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Valuation of the U.S. Equity Market in the Broad Macroeconomic Context

Global Markets Team– December 2022

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Introduction

So far in 2022, the U.S. equity market has experienced the worst performance since the 2008 GFC. While in previous years the investors were eager to follow the "buying the dip" paradigm, putting their faith in FED rescuing the stock market through the quantitative easing policy, this year has brought an unprecedented combination of monetary, geopolitical, and macroeconomic developments, resulting in substantial meltdowns across most of the asset classes.

This report aims to provide insightful and actionable information on the U.S. equity market valuation. At the same time, the author acknowledges that the performance of the equity market is tightly connected to–if not caused by–the developments in the broader economic environment. Thus, the utility of analyzing it on its own, without consideration of external factors, would be close to none.

Before the stock market itself, this report provides an outline of the developments in the U.S. interest rate and treasuries markets. Moreover, the report will analyze the broad macroeconomic environment, with a focus put on the conditions in the private business sectors. The analysis will make use of phenomena occurring in different markets, such as commodities and the housing market, which may be taken as suggestions about the overall direction of the economy. This–in the author's opinion–is crucial for an understanding of the current situation in the U.S. equity market, as well as its possible developments in the nearest future.

While the first two sections of this report focus on markets other than the U.S. equity market, they should not be treated as giving an exhaustive picture of those markets. Instead, they aim on presenting and interpreting only selected data relevant to the equity market, serving as background information necessary to understand the analysis performed in the third section.

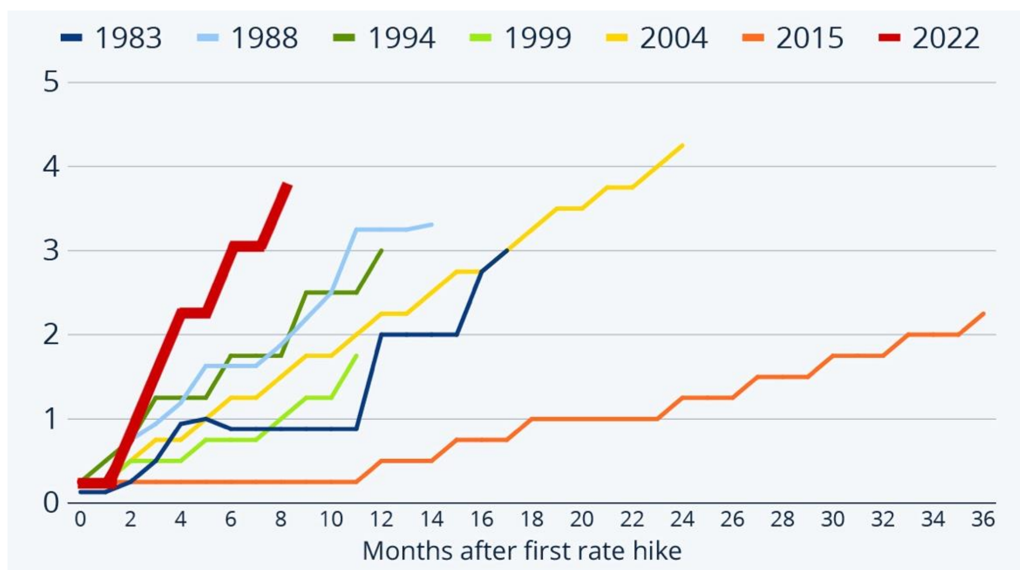
Interest Rates and Debt Markets

This section will outline the effect of the FED's tightening policy on the U.S. interest rates and the U.S. treasuries market. A particular focus will be put on showing the 2022 tightening cycle compared to similar past cycles. The emphasis will be put on the reaction of the treasury market, followed by an overview of the extent to which the FED's future actions are priced in across different types of financial instruments.

Unprecedented Velocity of 2022 Tightening Cycle

The current rate hiking cycle has started with a 25bps target rate increase, on March 16, 2022. At the time, the FOMC expected inflation to return to the 2% target without disturbing the labor market (Federal Reserve, 2022). This initial, quarter-percent hike has turned out to be the beginning of the most aggressive rate-hiking cycle performed by the FED ever in history. Figure 1 illustrates the target Fed Funds Rate change in the current tightening cycle compared to the six previous cycles.

Figure 1 – Changes in Fed Funds Target Rate in Tightening Cycles Between 1983 and 2022, Expressed in Percentage Points



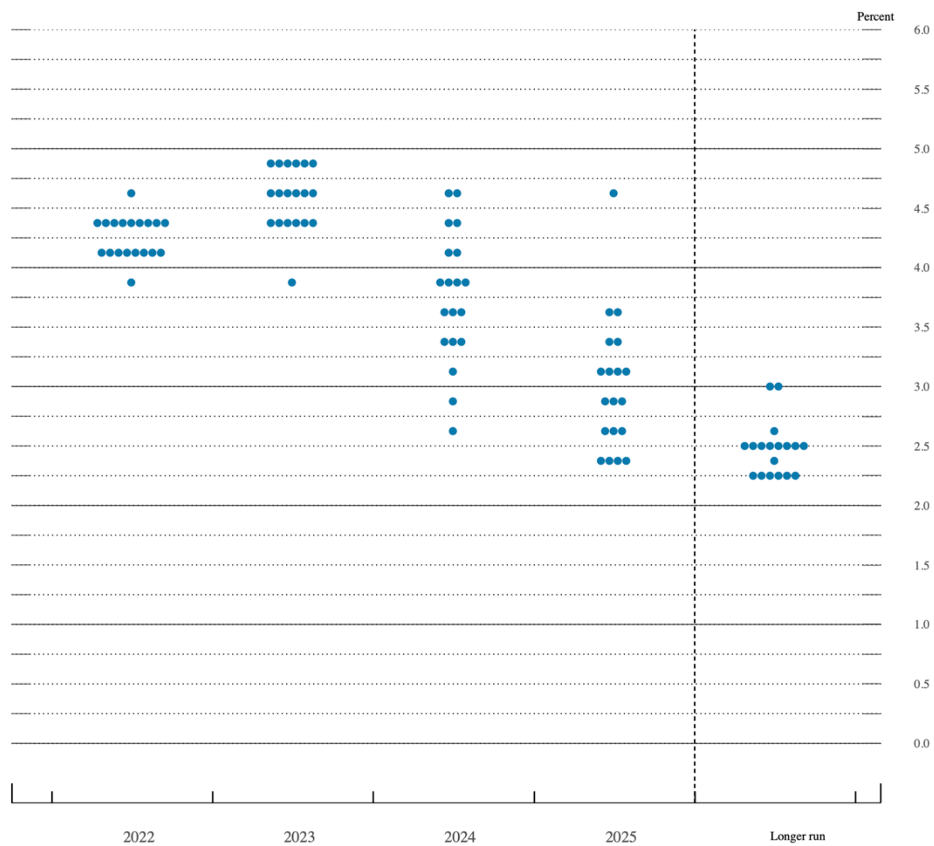
Source: Richter, 2022 (Annotated)

