faster and larger increases in demand relative to supply, while troughs in the O/I ratio are realised due to faster and larger decreases in demand relative to supply. The demand component, therefore, exhibits greater volatility relative to the supply component of the model. In the wake of the GFC, fluctuations in the O/I ratio generally remained within one standard deviation (6.43%) around its average YoY% change of 0.31% while core inflation generally remained within its target range throughout the period. A rounded bottom pattern is evident between 2013 and 2016, while a rounded top pattern is evident between 2017 and 2020.

Figure 1. Demand & Supply Effects on Core U.S. Inflation

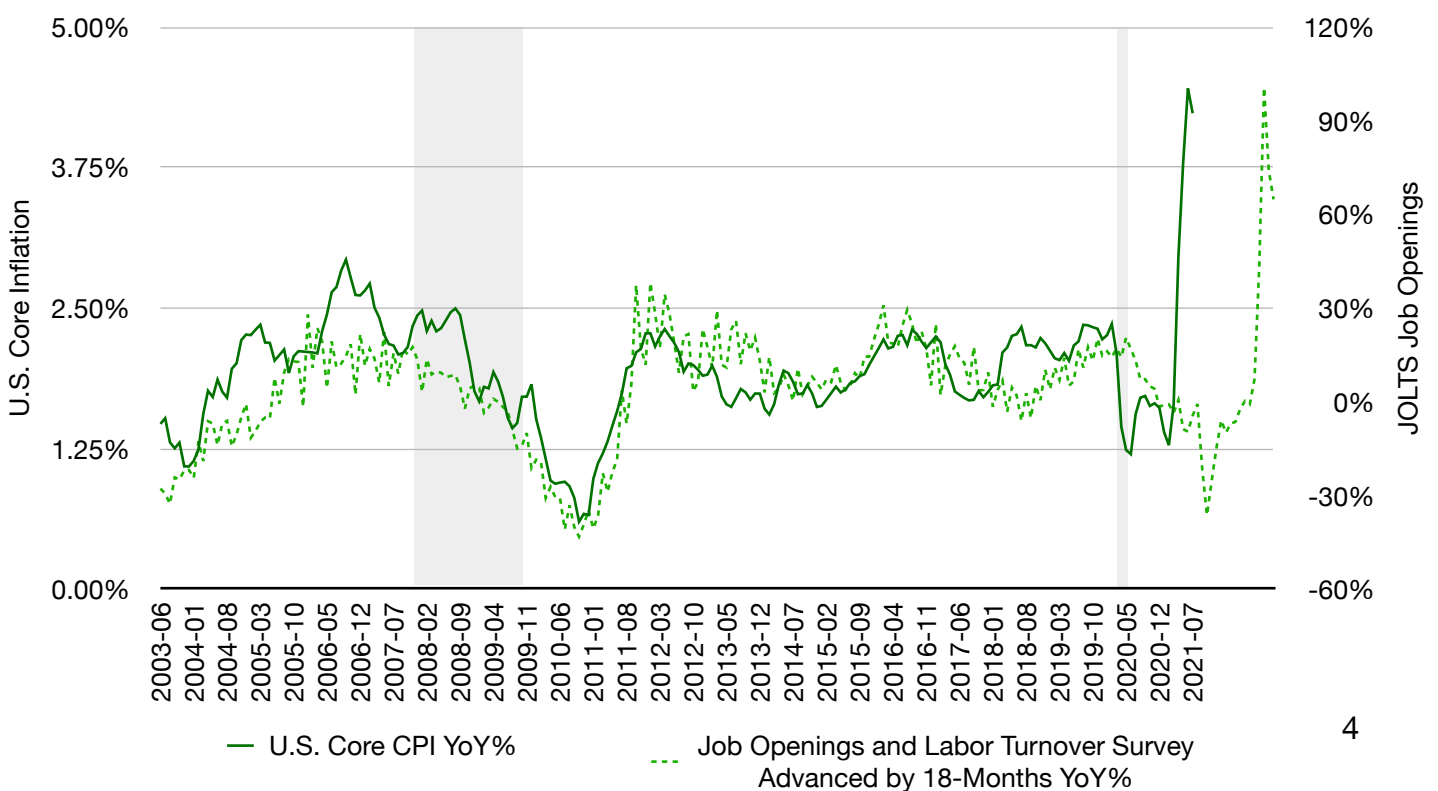


The O/I ratio fell dramatically in response to the COVID-19 pandemic as a result of a significant decrease in YoY demand in April 2020, while the YoY% change in supplies remained relatively stable. In a similar fashion to the GFC, federal monetary and fiscal responses followed to curb the negative economic effects of the pandemic. However, with interest rates already at the zero lower bound, the main policy tool implemented by the federal reserve was directed at fiscal policy, and in particular, a 19.65% YoY increase in M2 money supply in April 2020, which reached a high of 27.62% YoY in February 2021<sup>5</sup>. M2 money supply refers to the total volume of money held by the public at a particular point in time in an economy. With such exorbitant increases in the supply of cash to consumers, demand started to pick up, however, the increase in demand was significantly greater than the increase in the supply of goods due to global supply-chain constraints. These supply shocks were due to several factors including a constrained labour force and emergency shipments of personal protective equipment (PPE) that took preference over other consumer goods.

