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EUROPE AT WAR, AGAIN

GEOPOLITICS
ESG-INVESTING
PRIVATE ASSETS
MACRO STRATEGY
COMMODITIES
PRACTICE MANAGEMENT
PORTFOLIO CONSTRUCTION
ALTERNATIVE ASSETS
EMERGING MARKETS
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Financial Education

Europe at War, Again

I am very pleased to present to you our latest edition of The European Investment Journal.

Our minds are now thinking of the summerly pleasures of picnics and festivals but the war in Ukraine is also so ever present in our thoughts.

We have not seen such a land incursion since World War II, and this confirms to us how fragile peace and order is to maintain. We are now entering a period of instability, and disorder in Europe and beyond with the Ukraine situation just one tentacle on the octopus of war. The other tentacles are working either in step or as a cause of the war to inflict the maximum societal and economic pain on us.

Covid-19, like the insect at your picnic, will not go away, and remains a formidable force disrupting our daily lives and economic prospects. Inflation is now firmly entrenched and may become very sticky as worker wage demands spike leading to a vicious cycle of never really getting ahead. With this high inflation, monetary tightening is required causing higher interest rates and higher debt servicing costs. Energy prices are also soaring with supply continuity becoming a major threat. The markets are reading these negative signals and correcting into a bear market making retirement for many a longer wait.

These volatile markets and the challenging macro environment are making your jobs very difficult to serve your clients, but we hope the information in this edition will help you bring order to the financial outlook of your clients. Such articles as:

- Geopolitics – Containment, Cold War, Iron Curtain,
- Macro Strategy – A Generational Shift in Asset Allocation,
- Portfolio Construction – A Framework for Selecting ETFs as Hedges Against the Onset of Stagflation,
- Emerging Markets – An Update on China,
- ESG-Investing – The Role of Investors and Corporates in Tackling Climate Change,
- Alternative Assets – Digital Assets and Commodities: A Comparison of Institutional Portfolio Allocation,
- Technology – How are new Technologies Reshaping the Cyber Security Landscape?
- Private Assets – Private Assets – Between a Rock and a Hard Place,

  and
- Practice Management – Chartbook: Foods for Thoughts.

I trust you will find something interesting for your summer read amongst this selection.

I wish you and your family a wonderful summer.

Regards,

Keith F Costello
Publisher & CEO
Radius Europe GmbH

Features

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EUROPEAN INVESTMENT JOURNAL
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CONTAINMENT, COLD WAR, IRON CURTAIN.

Dr. Rudolf G. Adam
Title,
Company

Editor's note:

In this independent analysis and personal account of the current situation caused by the war in Ukraine, the author gives his own summative explanation of events, historical context, and possible insights for the future. This piece was completed on March 26th, 2022. By the time it appears in print, the situation on the ground may have changed. The author submitted the article for wider distribution, even though the facts may change, yet he hopes that the logic of his arguments will endure.

I. ON PREDICTING THE FUTURE AND DEFENDING OUR VALUES

We know relatively little about the past. We know nothing about the future. So we derive our expectations for the future from what past experiences we know.

Putin is currently demonstrating his control over the narrative of the past so that it can be a formidable weapon to shape the future.

The more usual rationale would be to analyse trends and dynamic changes and extrapolate them into a linear future. We derive our algorithms from observing present reality. This works reliably well if we acknowledge and adapt for gradual developments. Of course, it breaks down in cases of cataclysmic change — the black swan that became famous through Nassim Taleb. Wars always imply cataclysmic change. We have just lived through three unpredictable events: The coronavirus pandemic, the 9/11 terror attacks on the twin towers, and the war in Ukraine.

Some events are truly unpredictable. Others surprise us only because we fail to see the symptoms announcing them.

- Experts had repeatedly warned about the implications of a truly global pandemic, but we failed to take adequate precautions.
- Experts had warned about Islamic fundamentalism, but nobody took notice of the intelligence that half a dozen Arabs wanted to learn how to fly a plane, but not how to land it.
- For years, whilst we neglected our armed forces and our civil defences, Putin was setting his scene, making no secret of his disdain for Ukraine. He had repeatedly declared it had no genuine statehood, that it was no real nation, that its government was a clique of fascists, that it was a wayward child of Mother Russia. And yet most people woke up in disbelief when his troops swerved into Ukraine.

Short of exact predictions, we try to identify drivers and trends. We try to define some dykes over which we assume the current stream of future events might flow. Knowing the shape of the future, in fact shaping that future, is what 'strategy' is about. In uncertain times, a clear and sober strategic view and a sound understanding of current trends are absolutely vital. Strategic thinking anticipates possible moves of the opponent; strategic thinking ponders risks and prepares a fall-back position if events take a different turn from what had been envisaged.

Our entire economic system is based on predictions: Savings, credits, investments, and contracts - we literally bank on our ability to predict the future. Insurance serves to reduce financial risks if we were wrong in our assumptions. But insurance cannot forestall the dreaded event; it can only mitigate its consequences by spreading the individual risk over a large number of clients.

We are currently on the threshold of a new epoch. We have been pushed down a corridor whose end is shrouded in darkness. So we are well advised to read the writing on the walls.

There are at least five factors that will ensure that our future will be different from our past:

- the return of major war,
- the spread of cyber-attacks and of sanctions as a substitute for traditional war,
- climate change, pandemics,
- fake news, what might be described as the loss of truth and the distortion of reality through propaganda,
- and the growing dichotomy in democratic societies masses through disinformation, fear, and hate.

Why is the war in Ukraine such a defining moment?

It involves a nuclear armed superpower; it is a blatant war of conquest and subjugation; it is waged with ghastly brutality; it has plunged a permanent member of the UN-Security Council, i.e. a country that can paralyze that institution with its veto-power, into complete isolation.

In the vote of the Security Council condemning Russia's aggression, both China and India abstained. They abstained again in the General Assembly. Two countries representing a third of the world population remained passively silent against a glaring breach of the UN Charta. What is that Charta worth if the world community remains indifferent? Perhaps the War in Ukraine has revealed the irrelevance of the UN in face of a major war that is conducted by one of the permanent members of the Security Council.

The war against Ukraine's independence will be a forceful factor undermining an already porous non-proliferation regime. Ukraine had renounced all nuclear weapons stationed on its territory after the break-up of the Soviet Union. In exchange, it had received a guarantee recognizing its sovereignty, its territorial integrity, and the inviolability of its borders (Memorandum of Budapest 1994). It now seems that this treaty has been torn to shreds. The other two guarantors, the United Kingdom, and the United States, remain inactive, thereby showing less resolve than the United Kingdom and France who declared war on Nazi Germany in 1939 after it had invaded Poland, whose security those two countries had at that time, guaranteed. Perhaps a lesson of war in Iraq, Libya and Ukraine is: If you feel threatened by a superpower, acquire nuclear weapons, and if you have some, never give them up!

This recent war in Ukraine has revealed that the concept of a rules-based international system is in tatters, the authority of international law irreparably damaged. For rules and laws are only relevant if there is an overwhelming majority that not only accepts them as binding on themselves but is also ready to defend them if they are flouted. That majority is eroding.

The next decades will see a return to a world that resembles the one before 1945: A world in which the strong do as they will and the weak suffer what they must, a world in which might is more important than right. It will be a world of fierce competition in military power, technological know-how, control over trade routes and money flows. A recrudescence of nationalism will whip up jingoistic aggressiveness and hysterical fears of threats - fears that are invoked to justify preventive aggression.

The resentment of alleged historical wrongs is already a powerful instrument in Russia and China to ensure the loyalty of their people and to mobilize their support for a revisionist posture. History itself is being distorted to undergird abstruse claims. A law, recently passed in the Russian Duma area, punishes 'fake news' concerning the 'military special operation' in Ukraine with fifteen years imprisonment.

The error of many western observers was the naive belief that values, norms and rules develop strength out of themselves. Yet one thing that history shows is that 'right' never was stronger than 'might'. Laws and judgments need the police and the power of executive organs of the state to enforce them against those that break or flout them. The same applies to international law. Unless in the last resort we are prepared to resort to military might to enforce them, we should not be surprised if they are violated.

To uphold values we must pay a price, and it is the extent of such a potential sacrifice that determines how much our much-vaunted values are worth to us. Verbal commitment is cheap; what counts is what we are prepared to risk to defend and to enforce our values.

II. RETURN OF THE THREE-WORLD-MODEL AND THE THREAT OF NUCLEAR WAR

It is anticipated that our world will return to the Three-World-Model of the Cold War.

- the First World comprising democratic countries, traditionally called 'The West';
- the second world comprising Russia, China, and their satrapies (such as Belarus, Syria, Abkhazia, North Korea);
- and the third World consisting of developing countries in Africa and Asia.

It is likely that these three worlds are bound to drift apart rather than come closer, at least for the next decades, as the West scrambles to pour resources into its defences and with its political attention absorbed by the huge task of reorienting its supply chains, particularly those for fossil fuels.

These are enormous challenges: reorienting its financial and economic ties, ramping up defences, overcoming the enduring consequences of the pandemic and the continuing efforts to contain climate change. Sadly, war has a most disastrous effect on our global climate balance.

Since the first two cities of the nuclear age were annihilated in 1945, we have feared nuclear war. This fear is of a global strategic exchange aimed at removing the opponent and its associated human civilization, as 'collateral damage'. However, it would make little strategic sense to target nuclear warheads at cities again. Should a nuclear weapon be used in future, it will more probably be a small, tactical warhead targeted at a military installation or a piece of vital infrastructure.

The danger of the nuclear threshold being crossed is still small, but that threshold is becoming lower. We miscalculated Russia's readiness to start a conventional war. We might equally miscalculate Putin's readiness to resort to threats, but also to order nuclear attacks. The dictator that unleashed a war of aggression and conquest in the last century did not hesitate to accept the total destruction of his own country before he took his life. Had he had nuclear weapons, would he have used them as a last desperate resort? The question is hypothetical, but the answer is more probably yes than no.

Putin's psychology is difficult to gauge. He seems to despise compromise, he considers backing down as a weakness and showing weakness is for him tantamount to capitulation. This puts the West before a dilemma: On the one hand we should consider offering Putin a face-saving exit from this war. On the other hand we cannot reward his aggressiveness by conceding territorial gains. If we take our values seriously, a minimal outcome of the current war should be the restitution of the previously existing situation. Though even that would go too far to accommodate Russia, since it would imply a de facto recognition of its annexation of Crimea and the 'independent republics of Donetsk and Luhansk'.

The current nuclear doctrine of the Russian Federation specifies:

"The Russian Federation reserves the right to use nuclear weapons in response to the use of nuclear and other types of weapons of mass destruction against it and/or its allies, as well as in the event of aggression against the Russian Federation with the use of conventional weapons when the very existence of the state is threatened."

(Principles of State Policy of the Russian Federation in the Sphere of Nuclear Deterrence, published June 2nd, 2020).

It is the perception of the present Russian political elite that the existence of the state is identical with the continuation of their rule. Putin would probably not hesitate to cross the nuclear threshold were he to conclude that his very own survival as head of state is at stake. The inner circle of his closest advisors would probably reinforce such a decision since their survival is inextricably bound up with his. That is why whatever we do, we should leave no doubt that regime change in Moscow is not our strategic aim. In this regard some politicians have resorted to unnecessarily provocative rhetoric.

A nuclear exchange would not necessarily imply global Armageddon. It would at first probably be a show of resolve, a demonstration that the nuclear threshold is not an insurmountable barrier (escalate to de-escalate). It would, however, mean we would be in uncharted strategic waters. Nobody has ever commanded a limited nuclear exchange, nobody knows how the signals of one side will be interpreted by the opponent, nobody knows the mentality in which decisions of inconceivable destructiveness would have to be taken. Essentially: nobody has negotiated under the threat of all out nuclear war.

Nuclear attacks may be a horrible, yet remote threat. Much more dangerous are new types of warfare: Cyber-attacks, attacks on vital infrastructure, the systematic distortion of reality. Russia is waging an all-out information war by closing all independent information flows into the country and intensifying a propaganda campaign to project a harmless impression of its atrocities in Ukraine.

Perhaps we will have to resort to much more radical means of countering this tsunami of disinformation and at the same time we will have to step up our own means to project our view of reality to reach the Russian Federation. The days of Radio Free Europe and Voice of America, of BBC and Deutsche Welle broadcasting on short wave and of Russian jamming such broadcasts are returning.

III. THE DOUBLE EDGED SWORD OF SANCTIONS

As a reaction to the war in Ukraine most of the trade and financial relations with Russia have been severed. They are aimed at crippling Russia's economy and at eroding the financial basis on which its military operates. Such a response, to wage a war with economic warfare, and similar to nuclear war, treads a path through uncharted waters.

So far most economic sanctions have made little difference to the countries targeted. They served as a symbolic (and cheap) substitute for political and military measures. The full panoply of sanctions imposed on countries like North Korea, Iran or Venezuela may have caused pain, though have not led to regime change. Political behaviour in those countries has not been affected and we cannot be sure how these sanctions will really work. Indeed, we have no idea how Russia is going to react to them. Its reaction could be anything from just 'shrugging them off' to cutting energy supplies to Europe. The sanctions could be labelled by Putin as acts of aggression threatening the existence of the state — in which case the current doctrine would give him a free hand in ordering a nuclear retaliation.

The current sanctions imposed on Russia are different from previous ones: they are encompassing, they are almost universal, they are meant to hurt. The Russian ruble has lost a third of its value. Russia's credit rating has plummeted to 'junk' level (S&P: CCC-). Foreign direct investment is fleeing the country, cross border financial transactions are well-nigh impossible.

Some media triumphantly proclaim that Russia is going to be 'brought to its knees'. But what are the consequences of such a policy? Make no mistake: What makes sanctions effective is not their sweeping range, but their almost universal support. Sanctions achieve little if they offer loopholes or chances to circumvent them. Sanctions encourage crime, smuggling and the camouflaging of transactions through straw men or obfuscating the true beneficiaries of international transactions. As long as China, India and the Arabic world remain reticent about joining these sanctions there are enough rat runs that can undermine the present sanctions regime.

Sanctions will inflict losses indiscriminately on all parts of the Russian society. Poor strata will be more affected than rich ones. Bankruptcies will soar. Since this is the result of war, bankrupt businesses will be taken over by the state. Sanctions will strengthen the grip of the state, i.e. the Putin-entourage, over the economy. Russia will have a smaller, much more politicized economy that serves first and foremost the interests of its political elite and their henchmen, not the wellbeing of the population. The economic elite is far too dependent on Putin's government, and they all remember only too well the fate of Mikhail Chodorkovsky. The state sector will grow, enabling the new owners to shift losses to the taxpayers and to privatise profits.

If economic and financial sanctions are used for political purposes they must have a clear political price tag. They must be conditioned and monitored whether they have the desired effect and that effect must be measured against the grievances that caused them. It is also essential to communicate clearly what must be done for them to be lifted.

If sanctions are a form of warfare, they need well-defined rules for their application. Proportionality is one of them. Their effect could be devastating — not as catastrophic as bombing or shelling, but they can gradually grind down the economic potential of an adversary. At the same time they are bound to have serious repercussions on those countries that impose them and on associated countries that depend on trade and monetary transactions with the sanctioned country. In this case that would be most of the central Asian republics, Mongolia, and Armenia.

Proportionately, they may have to suffer under the impact of sanctions more than Russia herself. It is becoming apparent that war and sanctions send ripples through the entire global economy: Fossil fuels would experience price hikes like the oil crisis of 1973. Cereals and cooking oil would experience shortages and corresponding price hikes. Both tendencies will hit developing countries particularly hard since they rely upon imports of fuel and food.

Sanctions can be corrosive. They feed mutual alienation and suspicion. The effect of prolonged sanctions could be to push the Russian population closer towards defiant nationalism. For example, the Morgenthau-plan of August 1944 stiffened resistance in Nazi-Germany. Putin's propaganda has harped on the West being bent on destroying mother Russia. Now it can produce proof of this narrative: See how the West is determined to strangle our great country!

Sanctions could result in a secluded hermit-Russia, indulging in its messianic role of both saviour and victim. The last opinion poll taken immediately before the invasion of Ukraine showed 71% in favour of Putin. Russian propaganda is successful, all independent media have been silenced, communication with the rest of the world is strictly censored, and social media are either filtered or completely suppressed. How are simple Russians going to form their opinion?

We should not forget that Russia remains our neighbour and a neighbour of Ukraine. We will need to somehow cooperate or at least to reach some understanding with Russia in order to successfully tackle global challenges: Climate change, terrorism, pandemics. Russia sits on top of 6% of global oil reserves, of 20% of global gas reserves. It has vast resources in metal ores, in diamonds, gold, coal, timber. It will grow increasingly difficult to exclude such a country from global trade flows over a prolonged period.

In Russia, production costs for one barrel of crude oil are around 35 US$ on average. Two years ago, when crude dropped to below 30 US$, Russia was making a loss. But war has pushed oil prices up to unprecedented heights. At the moment, oil is well above 100 US$ per barrel. For each barrel exported, Russia makes a windfall profit of more than 60US$.

In war, the price of oil and gas shoots up. War creates that additional income that Russia needs in order to wage that war. For Russia, war is financing itself. And despite all high-sounding rhetoric about sanctions we are still unable and unwilling to drastically curtail our imports of Russian gas and oil and to deprive Russia of the resulting income. With more than 600 billion US$ reserves and a public debt ratio of less than 15% of GDP Russia's budget is solidly financed.

In December 2021, Russia exported about 7.8 million barrels a day, at present price levels 450 million US$ a day or about 150 billion a year. The break-even point for the Russian budget is calculated at around 70 US$/b. So a price level above 100 US$ promises financial comfort for the Russian minister of finance. Consider at the same time that the exchange rate of the ruble has plummeted by about 30%, so the purchasing power of US dollars has gone up 30% inside the country. That presages a return to trade patterns of Soviet times: A rigid separation of Russia's internal market from global markets, a new insistence on self-sufficiency and import substitution, currency controls, perhaps a return to an artificially fixed exchange rate.

Russia also has an eastern neighbour whose hunger for fuels is insatiable. Expect China to lap up any surfeit the Russians can't export to the West. China's can only profit from Russia's invasion of Ukraine: Russia will be weakened and thus a more pliable neighbour. China can demand extremely favourable conditions if it continues to trade with Russia and to lend it clandestine financial and military support. If Putin wins, China will have a deeply grateful neighbour. If Putin loses, that will corroborate China's senior and more powerful position in this strategic partnership. Russia would over time become a Chinese client state as North Korea already is. Russia and China will complement and compensate each other. Together they dominate the landmass of Eurasia. Both Russia and China profit from keeping their long border peaceful as it enables them to turn outward to confront the USA.

It is likely that Putin calculates that once he has consolidated his grip on Ukraine and once the first wave of western moralizing indignation has died down, there will be a gradual, even if reluctant return to normality after five to ten years and that the Russian bear has enough financial fat to survive such a prolonged hibernation.

IV. HOW COULD WAR IN UKRAINE END? FIVE CONCEIVABLE OUTCOMES

1. The most probable outcome at the time of writing is unfortunately a prolonged war, growing in brutality and destructiveness, recalling pictures from Aleppo and Grozny, ending in a puppet regime installed in Kyiv.

After labelling the present government as fascist, drug addled and genocidal, Putin cannot settle for less. He would appear weak, the strong ex-KGB-man, the Judo-black belt, the ice hockey player beaten by a provincial comedian of Jewish descent. Putin would be debunked, his almighty aura of tsar-like augustness would vanish. That new regime would probably sign a friendship treaty favourable to Russia: Joining the Eurasian Economic Union and the Collective Security Treaty Organization, recognizing the independence of the statelets of Donetsk and Luhansk within their present administrative borders, accepting a permanent military presence on Ukrainian territory.

This military presence would be large enough to crush any protest and to ensure any future democratic election will produce 'acceptable' results. Ukraine would become a copy of a Warsaw pact country.

2. Against all expectations there is a growing possibility that the Russian offensive will simply stall because of casualties, loss of equipment, logistic problems, and low morale.

It might be possible for the Ukrainian forces to push Russians back and to recapture cities occupied by Russia. The big question is whether Putin will accept what would be tantamount to defeat or whether he would escalate further. Russia still has some more dreadful weapons in its arsenal – including nuclear warheads.

If the West refuses to accept such a regime and continues to support resistance and guerrilla in Ukraine it might provoke a Russian response of sabotage, cyber-attacks and more assassination attempts on the territory of NATO-states. It would raise nuclear tensions, a return to hair trigger alert. Fear of a miscalculation would be frighteningly high in the uncertainties of conflict. Putin probably calculates that the sharp western reactions will gradually die down as they did after Budapest in 1956 and Prague in 1968.

In the end, the West will learn how to live with a fait accompli that it has neither the means nor the will to overturn, even if it is an ugly and repulsive fact.

3. The third option would be a mutiny of Russian soldiers refusing to obey commands, deserting home, or defecting in large numbers.

What makes this option plausible is the fact that Russian soldiers and their victims speak the same language. It is not possible for Russian propaganda to indoctrinate soldiers that see with their own eyes and hear with their own ears a different reality. But discipline is strict, and punishments are draconian in the Russian army. The Russian government has threatened collective punishment of relatives of defectors. Therefore such an option is unlikely. Russian soldiers may moan, but they also fight.

4. The fourth option would consist of mass protests in Russian cities forcing the government to stand down: The Romanian/Ceausescu scenario re-enacted.

This would only be possible if the security apparatus were to side with the protesters, refusing to obey orders to arrest and — as it happened in Belarus — to shoot. Since discipline inside the security agencies is even tighter than in the army, this option appears less probable at this moment in time.

5. Least probable of all is a coup of the bodyguards inside the Kremlin: The re-enactment of a July 20th scenario against Hitler (which, alas, failed!).

A member of those few who are physically close to Putin would use his access to eliminate him. A president who has taken such massive precautions against an infection during the Corona pandemic will certainly have considered this possibility, too. Screening, unpredictable rotations, loyalty tests will work to make such an outcome practically impossible. Any other way of getting rid of Putin is equally remote. Putin does not have to face a Politburo of equals that has the power to depose him as the Politburo did with Khrushchev in 1964. He does not have to face a Central Committee that could criticise him and elect opponents to his course to the Politburo. Gorbachev had to deal with the permanent opposition of Ligachyov and Chebrikov. Putin does not have to face any such opposition.

The conclusion from these options is obvious: We will have to live with Putin at the head of Russia until the end of his days. He will grow more paranoid and more aggressive. Having broken some of the most fundamental norms of international behaviour, disregarding the Budapest Memorandum and the Friendship Treaty with Ukraine as well as using radiologic and chemical weapons to eliminate opponents (Litvinenko, Skripal, Navalny), he has lost all credibility. His word cannot be trusted.

This will spell out a politic of containment and mutual threats — no benign conditions for cooperation and trade and no framework for peace and predictability. If he is convinced that NATO is determined to put an end to his regime he will ramp up his subversive efforts to weaken NATO and to exploit splits in its unity. Once Putin feels he has consolidated Ukraine he might feel emboldened to move against the Baltic countries and/or other former Soviet republics. That is the strongest argument for not allowing him to prevail in the ongoing conflict.

The foremost challenge of western diplomacy is to deter Putin from further attacks convincingly without offering him a pretext to present the conflict in Ukraine as part of a sinister camouflaged attempt of NATO to overthrow his regime. That will be a precarious balancing act. It will require a good dose of psychology trying to read Putin's mind. What the West should be particularly cautious about is provocative rhetoric and empty verbal threats.

In many ways, Putin's Russia is more difficult to handle than the Soviet Union. He has surrounded himself with sycophants and toadies. He can rule whimsically. He can indulge himself and follow his dream of going down in history as restoring Russia to her erstwhile grandeur, following in the steps of his admired idol Peter the Great - and implementing his designs with a comparable disdain for human suffering. Putin is living proof to Lord Acton's famous quote: "Power corrupts, and absolute power corrupts absolutely".

A future for Ukraine?

Ukraine, the blood lands, is bleeding again. That is a political, economic, and above all a human catastrophe. But we cannot right these wrongs by risking total conflagration in Europe and beyond. NATO is a defensive alliance. It has drawn a line before Ukraine. It should observe this line in the expectation that Putin will also respect that line. But it should leave no doubt that whenever he dares to cross that line, the response will be swift and devastating, making him suffer a greater disaster than he can possibly inflict.

Talk about Ukraine joining the EU is unrealistic. What Ukraine needs right now is military support. That is the last thing the EU can provide. The talk about a quick way to EU-membership ignores all the facts that have made such membership impossible in the past. It would burden the EU with expectations it could never fulfil. In the end, all would suffer:

- Ukraine, because it would receive no additional effective support for its security needs;
- the EU, because once more it would be unmasked as confident in promises and deficient in delivery.

But more effective help is urgently needed. Maybe we should think outside the boxes of EU and NATO: Why not cobble together a truly global coalition to support Ukraine, including e.g. Indonesia, Japan, Malaysia, Kenya, Egypt, and Argentina? It would demonstrate beyond doubt that NATO remains a strictly defensive alliance and that Ukraine is a test case not for European, but for global stability.

Sanctions, like war, are easy to impose, difficult to terminate and even more difficult to see through to the end. At the moment, they are half hearted, because Russian gas and oil exports generate sufficient income to support the war. Sanctions against Russia resemble a mother of a self-confessed pyromaniac reducing her son's pocket money but refusing to take away his matches and his kerosene.

How such swee ping sanctions could be agreed in such an almost universal way, is indeed an encouraging start. Yet they are clumsy, they require a gigantic bureaucratic effort that can easily be fooled, thwarted, and circumvented. Above all, after some time the unity of the global alliance supporting them is bound to fray, some sanctions will peter out as the will to maintain them erodes since they are painful also to those who impose them. Sanctions are not an end in themselves. They are supposed to achieve political ends. And before those ends have not been achieved, they will have to stay in place.