However big the cycle seems in nominal terms, research by Homer & Sylla (1991) shows that from a point of relative change in the interest rate there has never been such a sharp increase in the interest rates in the history of mankind. To illustrate that with an example, during the 2004-2006 cycle FED increased the target rate from 1.00% to 5.25%. This gives a 425%

increase, spread across a two-year period. In comparison, in 2022 FED has–by far–increased the target rate from 0.25% to 4.00%, with the last increase in November 2022, making it a 1500% increase, spread across as little as 8 months.

Investors should also pay attention to the actions that the FOMC anticipates in the nearest future. The dot plot published in the September 2022 Summary of Economic Projections (Figure 2) suggests that the committee not only expects the terminal rate above the 4.5% threshold but also, unanimously, that the target rate will stay on the elevated level–above 2.25%–until the end of 2025.

Figure 2 - FOMC Participants' Assessment of Midpoint of Appropriate Target Range for Federal Funds Rate



Source: Federal Open Market Committee, 2022

Whether the FED will be able to stick to its tightening plan is a difficult question to answer, and the markets' stance on this issue will be examined in the further part of this section. Yet, it is important to keep in mind what is the FED strategy, as it may be of high utility in understanding factors that currently driving the prices of the assets.

The Reaction of the Bond Market

Such an aggressive stance from the FED, emphasized by the relative size of hikes, caused a treasury market to experience what is set to become the worst year on record by far for the bonds. Due to the nature of bond pricing–more precisely the high significance of the discount rate in long-maturity treasuries–long-end bonds experienced the most dramatic decline in returns, losing as much as 26.28%, compared to short- and medium-end, which lost 4.63% and 10.02% on average, respectively (Lynch, 2022). The scale of the turmoil is illustrated in figure 3, showing historical returns for US 10-Year Treasury Note. This maturity is of particular importance, as its yield is often used as a risk-free discount rate in the stock market's valuation. Moreover, those are spreads between the 10-Year Note and other short-end treasuries that are focused on when examining monetary policy priced in by the treasury market.

Figure 3 - Historical Returns of the US 10-Year Treasury Note (2022 as of 14.10.2022)

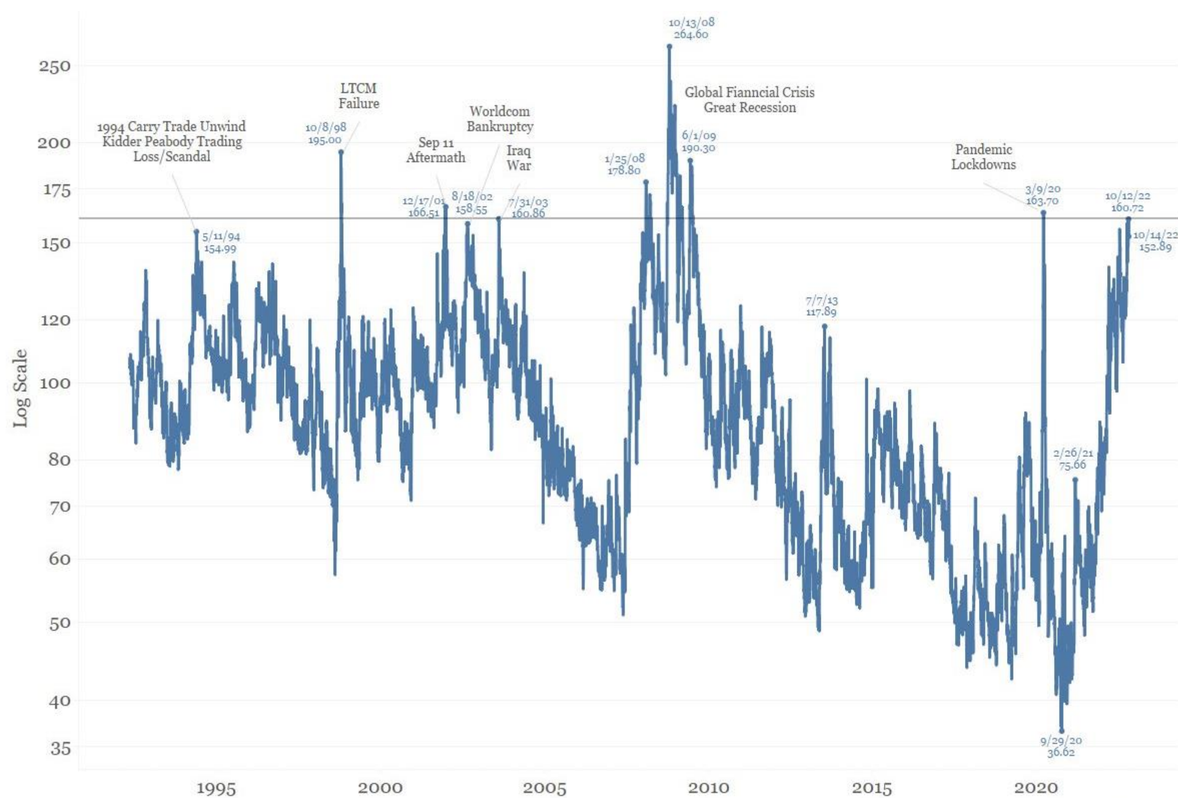
Year	Return	Year	Return	Year	Return	Year	Return	Year	Return
1928	0.8%	1947	0.9%	1966	2.9%	1985	25.7%	2004	4.5%
1929	4.2%	1948	2.0%	1967	-1.6%	1986	24.3%	2005	2.9%
1930	4.5%	1949	4.7%	1968	3.3%	1987	-5.0%	2006	2.0%
1931	-2.6%	1950	0.4%	1969	-5.0%	1988	8.2%	2007	10.2%
1932	8.8%	1951	-0.3%	1970	16.8%	1989	17.7%	2008	20.1%
1933	1.9%	1952	2.3%	1971	9.8%	1990	6.2%	2009	-11.1%
1934	8.0%	1953	4.1%	1972	2.8%	1991	15.0%	2010	8.5%
1935	4.5%	1954	3.3%	1973	3.7%	1992	9.4%	2011	16.0%
1936	5.0%	1955	-1.3%	1974	2.0%	1993	14.2%	2012	3.0%
1937	1.4%	1956	-2.3%	1975	3.6%	1994	-8.0%	2013	-9.1%
1938	4.2%	1957	6.8%	1976	16.0%	1995	23.5%	2014	10.7%
1939	4.4%	1958	-2.1%	1977	1.3%	1996	1.4%	2015	1.3%
1940	5.4%	1959	-2.6%	1978	-0.8%	1997	9.9%	2016	0.7%
1941	-2.0%	1960	11.6%	1979	0.7%	1998	14.9%	2017	2.8%
1942	2.3%	1961	2.1%	1980	-3.0%	1999	-8.3%	2018	0.0%
1943	2.5%	1962	5.7%	1981	8.2%	2000	16.7%	2019	9.6%
1944	2.6%	1963	1.7%	1982	32.8%	2001	5.6%	2020	11.3%
1945	3.8%	1964	3.7%	1983	3.2%	2002	15.1%	2021	-4.4%
1946	3.1%	1965	0.7%	1984	13.7%	2003	0.4%	2022*	-18.1%