While core inflation initially fell below the 2% target, partly due to a decrease in the O/I ratio, it quickly began to rise again as the O/I ratio peaked and demand outpaced supply. Core inflation jumped to 2.96% YoY in April 2021 and has recently peaked at 4.45% in June 2021, before decreasing slightly to 4.23% in July. This dramatic rise in inflation tends to be transitory with respect to demand and supply considerations, however, with the exclusion of the food and energy sectors from the core inflation measure reported, this phenomenon seems to be driven by more than just demand and supply factors with regard to consumer goods. In particular, the peak of the forward O/I ratio during the GFC did not result in a rise in core inflation above the 2% target, while the current peak in core inflation is significantly above its intended target.

In Figure 2. we consider another metric; the Job Openings and Labour Turnover Survey<sup>6</sup> which produces data on job openings, hires, and separations within the U.S. labour market. We focus on total nonfarm job openings across the entire U.S.. Once again, the metric has been advanced by 18-months to represent it as a leading indicator of core inflation. Our focus is on the rigidity of prices, also known as price stickiness which refers to the tendency of prices to remain constant or to adjust slowly to economic conditions. The rigidity of goods prices is lower than that of wages. This is because a firm can adjust the prices of the goods it sells more easily if say, for example, the cost of production decreases. By decreasing the price of the goods it sells, a firm can increase demand for its goods and sell larger quantities, thereby realising a larger profit. In contrast, wages exhibit larger rigidities because a labourer will not so easily accept a lower wage for the same standard of work or output produced. Labour unions make it particularly difficult for

Figure 2. Labour Market Effects on Core U.S. Inflation



firms to decrease their wage bills. Therefore, demand and supply effects on inflation tend to be more transitory while wages tend to create permanent increases in inflation.

In figure 2. we see that the relationship between U.S. core inflation and forward JOLTS job openings is far more significant than the relationship between inflation and the forward O/I ratio. Increases in the demand for labour tends to result in increased wages which, as previously mentioned, creates permanent inflationary increases due to large wage rigidities. Recently, the demand for labour in the U.S. has increased by approximately 100% after significant job losses in April of 2020. The demand for labour is now significantly greater than it has been over the past two decades due to the strong rebound in economic activity in the U.S..

While the O/I ratio seems to have reached its peak and is likely to decrease or, at the very least, stabilise over the coming months, thereby decreasing the transitory effects of inflation, the rigidity of increased wages due to strong labour demand could result in higher levels of inflation for longer periods. The risk of non-transitory inflation is thereby increased in the long-term and may require the federal reserve to intervene. Specifically, this could result in near-term contractionary monetary policies in the form of interest rate hikes to quell lending and investment activities and prevent the economy from “overheating”.

## REAL EARNINGS YIELDS AND EQUITY VALUATIONS

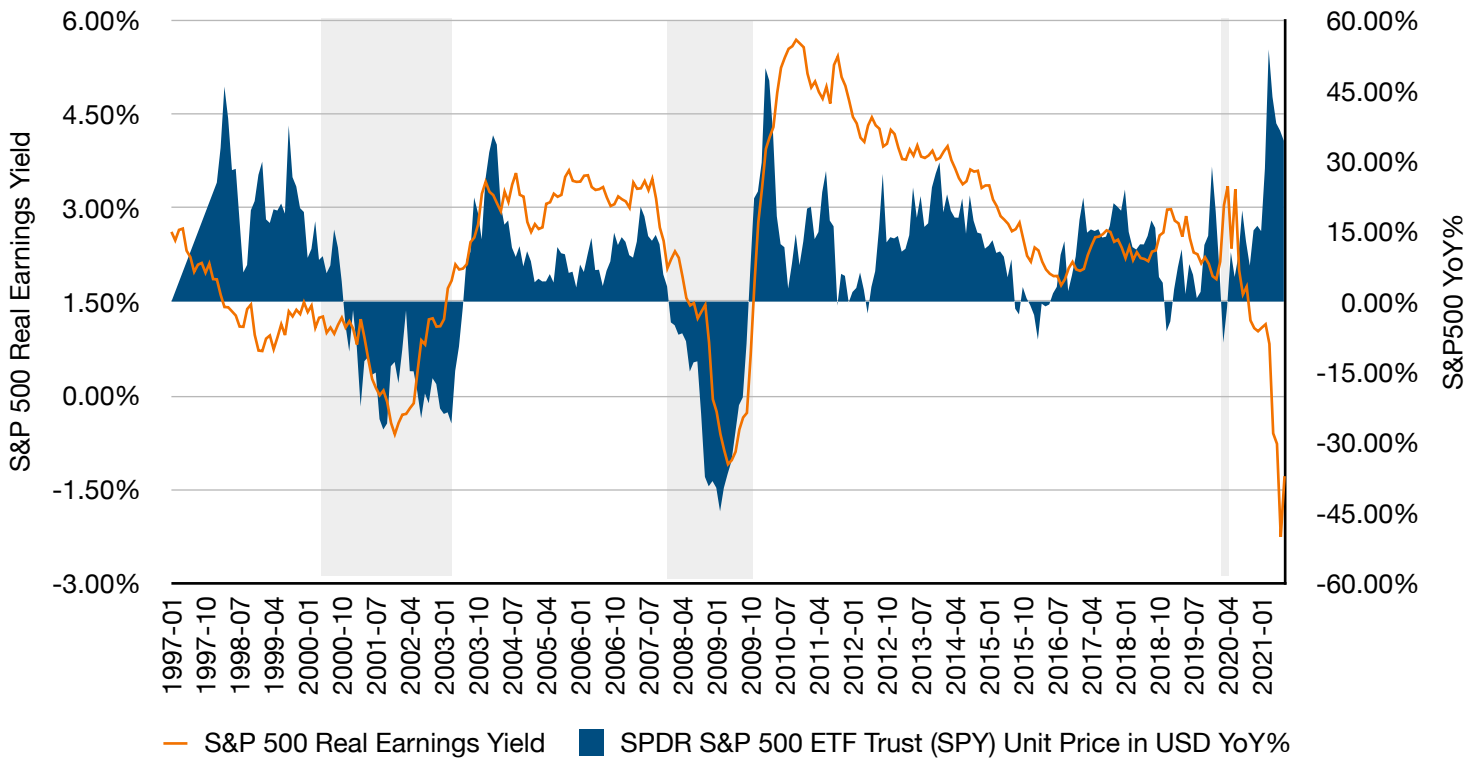
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Figure 3. plots the YoY% change in the SPDR S&P 500 ETF Trust (SPY)<sup>7</sup> - an exchange-traded fund that is designed to track the S&P 500 stock market index - with an overlay of the Real Earnings Yield<sup>8</sup> (REY) of the S&P 500. The REY is the inverse of the Price-to-Earnings (P/E) ratio adjusted for inflation;  $[\frac{E}{P} - CPI]$ . This is a market valuation metric that refers to the earnings per share for the most recent 12-month period divided by the current price per share, adjusted for the level of inflation. A low REY is an indication of an overvalued market while a high REY is an indication of an undervalued market.