A final word of optimism:

The war has proved beyond doubt that Ukraine is a nation. The heroic resistance against brutal occupants is all the more remarkable since most analysts had expected at least a significant part of the population to accept Russian domination either passively or even actively. The most revealing moments in this war are soldiers in Ukrainian uniforms who wish Putin and his Russia to hell in perfect, accent-free Russian; language is no indicator for national feelings.

The second encouraging thought is that Ukrainian society will be shaken up fundamentally. Like the population in Germany after 1945, old cliques, clientelism and oligarchic exceptionalism will hardly survive the war. Ukraine will re-emerge rejuvenated, purged of the last remains of Soviet deformations.

The price is horrendous — but one may derive some minimal comfort from the fact that behind the dark clouds of the current disaster there may be a faint silver lining.

A GENERATIONAL SHIFT IN ASSET ALLOCATION

BONDS ARE NOT YOUR FRIEND

Larry McDonald
Author,
The Bear Traps Report

Big Picture

When we think clearly about the 'hard assets vs. financial assets' debate — we can see a shift in the game of play.

But what takes the trade to the next level?

Have we yet to see even the slightest indication of real financial asset selling?

And what will give real sustainability to the hard asset and value equity thesis?

It all comes down to the dollar. For much of the last 20 years, the U.S. political leadership has been weaponizing its currency. One might say they have done this too many times. Bear in mind, today´s roulette wheel of sanctions stems from a different pack of pills.

Before the war in Ukraine, inflation in the U.S. was already running at nearly 8%. Now the United States has chosen to bring out its sanctions against a country that has the regional control and influence of over 10-15% of the global commodity complex.

We are uncertain whether the risk/reward has been meticulously thought through here. The risks of a self-inflicted wound are high, and complacency around these risks is even higher. U.S. sanctions and counterattacks from Putin push inflation´s roots much deeper below the surface and make higher price pressures far more sustainable than any time in recent memory.

This gives 'unintended consequences' a whole new meaning. As we stressed in the summer of 2020, the 'Cobra Effect', coming from a fiscal and monetary policy overdose, delivers many surprises wrapped in inflationary pressures. However, with the additional 'sanction games', this raises these stakes to a whole new level.

Zoltan Pozsar from Credit Suisse says, "'Our currency, your problem' becomes 'our commodities, your problem'".

Globally, the lights on the 'U.S. dollar weaponization' stage have never been brighter. Even one of the U.S.´s most trusted allies — The Kingdom of Saudi Arabia – is looking at ways to lay-off dollar risks and possibly trade their dark crude in red Chinese yuan (CNH). This does not imply that the U.S. dollar will lose its world´s reserve currency status this decade – that is absurd — but make no mistake: a near-term diversification away from the greenback is certain. And this in turn has a large impact on rates, inflation, and hard assets.

THE BEAR TRAPS REPORT
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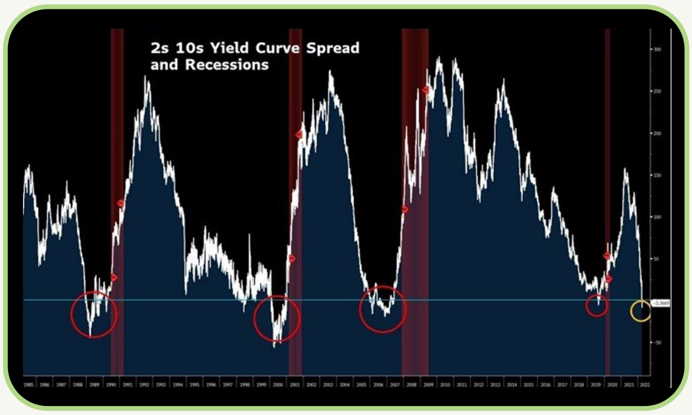
Recession Signals

Within Eurodollar futures (rate hike bets), 7–8 hikes are priced for 2022, while rate cuts are being priced by the end of 2024. Regional banks and home builder equities are off ~30%, restaurant stocks have been destroyed, while airlines (CMBS, and GM) are suffering. Meanwhile, consumer staples are widely outperforming discretionary and yield curves are inverting — these all indicate: a recession.

2s / 10s Inversion Data



We are rapidly going from concerns about hyperinflation to deflation — and the Fed from QT to re-expanding its balance sheet. Lots of attention is now on the yield curve, with the 2s/10s spread inverting. Many economists consider this a clear sign the bond market is pricing in a recession but the timing of such an event is ambiguous. In the past, when did 2s/10s turn negative?

- December 1988 - recession didn't start until July 1990.
- January 2000 - recession started March 2001
- December 2005 - recession didn't start till Dec 2007
- Aug 2019-but an official recession (as per NBER) never came, especially cause Fed made dovish pivot. Still there was a big contraction in Feb-April 2020.

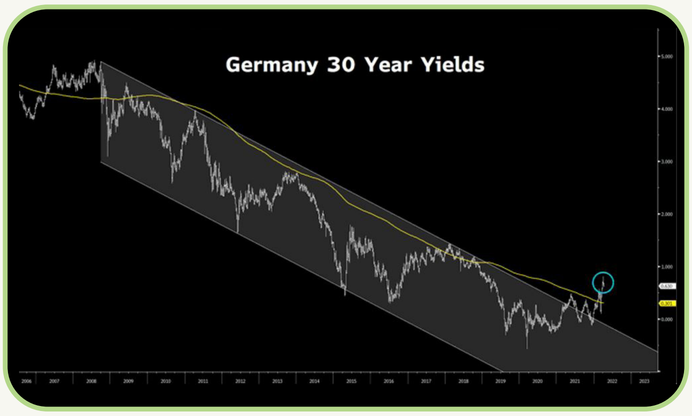
But this hiking cycle is expected to be 3–5x faster. In recent weeks, we keep hearing the narrative that equity returns are generally positive, after the 2s/10s yield curve inverts. It is so disingenuous to say this without context. In the 2004–2007 hiking cycle the Fed hiked 3-4x per year max — a speed of 30mph! Not 9 hikes in 12 months – a speed of 90mph - as the Street is leading us to believe. The speed of the withdrawal of accommodation means everything. Not to mention QT and rate hikes combined is equivalent to even more hikes. The Fed figured this out in Q4 2018 - they tried to execute both at the same time and blew up the market. Moral: Don't fight the Fed.

Global Spending Overdose

Essentially, we have an inflation problem and worldwide governments are placing printed cash into bank accounts as a remedy. You literally cannot make this up. Austria recently unveiled a $2.2B package for energy cost relief and the German coalition parties are working on an energy cost relief package ($16B). In California, Governor Newsom proposed an $11 Billion relief package for Californians facing higher gas prices. Italy also approved a $9 Billion aid package for energy. From the recent memories of austerity and Black Zero: we are entering a period nothing like the previous deflation-risk-riddled decade (2010-2020).

The German government already adopted several measures including a rise of the basic tax-free allowance and increased mileage allowances for commuters with longer journeys. The comprehensive set of relief measures amounted to more than 15 billion euros (about 16.5 billion U.S. dollars). Of course, secular demand is declining due to demographics (aging, low birth rates, low worker replacement ratios), but many are still assuming that a pre-2019 COVID world of excess supply, savings, and manufacturing capacity made frictionless with globalization will eventually return.

German 30 Year Yields



The USA's 'global yield anchor' is giving way. The spread between U.S. and German 30 year yields was +238bps 2019 to +186bps today. Global yields are juicing U.S. yields higher. This is a large sell signal for U.S. equity indexes (QQQ), in our view.

The Death of Base Effects and the Rise of the Hawkish Fed

Last summer (2021) the standard view on inflation, as expressed by Oxford Economics, was that high inflation measures were 40% caused by base effects. So a nearly 5% CPI was really more like a touch under 3% CPI, so all was good. The conclusion? Base effects would vanish as YoY figures began to compare against months during which the economy was reopening.

Now, here we are with base effects gone and inflation at 7.9%. Back to our rational actor who is a $3mm net worth retiree whose cost of living is $150k to $200k. He was told for the past several months that inflation was transitory. Base effects!

Being rational, our rational retiree didn't react. Yet now, we are getting reactions, and this will increase. Now our rational actor retiree is panicked because inflation is now sticky. As his bond portfolio rolls over, he is less sanguine about the current market price and yields. He begins to stock up on goods. His cost of living is higher, and it doesn't feel like it is about to go down.

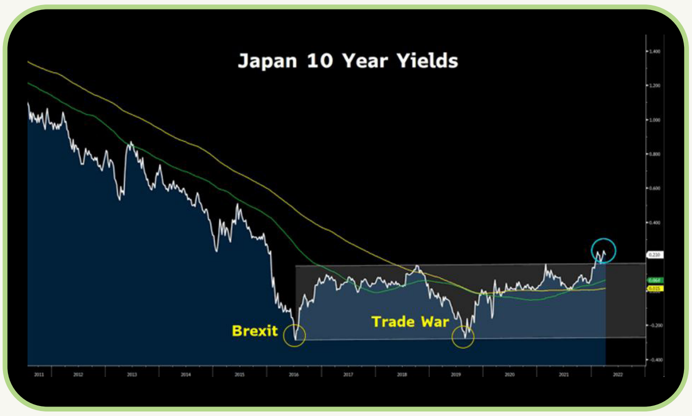
It's not just him, it's a global phenomenon.

EU austerity has gone. The EU is selling as many bonds as it can. Japan has just announced a massive stimulus plan, and this for a country with debt to GDP tagging over 250%! Politicians around the world have gone rogue. It's not just the USA. It's universal madness. The kind of universality and the kind of madness that crashes sovereign debt markets. The kind of universal madness that causes people to buy precious metals even when rates are going up, even while the U.S. dollar is strong. If rates outside the U.S. continue to rise, if negative-yielding debt vanishes altogether as it appears is happening, then a key anchor to lower-yielding U.S. treasuries has been yanked.

So as the baseline effect fades and inflation worsens, rational actors that delayed responding begin to respond in increasing numbers. And they do so by requiring higher yields on treasuries and by stocking up on staples. The Fed sees this and is afraid.

As a result, we can all expect to see increasingly hawkish rhetoric from the Fed. It must raise rates to maintain credibility, or rational actors will teach the Fed a lesson it doesn't want to learn. And that may be too late!

The Yield on Japan's 10 Year Bond at New Recovery High



The yield on Japan 10s has increased to the point that a double bottom in yield is now in place. (Taking the Brexit bottom plus the Trade War bottom and breaking above the highest yield print in between the two.) This points to yet higher yields going forward. Call Lacy Hunt!

The Fed has to Convince the Market of What?

In essence, the Federal Reserve has convinced the market of two things:

1) rate raises will be higher than formerly believed.

2) such raises will do little to cure inflation, at least over the near term.

Breakevens (the yield of an inflation-protected bond minus the yield of a non-inflation-protected bond of the same maturity) were at 3.42% at the start of the Fed's March meeting. That recently got to 3.57%. So, traders decided that inflation was actually worse after the Fed meeting than before the Fed meeting. In fact, it is now at a record high.

Furthermore, the bear market rally shows that the stock traders do not believe they are fighting the Fed. Ultimately, stocks believe that for all the clamor around higher rates, net-net monetary policy is and will continue to be loose, only: less loose than it was.

'Loose' money means Fed Funds after inflation are negative. Since inflation is running near 8%, no reasonable person thinks Powell will make Fed Funds actually positive after inflation. This explains the rise in yields on the 10-year: traders are trying to get more vig given ongoing inflation. It also explains the rise in gold, which in addition to its safe haven bid is also an inflation hedge.

Consequently, the markets were surprised by a more hawkish Fed, however they don't believe inflation is going away. We still think that aggressive tightening will lead to recession, assuming one isn't already underway. We still believe we are either in or about to enter stagflation (depending on one's definition of the term). So faster hikes but inflation still rages — in our view — the S&P 500 will be 20-30% lower in this world.

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ISM Leading

There are times when developments pile up so fast late in the week that the street doesn't have time to process the significance of the data. The Wall Street research community has always been 'slow on the draw' — but we believe strategists and analysts will be confronted with a seminal moment in the weeks ahead.

What is the state of play you ask?

We have a U.S. equity market that has been led by Utilities (XLU up 15% since late November vs. -3% for the S&P 500 over the same period) and Consumer Staples XLP for nearly five months now. In the U.S., ISM Manufacturing fell in March to 57.1 vs. 59 est. and 58.6 in prior month — the lowest since September 2020.

Above all, new orders (light blue above) plunged from 61.7 to 53.8. At the same time, the Dow Jones Transports had one of the sharpest one-day declines in years last Friday. Classic 'economic bellwethers' like Union Pacific (UNP) dropped over -5% on the day. Warning: U.S. banks (Citi) and consumer plays (GM and Home Depot) are 30-35% off their highs with the U.S. Treasury curve moving deeper into inversion territory.

CLEARLY, this is NOT all about 2s/10s and the rates curve. There is unequivocally much more going on. We see 20-30% near term downside for the Nasdaq. (Special thanks to Nordea here).

Wealth Destruction in Equity Market Drawdowns

"We underestimate the wealth effect on the economy and this type of volatile stock market moves, it has an impact that I don't think we fully understand nor measure correctly. I think it's important to recognize that if we get a major stock market adjustment, we are going to feel it in the economy, which has a very short lag,"

— Former Fed Chair Alan Greenspan

Risk-Parity pain

2022: Stocks -$7.8T vs Bonds -$4.9T
2018: Stocks -$3.2T vs Bonds -$1.4T
2008: Stocks -$10.5 vs Bonds +$4.1T
2015: Stocks -$4.5T vs Bonds +$2.1T
2011: Stocks -$3.7T vs Bonds +$2.5T
2010: Stocks -$2.4T vs Bonds +$1.8T

One of the powerful points we mentioned in our book? Global bestseller - A Colossal Failure of Common Sense — The 'wealth effect.'

The 'wealth effect' is the premise that consumers tend to spend more when broadly-held assets like real estate and stocks are rising. The notion that the wealth effect spurs personal consumption makes sense intuitively. So far, Street estimates say the wealth effect has taken off around 0.20-0.50% from consumer spending. The weakness in consumer spending growth will weigh on GDP growth. A 1% to 2% drop in consumer spending would take around 0.6% to $1.2% off of GDP.

Greenspan's comments (above) were from a period of NEGATIVE stock-bond correlation. With high conviction, we believe we have moved into a sustained regime of a positive (move up and down together) stock-bond correlation. In the 1970s-1980s this was far more common than not.

Wealth destruction drawdowns

Bottom line — the wealth destruction is spectacular and there is NO bond protection. The 2008 stock market crash wiped out $7.2T in shareholder wealth Lehman era, but bonds delivered investors a $2.9T profit cushion, that's not the case today.

CPI Plus U.S. CDS Imply Much Higher Yields

On March 10, 2022, the Bureau of Labor Statistics released its Consumer Price Index reporting inflation at 7.90% over the past 12 months through February. Using a generously benevolent CDS (credit default swap) on the U.S. Government of 10bps would indicate an 8% yield on the U.S. ten-year bond if everyone believed that inflation would continue at that pace for the next 3,650 days.

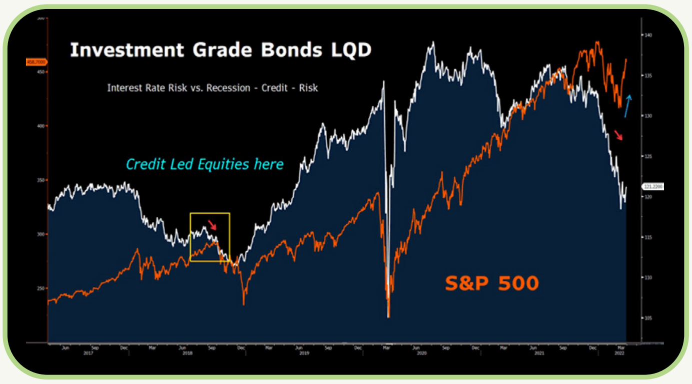
Currently, the ten-year has already surpassed our 2.40% target set in 2020. The question is, liquidity is poor in the treasury market, which is obviously a negative sign. A breakthrough past 2.40% would set up the possibility of a Treasury bond crash. A double in yields is not unthinkable. Recently, we were treated to Goldman Sachs prognosticating the possibility of two 50bps hikes at upcoming Fed sessions. We have long maintained that Goldman is essentially the trial balloon mouthpiece for possible future Fed moves. Essentially, the Fed asks them to push the market around so that the market 'gives' the Fed what it wants. If the markets don't fall apart, then the Fed will feel it has leeway to tame inflation. Once high inflation lasts longer than a year, behavior changes.

A retiree with $3mm to his name, can deal with 6 months of inflation peaceably enough. However, our research shows that high levels of inflation that last 12 to 16 months begin to affect decisions decisively. Ultimately this view is based on Rational Expectations Theory, which holds that people try to maximize their well-being and so don't react right away to immediate changes in cost pressures but do so eventually.

The theory asserts that actors toe the line if, in their view, the Fed has credibility in fighting inflation. However, if the Fed loses that credibility, under Rational Expectations Theory, then actors ignore Fed rhetoric, assume it is soft, and act in ways consistent with higher inflationary expectations. This behavioral response to a 'soft' Fed shows itself in hoarding goods and selling bonds.

Powell is keenly aware of Rational Expectations Theory and is anxious to maintain Fed credibility. He wants rational actors to think the Fed is 'tough.' His increasingly hawkish rhetoric proves as much. If rational actors change their minds about the Fed, therefore, treasuries crash.

LQD Investment grade bonds vs. S&P 500

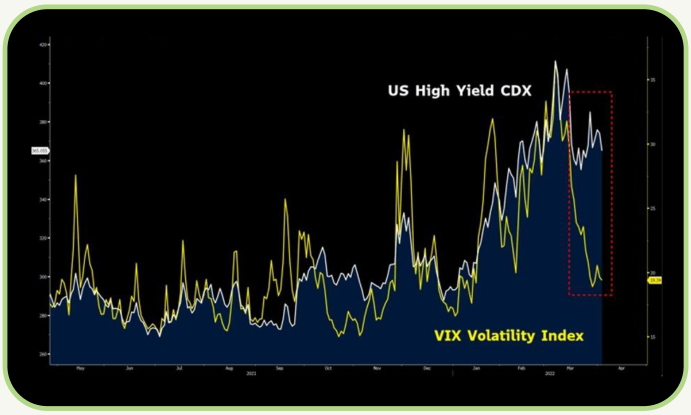


The LQD Investment Grade Bond ETF is significantly lagging the S&P 500. Although the LQD is rate-sensitive, even high yield has widely underperformed equity markets in recent weeks. Notice in September 2018, credit was weakening, while equities were just weeks away from setting their peak for the year. Credit is NOT buying this rally in stocks.

Credit vs. Equities

Junk bond pain vs. the S&P 500 is important. Marty Zweig believed high yield investors did more work than equity types. So, when he saw high yield rally, it was one of his favorite 'buy' signals. On the other hand, when he saw high yield lower, it made him cautious because he felt something was wrong under the surface. A high yield bond is effectively selling a put on an over-levered company, and you don't want the company put to you via a bankruptcy proceeding. Furthermore, if high yield continues to under-perform, more money will pull from it. Eventually it becomes a self-fulfilling prophecy not enough junk cash to refi junk bonds. We are a long way away from that, but it gives you a sense of things that generically high yield is so outperforming equities.

VIX Volatility Index vs. High Yield CDX



S&P 500 volatility (VIX) has come down substantially in the past few weeks and is now at its lowest level since early February. Meanwhile, high yield CDX (cost of default protection on U.S. high yield bonds) has tightened, but not nearly to the same extent. If the VIX fell as much as CDS spreads it would still be up near 28 vs. 19.1 today.

Truckers Deep Dive

The recently reported decline in truck jobs was the first in just under two years, but it comes after an upward revision from the month before. Truck jobs had increased for 21 months in a row, often accompanied by complaints of a driver shortage. A record number of new truck driving applications were received amidst soaring earnings for truckers, which, naturally, was followed by a record number of truck licenses being issued.

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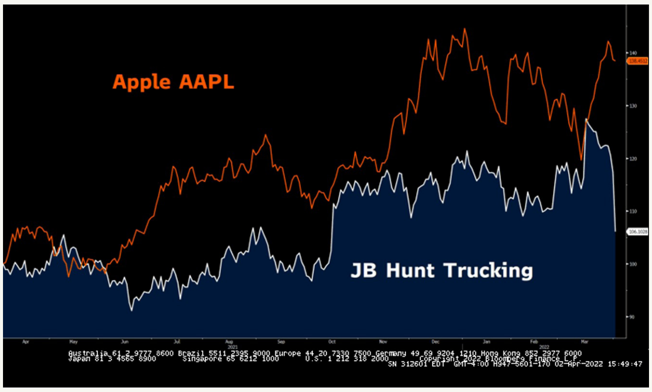
Now we get a report that a decline of 4,900 jobs took the seasonally adjusted number for total jobs in the trucking sector to 1,550,880. The last decline had been in April 2020 during the collapse caused by lockdowns. It should be noted, however, that while seasonally adjusted March showed a decline, the February non-seasonally adjusted number was adjusted higher, to 1,545,100 jobs from 1,533,100. Nonetheless, the job losses clearly surprised the market, given that March is a seasonally strong month. The decline comes against a higher base. Therefore, we may expect moderation in trucking industry wages as well, when those numbers come out in a couple of weeks. It should be noted that twelve months ago there were 55,900 fewer jobs in the trucking sector than today.

Meanwhile, the warehousing sector showed job growth, with seasonally adjusted jobs at 1,764,700, a 4,300 increase. The big-ticket news item, however, was the February upward revision from the initially reported 1,738,200 was increased to 1,760,400. Nonetheless, average weekly hours worked fell from 38.8 to 38.6, and hourly compensation fell from $23.10 to $22.85. So that may show a topping out in the warehouse sector as well.

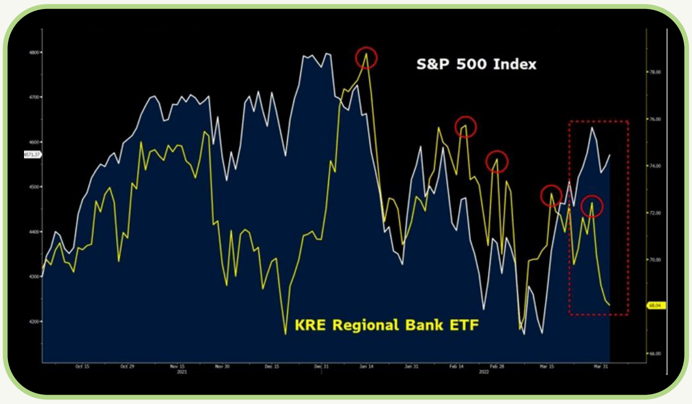
It does seem, overall, that the trucking/warehouse section of the supply chain has topped out. However, this could mean that declines are followed by increases in turn followed by declines, if the need is to keep inventories level, as opposed to outright reduce them. The real fun is over. How bad it gets going forward, or even if it gets bad at all, is much less clear.

Apple vs. JB Hunt Trucking



Numerous economically sensitive equity sectors and companies are in significant pain, despite the rally in U.S. equity indexes. Apple has completely diverged from JB Hunt Trucking, as well as many consumer-sensitive equities. In our view, this is a major sell signal for Apple.

U.S. Regional Banks are sickly



Importantly, while Apple and Tesla party on — the KRE Regional Bank ETF and the S&P 500 have significantly diverged over the past week. Since its early January peak, the KRE has been setting consistent lower and lower highs. The flattening yield curve has been a large driver here but there is clearly lending - credit risk at play as a recession nears.

Charts and data via Bloomberg LP

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A FRAMEWORK FOR SELECTING ETFS AS HEDGES AGAINST THE ONSET OF STAGFLATION

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CIO,
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Introduction

Designing a portfolio to deal with stagflation brings its own challenge when it comes to stress testing the strategy. In the early 1970s oil prices surged in the U.S. and the economy went into reverse.

But how does one test a thesis today that was based on evidence from 50 years ago? Due to lack of data, it is almost impossible to test out how most Exchange-Traded Funds (ETFs) and active funds would have behaved during that era of Stagflation.

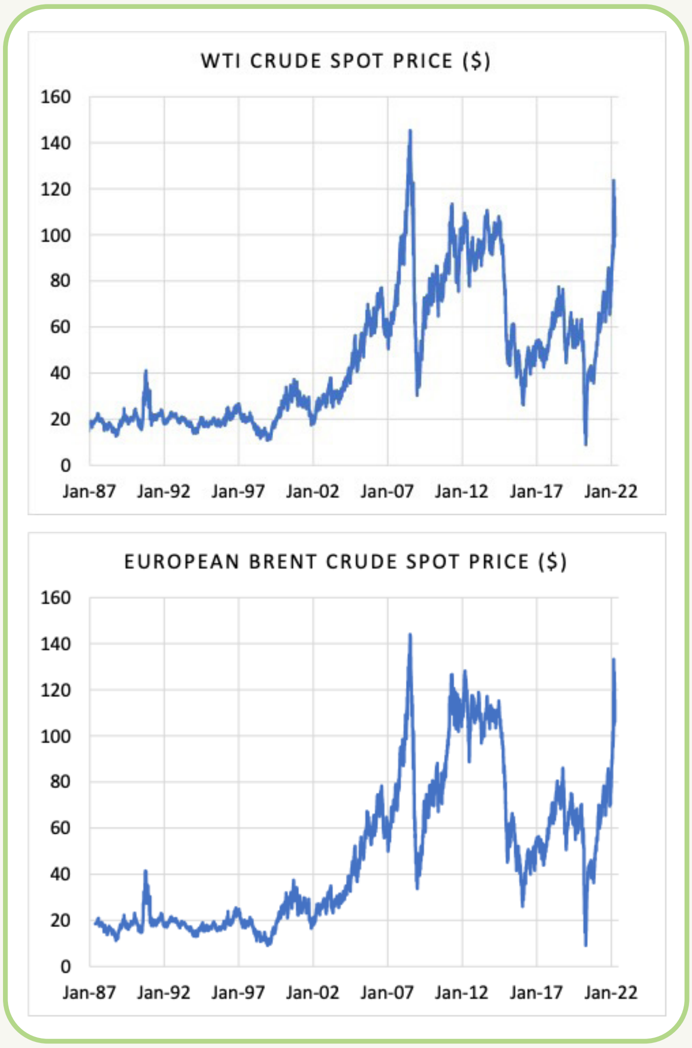
In this article we offer a 2-step framework that addresses that limitation. The first step is based on the principle that a globally diversified multi-asset portfolio offers the best defence against unanticipated events. To determine which type of asset/sub-asset classes we invest in, we use a technique from statistical science known as Cluster Analysis, using long term data sets which allows one to naturally identify separate categories of ETFs purely by their risk/return characteristics.

