

Bitcoin and other cryptocurrencies – assessing a controversial asset class

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Reading time

15 minutes

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Executive summary

Cryptocurrencies have seen a remarkable rise over the past decade. They've moved from the fringes of the investment world, to being an emerging asset class. The trustworthiness of traditional assets, and even currencies, have been called into question. Cryptocurrencies are said to provide a solution to these threats – but do they succeed? Should you have them in your portfolio? And, what are the risks?

A cryptocurrency is a digital coin – in other words, it is completely virtual. It is estimated that there are 100 million cryptocurrency investors, 8,000 tradable assets, the total “market capitalisation” is USD 1.5 trillion and Bitcoin dominates with a market share of 61% or USD 950 billion. We review a number of valuation methods for Bitcoin: network value to transaction, cost of production, stock to flow model, gold substitute and speculative bubbles framework. Forecasts range from zero to USD38,800, all below the current price of USD58,000, but with long-term forecasts of up to USD1m. Very few investments instruments or asset classes have ever attracted such a dramatic divergence in opinions.

Early investors have reaped enormous returns. Even accounting for volatility, Bitcoin and Ether have delivered far superior returns than any other asset class. The consensus on what *fair value* is will determine whether the next ten years are as attractive as the last. We believe that a key distinction will depend on whether cryptocurrencies are viewed as a *medium of exchange* or a *store of value*, like gold or US dollars.

If cryptocurrencies are viewed as a *medium of exchange*, they will not command a large premium for the price of their tokens. That said, we do see how the most dominant cryptocurrencies – in particular Bitcoin – could become a form of *digital gold*. Here, the valuation mechanisms for safe haven currencies and gold would be an appropriate benchmark.

Investors may want to expose a small percentage of their portfolio to established cryptocurrencies, such as Bitcoin. Like gold, they should treat the investment as a hedge against a possible devaluation of fiat currencies, rather than speculation. Adding Bitcoin may increase overall volatility and contribute to losses, in certain instances, but its *raison d'être* would be strategic – offering potential protection from a sustained loss of confidence in the current economic world order. **Prior to any investment, we strongly recommend that you seek professional advice.**

Risk warning on cryptocurrencies, please read before continuing

Cryptocurrencies are high risk. This Briefing does not constitute investment advice. You should not invest in or deal in any financial product unless you understand its nature and the extent of your exposure to risk. You should also be satisfied that it is suitable for you, in the light of your circumstances and financial position. The information available in this Briefing is meant for educational purposes only and in no way is a guarantee of successful investing or an endorsement of investment in any particular product or investment in cryptocurrencies generally.

Cryptocurrencies are a medium of exchange that are created and stored electronically in blockchains, which are distributed public databases that keep a permanent record of digital transactions. Unlike traditional currency, these alternatives have no physical form and typically are not backed by tangible assets. They are not insured or controlled by a central bank or other governmental authority, cannot always be exchanged for other commodities, and are subject to little or no regulation.

Investments denominated in a cryptocurrency may expose you to great risk. The past performance of any investment is not necessarily a guide to future performance. The value of investments or income from them may go down as well as up. As cryptocurrencies, like stocks and shares, are valued from second to second, their bid and offer value fluctuates sometimes widely. The value of cryptocurrencies may rise as well as fall due to, and not just including, the volatility of world markets, interest rates, economic conditions/data and/or changes in the rate of exchange in the currency. You may not necessarily get back the amount you invested.

Crypto investing and trading is a new market. It requires specialised knowledge that may be difficult to acquire. High growth has led to volatility. And while it may seem attractive to invest in digital currencies, this new field does have significant instability to consider before investing. As with any new investment, be sure to weigh the risk versus rewards, so you can make the right choice for your situation. Please seek independent and professional financial advice from a suitably regulated and qualified adviser, prior to any investment.

Cryptocurrencies have seen a remarkable rise over the past decade. They've moved from the fringes of the investment world, to being an emerging asset class.

The trustworthiness of traditional assets, and even currencies, have been called into question by: (1) the longstanding ultra-low interest rates set by central banks, (2) the high levels of debt in both developed and developing economies, and (3) the accelerated “printing” of trillions of dollars by central banks and the resulting prospect of surging inflation.

Cryptocurrencies are said to provide a solution to these threats – but do they succeed? Should you have exposure to cryptocurrencies in your portfolio? And, what are the risks?

Cryptocurrencies – the context

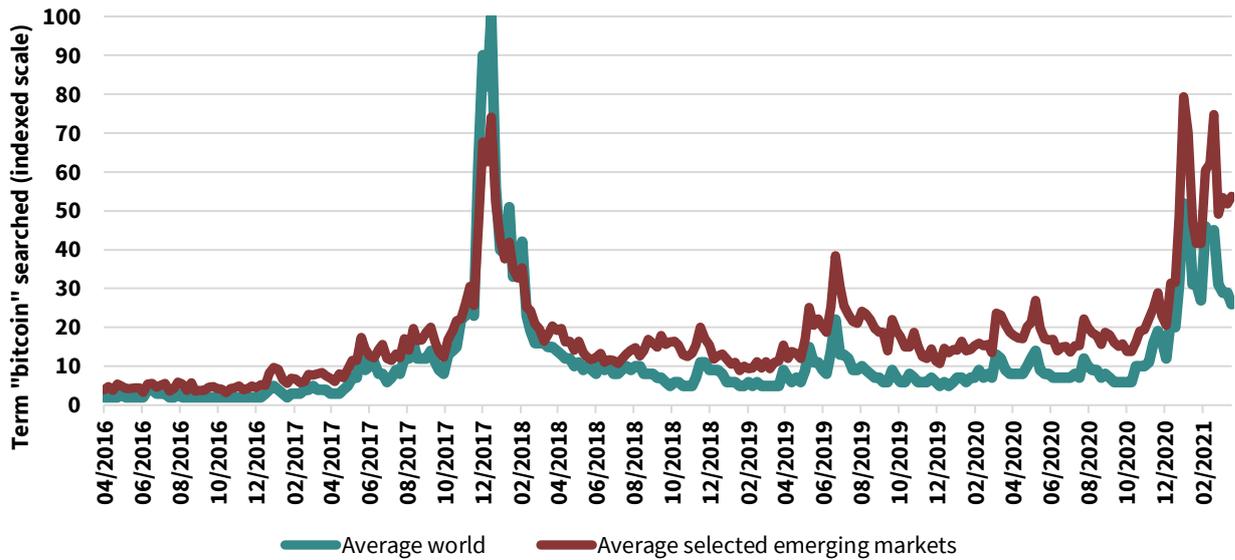
To start, let's look at some of the supposed features of cryptocurrencies. We are told that they:

- Are safer because each transaction is verified by a large, decentralised network of computers
- Are a protection against inflation, because of finite supply
- Are a store of value, outside the reach of governments who may tax the wealthy or confiscate assets in times of crisis, as they have historically done^[1]

These features have rendered them an increasingly attractive alternative to investors in the current investment climate. In particular, the most prominent cryptocurrency, Bitcoin.