The REY has a strong relationship with the YoY% returns of the S&P 500, as indicated in figure 3. Negative REY values are especially concerning as they have historically been correlated with significant market downturns of between 20% to 40% YoY over the measurement period. The two most recent examples of such a downturn was the dot-com bubble in the early 2000s and the GFC in the mid-2000s. The REY descended into negative territory in April of 2021, and fell to a low of -2.26% in June, before rebounding to -1.29% in July as a result of positive earnings announcements by several constituents of the S&P 500 index. Negative REY values have coincided with slightly lower YoY% returns for the S&P 500 index since April 2021, however, returns are still elevated due to base effects related to the short-lived market crash in 2020, high levels of market leverage, positive economic sentiment and accommodative monetary and fiscal policies.

While the S&P 500 price index remains near all-time highs, the threat of negative earnings surprises and higher long-run inflation may add continued pressure to the REY metric. If the metric stays lower for longer, it could signal a market correction due to over-valuation and a flight-to-quality whereby investors sell what they perceive to be higher-risk investments to purchase safer investment options.

Figure 3. Real Earnings Yield Effects on Equity Returns



## THE EFFECT OF LEVERAGE ON EQUITY RETURNS AND MARKET RISK

Figure 4. plots the time-series of debit margin balances<sup>9</sup> alongside the unit price of the SPDR S&P 500 ETF Trust (SPY). The debit balance in a margin account is the total dollar amount owed by a customer to a broker for funds borrowed to purchase securities. This is known as leverage - an investment strategy of using borrowed money to purchase securities in the expectation that the value of those securities will rise over time, allowing the borrower to sell those securities at a higher price, thereby benefitting from the difference between the amount borrowed (including interest) and a realised capital gain. A clear positive relationship can be seen throughout the measurement period between investors margin debit balances and the value of the SPDR S&P 500 ETF Trust (SPY).

Highly leveraged investors are highly exposed to market risks because any significant drawdown in the value of the securities bought on margin is likely to be met with a margin call. A margin call is when the lender demands additional collateral (cash deposits or other assets provided by the borrower to the lender to minimise the lender's risk) to cover possible losses incurred by the borrower as a result of their investing activities. The borrower can either provide more collateral or sell some of the securities in their portfolio to cover the losses. When the market is over-leveraged, a significant market drawdown can result in a multitude of margin calls. If the majority of over-leveraged investors decide to sell their securities to cover the margin call, the value of the market could continue to fall, resulting in further margin calls and cascading prices, further exacerbating the market drawdown and possibly ending in a major market correction.