The second step involves filling those asset allocation 'buckets' by conversely taking a short-term snapshot of how a range of ETFs have performed during the period when the market seems to have undergone a macro-economic regime change.

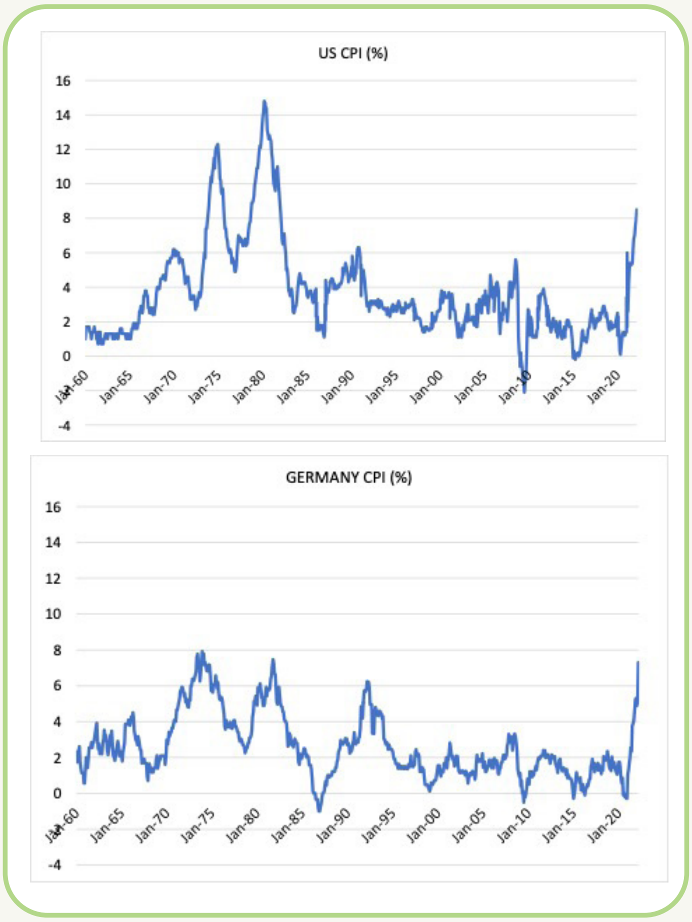
The Spectre of Stagflation

In late March 2022 several investment banks talked openly about the Fed increasing US interest rates by 50bps more than once during the remainder of the year. Since that infamous moment in 2009 when rates headed close to zero, the recent change in sentiment by the Fed's policy makers, as they look to tackle inflation, has been abrupt to say the least. By any traditional yardstick, the mere thought that the Fed would even contemplate more than one 50bps increase in a short period of time would likely signal a recession. We can add to this the dramatic impact that the war in Ukraine is having on commodity prices, and very quickly the fear of an impending period of stagflation is back on the cards.

Algo-Chain



Source: U.S. Energy Information Administration, www.eia.gov, as of 31 Mar 2022.



Source: St Louis Fed, https://fred.stlouisfed.org, as of 31 Mar 2022.

Larry Fink, Blackrock's CEO, in his letter to shareholders spoke about the peace dividend that has been in place since the fall of the Berlin Wall. Citing Russia's invasion of Ukraine as a pivotal moment in geopolitical history, Fink's view is that the ramifications will last for decades along with the macro-economic trends which in turn will reshape capital markets.

Economists invariably define stagflation *as a period when an economy experiences high inflation, along with high levels of unemployment and very little or no economic growth.*

In late 1973 the Yom Kippur War in the Middle East gave rise to a US oil embargo by OPEC producers resulting in oil prices increasing three-fold. On the back of what had been an expansionary period for the US economy, the net effect was to see a period of stagflation. However if one deconstructs the macro-economic policies at the time, there are clear parallels with the situation today, admittedly more so in Europe than in the US, as Russia's oil and gas pipeline has brought the topic of energy security into sharp focus.

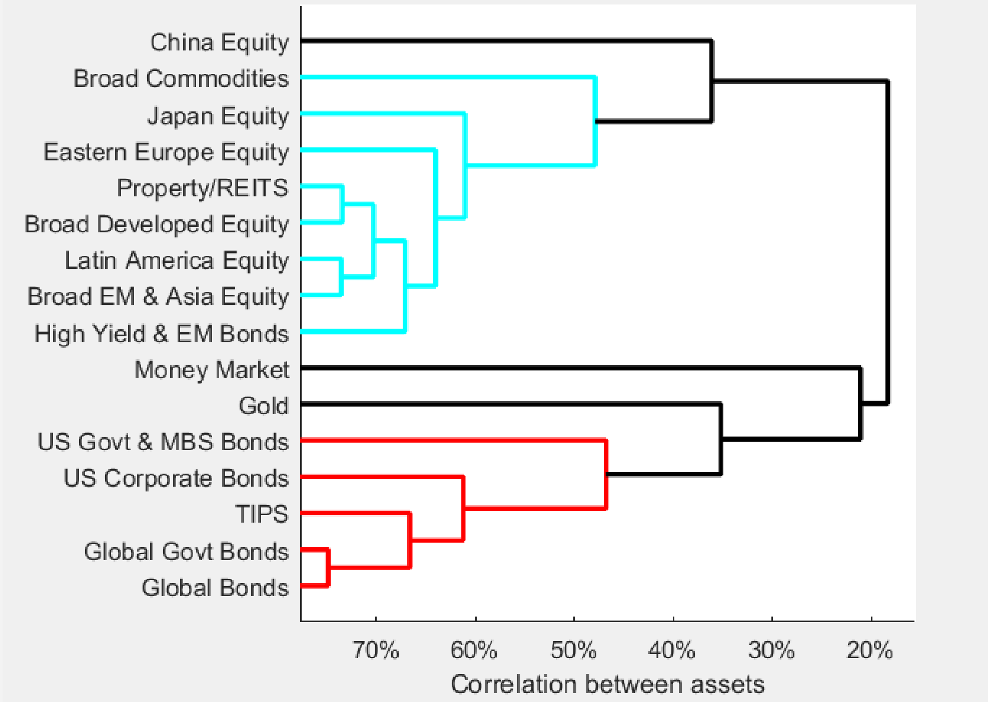
Investment managers face a renewed urgency to deal with this changing landscape, characterised by fixed income bond prices remaining under pressure, commodity prices whipsawing from one day to another, and the 'easy returns' that the tech bubble offered no longer to be relied upon. Welcome to the world of stagflation investing.

The 12,000+ ETF Portfolio Conundrum

Since its inception in 1990 when the world's first ETF was created in Canada, the industry has grown beyond all recognition. With over $10 trillion in assets and over 12,000 ETFs listed in Europe and the US, the sheer number of the funds available for inclusion within a multi-asset portfolio presents an investment manager with a problem that the pioneers of the industry didn't face at the time. With so many investment themes and ideas available as an exchange traded product, one can be forgiven for asking: where does one start?

As is often the case with some headline numbers, they can be misleading, as it is with the 12,000+ listings. Under closer inspection, many of those listings represent the same fund, albeit listed on a different exchange or offered as a different currency share class. In addition, we need to also remember that the same product idea is offered by different product

Cluster Analysis for a Select Set of ETFs



Source: Algo-Chain, Markit, data from 31 Dec 2001 to 31 Mar 2022 in USD.

providers as personified by there being over 100 listings each that track the S&P 500 Index. Within that coveted list, the SPDR S&P 500 ETF will always stand out with almost $400 bn in assets under management.

Notwithstanding those duplications, restricting one's attention to listings on the London Stock Exchange still leaves over 1,000 distinct investment tools to choose from.

But are they truly distinct, or instead highly correlated?

This is the real question one must address, particularly when building a multi-asset portfolio – the more independent factors one has, then the better the free lunch of diversification tastes. Our own preferred method for addressing this issue is to use a technique from data science, called cluster analysis. The basic idea is to use the metric of pairwise correlation between ETF returns to decompose a large list of ETFs into a much smaller set of clusters.

The diagram in the chart above shows how an input list of 37 distinct ETFs can be broken down into 12 subsets each that contain one or more ETFs. In theory one could start with 1,000 ETFs and then decompose that list into 12 similar subsets, but in practice data limitations will get in the way. Instead, we restrict our attention to those ETFs where the benchmark itself has a long history (at least 20 years) and the exposures can be described as somewhat distinct. The resulting set of reference clusters then becomes our starting point from which to make specific ETF selections. At its simplest, one could choose one or more ETFs from each of the clusters to then populate a pre-chosen asset allocation model. Not forgetting that it will be that asset allocation model that will dictate what the target risk will be of the actual portfolio.

Invoking Benjamin Graham and his Voting Machine When Selecting ETFs

Attributed to Benjamin Graham, the founding father of Value Investing, but made popular by Warren Buffet, the phrase 'In the short run, the market is a voting machine, but in the long run, it is a weighing machine' does offer some guidance when selecting ETFs. None of us can say for sure what will turn out to be the best investments over the next 1 or 5 years, but we can at least look to see what the voters in the markets are saying.

The change of sentiment since the start of 2022 has been quite abrupt, a situation that has become more acute since the Russian invasion of Ukraine. For each of the ETFs in the separate clusters, we constructed a Z-Scored Momentum signal to provide a simple framework to identify what the 'voters' have been saying. Unlike single stocks, diversified ETFs don't generally come with idiosyncratic risk, suggesting they might even do well when they get put onto the weighing machine in one or more years' time.

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The two tables below show, for illustration purposes, a range of exposures that one might think of working well during periods of stagflation. We run these exposures through our Z-Scored Momentum machine (with a half-life of 30 days). One will find some typical exposures amongst the top 10, like Utilities, Agribusiness, and general commodities. More surprising at first sight might be that TIPS and other 'inflation protection' exposures are in the bottom 10, with TIPS having a value of -2 (out of a range between +2 and -2, signalling a clear buy/sell signal). The Tabula Enhanced Inflation ETF, a mix of inflation-linked bonds and breakeven inflation, does not fair that much better with a value of -0.66.

These league tables can be of use when deciding which ETF selections to make from the available list of ETFs in each of the separate clusters.

Top 10 ETFs by Momentum Signal

ETF Name	23 Mar 2022	24 Mar 2022	25 Mar 2022	28 Mar 2022	29 Mar 2022	30 Mar 2022	31 Mar 2022	01 Apr 2022	04 Apr 2022	05 Apr 2022	06 Apr 2022	07 Apr 2022
Global X Renewable Energy Producers UCITS ETF ... - RNRG_LN	1.82	1.99	1.87	1.95	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Invesco Utilities S&P US Select Sector UCITS ETF - XLUS_LN	0.80	1.10	1.55	1.69	1.92	2.00	1.97	2.00	1.99	2.00	2.00	2.00
iShares Agribusiness UCITS ETF USD (Acc) - SPAG_LN	1.92	2.00	2.00	1.90	1.38	1.56	1.44	1.50	1.41	1.33	1.19	1.29
SPDR Barclays EM Inflation Linked Local Bond ... - EMIL_LN	1.21	1.30	1.49	1.33	1.66	1.75	1.72	1.82	2.00	1.84	1.53	1.27
VanEck Vectors Rare Earth and Strategic Metals ... - REGB_LN	1.89	2.00	2.00	1.77	1.99	2.00	2.00	2.00	2.00	2.00	1.74	1.21
VanEck Vectors Gold Miners UCITS ETF - GDGB_LN	1.71	1.65	1.62	1.31	1.36	1.47	1.33	1.59	1.48	1.20	1.09	1.18
L&G Quality Equity Dividends ESG Exclusions ... - LDAG_LN	1.23	1.37	1.28	1.19	1.47	2.00	1.92	1.78	2.00	2.00	1.70	1.12
Lyxor EUR 2-10Y Inflation Expectations UCITS ETF - INFL_LN	1.05	1.26	1.01	1.07	1.66	2.00	1.40	1.39	1.17	1.03	1.13	0.87
WisdomTree Broad Commodities - AGCP_LN	2.00	2.00	2.00	1.43	0.99	1.37	1.00	0.87	1.08	1.12	0.81	0.82
SPDR S&P Global Dividend Aristocrats ESG UCITS ... - GEDV_LN	0.97	1.29	1.29	1.62	2.00	2.00	1.21	1.47	1.35	1.13	1.06	0.79

Source: Algo-Chain, Markit, as of 7 Apr 2022

Bottom 10 ETFs by Momentum Signal

ETF Name	23 Mar 2022	24 Mar 2022	25 Mar 2022	28 Mar 2022	29 Mar 2022	30 Mar 2022	31 Mar 2022	01 Apr 2022	04 Apr 2022	05 Apr 2022	06 Apr 2022	07 Apr 2022
Lyxor SG Global Quality Income NTR UCITS ETF - SGQP_LN	0.04	0.19	0.38	0.30	0.59	0.80	0.45	0.84	0.74	0.72	0.82	0.70
The Royal Mint Physical Gold ETC Securities - RMAU_LN	0.91	1.43	1.20	0.88	0.40	0.78	0.89	0.65	0.63	0.84	0.58	0.59
Lyxor US$ 10Y Inflation Expectations UCITS ETF - INFU_LN	2.00	2.00	1.94	1.93	1.15	1.19	1.03	0.55	0.52	0.74	0.62	0.58
iShares $ Corp Bond Interest Rate Hedged UCITS ... - LQDG_LN	-0.17	-0.37	-0.08	-0.02	0.17	0.24	0.13	0.18	0.54	0.48	0.31	0.35
Invesco Morningstar US Energy Infrastructure ... - MLPQ_LN	0.18	0.38	0.52	0.40	0.41	0.42	0.26	0.33	0.43	0.33	0.31	0.32
iShares Asia Property Yield UCITS ETF USD (Dist) - IASP_LN	0.18	0.23	0.26	0.23	0.48	0.55	0.41	0.47	0.59	0.59	0.41	0.14
SPDR Dow Jones Global Real Estate UCITS ETF - GBRE_LN	-0.46	-0.38	-0.13	0.01	0.61	0.46	0.18	0.47	0.30	0.19	0.29	0.08
Lyxor $ Floating Rate Note UCITS ETF - BUOY_LN	-1.14	-1.10	-1.09	-0.99	-0.89	-0.80	-0.80	-0.71	-0.68	-0.57	-0.59	-0.60
Tabula US Enhanced Inflation UCITS ETF (USD) - Acc - TINF_LN	1.41	0.98	0.64	0.53	-0.13	0.13	-0.28	-0.66	-0.66	-0.66	-0.66	-0.66
iShares $ TIPS 0-5 UCITS ETF - TIP5_LN	0.42	0.35	-0.36	-0.46	-1.23	-0.96	-1.39	-2.00	-2.00	-2.00	-2.00	-2.00

Source: Algo-Chain, Markit, as of 7 Apr 2022

Examples of ETFs to Consider as Suitable as a Hedge Against Inflation

Innovation has always been one of the hallmarks of the ETF industry as each competing ETF provider looks to gain market share with their latest fund launches. In this final section we shine the focus on a variety of ETFs that we believe are useful tools to have in one's stagflation toolbox, covering the four key categories of ETFs, namely Alternatives, Commodities, Fixed Income & Equities. The 8 individual charts below show how these ETFs have performed during Q1 2022, as measured in USD, during a period when the talk of rate rises, and oil spikes became the order of the day.

ETF Asset Class: Alternatives

Invesco Morningstar US Energy Infrastructure MLP UCITS ETF
Management Fee 1.25%, AUM $360m

This ETF tracks the Morningstar MLP Composite Index which aims to provide diversified exposure to US publicly traded energy master limited partnerships (MLPs). Each constituent is weighted by the dollar value of their annual distribution and is capped at 10% and rebalanced quarterly and reviewed semi-annually.

Implemented as a swap-based ETF, on a year-to-date basis, this comfortably outpaced the S&P 500 index, providing access to an investment class not readily available to all investors. More expensive than most ETFs, but sometimes it's worth paying for that niche exposure.

SPDR Dow Jones Global Real Estate UCITS ETF
Management Fee 0.40%, AUM $340m

The Dow Jones Global Select Real Estate Securities Index tracks over 250 Real Estate Investment Trusts, REITs, and Real Estate Operating Companies, REOCs, thus providing an investor with a US centric, but globally diversified portfolio.

The risks that come with a REITs business model are very much in line with the key risks of the day, stagflation driven by energy prices. With regards to rate rises, these businesses have had plenty of time to restructure their loan book and hedge out some of their duration risk.

A recent innovation in this field has been the recent launch of REITs ETFs that focus their allocation to niche sectors within the property market, which are expected to continue to perform well even during a downturn. These are the WisdomTree New Economy Real Estate UCITS ETF and the First Trust Alerian Disruptive Technology Real Estate UCITS ETF.

ETF Asset Class: Fixed Income

Lyxor EUR 2-10Y Inflation Expectations UCITS ETF
Management Fee 0.25%, AUM $3,300m

This ETF is noteworthy for its innovative approach to the way it looks to provide the investor with exposure to an inflation risk premium. First the facts, tracking the Markit iBoxx EUR Breakeven Euro-Inflation France & Germany Index, this ETF looks to provide exposure to breakeven inflation by entering into a long position in inflation-linked bonds issued by France and Germany and a short position in France and Germany sovereign bonds. A similar product also exists that looks to provide exposure to US Breakeven Inflation, this time with a portfolio of a long US TIPS position netted off against a short US Treasuries position. In both cases the product is delivered as a swap-based ETF.

The ETF has performed very well during the first quarter of 2022, delivering over 3.5% in USD and with currency appreciation close to 7% in EUR. Whether that level of returns can be maintained is unlikely, but it does offer a very effective way to ride the inflation wave.

SPDR Barclays EM Inflation Linked Local Bond UCITS ETF
Management Fee 0.55%, AUM $41m

While many Fixed Income ETFs are likely to get crushed in the months ahead, that's not true for every ETF. Courtesy of the ETF team at State Street, with their SPDR Barclays EM Inflation Linked Local Bond ETF, this fund offers a not so common combination of Emerging Market debt and inflation linked coupons.

Given the optics of the Developed Fixed Income Market, this almost looks too good to be true. With a yield close to 9% and a year-to-date performance above 7% (as of the 5th of April) then this product looks attractive. How is this possible, well the magic is provided by the underlying portfolio which comprises 70 or more local EM currency inflation-linked bonds.

ETF Asset Class: Equities

Global X Renewable Energy Producers UCITS ETF
Management Fee 0.50%, AUM $2.2m

This newly launched product from the US ETF issuer, Global X, tracks an index that produces energy from renewable sources such as wind, solar, hydroelectric, geothermal, and biofuels. If any new fund launch captures the zeitgeist of 2022, then this ETF must surely be a strong contender. Comprising 46 holdings, this ETF could benefit from the renewed crisis around the topic of energy security which

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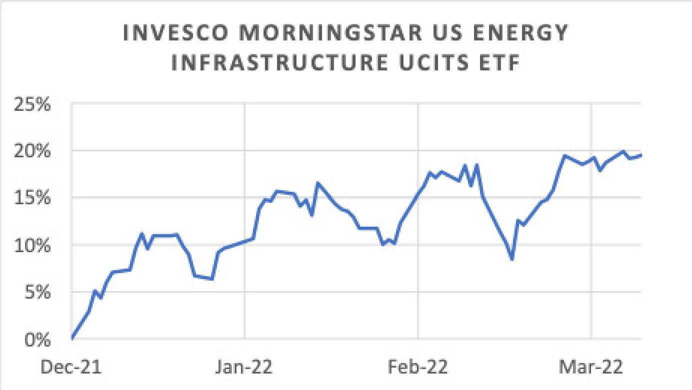
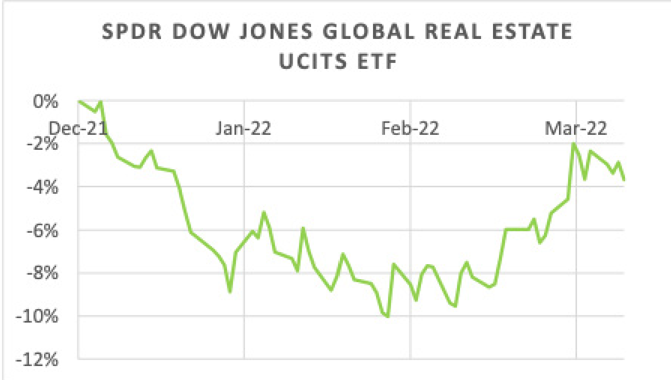
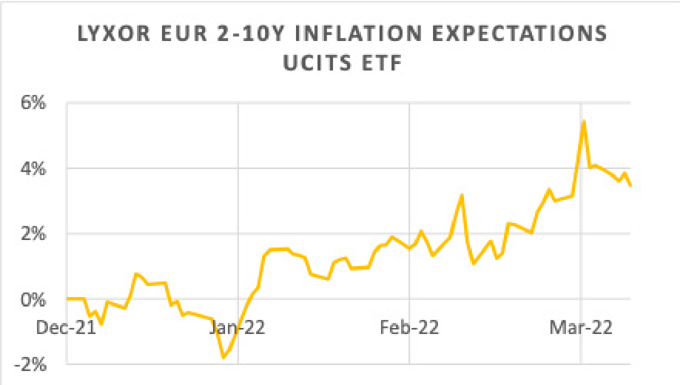
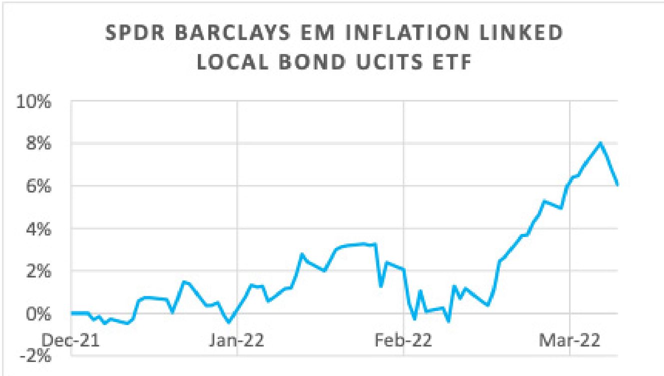
Alternative ETFs



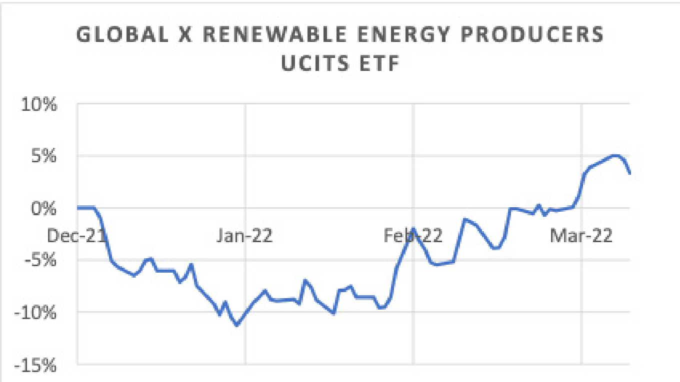


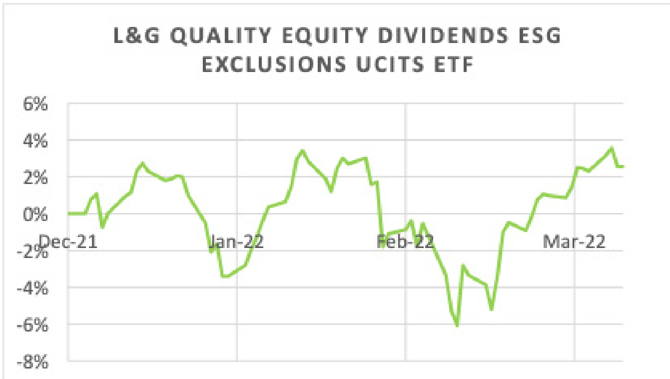
Fixed Income ETFs



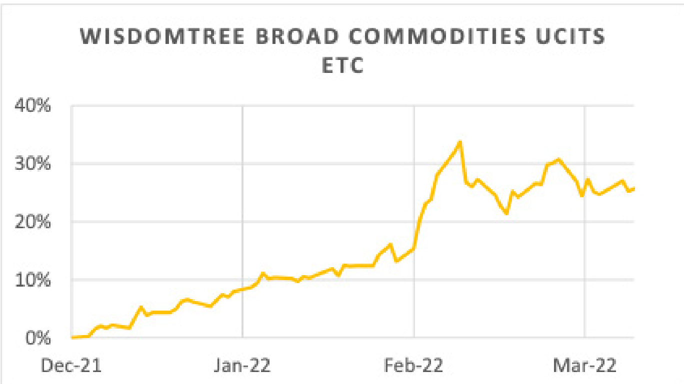


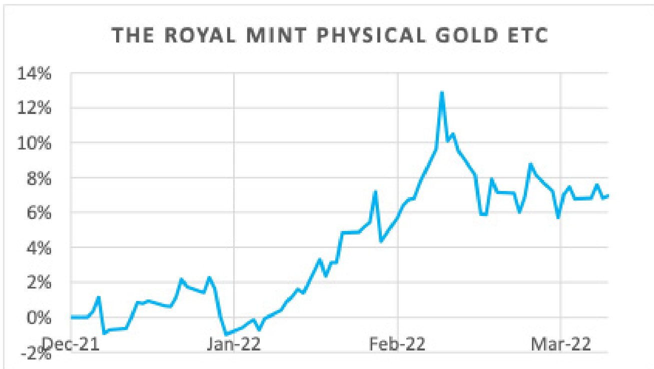
Equity ETFs





Commodity ETFs





Source: Algo-Chain, Markit, as of 7 Apr 2022, in USD does favour renewables.