Looking at investors' collective interest in Bitcoin, crudely approximated and depicted in **Chart 1** by how many times the term “Bitcoin” was searched on Google, it becomes clear that this interest is more pronounced in times where Bitcoin experienced steep price increases – such as in 2017, and in late 2020/early 2021.

However, more interestingly, the chart also highlights a consistently stronger interest in the cryptocurrency from emerging economies such as Argentina, Brazil, Iran, Russia, Turkey, and Venezuela. Here, conventional currencies are perceived to be more vulnerable, and Bitcoin is thought to offer local investors superior protection of value.



Selected emerging markets are Argentina, Brazil, Iran, Russia and Venezuela
 Source: Google Trends (2021)

Chart 1: Term “bitcoin” searched on Google (2016 – 2021), in world and selected emerging markets

The strong returns that Bitcoin, Ether and other cryptocurrencies have enjoyed over recent years have led established financial services firms – such as Blackrock, Fidelity and Goldman Sachs – to enter this sector, seeking regulatory approval to offer cryptocurrency-based exchange traded funds.

At the same time, crypto-players are moving towards the mainstream. Kraken, a regulated crypto-exchange in the US, has for example registered formally as a bank. It appears that FOMO (or “fear of missing out”) amongst both institutional and individual investors has become prevalent. In our own research, one crypto-expert summarised this phenomenon as follows:

“Five years ago, it would have been irresponsible to advise your clients to invest into Bitcoin. But today, it seems irresponsible to not have any exposure to them!”

He may have a point. However, investors attracted to this type of exposure would be well advised to remember certain additional risks associated with cryptocurrencies that are much less prevalent in traditional asset classes: (1) crypto-markets remain much less regulated than conventional markets, (2) the complexity and technical nature of cryptocurrencies makes them much harder to understand and analyse, and (3) in certain instances, particular attributes and processes associated with cryptocurrencies are non-transparent. As a result, the management of investment risk becomes much more challenging, and the nature of the investment instrument is very volatile. Investors must therefore see crypto-currencies as high risk.

Explaining cryptocurrencies and assessing their value

What are cryptocurrencies?

A cryptocurrency is a digital coin – in other words, it is completely virtual. These digital coins are designed to work as a store of value and a medium of exchange, rather like conventional currencies. The difference is that individual coin ownership records are stored in a completely digital ledger, in an intricate computer database. Very strong cryptography is used to secure transaction records and to verify the transfer of coin ownership.

Each coin can be stored in a “digital wallet” – on a computer, or within an app on a phone. The digital coins can then be transferred between different wallet holders and each transfer is recorded in a public list called the blockchain. It is this public ledger that traces movements of all available coins, ensuring that a coin cannot be spent twice in the market. Well-known incumbents, such as Bitcoin, also limit and control the creation of additional coins. As a result, creating scarcity of the asset and hopefully preventing dilution of value.

What are the characteristics of the cryptocurrency market?

The global cryptocurrency marketplace is now very sizable indeed:

- It is estimated that there are now 100 million cryptocurrency users and investors
- There are currently approximately 8,000 tradable crypto assets
- The total “market capitalisation” stands at approximately USD 1.5 trillion
- Bitcoin dominates the overall market, with a market share of 61% or USD 950 billion
- Ethereum, which aims to be a “smart-contract platform for decentralized finance”, with its asset Ether, represents around 11% of the overall market, or USD 200 billion^[2]
- Bitcoin and Ethereum are the largest open and decentralised networks, and as a result, hundreds of companies are building infrastructure using the platforms

Recently, established financial institutions have embraced Bitcoin and opened the path for it to play a more mainstream role in the world of finance. PayPal, Square, Revolut, and many other FinTech companies have started to allow use and access to Bitcoin and other cryptocurrencies. Even so-called “Bitcoin ATMs” are starting to be deployed in many countries.

Meanwhile, traditional financial services corporations – like Mastercard – have announced their plans to offer Bitcoin in the future. Other listed entities such as MicroStrategy and Tesla have even put Bitcoin on their balance sheet, as part of their corporate treasury strategy. Tesla recently announced that their cars can now be purchased using Bitcoin.

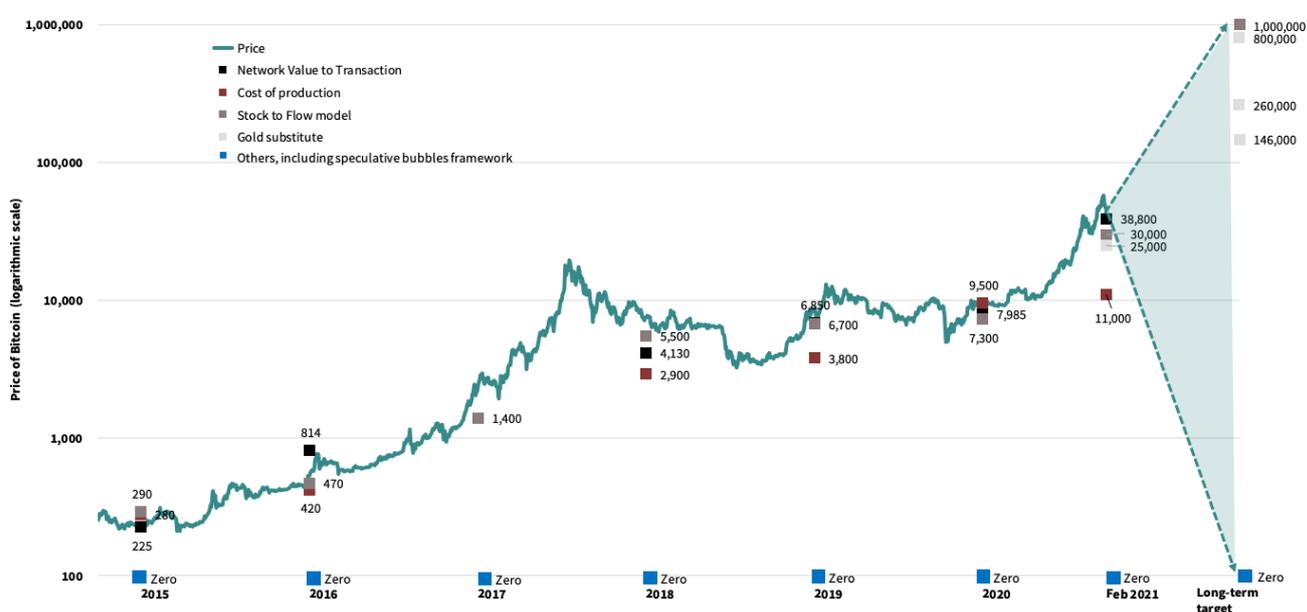
That said, there are reasons for the lack of broader adoption in developed countries. Firstly, the national payments infrastructure does not allow it, or is not capable of allowing it. Secondly, individual states are focused on the stability of their national currency and see cryptocurrencies as a potential threat to that stability. In some emerging markets, however, with high inflation or exchange rate volatility this is slowly starting to change.