Source: Bilello, 2022

What is very often neglected during the analysis of the treasury market, is that not only did it experience a decline of unprecedented significance, but also a spike in volatility comparable to the one in March 2020, at the beginning of the covid crisis. Figure 4 illustrates the historical performance of the MOVE index, which measures the volatility of the basket of 1-month exchange-traded options on 2-year, 5-year, 10-year, and 30-year treasuries (Intercontinental Exchange, 2019). As the options are frequently used to hedge against the volatility of the

underlying instrument, the index gives a decent proxy of volatility in bonds expected by market participants.

Figure 4 - Historical Performance of Merrill Lynch Option Volatility Estimate (MOVE)



Source: Bianco Research, 2022

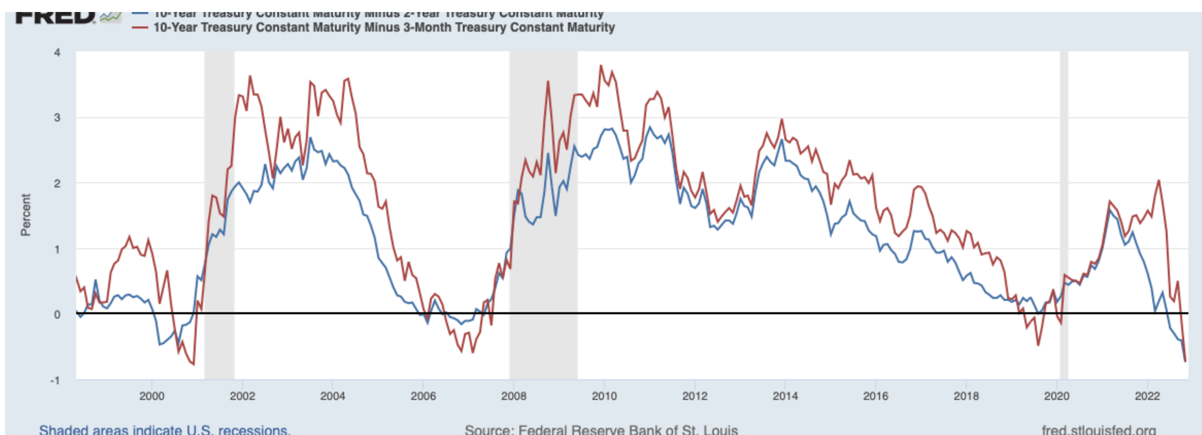
FED's tightening monetary stance has elevated the MOVE index to levels seen in March 2020, at the beginning of the covid crisis. Such volatility in the bond market is a rather disruptive phenomenon, as the U.S. treasuries are perceived as a rather risk-off asset, supposed to decrease the volatility of the portfolio. Apart from their use as an investment, treasuries are re-used as collateral in interbank financing transactions (Infante & Saravay, 2020), thus one may speculate that the elevated volatility not only has a negative influence on investors' portfolios but also–to some extent–has a detrimental influence on the stability of the monetary system.

Outlook Anticipated by the Markets

With such an extreme reaction from the treasuries market, it is particularly interesting that at the same time, the FED's hawkish stance is not priced in the exact same way as the FED presents it. Chairman Jerome Powell is increasingly more aggressive with his rate hike narrative, during his last speech claiming that the terminal rate will peak higher than expected

by the markets, at the same time acknowledging that he would prefer to overtighten the economy, rather than underdo it (Smith, 2022; Lovin, 2022). At the same time, since the first 2s10s inversion in April, the bond market seems to repeatedly display signs of doubt in the central bank's stance. Following mentioned temporary inversion, 2s10s remains negative since the first week of July and currently is the most inverted since 1981. In recent weeks the 3m10s has also inverted – temporary at first, only to enter the negative territory only a week later and stay there until now. This inversion is also significant from a historical perspective, currently approaching the magnitude last time seen in December 2000.

Figure 5 - UST 10-Year Yield Minus UST 2-Year Yield, UST 10-Year Yield Minus UST 3-Month Yield



Source: Federal Reserve Bank of St. Louis, 2022a & 2022b

Those inversions send a clear signal about investors' views on the state of the economy. Whereas the short-end part of the yield curve is controlled solely by the FED's monetary policy, the long-end yields are influenced by long-term growth expectations. The fact that the inversion occurs in the first place and remains inverted for a prolonged period illustrates investors' uncertainty about the current state of the economy, as well as their belief that along the tightening cycle, FED will encounter a reason to cut the target rate. But what is even more important is that–with the inversion spreading to the shorter maturities–market participants start to anticipate that the change in the policy is getting closer and closer. At the same time, the market-implied terminal rate calculated by the Federal Reserve Bank of Atlanta, as well as the futures-implied terminal rate stands around 5% (Federal Reserve Bank of Atlanta, 2022; CME Group, 2022c). Combined with the inversions, this data suggests that while the FED is expected to loosen the monetary policy in adjustment to the economic environment, the markets price in that it will take place only after the period of even further tightening.

