OFFENCE WINS GAMES BUT DEFENCE WINS CHAMPIONSHIPS

Building resilient portfolios for uncertain times

Balancing protection and upside potential is a difficult exercise, but we hope investors will find some ideas and some inspiration on how to tackle it in this paper, whether it is through a dynamic asset allocation that rebalances between cyclical and defensive assets or through the selection of asymmetric defensive assets like gold, quality equities or long duration government bonds for example.

November 2020

WisdomTree®

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EXECUTIVE SUMMARY

Every time equity markets go through a period of turbulence, with higher drawdowns and higher volatility, investors' interest for defensive assets or defensive investing spikes. However, at that point in time, it is already too late. Money has been lost and it will take even larger gains to recover account balances to prior levels.

Of course, timing the markets is incredibly difficult, and predicting the next downturn is close to impossible. As demonstrated by the Covid-19 crisis, market crashes can be triggered by an infinite number of economic or geopolitical events that cannot be accurately anticipated. If investors were in possession of a crystal ball, they could switch between low beta assets and high beta assets[1] at the exact right times to protect against deep drawdowns and benefit from large rebounds. Unfortunately, it is not the case and it is therefore essential to focus on protecting portfolios as soon as increased uncertainty arises in the market, if not constantly.

The objective should be to build versatile portfolios that can adapt to quickly changing market conditions and can resist unexpected events. In other words, to build all weather-portfolios that can protect the investor in crises by reducing drawdowns and participating on the upside to build wealth from one cycle to the next.

In this paper, we aim to:

+ Illustrate the pitfalls of market timing for long-term strategic wealth building and demonstrate the potential advantages of using all-weather, defensive portfolio allocations
+ Introduce the WisdomTree Defensive Asset Framework as a way to rank and select a balanced set of assets, considering their ability to reduce drawdowns and to capture upside moves
+ Propose investment concepts that can help portfolio managers and investors navigate uncertain times like:
    - Being allocated to Quality, Momentum, Multi-Factor strategies in equities as opposed to beta benchmarks
    - Investing in longer duration and higher risk government bonds as opposed to risk-free assets, like cash
    - Building a strategic allocation to Gold
    - Using safe-haven currencies, such as the US Dollar (USD), Japanese Yen (JPY) and Swiss Franc (CHF) to diversify portfolios
+ Showcase all-weather portfolios based on asset selection
+ Illustrate how a systematic dynamic asset allocation can help in building resilient portfolios.

[1] High Beta stocks tend to move more than the market. They are supposed to be riskier but provide higher return potential than the market. Low Beta stocks tend to move less than the market. They are supposed to be less risky but provide less return potential than the market.

The pitfalls of market timing and the advantages of a systematic defence

Two indisputable mathematical facts explain the advantage of a more defensive approach to investing over an aggressive one.

First, a large part of the equity gains over the long-term comes from a very small number of very good days. Removing only the best 10 days of an investment in the S&P 500 over the last 20 years[2] would have turned a 4.9% annualised return into a 0.89% one. Therefore, it is fundamental not to miss those bumper returns even though there is no way to predict exactly when they will happen.

Second, any loss has to be recouped before starting to make money again. A loss of -50% requires a gain of 100% to be erased, while a -15% loss only needs a 17.7% gain. So, by investing more defensively, investors:

+ Can stay invested continuously without worrying as much about drawdowns, which means that the best return days may not be missed
+ Do not need to run after losses and can build their wealth from a cycle to the next.

Please refer to chapter 1 where we delve further into this.

WisdomTree Defensive Assets Framework

For an investor with perfect market timing skills, pure risk reduction would be the alpha and the omega of our analysis. Cash, Japanese Yen, Gold or Government Bonds tend to perform well in equity drawdowns and would counterbalance them nicely. However, since most equity drawdowns are violent and are triggered by unpredictable events, investors need to consider the possibility that they should stay invested in defensive assets for long periods of time in preparation for possible shocks. The opportunity cost of doing so, however, can be significant and varies a lot from one asset to another. This is why we have introduced a more detailed framework to select the best, most relevant assets for this purpose.

This framework is based on 4 considerations:

+ **Risk Reduction** i.e. reduction of drawdowns, volatility...
+ **Asymmetry of Returns** i.e. versatility, the capacity of the asset to capture more of the performance of an asset when it goes up than when it goes down and to reduce opportunity cost (i.e. the performance that an investor did not benefit from because he was invested in another asset)
+ **Diversification** i.e. uncorrelated behaviour to the rest of the portfolio and in particular to equities
+ **Valuation** i.e. a cheaper asset usually exhibits less room for negative performance and less crowding as well.

[2] Source WisdomTree, Bloomberg. As of 30 September 2020. **Historical performance is not an indication of future performance and any investments may go down in value**.

The objective of this paper is to use this framework across asset classes and across assets to highlight which would be the most useful to build a robust, all-weather portfolio.

Please refer to chapter 2 where we delve further into this.

Equities are cyclical but not all equity strategies are created equal

No equity basket can offer full protection or full diversification versus a market cap weighted equity index. However, salient differences exist between different regional exposures, sectors, and factor baskets.

Traditionally defensive equities like minimum volatility (Min Vol) or Utilities exhibit very strong defensiveness in equity crises. Looking at the 7 biggest drawdowns in the last 20 years, such equity baskets have outperformed traditional betas in every one of them. But they also have limited upside potential. Utilities have an upside capture ratio of only 55% i.e. when the market cap weighted equity index goes up by one per cent, on average Utilities go up by 55bps. Minimum Volatility is not that much better with 70% upside capture.

On the other hand, our analysis shows that some often-overlooked strategies like Quality, Multi-Factor or Momentum have:

+ Also outperformed the market cap equity index in those 7 drawdown periods
+ Have exhibited a significantly larger upside potential with an upside capture ratio above 90%.

Quality, Multi-Factor, Momentum, therefore, have the right profile for a core equity exposure. They exhibit all-weather behaviour across market regimes, that delivers robust performance in bull and bear markets alike. They can be used at the core of a multi asset portfolio that can then be enhanced by other asset classes.

Please refer to chapter 3 where we delve further into this.

Adding duration risk to a Fixed Income allocation can reduce the overall risk for investors

Fixed Income assets are expected to provide protection in periods of equity drawdown and our analysis shows that the vast majority of bonds do outperform equities in crises. Cash, Government Bonds, Corporate Bonds and even high yield or Emerging Market bonds delivered better performance than equities in the 7 equity drawdowns that we considered over the last 20 years. However, only Government Bonds and Cash go a step further and managed to deliver outright positive performance. In a multi asset portfolio, this is really the goal of an investment in Fixed Income not just cushioning the losses but creating some performance uplift through negatively correlated assets. Zooming in further, we find that:

+ Longer duration government bonds can provide even higher uplift in drawdowns. In this case, higher volatility is a good thing since we are trying to harness the negative correlation of the returns of those assets to equities
+ Cash and highly rated Government Bonds (AAA for example) tend to exhibit small upside capture and create large drags to portfolios when the economy is recovering or doing well

- Longer duration Government bonds and Government bonds with slightly higher credit risk have historically provided higher upside capture outside of drawdowns.

So overall, the assets that have demonstrated well-rounded characteristics are Government Bonds with an extra something, i.e. with slightly longer duration or slightly more credit risk. They show a strong uplift (not just risk reduction) in equity drawdowns, a good capacity to benefit from economic expansion and very low correlation to other assets.

Please refer to chapter 4 where we delve further into this.

Gold, a precious ally in the fight against equity drawdowns

Broad Commodities are a strong diversifier. They are used to complement an Equity and Fixed Income portfolio, sitting in the Alternatives bucket. In our analysis, Commodities and in particular Enhanced Commodities exhibit interesting diversification properties over the long-term, but Gold is really the standout winner according to our Framework. It exhibits all the necessary characteristics that we are looking for, with strong risk reduction in equity drawdowns, a good capacity to benefit from economic expansion and very low correlation to other assets.

Our analysis shows that Precious Metals and Gold, in particular, behaved extremely well in equity drawdowns. Gold outperformed equities in all drawdown periods and performed positively in 5 out of the 7 crises considered. It delivered on average 14% annualised performance during those periods as well, a nice uplift for any multi asset portfolio. Looking at the 10 worst quarters for equities in the last 20 years, Gold delivered positive performance (not just outperformance) in 7 of them.

On the other side of the equation, Gold is also a powerful inflation hedge and it tends to behave strongly in higher inflation scenarios where currencies are devalued. Both results are a testament to Gold as a financial hedge and safe-haven asset as well as a real asset. Those two characteristics are particularly well suited for the current situation with uncertainty on the shape of the economic recovery and the threat of inflation and devaluation following the huge programs initiated by Central Banks around the world.

Please refer to chapter 5 where we delve further into this.

Currencies can be used as a defensive overlay

Currencies tend to behave in a Risk-on or a Risk-off way. US Dollars, Swiss Francs or the Japanese Yen are considered as safe-havens by investors and they tend to gain when the risk sentiment in the markets turns bearish. On the contrary, risk-on currencies like Australian Dollars or Canadian Dollars benefit from risk appetite in the markets. Our analysis strongly demonstrates that in equity drawdowns currencies are driven by this main differentiation and that investors could harness it in their portfolios.

In most cases, currency exposure is not obtained directly, but in conjunction with another asset. For example, a euro-based investor investing unhedged in US Treasuries would gain exposure to US Government Bonds and to the US Dollar at the same time. Our analysis shows that:

- Combining a defensive asset with a risk-off currency overlay would typically improve the defensiveness, in a crisis, of the investment

- Such combinations may be more volatile day to day but can still deliver significant outperformance in an equity crisis
- Investing in foreign assets can offer strong diversification possibilities to portfolio managers.

Mixing an all-weather asset with risk-off currencies can offer a wide range of possibilities for investors. Coming back to our Equity and Fixed Income findings, Quality equities denominated in USD or Long Duration Treasury Bonds denominated in USD could prove valuable in our portfolio construction.

Please refer to chapter 6 where we delve further into this.

A defensive portfolio that can perform strongly across cycles

Having used our framework to highlight multiple interesting investments in the 4 main asset classes (Equity, Fixed Income, Commodity, Currency), it is time to put them to the test in a portfolio context.

As discussed at the onset of this paper, avoiding losses and smoothing returns are some of the main objectives when it comes to asset allocation. In this part, we will use a euro focused, diversified 60/40 portfolio as the standard to which we compare 2 illustrative portfolios:

- The Illustrative Recession Portfolio focuses on risk reduction only without focusing on the rest of our framework i.e. asymmetry & upside potential, or valuations
- The Illustrative Defensive Portfolio aims to invest in the assets that our framework has uncovered i.e. assets that balance risk reduction and upside potential to deliver a more versatile investment profile, which can be more suited to uncertain times, like Quality Equities, Long Duration Government Bonds, Gold...

We find that, in line with our discussion at the onset on the benefits of investing in resilient assets, both Illustrative Portfolios have beaten the 60/40 portfolio and equities over the long-term, delivering higher returns and lower volatility.

Our second finding is that the Illustrative Recession Portfolio tends to behave as a one-trick pony delivering a strong performance in equity crises but lagging in most other scenarios. The usefulness for investors is therefore limited to periods where equity drawdowns are guaranteed. On the other hand, the Illustrative Defensive Portfolio:

- Exhibited strong risk reduction when equity drawdowns happened
- Improved on the performance of equities when the economy was mixed
- Lagged equities but with still very decent upside capture in periods of economic boom.

Please refer to chapter 7 where we delve further into this.

Adaptability? Look to Dynamic Asset Allocations

Our final chapter focuses on investment techniques that use rotation between assets or between asset classes as their main tool to limit risk. We look in particular at 2 simple strategies based on Tactical Asset Allocation principles and 2 based on Risk Mitigation Techniques. Our analysis shows that all those strategies would have outperformed a 60/40 portfolio over the long-term showing that they can deliver long-term value for investors.

Overall, we observe that the risk mitigating techniques have on average reduced the size of the drawdowns in the 7 equity crises considered. In fact, those 2 strategies show a very balanced profile on the downside and the upside that improved on a classic 60/40 portfolio. The Tactical Asset Allocations provided more mixed results, in part because the portfolios are very simple with binary 0% or 100% allocations, but also because they rely on predictive signals to anticipate the relative performance of the assets which is, as we know, always going to be a bit of a hit and miss. However, the momentum driven portfolio has shown a lot of promise with reduced drawdowns and the highest upside capture of all the portfolios.

Please refer to chapter 8 where we delve further into this.

Definitions and Indices used in this paper can be found in the appendix.

CHAPTER 1: THE PITFALLS OF MARKET TIMING AND THE ADVANTAGES OF A SYSTEMATIC DEFENSE

Risky assets like Equities follow the random walk. At least that is how mathematicians tend to model them. Trying to time returns is, therefore, a very risky game. From an investment of $10,000 in the S&P 500 20 years ago, an investor would currently own $30,819[2]. A nice, annualised return of 5.8% despite the recent drawdown in 2020. However, if such investor had missed only the 10 best days over those 20 years, i.e. 10 days out of more than 5,000 trading days, they would be staring at only $14,124. An overall return of 1.74%. Such a dramatic difference for 10 days. Looking more precisely at when those 10 great days happened, it appears that they concentrated around:

+ Major periods of equity drawdown (October 2008, November 2008, March 2020)
+ Periods just after the lows i.e. early in the rebound (March 2009, March 2020, April 2020).

Trying to time markets and significantly cut equity exposure in periods of market crashes would therefore have increased the risk of missing those days.

Another overlooked fact is that to regain the money lost in a 50% drawdown, an asset needs to gain 100%. So, if a volatile asset were to lose 50% and then gain 50%, the overall performance would be -25%. However, if a less volatile asset were to lose 15% and then gain back those 15% then the overall performance would only be -2%. This simple mathematical rule gives a fundamental advantage to more risk conscious assets and portfolios.

Those two mathematical facts explain the potential advantage of a more defensive approach to investing over a more aggressive one. By investing more defensively, investors:

+ Can stay invested continuously without worrying as much about drawdowns, which means that the best return days may not be missed
+ Do not need to run after losses and can build their wealth from one cycle to the next.

CHAPTER 2: THE WISDOMTREE DEFENSIVE ASSET FRAMEWORK

When it comes to constructing a defence minded portfolio, investors have 3 main avenues open to them:

+ Asset Selection, using "naturally" defensive assets, i.e. assets that are defensive or diversifying by nature
+ Asset Allocation, using non-derivative based systematic defensive strategies like Vol Targeting (regular rebalancing between high volatility and low volatility assets to maintain risk around a certain level), Capital Protection mechanisms (Constant Proportion Portfolio Insurance) and so on
+ Derivatives and non-linear instruments to protect the portfolio and transform non-defensive assets in defensive assets

Here we aim to cover Asset Selection and Asset Allocation extensively, starting with defensive assets themselves. Derivative based strategies are completely different in nature and they tend to be very expensive to maintain over the long-term which is why we will not cover them here.

What do defensive assets look like?

In a typical multi asset portfolio, by virtue of the risk embedded in each individual asset class, the biggest source of risk is a period of negative performance in equities, i.e. an equity drawdown. In fact, the analysis of a common portfolio allocation invested 60% in European equities and 40% in Euro fixed income shows a 90% risk contribution from equities. It is therefore only natural that defensive assets tend to be defined in opposition to equities, "anti-equities" assets so to speak i.e. assets that do well in equity drawdowns.

In Figure 1A, we focus on this initial definition and look at performance across asset classes in 7 well known equity drawdown periods: the Tech Bubble (4 September 2000 to 12 March 2003), the Financial Crisis (16 July 2007 to 9 March 2009), the Euro Crisis I (15 April 2010 to 5 July 2010), the Euro Crisis II (2 May 2011 to 4 October 2011), the China Crisis (15 April 2015 to 11 February 2016), Q4 2018 (21 September 2018 to 27 December 2018) and the Covid-19 Crisis (12 February 2020 to 23 March 2020). The bottom part of Figure 1B shows the performance of the STOXX Europe 600 total return index over those periods in particular (grey shading).