How do you assess the true, intrinsic value of cryptocurrencies?

With the considerable hype that crypto-assets currently enjoy, a regular question we face is around its *fair value*. As tempted as investors are to allocate a portion of their wealth to cryptocurrencies, many are concerned about valuation levels. So how can we establish the fair price of a crypto-asset?

Valuing any asset is both an art and a science. There are a broad range of factors – supply and demand, expected future value, the risk of loss, liquidity, the cost to hold the asset, future cash flows, assumed future interest rates and legal/regulatory factors.

Whilst valuation approaches for equities and bonds are well established and widely accepted, there is no such consensus in relation to cryptocurrencies. Having said that, a number of different methodologies are being applied to attempt to value cryptocurrencies, largely dependent on how the currency is being used. We take a closer look at how Bitcoin is being valued using some of these approaches:



Source: Endo Capital

Chart 2: The price of Bitcoin and fair valuation estimates using different valuation methods

Chart 2 summarises the value assigned to Bitcoin by different valuation methodologies at various points in time, as well as its long-term target value. The green line plots the actual price of Bitcoin. We will expand further the methods shown here to assess Bitcoin's value:

- **Network Value to Transaction:** This approach values its network size and transaction volumes, similar to other payment and exchange service providers^[3]
- **Cost of production:** This method estimates the financial effort required to compete against other miners in validating transactions and where the *winning miner* extracts newly minted Bitcoins from the blockchain, similar to mining conventional precious metals^[4]

- **Store of value:** This views Bitcoin as a store of value, arguing that it will replace gold as the pre-eminent, non-government backed medium to protect wealth. We look at two somewhat related methodologies, in particular:
 - **Stock to Flow model:** This calculates the ratio of total stock of available precious metal, such as gold, to its annual production and applies it to how many Bitcoins have been mined, so far in total, to those that are yet to be mined^[5]
 - **Gold substitute:** This approach essentially assumes that gold will be at least partially replaced by Bitcoin and derive a price per Bitcoin by estimating the total market size for gold divided by the number of Bitcoins available^{[6][7][8]}
- **Others, including speculative bubbles framework:** The speculative bubbles framework is one prominent representative of the “others” group. It analyses the price formation in Bitcoin, over time, and identifies the existence of an unsustainable, speculative bubble^[9]. The negative sentiment on Bitcoin – reflected by a prediction of its long-term value being zero – is echoed by a whole host of other financial markets commentators that argue conceptually about Bitcoin’s true value. The key argument put forward by this group focuses on the concern that governments will react negatively towards a currency that they cannot control, and will therefore ban or restrict its use. Other concerns, such as those shared by Professor Nouriel Roubini at New York University, include that Bitcoin is “not a scalable means of payment” and “not a stable store of value” given its technical limitations and its price volatility^[10]

The logarithmic nature of the vertical, y-axis conceals the fact that the range of estimates is enormous. Let’s take a look at range of values as of February 2021: (1) proponents of the cost of production approach, which typically serves as a lower boundary on the price estimate, see its current value at around USD 11,000, (2) whilst those focusing on the network’s value, estimate around USD 38,800, and (3) backers of the store of value/gold substitute approach see current fair value between USD 25,000 and USD 30,000. Very few investments instruments or asset classes have ever attracted such a dramatic divergence in opinions.

That said, all of these estimates lie significantly below the current market price of USD 58,000, as at April 2021. Perhaps this is not too surprising, as the bulk of the *long-term* price targets are orders of magnitude different from the current price. Long-term price estimates range from zero amongst Bitcoin sceptics, to a million dollars and more amongst Bitcoin bulls!

Some observers – notably banks – have recently become more optimistic about Bitcoin. Even JP Morgan, the world’s largest investment bank, whose CEO Jamie Dimon was vocally negative on Bitcoin for many years,^[11] has recently stated its long-term price target for Bitcoin is USD 146,000.

Finally, we observe that in the early years of Bitcoin’s existence, its value to users was mainly perceived to be as a means of payment, facilitating transactions between parties. Consequently, *technologically-focused* valuation frameworks focusing on the size of the network were emphasised. This has changed. In recent years, Bitcoin’s price has largely been driven by the “digital gold” narrative – its ability to *store value* has become key. This is as opposed to it being a currency – not least because some of the key features of a currency, such as being government backed or displaying low levels of price fluctuations, are simply not met. Reflecting this evolution, valuation models for commodities have become more common as a basis for valuing cryptocurrencies. These established methods may be the reason why more traditional financial institutions have entered the space.

Cryptocurrencies and your overall portfolio strategy

As advisors to wealthy families, our primary concern is how cryptocurrencies fit into an overall portfolio strategy of our clients. To address this, we first take a look at some basic descriptive statistics that will give us insight into the nature of the returns and risks associated with cryptocurrencies.

What are the historic returns from cryptocurrencies?

Early backers of Bitcoin and Ether have enjoyed truly phenomenal returns. The left panel of **Chart 3** depicts their performance compared to other assets, in the past six years. The fact that we used a logarithmic scale speaks for itself – Bitcoin increased 168-fold, whilst Ether multiplied 521 times!

Traditional assets have, as you would expect, performed far less spectacularly during the same period. Even Elon Musk's electric vehicle venture, Tesla, which at the time of writing was worth more than all other major automobile companies combined, managed to *only* grow 17 times in the same period.

What have the historic volatilities (or risk) of cryptocurrencies been?