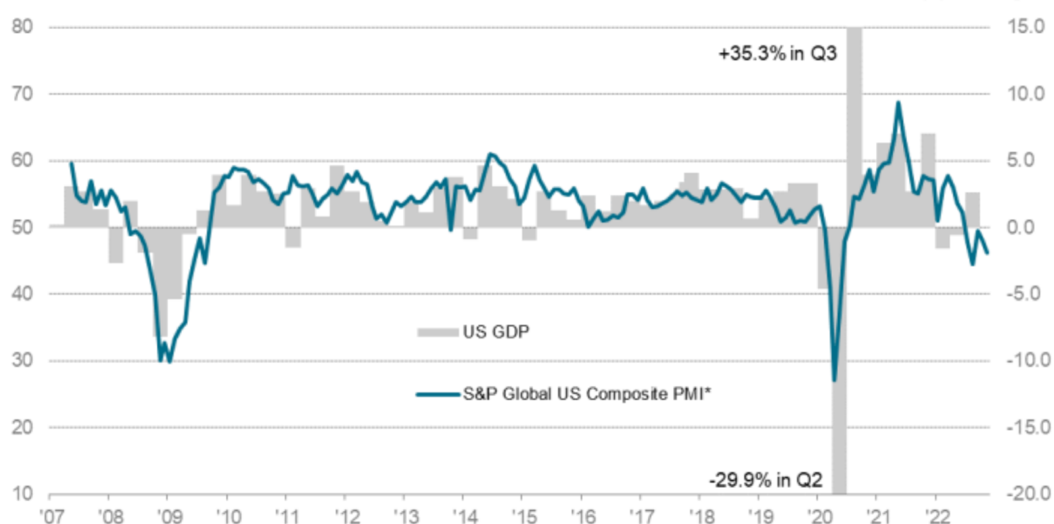
Broader Macroeconomic Environment

This part of the report will focus on the current state of the U.S. economy. Current trends in economic activity will be shown with the use of appropriate leading indicators. Emphasis will be put on consumer and business confidence, as well as on the state of the US housing market with references to tightening financial conditions and developments in the interest rate environment described in the previous section. Based on the analysis, inferences will be made about the future outlook of the U.S. economy.

First Signs of the Economic Slowdown

A recession is widely defined as a decline in GDP in two consecutive quarters. One could argue the US economy has already entered a recession, as in the second and third quarters of this year the GDP has decreased in real terms (U.S. Bureau of Economic Analysis, 2022a). With unemployment staying at a low level, it can be argued whether the current state of the economy should be called a recession. What is not arguable though, is that during recent months the economy has entered a substantial slowdown. Figure 6 illustrates the S&P U.S. Composite PMI, an index reflecting the overall health of the US private manufacturing and services sectors, based on the survey regarding the actual changes in business activity (IHS Markit, n.d.). Its prints below 50 are signaling the contraction of the economic activity in the US private sector, while prints larger than 50 mean that the activity has expanded.

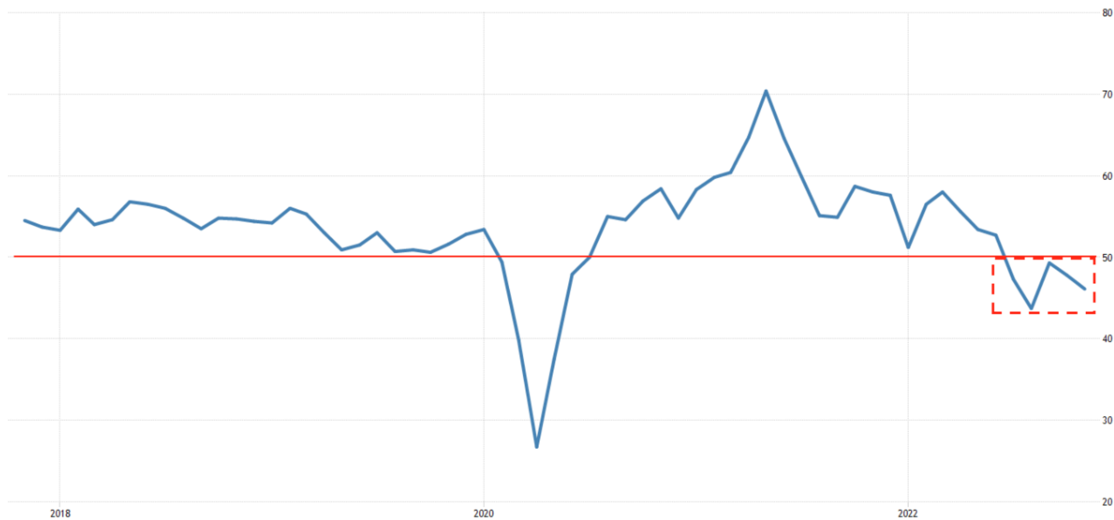
Figure 6 - S&P Global Flash US Composite PMI (LHS); US GDP QoQ % Change (RHS)



Source: S&P Global, 2022a

According to the index, November 2022 was the fourth consecutive month during which the economic activity in US private sector contracted. It is also worth noticing that the services component of the index has experienced a fourth consecutive print below 50 (Figure 7), in contrast to the manufacturing component which has only now flipped to a print indicating contraction.

Figure 7 - S&P Global Flash Services PMI



Source: S&P Global, 2022b

In general, the usual order of the slowdown spreading across the economy is from the goods and manufacturing, only to hit the services sector later. Seeing weakness in this sector as a force which this time is leading the economic slowdown may provide a valuable perspective on the overall economic outlook.

In spite of negative news and macroeconomic data, the labor market seems to be in surprisingly good shape. The FOMC repeatedly uses it as an argument to back up its extremely tight monetary policy. Yet, in the case of the labor market, there are two crucial things one needs to bear in mind. On one hand, data from this market tends to be one of the most lagging indicators, taking a hit only in later phases of the economic downturn, due to the costs connected with laying the workers off. On the other hand, even in this market, there are signs which may suggest a kind of transition from an expansion to a contraction phase. Numerous tech companies are starting to announce layoffs (Garfinkle, 2022). This, while being rather anecdotal evidence, is in line with what the S&P PMI shows–the services sector is the one

leading the slowdown, and most likely is the one that will display its first effects when it comes to the weakening of the labor market.

Another market that displays cues potentially suggesting an economic slowdown is a commodity market. The phenomenon which should attract investors' attention is the contango present in the Crude Oil Futures–the market is pricing the oil to be more valuable in the future than in the present moment (Figure 8). Due to oil's widespread use in industrial production, the behavior of its price may give valuable information about the overall economic activity.