Figure. 4 Margin Debt and Equity Valuations

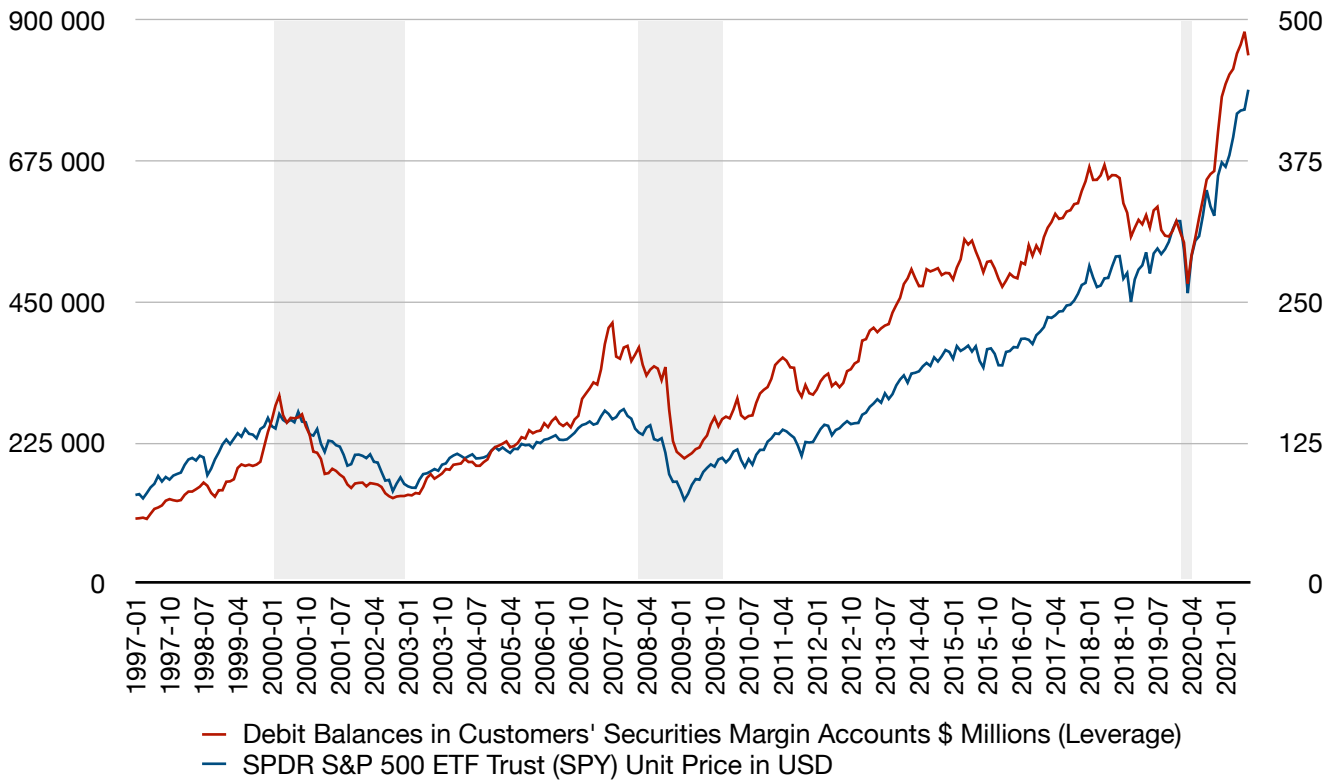
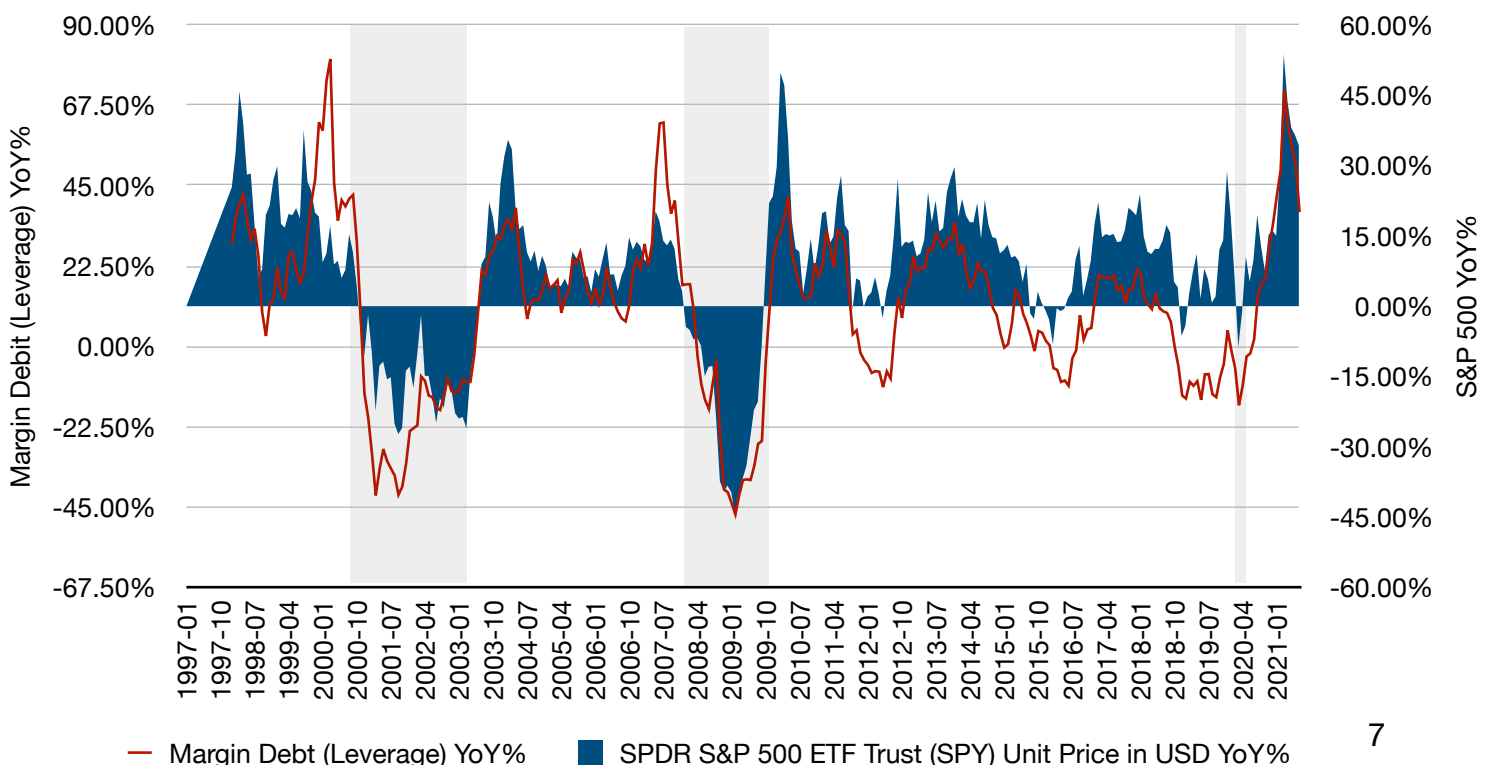