Not surprisingly – and very apparent from the chart – this exceptional return was accompanied with very high levels of price fluctuations, or *volatility*. Bitcoin's annual price fluctuation stood at 72%, whereas Ether's volatility was a stratospheric 130% per annum. In contrast, the volatility of the more traditional S&P 500 index was 19% per annum. It quickly becomes evident that the inclusion of cryptocurrencies in a portfolio will dramatically increase volatility across the whole portfolio. In the end, volatility is a key measure of risk and must be considered carefully.

What has the relationship between historic returns and risk been? Is it an efficient relationship?

Ultimately, investment returns, and the volatility of particular assets need to be examined together. When plotting the relationship in a risk-return graph, as shown in the right-hand panel of **Chart 3**, it is clear that the cryptocurrencies occupy the upper right-hand space, whilst traditional assets are concentrated in the bottom-left corner. To put it simply, cryptocurrencies have provided much higher returns, with much higher risk, compared to traditional asset classes.

But, has that relationship between return and risk been an efficient one – has an investor been rewarded for that risk? One way to assess this is via the *Sharpe Ratio*. Here, you divide annual returns by volatility. This allows you to see how much return you gain from adding risk to the portfolio. The results here are positive for cryptocurrencies with the outcomes for Bitcoin (1.89) and Ether (1.62), comparing very favourably to other assets such as S&P500 (0.56), gold (0.42), silver (0.29), and bonds (0.14).

That said, it is critical to note that this relationship is historic. It is based on past returns and past volatilities. There is certainly no guarantee that future returns will be so attractive, and it is possible that volatility could remain high, thus reducing the efficiency of the relationship.

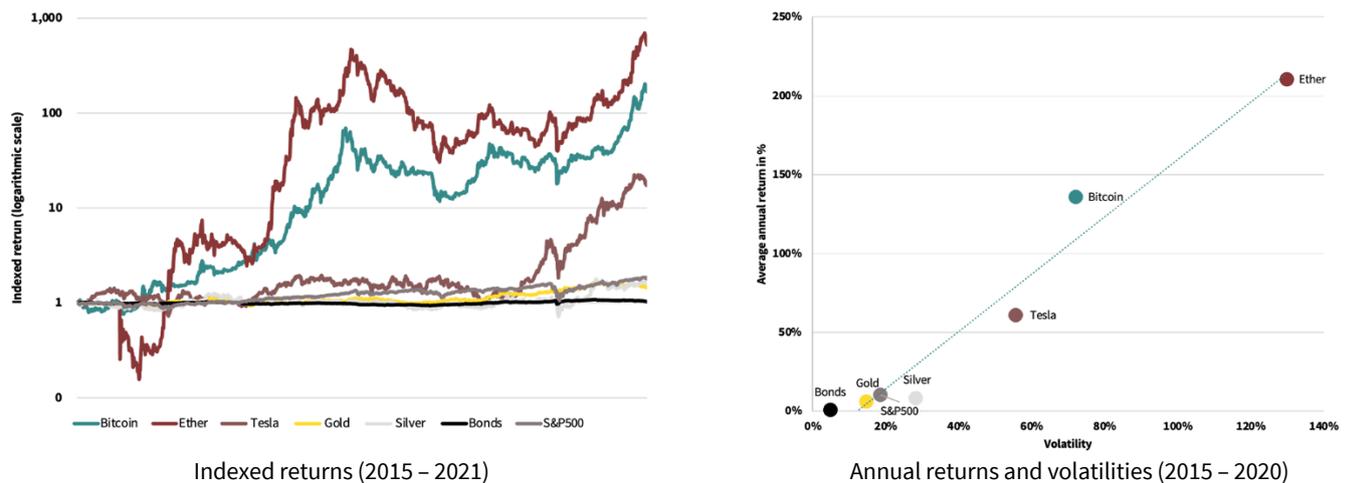


Chart 3: Performance and volatility of selected cryptocurrencies and traditional assets

What are the portfolio diversification characteristics of cryptocurrencies?

As a general rule, portfolios are well diversified if they are composed of assets that do not move in lockstep – or tandem – with each other. In an ideal portfolio, if there are losses in one position, these are balanced with gains in another, leaving the overall portfolio value unchanged. Of course, in the end, the art is to arrive at a portfolio that provides excess returns above that simple offsetting.

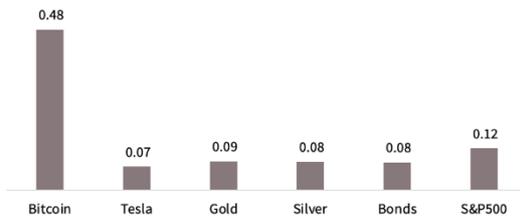
A hotly debated topic is whether crypto-assets have this offset ability and can therefore provide the portfolio with stability in times of market downturns. **Chart 4** looks at the correlation between crypto and traditional assets. We calculated the relationship for the period between January 2015 and February 2021.

The panels on the left-hand side show the correlations of the returns of Bitcoin and Ether with other assets. This shows us that Bitcoin and Ether move relatively similarly – they have a correlation of 0.48, with 1.0 being a perfect correlation. But they move much less in sync with other assets. So, they do have the potential to increase diversification in a portfolio. On the surface, this is valuable.

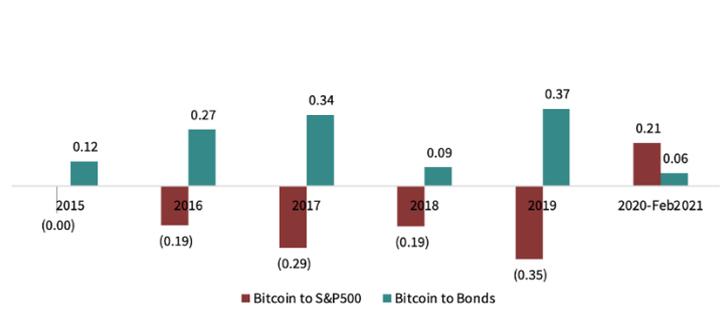
Having said that, the correlation has changed markedly from one year to another, as the panel on the right-hand side demonstrates. As an example, Bitcoin used to be heavily negatively correlated to the S&P500 index until 2020, where it has begun to move in sync with equities. Similarly, Ether has become far more correlated to both the equity *and* bond markets recently.

A potential explanation for this is that, as an emerging asset class, the composition of the underlying investors in cryptocurrencies is still shifting and will continue to do so until an eventual equilibrium is found. This increasingly positive correlation can be seen as a sign that the asset class is becoming more mainstream.