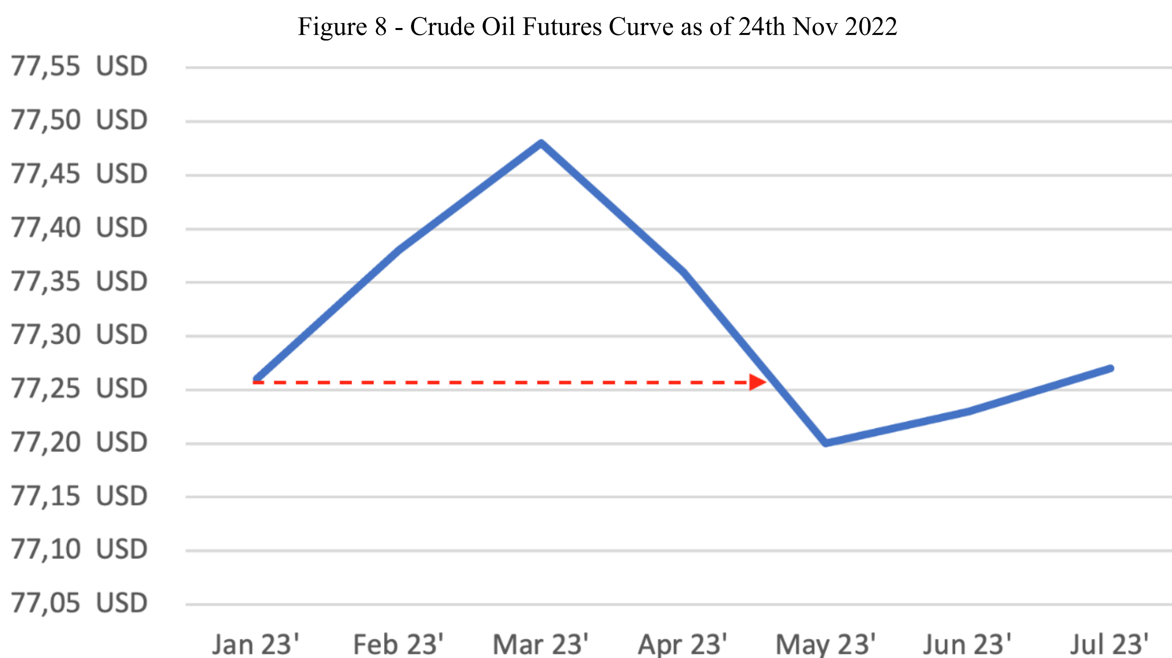


Figure 8 - Crude Oil Futures Curve as of 24th Nov 2022

Source: CME Group, 2022b; Own Evaluation

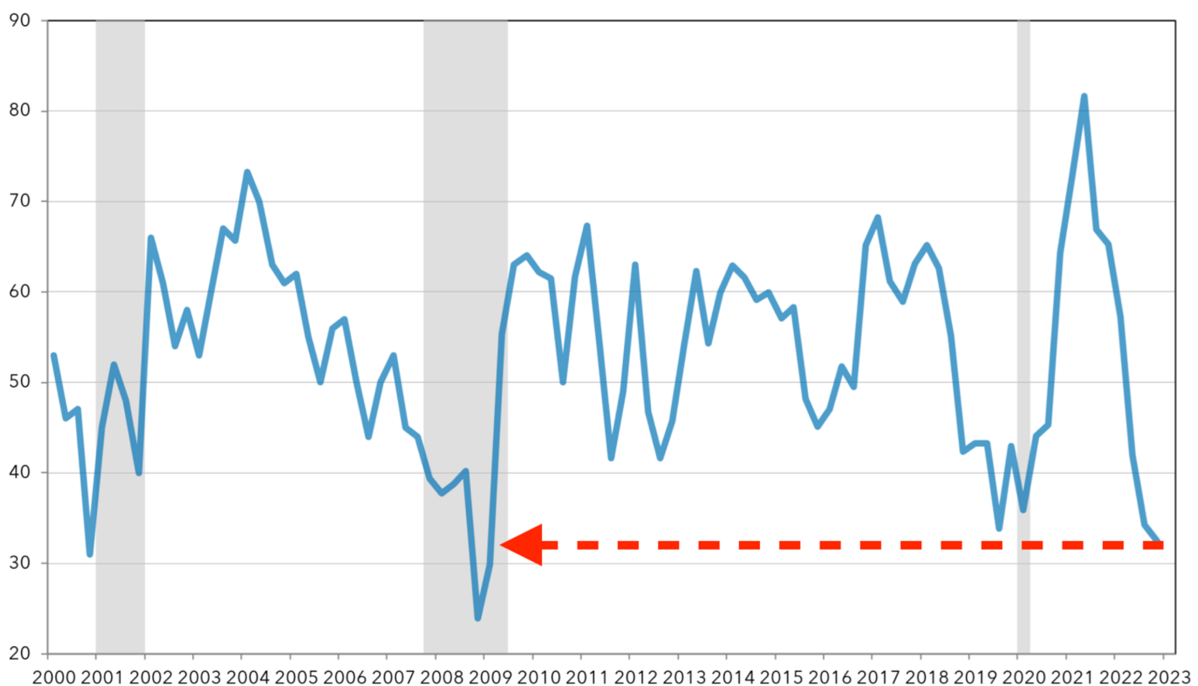
Although there may be several reasons for contango to occur–especially in a commodity as vulnerable to geopolitical headwinds as oil–one of them may be a deteriorating demand, resulting from declining economic activity. This is not a definite reason, yet in combination with other data suggesting the end of the expansionary phase, it surely is one worth considering.

Declining Confidence of Businesses and Consumers

The aforementioned decline in the S&P PMI is consistent with other indicators, such as the NY Empire State Manufacturing Index and Philadelphia Fed Manufacturing Index which have been showing the first signs of declining business conditions, as well as declining confidence on a forward-looking basis, for a couple of months already. The surveys which serve as the basis for both indices suggest that manufacturers, on average, expect the business conditions to

decline further during the next 6 months (Federal Reserve Bank of New York, 2022; Federal Reserve Bank of Philadelphia, 2022). Moreover, the U.S. CEO confidence report from The Conference Board (2022a) indicates that only 2% of executives surveyed do not expect some–either deep or shallow–form of recession, with the last print of CEO Confidence Measure at 32 being the lowest since the GFC (Figure 9). As the executives of the companies are rather well-informed about the economic outlook for their business and have the access to a large amount of information, this may suggest that the economy is on track to deteriorate further.