For new product launches in the ETF space, most institutional investors are forced to take a wait and see approach. Institutional mandates invariably require a fund to have $100m or more in assets under management, which counts this ETF out of the running launch in Dec 2021 with only seed money in the asset pool. In the meantime, the Global X will need to rely on retail investors to pick up the gauntlet.

L&G Quality Equity Dividends ESG Exclusions Asia Pacific ex-Japan UCITS ETF
Management Fee 0.40%, AUM $24.3m

It seems like a lifetime ago when dividend branded ETFs were the order of the day, that was until all things tech and thematic pushed value investing to the side-lines. Ok, there was a false dawn about one year ago when many commentators were excitedly writing about the rotation from growth to value stocks, but this time around it feels like it might be a trend that's here to stay.

There will always be a need for income paying equity ETFs, but in an era dominated by ESG rated funds, then it was only natural the ETF issuers would bring these two aspects of investing into one fund. Paying a dividend yield of over 5% this particular ETF was launched one year ago by L&G who have slowly but surely built the reputation as an innovative ETF issuer.

ETF Asset Class: Commodities

WisdomTree Broad Commodities UCITS ETC
Management Fee 0.49%, AUM $200m

The current macroeconomic regime change has been personified by the extreme levels of market volatility in some commodity sectors. So much so that the London Metal Exchange suspended trading nickel contracts last month, and in a matter of minutes tarnished its reputation. While it is tempting to include pure commodity plays in one's portfolio to deal with the onset of stagflation, the risks that come with extreme drawdowns (what goes up must come down!) does suggest a more considered approach might be required.

This ETF from WisdomTree provides a good antidote to that concentration risk with exposure to Energy, Agriculture, Industrial Metals, Precious Metals and Livestock. Even though this fund was launched over 15 years ago, it has taken all of the time since the crash of 2008 to just about break even. Be warned, even broad commodity exposures might catch you out!

The Royal Mint Physical Gold ETC Securities
Management Fee 0.22%, AUM $525m

The last of the ETFs in the spotlight is a fund that provides investors with an investment into gold. While this is not a particularly original proposition there are several aspects worthy of discussion. On paper, given the other precious metals accessible to investors, there is an argument to be said that gold should not hold the coveted position that it does. However, this launch has shown that with the right brand the retail investment community will pay attention. Since the launch two years ago this fund has gathered $525m in AUM.

With the recent press release, it has been announced that this fund sources gold on a best endeavour basis, to assure investors that the gold is from an audited conflict-free source. The gold will be backed, in part, by bars made from recycled gold. It is conceivable in the years ahead, that this way of thinking could become the norm across several aspects of the Financial Services industry, so it will be interesting to see what the take up is on this variation to investing in Gold.

What to do next?

As an investor, it would be ideal if a single idea or approach did the job, but unfortunately it is never as simple as that. We have laid out a framework to categorize and differentiate a large input list of ETFs based on their long-term behaviour, combined with a selection process that looks to exploit the fact that the decision to invest is akin to a 'here and now voting' mechanism.

This does not, however, address the question of how frequently one should re-balance a portfolio. The real problem is always one of timing and out-of-date information. By the time one has enough evidence that any Stagflation era has come to an end, one will have missed the ideal time by which to mitigate against that change of economic regime. Fortunately, one can benefit from the truisms that are better known as 'best practices' elsewhere. If one maintains the target risk profile of a diversified portfolio, that alone will mean there will be less surprises, which in turn pre-supposes that the original asset allocation model is indeed diversified across asset classes and geographies.

The opportunity set that ETFs brings to the table is vast, and even accounting for the fact that no single ETF can, with a 100% certainty, act as a hedge against Stagflation. One could do worse than embedding any Stagflation friendly

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AN UPDATE ON CHINA Q1.2022

Antonio Curia,
Executive Director,
Wimmer Financial LLP

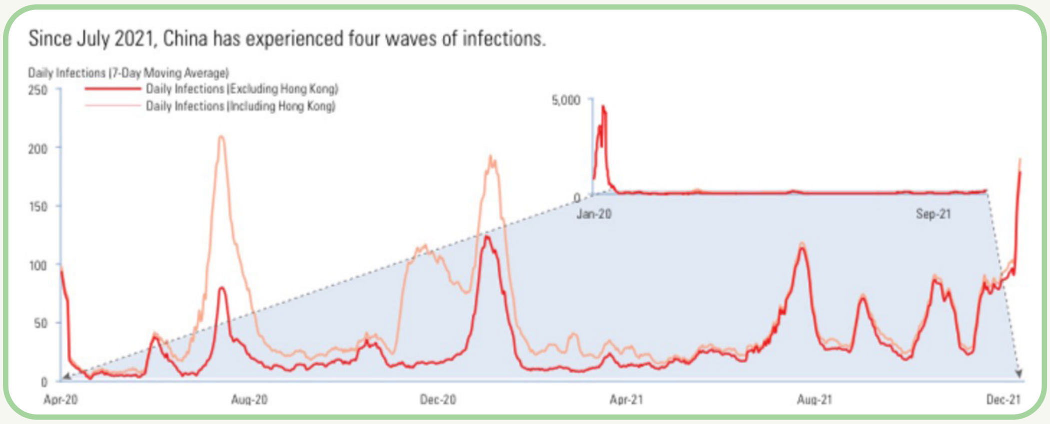
We expect 2022 to be a year of rebalancing in the Chinese economy as the government looks to find a balance between supporting economic growth and accelerating structural reforms and sustainability initiatives.

Growth remains a key part of China's story, but the government is now more focused on fostering sustainable, broad-based growth.

The situation in the Indo-Pacific is a slowly developing story between China and Taiwan.

China's easing of monetary policy, seen against a tightening bias in the West, could also strengthen the investment case for both Chinese equities and stocks in the broader emerging market universe.

The start of 2022 marks almost two years since the start of the coronavirus pandemic. Over the last 24 months the markets have experienced a rollercoaster of highs and lows, several which have been unexpected. The main concern for investors in the year ahead is finding ways to protect their capital from being eroded by rising inflation, whilst also keeping the portfolios in line with their risk budgets. Chinese policymakers have remained adamant about adhering to 'zero-COVID', which may entail additional downside risks. However, China's National Medical Products Administration's decision to approve Pfizer's COVID-19 drug Paxlovid is an encouraging sign that policymakers are gearing towards gradual reopening in H2-22. Despite the volatility in markets over recent years, a number of asset managers believe the year ahead will be one of an adjustment to the new normality for investors. Markets across the world are expecting central banks to eventually raise real interest rates in order to deal with increasing inflation and high growth. The outlook, however, is deemed to be positive with normal levels of growth expected to resume, and a number of opportunities still available.



Data through December 29, 2021. Source: Investment Strategy Group, JHU

China's 2021 woes stemmed from a combination of shrinking credit availability, acute debt in the property sector and restrictive regulatory forces. Heightened competition with the US in technology and cybersecurity was another burden. US-China frictions could intensify in 2022. According to figures by the Peterson Institute of International Economics, China only met +/-60% of its obligations under the phase one trade deal. President Biden will be under pressure to adopt a harsher stance on China in 2022. As a result we could witness increased regulation, restricting Chinese companies from accessing US technology and capital markets.

China's economy was still quite strong in 2021, with consensus for real gross domestic product (GDP) growth at around 8.5%; this follows 2020's growth of 2.3%, the strongest among major economies. However, we have seen a broad-based slowdown in recent months because of the COVID-19 Delta and Omicron variants, government environmental controls, and regulation impact.

One big scare came from China's deleveraging drive, made possible by the strong economic backdrop earlier in the year. This rattled the property sector, which has far-reaching importance to China's economic health. Evergrande - China's second-largest developer - defaulted, forcing authorities to step up support. Stock prices negatively reacted, but the contagion has been contained so far by broad restructuring and a call on banks to boost real estate lending and ease debt restrictions to shore up market liquidity.

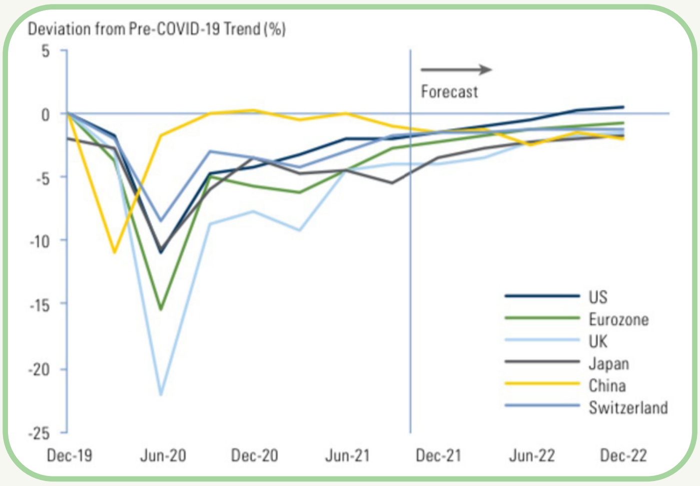
Whilst we expect that China will continue to discourage speculation, shares of developers and property management companies could recover if investor sentiment improves from last year's overly pessimistic response. Regulation temperament has been another sticky concern. But after a crackdown on education and tech companies last summer, we think China's focus is now on implementing regulations, rather than more tightening. This was the theme of December's Central Economic Work Conference, where minutes showed a shifting emphasis to economic stability and energy, as well as a steady emphasis on carbon (green) initiatives, and away from regulation.

The expectation for 2022 is to be a year of rebalancing in the Chinese economy as the government looks to find a balance between supporting economic growth and accelerating structural reforms and sustainability initiatives; namely Common Prosperity and carbon neutrality. This may lead to decelerating growth to around 5.5% in 2022.

China's debt-to-GDP ratio continued to decrease in Q4 2021 to 264.3%, from 266.5% in Q3. Notwithstanding the deleverage path in 2021, the debt is still much higher than the pre-pandemic one (247.5% in Q4 2019). Overall, China's debt ratio experienced a reduction throughout 2021 from its earlier peak, led by the corporate sector, but there was a steady increase in public debt. The recent Central Economic Work Conference suggests efforts to control debt and rein in the property sector will continue. Aside from the quick rebound in GDP which helped to ease the denominator effect, the declining debt also signalled China's relatively tightened financial measures to contain debt expansion. These tightening measures have not derailed growth too much as 2021 ended with over 8% real GDP growth rate.

Source: Natixis
N.B. LGFV only includes the marketized value for all the entities that publicly report financial statements or issue bond

Overall, we expect macro policies to become more accommodating in 2022 to support the growth target. President Xi's stated goal is to double the size of China's GDP by 2035, which equates to average annual real growth of about 4.7% for the next 15 years. It would start higher and decline, probably toward 3% as we approach 2035—but that is still a healthy growth for a $14.5 trillion economy.



Data through Q3 2021, forecast through Q4 2022.
Source: Investment Strategy Group, Haver Analytics.

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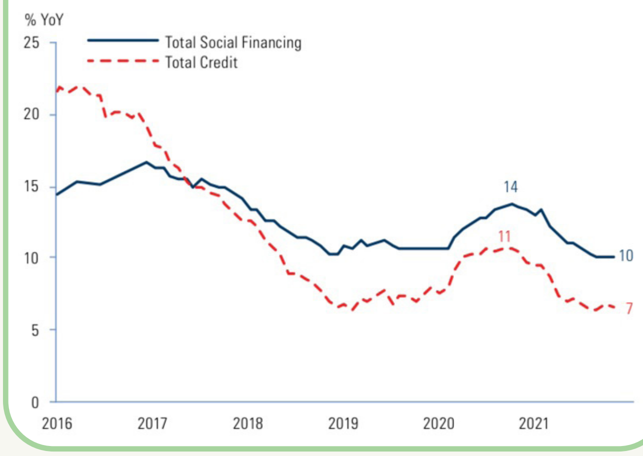
	2020	2021	2022	2023
China	2.4	8.0	4.5	5.0
US	-3.4	5.5	3.5	2.6
EU	-5.9	4.8	3.9	2.4
UK	-9.7	6.0	4.2	2.5
Global	-3.2	5.6	3.8	3.5

China recently started to loosen its monetary policy and has ample room to ease further, in our view, after tightening for the past year. This should help stabilize the economic backdrop and support corporate earnings. The country's credit impulse—the change in newly issued credit relative to GDP—seems close to an inflection point and is on the rise.

Credit Impulse (Percent)

As of December 31, 2021
Source: CLSA and AllianceBerstein (AB)

Credit growth has slowed since late 2020 as policymakers gradually dialed back stimulus.



Data through November 2021.
Note: ISG credit measure includes total social financing (excluding equities), government bonds, "missing" shadow credit and external debt. Source: Investment Strategy Group, CEIC, Haver Analytics.

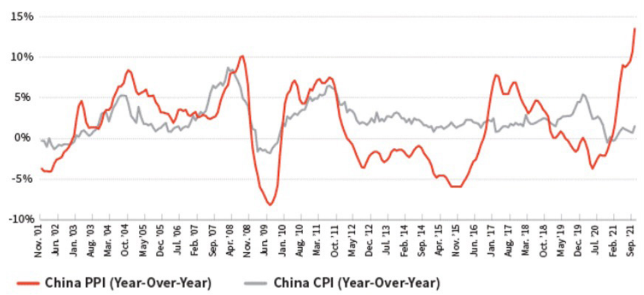
Inflation:

China's producer price index (PPI) year-over-year change was 13.5% in October 2021, the highest level in the last 20 years. This sharp increase was driven by rising global commodities prices, structurally reduced supply of manufacturing capacity as a result of supply-side reforms, infrastructure stimulus, and export growth. But China's consumer price index (CPI) year-over-year increase in October 2021 was only 1.5%. There are structural reasons for this huge divergence. China has a strong and growing e-commerce business, which tends to lead to price deflation.

Also, Chinese manufacturers have been able to largely absorb PPI pressure despite some margin compression in the near term given the compensation from strong unit volume growth and improved cost structure.

Inflation Gap—Chinese Producer and Consumer Prices Diverge

Despite a massive spike in producers' input costs, consumer price growth in China remained muted in the second half of 2021. Inflation will be an important trigger for the performance of China's markets in 2022.



Source: Bloomberg, as of November 2021

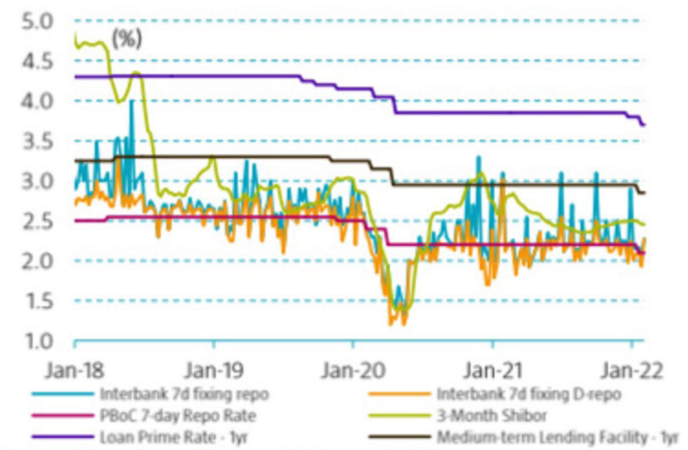
The situation in the Indo-Pacific is a slowly developing story between China and Taiwan. With Taiwan one of the largest producers of semiconductors, any disruptions could produce shortages and serious supply chain issues for everyone using semiconductor chips. The Forex markets might also be a good proxy for these developing events. Moves in the yuan and yen could foretell possible problems.

Monetary:

The People's Bank of China (PBoC) has continued to tighten monetary policy—its balance sheet has shrunk from over 40% of GDP to between 30% and 35% of GDP, reducing its size to nearly half of what it was in 2009. Meanwhile, China has started to loosen its monetary policy. After tightening for the most part in 2021, the PBOC pivoted towards a more accommodative stance during the Central Economic Work Conference, on December 10. The PBOC's stance has therefore officially changed from 'cross-cyclical adjustment' to 'counter-cyclical support'. Its easing stance, seen against a tightening bias in the West to counter inflation, could strengthen the investment case for Chinese equities and broader emerging market stocks. Although rising inflation is a global phenomenon and producer prices in China have climbed, Chinese producers' margins have been more resilient than we expected, signalling their ability to pass on some cost increases to end-consumers locally and overseas. This partly reflects the world's continued dependence on China for a wide range of goods in the absence of alternative sources of supply. We expect global inflationary pressures to recede in 2022, though not to the previous lows.

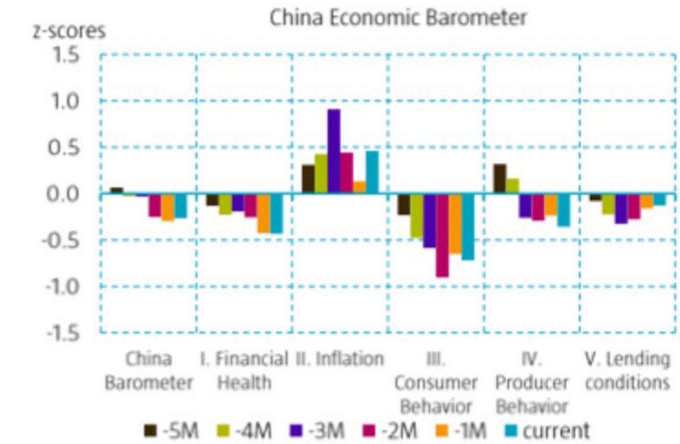
The pandemic could continue to obstruct supply chains, while US trade tariffs and a general deterioration in global trade relations in recent years could underpin inflation structurally. We expect additional fiscal stimulus measures to be announced ahead of the National People's Congress (NPC) in early March. The consensus so far has focused on targeted spending on new infrastructure. This would provide impetus behind economic activity, while simultaneously avoiding exacerbating pressures on perceived asset bubbles such as the real estate market. Recent policy announcements certainly point in this direction.

Chart 1. Selected policy and money market rates



Source: Bloomberg, Robeco; 3 February 2022

Chart 2: Barometer signals still-subdued momentum



Source: Bloomberg, Robeco; 3 February 2022

The outlook for China comes with caveats, one of which is how the pandemic plays out. China has adopted a 'zero-COVID-19' strategy, due in part to its large population and the sizeable health care costs that uncontrolled outbreaks would incur. We do not see China opening up meaningfully without a higher vaccination rate and proof that available vaccines would be effective against any coronavirus variant. The strict approach could also last at least until the Chinese Communist Party's 20th National Congress in late 2022. We expect travel restrictions and other curbs to keep domestic consumption subdued.

2022 has already shown investors that it could be a pivotal year for all markets because of the ongoing pandemic and the geopolitical tensions we're currently facing.

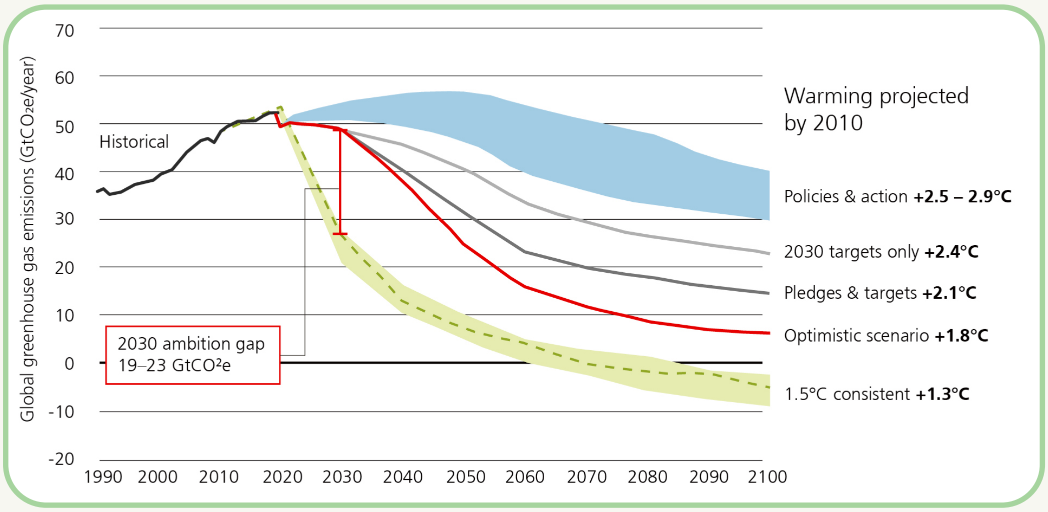
THE ROLE OF INVESTORS AND CORPORATES IN TACKLING CLIMATE CHANGE

Andrew Walsh,
Head of UBS ETF & Index Fund Sales,
UBS

What is the scale of the problem?

While climate change has taken center-stage in recent years, it can be overwhelming to understand both the magnitude of the challenge that lies ahead of us, as well as the limited time at our disposal to act and transition towards a net-zero economy. According to the Intergovernmental Panel on Climate Change (IPCC), global warming scenarios of 1.5°C and 2°C will both be exceeded during the 21st century unless deep reductions in emissions occur in the coming decades. As shown in Figure 1, the reduction in global emissions will have to be drastic to stay consistent with 1.5°C and 2°C scenarios. To keep the 1.5°C target within reach, the world needs to halve emissions over the next decade to reach net zero emissions by the middle of the century.

Figure 1: Warming projections under different scenarios

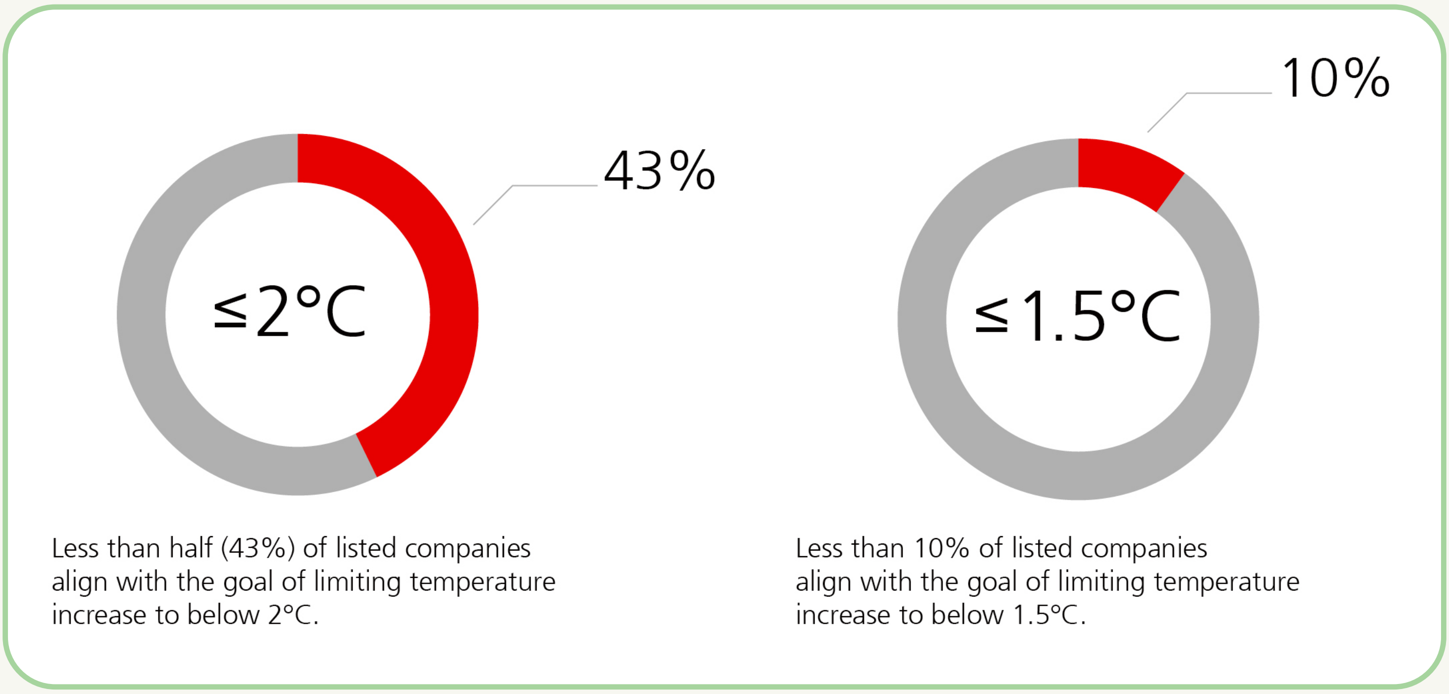


Source: Climate Action Tracker

What is the current situation?

To assess how companies are currently aligned to these different scenarios, we can use the MSCI Implied Temperature Rise assessment, which provides an indicative temperature alignment for companies which can easily be compared to global warming scenarios depicted in Figure 1. Unfortunately, a substantial portion of listed companies are still misaligned with these goals. According to MSCI[1], and as shown on Figure 2, less than 10% of the MSCI ACWI IMI constituents are aligned with the goal of limiting temperature increase to below 1.5°C, while less than half are aligned with a below 2°C target.

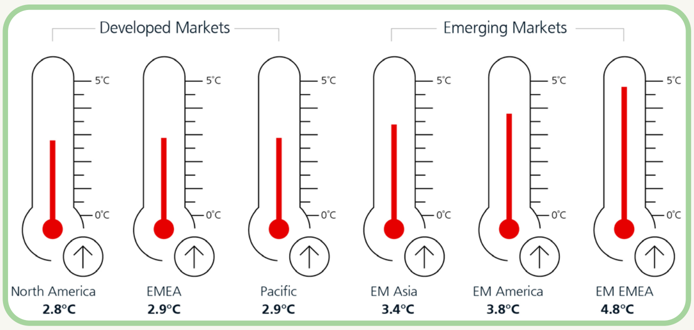
Figure 2: Percentage of MSCI ACWI IMI constituents aligned with temperate increase scenarios



Source: MSCI, Net-Zero Tracker, October 2021

If we break down the implied temperature rise of listed companies by region, Figure 3 indicates that none of the regions are aligned with the Paris Agreement target, and by quite a wide margin. Companies in developed markets are showing lower temperature rise levels compared to emerging markets, but they still fall short of global targets.