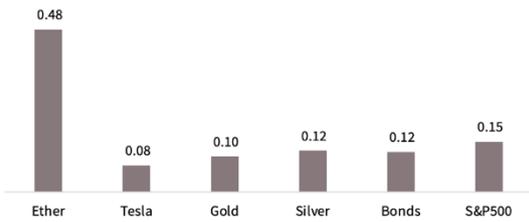
Bitcoin: Long term correlation of returns with other assets



Bitcoin: Correlation to equities and bonds



Ether: Long term correlation of returns with other assets



Ether: Correlation to equities and bonds

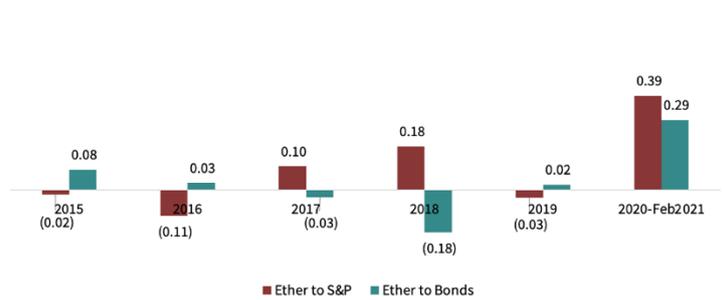


Chart 4: Correlations of returns between Bitcoin and Ether, and traditional assets

Ultimately, the litmus test for effective portfolio diversification is that protection kicks in when it matters – during periods of market distress. To test this, we examined – over the last six years – the ten worst trading days of: (1) the S&P500 index, (2) the broad bond market, and (3) a fictitious portfolio that consisted equally of the S&P500 index and bonds. We observed the following:

- For the S&P500 index, daily losses were between -4% and -12%. During these ten days, neither Bitcoin nor Ether offered much support with counteracting losses. In fact, some of the cryptocurrencies' own worst days were recorded on the same days. For example, on 12th March 2020, Bitcoin and Ether lost 37% and 42% of their value, respectively. Their performance was positive only in less than half of the ten worst days for the S&P500 index
- For the bond market, a slightly better picture emerges, at least for Bitcoin. When looking at the bond market's ten worst days, Bitcoin managed to have a positive performance in eight days when the bond markets lost between -0.6% and -5.4%
- Finally, the performance of the two cryptocurrencies on the ten worst days of a 50:50 portfolio exposed to the S&P500 index and bonds resulted in only four positive days for the cryptocurrencies

Chart 5 documents the cryptocurrencies' respective performances in detail. It is evident that neither Bitcoin nor Ether have been adequate hedges to falls in equity and bond markets.



Note: Analysis uses daily returns between February 2015 and February 2021. For bonds, Vanguard Total Return Bond Market ETF is used as proxy

Chart 5: Performance of Bitcoin and Ether on 10 worst days for S&P500, bonds and balanced strategy, between 2015 and 2021

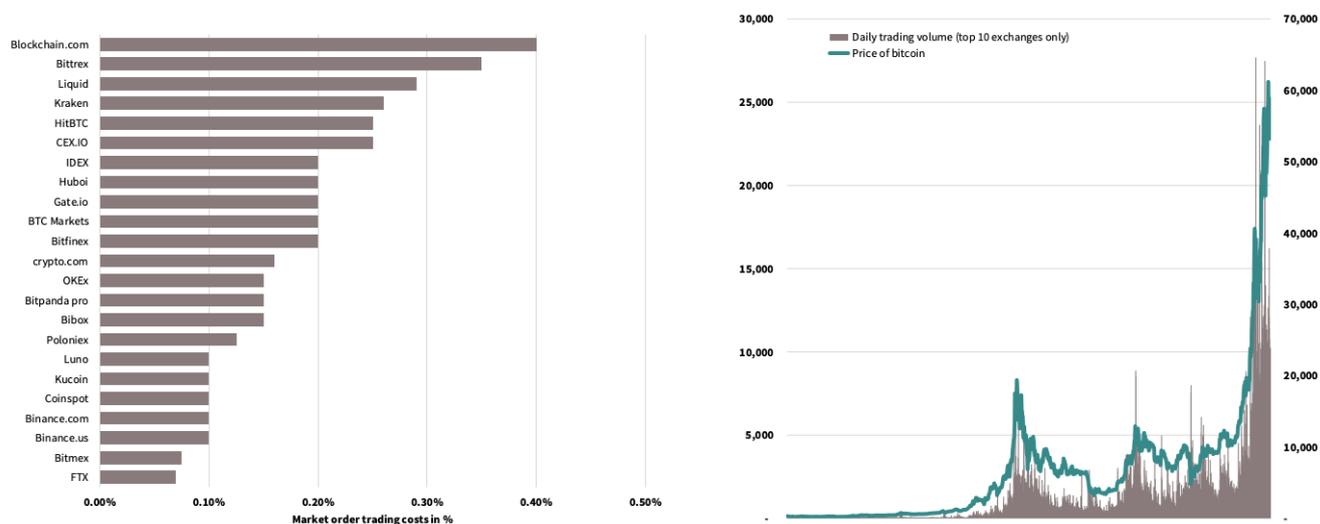
What are the liquidity characteristics and transaction costs of cryptocurrencies?

As portfolio managers, we are naturally interested in the costs of trading cryptocurrencies as such costs will impact returns. The panel on the left-hand side of **Chart 6** lists the average trading fees on major exchanges.^[13] In the past, exchange fees were notoriously expensive – however, today, trading in real-time for between 10 and 40 basis points has become the norm. We call these costs the *explicit* costs of trading cryptocurrencies.

Beyond these explicit costs, we also inspected the depth of the market for cryptocurrencies in order to gauge the market's *implicit* trading costs. These can arise when a large order is placed, in an illiquid market, leading to an adverse price movement. These costs are very specific to the particular circumstance of the trade and can therefore be difficult to isolate. However, examining the total trading volumes and comparing it to the market value of the total outstanding coins can provide us with an indication.

Our analysis focuses on Bitcoin being the bellwether for the asset class. Bitcoin’s total trading volume – as displayed in the panel on the right-hand side of **Chart 6** – has grown substantially over the years. It has then “skyrocketed” in the past twelve months and spiked at over USD 30 billion per day, with a recent average of around USD 10 billion, in the most recent month.^[12]

With Bitcoin’s current total valuation of around one trillion dollars, this would mean that roughly 1% of Bitcoin’s value is transacted every day, which is not too dissimilar to an established mega-cap stock such as Google, with turnover of around 2% of its market capitalisation. It therefore appears that liquidity has reached satisfactory levels.