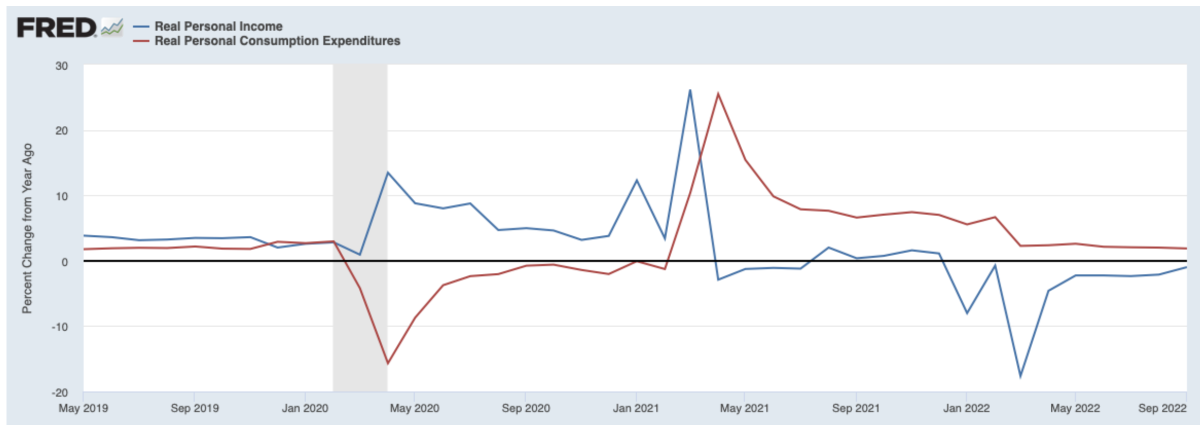
Figure 9 - The Conference Board Measure of CEO Confidence



Source: The Conference Board, 2022a

At the same time, while the Consumer Confidence report indicates that the present economic condition is not quite yet a recession, the expectations about the future declined in October (The Conference Board, 2022b). Many factors may have contributed to this decline, yet one which may have impacted the sentiment was the growing disproportion between real personal incomes and real personal expenditures. As illustrated by Figure 10, since the beginning of 2022 real personal income of US consumers, on a YoY basis, experienced a decline every month. During the same period, real personal consumption expenditures were constantly increasing on a YoY basis.

Figure 10 - Real Personal Income YoY % Change (Blue), Real Personal Consumption Expenditures YoY % Change (Red)



Source: U.S. Bureau of Economic Analysis, 2022c & 2022d

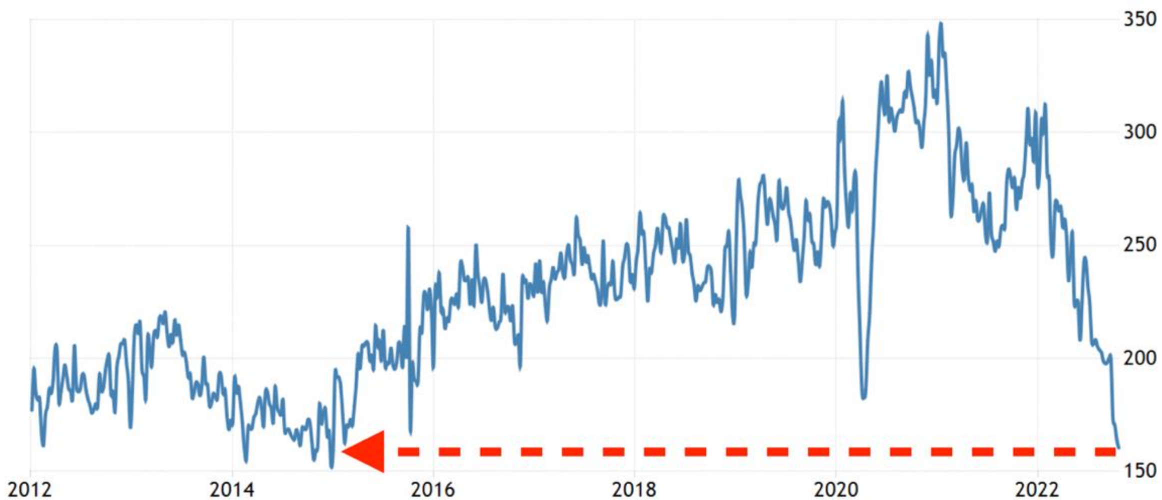
Declining real incomes combined with increasing real expenditures had significantly affected the personal saving rate, which in recent months oscillated between 3.0% and 3.5%, levels seen for the last time during the beginning of the GFC (U.S. Bureau of Economic Analysis, 2022b). Such a low savings rate shows a rather weak condition of the U.S. consumer, possibly indicating a decline in consumption in the following months.

Disruptions in the U.S. Housing Market

The Real Estate market is of particular importance when evaluating the state of the U.S. economy, as its combined contribution to GDP averages as high as 15-18% (National Association of Home Builders, n.d.). Moreover, the situation in a housing market influences consumption, through the occurrence of the wealth effect - with the value of consumers' property increasing, they tend to increase their spending, even if their incomes are not growing at the same pace (Hashimzade et al., 2017).

Since the beginning of the year, the U.S. housing market has started showing the first signs of cooling, quickly becoming a rather sharp decline. In September, the Pending Home Sales Index (PHS) had plunged by 10.2% on a MoM basis, which–excluding 2020 lockdowns–is the biggest monthly decline since May 2011. According to the Mortgage Bankers Association of America, mortgage applications expressed by the MBA Purchase Index have almost reached post-GFC 2014 low in the first week of November (Figure 11).

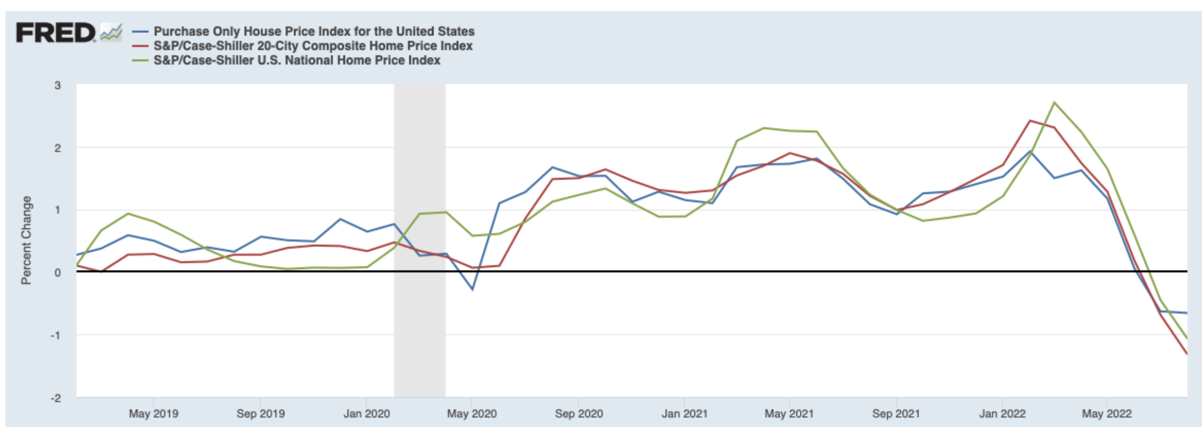
Figure 11 - United States MBA Purchase Index