FIGURE 1A: PERFORMANCE IN PERIODS OF EQUITY DRAWDOWN

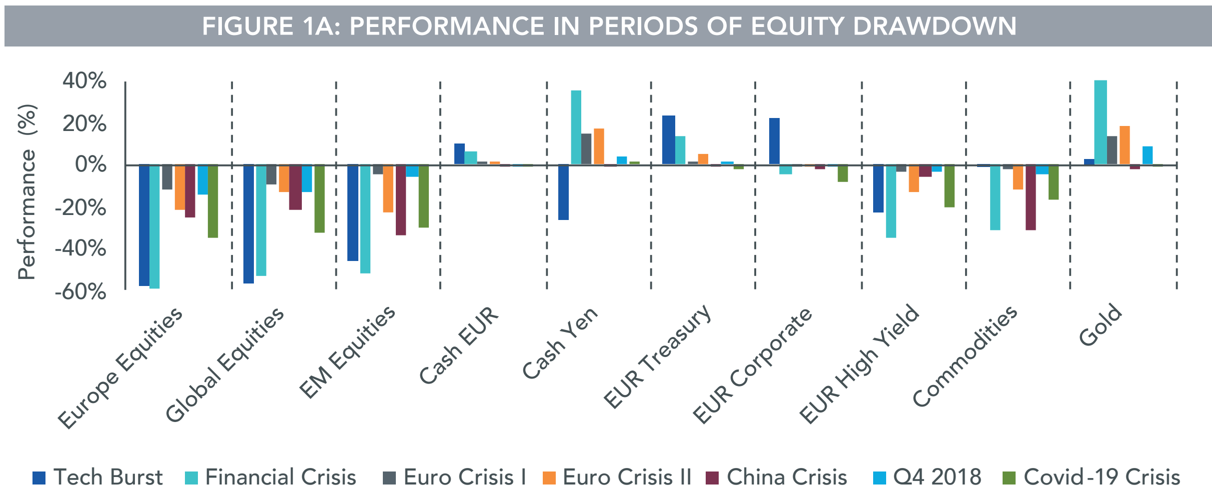
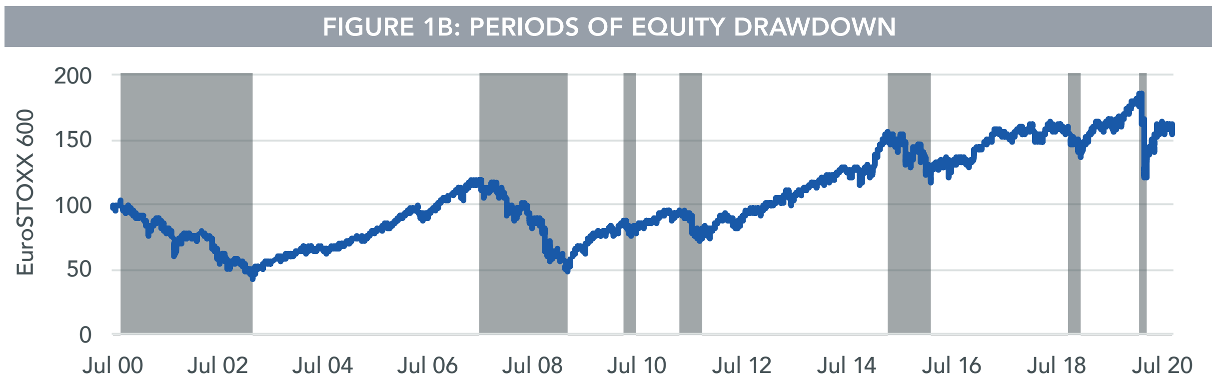


FIGURE 1B: PERIODS OF EQUITY DRAWDOWN



Source: WisdomTree, Bloomberg. July 2000 to September 2020 In EUR. **Historical performance is not an indication of future performance and any investments may go down in value.** See the appendix for more details on the indices used in the figure.

Quite clearly, all equities behaved cyclically and therefore lost money in the above-mentioned crises. Broad commodities, as well as High yield bonds, also behaved quite cyclically showing negative performance during all 7 drawdown periods albeit less so than equities. On the other end of the spectrum, Gold, Cash and Government Bonds delivered strong positive performance in all those periods. Japanese Yen also did well in most periods exhibiting safe-haven type behaviour.

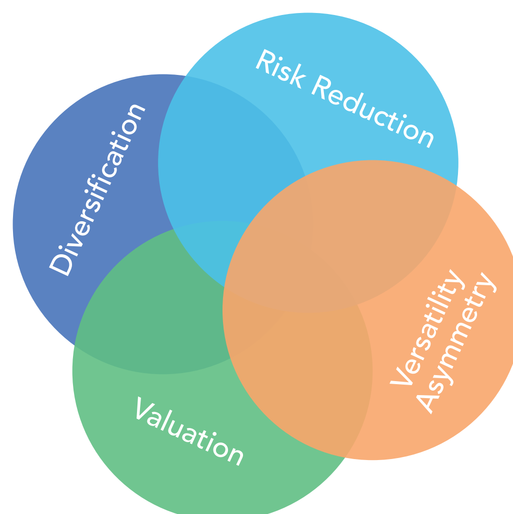
For an investor with perfect market timing skills, Figure 1A would be the alpha and the omega of our analysis. Gold, Cash, Japanese Yen or Government Bonds tended to perform well in equity drawdowns and would have counterbalanced the equity drawdowns nicely. However, since most of the equity drawdowns were violent and were triggered by unpredictable events, investors may have had to consider the need to stay invested in defensive assets for long periods of time in preparation for possible shocks. The opportunity cost of doing so could be significant and varies a lot from one asset to another. This is why we have introduced a more detailed framework to classify those assets.

The Details of the Framework

This framework is based on 4 considerations:

- **Risk Reduction** i.e. reduction of drawdowns, volatility
- **Asymmetry of Returns** i.e. versatility, the capacity of the asset to capture more of the performance of an asset when it goes up than when it goes down and to reduce opportunity cost (i.e. the performance that an investor did not benefit from because he was invested in another asset)
- **Diversification** i.e. uncorrelated behaviour to the rest of the portfolio and in particular to equities
- **Valuation** i.e. a cheaper asset usually exhibits less room for negative performance and less crowding as well

FIGURE 2: WISDOMTREE DEFENSIVE ASSETS FRAMEWORK



In order to improve the versatility of a portfolio, it is important to consider all 4 aspects for potential investments.

The objective here is to use this framework across asset classes and assets to highlight which would be the most useful to build a robust, all-weather portfolio. To do so, we aim to use relatively standard tests for the 4 themes in our framework:

- For **Risk reduction** we will continue to focus on performance in severe equity drawdowns (see Figure 1).
- For **Asymmetry of Returns** we will use a regime analysis focusing on returns in period of economic expansion or economic slowdown to try to gauge the opportunity cost of the different assets (see Figure 3).
- For **Diversification**, we will look at the overall correlation and correlation during severe equity drawdowns (see Figure 4).
- Finally, for **Valuation**, we will use an asset class's specific test as its measure vary greatly from one asset class to another

A first test of the framework on a cross asset class basis

From a **Risk Reduction** point of view, Figure 1 has shown that Gold, Cash, Japanese Yen and Government Bonds have performed the best in crises with positive returns in most of them. Corporate bonds, high yield bonds, while losing money, still outperformed equities in those periods.

Focusing on **Asymmetry of Returns** next, we are looking for a versatile asset that can also perform well in economic expansions. When preparing for a period of uncertainty, it is important to not just prepare for "the worst" but also to prepare for other scenarios such as an unexpected late cycle rally for example. The Holy Grail would be a fully asymmetric asset that captures all the upside without capturing any of the downside. Lacking such asset, investors need to balance both sides of the equation in light of their investment goals.

In Figure 3, we have split the last 20 years or so into 4 regimes using the Organisation for Economic Co-operation and Development ("OECD") Composite Leading indicator ("CLI"). The CLI has been designed to provide early signals of turning points in the business cycle and tends to decrease a few months before the economy starts to slow down or increase before the economy restarts. So, a strong decline in CLI tends to indicate a probable downturn in equity markets for example. The 4 regimes are characterised by:

+ A strongly negative CLI which indicates a bad economic environment and potential recession
+ A moderately negative CLI which indicates a challenging economic environment
+ A moderately positive CLI which indicates a recovering economic environment
+ A strongly positive CLI which indicates a vigorous economic environment and economic expansion

Five out of the 10 assets considered in Figure 3 have shown positive historical performance when the economy is slowing down (Cash, Japanese Yen, EUR Treasury, EUR Corporate and Gold), which is in line with findings in Figure 1. However, only three of those have also shown significantly positive performance when the economy is doing a little bit better or a lot better: Gold, EUR Government Bonds (or EUR Treasuries) and EUR Corporate bonds. Those assets are therefore the most asymmetrical. On the contrary Cash and Japanese Yen's performance during those periods tends to be lacklustre to negative which means that in any other scenario than an equity drawdown they might create a drag on a portfolio's performance.

FIGURE 3A: AVERAGE MONTHLY PERFORMANCE DEPENDING ON CLIs

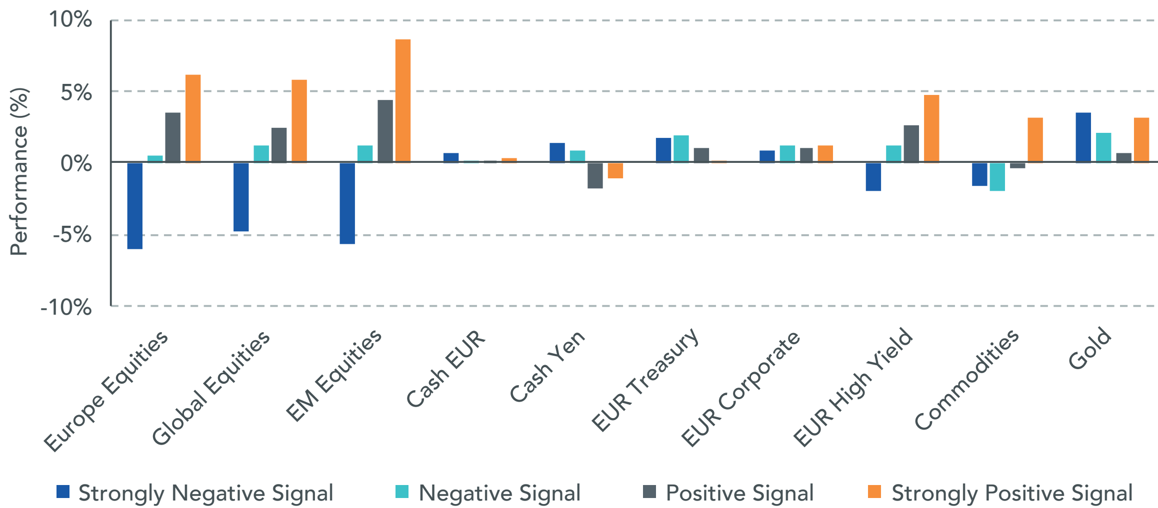
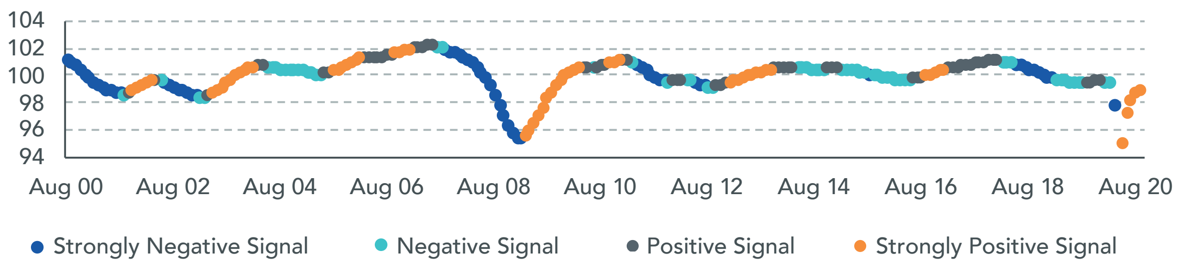


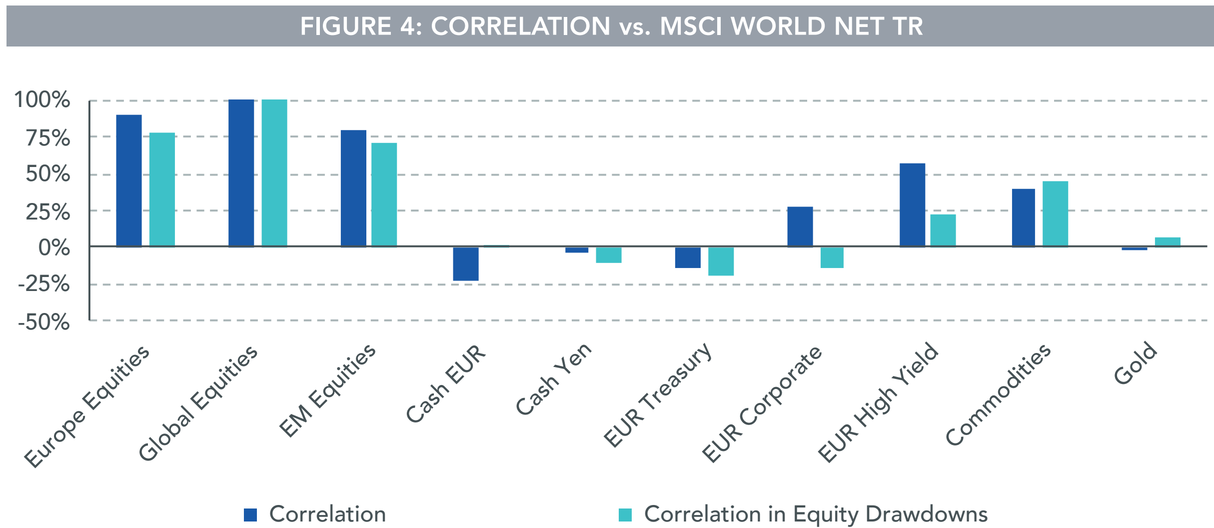
FIGURE 3B: THE OECD COMPOSITE LEADING INDICATOR IS USED TO DEFINE 4 MARKET REGIMES



Source: WisdomTree, Bloomberg. Period July 2000 to September 2020. Calculations are based on monthly returns in EUR. **Historical performance is not an indication of future performance and any investments may go down in value.** See the appendix for more details on the indices used in the figure.

Our third attribute is **Diversification**. Academics have been showing for decades that in a portfolio context, diversification is key to increase the robustness of the portfolio and improve its long-term prospects. Some assets have such asynchronous behaviour that they benefit a portfolio independently of the rest of their characteristics. In Figure 4, we look at the historical correlation of monthly returns over the last 20 years or so versus Global Developed Equities as well as the correlation of daily returns during severe equity drawdowns. Government Bonds, Corporate Bonds, Japanese Yen and Gold stand out with low overall historical correlation and low to negative correlation in past equity crises. Such behaviours are supportive of the overall portfolio by providing some lifts when equities are suffering.

FIGURE 4: CORRELATION vs. MSCI WORLD NET TR



Source: WisdomTree, Bloomberg. Period July 2000 to September 2020. Calculations are based on monthly returns in EUR for the Correlation and Daily return in EUR for the Correlation in Equity Drawdowns. **Historical performance is not an indication of future performance and any investments may go down in value.** See the appendix for more details on the indices used in the figure.

On a cross asset class basis, Gold, Government and Corporate Bonds have shown themselves as strong contenders for inclusion in an all-weather portfolio, fit for a large panel of scenarios. In the next part, we will focus entirely on equities and highlight equities strategies that behave defensively but are also able to participate in market rallies.