Source: For exchange trading fees, refer to www.cointracker.io/blog/2019-crypto-exchange-fee-comparison. For exchange trading volumes, see www.messari.io

Chart 6: Exchange transaction costs and liquidity in Bitcoin trading between 2015 and February 2021

Investing in and storing cryptocurrencies securely

We now take a closer look at how investors actually get and maintain their exposure to cryptocurrencies. Specifically, we will sketch out how to transact and store cryptocurrencies effectively.

How do I invest in cryptocurrencies?

With Bitcoin investment becoming increasingly mainstream, a rising number of both non-regulated and regulated financial service providers (e.g. Revolut, eToro, PayPal) offer access to cryptocurrencies. The mechanics vary considerably, however. Typically, the investor gets economic exposure to the cryptocurrencies via a pooled investment vehicle. In the following paragraphs, we will instead focus on the direct ownership of cryptocurrencies, as this ensures higher transferability and lower fee levels for investors.

In order to buy a cryptocurrency, such as Bitcoin, an investor generally has to create an account on a so-called crypto-exchange – verifying their identity and then transferring funds into their account by credit card or bank transfer. Some of the more established exchanges are Coinbase, Binance, Huobi, Kraken and Bitstamp.

Whilst the process might look and feel similar to signing-up for an online brokerage account, it is important to remember that these exchanges are the link between a highly regulated financial world and the relatively free-wielding crypto ecosystem. Consequently, investors should be aware of potential fees for depositing *fiat* money, in other words traditional currency, into your account on these exchanges.

Similarly, money transfers from crypto-exchanges to traditional banks can be cumbersome, at times. Money flows from crypto-exchanges to the investors' conventional bank accounts will be subjected to high levels of scrutiny, in order to comply with regulatory requirements, such as anti-money laundering procedures.

The actual mechanics of trading are similar to traditional exchanges. Exchanges will match buyers and sellers, or act as brokers. They offer a large number of tradeable currency pairs – both *fiat* currencies against cryptocurrencies, and between cryptocurrencies. In contrast, however, to traditional exchanges crypto-exchanges operate 24 hours per day, 365 days of the year.

Besides buying cryptocurrencies outright on an exchange, an alternative means is available to those investors that are willing to invest in crypto mining operations and therefore benefit from the “production” of newly minted coins. Generally speaking, Miners run very powerful computer farms that offer transaction validation to the Bitcoin network and in exchange receiving transaction fees plus the mining reward in the form of newly-minted Bitcoins. There are several service providers who rent shares of computing power of their mining farms that usually have access to low-cost electricity near geothermal or hydropower operations. A more detailed discussion is beyond the scope of this Briefing.

How do I store cryptocurrencies securely?

Once a cryptocurrency holding is acquired, safe custody for the private key – which allows investors to claim, transfer and exchange their coins – needs to be considered. For smaller amounts, it is typically the most efficient solution to directly store the coins on the crypto-exchange, as they usually offer free custody for their investors. However, exchanges have been regularly targeted by sophisticated cybercriminal activities, and this could result in the loss of an investor's holding. It is estimated that a total of 3.8 million Bitcoins have been lost or stolen, so far.^[14] Having said this, as a consequence of past security breaches at exchanges, the large and reputable exchanges have put in place tighter online security measures.

Crypto-investors with significant holdings that do not want to store their coins at the exchange but are worried about their own ability to store the keys reliably, can turn to professional custodian services. The main types of approaches/services can include:

- **Private key management:** This is offered to private or institutional investors in order to keep their “passwords” safe. A number of solutions have been developed, including multi-signature wallets that require (say) three out of five signatures in order to move coins out of the wallet where the coins are stored
- **(Offline) cold storage:** This represents the safest way to secure crypto-assets. The concept is based on the simple idea that keeping the passwords away from the internet makes them impossible to steal by a hacker. This could be done by professional custodian services or by simple hardware wallets that are available for less than USD 100
- **Diversification of locations:** Here, parts of the digital keys are kept in a number of different locations to enhance security further. One famous example is a system that was devised to keep one fifth of the key on each of five continents, with a 24-hour lock period. Additionally, the “three out of five” multi-signature protocol was also imposed
- **Anti-blackmail:** Such services offer personalised support to ensure that withdrawals cannot be made under duress. For example, a 48-hour cooling-off period or a requirement to have an independent confirmation by a lawyer, before a transfer is effective, can be implemented. Other elements may include a specific phone password, for such situations, so that only a small amount will be paid out, in order to both save the life of the key-holder and protect the bulk of her/his wealth

Whilst adding a layer of complexity, these measures will reduce counterparty and custodial risk, and should be considered.

Our views – the investment case for cryptocurrencies

In this Briefing, we looked at several key aspects of cryptocurrencies that are relevant for investors. The visibility and past returns of Bitcoin – in the context of the current political and economic climate – have resulted in Bitcoin being the most prevalent incumbent in the cryptocurrency universe. That said, Ethereum’s Ether, although newer, enjoy a sufficient critical mass to be a plausible component for an investment portfolio.

Early investors have clearly reaped enormous returns. Even accounting for very significant price volatility, Bitcoin and Ether have delivered far superior returns than any other asset class. This has led to a growing view in the market that cryptocurrencies have a role to play in the future. It is our view that the consensus on what *fair value* is will, ultimately, determine whether the next ten years are as attractive as the last ten years. We believe that a key distinction in determining fair value will depend on whether cryptocurrencies are viewed as a *medium of exchange* or a *store of value*, like gold or US dollars.

We believe if cryptocurrencies are viewed as a medium of exchange or payment, they will not command a large premium for the price of their tokens. Indeed, fair value may already have been achieved or exceeded.

That said, we do see how the most dominant cryptocurrencies – in particular Bitcoin – could become a form of *digital gold*, supplementing or even replacing other stores of value. The critical pre-requisite to this occurring will be that governments and regulators have no effective means or desire to prevent this from happening. In this scenario, the valuation mechanisms for safe haven currencies and gold would be an appropriate benchmark for any cryptocurrencies fulfilling the same purpose.