Figure 3: Implied temperature rise of listed companies by region



Source: MSCI, Net-Zero Tracker, October 2021

MSCI Climate Paris-Aligned indexes aim to be aligned with a 1.5°C scenario by 2030, which can support investors with their net-zero commitments. Thanks to their 10% self-decarbonization trajectory, we can already observe how they are moving towards their target. For example, the implied temperature rise of the MSCI ACWI Climate Paris-Aligned index is equal to 2.12°C, while the MSCI ACWI index exhibits a rise of 2.97°C[2].

The role of corporates in transitioning to a more sustainable future

Corporates will play a significant role in the transition towards a more sustainable economic future as they will have to significantly decarbonize their business operations and products. To help financial-market participants understand, manage, and disclose their exposure to climate risk (physical and transition) and climate opportunities, the Task Force on Climate-related Financial Disclosures (TCFD) recommends that firms enhance their climate disclosures along four dimensions[3]:

1) the role of the board of directors in assessing and managing climate risks and opportunities (Governance)

2) identifying the types of risks and opportunities posed by climate change (Strategy)

3) disclosing firm processes surrounding core risk management steps (Risk Management)

4) disclosing climate metrics and targets used to identify climate risks and opportunities (Metrics and Targets)

[1] The MSCI Net-Zero Tracker, October 2021
[2] Source: MSCI. Index holdings as of 28 February 2022, Climate data as of 03 March 2022.
[3] Source: MSCI. FAQ-Understanding MSCI Climate Indexes. November 2021.

The MSCI Climate Paris-Aligned indexes are aligned with the recommendations of the TCFD. This is important, as the four dimensions holistically integrate how corporates are assessing the impact of climate change on their businesses, how they are adapting their strategies accordingly and how they manage climate risks / opportunities. Setting emission reduction targets and reporting on emissions is a crucial step for corporates, as we will show in the next section.

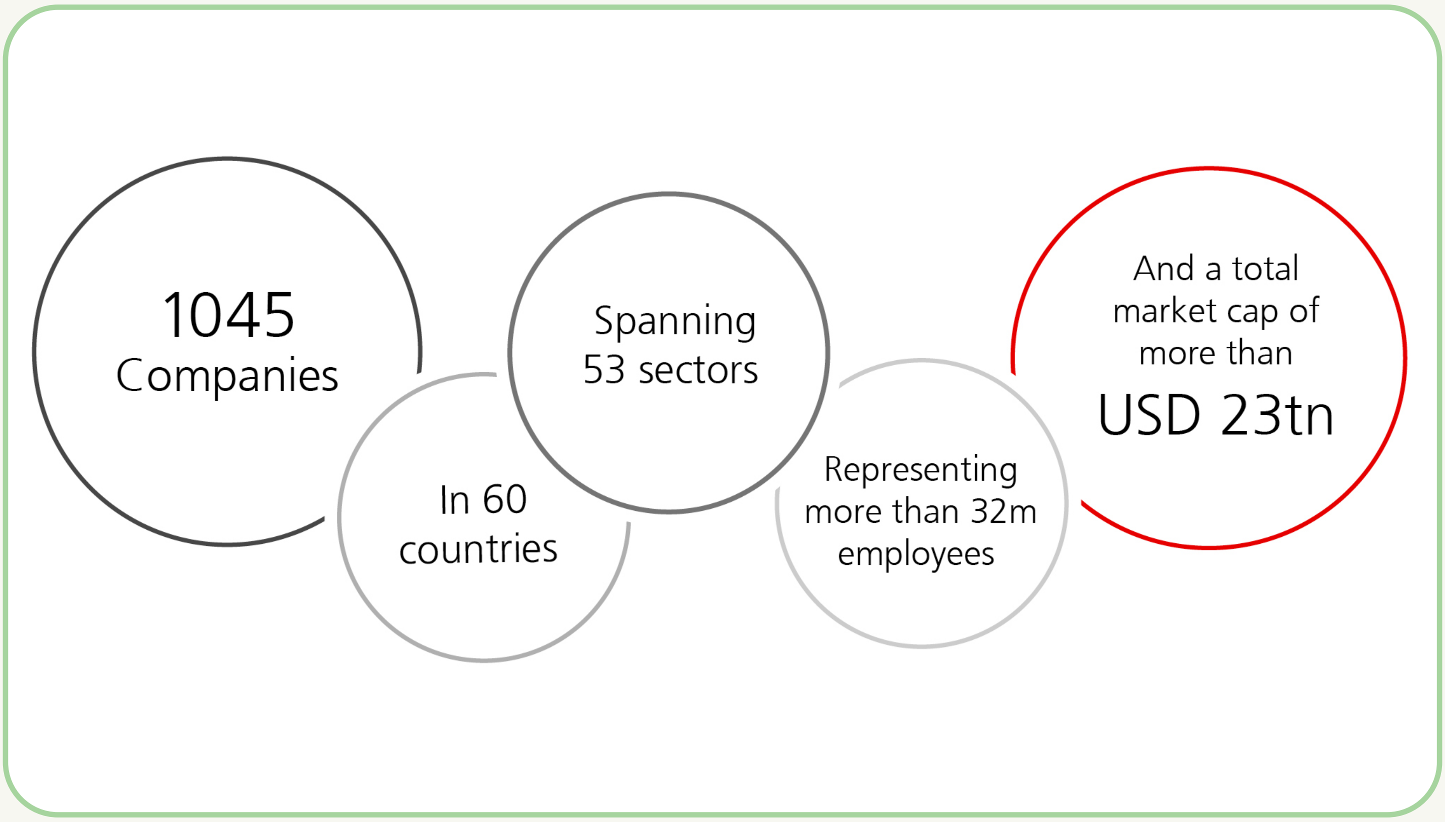
The importance of setting emission reduction targets

As corporates decarbonize their business operations and products, one of the key pillars to achieve this goal is linked to how they will be setting their emission reduction targets. One way to assess the credibility of these targets is to leverage the work performed by well-recognized organizations such as the Science Based Targets initiative (SBTi), or from ESG data providers such as MSCI ESG Research.

1) Science Based Targets initiatives (SBTi)

Since the launch of the Science Based Targets initiative (SBTi) and the Paris-Agreement reached in 2015, there has been a surge in corporate climate ambition, with SBTi companies leading the way. Over 1,000 companies spanning 60 countries and over 50 sectors — including one-fifth of the Global Fortune 500 — are working with the SBTi to the transition to a net-zero economy by setting emissions reduction targets grounded in climate science through the SBTi.

Figure 4: SBTi by the numbers

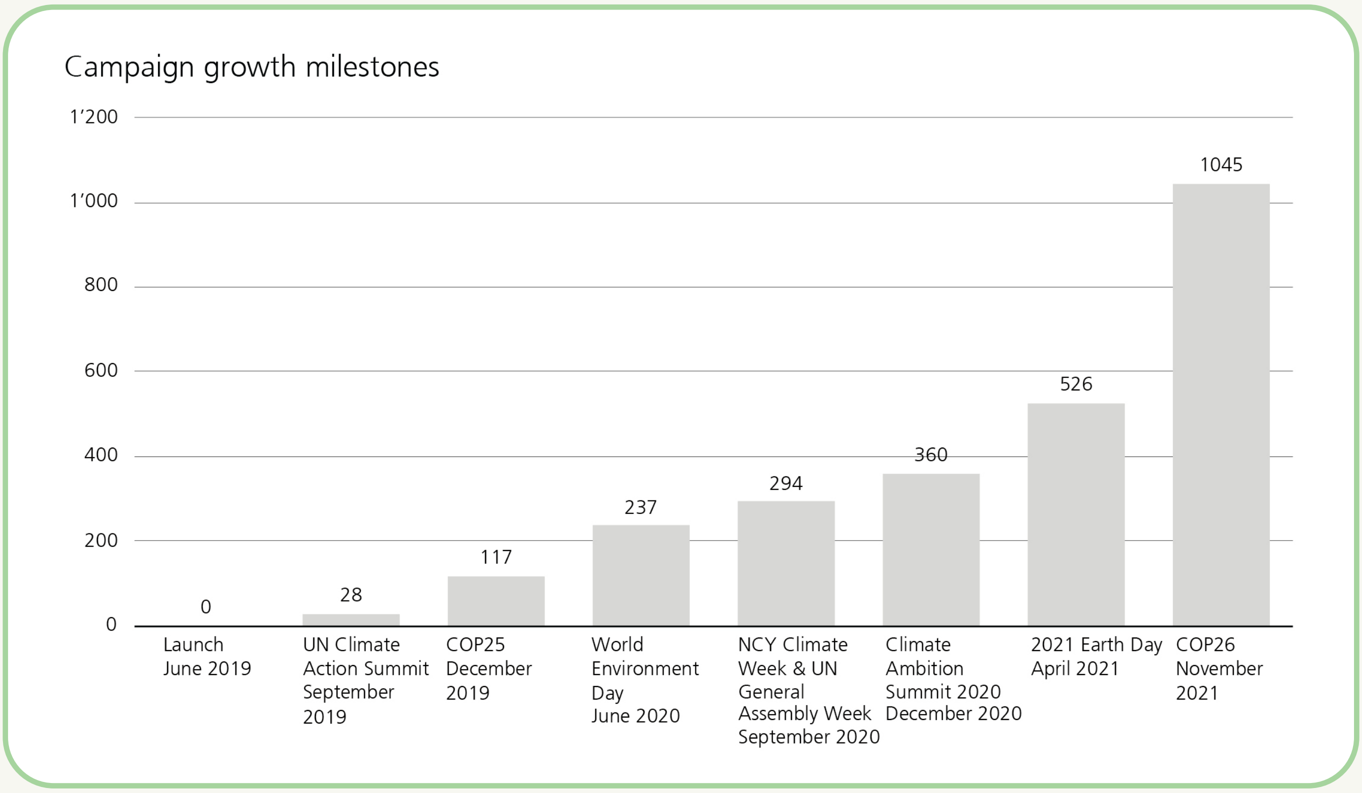


Source: SBTi: Status report: Business ambition for 1.5°C responding to the climate crisis

Considering data from the SBTi, it is interesting to observe the significant increase in the number of companies committing to 1.5°C and Net-Zero targets. Figure 5 shows how from December 2019 to November 2021 the number of commitments increased from 117 to 1045.

[4] Source : SBTi website and 2020 Status Report.

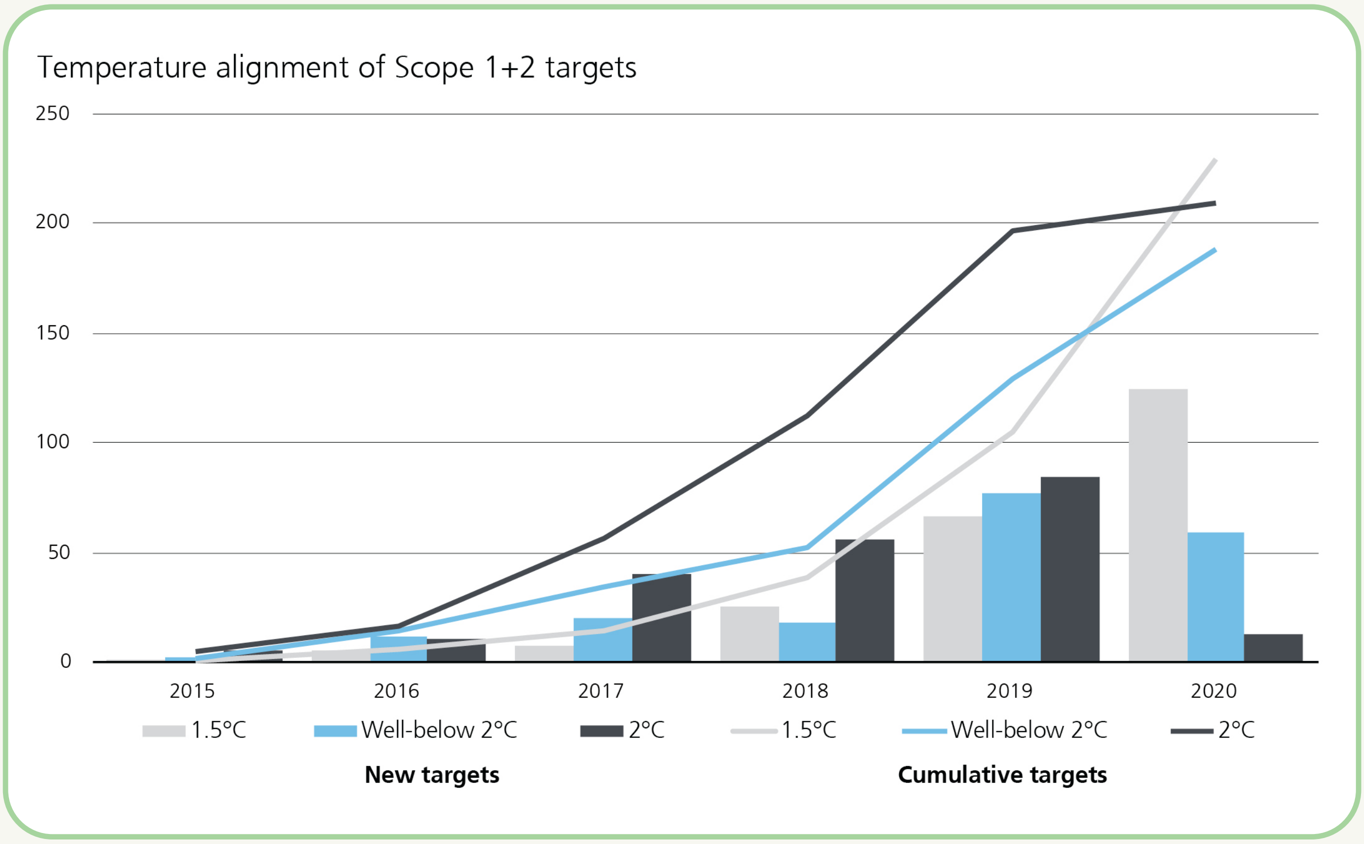
Figure 5: Campaigns and commitments growth



Source: SBTi: Status report: Business ambition for 1.5°C responding to the climate crisis

As we can see in Figure 6, there has also been a paradigm shift between companies previously setting 2°C, or well-below 2°C targets from 2015 to 2019, to more recently where we have seen a significant increase in companies setting more stringent 1.5°C targets.

Figure 6: Temperature alignment of Scope 1+2 targets



Source: SBTi: Annual progress report, 2020

Setting science-based net-zero emission targets

Net-zero emission targets have rapidly moved to the mainstream: in 2019, net-zero pledges covered just 16% of the global economy; by 2021, nearly 70% had committed to net-zero by 2050. Rapid, deep cuts to value-chain emissions are the most effective and scientifically-sound way of limiting global temperature rise to 1.5°C. Most companies will require deep decarbonization of 90-95% to reach net-zero under the SBTi Net-Zero Standard.

2) MSCI ESG Research[5]

To assess emission reduction targets, MSCI ESG Research has developed an analytical framework which breaks down targets by three main dimensions: comprehensiveness, ambition and feasibility.

- Comprehensiveness: The model analyzes whether a target covers all emissions scopes, but more importantly it also looks at the percentage of the company footprint covered by the target.
- Ambition: Understanding the rate at which a corporation is planning to reduce its emissions, as well as the residual emissions by the target end year, is key.
- Feasibility: By looking at a company's track record in meeting previous targets or their progress on currently active targets, one can gain an understanding of how current targets are likely to be met.

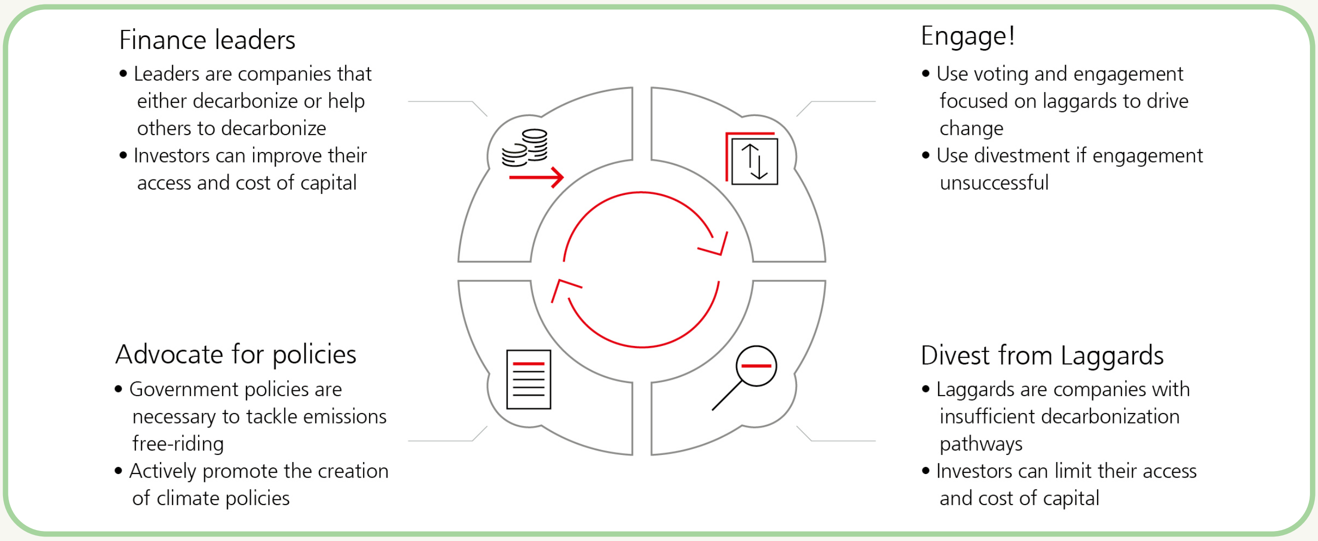
MSCI Climate Paris Aligned indexes support investors by overweighting companies setting credible emissions reductions targets by at least 20% compared to their corresponding parent indexes.

The role of investors in the transition to net-zero emissions

Now that we have highlighted the daunting task of transitioning to net-zero emissions, we can consider the role of investors. According to a McKinsey report[6], all members of society, including the investment community, will have to contribute to achieve net zero emissions, as they estimate an annual increase of 3.5 trillion USD in physical assets spending will be required. To put this figure in perspective, this 3.5 trillion USD corresponds to about half of global corporate profits, one-quarter of total tax revenue, and 7 percent of household spending.

How can asset owners contribute to this effort and play a role in the transition? As shown in Figure 7, they can increase their exposure to companies with credible net-zero targets, while also engaging with firms to influence them to pivot their business models towards lower carbon emission strategies. In addition, they can divert their capital towards businesses that provide green opportunities while at the same time reducing their exposure to companies exposed to climate risks and stranded assets.

Figure 7: How can investors drive companies' Net-Zero alignment?



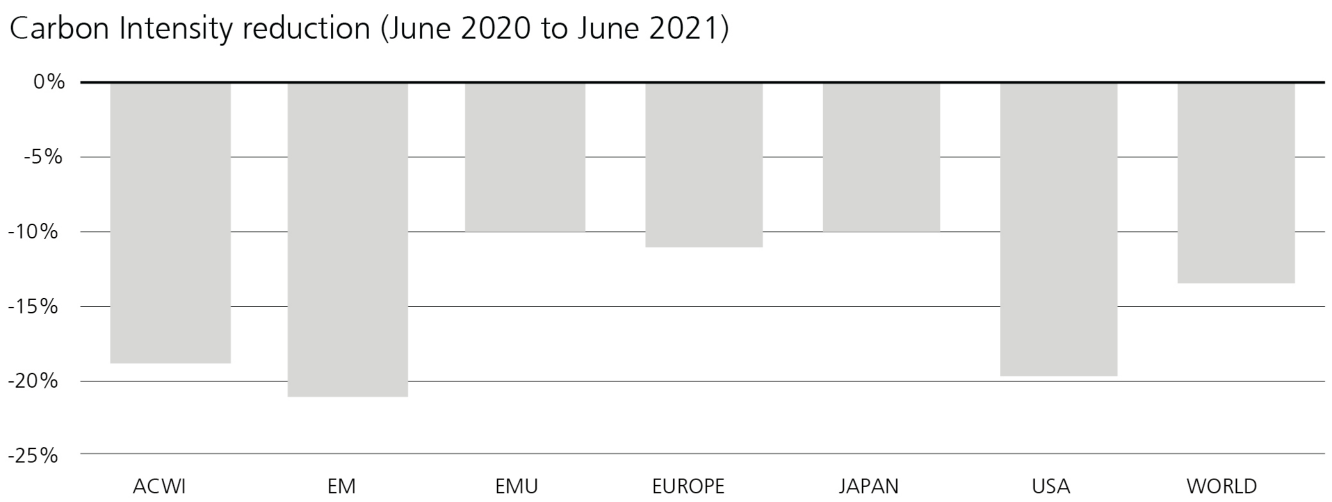
Source: MSCI. Net-Zero Alignment – Objectives and Strategic Approaches for Investors. September 2021.

Source: MSCI. Breaking Down Corporate Net-Zero Climate Target, May 2021.
Source: McKinsey Global Institute. What it will cost to get to net-zero. January 2022.

To facilitate this process, the European Commission's climate benchmarks can support investors to reallocate capital towards a low-carbon and climate resilient economy. The minimum requirements for EU Paris-Aligned benchmarks provide a legal framework which helps legitimize climate solutions. Investors can use this benchmark as an instrument to stay at the forefront of the transition, favoring today the players of tomorrow's economy.

The MSCI Climate Paris-Aligned indexes not only meet, but exceed the minimum requirements for EU Paris-Aligned Benchmarks. Their methodology integrates a 50% carbon footprint reduction, together with a 10% year-on-year self-decarbonization glidepath, with the aim to achieve a 1.5°C temperature pathway by 2030 and support investors in meeting their net zero commitments. We can already observe that the indexes have achieved their first annual self-decarbonization. In Figure 8, we can see that all exposures have achieved this objective which started in June 2020 with the inclusion of Scope 3 emissions in the index methodology. Interestingly, for broader exposures like ACWI, EM or USA, the indexes have even achieved a higher self-decarbonization.

Figure 8: Yearly decarbonization rate MSCI Climate Paris Aligned indexes



Source: UBS Asset Management, MSCI. Data as of May 2021 semi-annual index review.

DIGITAL ASSETS AND COMMODITIES: A COMPARISON OF INSTITUTIONAL PORTFOLIO ALLOCATION

Christopher Tyrer,
Head of Fidelity Digital Assets in Europe

INTRODUCTION

Today, a growing number of institutional investors say many digital assets have the distinct characteristics necessary to be considered a new asset class. Parallels between the current digital asset markets and the commodity markets 20 years ago are striking and may make the case for why digital assets can be considered an asset class of their own – albeit a nascent one.

Before the early 2000s, most traditional investment portfolios did not have a commodities allocation. A series of product, regulatory, market access, and infrastructure developments occurred around this time, opening these markets up to new institutional participants and leading to significant institutional inflows over the following decade. Digital asset markets appear to be following a similar path to maturation, judging by its infrastructure transformation, improved market access and evolving product suite over the past four years.

I. A BACKGROUND OF COMMODITIES MARKETS

Given that agriculture was human's first organised activity, it is not surprising that commodity markets pre-date all others. The first derivative contracts can be dated back to the Sumerians in 4500-4000BC, where clay tokens were used to represent deliverable quantities of various commodities. These tokens are akin to physically settled futures contracts[1,2]. Modern standardized futures contracts became more commonplace in the 19th century, again with agricultural commodities[3]. In the 1970s, swaps were introduced. The 1980s saw the introduction of today's crude oil futures markets and producer countries moving from a system of absolute fixed pricing to price discovery via futures of the world's largest commodity market[4].

Despite all this growth, innovation, and development, commodities markets largely remained the domain of corporate hedging participants with little to no institutional investment interest. A confluence of developments in the 1990s and early 2000s changed all this.

Developing product suite

The Goldman Sachs Commodity Index (GSCI) was created in 1991 and was the first practically investable commodities futures index. For the first time, a broad-based price exposure to a balanced basket of commodities could be achieved via a financially settled swap written by Goldman Sachs (or other investment banks with the capability). This development was ground-breaking as it negated the need for investors to construct these complex portfolios themselves, which would entail managing an array of physically delivered futures contracts with varying expiries on different exchanges in different time zones and the operational burden and execution risk that came with it. GSCI swaps packaged up these operational intricacies into a single contract and created commodities-exposure-as-a-service.

In the 2000s, single asset commodity ETPs were also introduced. These new regulated products trading on exchanges offered investors cost-effective price exposure to commodities through existing market access channels, eliminating the storage complexities of physical exposure, expiration risk on futures exposure, or counterparty credit risk to a bank on swap exposure.

In addition, the late 1990s and early 2000s were generally a time of significant developments in technology and financial engineering, which enabled unique risk and payoff profiles to sophisticated investors through (sometimes complex) derivative structures.

Improved regulatory environment and market access

In the U.K., the term 'Big Bang' is used to refer to the radical overhaul of the rules governing the London Stock Exchange. Financial market deregulation, started by Margaret Thatcher in the 1980s, is in no small part responsible for the U.K. subsequently retaining its position as the pre-eminent financial capital of Europe and arguably the financial centre of the increasingly globalised economy over the next 25 years[5].

Similarly, the U.S. went through a trend in the 1980s and 1990s which saw the deregulation of markets (specifically in commodities: oil from 1981-1988, U.S. Natural Gas in 1985, U.S. electricity in 1992) and of market participants (culminating in the Financial Services Modernization Act of 1999)[6].