Source: U.S. Bureau of Economic Analysis, 2022c & 2022d

Both PHS and MBA Purchase Index are rather forward-looking indicators, thus the low results now may indicate a further slowdown of the real estate market. Moreover, while the housing market has displayed signs of weakness since the beginning of the year, due to its relative illiquidity it was not reflected by the price for the first few months. Yet with time passing, housing prices are starting to catch up with the general condition of the market. Figure 12 illustrates the monthly change in three popular housing price indices, all of them experiencing two consecutive months of decline.

Figure 12 - Purchase Only Price Index for the U.S., S&P/Case-Shiller 20-City Composite Home Price Index, S&P/Case-Shiller U.S. National Home Index



Source: U.S. Federal Housing Finance Agency, 2022; S&P Dow Jones Indices LLC, 2022a & 2022b

One of the possible causes of the housing market deterioration may be a sharp increase in the mortgage rates, caused by the tightening monetary policy exercised by the FED mentioned in the first section. According to the data collected by Freddie Mac (2022), since the beginning

of the year, the average 30-year fixed mortgage rate has increased by almost 120% making housing financing substantially less affordable for the U.S. consumer.

Unfortunately for homeowners, based on what is now visible in the housing market, declines in housing prices are likely to continue. As previously stated, the used indices–PHS and MBA Purchase Index–are forward-looking. With housing prices being a rather lagging measure, it is safe to say that what is now shown by indicators will be reflected in prices only in the next year. This, combined with the input costs elevated due to increased prices, may cause the supply of new homes to substantially decrease.

Outlook for the Future

The macroeconomic data presented in this section suggest that the U.S. economy, being in a period of transition between expansion and contraction, may soon experience a rather sharp contraction, in contrast to a "technical recession" that took place earlier this year. The forward-looking indicators point to an outlook that is largely unfavorable, both for consumers and businesses. As pointed out, this is reflected by the low prints of sentiment indicators, based on which it may be inferred that both businesses and consumers will be inclined to more conservative financial decisions, thus limiting their spending.

Leading indicators are pointing to an end of the expansionary economy already for some time. Yet, with negative forward-looking ones, they may soon switch to indicate the contraction more unequivocally, which will then lead to the signs of a slowdown in more lagging indicators, such as employment and broader price indices.

Lastly, it is of major importance to take into consideration the effects of drastic tightening described in the first section. Even though its impact on some parts of the economy is already visible, as in the case of real-estate prices and mortgage rates, Friedman (1961) suggests that the rate hikes may sometimes take as long as eighteen months to fully impact the real economy, while Culbertson (1960) argues that the predominant direct effects of changes in the monetary policy may be visible in the real economy only after three to six months. Thus, with the first rate hike in March, the U.S. economy is yet to experience the majority of the effects of the current tightening cycle.

Valuation of the U.S. Equity Market

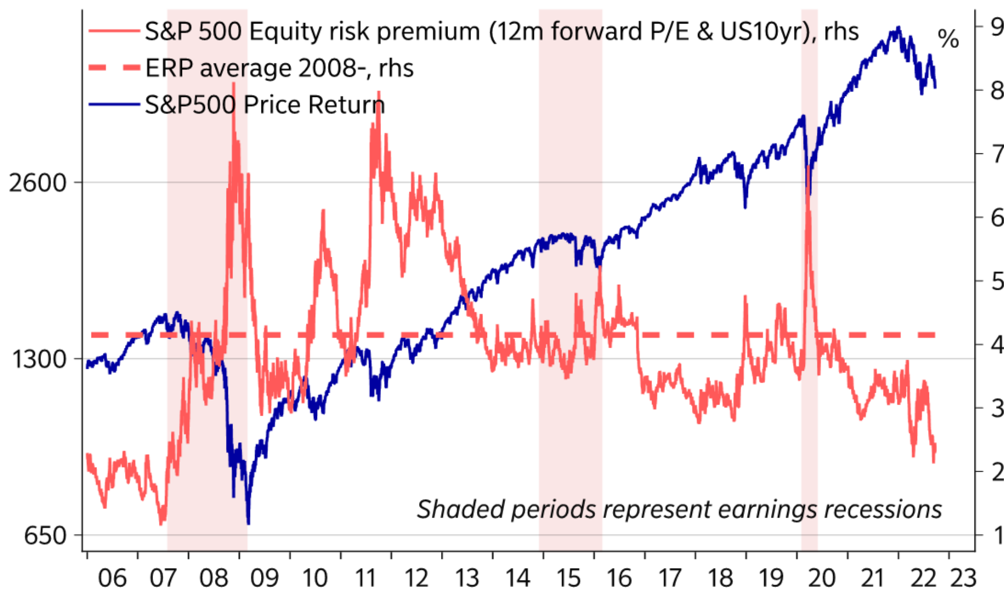
As already mentioned in the introduction of this report, 2022 has so far been a bad year for equities. Oscillating around 20% down YTD, the S&P 500 has completely pared more than a thousand points of its 2021 gains. This section will analyze the current valuation of the U.S. stock market, with a focus on the equity risk premium (ERP) required by investors. To do this effectively, the analysis will be based on the background information built up over the previous two sections. Finally, this section will examine whether the pricing of the equities is consistent with what markets are discounting across different sets of financial instruments. In the analysis, the S&P 500 index will be used as a proxy for the whole U.S. equity market.