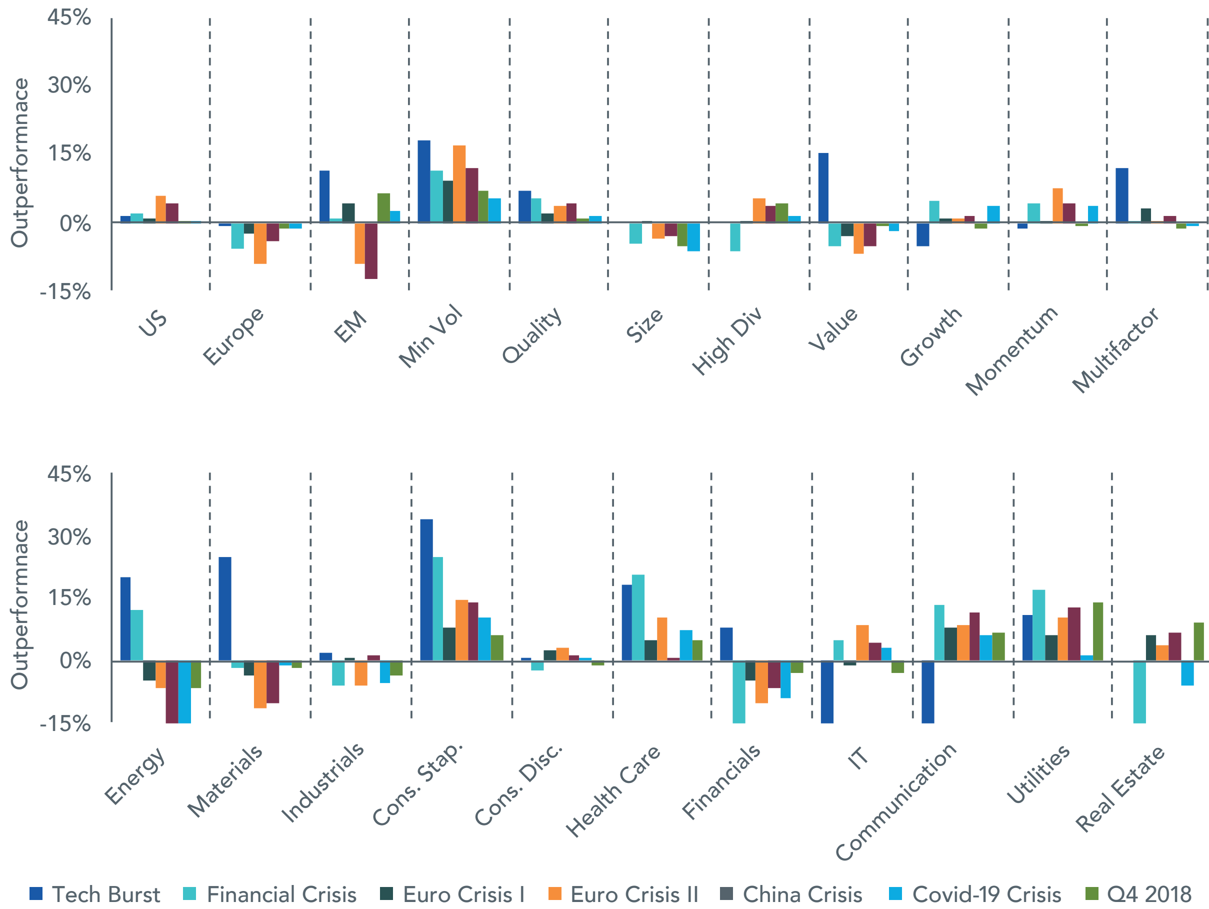
CHAPTER 3: EQUITIES ARE CYCLICAL. ARE ALL EQUITY STRATEGIES CREATED EQUAL?

From a Euro-based investors point of view, there is an infinite number of equity baskets that can be invested in. Here, we will concentrate on some of the most classic ones such as regions (Europe, US, and emerging markets), sectors and factors. For sectors we focus on the 11 Global Industry Classification Standard (GICS) sectors in developed markets equities. For the factors, we will concentrate on the 7 most classic i.e. Minimum Volatility, Quality, Value, High Dividend, Size, Growth and Momentum plus a Multi-factor approach in developed equities as well (more details on the indices used are available in appendix).

Starting with Risk Reduction, Figure 5 exhibits the outperformance of the different equity baskets in periods of drawdowns versus the MSCI World. It clearly differentiates between 3 types of equity baskets:

+ Higher risk baskets like Financials, Energy, Value or Europe that underperformed in most drawdowns
+ Middle of the road baskets which did not show any strong inclination on the upside or the downside versus the benchmark in drawdown periods
+ Defensive baskets that delivered outperformance in all periods and delivered a strong outperformance overall in those periods. These include sectors like Health Care, Consumer Staples, Consumer Discretionary and Utilities, styles like Min Volatility, Multi Factor and Quality. US equities fall in this category thanks to the safe-haven nature of the US dollar.

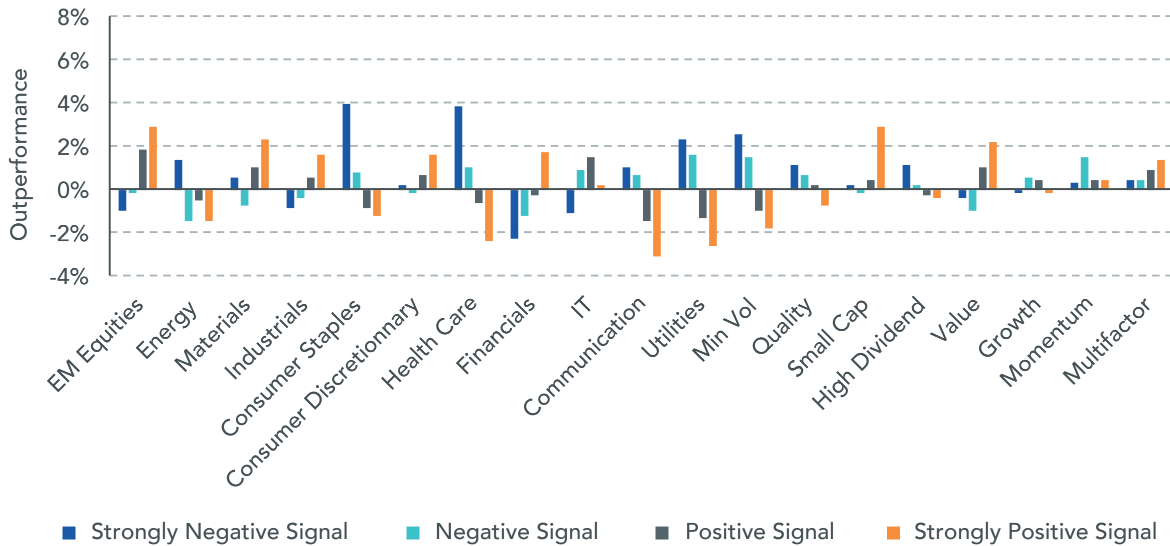
FIGURE 5: OUTPERFORMANCE vs. MSCI WORLD IN PERIODS OF EQUITY DRAWDOWN



Source: WisdomTree, Bloomberg. In EUR. Up to September 2020, MSCI World Communications is proxied by MSCI World Telecommunications. **Historical performance is not an indication of future performance and any investments may go down in value.** See the appendix for more details on the indices used in the figure.

Those 8 defensive baskets, Health Care, Consumer Staples, Consumer Discretionary, Utilities, Min Volatility, Quality, Multi-Factor and High Dividend, have historically been the most protective in equity drawdowns, delivering outperformance in most, or all, of the 7 crises. As the next step, we want to look at the upside potential of these same assets to assess their versatility. Figure 6 shows the regime analysis of baskets in the Defensive and Middle of the road categories, showing a large disparity of behaviours.

FIGURE 6: AVERAGE MONTHLY OUTPERFORMANCE (vs. MSCI WORLD) DEPENDING ON CLIs



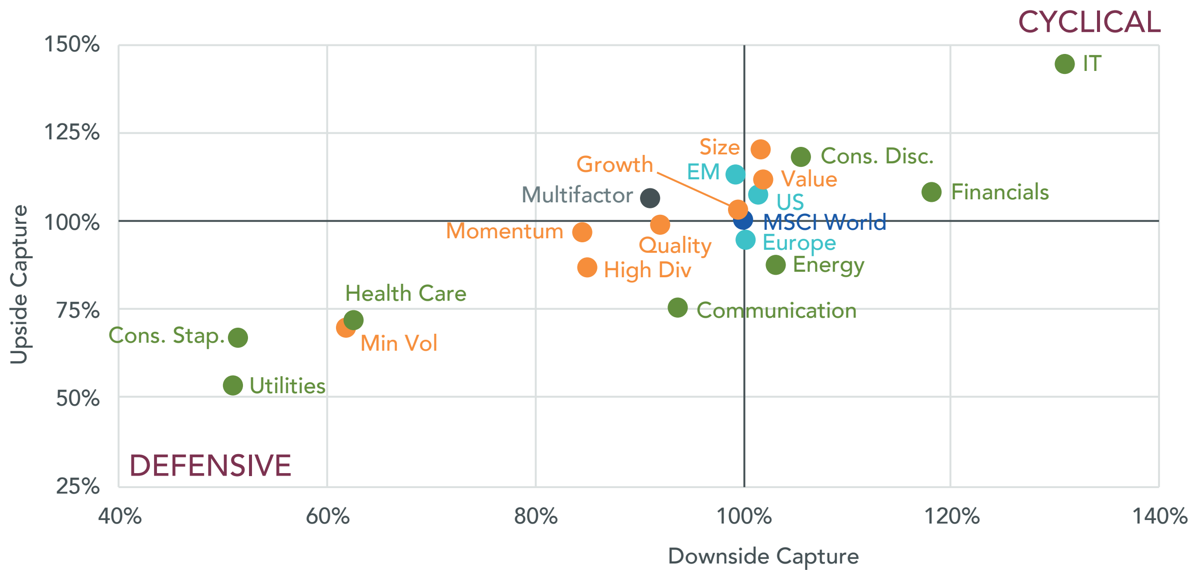
Source: WisdomTree, Bloomberg. Period July 2000 to September 2020. Calculations are based on monthly returns in EUR. **Historical performance is not an indication of future performance and any investments may go down in value.** See the appendix for more details on the indices used in the figure.

Some baskets like Min Volatility or Health Care have shown large outperformance when the CLI is negative but also have exhibited large underperformance when the CLI was positive, indicating a potentially very large opportunity cost. Other baskets, like Momentum, High Dividend, Quality, Multi-Factor or Consumer Discretionary exhibited a more balanced profile with some outperformance for most value of the signal.

Combining, Risk Reduction and Asymmetry of Returns, only a few baskets have outperformed in most crises and are minimizing the cost of opportunity. Such assets are Quality, Multi-Factor, Consumer Discretionary. High Dividend, Momentum. US Equities are just behind.

In equities, another way to assess the Asymmetry of Returns for a given basket is to calculate how much of the negative performance of developed equities (respectively positive performance) is captured by the different equity baskets (called downside and upside capture respectively).

FIGURE 7: UPSIDE AND DOWNSIDE CAPTURE vs. MSCI WORLD



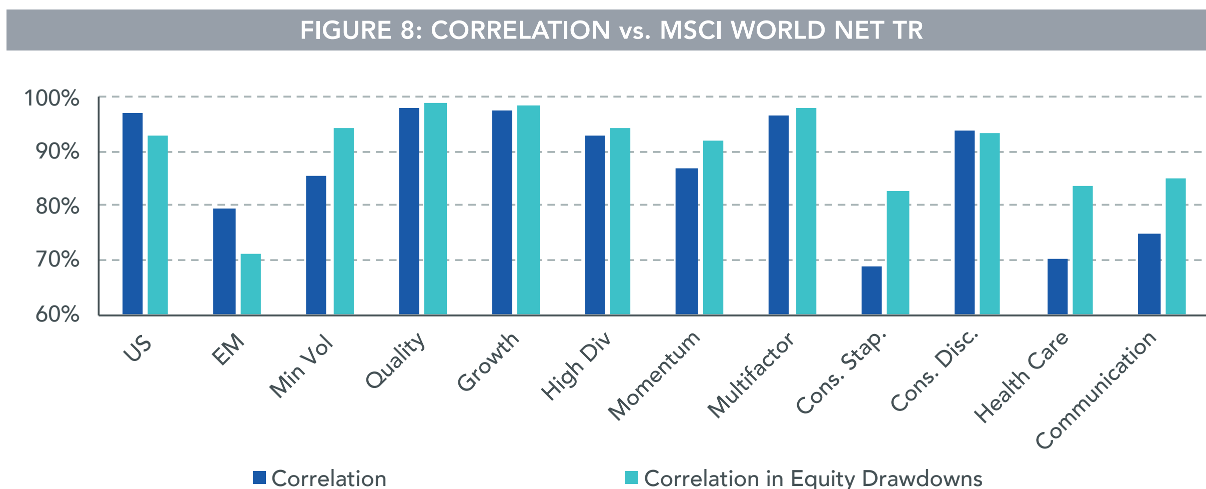
Source: WisdomTree, Bloomberg. Period July 2000 to September 2020. Calculations are based on monthly returns in EUR. Green is Sectors, Orange is Factors and Light Blue is Regions. **Historical performance is not an indication of future performance and any investments may go down in value.** See the appendix for more details on the indices used in the figure.

Out of the 8 baskets that we singled out in Figure 5 for their defensive characteristics, 4 end up in the bottom left of Figure 7 which confirms their ability to historically cushion a downturn in equities, but also highlights how much of the upside is sacrificed. Min Volatility, for example, exhibited an upside capture of 70% only. Utilities captured only 55% of the upside.

In the middle of the graph, Quality, High Dividend, Momentum, Multi-Factor seem to offer a more balanced trade-off with an upside capture above 90% and a downside capture below 95%. Such baskets would bring more versatility to a portfolio than the other 3. Multi-Factor, in particular, exhibited a very interesting profile with a strong asymmetry between its upside capture ratio and its downside capture ratio. In this analysis Consumer Discretionary exhibits a downside capture above 100% which does not help bolster its "defensiveness" credentials. Overall, Quality, Multi-Factor, High Dividend and Momentum are comforted as the winners of this analysis.

Regarding our third criteria, Diversification, Figure 8 shows that geographical allocation can play a large role. US equities and Emerging Markets equities, to a larger extent, exhibit very reduced correlation overall and in crisis. This demonstrates once again the power of diversifying away from an investor's own market into other geographies. Purely defensive baskets like Min Volatility or Consumer Staples also exhibit low correlation. This is, however, the sign of a low beta (i.e. low downside and upside capture) more than true risk diversification.

FIGURE 8: CORRELATION vs. MSCI WORLD NET TR



Source: WisdomTree, Bloomberg. Period July 2000 to September 2020. Calculations are based on monthly returns in EUR for the Correlation and Daily return in EUR for the Correlation in Equity Drawdowns. **Historical performance is not an indication of future performance and any investments may go down in value.** See the appendix for more details on the indices used in the figure.

One last aspect to consider is valuations. It is not rare to see some sectors or styles becoming very expensive following a period of exuberance in the market price. Practitioners will remember the run to Min Volatility stocks in 2016, and then more recently to the FANGs (Facebook, Amazon, Netflix, Google [Part of Alphabet]).

At WisdomTree, we strongly believe in valuation discipline and that is why our strategies embed some mechanisms to control the valuation in our portfolios through stock screening and reweighting. Regular rebalancing also helps to avoid weight drifting. In particular, our flagship equity strategies focus on Higher Dividend and Quality exposures through well-defined systematic strategies that, while investing in the most relevant stocks, weight them by cash dividend allowing to maintain a reasonable level of valuation over time.

Overall, no equity basket can offer full protection or full diversification versus a market cap index. However, Quality, Multi-Factor, High Dividend and Momentum show the right profile for a core equity exposure. They exhibit an all-weather behaviour across market regimes, that delivers robust performance in bull and bear markets alike. They can be used at the core of a multi asset portfolio that can then be enhanced by other asset classes.