These deregulatory shifts helped London and New York became global financial capitals. On both sides of the Atlantic, the financial services sectors experienced enormous growth, and investment banks set up ever-larger trading desks to capture the ever-increasing value on offer. Banks expanded into different asset classes and developed more investment products. From a commodities perspective, this resulted in a transition from a small minority of investment banks offering services in the late 1990s to the majority of banks by the early to mid-2000s. The growth in product offerings created healthy competition and improved market access for institutional investors.

Transformed infrastructure

In the early 2000s, many markets began a paradigm shift from largely open outcry/voice brokered order execution to screen-based systems. In commodities, a then small electronic trading start-up called the Intercontinental Exchange (ICE) acquired the International Petroleum Exchange (IPE) in 2001. Electronic trading of the IPE's futures contracts commenced shortly thereafter side-by-side with open outcry pit-based trading. In 2005, the physical exchange was shuttered. This example was repeated across multiple other commodities exchanges around this time.

The advent of screen-based trading removed the information and data asymmetries that had long existed. The opacity that had discouraged broader market participation in the commodities markets was replaced with transparency. As such, not only was market access democratised but so was market data.

Portfolio allocation

It is hard to imagine now, but, in 2000, commodities were generally not considered a true asset class for the purposes of traditional portfolio allocation. Commodities were largely corporate hedging markets in which wholesale producers transacted with wholesale consumers (often intermediated by investment banks). For the purposes of risk-managing their future revenue streams, producers would sell a proportion of their forecasted production at a fixed price, guaranteeing a certain level of income. Similarly, consumers of the same commodity would buy a proportion of their forecasted demand to lock in a certain proportion of their input costs. Both activities would allow each company to make better assumptions about their future revenue/cost profile, which in turn would enable more accurate budget forecasting and financial planning. There was little to no passive or active institutional participation in these markets.

As a result of the developments outlined above, the commodities markets opened to a new segment of market participants. With more transparent data, better market access, a suite of investment products and a host of investment banks now servicing the asset class, institutional investors began to pay attention and the investment case was extremely compelling.

The investment case

The market structure and price characteristics of commodities gave rise to several investment thesis within a traditional investment portfolio:

Diversification – Commodities had not historically traded alongside traditional financial markets and exhibited little to no correlation to these asset classes, even over short time horizons. According to the basics of modern portfolio theory, the introduction of an uncorrelated asset to a diversified investment portfolio improves the efficient frontier and increases the risk-adjusted returns. As Nobel Prize laureate Harry Markowitz said in 1952, "diversification is the only free lunch in investing."

Positive expected return – Notwithstanding the diversification benefits of commodities to an investment portfolio, the market structure of a healthy commodity market is backwardation. That is to say that the promptest contracts are generally more expensive than longer dated contracts when the market is not in near-term oversupply. A corollary of this is that commodity indices such as the GSCI that 'roll' their positions monthly (i.e. sell prompt contracts and buy forward contracts in order to keep their exposure from maturing), collect a premium each month when the market structure is favourable. This is known as the 'roll yield' and it was in the mid-high single digits on an annualised percentage point basis[7]. Thus, even if the price of commodities did not rise, there was a positive expected return owing to the inherent market structure should this term structure persist.

The case for price appreciation – In addition to the above two technical characteristics of commodities price exposure via derivatives, there were very supportive forward supply and demand balances for commodities generally in the early 2000s. These dynamics were largely due to the urbanisation and economic expansion aspirations of the Chinese Communist Party outlined in the tenth Five-Year Plan released in 2000. The Five-Year Plans of China are a series of social and economic development objectives issued going back to 1953. The tenth plan contained targets that were both extremely ambitious and would be very commodities-demand intensive if they were to be realised. One objective was to increase the number of urban employees by 40 million and transfer 40 million surplus rural labourers to cities[8]. This would have been an increase in the urban workforce equivalent to the whole of Germany at the time[9]. This alone would require an enormous expansion of the industrial and social infrastructure including factories, power stations, roads, housing, hospitals, schools, etc.

It was clear that the extent of the program would require an enormous number of resources and would create highly probable forward demand pressures in the commodities markets, the likes of which can only be seen in centrally planned economies.

The actual increase in China's urban population from 2000 to 2005 was over 100 million people[10] and, as can be seen below, China's total primary energy consumption, as a proxy for its demand across the entire commodities complex, nearly doubled over the same period.

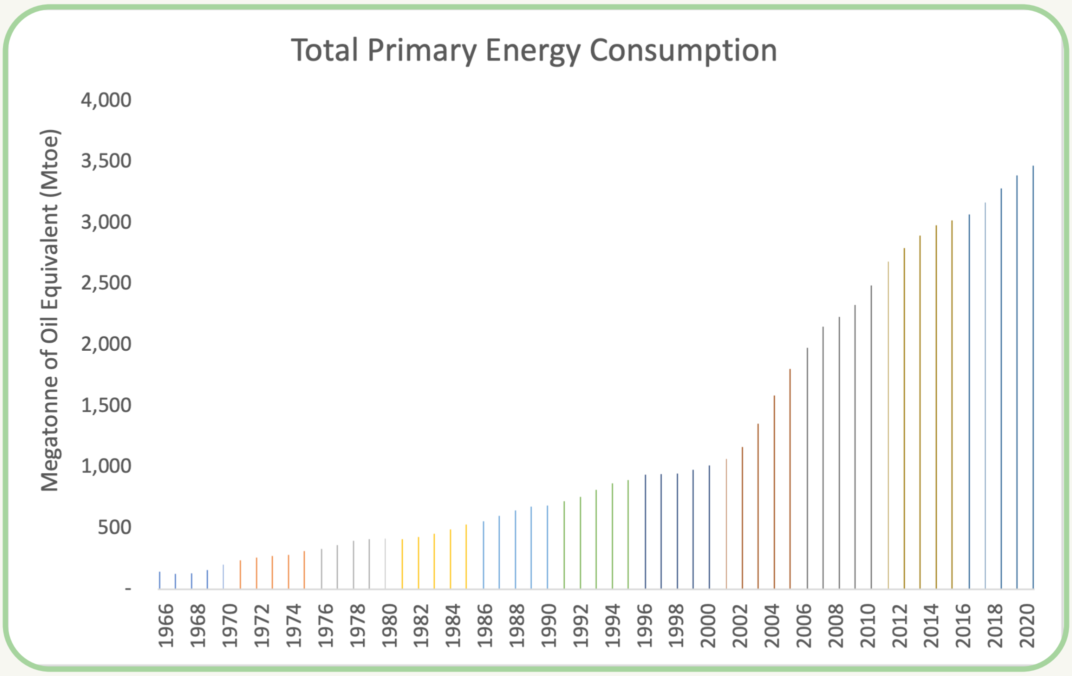


Chart Source: "Application of the Novel Fractional Grey Model FAGMO (1,1,k) to Predict China's Nuclear Energy Consumption" by Wenqing Wu, Xin Ma, Bo Zeng & Yong Wang. Recreated with Updated Date Source: BP Statistical Review of World Energy. Date Accessed: 08/15/2021.

This increased forward demand profile created a very compelling standalone investment thesis irrespective of the beneficial allocation properties described above.

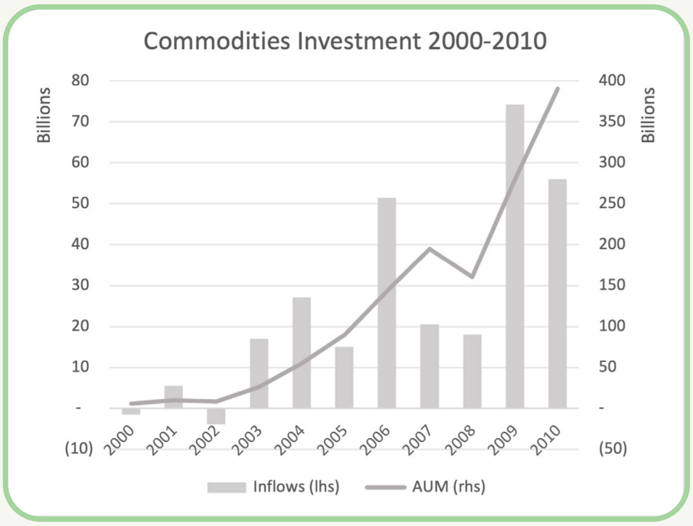
The macro support – This positive commodities narrative also coincided with a multi-year bear market for equities (1Q20-4Q02) following the bursting of the tech bubble in 2000. This stock market underperformance created an environment in which investors were open to exploring other sources of return. Indeed, this proclivity has persisted and grown stronger over time as can be demonstrated by alternative investment allocations, which according to estimates published by the CAIA Association were 6% of global investable markets in 2003 and as high as 12% in 2018[11].

The diversification benefits, positive expected return, and implied supply/demand fundamentals created a near perfect investment thesis for an allocation to commodities in the context of a traditional diversified investment portfolio just at a time when investors were receptive to increasing their exposure to alternative investment assets in general.

Build it and they will come

Improved market access, increased transparency, development of investable products, the unique portfolio-contribution attributes of commodities, and the future price outlook for the asset class at large piqued institutional interest and prompted very rapid institutional investment over a relatively short period.

The below chart shows institutional commodities investments from 2000 to 2010 derived from futures' position reports data. In the 2000-2002 period, there was really very little in the way of institutional involvement in the commodity markets at all. From 2003-2010 there were substantial investments made each year, taking total assets allocated to commodities to nearly $400bn by 2010.



Data Source: Barclay Commodities Research. Date Accessed: 05/01/2021.

It is now received wisdom that commodities are a separate asset class for traditional investment purposes and a good proportion of advised portfolios have some exposure to commodities as an asset class.

II. A DIGITAL ASSETS COMPARISON

Today, a growing number of institutional investors say many digital assets (which some refer to as digital commodities) have the distinct characteristics necessary to be considered a new asset class. In our 2021 Institutional Digital Asset Study of more than 1,000 institutional investors, 23% said they believe digital assets belong in an independent asset class.

Below we cover some of the parallels between the emerging digital asset markets and the institutionalisation of commodities markets 20 years' ago.

Developing product suite

Like the commodity markets in the mid-1990s, the digital asset market is still in its early stages of product development. That being said, significant progress has already been made already over the last several years.

Around the world, the pathways of exposure for institutional investors to bitcoin and other digital assets are growing. In the U.S., there are several competing trusts that provide passive price exposure to bitcoin such as Grayscale's GBTC product, which dates to 2013. In December 2017, the CME launched its bitcoin futures contract. Over the last 12 months, through the purchase of 114,042 bitcoin12, MicroStrategy has also created both equity and bond vehicles that offer indirect price exposure to bitcoin as its original business intelligence activities are now dwarfed by the size of the bitcoin position held on the company balance sheet. For investors without a mandate to invest in Bitcoin directly but able to purchase corporate debt or public market equity, this is an important product development.

The first exchange-traded fund (ETF) was approved in Canada and began trading on the Toronto Stock Exchange (TSX) in February 2021. In Europe, there are multiple ETPs/ETCs approved by regulators in Germany, Sweden, and Switzerland with the CoinShares products dating back to 2015. Globally, there are now numerous private funds that track the price of bitcoin.

Multiple regulated exchanges around the world have also introduced leverage to sophisticated investors. Leverage and capital efficiency are key inputs in terms of maximising returns for hedge funds and assessing the viability of trades and allocations.

Improved regulatory environment and market access

As with commodities in the late 1990s and early 2000s, market access to bitcoin is improving dramatically. From a retail standpoint, Paypal, Square, Venmo, and Revolut alone have given market access to over 500 million users since 2018.[13,14,15,16] Additionally, Mastercard recently announced that it would start supporting select digital assets directly on its network. Similarly, Visa announced that it would use USD Coin (USDC), a stablecoin backed by the U.S. dollar, to settle transactions over Ethereum. The two companies facilitate payments around the world and are accepted by more than 40 million merchants globally.

For institutions, the number of market access channels has increased significantly. For example, Fidelity Digital Assets launched its own execution capability in June of 2019. This allows clients to access liquidity direct from secure cold storage. Many other third-party custodians have subsequently followed suit. In addition, the reliability, professionalisation, and feature/functionality of digital asset exchanges over the last 3-5 years has improved dramatically and many are now consistent with the expectations and demands of institutional investors.

Dedicated institutional liquidity venues such as LMAX Digital have also launched and seen major traction. TP ICAP, one of the largest interdealer brokers in the world, is set to open a wholesale trading platform for digital assets, working in collaboration with Fidelity Digital Assets to provide secure post transaction settlement services.

Many traditional banks and prime brokers now provide access to CME futures, which was not the case at launch in December 2017. The curve structure and negative roll yield makes futures a cost-inefficient vehicle for long-term bitcoin price exposure and physical bitcoin remains largely inaccessible through most prime brokers. Thus far, regulation has stymied greater involvement from banks and other traditional financial intermediaries.

It was described above that deregulation acted as an enabler to greater institutional activity in commodities (and across the entire financial industry more broadly). Regarding digital assets and bitcoin specifically, a lack of regulation has acted as an impediment to the provision of services in and market access to this asset class. This variance in catalysation can be explained, to a great extent, by the measures taken by regulators in the aftermath of the global financial crisis. From 2009 to 2016, Boston Consulting Group estimates that European and North American banks were fined $321b in aggregate[17]. In response, banks have tightened regulatory compliance programmes and, therefore, tend to require a higher degree of regulatory clarity before engaging in new activities or supporting new assets. Until recently, that clarity had been absent, but there is now increasing input from regulators.

In the U.S., the Office of the Comptroller (OCC) has given very clear guidance regarding the custody of digital assets. On July 22, 2020, the OCC published an interpretive letter authorizing national banks and federal savings associations regulated by the agency to custody digital assets. While the OCC has not prohibited the institutions it regulates from engaging in digital asset custody, this is the first time it has provided a formal statement and clear guidance allowing banks to engage in the activity. The lack of guidance to date is a core reason that nationally chartered institutions have remained on the side-lines when it comes to providing digital asset services.

In Europe, there have also been meaningful developments on the regulatory front. In September 2020, the European Commission's legislative proposal to cover digital assets was released, called the Markets in Crypto-Assets (MiCA). MiCA focuses on rules to regulate currently out-of-scope assets and currently unregulated crypto-asset service providers (CASPs) such as custodians and exchanges. If adopted, MiCA could take some years to implement, but the will to provide greater clarity is present and the proposed regulation is supportive of future innovation, adoption, and commercial activity in the space.

Since the OCC guidance last year, Bank of New York Mellon, US Bank, Morgan Stanley, JP Morgan, and Goldman Sachs have all announced their intentions to launch services or provide market access to digital assets[18,19,20,21,22]. In contrast, European banks have lagged in their support for digital assets, which might be explained by the lack of clear, implemented regulation.

There are many other banks and intermediaries that remain on the side-lines, and it is therefore expected that there are still significant gains possible in terms of market access. Importantly, the regulatory clarity and/or changes required to enable those gains has already been given or is in proposed form.

Transformed infrastructure

In recent years, market infrastructure has improved dramatically. In 2017, it was not uncommon to see 5-10% price differences between different exchanges in periods of high market volatility. Since then, many traditional programmatic market-makers have entered the space and inter-exchange price discrepancies have collapsed to the cost of transaction and working capital rebalancing. The introduction of these liquidity providers has also improved liquidity and depth of order book. This has been well evidenced by the minimal market impact of several large-scale corporate treasury purchases from the likes of MicroStrategy and Tesla.

On the custody front, the announcement of Fidelity Digital Assets' custody offering in October 2018 was a watershed moment for the institutionalisation of the industry. Since then, there have been great improvements in the service offerings of many custodians, which has created several credible options for institutional investors.

In addition, there have been meaningful developments in the ability of market participants to borrow and lend digital assets. Whereas this capability did not materially exist other than on a peer-to-peer, bilateral basis in 2017, there are now many providers that enable market participants to borrow and lend digital assets or borrow fiat currency collateralised against digital asset holdings. Fidelity Digital Assets announced its own collateral agency offering in November of 2020.

Lastly, the number of data providers and credible research teams focusing on digital assets has increased significantly over the last several years. High quality price data, blockchain data, fundamental asset data, and asset-specific research are prerequisites for institutions to make substantial investment decisions.

Portfolio allocation

Fidelity Digital Assets' 2021 Institutional Investor Digital Asset Study found that 52% of surveyed investors in Asia, Europe, and the U.S. have an allocation to digital assets. Whilst the institutional adoption of digital assets is seeing continued year-over-year growth, there is still room for significant growth. Whereas in 2017, the product suite, market access, and digital asset infrastructure were not yet at a level sufficient to enable or accommodate broad-based institutional investment, the developments since have been transformational. Whilst inconveniences may remain, for example, not being able to access the market through a preferred prime broker, it is now difficult to argue that there are structural blockers to institutional participation, nor could it be argued that the infrastructure or service providers are not of an adequate quality. As with the commodities markets in the early 2000s, these developments all represent an incredibly relevant shift.

The investment case

It is beyond the scope of this research piece to put forward a comprehensive investment case for bitcoin. Nonetheless, it is worth noting the similarities of the various components of the investment case to those of a commodities allocation in the early 2000s.

Diversification – As bitcoin demonstrated strong correlation to traditional financial assets during the pandemic-induced market crash in February/March 2020, this prompted some commentators to question the narrative that bitcoin is an uncorrelated asset. The reality is that, in periods of market stress, all cross-asset correlations tend to 1. This is due to investors seeking to move to cash as portfolio volatilities spike. This broad-based risk-off selling pressure therefore impacts all markets simultaneously and creates inter-asset correlations that are not typically seen in normal market conditions.

During this same period, gold declined by 15% in a move that was also counterintuitive when considering its typical investment premise and price correlations. This phenomenon was also witnessed in the market stress during the global financial crisis. From March 2008 to September 2008, gold declined from its local high faster than equities (29% versus 19%) before outperforming until the equity market bottomed in March 2009.

Correlations should be viewed over the long term as short-term aberrations can and will occur. Since peaking in October 2020, bitcoin/equity 30-90d correlations have declined to levels that were seen previously (0.15-0.20) and levels that would be consistent with diversification benefits to inclusion in an investment portfolio.

Positive expected return – As discussed previously, the lending market for bitcoin has developed rapidly. For passive holders that wish to earn a yield, the options are increasing and the sophistication improving with time. With proof-of-stake assets, this positive expected return is even more obviously demonstrable and interesting in a yield-starved macroeconomic environment.

The case for price appreciation – As Fidelity Investments' Director of Global Macro Jurrien Timmer highlighted in his recent research piece "Understanding Bitcoin," Metcalfe's Law may offer some S-curve demand perspectives.

The two charts below show the raw number of worldwide mobile phone subscribers overlaid against the raw number of bitcoin addresses. The S-curve on the left is set to a linear scale; the one on the right, to a log scale.

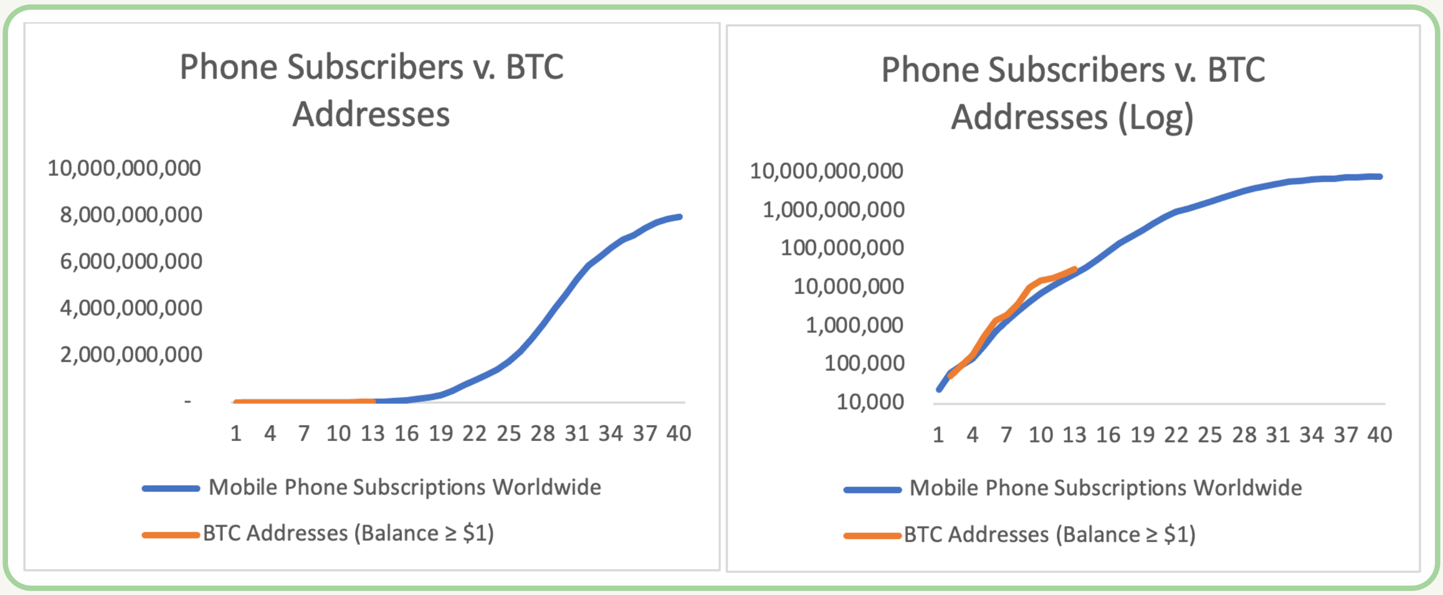


Chart Source: "Understanding Bitcoin" by Jurrien Timmer. Recreated with Updated Date Source: World Bank Phone Subscribers & Coin Metrics BTC Addresses. Date Accessed: 08/15/2021.

According to Timmer's analysis, it appears that the bitcoin growth curve may still be in its early phase and could remain so for a number of years. "Thus, the bullish case for bitcoin: Price is at the intersection of supply and demand, and demand is growing exponentially while supply (per BTC S2F) approaches its limit. Bitcoin can act as a store of value because of its scarcity, but it's also an integral part of a technological revolution (blockchain encryption) with potentially explosive demand growth," wrote Timmer.

This type of analysis is an interesting framework for investors attempting to model future demand and would suggest that significant future demand is still possible if bitcoin continues to track this level of growth and adoption.

The macro support – Recent global monetary policy, and increasingly fiscal policy, have created a positive macro backdrop for future bitcoin investment allocations. Many investors remain concerned at the rate of central bank balance sheet expansion, the scale of the budget deficits being run in many developed economies, and the potential for inflation as a result. Bitcoin is seen by many as being an asset that will have a leveraged return profile in an inflationary environment and see it therefore as a portfolio hedge against this outcome.

III. Conclusion

There are striking similarities between the digital asset market of today and the commodities markets of the early 2000s. The commodities product suite, market access, and market infrastructure all went through dramatic improvements. These shifts helped enable institutional participation, but the timing also coincided with an incredibly strong investment narrative and a very supportive macro environment. It was the simultaneous marriage of all these factors that prompted such rapid investment growth in commodities.

The digital asset markets today are going through, and in some areas have arguably completed, a similar transition from the viewpoint of product suite, market access, and market infrastructure. Over the last four years there have been massive advances in these areas and the importance of this as an enabler of institutional participation cannot be understated. As with commodities in the early 2000s, these developments are occurring at a time when many view the investment narrative and macro backdrop as also being particularly compelling.

There are certainly differences between the facts and circumstances of the digital asset markets of today and the commodities markets of the early 2000s. The most notable is that no one in 2001 argued that copper or iron ore were illegitimate assets. Whilst these views are becoming increasingly rare and atypical, digital assets are still a new technology and success of individual projects is far from preordained. This was not the case for commodities, which had, in some cases, been in active use for several thousand years, dating back to pre-historic times.

Notwithstanding, the sequence of events and conditions that are unfolding in the digital asset markets today are strikingly like that of the commodities markets in the early 2000s. In commodities, these conditions resulted in an enormous amount of capital flowing into the asset class in the years immediately succeeding. Whether the same will be true for digital assets remains an open question.

[1] Banerjee, Jasodhara (16 January 2013). "Origins of Growing Money". India: Forbes India Magazine
[2] Sinha, Ram Pratap; Bhuniya, Ashis (7 January 2011). "Risk Transfer Through Commodity Derivatives: A Study of Soyabean Oil". SSRN 1736406.
[3] Cronon, William. Pricing the Future: Grain. Nature's Metropolis: Chicago and the Great West. University of Chicago, 1991. pp.109-133
[4] https://www.oxfordenergy.org/publications/oil-pricing-systems/
[5] https://www.cps.org.uk/files/reports/original/111028101637-0061019EconomyBigBang20YearsOn.pdf
[6] https://en.wikipedia.org/wiki/Deregulation
[7] https://www.indexologyblog.com/2014/01/03/backwardation-is-back/
[8] http://www.china.org.cn/english/features/38198.htm
[9] https://tradingeconomics.com/germany/labor-force-total-wb-data.html
[10] https://www.macrotrends.net/countries/CHN/china/urban-population
[11] https://caia.org/next-decade
[12] https://www.theblockcrypto.com/linked/117475/microstrategy-takes-its-bitcoin-holdings-to-114000-btc-5-1-billion
[13] https://www.statista.com/statistics/218493/paypals-total-active-registered-accounts-from-2010/
[14] https://www.pymnts.com/cryptocurrency/2021/venmo-users-can-now-buy-sell-hold-cryptocurrency/
[15] https://www.statista.com/statistics/943068/estimated-growth-of-online-banks-globally/
[16] https://www.businessofapps.com/data/cash-app-statistics/#:~:text=Out%20of%20the%2030%20million,million%20own%20a%20Cash%20Card
[17] https://image-src.bcg.com/BCG_COM/BCG-Staying-the-Course-in-Banking-Mar-2017_tcm9-146794.pdf
[18] https://www.wsj.com/articles/bitcoin-to-come-to-america-s-oldest-bank-bny-mellon-11613044810
[19] https://www.usbank.com/about-us-bank/company-blog/article-library/us-bank-details-new-cryptocurrency-offerings.html
[20] https://www.cnbc.com/2021/03/17/bitcoin-morgan-stanley-is-the-first-big-us-bank-to-offer-wealthy-clients-access-to-bitcoin-funds.html
[21] https://www.coindesk.com/jpmorgan-to-let-clients-invest-in-bitcoin-fund-for-first-time-sources
[22] https://www.bloomberg.com/news/articles/2021-06-14/goldman-expands-in-crypto-trading-with-plans-for-ether-options

HOW ARE NEW TECHNOLOGIES RESHAPING THE CYBER SECURITY LANDSCAPE?