What is not envisaged in current valuation approaches is the presence – and potential positive feedback loop – of next-generation financial services that harness the crypto ecosystem, such as Decentralized Finance (DeFi). These will likely include lending, leveraged trading, option trading and insurance. A strong base of US, Swiss, Singapore and UK based start-ups have developed in recent years and will likely contribute to further innovations and use-cases. Furthermore, the use of blockchain technology already enables more efficient transfer and transaction of financial assets. Tokenisation of real-world and virtual assets is also thriving, with new tokens that represent digital “unique” art (NFTs) or access to real estate, in virtual worlds, are being launched on a weekly basis.

On that basis, investors may want to expose a small percentage of their overall portfolio to established cryptocurrencies, such as Bitcoin. Similar to gold, they should treat the investment as a hedge against a possible devaluation of fiat currencies, rather than a speculation that enhances the overall portfolio performance. To be clear, adding Bitcoin may increase overall volatility (risk) and contribute to losses in the portfolio, in certain instances, but its *raison d’être* would be more strategic. It would offer potential protection from a sustained loss of confidence in the current economic world order – somewhat like gold has done, in previous points of crisis. **Prior to any investment, however, we strongly recommend that you seek professional advice on the suitability of cryptocurrencies for your circumstances.**

Aside from the question of valuation, it is also critical to examine the interplay between cryptocurrencies and other asset classes, in order to gauge their impact on the investors’ portfolios as a whole. Here, the evidence from the past ten years is much less appealing – as cryptocurrencies failed to hold their value in times of general market distress. To be fair to cryptocurrencies, Bitcoin has only been traded for ten years while Ether was first priced, approximately six years ago. It may yet be too early to ascertain their behaviour in a broader portfolio context and thinking in this area may therefore evolve further in the coming years.

With respect to the actual process of investing, most of what we described above is tailored for investors seeking retail-sized trades. For investors seeking larger exposures for their portfolios, the world of high value cryptocurrency transactions can be a minefield for new entrants. Here, market participants often work with a trusted and known network of individuals. For larger transaction volumes, Enodo can engage on behalf of clients with providers that are interconnected across multiple exchanges, resulting in deeper liquidity across multiple currencies. We are also able to provide multiple layers of platform security, private and encrypted communication channels and defined settlement times. If needed, escrow services and secure cold-storage of assets can be offered.

Whilst certainly not a panacea, this Briefing highlights the developments made in cryptocurrencies over recent years and their potential role in the portfolios of wealthy families. Enodo is here to support you in thinking about whether they are appropriate for your circumstances, and to help with considering the potential benefits and risks involved.

We would like to acknowledge the input of our guest contributor, **Torsten Hoffmann** (see below for full biography), and a number of other reviewers with experience in the cryptocurrency ecosystem.

Notes

[1] Examples include the expropriation order of gold holdings in the US in 1933 (Executive Order 6102) by President Roosevelt or more recently, the bail-in requirement of depositors at two failed Cypriot banks in 2013 imposed.

[2] See <https://messari.io>.

[3] We have used the Network Value Transaction Ratio (NVT) framework as a representative of this group. NVT attempts to determine the value of the Bitcoin network by measuring the flow of money within the network as a proxy for network valuation. See <https://woobull.com/introducing-nvt-ratio-Bitcoins-pe-ratio-use-it-to-detect-bubbles/>. NVT values in chart are taken from <http://charts.woobull.com/Bitcoin-price-models/>. Also see García-Monleóna (2021) for a theoretical discussion on the different types of cryptocurrency platforms and how their valuation will differ with varying functionality. García-Monleóna, F., Danvila-del-Valle, I. and F. J. Lara, (2021), "Intrinsic value in cryptocurrencies", *Technological Forecasting and Social Change*, 162, January 2021

[4] See in particular Hayes (2017) who identifies the main drivers for the cost of mining Bitcoins. He then uses a basic micro economic model where - at perfect competition - the marginal cost of production should equal the price of the good. Plugging in real world production values representing computing power, cost of electricity, network difficulty and coin reward, he estimates the cost of producing or mining Bitcoin, which should represent the lower boundary for the Bitcoin price. Hayes, A. (2017), "Cryptocurrency value formation: An empirical study leading to a cost of production model for valuing Bitcoin", *Telematics and Informatics* 34 (2017) 1308–1321. Values for chart 2 are taken from Hayes (2017) for 2016 and a previous working paper where he used earlier figures to derive a value for 2015. Values for 2018, 2019 and 2020 are taken from coinsavage (<https://coinsavage.com/content/2019/12/Bitcoins-production-cost/>). The value in 2021 is taken from J.P. Morgan Perspectives (2021)

[5] Authors assuming that the main value of Bitcoin derives from its ability to store value akin to gold have applied techniques that allow for a comparison with the hard commodity. An anonymous author called PlanB@100trillionUSD modelled the price of Bitcoin on the basis of the stock to flow ratio, i.e. the amount of coins already 'unearthed' vs how many coins are currently being mined. <https://medium.com/@100trillionUSD/modeling-Bitcoins-value-with-scarcity-91fa0fc03e25>

[6] Measured by the annual inflation rate (which is just the inverse of stock to flow ratio) Bitcoin will become more scarce than gold in the next halvening in the year 2024.

[7] Other authors infer the value of Bitcoin by calculating its target size if Bitcoin replaced parts or all of physical gold and/or fiat currencies that are being used as store of value by the private sector and sovereigns. An insightful paper was produced by Pfeffer (2017). <https://medium.com/john-pfeffer/an-institutional-investors-take-on-cryptoassets-690421158904>

[8] JPM essentially applies a similar logic as Pfeffer in their valuation approach, however, explicitly take into account the differences in price volatilities between Bitcoin and gold, thereby discounting Bitcoins full potential until it has become less volatile on average. See J.P. Morgan Perspectives (2021). JPM 2021, "Digital transformation and the rise of fintech: Blockchain, Bitcoin and digital finance"

[9] See for example an application of the Bitcoin price on the theory of speculative bubbles by Cheah (2015). Cheah, E., and J. Fry (2015), "Speculative bubbles in Bitcoin markets? An empirical investigation into the fundamental value of Bitcoin", *Economics Letters*, 130, May 2015, 32-36

[10] See for example <https://markets.businessinsider.com/currencies/news/Bitcoin-value-negative-environmental-impact-nouriel-roubini-cryptocurrencies-2021-2-1030067687>. For a somewhat light-hearted summary of all 'nay-sayers' throughout the history of Bitcoin, please refer to <https://99Bitcoins.com/Bitcoin-obituaries/>

[11] See <https://www.forbes.com/sites/laurashin/2017/09/18/jamie-dimon-heres-why-youre-wrong-about-Bitcoin>

[12] Using 30-day average values. Based on messari.io's methodology to include only the 10 exchanges identified by Bitwise Investments as well-functioning markets. As of early 2019, it is suspected that the majority of reported global trade volume is due to wash-trading or other practices that are not representative of well-functioning markets. Their 'Real 10 Volume' metric omits volume from exchanges that don't show consistent patterns of well-functioning markets. The 10 exchanges meeting that criteria, as identified by Bitwise Investments are: Binance, Kraken, Bitfinex, Coinbase, Bitstamp, BitFlyer, Gemini, itBit, Bittrex, and Poloniex.