CHAPTER 4: ADDING DURATION RISK TO A FIXED INCOME ALLOCATION CAN REDUCE THE OVERALL RISK FOR INVESTORS

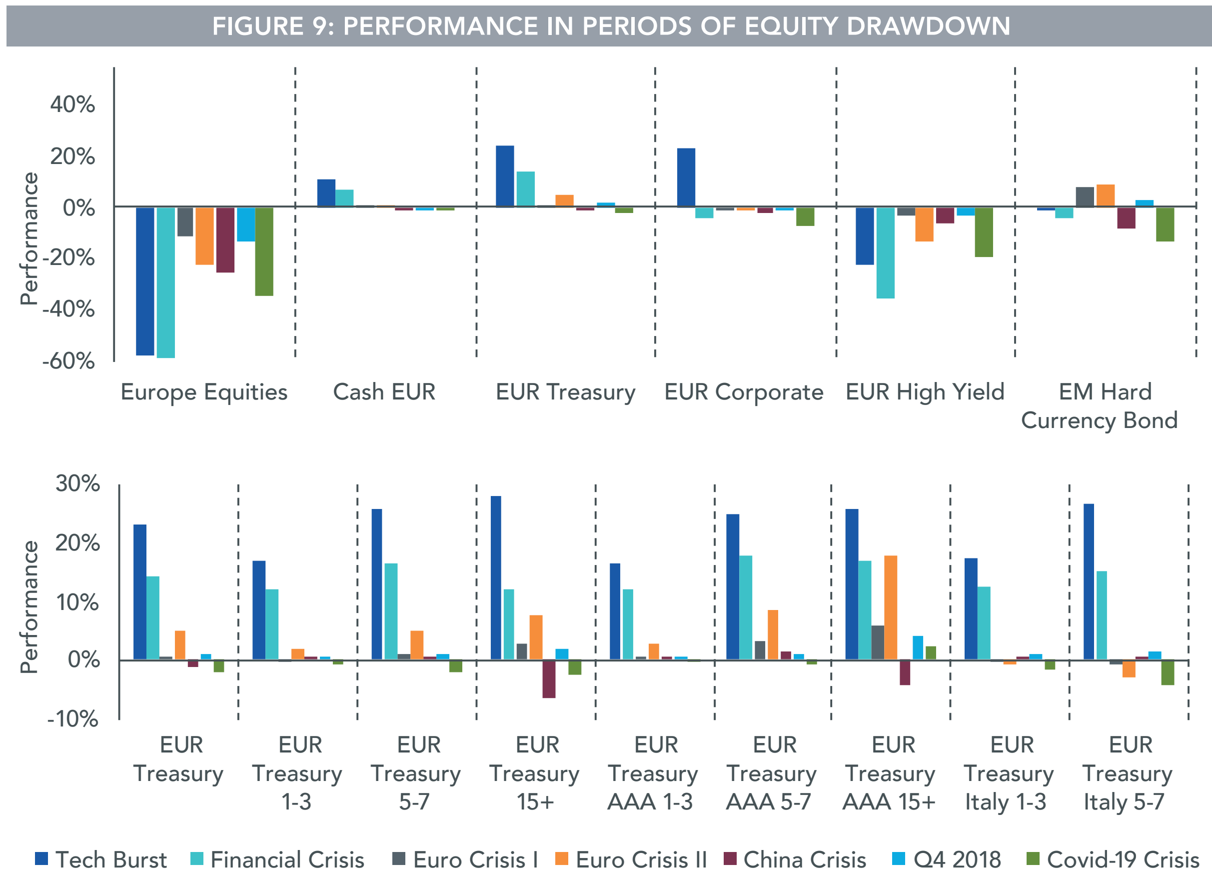
Fixed income is kind of the poster child for defensive assets. In this chapter, we focus on fixed income in the investor's home currency, in this case, Euros. We will look at foreign currency fixed income in later chapters.

Historically, the natural starting point for a multi asset portfolio has been a 60/40 asset mix (60% in equities and 40% in fixed income). This mix aims to provide exposure to the historically superior returns exhibited by equities, meanwhile also granting the diversification benefits available in fixed income assets. Within this framework, fixed income assets are considered the ultimate defensive assets providing some cushioning in the event of an equity downturn, partly due to their lower volatility but, more importantly, thanks to their negative correlation to equity returns.

In Figure 9, we start with the Risk Reduction aspect of our framework, considering the performance of different fixed income assets in the 7 pre-determined equity crises. As could be expected, fixed income assets outperformed equities in all crises. However, when investing in fixed income, a multi asset portfolio manager expects positive performance from bonds in those severe equity drawdowns. In Figure 9, only Cash, EUR Treasuries and sometimes EM Hard Currency Bonds delivered on that promise.

Zooming in further on EUR Treasuries, it is clear that higher rated Treasuries (like AAA) tend to deliver a stronger uplift in a crisis than lower rated Treasuries (like Italy). This is partially driven by investors' behaviour and their tendency to allocate money to lower risk, safe-haven assets in times of crisis (such as German Bunds or US Treasuries). But interestingly enough, when equities have dropped in price, history has shown that lengthening duration was the most beneficial lever to pull — even doing better than increasing credit quality (see EUR Treasury 15+ vs EUR Treasury 1-3). Such long duration assets show greater sensitivity to changes in interest rates and in scenarios where equity prices fall, bond prices tend to rise (thanks to bond yields falling).

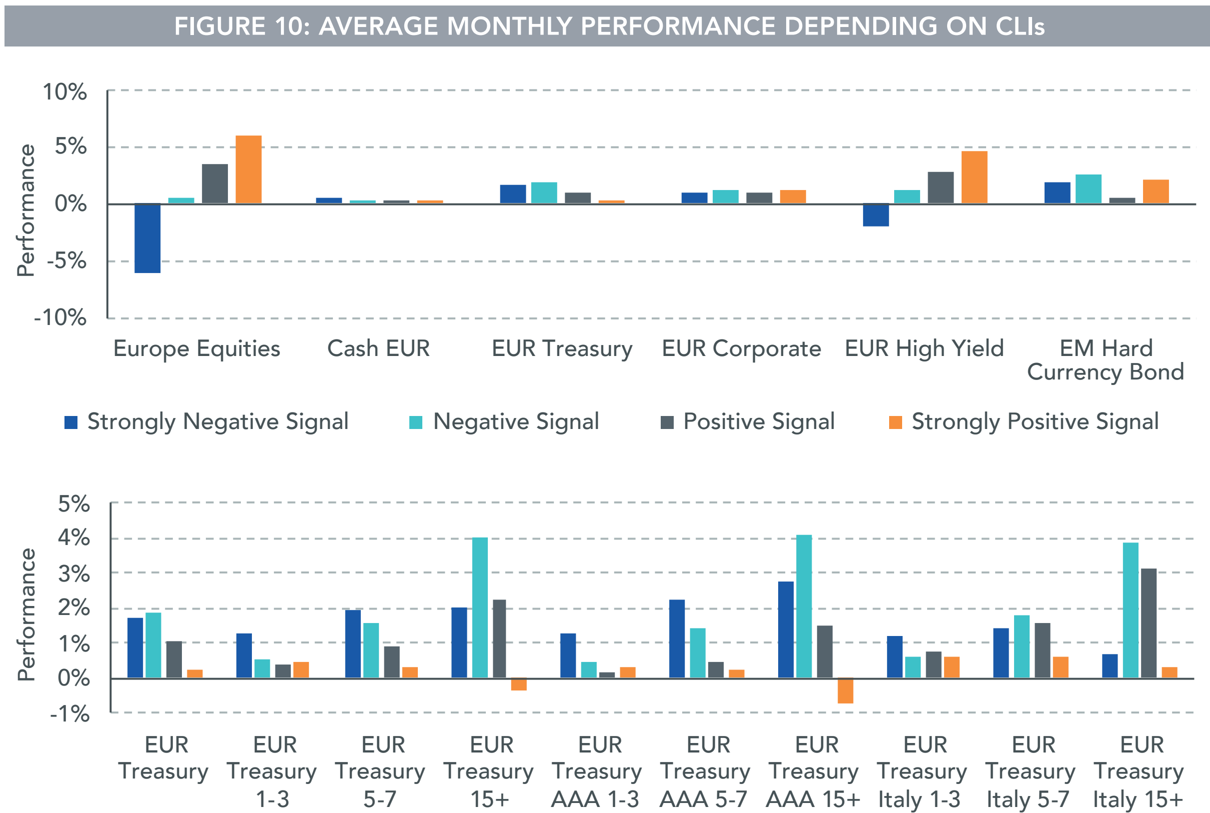
FIGURE 9: PERFORMANCE IN PERIODS OF EQUITY DRAWDOWN



Source: WisdomTree, Bloomberg. Period July 2000 to September 2020. Calculations are based on daily returns in EUR. For data availability reasons, in the bottom graph the Tech Burst is defined from end of August 2000 to end of March 2003 and the Financial Crisis is defined as end of June 2007 to end of March 2009. **Historical performance is not an indication of future performance and any investments may go down in value.** See the appendix for more details on the indices used in the figure.

Focusing on the other side of the equation, i.e. the Asymmetry of Returns, it is clear that in regimes where equities have been doing well, the higher the credit risk of the fixed income asset, the better the performance. Cash perfectly highlights the pitfalls of focusing solely on risk reduction. First, it has tended to show small positive returns when the CLI is very negative but contrary to assets with higher volatility it has not provided any positive uplift. Second, it did not appear to benefit from any price appreciation during better economic times and therefore it cannot be considered as a medium to long-term investment.

FIGURE 10: AVERAGE MONTHLY PERFORMANCE DEPENDING ON CLIs



Source: WisdomTree, Bloomberg. Period July 2000 to September 2020. Calculations are based on monthly returns in EUR. **Historical performance is not an indication of future performance and any investments may go down in value.** See the appendix for more details on the indices used in the figure.

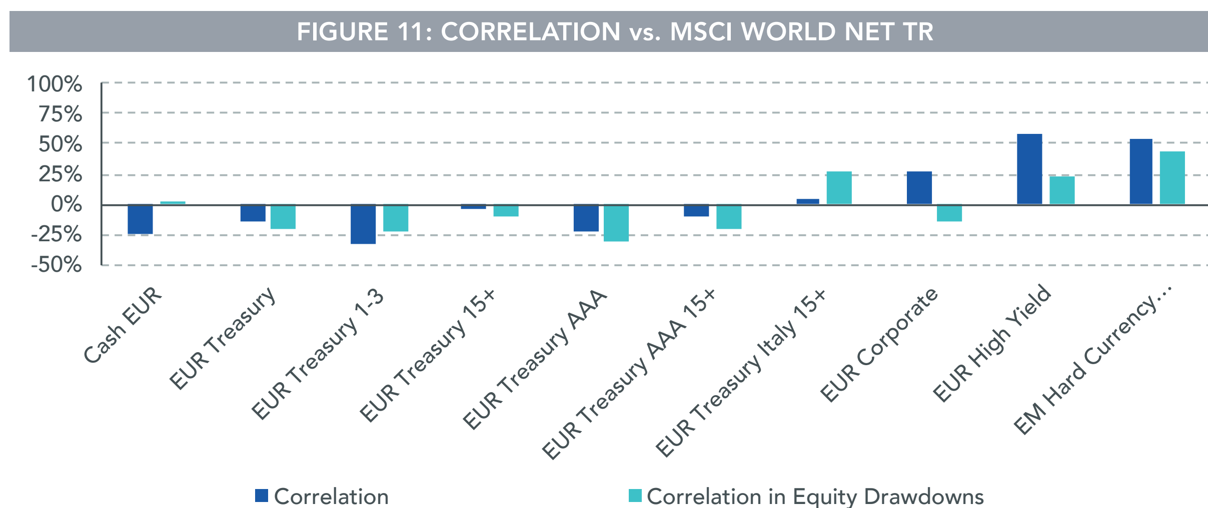
Next, we assess the impact of duration and ratings on the performance profile of EUR Government Bonds in Figure 9. Once again, the higher the credit rating and the duration of the asset, the higher the performance when the CLI was strongly negative or negative. In the other two regimes, increasing the credit rating of the fixed income assets could deteriorate the performance. Like cash, AAA government bonds exhibited a very strong performance drag in any market scenario outside of equity crashes, creating a large opportunity cost on the money invested.

Increasing the duration improved the returns of the asset for the 3 regimes where the CLI was not strongly positive. When the signal was strongly positive, the effect seemed to vary depending on the credit rating. For AAA Treasuries, increasing the duration magnified the underperformance in that regime. For lower quality bonds such as Italy treasuries (rated A-/BBB), the impact of increasing the duration in that regime was less. Overall, long duration Eurozone government bonds (average rating AA-/A+) delivered strong outperformance in equity drawdowns thanks to their negative correlation to equities and higher volatility profile but also delivered strong performance in other regimes.

In conclusion, by aiming for government bonds with average credit quality and higher duration (see EUR Treasuries 5-7 or 15+) it appears possible to get better risk reduction than Cash, German Bunds or EUR Treasuries while participating in the upside performance almost as well as with EUR corporates.

In Figure 11, we can observe that correlations between equities and fixed income assets have been very low, negative even, historically. Aligned with previous findings, government bonds and more particularly higher rated government bonds exhibit a strong negative correlation to equities while corporate bonds and high yield bonds show a high positive level of correlation. Focusing on correlation during equity drawdowns only, we observe that assets with a bit more volatility like longer duration assets or corporate bonds seem to benefit more strongly from the change in regime. The difference between typical correlation and correlation in drawdowns is higher for those assets. On the contrary, the correlation in crisis is higher than the overall historical correlations for EUR Treasuries 1-3.

FIGURE 11: CORRELATION vs. MSCI WORLD NET TR



Source: WisdomTree, Bloomberg. Period July 2000 to September 2020. Calculations are based on monthly returns in EUR for the Correlation and Daily return in EUR for the Correlation in Equity Drawdowns. **Historical performance is not an indication of future performance and any investments may go down in value.** See the appendix for more details on the indices used in the figure.

Once the asset allocation mix which best suits an investors risk profile has been selected, the implementation process requires strong consideration as well. This is where the "Valuation" component comes in. Fixed income is such a sprawling asset class that there is an infinite number of ways to invest in a given segment. Linking back to our framework, the objective is to extract the asset class behaviour we are looking for, meanwhile, considering asset class valuations (i.e. to improve the yield we can extract from the underlying assets). WisdomTree's view is that by using systematic strategies, it is possible to enhance the income potential of a fixed income segment, such as treasuries or aggregates, by sourcing opportunities and shifting exposures across countries and duration buckets within that segment to increase yield and therefore improve the long-term outcome of such a portfolio. In particular, using a treasury focused enhanced yield strategy, which exhibits, on average, higher yield and slightly higher duration than traditional benchmarks, it is possible to improve the performance in good economic scenarios while delivering equivalent defensiveness in downturns.

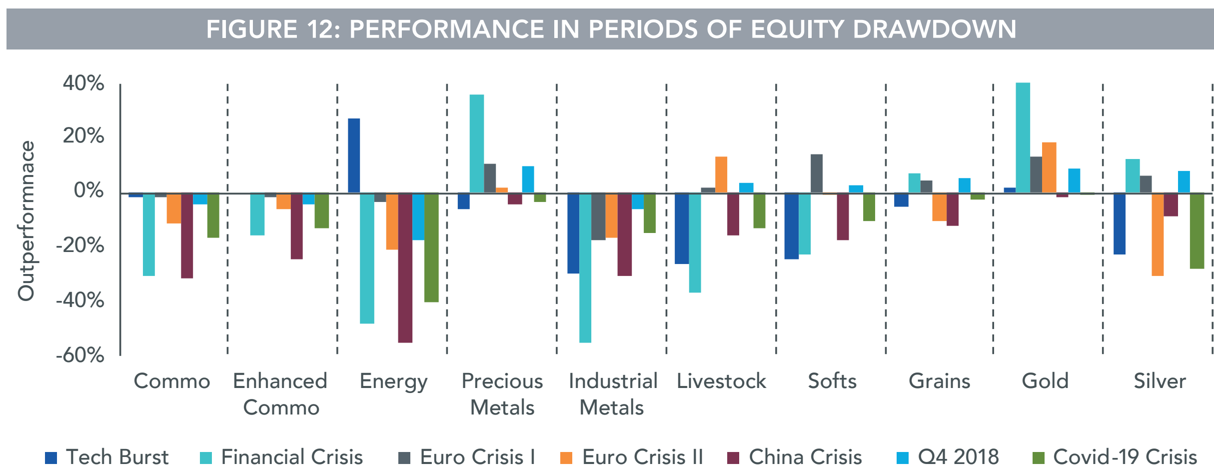
Overall, Fixed Income assets, in general, have demonstrated their capacity to cushion equity drawdowns. However, the assets that have demonstrated the better all-weather characteristics are government bonds with an extra something, i.e. with slightly longer duration or slightly more credit risk. They have shown strong uplifts (not just risk reduction) in equity drawdowns, as well as a good capacity to benefit from economic expansions and very low or negative correlation to other assets.

CHAPTER 5: GOLD, A PRECIOUS ALLY IN THE FIGHT AGAINST EQUITY DRAWDOWNS

Investing in commodities is complex. It is very hard to invest in the physical commodity and get access to the spot price. In most cases, it is necessary to buy futures contracts and there is a lot to choose from, from short dated, close to expiry ones to longer dated ones. In this chapter, we analyse traditional Commodity benchmarks that tend to use short-dated futures rolled periodically to invest in the different commodities in the universe (being commodities in general or sectors). The only exception are precious metals, were physical investments are considered (physical gold bullions in vaults for example). Enhanced commodities are meant to represent "smart beta" or "factors" in commodities where the strategy can invest further along the curve (i.e. not always in the front month future) to improve the roll yield available to the investor while delivering similar spot and collateral returns. More information on this topic is available on our website. Those strategies have historically delivered strong outperformance over time while keeping the correlation with the benchmark very high.