Figure 5. plots the YoY% change in the SPDR S&P 500 ETF Trust (SPY) with an overlay of the YoY% change in margin debt (leverage). The figure exhibits clear peaks and troughs in leverage that coincide with significant long-term drawdowns in the S&P 500 index during the dot-com bubble and the GFC. Smaller short-term drawdowns were also predicted by negative YoY% margin debt balances in 2012, 2016 and 2018/2019. Margin debt peaked at 71.62% YoY in March 2021 and has fallen to 37.55% as of July 2021. Month-on-month% (MoM) margin debt declined by -4.28% in July 2021, the first monthly decline since March 2020.

Figure. 5 Margin Debt (Leverage) YoY% and Equity Valuations YoY%



## MARKET VALUATION MODELS

Figure 6. plots the time-series of the cyclically adjusted price-to-earnings ratio (CAPE)<sup>10</sup> which is defined as the price of the S&P 500 divided by the average of ten years of earnings (moving average) of constitutes of the index, adjusted for inflation. The CAPE ratio is one of many standard metrics with which to determine if the stock market is overvalued, undervalued or fairly valued. The model has exhibited strong statistical significance in forecasting major market corrections and extended periods of poor equity market returns using backtested data since 1881. This metric is therefore a powerful tool in macro risk management.

The CAPE ratio reached a high of 44.2 in December 1999 before a dramatic fall to 21.21 in February 2003. The metric effectively predicted a significant overvaluation between 1998 and 1999 before the dot-com crash in March 2000 to October 2002 which resulted in a drawdown of 76.81% for the tech-heavy Nasdaq Composite index, while the S&P 500 fell by 43.19%. From figure 7 - which plots the percentage deviation of the CAPE ratio from its average value of 27.75 over the measurement period - we find that the valuation metric was over two standard deviations above its average, peaking at 59.27%. This can be interpreted as a 59.27% overvaluation of the market at the time, relative to the measurement period reported.

In the post-dot-com bubble period, the CAPE ratio fluctuated slightly below its average for approximately 5 years, after which the ratio fell to a low of 13.32 as a result of the global financial crisis. The strong economic recovery in the wake of the global financial crisis and the COVID-19 pandemic has subsequently lifted the ratio back to a high of 37.98 as of July 2021, representing a 36.85% deviation from its average, and therefore a 36.85% overvaluation of the market.