Current Risk Premium of the Equity Market

Equities are risk assets, and their expected return needs to incur the market risk premium – an additional return of return on top of the risk-free rate, which investors require for taking up the risk (Law, 2018). As the expected return of the equity market is not traded per se, and therefore not available to investors on its own, it needs to be calculated from available data. One such way is to take the inverse of the 1-year forward Price/Earnings ratio. Data transformed in such a way shows the estimate of the earnings yield of the SP 500 index. According to estimates by Birinyi Associates, Inc., published by the Wall Street Journal, the 1-year forward P/E of the SP 500 currently stands at 17.75, which after inverting gives the expected yield of 5.634%. The next step is to subtract the risk-free rate. The rate which is often used for this purpose is a yield on a 10-year U.S. Treasury, which as of November 25th is equal to 3.729%. Therefore, the resulting market-risk premium is 1.905%, this being the additional return for which the investors are ready to allocate their money to the S&P 500 instead of the risk-free asset–in this case, the 10-year treasury.

Figure 13 represents the S&P 500 ERP calculated using the same input data as in the previous paragraph. Noticeably, in historical terms the current market risk premium is exceptionally low provided the post-GFC average is slightly higher than 4%. Moreover, in the case of two out of three earnings recessions–when the corporate profits by at least two subsequent quarters–the ERP increased substantially, above 7%.

Figure 13 - S&P 500 Price Return, S&P 500 ERP with 2008-today Average (RHS)



Source: Macrobonds & Nordea, 2022

It is worth considering that–with earnings being constant–the ERP of 4% would imply the S&P 500 on a sub-3000 level, whereas the ERP of 7% - roughly 2100. Currently, the index is trading at around 4000 points, hence from this point, it would mean a decline of about 27% and 47% accordingly.

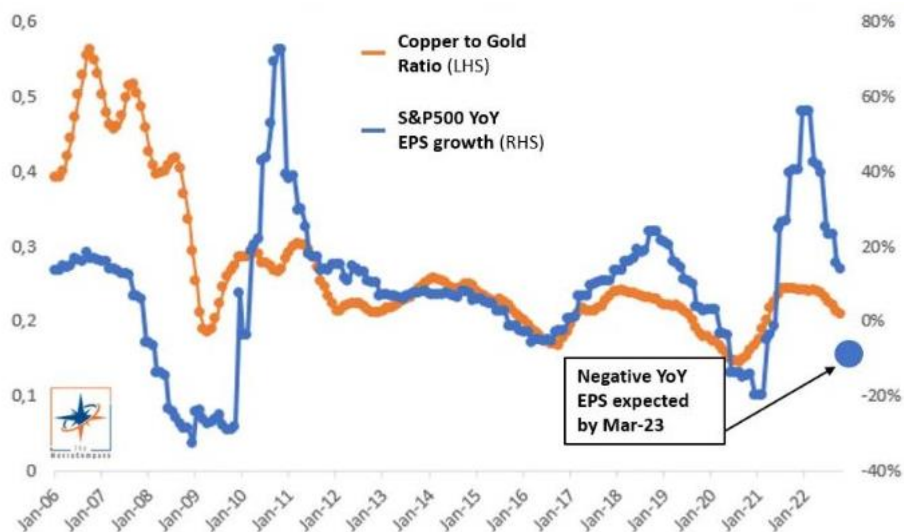
Different Perspective on the 2022 Sell-Off

Taking the equity risk premium into consideration allows for viewing this year's equity sell-off from a different perspective. According to the consensus available in the mainstream media, this year's decline was caused by deteriorating expectations regarding the future outlook of the economy. Yet with ERP being on such a low level, the reason for this year's declines needs to be not the earnings recession risk, but rather a substantial increase in a discount rate, mentioned in the first section. Growth companies–which constitute a large proportion of the post-2020 rally biggest winners–should be considered as rather long-term assets due to expectations of future earnings playing a large role in their valuations. Consequently, a large increase in the discount rate impacts the valuations of such companies to the highest extent, analogically to the case of long-end maturity bonds. Such an increase has led to the repricing of the stock market, by substantially decreasing the present value of future earnings generated by the companies, and the fact that growth companies constituted a big part of stocks' post-2020 gains may explain why this year's decline has been so substantial in terms of its size.

Outlook for the Earnings of the U.S. Equity Market

In the case of a robust economy, with an extremely optimistic and expansionary outlook, a low ERP similar to the current one could be justified. In fact, analysts' consensus for S&P 500 2023 earnings growth currently stands at 5.7% (Butters, 2022). At the same time, the U.S. economy is far from being robust and expansionary, what by now has been demonstrated in the report. The data presented in the previous sections of the report suggests that the U.S. economy may enter a slowdown in a near future, and assuming the economic contraction takes place, it will most likely affect corporate earnings. Such suggestions may, once again, be found in the commodities market. One of the indicators which may be used as a proxy for the outlook for corporate earnings is a copper-to-gold ratio. Copper is a commodity highly demanded in the expansionary economy, due to its wide usage in industrial production (CME Group, 2022a). On the other hand, gold is an alternative, safe-haven store of value, often chosen by investors when the outlook about the future is highly uncertain.

Figure 14 - Copper-to-Gold ratio (LHS); SP500 YoY EPS Growth (RHS)



Source: Peccatiello, 2022

Due to the roles of both metals, decreasing copper-to-gold ratio may be interpreted as a sign of deteriorating overall economic activity. Historically, such a move tended to lead a decrease in corporate earnings. As presented in figure 14, since the beginning of the year the ratio is trending to the downside. This is another macroeconomic cue in line with the slowdown scenario presented throughout this report, yet one that can be seen as leading to the decrease in corporate earnings in a more direct way.

Conclusion

The analysis performed throughout this paper illustrates what seems to be a mispricing of the U.S. equity market. Such a low ERP required by investors seems not in line with what is visible in the economic data, and what is discounted by the treasury market. Having established that the treasury market is pricing in some problems in the economy down the road, it is particularly interesting–as long as the ERP is considered–that the equity market is not pricing in the earnings recession. Should investors acknowledge the risk of one, the equity market would probably experience a major repricing to the downside, due to the bigger market risk premium required by investors.

At the same time, it is worth to pay the attention to another possible scenario that would also cause the ERP to come back to its average, namely a decrease in the risk-free rate, which is the ERP calculation input. With an extraordinarily tight monetary policy of the FED and unfavorable macroeconomic conditions, the stability of the monetary system may deteriorate, what was briefly mentioned in the first section of the report. A shock in the monetary system–presumably one of the magnitude similar to the GFC or March 2020–could cause the FED to reverse its policy to provide stability for the system, effectively bringing the treasury yields down. If such an event would occur, the shock itself would probably lead to a downside in the equity markets as well. Yet, investors should also keep a scenario like this in mind, as in such a case betting on a widening ERP could require expressing this macroeconomic view in a different way than simply betting on a stock market decline.

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