Starting as usual with Risk Reduction, in Figure 12, we see that broad commodities and most commodities sectors are cyclical in nature. Enhanced Commodities fare better than traditional benchmarks overall, but most commodities lose money when equities lose money. The standout defensive asset is gold. In all drawdown periods, gold outperformed equities and in 5 out of 7, it performed positively, delivering on average 14% annualised returns during those periods. To put this result in perspective, over those 7 periods, European equities have delivered on average -39.2%, Min Volatility equities -21.9%, Cash +2.7%, AAA EUR Treasuries +8.3%, and USD Treasuries +12.4%. It is worth noting here as well, that Grains have shown some resilience in the face of equity drawdowns as a commodity which is also a basic necessity.

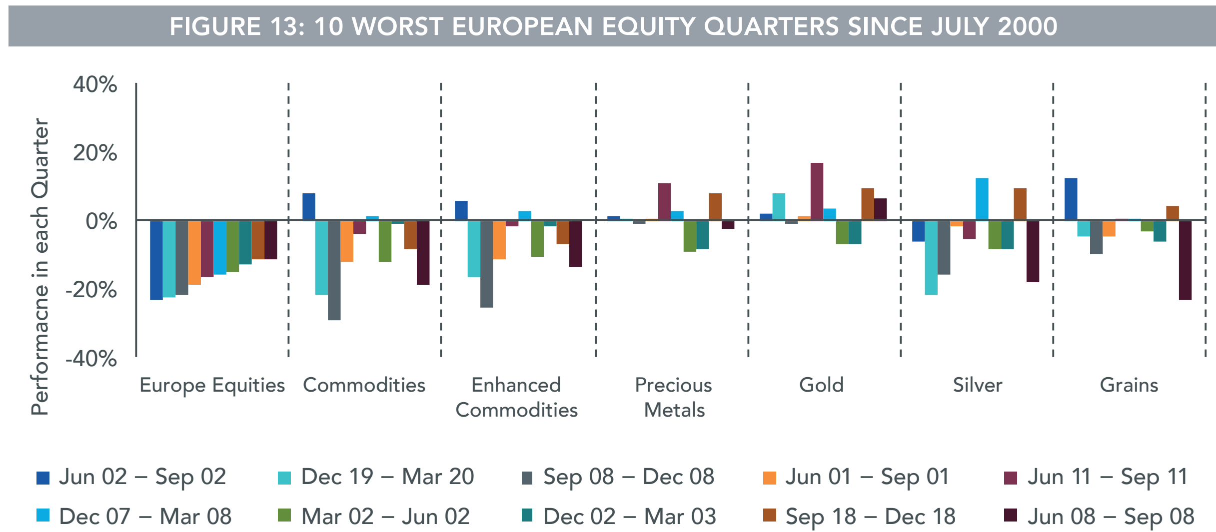
FIGURE 12: PERFORMANCE IN PERIODS OF EQUITY DRAWDOWN



Source: WisdomTree, Bloomberg. In EUR. Period July 2000 to September 2020. Enhanced Commodities Data starts only in May 2001, so it is not represented in the period of the Tech Bubble. **Historical performance is not an indication of future performance and any investments may go down in value.** See the appendix for more details on the indices used in the figure.

In Figure 13, we observe that over the 10 worst quarters for European equities in the last 20 years, Gold has 7 quarters of positive performance. On average gold outperformed equities by 20% in those quarters. Silver provides results that are mixed despite outperforming equities by 10.5% on average. Grains' results are also mixed with 4 positive quarters out of 10 and an average 13.5% outperformance over equities in those 10 quarters. While commodities did not provide a positive return in most quarters, in 8 of the 10 periods they outperformed the equity market, by 8% on average, proving that they are still a powerful diversifier. Enhanced Commodities fared even better outperforming equities by 9%, on average, per quarter. It is worth noting that Q1 2020, was the 2nd worst quarter of the last 20 years and that in that period gold gained 7.9% i.e. 30.5% more than equities.

FIGURE 13: 10 WORST EUROPEAN EQUITY QUARTERS SINCE JULY 2000



Source: WisdomTree, Bloomberg. In EUR. **Historical performance is not an indication of future performance and any investments may go down in value.** See the appendix for more details on the indices used in the figure.

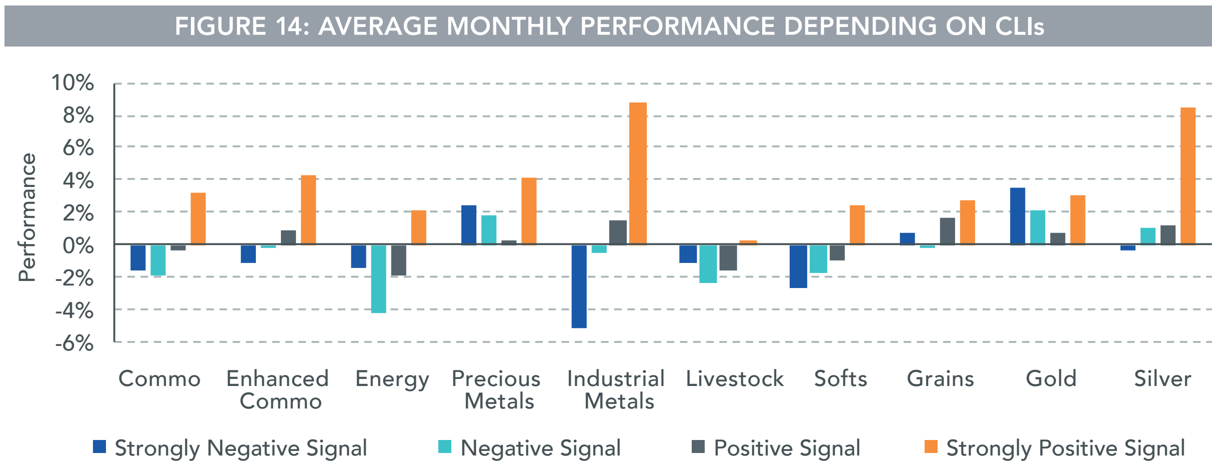
Looking at the Asymmetry of Returns, Enhanced Commodities behaved very well compared to front month commodities, significantly cutting the downside in negative economic environments, and doing better in positive ones. It is worth noting as well, the extent to which commodities and enhanced commodities performed when the economic signals were strong. This is linked to the well documented properties of commodities as an inflation hedge.

Gold exhibited a very interesting profile with positive returns in the 4 scenarios and very importantly strong outperformance in very negative and very positive scenarios. This is a testament to gold as a financial hedge and safe-haven asset as well as a real asset that may tend to behave strongly in high inflation scenarios where currencies are devalued. Those two characteristics are particularly well suited for the current environment with uncertainty on the shape of the economic recovery and the threat of inflation and devaluation following the huge programs initiated by Central Banks around the world.

Silver, similarly, to palladium and platinum, also offers an interesting payoff, behaving part like a precious metal and part like an industrial metal. In periods where the economy is strong, it benefits from being used in the industry and behave more pro-cyclically than gold. However, in an economic downturn, it benefits from its status as a precious metal and delivers some protection.

Grains exhibits positive performance in all 4 scenarios, putting it on par with corporate bonds and gold for the most balanced profile across scenarios

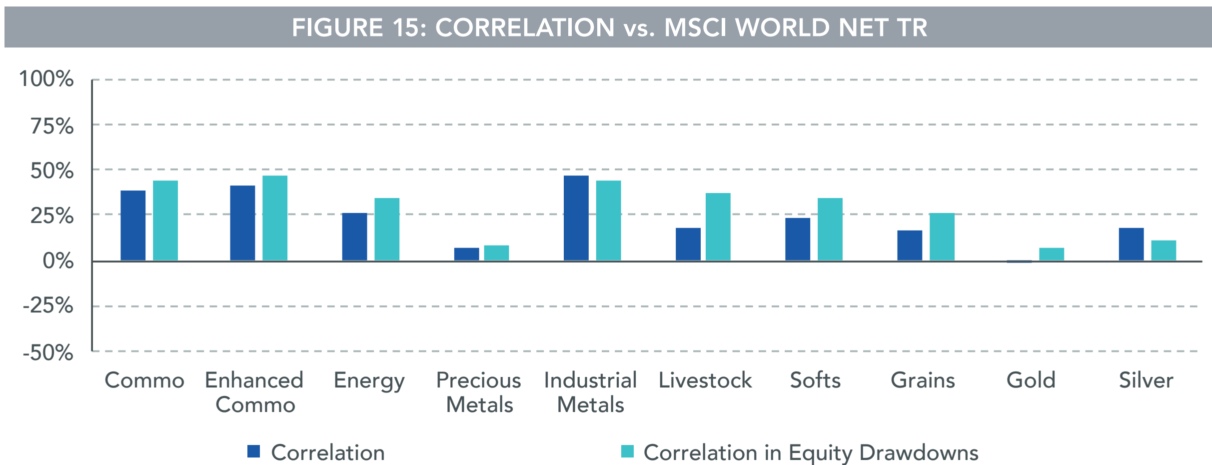
FIGURE 14: AVERAGE MONTHLY PERFORMANCE DEPENDING ON CLIs



Source: WisdomTree, Bloomberg. Period July 2000 to September 2020. Calculations are based on monthly returns in EUR. Enhanced Commodities Data starts only in May 2001. **Historical performance is not an indication of future performance and any investments may go down in value.** See the appendix for more details on the indices used in the figure.

In a multi asset portfolio, Commodities are often considered as the chief diversifier among risky assets. Figure 15 demonstrates this further with the broad asset class, the smart beta approach and the different sectors showing very reduced correlation. Once again, precious metals and gold stand out with correlations that are very close to zero. From a pure portfolio construction point of view, this is very exciting as it hands us a diversifying asset that can help reduce the overall volatility of the portfolio.

FIGURE 15: CORRELATION vs. MSCI WORLD NET TR



Source: WisdomTree, Bloomberg. Period July 2000 to September 2020. Calculations are based on monthly returns in EUR for the Correlation and Daily return in EUR for the Correlation in Equity Drawdowns. Enhanced Commodities Data starts only in May 2001. **Historical performance is not an indication of future performance and any investments may go down in value.** See the appendix for more details on the indices used in the figure.

Overall, Commodities and in particular Enhanced Commodities exhibited interesting diversification properties for a multi asset portfolio over the long-term, but gold was really the standout winner according to our Framework here. It tended to exhibit all the characteristics we are looking for in a strategic investment with strong risk reduction in equity drawdowns, a good capacity to benefit from economic expansion and very low correlation to other assets.

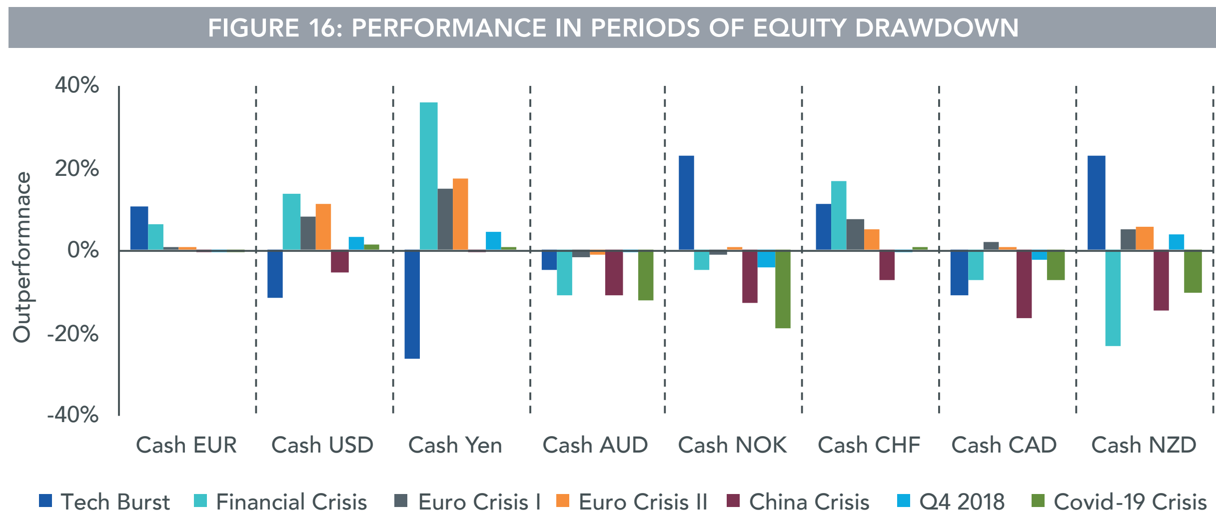
CHAPTER 6: CURRENCIES CAN BE USED AS A DEFENSIVE OVERLAY

In a nutshell, currencies are either risk-on, meaning that they tend to perform well when the market sentiment is positive, or risk-off, meaning that they tend to perform well when the market sentiment is negative. In Figure 16, we focus on the performance of money market investments in G10[3] currencies from the point of view of a Euro (EUR) investor. This figure perfectly illustrates currencies reaction to periods of stress:

+ Risk-on currencies tend to do poorly in periods of stress and in particular when equities go down. In Figure 16, the Australian Dollars (AUD) exhibits this behaviour perfectly with negative historical performance across the board during equity drawdowns
+ On the other hand, risk-off currencies tend to perform strongly during those same equity downturns. The US Dollar (USD), the Japanese Yen (JPY) and the Swiss Franc (CHF) have shown strong performance during crises with positive performance in 5 out of 7 drawdowns for each of them. This behaviour is driven quite strongly by investor behaviour and the tendency for money to flow to safe-haven economies and safe-haven currencies in periods of trouble.

Outside of those periods of stress, the risk-on/risk-off behaviour is less prevalent, and the performance of the currencies is driven more strongly by local factors such as central bank interest rates, economic performance, or inflation expectations.

FIGURE 16: PERFORMANCE IN PERIODS OF EQUITY DRAWDOWN



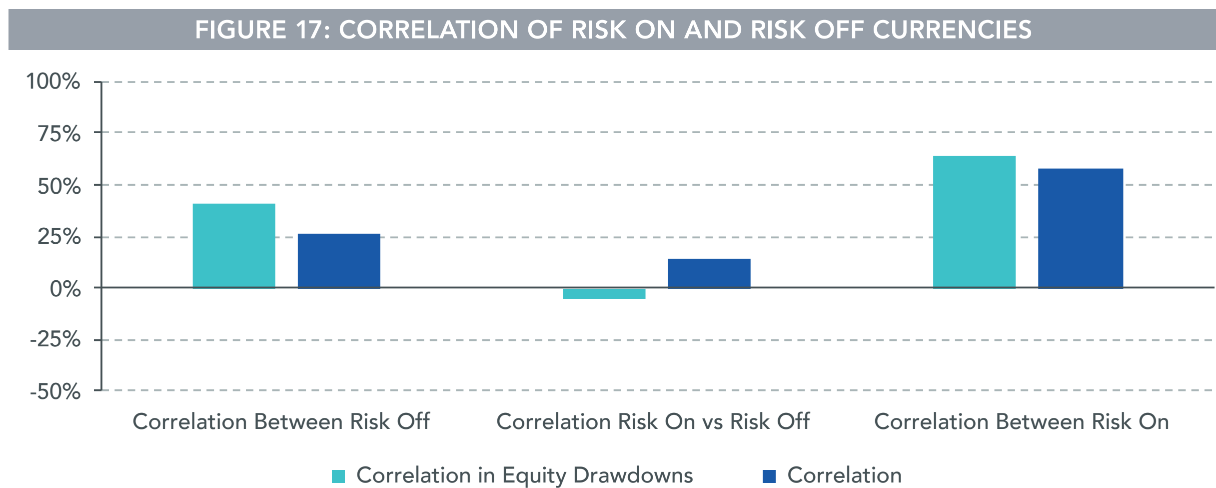
Source: WisdomTree, Bloomberg. In EUR. Period July 2000 to September 2020. **Historical performance is not an indication of future performance and any investments may go down in value.** See the appendix for more details on the indices used in the figure.

[3] G10 Currencies are ten of the most heavily traded currencies in the world. United States dollar (USD), Euro (EUR), Pound sterling (GBP), Japanese yen (JPY), Australian dollar (AUD), New Zealand dollar (NZD), Canadian dollar (CAD), Swiss franc (CHF), Norwegian krone (NOK), Swedish krona (SEK).

This Risk-on/Risk-Off phenomenon can also be observed through correlations. In Figure 17, we looked at the correlations between risk-on currencies (AUD, NZD, and CAD), between risk-off currencies (JPY and CHF) and across risk-on and risk-off currencies. The histogram clearly illustrates the behaviour described above in periods of equity drawdowns.