[13] By total transaction volume, the biggest global crypto exchange is Binance (founded in 2017), while Coinbase is the market leader in many developed countries. Founded in 2012, Coinbase has recently filed for an IPO and according to official documents it has 43 million registered users and 2020 annual revenue of USD 1.3 billion. Coinbase's total market capitalization is currently inching towards USD 100 billion, which is higher than that of the 200-year old institution NYSE and NASDAQ combined.

[14] See for example <https://fortune.com/2017/11/25/lost-Bitcoins/>

About the authors

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Nick has over 20 years of experience in wealth management, predominantly spent at UBS where he was a Managing Director. He held a number of senior leadership roles, including Head of Wealth Management for Global Emerging Markets in London, where he led a sizable business advising wealthy families in Central & Eastern Europe, Middle East, Turkey, Israel, Africa, Latin America and Asia-Pacific.

For six years, Nick was Head of Investment Products and Services where he led the investment management, capital markets, alternative investments, lending and wealth planning functions, responsible for over USD50 billion of client assets, and a sizable lending book. He also founded the client philanthropy unit in the UK, which supported clients in maximising the strategic impact of their giving. He has been a regular media commentator. Over the years, he has also maintained a strong academic interest in business psychology.

He has served on numerous non-profit boards and is currently Vice Chairman of the governing body of Royal Holloway, University of London, amongst the top 25 in the UK and 250 globally. He also chairs the committee overseeing the university's USD100 million endowment.

He holds MSc in Organizational Psychology and MBA in Finance degrees from the University of London, is a Chartered Wealth Manager, Chartered Fellow of the Chartered Institute for Securities & Investment and Member of the British Psychological Society. He was elected Fellow of the Royal Society of Arts for his work in philanthropy. He is also a part-time Doctoral researcher in organizational psychology and family-owned business at Durham University.

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Baris has over 15 years of experience in wealth management and investment banking in London, Zurich and Frankfurt. Between 2006 and 2020, he worked for UBS, where he was a Managing Director.

He served as Head of the Global Family Office, Ultra High Net Worth Emerging Markets and Financial Intermediaries units for UK and Jersey, offering wealth management, structuring, lending and investment banking solutions to the largest clients of the firm. His team was entrusted with over USD12 billion of client assets.

Prior to this, he was responsible for various significant teams serving wealthy families in Central & Eastern Europe, Middle East, Turkey, Israel, Africa, Latin America and Asia-Pacific.

Before joining UBS, Baris was a research assistant to the Chair of International Banking and Finance at the Goethe University Frankfurt and a visiting scholar in Finance at the Wharton School, University of Pennsylvania.

He published papers on global stock exchanges in peer-reviewed academic journals, including the prestigious Journal of Banking and Finance, and was a regular commentator in the media.

Baris holds a Doctoral degree in Finance from Goethe University Frankfurt and the Diplom Kaufmann degree from the University of Regensburg, as well as an MBA degree. He has completed the Chartered Financial Analyst and Financial Risk Manager programmes.

About the guest contributor

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Torsten is a serial entrepreneur, advisor and investor with a focus on technology and media who started as a journalist covering the ‘New Economy boom in 1999’.

As producer and director of the two award-winning documentaries “Bitcoin: The End of Money as We Know It” (2015) and “Cryptopia: Bitcoin, Blockchains and the Future of the Internet” (2020), his insights made it into hundreds of millions of television homes in 40 countries. Since the production of his first documentary, the price of Bitcoin has increased by 17’500%.

He is a sought-after expert who regularly speaks at technology and finance conferences worldwide. He regularly advises financial institutions and high net worth individuals on the latest developments in the blockchain industry and is an angel investor in several start-ups. He has been active as a strategy consultant since 2008.

Torsten has lived extended periods of his life in the US, Asia, Australia and Europe. He holds an MBA from Oxford University.

The story of Enodo

Enodo is the Latin word to explain, literally to *unknot* or *untangle*. This encapsulates our vision – to bring clarity to the complexity of being wealthy.

Our founders have had the privilege of advising some of the world's wealthiest families. They've observed first-hand the liberation and opportunity that wealth can bring – unifying families around a common purpose, creating real economic impact via a family business, or contributing to wider society through audacious philanthropy.

At times, they've also seen the stress and confusion that can result. They've witnessed family disharmony, miscalculations in family business or investment strategy, and the hugely detrimental impact of working with advisors who put their own interests first.

Our founders have engaged in the discipline of advanced academic research. Their own analysis of peer-reviewed academic literature across the disciplines of finance, economics and business psychology, combined with their deep professional experiences, have allowed them to arrive at new perspectives on how *to be wealthy* and how *to manage wealth*.

The result of their thinking is the Enodo Leadership in Wealth™ advisory framework which supports wealthy families in using their wealth to lead across all the dimensions of their life – *family, firm and society*. Amongst other things, their framework includes:

For your family

- Family governance and family office set-up
- Investment risk and asset allocation – including family business assets and debt
- Chairing a family investment committee
- Selecting the best investment managers
- Analysing investment opportunities, including alternative investments and recent innovations (e.g. cryptocurrencies)
- Understanding the impact of investing in your passions, such as art and collectibles
- Monitoring of performance and risk
- Guiding and analysing where you are in dispute with your investment advisor

For your firm

- Organizational culture and performance
- CEO / founder succession and role of family members
- Financial optimisation – including debt, hedging and foreign exchange
- Reviewing your equity and debt capital market opportunities
- Corporate and social responsibility

For your society

- Philanthropy and impact investing
- Establishing a family foundation

The Enodo Goal-based Asset and Liability Allocation (GALA) Modeller™ offers ground-breaking insights into optimal strategic asset allocation – examining the risk characteristics of a family business shareholding and analysing tolerance for risk from psychological personality profiling. You can experience a shortened version of this powerful tool [here](#).

At Enodo, we offer rigorous, independent and intelligent advice to wealthy families around the world. We aspire to be your trusted partner, wherever life may lead you.

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