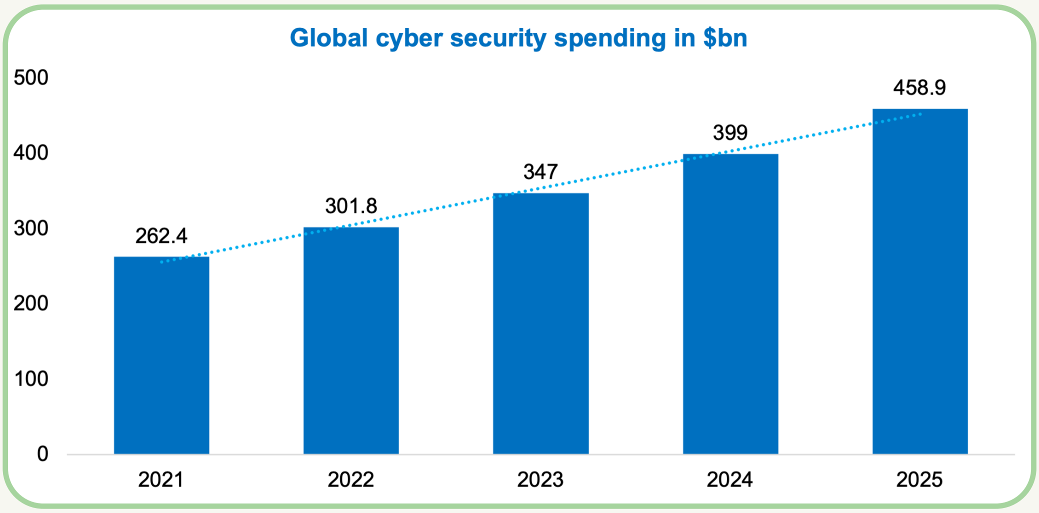
Aude Martin,
Senior ETF Investment Specialist, Legal & General Investment Management (LGIM)

Stand first: Edge security, blockchain and biometrics could help protect companies and public institutions from the growing threat of cybercrime.

As the world becomes ever more digitally connected, cyber security has become mission critical. Without cyber security solutions in place, institutions cannot operate securely, and potentially putting the end-customers and users' data at risk.

The pandemic has highlighted the relentlessness of cyber criminals, who seized upon the opportunity to target the healthcare industry. In the UK, the National Cyber Security Centre handled a record 777 cyber security incidents, which targeted covid vaccine research, just between August 2020 and September 2021[1]. In France, at least 27 cyber-attacks were recorded against hospitals in 2020 alone[2], and in Italy a ransomware paralysed the country's largest region's vaccination-booking platform in August last year[3].

Against this backdrop, it's no surprise that cyber security spending is rising fast. In the US, federal spending is projected to increase from $17.9bn to $20.3bn in 2022, and President Joe Biden has strengthened cyber security measures and funding into his new Infrastructure Bill. Private companies are also upping their spending to keep pace with the existential threat posed by digital disruption.



Source: Cybersecurity Ventures

[1] Source: https://www.bbc.co.uk/news/uk-59315232
[2] Source: https://atalayar.com/en/content/france-records-27-cyber-attacks-against-hospitals-2020
[3] Source: https://www.thelocal.it/20210801/hackers-shut-down-rome-region-website-affecting-vaccine-bookings/

Legal & General
INVESTMENT MANAGEMENT

The threat landscape: recent breaches and attack vectors

As we begin to emerge from the pandemic, cyber-attacks continue to escalate, with hostile actors continue to probe both private and public institutions. Below is a summary of a few high-profile attacks in recent months:

- Toyota halts car production for a day in Japan after its supplier was hit by suspected cyber attack[4]
- Cyber-attack forces The Works to shut shops temporarily and suspend new stock deliveries[5]
- Gloucester City Council discovers systems breaches, with many online services affected[6]
- Ferrovie dello Stato, Italy's rail operator, detects signs of hacking in its systems[7]
- Ransomware hits Oil tanking fuel-distribution system in Hamburg[8]

While we can't know who will find themselves on the list next, we do have some information on the vectors that the attackers will be looking to exploit. One known vulnerability that could lead to large-scale cyber security breaches is known as Log4Shell[9]. In November last year researchers identified that this open-source logging library – which is used by many applications to log error messages – contained vulnerabilities that could allow hackers to steal credentials and even control victims' computers remotely.

This exploit is significant because of the ubiquity of Log4Shell; the complex dependencies of platforms that use it, making it costly and time-consuming to address; and how easy it is to turn the vulnerability into an exploit.

New technologies on the digital front line

The increase in both the number of cyber-attacks and their sophistication has created the need for solutions providers to fill the vulnerability gap. Many of the proposed solutions will take advantage of emerging technologies – though some of these technologies could also be utilised by cyber criminals. On our radar are the following three big trends.

1. From cloud to edge

By now, most of us are familiar with the concept of cloud, which enables us to share and collaborate on documents regardless of our location. Cloud-based security systems are a growing area, with the market expected to grow at a 13.78% CAGR* by 2026[10]. But as the cloud evolves, new security approaches become necessary. One example is 'edge' containers, which are located at the edge of a network, closer to the data source, while cloud containers operate in a data centre. Processing data at the network's edge can increase the speed of applications and enable richer, artificial intelligence-powered functionality and user experiences.

Edge containers, however, pose fresh security challenges. For example, because edge computing relies on more devices in a wider range of locations than cloud computing, there are more potential entry points for hackers. A recent global survey of 1,520 security practitioners from organisations with 1,000+ employees found that most of them expect to spend more than 10% of their edge computing investment on security[11].

2. Could Blockchain help against DDoS?

Blockchain is perhaps best known as the key technology underpinning Bitcoin. This same technology could help defend networks[12] against distributed denial of services (DDoS) attacks, in which cyber criminals bombard servers with requests to take them offline. By using blockchain, which enables decentralisation through the participation of members across a distributed network, companies could eliminate the single point of failure that allows DDoS attacks to succeed.

In a blockchain database, only new records can be created, and each 'node' on the network contains a complete copy. If a copy is compromised, that copy is detached from the network, preserving the integrity of the data. By maintaining a list of compromised internet protocol (IP) addresses in the ledger, blockchain could resist future attacks.

*CAGR: Compound annual growth rate
[4] Source: https://news.sky.com/story/toyota-halts-production-on-13-000-cars-after-cyberattack-12554168
[5] Source: https://www.bbc.co.uk/news/business-60993635
[6] Source: https://www.bbc.co.uk/news/uk-england-gloucestershire-60638835
[7] Source: https://www.bloomberg.com/news/articles/2022-03-23/italy-rail-operator-says-it-detected-signs-of-hacking-in-system
[8] Source: https://time.com/6145144/ransomware-germany-colonial-pipeline-hackers/
[9] Source: https://www.dynatrace.com/news/blog/what-is-log4shell/?utm_source=google&utm_medium=cpc&utm_term=log4shell%20explained&utm_campaign=uk-appsec-application-security&utm_content=none&gclid=EAIaIQobChMI0cXjuceM9wIVR-3tCh2cCgBKEAAYASAAEgLrFvD_BwE&gclsrc=aw.ds
[10] Source: https://www.marketsandmarkets.com/Market-Reports/cloud-security-market-100018098.html
[11] Source: https://cdn-cybersecurity.att.com/docs/industry-reports/cybersecurity-insights-report-eleventh-edition.pdf
[12] Source: https://www.techslang.com/is-blockchain-the-perfect-defense-against-ddos-attacks/#:~:text=In%20the%20event%20of%20a,the%20relentlessness%20of%20a%20DDoS

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3. How hardware security is strengthening authentication

According to the Ponemon Institute, the cost of credential theft has risen by 65% the past year. One proposed solution to this problem is biometric systems, which offer a way of verifying a person's identity that is harder to clone than a password.

The global hardware security modules market size is projected to reach $7.9 billion by 2028, according to Verified Market Research, implying a compound annual growth rate (CAGR) of 12.4% between 2021 and 2028[13].

One of the benefits of biometric security is that it can be used for multi-factor verification relying on fundamentally different technologies. For instance, to gain access to a building a user might be prompted to scan their access card and then verify their fingerprint. While the access card can be cloned, the fingerprint relies on physical properties that present a different obstacle for would-be intruders.

Staying one step ahead

Although the emergence of new technologies can often be a double-edged sword, as cyber criminals look to use these tools for their own ends, cyber security companies stand to benefit directly from innovations that can help them protect our critical data. In this constantly evolving space, one thing is certain: the need for cyber security will grow, as more of our personal and working lives are lived online.

Author: Aude Martin, Senior ETF Investment Specialist, Legal & General Investment Management

Aude joined LGIM ETF in July 2019 as a cross asset ETF Investment Specialist. Prior to that, Aude worked as a delta one trader at Goldman Sachs and within the structured products sales teams at HSBC and Credit Agricole CIB. As an investment specialist, she contributes towards the design of investment strategies and actively supports the ETF distribution and marketing efforts. She graduated from EDHEC Business School in 2016 with an MSc in Financial Markets specialising in trading and Master in Management; she has an undergrad degree in Law from Paris X Nanterre University.

Key Risks

Past performance is not a guide to the future. The value of an investment and any income taken from it is not guaranteed and can go down as well as up, you may not get back the amount you originally invested. For illustrative purposes only. Reference to a particular security is on a historic basis and does not mean that the security is currently held or will be held within an LGIM portfolio. The above information does not constitute a recommendation to buy or sell any security. Assumptions, opinions and estimates are provided for illustrative purposes only. There is no guarantee that any forecasts made will come to pass. It should be noted that diversification is no guarantee against a loss in a declining market. Views expressed are of LGIM as of 12 April 2022.

[13] Source: https://www.prnewswire.co.uk/news-releases/hardware-security-modules-market-size-worth-7-9-billion-globally-by-2028-at-12-4-cagr-verified-market-research-r--892410808.html#:~:text=According%20to%20Verified%20Market%20Research,12.4%25%20from%202021%20to%202028.

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PRIVATE ASSETS – BETWEEN A ROCK AND A HARD PLACE

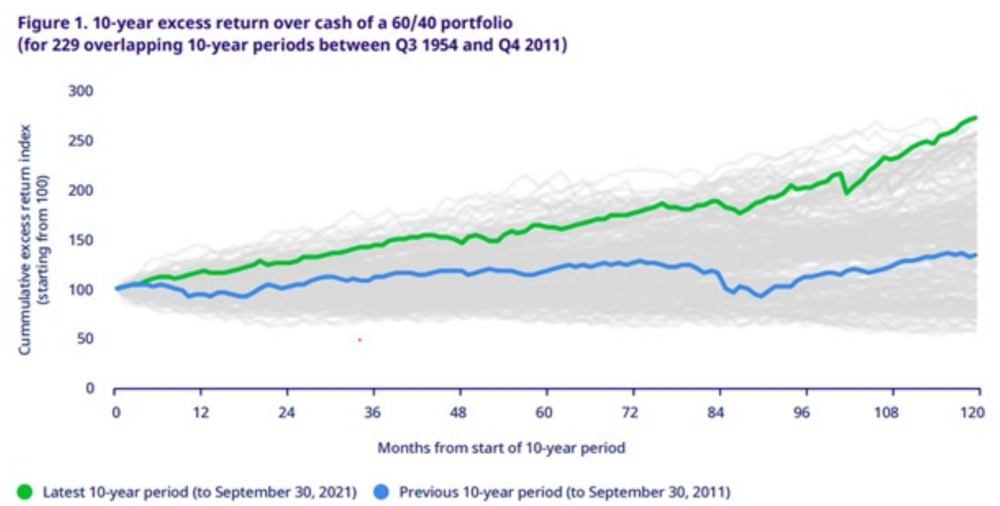
Regina A. Costello,
CEO & Founder,
ARS PECUNIAE GMBH

There seems to be an insatiable appetite for private assets among investors, especially institutional investors. The lure is at least twofold. One picks up the illiquidity premium while at the same time not having to deal with daily price fluctuations. On top, most investors see it as an additional diversification. Needless to say, the long success of big investors like Harvard University or Columbia University is a case in point and worthwhile to follow. Or is it not?

Risk management is tantamount. This is the reason we as advisor have to ask ourselves regularly whether things have changed for our investment framework. If so, which we suggest at this point in time, it is advisable to revisit and reexamine investments already made and the underlying investment case.

A New Paradigm

Until September 2021, a strategy of 60/40 (public equity / bond) has been spectacularly successful for the last 10 years. This outperformance, which has been pronounced for the US markets amid a positive global environment, can be seen in this graph[1], comparing such a US-centered portfolio over cash in a rolling 10-year period, starting in September 2001:



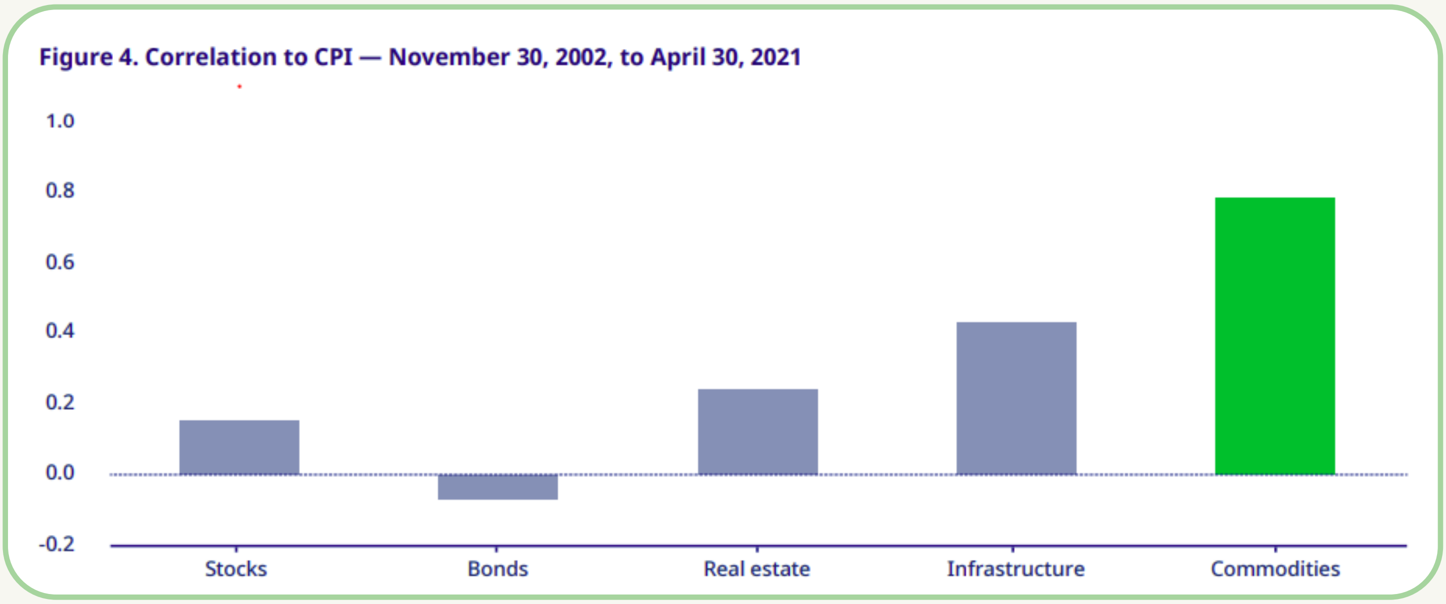
Source: Mercer, November 2021

[1] Study from Mercer LLC: Top Considerations for Private Markets in 2022, November 2021.

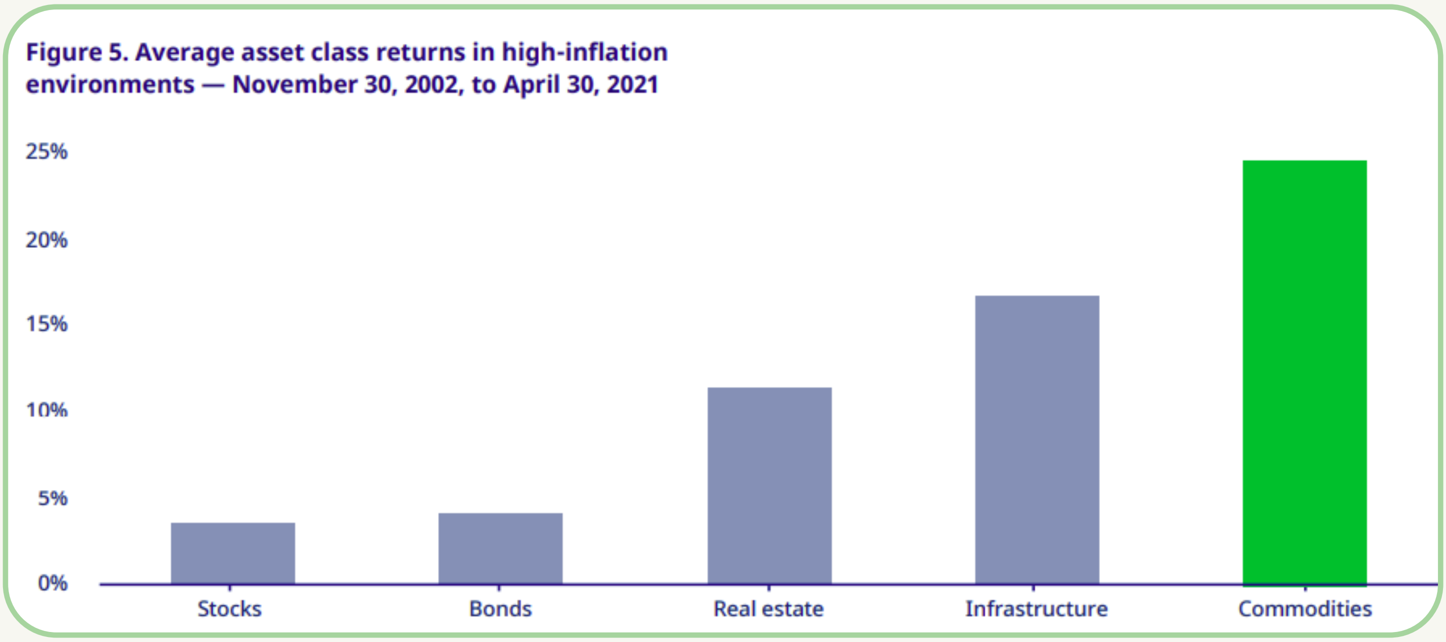
Recently however, investors' expectations of future returns have been lowered as inflation and rising bond yields seem to have taken hold. A renewed focus on alternative assets can be observed. The question one needs to ask is: which areas would benefit in the alternative asset space without giving up the much needed flexibility in these times of seemingly abrupt change?

Which Diversification?

The emphasis has turned to diversification focused on managing an inflationary world. The statistic, taken from Mercer's report, seems impeccable for private assets:



Source: Aether Investment Partners



Source: Aether Investment Partners

Private assets must be the solution! Thoughtfully, all the large asset managers like Vanguard, Blackrock and Macquarie Asset Management are rushing to enable access for wealthy individuals[2]. And, according to an article by the Wall Street Journal, wealthy investors are indeed piling into the asset class, most recently to avoid volatility[3].

We caution that the period depicted in above graphs was not comparable with the persistently higher inflation we have seen since the beginning of 2021. And there are particular challenges to this asset class which are often forgotten: if large institutional investors struggle with access to the best managers, the need of a longer-term investment process with various capital calls and neither fast liquidity nor rebalancing possibility, how will the wealthy individual client cope?

Exits - the Return on Capital and of Capital at the Same Time

Another important consideration for investments is the depth of liquidity in an asset to be able to exit at any given time. Private assets represent an investment in the (financial) economy as every other asset does (except physical gold). The asset class had been blessed with a functioning exit channel almost as long as the above graphs suggest as the combination of lower bond yields and central bank supported asset markets and makes it easy for potential buyers to 'wheel and deal'. That was the case for almost as long as the above graphs suggest. However, most asset managers have experienced the freeze of capital markets in the Financial Crisis and the devastating effects especially in the hedge fund community. Benevolent capital markets are therefore needed for attractive exits or investment returns respectively.

The Modern Oracle of Delphi – The Wealth Effect

Investment decisions are generally based on a judgement considering where we are in the business cycle and what we are to expect. Let's look at the status of the US economy and capital markets as expressed in terms of US household wealth[4]. While the first quarter of 2020 saw a decline of around $6 Trillion in US wealth, the next seven quarters saw an overall gain of US Household wealth of approx. $40 trillion. This 26% growth in real terms compares with a gain of 55% in the entire decade of the 1990s and 43% in the period of 1922-29. Most recently, the large losses in the crypto space (estimated at around $1,7 trillion globally), another $9 trillion in equity losses (as measured in the decline of the S&P500) and some $1 trillion losses in bond valuation amount to a sizable reduction in Net Wealth.

We can easily view this as a shock not just to household wealth, but, more importantly, to consumption attitudes. This would suggest a very negative feedback loop adding to the headwinds of sizable cost of living increases. That is a very dangerous situation for all investments, private or not, if combined with the effects of the tightening cycle of the central banks and an ever-increasing attitude of those institutions to fight inflation until something brakes.

Conclusion

If things can change as dramatically as they have done in the last two years, a traditional long-term investment horizon might not serve investors very well. How do we ascertain a realistic (il-) liquidity premium under these circumstances? Does it make sense to invest in these assets now? How far will a re-valuation of assets, which obviously is underway now, go? How far will it impair private assets, usually one of the last dominoes to fall?

In the current environment we would err on the conservative side and be very flexible. Also consider alternative approaches which might be more liquid and appropriate. How about a look into volatility strategies or even trend following concepts which have shown impressive resilience in the last six months?

[2] https://www.thinkadvisor.com/2021/11/04/asset-managers-expanding-access-to-private-markets/
[3] https://www.wsj.com/articles/wealthy-investors-pile-into-private-equity-to-escape-stock-volatility, March 26th, 2022.
[4] Statistics taken from the Fed's Z.1 Financial Accounts Report by the macro analyst & Managing Director Josh Steiner of Hedgeye, Early Look, May 25th, 2022.

CHARTBOOK – FOOD FOR THOUGHTS COMMODITES, GOLD & BITCOIN

This section provides you with information in a different format. To give you a perspective, we like to present charts with longer-term time horizons. The editing team of the European Investment Journal invites you to submit topics and charts respectively for future editions.

This chart deck has been submitted by Incrementum AG, Lichtenstein, author of the well-known, globally distributed In Gold We Trust Report.