+ The correlation between risk-off currencies increased during equity drawdowns signifying that in crises, the market regime drives the performance more directly than local or geographical drivers
+ The same behaviour is observed on risk-on currencies where correlation also increased in drawdowns
+ Maybe the most illustrative point is that the correlation between risk-on and risk-off currencies turned negative in those drawdowns, highlighting quite clearly how currencies divide into two groups under stress.

FIGURE 17: CORRELATION OF RISK ON AND RISK OFF CURRENCIES

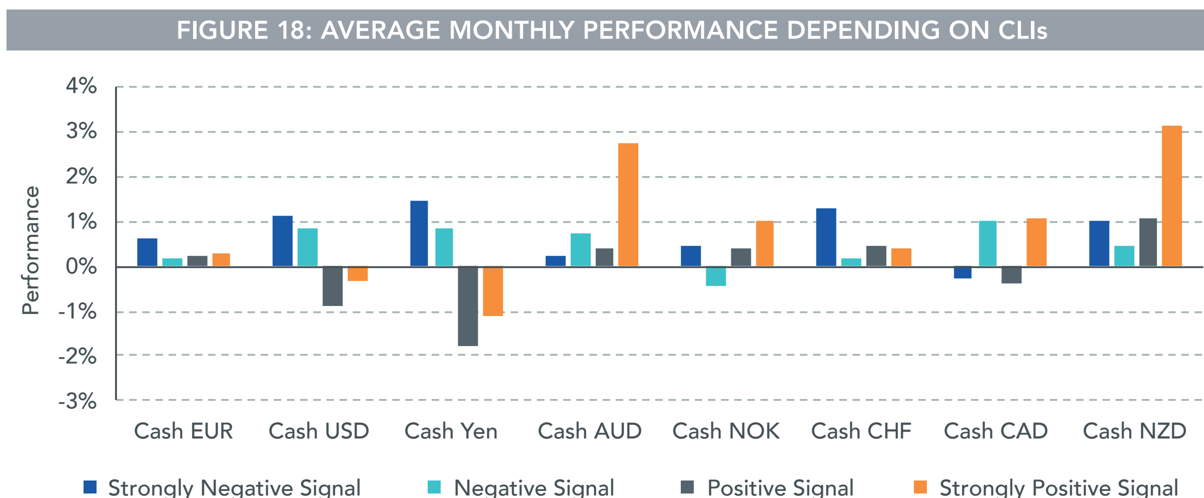


Source: WisdomTree, Bloomberg. In EUR. Period July 2000 to September 2020. Enhanced Commodities. **Historical performance is not an indication of future performance and any investments may go down in value.** See the appendix for more details on the indices used in the figure.

From a Risk Reduction point of view, risk-off currencies like the US Dollar, Japanese Yen and Swiss Franc (CHF) are the most suitable. Their behaviour in crises would provide an uplift to a portfolio.

Focusing on the Asymmetry of Returns in Figure 18, safe-haven currencies have mostly been driven by their risk-off behaviour with positive performance in negative economic scenarios and negative performance in positive market scenarios with the slight exception of CHF that could show some promise. Risk-on currencies had a more diversified profile, but they were not doing enough in equity drawdowns to really be considered in our framework. So overall there is no real asymmetry to be found in this asset class as currencies have behaved very strongly according to their risk feature during and outside of risk periods.

FIGURE 18: AVERAGE MONTHLY PERFORMANCE DEPENDING ON CLIs



Source: WisdomTree, Bloomberg. Period July 2000 to September 2020. Calculations are based on monthly returns in EUR. Enhanced Commodities Data starts only in May 2001. **Historical performance is not an indication of future performance and any investments may go down in value.** See the appendix for more details on the indices used in the figure.

Currencies are among the most liquid assets in the world. When it comes to implementation, investors are spoilt for choices from direct currency holdings to money market funds or short-term treasury exchange traded funds (ETFs). For more tactical implementation, delta one and leveraged exchange traded products (ETPs) are also available on most currency pairs.

Since 2009, when WisdomTree introduced the concept of currency-hedged equities to the ETF structure in the US — a concept that caught fire subsequent to the introduction of Abenomics[4] in Japan in late 2012 —, investors have fully awakened to the "currency factor". Currency exposures, that are gained mainly though investing in foreign assets, have a rather significant impact on the risk/return profile over time. In fact, currency exposure is often gained as an overlay to other asset classes. Our next step is, therefore, to assess the combinations between funded assets like government bonds or equities with a currency overlay through the prism of our defensive framework.

For example, a Euro-based investor investing in Japanese equities would gain exposure to Japanese equity performance but also to the performance of Japanese Yen versus Euro. In order to remove this implicit currency overlay, the investor would need to hedge their portfolio against the currency risk and buy exposure to Japanese equities hedged in Euro. Since Japanese Yen tends to perform positively in times of stress and equity drawdowns, it seems only natural to believe that the hedged exposure would, in fact, do worse than the unhedged exposure when equities face a downturn. This is indeed what we observe in Figure 19. In 5 out of 7 drawdowns, unhedged Japanese equities have outperformed the Euro hedged exposure. Of course, the choice depends on the investment goal:

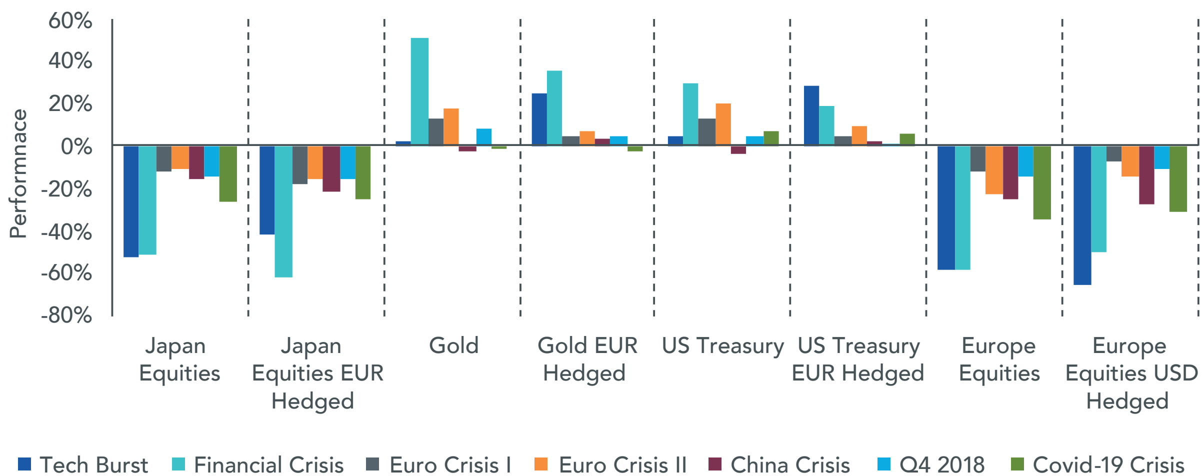
+ The purest exposure to the performance of Japanese equities would come from hedging the exposure to the Yen back to the investor's base currency. This could be important if the idea is a tactical, bullish thesis on Japan's equities

[4] Abenomics refers to the economic policies implemented by the Government of Japan led by the Liberal Democratic Party of Japan since the December 2012 general election. They are named after Shinzō Abe, who served a second stint as Prime Minister of Japan from 2012 to 2020.

+ A long-term, lower volatility exposure could benefit from an unhedged exposure to Japan's equities, since the returns of the Yen and Japan's equities tend to move in opposite directions.

Overall, we can expect that adding risk-off currency exposure to already defensive assets would increase their risk reduction. For example, we can imagine that gold, a very powerful defensive asset would do better in equity drawdown if unhedged in US Dollars than hedged in Euro or that unhedged US Treasuries would do better than US Treasuries hedged in Euros. Figure 19 illustrates those two cases as well. Similarly, to Japanese equities, Gold and unhedged US Treasuries have outperformed their hedged exposures 4 and 5 times respectively out of 7 times.

FIGURE 19: PERFORMANCE IN PERIODS OF EQUITY DRAWDOWN



Source: WisdomTree, Bloomberg. In EUR. Period July 2000 to September 2020. **Historical performance is not an indication of future performance and any investments may go down in value.** See the appendix for more details on the indices used in the figure.

In the above 3 examples, the risk-off currency overlay was built in the exposure. Gold is naturally a USD denominated asset. What about assets that are denominated in risk-on currencies like Euro or Australian Dollar for example? In this case, it is possible to use currency hedging as a way to add the required risk-off currency exposure to any asset. For example, if a Euro investor were to buy Eurozone equities hedged in USD, it would gain Eurozone equity exposure as well as US Dollar exposure. In Figure 19, we illustrated the performance of both assets in the 7 drawdown periods we have been considering, the currency overlay using a risk-off currency (in this examples USD) added some defensiveness to the Eurozone equities with the hedged asset outperforming in 5 out of the 7 crises. In a portfolio context, this opens a wide range of possibilities that can be exploited by investors.

Overall, when considering foreign assets, the question of the currency and hedging always comes up in the portfolio construction phase. The result of our analysis is that considering asset denominated in risk-off currency in an unhedged version can add to the defensiveness of the portfolio. In fact, mixing an all-weather asset with a risk-off currency can offer a wide range of possibilities for investors. Coming back to our equity and fixed income findings, USD denominated Quality equities or Long Duration Treasury Bonds denominated in USD could prove pretty valuable in our portfolio construction.

In the above review, we have concentrated our attention on classic currencies. In the last few years, institutional investors have witnessed the rise of a new type of currencies: Cryptocurrencies. In this series, we have decided not to focus on those but WisdomTree aims to deliver educational materials at the forefront of the industry for those interested in this topic.

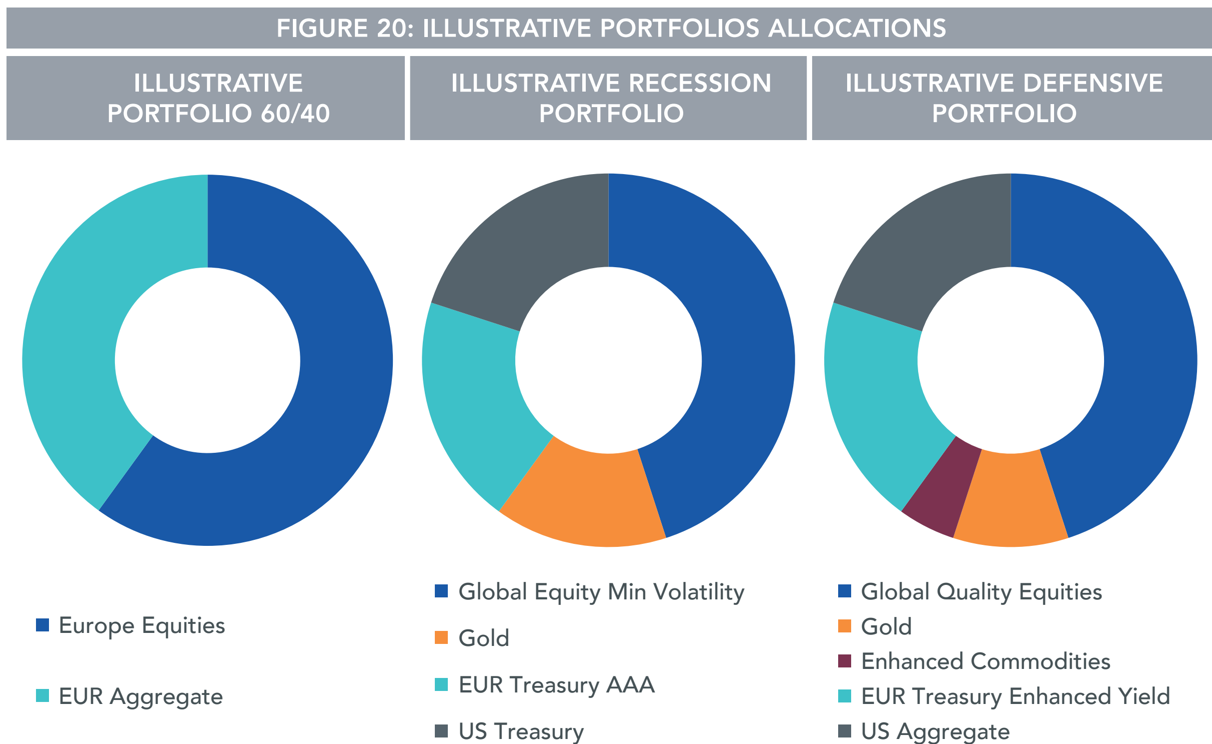
CHAPTER 7: A DEFENSIVE PORTFOLIO THAT CAN PERFORM STRONGLY ACROSS CYCLES

Having used our framework to highlight multiple interesting investments in the 4 main asset classes (Equity, Fixed Income, Commodity, Currency), it is time to put them to the test in a portfolio context.

As discussed at the onset of this paper, avoiding losses and smoothing returns are some of the main objectives when it comes to asset allocation. This is why so many investors have adopted a 60/40 portfolio which mixes 40% of safer assets such as bonds and 60% or higher risk assets like equities or commodities as a benchmark. This mix aims to provide exposure to the historically superior returns exhibited by equities, meanwhile also granting the diversification benefits available in fixed income assets.

In this part, we will use a Euro focused, diversified 60/40 portfolio as the standard to which to compare some illustrative portfolios. Building on our findings, we will use the following portfolios as an example:

+ The first, the Illustrative Recession Portfolio, will focus on risk reduction only without focusing on the rest of our framework i.e. asymmetry & upside potential, or valuations
+ The second, The Illustrative Defensive Portfolio will aim to invest in the assets that our framework has uncovered i.e. assets that balance risk reduction and upside potential to deliver a more versatile investment profile, which can be more suited to uncertain times.



Source: WisdomTree. October 2020. Europe Equities is proxied by the STOXX Europe 600 net total return index. Enhanced Commodities is proxied by Optimized Roll Commodity Total Return Index. Gold is proxied by the LBMA Gold Price PM Index. Silver is proxied by the LBMA Silver Price index. EUR Aggregate is proxied by the Bloomberg Barclays EUR Aggregate TR Index. EUR Treasury AAA is proxied by the Bloomberg Barclays EUR Aggregate Treasury AAA TR Index. US Aggregate is proxied by the Bloomberg Barclays USD Aggregate TR Index. US Treasury is proxied by the Bloomberg Barclays US Aggregate Treasury TR Index. EUR Treasury Enhanced Yield is by the Bloomberg Barclays EUR Treasury Enhanced Yield TR Index. Global Equity Min Volatility is proxied by the MSCI World Min Volatility net TR Index. Global Quality Equities is proxied by WisdomTree Global Quality Dividend Growth net TR Index.

Our benchmark, the Illustrative Portfolio 60/40, invests 60% in European equities and 40% in EUR Government and Corporate bonds through an aggregate index.

In the Illustrative Recession Portfolio, we start by replacing the European equities by a Min Volatility approach to developed equities in an unhedged version. This will benefit the portfolio in 3 ways:

1. The geographical diversification away from Europe will improve the risk-return profile
2. The Min Volatility approach will create strong defensiveness as described earlier
3. The currency exposure, heavily skewed towards USD and JPY, will also add some protection.

In fixed income, we focus on the assets with the strongest risk reduction potential with highly rated local Government bonds (AAA EUR Treasuries) and Government bonds in a safe-haven currency (US Treasuries). Finally, we add extra diversification using gold unhedged in US dollars. Such exposure can help the portfolio through the defensiveness of gold but also the US dollar.