Figure 6. CAPE Market Valuation Model

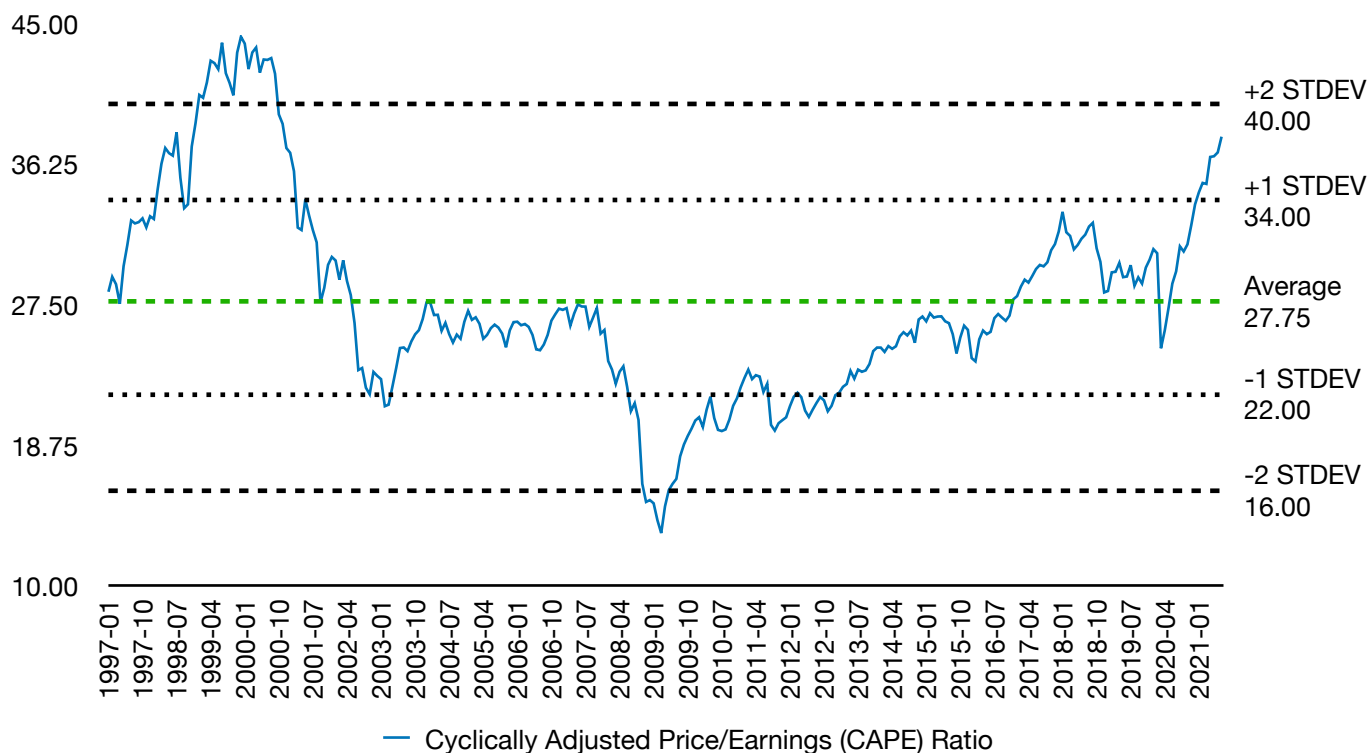
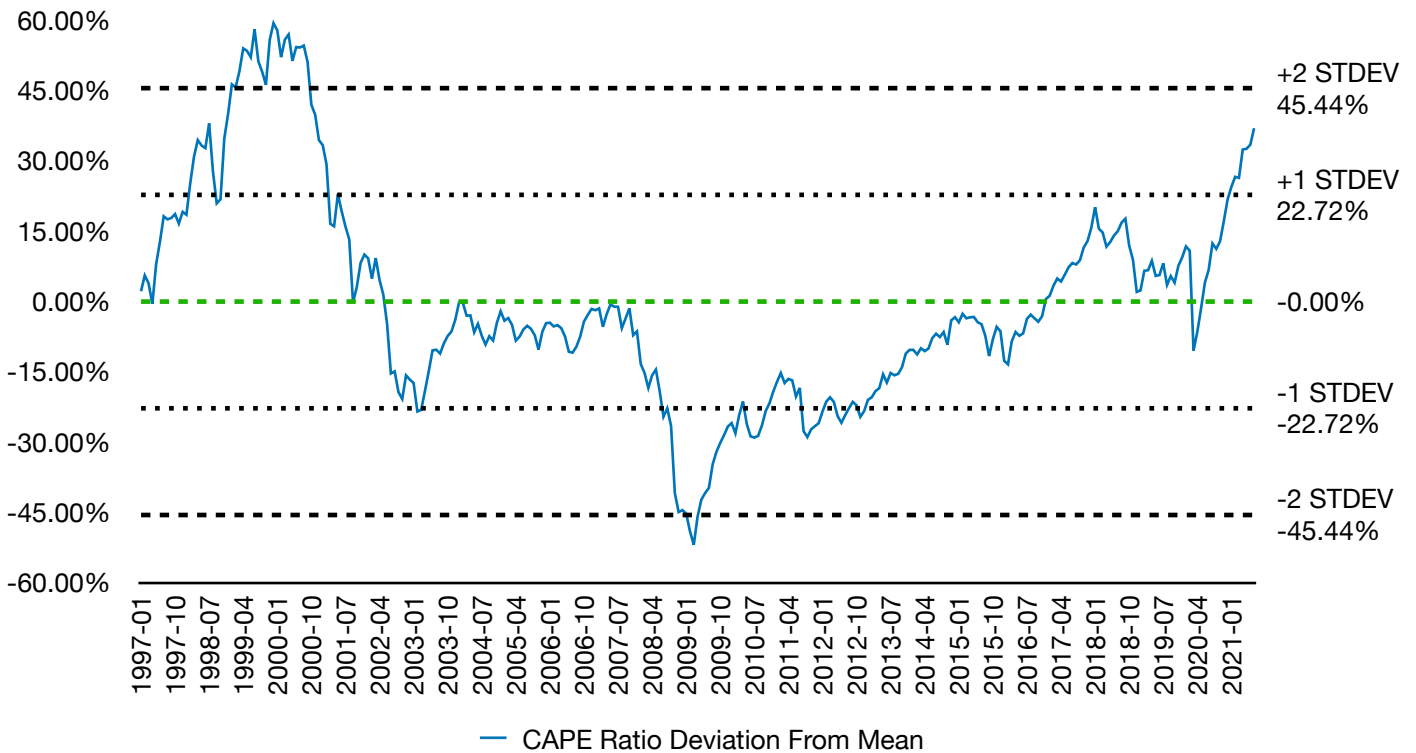




Figure 7. CAPE Market Valuation Model - Mean Deviations



A similar market valuation metric is known as Tobin's Q, and represented by figure 8, is constructed by calculating the ratio of the aggregate market value of non-financial corporate equity including liabilities<sup>11</sup>, and non-financial corporate net worth<sup>12</sup>. The metric, therefore, measures the valuation of the market compared to the actual net worth of constituents of the market. A Q ratio between 0 and 1 indicates an undervalued market, while a value above 1 indicates an overvalued market. A Q ratio of 1 indicates that the market is fairly valued relative to the value of its constituents net assets.

The disadvantage of this measure is that data is released quarterly and is usually released only two months after the end of each quarter. The measure, therefore, lags more recent market events and can provide mistimed signals. To help overcome this limitation, we apply Kalman filter interpolation methods to convert the quarterly series into an updated monthly series that is more comparable with the CAPE ratio. Kalman filter interpolation is a statistical technique that uses a series of observed measurements over time, including statistical noise, and produces estimates of unobserved variables. The Kalman filter is a Bayesian updating algorithm meaning that as new information arrives it updates predictions and can, therefore, "learn" to estimate the probability distribution of unobserved events.