1. Monthly Performance of Various Assets, 05/2020 – 04/2022
2. Gold Performance in Major Currencies. 2000 – 2022 YTD
3. Buffett Indicator (Wiltshire 5000 in % of US GDP), Q1/1971 – Q1/2022
4. Gold (lhs), in USD, and US CPI (rhs), yoy%, 01/1970-04/2022
5. US Commodity Price Index, 10-year rolling CAGR, 1815-2022
6. S&P GSCI Total Return Index/ S&P 500 Ratio, 01/1971 – 04/2022
7. The Characteristics of Gold, Fiat Currency and Bitcoin
8. Store of Value Characteristics: Bitcoin's Drawdowns Were Severly Higher
9. Terrific Performance Goes Hand in Hand with High Drawdowns
10. Summary

incrementum

1. Monthly Performance of Various Assets, 05/2020 – 04/2022

	Gold	Silver	HUI	Bitcoin	S&P 500	NASDAQ Comp.	MSCI World	VIX	UST 2Y Yield	UST 10Y Yield	WTI	CRB Index	DXY
May-20	2.75%	18.77%	2.22%	7.77%	4.53%	6.75%	4.63%	-19.44%	-18.47%	1.08%	88.38%	12.85%	-0.68%
Jun-20	3.15%	1.63%	7.84%	-3.82%	1.84%	5.99%	2.51%	10.61%	-5.97%	0.78%	10.65%	4.35%	-0.97%
Jul-20	10.90%	34.42%	18.98%	24.02%	5.51%	6.82%	4.69%	-19.62%	-29.21%	-18.94%	2.55%	4.16%	-4.15%
Aug-20	-0.25%	15.80%	0.34%	3.00%	7.01%	9.59%	6.53%	7.97%	21.50%	32.51%	5.81%	6.63%	-1.29%
Sep-20	-4.28%	-17.75%	-7.09%	-8.30%	-3.92%	-5.16%	-3.59%	-0.15%	-1.43%	-2.93%	-5.61%	-3.06%	1.89%
Oct-20	-0.40%	1.81%	-3.77%	29.21%	-2.77%	-2.29%	-3.14%	44.18%	19.48%	27.42%	-11.01%	-2.54%	0.16%
Nov-20	-5.37%	-4.34%	-9.84%	40.00%	10.75%	11.80%	12.66%	-45.90%	-3.77%	-3.61%	26.68%	10.60%	-2.31%
Dec-20	6.72%	16.61%	5.63%	49.60%	3.71%	5.65%	4.14%	10.60%	-18.27%	8.82%	7.01%	4.84%	-2.10%
Jan-21	-2.66%	2.44%	-5.34%	11.50%	-1.11%	1.42%	-1.05%	45.45%	-9.51%	16.81%	7.58%	3.82%	0.72%
Feb-21	-6.10%	-1.41%	-11.80%	33.59%	2.61%	0.93%	2.45%	-15.53%	15.81%	31.38%	17.82%	9.32%	0.33%
Mar-21	-1.53%	-8.38%	5.86%	36.53%	4.24%	0.41%	3.11%	-30.59%	25.83%	23.99%	-3.80%	-2.87%	2.59%
Apr-21	3.61%	6.19%	3.84%	-3.64%	5.24%	5.40%	4.52%	-4.07%	0.06%	-6.77%	7.47%	8.00%	-2.09%
May-21	7.79%	8.31%	15.94%	-35.42%	0.55%	-1.53%	1.26%	-9.94%	-13.37%	-2.78%	4.31%	2.98%	-1.37%
Jun-21	-7.16%	-6.94%	-16.26%	-5.75%	2.22%	5.49%	1.40%	-5.55%	79.59%	-7.13%	10.78%	3.74%	2.67%
Jul-21	2.47%	-2.47%	2.52%	20.13%	2.27%	1.16%	1.72%	15.22%	-25.62%	-16.51%	0.65%	2.20%	-0.28%
Aug-21	-0.01%	-6.19%	-7.27%	13.16%	2.90%	4.00%	2.35%	-9.65%	12.51%	6.65%	-7.37%	0.05%	0.49%
Sep-21	-3.13%	-7.05%	-9.60%	-7.58%	-4.76%	-5.31%	-4.29%	40.41%	33.18%	14.18%	9.53%	4.93%	1.73%
Oct-21	1.49%	7.43%	8.46%	39.64%	6.91%	7.27%	5.59%	-29.73%	78.04%	4.58%	11.38%	3.84%	-0.11%
Nov-21	-0.51%	-4.41%	2.30%	-5.80%	-0.83%	0.25%	-2.30%	67.22%	13.17%	-6.71%	-20.81%	-7.78%	1.99%
Dec-21	3.08%	2.06%	1.67%	-18.95%	4.36%	0.69%	4.19%	-36.67%	29.47%	3.82%	13.64%	6.02%	-0.03%
Jan-22	-1.75%	-3.59%	-4.54%	-17.02%	-5.26%	-8.98%	-5.34%	44.19%	61.37%	17.99%	17.21%	9.80%	0.60%
Feb-22	6.20%	8.85%	13.31%	8.36%	-3.14%	-3.43%	-2.65%	21.43%	21.25%	2.12%	8.59%	5.50%	0.17%
Mar-22	1.54%	1.44%	11.31%	9.91%	3.58%	3.41%	2.52%	-31.81%	62.54%	28.74%	4.76%	9.74%	1.66%
Apr-22	-2.11%	-8.20%	-9.41%	-15.70%	-8.80%	-13.26%	-8.43%	62.45%	16.98%	25.26%	4.40%	4.50%	4.73%
Average	**0.6%**	**2.3%**	**0.6%**	**8.5%**	**1.6%**	**1.5%**	**1.4%**	**4.6%**	**15.2%**	**7.5%**	**8.8%**	**4.2%**	**0.2%**
MAX	**10.9%**	**34.4%**	**19.0%**	**49.6%**	**10.8%**	**11.8%**	**12.7%**	**67.2%**	**79.6%**	**32.5%**	**88.4%**	**12.9%**	**4.7%**
MIN	**-7.2%**	**-17.8%**	**-16.3%**	**-35.4%**	**-8.8%**	**-13.3%**	**-8.4%**	**-45.9%**	**-29.2%**	**-18.9%**	**-20.8%**	**-7.8%**	**-4.2%**
Current Price	**1,896**	**22.7**	**282**	**38,582**	**4,132**	**12,335**	**2,796**	**33.4**	**2.73**	**2.94**	**104.7**	**328**	**103.0**

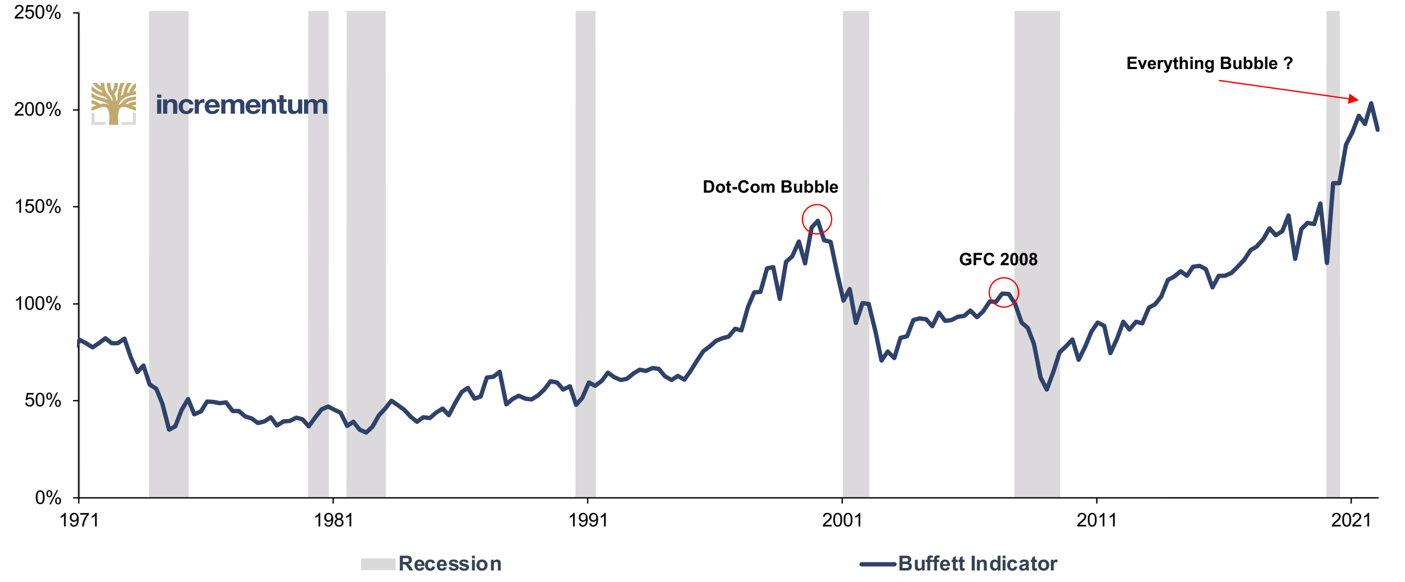
Source: Reuters Eikon, Incrementum AG

2. Gold Performance in Major Currencies. 2000 – 2022 YTD

Year	USD	EUR	GBP	AUD	CAD	CNY	JPY	CHF	INR	Average
2000	-5.3%	1.2%	2.4%	11.2%	-1.9%	-5.4%	5.8%	-4.2%	1.4%	**0.6%**
2001	2.4%	8.4%	5.3%	12.0%	8.8%	2.4%	18.0%	5.5%	5.8%	**7.6%**
2002	24.4%	5.5%	12.3%	13.2%	22.9%	24.4%	12.2%	3.5%	23.7%	**15.8%**
2003	19.6%	-0.2%	8.0%	-10.7%	-1.3%	19.6%	8.1%	7.4%	13.9%	**7.2%**
2004	5.6%	-2.0%	-1.7%	1.5%	-2.0%	5.6%	0.8%	-3.1%	0.1%	**0.5%**
2005	18.1%	35.2%	31.6%	25.9%	14.1%	15.1%	35.9%	36.3%	22.8%	**26.1%**
2006	23.0%	10.4%	8.1%	14.3%	23.3%	19.0%	24.2%	14.1%	20.7%	**17.5%**
2007	30.9%	18.4%	29.2%	18.0%	12.0%	22.5%	22.5%	21.8%	16.9%	**21.4%**
2008	5.4%	10.0%	43.0%	30.5%	28.7%	-1.5%	-14.2%	-0.8%	30.0%	**14.6%**
2009	24.8%	21.8%	13.0%	-1.6%	7.9%	24.8%	27.9%	21.1%	19.2%	**17.6%**
2010	29.5%	38.6%	34.2%	13.9%	22.8%	25.1%	13.2%	16.8%	24.8%	**24.3%**
2011	10.2%	13.8%	10.6%	9.9%	12.7%	5.2%	4.5%	10.7%	30.7%	**12.0%**
2012	7.1%	5.0%	2.4%	5.3%	4.2%	6.0%	20.7%	4.5%	11.1%	**7.4%**
2013	-28.0%	-30.9%	-29.4%	-16.1%	-23.0%	-30.1%	-12.6%	-29.8%	-19.1%	**-24.3%**
2014	-1.8%	11.6%	4.4%	7.2%	7.5%	0.7%	11.6%	9.4%	0.2%	**5.6%**
2015	-10.4%	-0.2%	-5.3%	0.6%	6.8%	-6.2%	-9.9%	-9.7%	-5.9%	**-4.4%**
2016	8.5%	12.1%	29.7%	9.4%	5.3%	16.1%	5.4%	10.3%	11.4%	**12.0%**
2017	13.1%	-0.9%	3.3%	4.6%	5.9%	6.0%	9.0%	8.3%	6.3%	**6.2%**
2018	-1.5%	3.0%	4.3%	9.0%	6.8%	4.1%	-4.2%	-0.8%	7.3%	**3.1%**
2019	18.3%	21.0%	13.8%	18.7%	12.6%	19.7%	17.2%	16.6%	21.3%	**17.7%**
2020	25.0%	14.7%	21.2%	14.1%	22.6%	17.2%	18.8%	14.3%	28.0%	**19.5%**
2021	-3.6%	3.6%	-2.6%	2.2%	-4.3%	-6.1%	7.5%	-0.6%	-1.7%	**-0.6%**
2022 YTD	3.7%	11.9%	11.6%	6.6%	5.5%	7.9%	17.0%	10.7%	6.6%	**9.1%**
Average	**9.5%**	**9.2%**	**10.8%**	**8.7%**	**8.6%**	**8.4%**	**10.4%**	**7.1%**	**12.0%**	**9.4%**

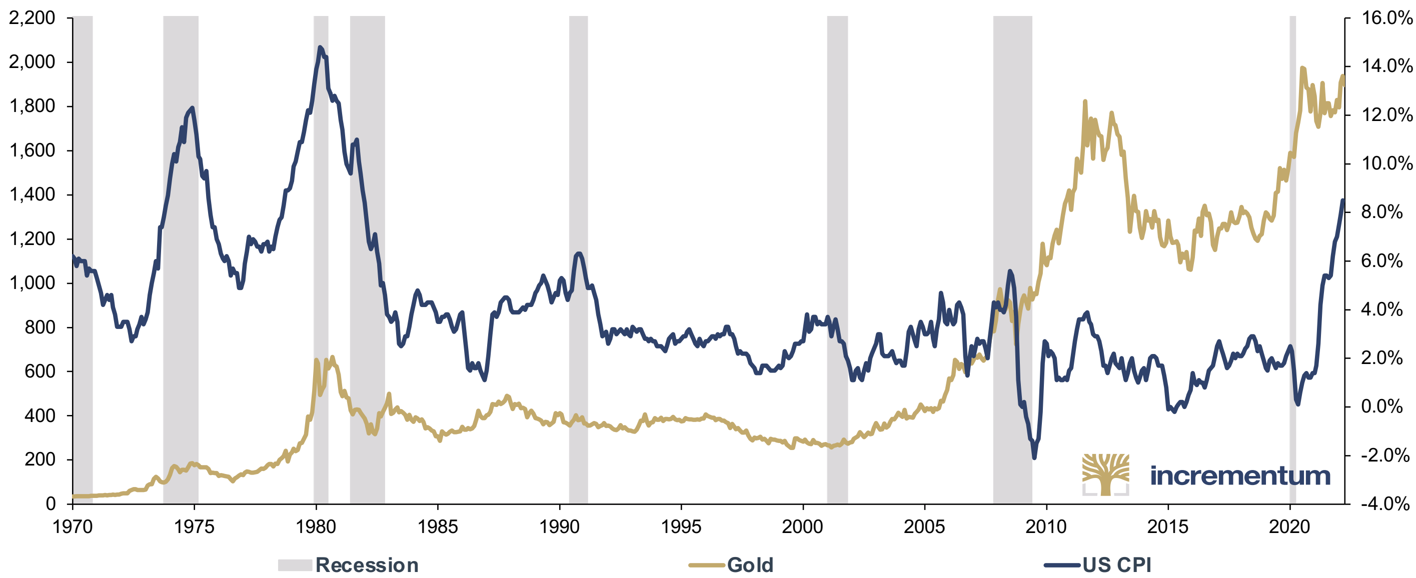
Source: Reuters Eikon (as of April 29th, 2022), Incrementum AG

3. Buffett Indicator (Wiltshire 5000 in % of US GDP), Q1/1971 – Q1/2022



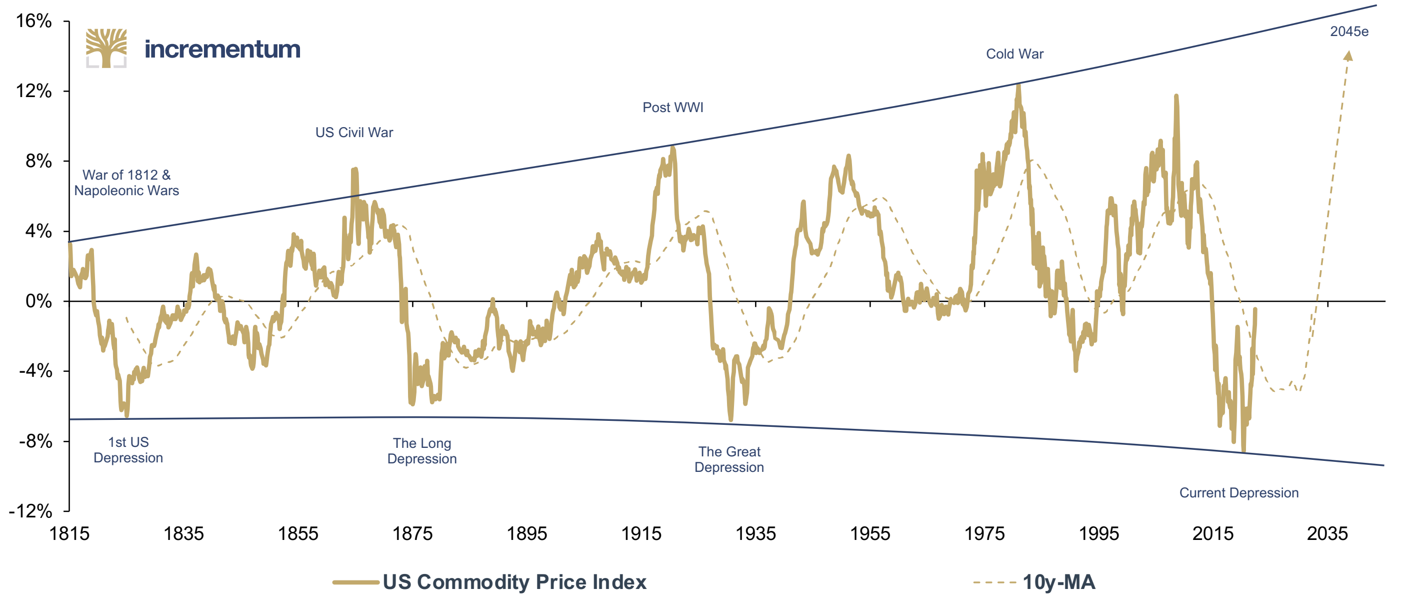
Source: Reuters Eikon, Incrementum AG

4. Gold (lhs), in USD, and US CPI (rhs), yoy%, 01/1970-04/2022



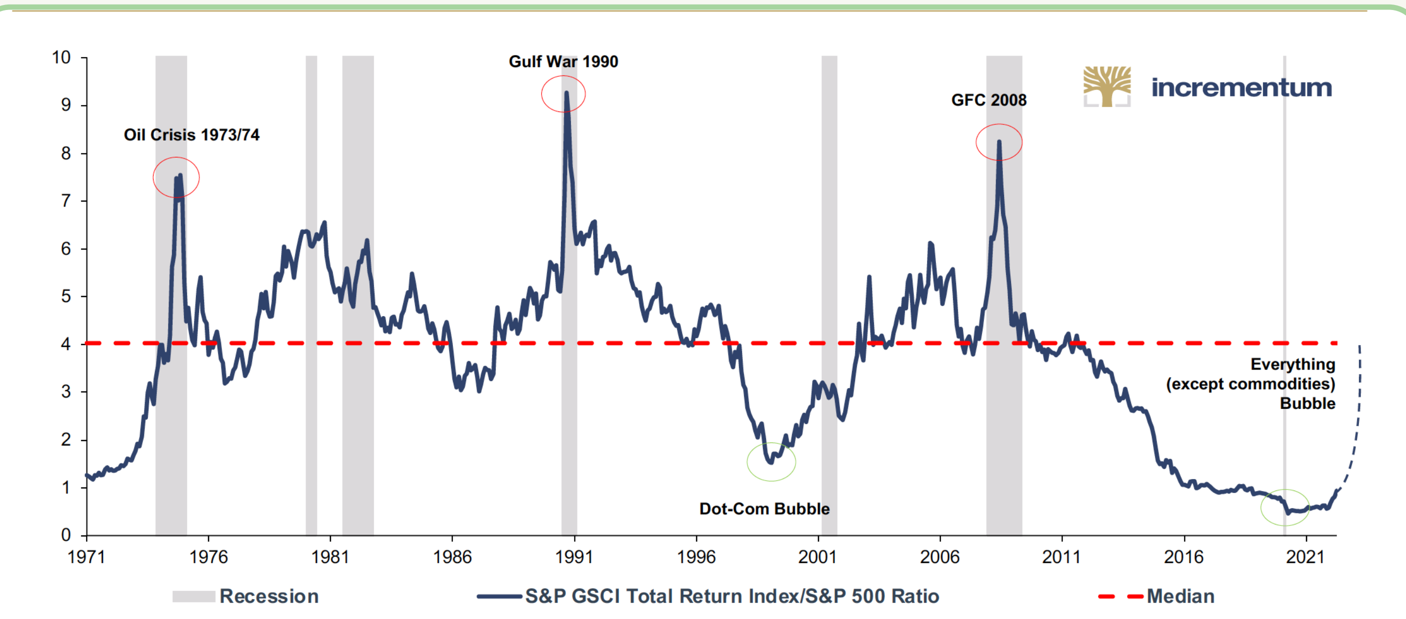
Source: Reuters Eikon, Incrementum AG

5. US Commodity Price Index, 10-year rolling CAGR, 1815-2022



Source: Reuters Eikon, Stifel Report, Incrementum AG

6. S&P GSCI Total Return Index/ S&P 500 Ratio, 01/1971 – 04/2022



Source: Dr. Torsten Dennin, Reuters Eikon, Incrementum AG

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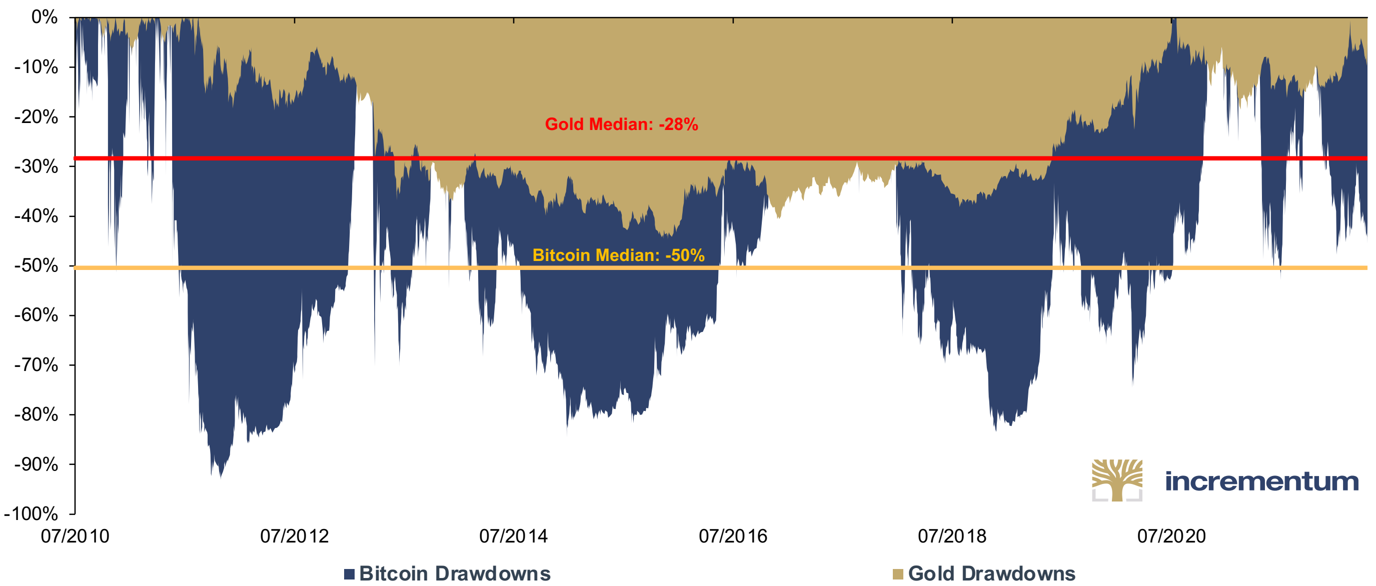
7. The Characteristics of Gold, Fiat Currency and Bitcoin

Traits of Money	Gold	Fiat Currency	Bitcoin
Fungibility	Moderate/High	High	High
Portability	Moderate	High	High
Durability	High	Moderate	High
Anonymity	High	Low	Moderate
Security	Moderate	Moderate	High
Non-monetary Utility	High	Low	Low
Scarcity	Moderate/High	Low	High
Decentralization	Moderate	Low	High
Programmability	Low	Low	High
Sovereignity (Government)	Moderate	High	Low
Price Stability	Moderate	High	Low
Energy Intensity for Creation	High	Low	High
Energy Intensity for Maintenance	Low	Moderate	High

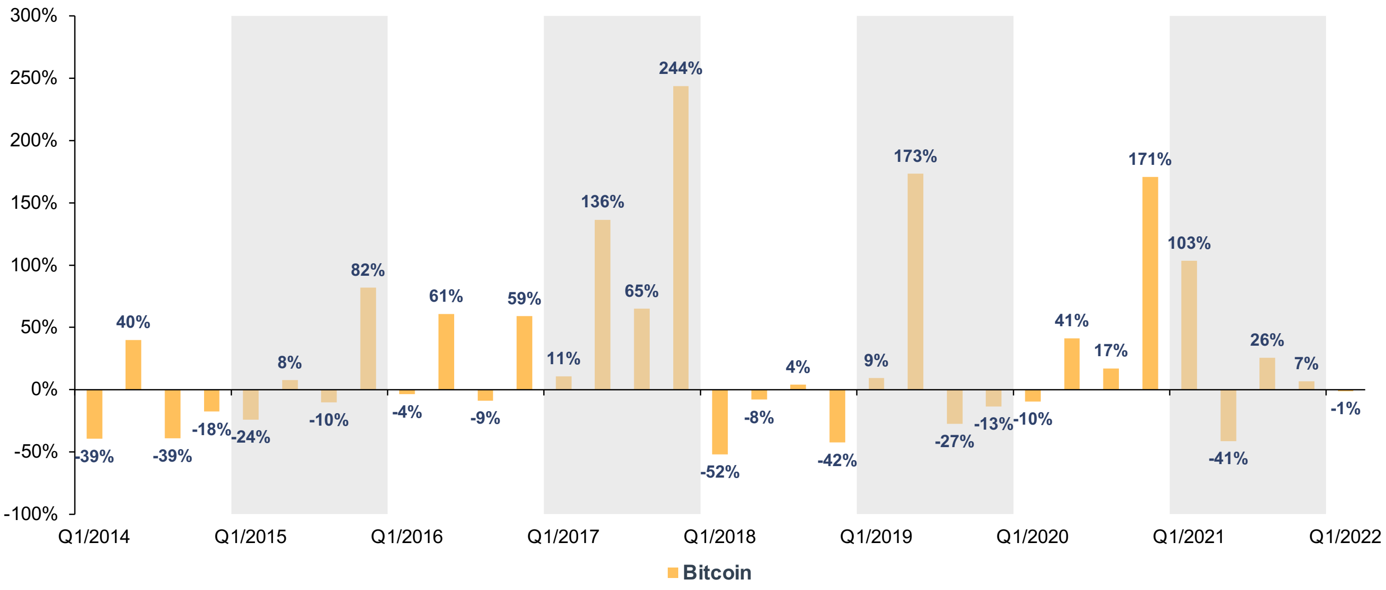
Source: 3iQ Research Group, Incrementum AG

8. Store of Value Characteristics: Bitcoin's Drawdowns Were Severly Higher



Source: Glassnode, Reuters Eikon, Incrementum AG

9. Terrific Performance Goes Hand in Hand with High Drawdowns



Source: IntoTheBlock, Reuters Eikon, Incrementum AG

10. Summary

1. Due to its unusual investment characteristics in terms of performance, correlation and volatility, **Bitcoin (and selected altcoins) can serve as useful supplement within a diversified portfolio.**

2. Gold and Bitcoin are non-inflatable and as such profit from monetary inflation. **Together they shine even brighter due to a superior risk/return profile.** We are convinced that an increasing number of investors will treat **Gold and Bitcoin as parts of one non-inflatable asset class.**

3. **Most altcoins are not here to stay.** However, some projects have the potential to serve as market disruptors and substantially change aspects in our lives. Conceptionally, **we consider (most) altcoins more like venture capital investments, whereas Bitcoin to us is digital Gold.**

4. In December, **we formulated three scenarios for the current halving cycle in our Bitcoin chartbook.** In our opinion, the most likely scenario (60%) was a delayed peak in this bisection cycle. However, we assigned a probability of 40% to the possibility that this bisection cycle is over, or that the model is obsolete. From today's perspective, we put the **probability of Bitcoin reaching a new all-time high in the remaining 24 months of this cycle at around 40%.** This scenario could manifest itself if the currently priced-in monetary tightening does not materialize.

The English Channel, The Strait of Dover at it's narrowest point. Image courtesy of the European Space Agency.