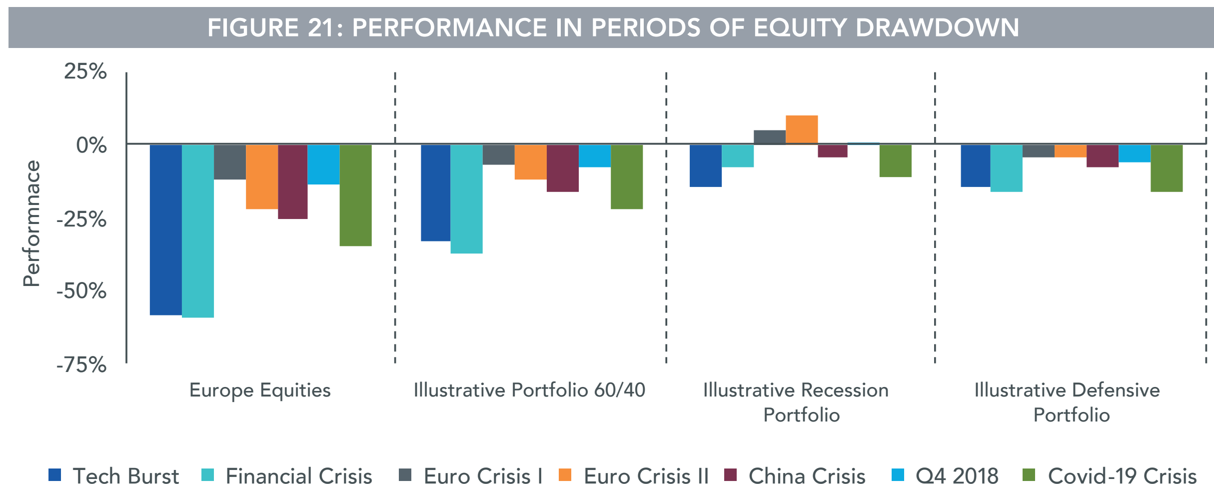
In the Illustrative Defensive Portfolio, we want to illustrate the potential advantages of more asymmetric and diversifying assets. We have therefore focused on developed equities with a quality twist using WisdomTree's proprietary approach. This approach will deliver similar geographical diversification and safe haven currency exposure as in the Illustrative Recession Portfolio but with an equity style that tends to be more all-weather than Min Volatility and therefore tends to deliver some risk reduction with some upside retention. In this example portfolio, we have also tried to increase diversification by introducing some gold and Enhanced Commodities. Finally, in the fixed income bucket, we focus on two strategies:

+ The Bloomberg Barclays US Aggregate index to benefit from the usual defensiveness of the USD dollars and US Treasuries but keeping US Corporate bonds for the upside potential

+ The EUR Treasury Enhanced Yield index which could deliver the risk reduction of Government bonds but with extra duration which could add diversification and extra yield which could improve the long-term prospects.

In Figure 21, we focus on the performance of the 3 illustrative portfolios (rebalanced to their initial weights quarterly to make sure that weights do not drift) during the 7 drawdown periods. As expected, the Illustrative 60/40 portfolio improves on pure equity in every crisis. The Illustrative Recession Portfolio exhibits performance in line with expectations, outperforming the other 3 assets/portfolios in each of the 7 periods and with positive performance in 3 periods. The Illustrative Defensive portfolio sits a little bit in the middle, outperforming the Illustrative 60/40 Portfolio in every period, reducing the drawdowns in each of the 7 drawdowns but not as much as the Illustrative Recession Portfolio.

FIGURE 21: PERFORMANCE IN PERIODS OF EQUITY DRAWDOWN



Source: WisdomTree, Bloomberg. In EUR. Period July 2000 to September 2020. **Historical performance is not an indication of future performance and any investments may go down in value.** See the appendix for more details on the indices used in the figure.

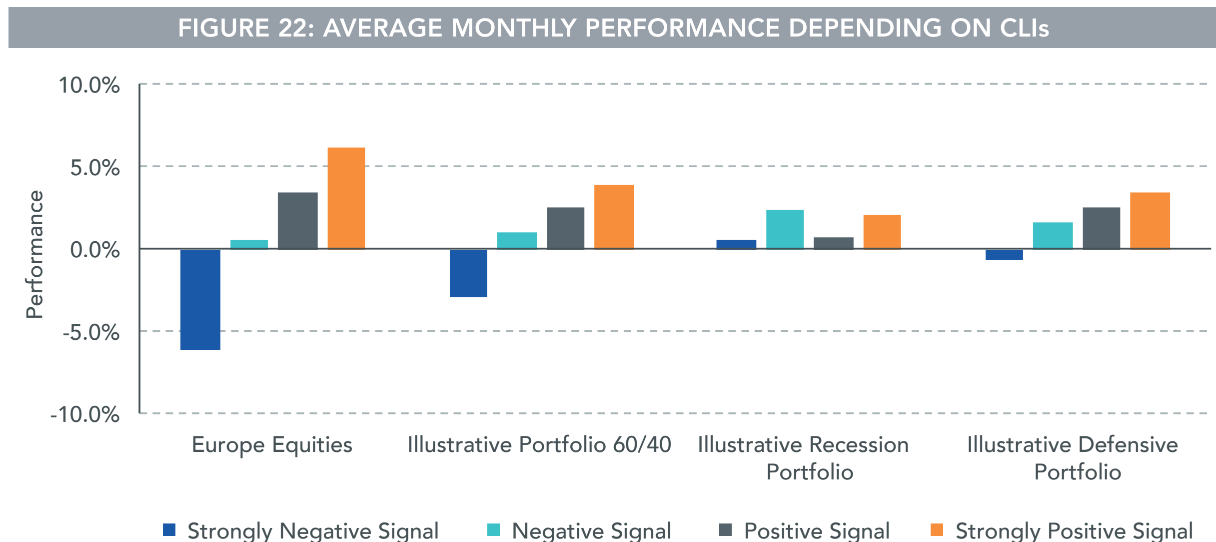
As discussed earlier, most investors do not have a crystal ball to tell them when to switch in the Illustrative Recession Portfolio just before the drawdown. Therefore, they would need to stay invested in those types of assets for long periods in preparation for possible shocks. Therefore, it is important to balance the risk reduction with the upside potential of the considered investments. While Figure 21 focuses exclusively on Risk Reduction, Figure 22 looks at the 3 example portfolios across business cycles and at the Asymmetry of Returns. Through that lens, the advantages of the example portfolios appear very clearly. The Portfolio 60/40 is almost a diluted version of equities. The other two example portfolios, on the other hand, exhibit unique behaviours. The Illustrative Recession Portfolio is very steady with a small increase in all regimes, being strong decline in CLI or strong increase (like what cash could deliver). It outperforms equities in the two regimes where the CLI is negative but underperforms strongly when the CLI is positive.

The Illustrative Defensive Portfolio, however:

+ Exhibits strong risk reduction when the CLI is strongly negative
+ Still improves on the performance of equities when the CLIs is mildly negative or mildly positive
+ Shows very decent performance in period of economic boom.

By focusing on asymmetric assets, such a portfolio aims to deliver an all-weather type of behaviour.

FIGURE 22: AVERAGE MONTHLY PERFORMANCE DEPENDING ON CLIs

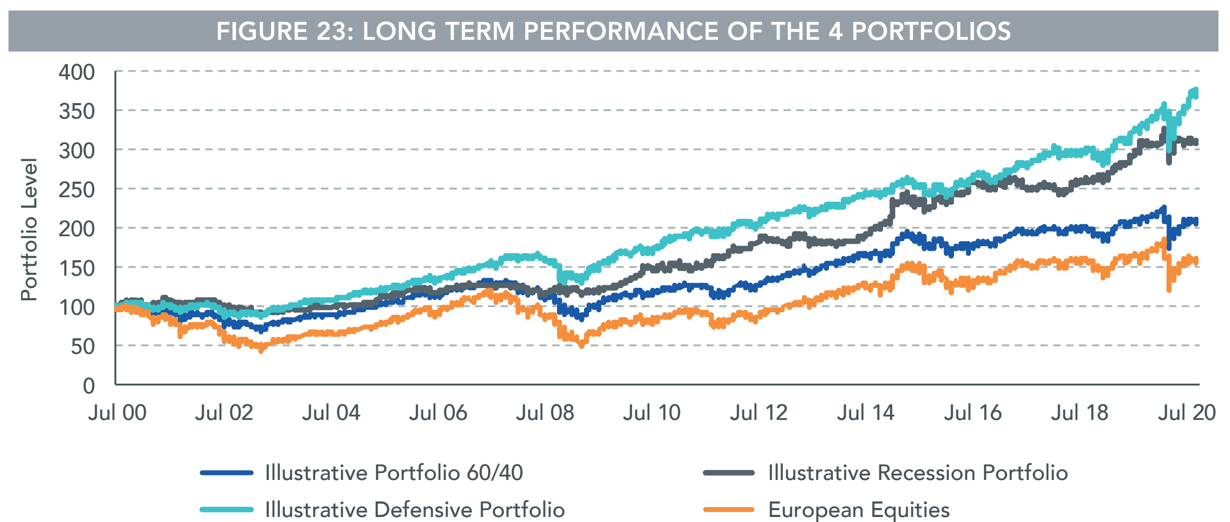


Source: WisdomTree, Bloomberg. Period July 2000 to September 2020. Calculations are based on monthly returns in EUR. Enhanced Commodities Data starts only in May 2001. **Historical performance is not an indication of future performance and any investments may go down in value.** See the appendix for more details on the indices used in the figure.

Figure 23 highlights the value of being defensive over the long-term. Over almost 20 years both Illustrative Portfolios beat the equities and the 60/40 mix despite the 10-year bull run and the fact that this should be a period where they are at a disadvantage (see Figure 22). This is driven by the often-overlooked fact mentioned earlier that it is a lot easier not to lose money than to win it back. To regain the money lost in a 50% drawdown, an asset needs to gain 100%. So, if a volatile asset were to lose 50% and then gain 50% the overall performance is -25%. If a less volatile asset loses 15% and then gain back that 15% then the overall performance is only -2%. This simple mathematical rule gives a fundamental advantage to more risk conscious portfolios.

The Illustrative Recession has done very well over the whole period, helped significantly by the very small drawdown it experienced in 2008/2009. The Illustrative Defensive Portfolio is doing the best of all, with the highest returns and lowest volatility despite showing a higher beta than the Illustrative Recession Portfolio. This portfolio benefits from being more balanced and from gaining on both sides of the equation i.e. lower drawdown and positive beta to economic improvements.

FIGURE 23: LONG TERM PERFORMANCE OF THE 4 PORTFOLIOS



	Annualised Returns	Volatility	Beta
European Equities	2.26%	19.38%	1.00
Illustrative Portfolio 60/40	3.70%	11.11%	0.57
Illustrative Recession Portfolio	5.77%	8.06%	0.15
Illustrative Defensive Portfolio	6.72%	7.26%	0.27

Source: WisdomTree, Bloomberg. Period July 2000 to September 2020. Calculations are based on daily returns in EUR. You cannot invest directly in an index. **Historical performance is not an indication of future performance and any investments may go down in value.** See the appendix for more details on the indices used in the figure.

2020 gives us an interesting case study for the different Portfolios above. Looking at the drawdown period only, the Illustrative Recession portfolio significantly outperformed all other portfolios even if the Illustrative Defensive Portfolio already more than halved the drawdowns of equities.

Assuming that an investor would not have had perfect 20/20 vision to invest in the illustrative Recession Portfolio for just that drawdown period, we look at a more realistic period of investment i.e. year to date (up to September 2020).

We observe that for the first 9 months of the year, the Illustrative Recession Portfolio still outperformed the Illustrative Portfolio 60/40, but it significantly underperformed the Illustrative Defensive Portfolio. In fact, it sits pretty much in the middle of both with a performance of 1.4% versus -5.3% and 7.2% for the other 2 portfolios respectively.

For that period, which includes the end of a bull run, a drawdown and a rebound, the Illustrative Defensive Portfolio is performing significantly better. This gives us a real-life example of the advantages of all-weather type investments of which the Illustrative Defensive Portfolio is an example, with its good defensiveness in Q1 and good upside profile in Q2 and Q3 2020.

FIGURE 24: PERFORMANCE OF THE 4 PORTFOLIOS DURING AND SINCE THE COVID-19 DRAWDOWN

	Drawdown 12 Feb - 23 Mar	Year to Date 31 Dec - 30 Sept	Last 12M 30 Sep - 30 Sept
European Equities	-34.69%	-11.56%	-6.15%
Illustrative Portfolio 60/40	-22.20%	-5.28%	-2.66%
Illustrative Recession Portfolio	-11.34%	1.38%	-0.07%
Illustrative Defensive Portfolio	-15.82%	7.14%	11.75%

Source: WisdomTree, Bloomberg. Period December 2019 to September 2020. Calculations are based on daily returns in EUR. You cannot invest directly in an index. **Historical performance is not an indication of future performance and any investments may go down in value.** See the appendix for more details on the indices used in the figure.

CHAPTER 8: ADAPTABILITY? LOOK TO DYNAMIC ASSET ALLOCATIONS

Up to this point, we have focused exclusively on how to use asset selection to increase a portfolio's protection against equity drawdowns. However, there are other routes open to investors to do so. One of the main ones is to use a dynamic asset allocation. Those techniques use rotation between assets or between asset classes as their main tool to limit risk. We will concentrate on systematic, rules-based methodologies to better understand how they work and what they could add to investors' portfolios.

Two main families are at the heart of dynamic asset allocation: Tactical Asset Allocation and Risk Mitigating Strategies.

Tactical Asset Allocation

It aims to actively balance and adjust weights in assets and asset classes to maximize portfolio return and keep market risk low compared to a given benchmark (usually the long-term investment guidelines of the investors or strategic asset allocation) using qualitative or quantitative signals. Those signals can fall into multiple categories such as:

+ The "Federal Reserve (Fed) model" signal: It compares stock earnings yields to nominal bond yields and invests in the asset with the higher yield
+ Business-cycle/macroeconomic signals: signals include term spreads, inflation, industrial production and so on
+ Fundamental valuation signals: includes dividend yield, P/B (price-to-book), P/E (price-to-earnings) ratio and so on
+ Momentum signals: use past performance of the assets as allocation signals

We focus here on:

+ The Illustrative Fed Model Portfolio, which allocates 100% monthly to its assets in European equities (Europe STOXX 600 net TR Index) if their earning yields are above the yield of nominal treasury bonds or 100% in the Bloomberg Barclays EUR Aggregate TR Index if not
+ The Illustrative Momentum Portfolio, which allocates 100% monthly to its assets in European equities if in the last 12 months they have outperformed the EUR Fixed Income (through Bloomberg Barclays EUR Aggregate TR) or, 100% in Bloomberg Barclays EUR Aggregate TR Index if not.

Over the 19 years, even simple dynamic allocations such as these ones have outperformed the Illustrative Portfolio 60/40 by a large margin. It is clear from Figure 25 that the Illustrative Momentum Portfolio has benefitted from cutting the 2008 drawdown, switching to fixed income early in the crisis while the Illustrative Fed Model Portfolio did not do so. Both portfolios suffer from "false positives" i.e. allocation switches that did not yield positive results but those are overpowered by the time where the strategy did work.

FIGURE 25A: LONG-TERM PERFORMANCE OF EXAMPLE TACTICAL ASSET ALLOCATIONS

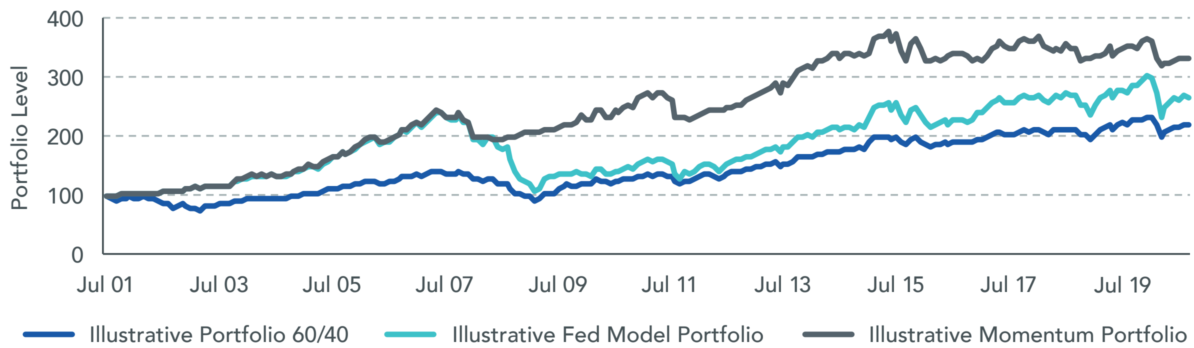
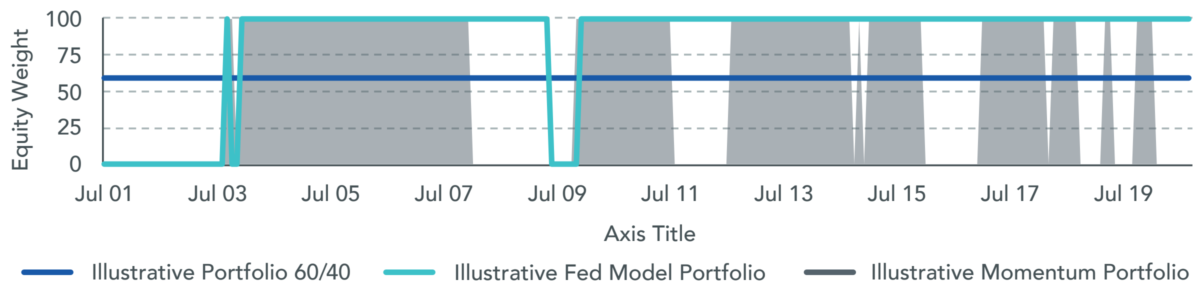


FIGURE 25B: EQUITY WEIGHTS OVER TIME



	Annualised Returns	Volatility
Illustrative 9% Vol Target Portfolio	5.32%	9.09%
Illustrative CPPI Portfolio	5.99%	9.39%
Illustrative Portfolio 60/40	4.19%	9.17%
Illustrative Defensive Portfolio	6.72%	7.26%

Source: WisdomTree, Bloomberg. Period July 2001 to September 2020. Calculations are based on daily returns in EUR. You cannot invest directly in an index. **Historical performance is not an indication of future performance and any investments may go down in value.** See the appendix for more details on the indices used in the figure.