The Q ratio reached a high of 1.67 in January 2000 before recording a low of 0.76 in January 2003. Results are astoundingly similar to that of the CAPE ratio and therefore the Q ratio also effectively predicted a significant overvaluation between 1998 and 1999 before the dot-com crash in March 2000. From figure 9 - which plots the percentage deviation of the Q ratio from its average value of 1.14 over the measurement period - we find that the valuation metric was also (similarly to CAPE) over two standard deviations above its average, peaking at 46.21%. This can be interpreted as a 46.21% overvaluation of the market at the time.

The Q ratio remained one standard deviation below its average in the post-dot-com bubble period before recording a low of 0.60 at the depths of the global financial crisis. The Q ratio has since increased to 1.72 as of July 2021 with a deviation/overvaluation of 50.20%, greater than the figures recorded at the height of the dot-com bubble.

Figure 8. Tobin's Q Market Valuation Model

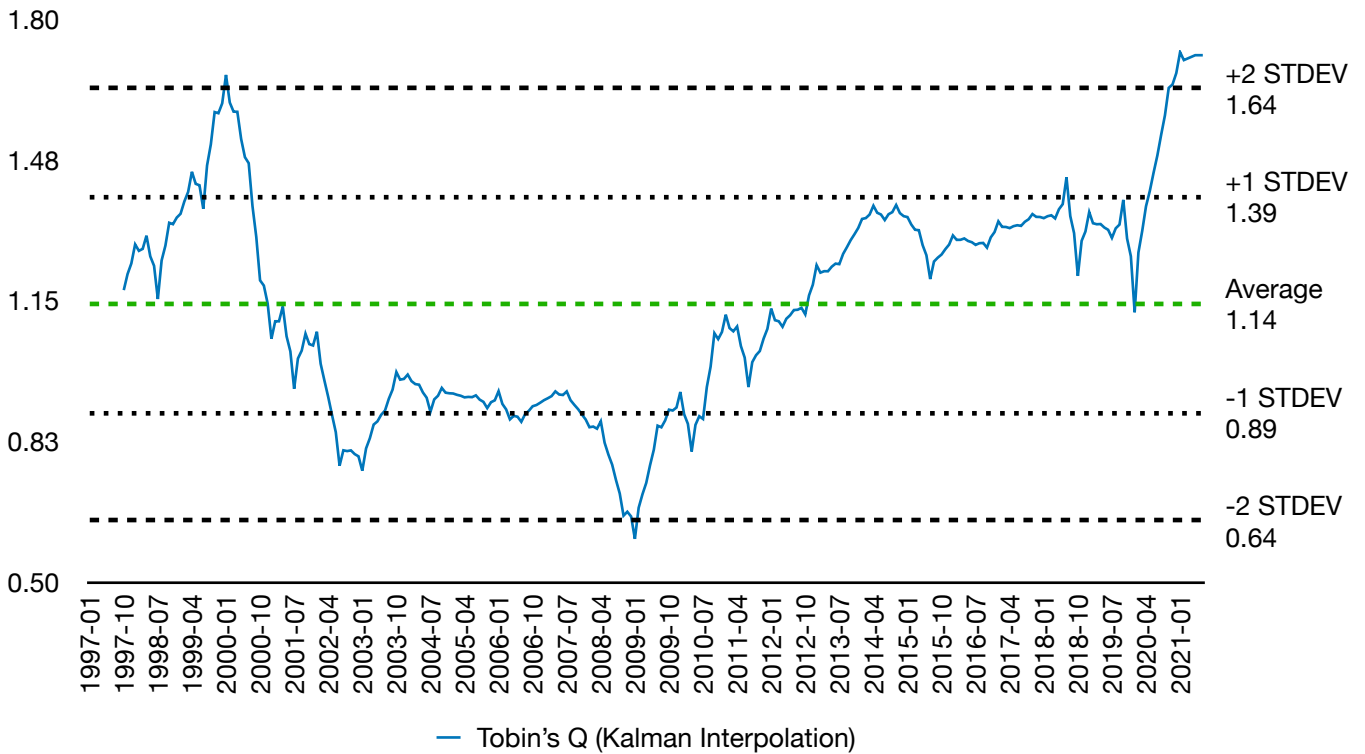
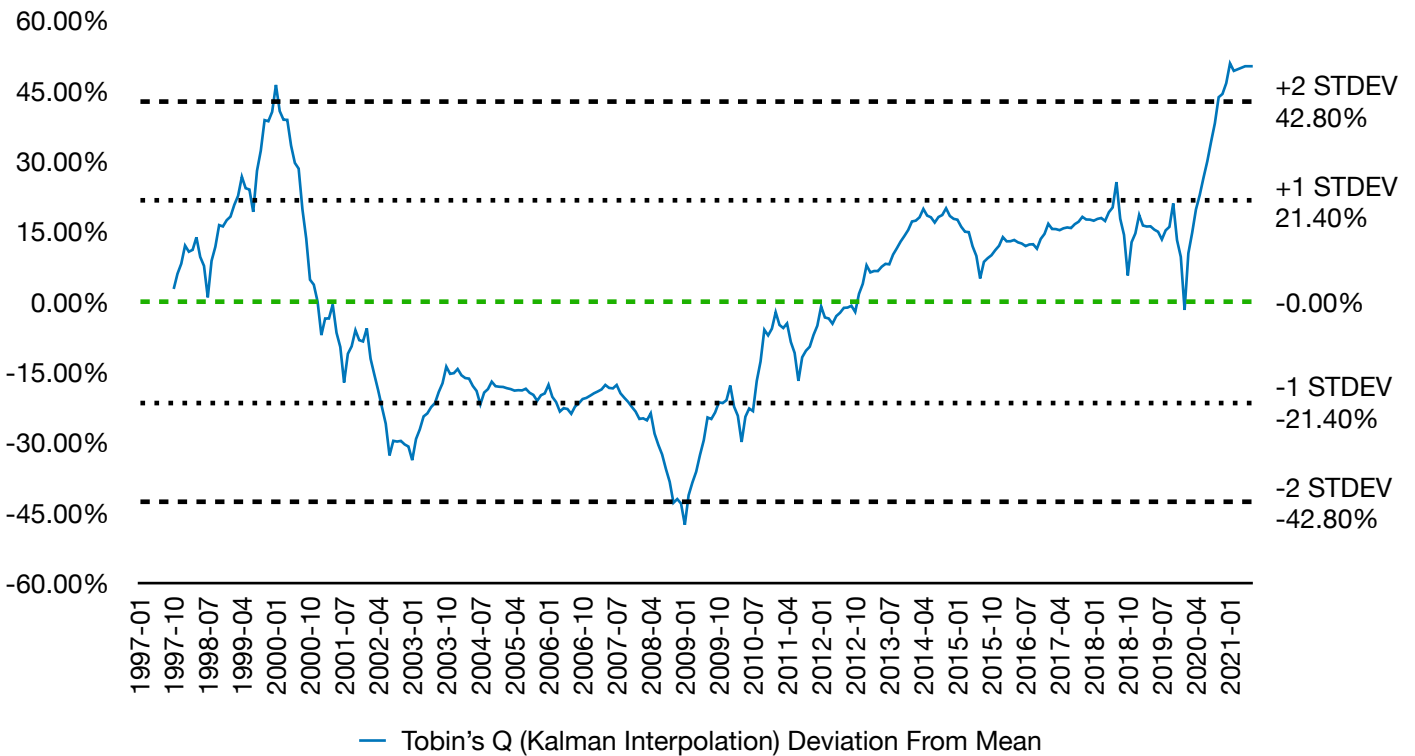


Figure 9. Tobin's Q Market Valuation Model - Mean Deviations



## FINAL THOUGHTS

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When analysing inflationary pressures, we rely on demand and supply fundamentals for both consumer goods and labour. Our forward O/I model shows a positive correlation with core U.S. inflation that is driven mainly by the volatile demand component. However, while the supply component is more stable over time, the COVID-19 pandemic has resulted in severe supply-chain constraints and has thereby added an extra element of volatility to realised price levels. The combination of pent-up volatile consumer demand and a constrained supply chain has contributed to a significant rise in core inflation. We consider these components to be more transitory in nature and therefore, as global supply-chains recover and economic activity continues to normalise, we expect these pressures to subside over time. On the other hand, labour factors exhibit greater rigidities and can lead to permanent inflationary increases, as indicated by the forward JOLTS model. We find a significantly greater correlation between the demand and supply for labour, and core U.S. inflation over time. A meteoric rise in labour demand has caused wages in the U.S. to increase significantly over the past year. The spike in YoY inflation from the federal reserves target of 2%, to a high of 4.45% in June 2021, is therefore a combination of both transitory, as well as permanent inflationary pressures which could be met by near-term contractionary monetary policies in the form of interest rate hikes to quell lending and investment activities and prevent the economy from “overheating”. These policies will put pressure on equity market valuations as investors take advantage of higher rates in bonds and treasuries which are considered to be “safe-haven” assets.

Real-Earnings yields (REY) are also under significant pressure due to high YoY% increases in inflation, high equity market valuations and earnings volatility. REY is a market valuation metric that refers to the earnings per share for the most recent 12-month period divided by the current price per share, adjusted for the level of inflation. Low REY values have historically been correlated with equity market drawdowns and the most recent REY readings have hit lows of -2.26% in June and -1.29% in July 2021. Elevated inflation and downside earnings surprises are therefore medium-term risks that could put further pressure on REY values and thereby, equity market valuations.

Another major concern is the volume of financial leverage in the market that has historically predicted peaks and troughs in YoY% equity market returns. Quantitative easing programmes and low-interest rates have supported leveraged trading and could cause significant financial instability in the case of any shock to the market that may result in drawdowns and which are subsequently met by margin calls by brokerage firms. If the majority of over-leveraged investors decide to sell their securities to cover the margin call, the value of the market could continue to fall, resulting in further margin calls and cascading prices, further exacerbating the market drawdown and possibly ending in a major market correction.

Finally, through the use of two standard market valuation models, the cyclically-adjusted price-earnings ratio (CAPE) and Tobin’s Q ratio, we find that current market valuations are at peaks last realised during the dot-com bubble, which was a historical period of over-valuation met by a drawdown of 76.81% for tech-heavy Nasdaq Composite index and a 43.19% drawdown in the S&P 500 stock market index. The CAPE ratio indicates a current over-valuation of approximately 36.85%, while the Q ratio indicates an over-valuation of approximately 50.20%.

Therefore, our consensus view is that there are significant systematic risks in the current market regime and that investors should be wary of the possibilities of market drawdowns, especially considering the historic bull market returns that investors have become accustomed to over the past year. We believe the combination of possible higher longer-term inflation, negative earnings surprises, unsustainable levels of financial leverage and historically over-valued equity markets pose significant risks to long-term investors and should be met with prudent de-risking tactical asset allocations.

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