Risk Mitigating Strategies

They use a predefined methodology to reach a given risk objective being a volatility target, a tracking error target or a max drawdown over a given time period. These methodologies include for example:

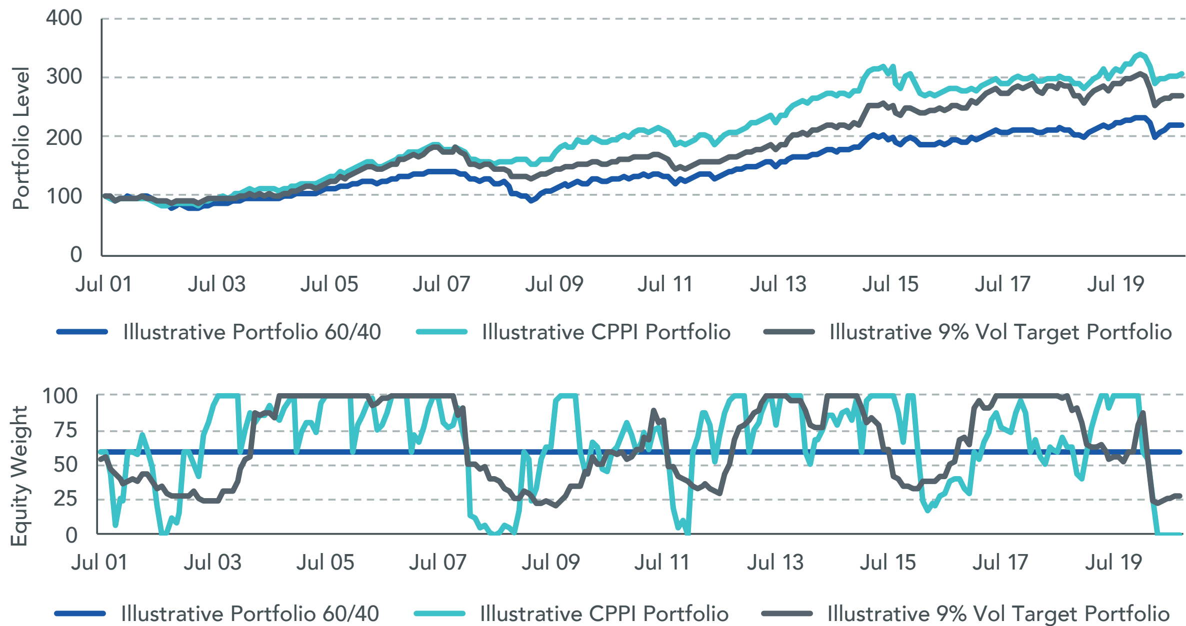
+ Volatility Targeting (vol target) which rebalances, on a regular basis, the weights of its assets to ensure that the volatility of the portfolio remains inside a pre-defined band
+ CPPI or Constant Proportion Portfolio Insurance which rebalances between a risky asset (usually equity) and a safe asset (usually cash-like instruments) to ensure that a pre-defined level of loss is never attained.

We focus on two examples of classic risk mitigation techniques:

+ The Illustrative 9% Vol Target Portfolio which allocates monthly between European equities (Europe STOXX 600 net TR Index) and EUR Aggregate (Bloomberg Barclays EUR Aggregate TR Index) by calculating the last 12-month realised volatility of both assets and calculating the weights that would have delivered 9% volatility over the period (not considering correlation effects). We picked 9% as the target because it would yield a similar risk profile as the 60/40 over the full period.
+ The Illustrative CPPI Portfolio which allocates monthly between European equities (Europe STOXX 600 net TR Index) and EUR Aggregate (Bloomberg Barclays EUR Aggregate TR Index). On a calendar year basis, the portfolio is not allowed to go under a floor level of 90% of the portfolio value at the start of the year. Each month, the strategy calculates the difference between the current value of the portfolio and the floor and multiple this by 6 (the multiplier) to determine the Equity exposure. At the start of the year, the equity allocation is therefore equal to 60% and then when the portfolio does well it increases and if it does not do well it decreases.

Again, over the 19 years, those simple allocations have outperformed the Illustrative Portfolio 60/40 by a large margin. Both these example portfolios have similar volatility to the Illustrative 60/40 Portfolio (around 9%) and yet have historically delivered a steadier performance.

FIGURE 26: LONG-TERM PERFORMANCE OF EXAMPLE RISK MITIGATING STRATEGIES



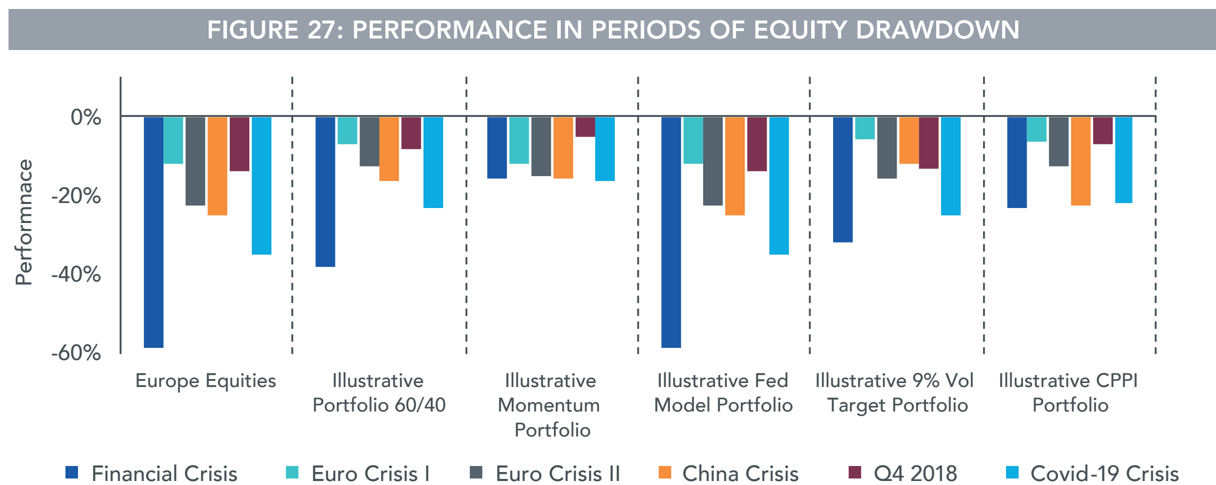
	Annualised Returns	Volatility
Illustrative 9% Vol Target Portfolio	5.32%	9.09%
Illustrative CPPI Portfolio	5.99%	9.39%
Illustrative Portfolio 60/40	4.19%	9.17%

Source: WisdomTree, Bloomberg. Period July 2001 to September 2020. Calculations are based on daily returns in EUR. You cannot invest directly in an index. **Historical performance is not an indication of future performance and any investments may go down in value.** See the appendix for more details on the indices used in the figure.

A Comparative analysis

Coming back to our framework, let us concentrate on the performance of those portfolios in periods of equity drawdowns. We observe that the risk mitigating techniques have, on average, reduced the size of the drawdowns. The Illustrative CPPI Portfolio outperformed the Illustrative 60/40 in 5 periods out of 6 and the Illustrative 9% Vol Target Portfolio in 3 out of 6. The Tactical Asset Allocations produced more mixed results, in part because the portfolios are very simple with binary 0% or 100% allocations, but also because they rely on predictive signals to anticipate the relative performance of the assets which is always going to be a bit of a hit and miss. Overall, the Illustrative Fed Portfolio struggled and only marginally improved on the Illustrative Portfolio 60/40. The Illustrative Momentum portfolio on the contrary did pretty well, outperforming the Illustrative Portfolio 60/40 in 4 out of 6 periods and delivering no drawdown below -20%

FIGURE 27: PERFORMANCE IN PERIODS OF EQUITY DRAWDOWN

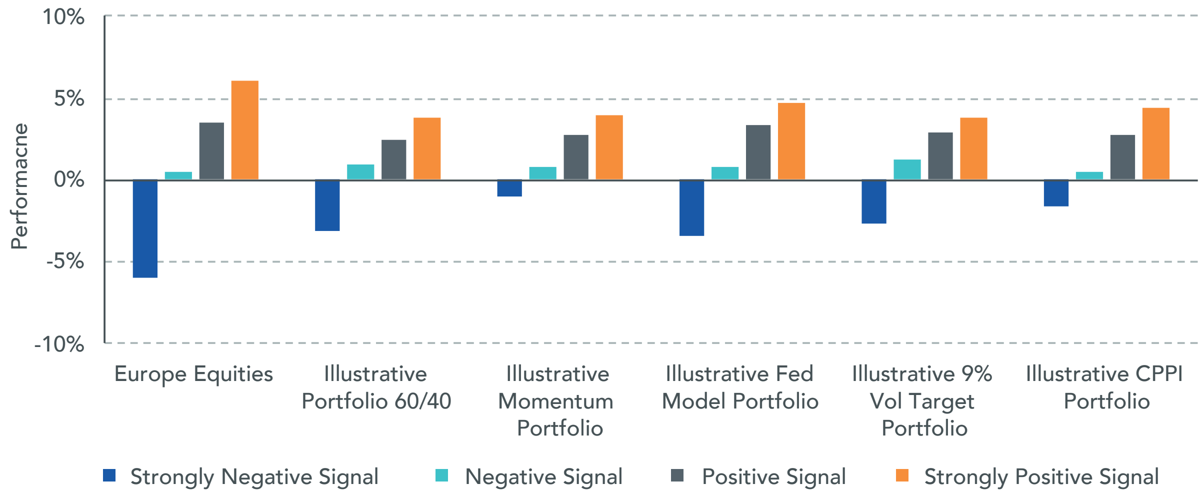


Source: WisdomTree, Bloomberg. In EUR. Period July 2000 to September 2020. **Historical performance is not an indication of future performance and any investments may go down in value.** See the appendix for more details on the indices used in the figure.

Focusing on the profile of returns of those dynamically allocated portfolios in different macroeconomic scenarios, we find that:

+ The Illustrative Momentum Portfolio exhibits an extremely interesting profile with reduced drawdowns when the CLI is very negative and high participation in the upside in the other scenarios
+ The Illustrative Fed Portfolio appears very, maybe too, aggressive in this analysis as well
+ Finally, both the Illustrative 9% Vol Target and Illustrative CPPI Portfolio show reduced drawdowns when the CLI is strongly negative and an upside capture slightly higher than the 60/40 portfolio

FIGURE 28: AVERAGE MONTHLY PERFORMANCE DEPENDING ON CLIs



Source: WisdomTree, Bloomberg. Period July 2000 to September 2020. Calculations are based on monthly returns in EUR. Enhanced Commodities Data starts only in May 2001. **Historical performance is not an indication of future performance and any investments may go down in value.** See the appendix for more details on the indices used in the figure.

CONCLUSION

In finance like in so many other fields, history is always a great teacher. In this paper, by looking at the past 20 years across asset classes, we have tried to highlight the different assets and investment techniques that would have allowed investors to build their wealth over the long-term. The above clearly illustrates that investors would most likely benefit from building versatile portfolios that can adapt to quickly changing market conditions and can resist unexpected events. In other words, building all-weather portfolios that can protect them in crises by reducing drawdowns and participate on the upside to build wealth from one cycle to the next.

Using the WisdomTree Defensive Asset Framework we have highlighted that:

+ Quality, Momentum, Multi-Factor are equity strategies that behave strongly both in crises and overall
+ Longer duration and higher risk Government bonds can bring both decorrelation and performance potential to a multi asset portfolio
+ Gold stands out as a defensive asset but also as a strategic asset in any portfolio by acting as a financial and an inflation hedge at the same time
+ Safe-haven currencies, such as the US Dollar, Japanese Yens and Swiss Franc can help diversify a portfolio further.

Historically, by combining all of those all-weather, defensive assets in a portfolio, investors would have been able to build resilient portfolios for uncertain times.

APPENDIX

7 Equity Crisis

The Tech Bubble (4 September 2000 to 12 March 2003)

The Financial Crisis (16 July 2007 to 9 March 2009)

The Euro Crisis I (15 April 2010 to 5 July 2010

The Euro Crisis II (2 May 2011 to 4 October 2011)

The China Crisis (15 April 2015 to 11 February 2016)

Q4 2018 (21 September 2018 to 27 December 2018)

Covid-19 (12 February 2020 to 23 March 2020)

Assets

European Equities is proxied by the STOXX Europe 600 net total return index. **US Equities** is proxied by the MSCI USA net total return index. **Emerging Market Equities** is proxied by the MSCI Emerging Markets net total return index.

Min Vol is proxied by MSCI World Min Volatility net total return index. **Quality** is proxied by MSCI World Quality Sector Neutral net total return index. **Size** is proxied by MSCI World Small Cap net total return index. **High Div** is proxied by MSCI World High Dividend net total return index. **Value** is proxied by MSCI World Enhanced Value net total return index. **Growth** is proxied by MSCI World Growth net total return index. **Momentum** is proxied by MSCI World Momentum net total return index. **Multi-Factor** is proxied by MSCI World diversified multi factor net total return index.

Energy is proxied by MSCI World Energy net total return index. **Materials** is proxied by MSCI World Materials net total return index. **Industrials** is proxied by MSCI World Industrials net total return index. **Cons. Stap.** is proxied by MSCI World Consumer Staples net total return index. **Cons. Discr.** is proxied by MSCI World Consumer Discretionary net total return index. **Health Care** is proxied by MSCI World HealthCare net total return index. **Financials** is proxied by MSCI World Financials net total return index. **IT** is proxied by MSCI World Information Technology net total return index. **Communication** is proxied by MSCI World Communications net total return index. **Utilities** is proxied by MSCI World Utilities net total return index. **Real Estate** is proxied by MSCI World Real Estate net total return index.

Cash EUR is proxied by daily compounded Eonia. **Cash Yen** is the performance of assets invested in short term cash in Japanese Yen from the perspective of a euro investors. **Cash USD** is the performance of assets invested in short term cash in US Dollars from the perspective of a euro investors. **Cash CHF** is the performance of assets invested in short term cash in Swiss Franc from the perspective of a euro investors. **Cash CAD** is the performance of assets invested in short term cash in Canadian Dollars from the perspective of a euro investors. **Cash NZD** is the performance of assets invested in short term cash in New Zealand Dollars from the perspective of a euro investors. **Cash NOK** is the performance of assets invested in short term cash in Norwegian Krona from the perspective of a euro investors. **Cash AUD** is the performance of assets invested in short term cash in Australian Dollars from the perspective of a euro investors.

Broad Commodities (Commodities) is proxied by the Bloomberg Commodity Total Return Index. **Enhanced Commodities** is proxied by Optimized Roll Commodity Total Return Index. **Energy** is proxied by the Bloomberg Energy subindex Total Return Index. Precious Metals is proxied by the Bloomberg **Precious Metals** subindex Total Return Index. **Industrial Metals** is proxied by the Bloomberg Industrial Metals subindex Total Return Index. **Livestock** is proxied by the Bloomberg Livestock subindex Total Return Index. **Softs** is proxied by the Bloomberg Softs subindex Total Return Index. **Grains** is proxied by the Bloomberg Grains subindex Total Return Index. **Gold** is proxied by the LBMA Gold Price PM Index. **Silver** is proxied by the LBMA Silver Price index.

EUR Treasury, EUR Corporate, EUR High Yield, EM Hard Currency Bond, EUR Treasury 1-3, EUR Treasury 5-7, EUR Treasury 15+, EUR Treasury AAA 1-3, EUR Treasury AAA 5-7, EUR Treasury AAA 15+, EUR Treasury Italy 1-3, EUR Treasury Italy 5-7, EUR Treasury Italy 15+ are proxied by their relevant equivalent in the Bloomberg Barclays TR Index Family.

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