MACROECONOMIC FORCES THAT INFLUENCE ALTERNATIVE ASSETS PRICING

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Abstract

Global Institutional Investors are showing great interest to opportunities that derive from Alternative Assets. This trend is further accelerated by hope of improving their portfolios' returns while also diversifying their assets.

At the global macro level, virtually all asset classes and investment strategies are cyclical in their return profiles, meaning they simply work better at some times than at others, depending on a bundle of macro factors including interest rates, GDP growth, central bank interventions and other geopolitical factors.

The purpose of this paper is to identify assets allocations within the Alternative Assets spectrum as a basis for providing clarity to macroeconomic factors that influence digital assets pricing.

Keywords: Alternative Investments, Digital Assets, FinTech

JEL Codes: G20, F41, E31

Introduction

A new challenge in asset allocation, looking at assets as vehicles of more fundamental factors, offers a new language to decipher financial markets. It builds a bridge between rigorous portfolio construction, echoing today popular risk-parity approaches, and a more fundamental method which interprets financial markets in terms of macroeconomic dynamics.

Alternatives investors have always been focused on the possibility of achieving a measure of downside protection, accessing differentiated exposures and identifying truly uncorrelated, complementary sources of returns.

A proper classification of Alternative Assets and Investments needs to be in place to show how they meet various investment objectives and their sensitivity to macroeconomic factors.

Asset Allocation

In the article published by De Laguiche and Tazé-Bernard in 2014, entitled "Allocating Alternative Assets: Why, How and How much?", a definition of asset allocation, which traditionally refers to the way a portfolio is divided between equity, fixed income and money market products, has expanded to the alternative investments like: hedge funds and unlisted assets.

This highly diverse investment landscape is hard to define due to the high degree of heterogeneity for the alternative assets. The most common distinction for these type of assets is classified in two major categories:

1. Listed Assets – Referred mostly to Hedge Funds, this category is important to the fact that Hedge Funds have increased their transparency, updated their valuations and reduced their leverage, thereby adhering towards the traditional funds' standards.
2. Unlisted Assets – Referred mostly to Real Estate, Natural Resources and Private Equity.

An important difference between listed and unlisted assets reflects in terms of liquidity. Hedge Funds may be subject to the risk of liquidity especially during time of crisis. Unlisted Assets are usual illiquid, predominately on a short-term; they automatically become liquid over long investment horizons. Their liquidity therefore depends on the investment horizon.

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Investments in commodities, which investors consider part of the alternative category, are therefore sought out in order to protect a portfolio from a risk of rising inflation.

The relationship between volatility and return is disrupted when it comes to alternative assets. First, for illiquid assets some of the additional return is compensation for greater liquidity risk, which cannot be measured via volatility. Second, volatility is an imperfect measurement of market risk, because especially in the world of hedge funds, the extreme risks that are observed are substantially greater than those of conventional assets with equivalent volatility, making the assumption of symmetrical returns required for the estimate inappropriate. Performance-related fees also contribute to asymmetry in the return distribution of these assets.

Spulbar and Birau (2019) suggested that volatility does not diverge to infinity and seems to react significantly different considering the case of high positive or high negative stock returns. Moreover, portfolio diversification strategy is a representative phenomenon of quantitative finance, most often applied in relation to low or negative correlations between financial assets.

Digital Assets

Within the digital assets realm, it's important to acknowledge Financial Technology (FinTech) Companies which promoted the use of Blockchain and Distributed Ledger Tech, the underlying technology for crypto assets, for various business models and financial services. FinTech has found a broader meaning day by day and now plays its role as a disruptor of order in various parts of the financial and monetary system, including micro payments, money transfer, lending, comparison and online sales of various types of insurance policies, capital increase, and asset management. It has even been recognized in the formation of new paradigms such as the crypto assets. (Mehdiabadi et al., 2020).

Crypto assets are digital financial assets, for which ownership and transfers of ownership are guaranteed by a cryptographic decentralized technology. Cryptocurrencies can be seen as part of a broader class of financial assets, "crypto assets", with similar peer-to-peer digital transfers of value, without involving third party institutions for transaction certification purposes (Giudici, G., Milne, A. & Vinogradov, D., 2020).

Much recent public discussions of cryptocurrencies have been triggered by the substantial changes in their prices, claims that the market for cryptocurrencies is a bubble without any fundamental value, and also concerns about evasion of regulatory and legal oversight.

Within the overall category of crypto assets, we can follow the distinctions drawn in recent regulatory reports, distinguishing two further sub-categories of crypto assets, on top of cryptocurrencies:

1. Cryptocurrencies: defined as an asset on a blockchain that can be exchanged or transferred between network participants and hence used as a means of payment—but offers no other benefits;
2. Crypto securities: defined as an asset on a blockchain that, in addition, offers the prospect of future payments, for example a share of profits;
3. Crypto utility assets: defined as an asset on a blockchain that, in addition, can be redeemed for or give access to some pre-specified products or services.

Within cryptocurrencies category we can further distinguish those whose quantity is fixed and price market determined (floating cryptocurrencies) and those where a supporting arrangement, software or institutional, alters the supply in order to maintain a fixed price against other assets (stable coins, for example Tether, USDC, DAI or the planned Facebook Libra).

Cryptocurrencies can be used both as a means of payment and as a financial asset. Glaser et al. (2014) provided evidence that, at least for Bitcoin (BTC), the main reason to purchase a cryptocurrency is speculative investment. Financial securities, such as ETNs (Exchange Traded Notes) and CFDs (Contract For Differences - Derivative Products) that replicate Bitcoin's price performance are made available by brokers, expanding the speculative investment opportunities to an even larger set of investors. With this in mind, it makes sense to evaluate cryptocurrencies as digital financial assets.

Cross Asset Investment Strategy

Rethinking strategic asset allocation in terms of diversification across macroeconomic scenarios, is a novel approach in Strategic Asset Allocation that consists in looking at asset classes as vehicles of more fundamental factors. According to this method, fundamental factors govern the majority of asset class dynamics, and hence, asset allocation should be rephrased in terms of risk allocation of fundamental factors.

Asset segmentation in terms of macroeconomic changes allows us to exploit portfolio diversification to the level of fundamental factors and to directly relate asset allocation to factors' risk premia.

Traditional approaches look at nominal bonds, commodities and equities as representative of deflation, inflation and growth. This interpretation is not adequate: asset classes do not constitute good axes, as e.g. equity and commodity share similar polarization to economic growth, but are opposite in terms of inflation.

The key principle is that asset price dynamics can be largely explained in terms of change in expectations of macroeconomic variables and market stress: stocks move not because of low or high growth but mainly because growth is above or below expectations.

The most relevant factors to determine asset prices are inflation, growth and market stress. Growth and inflation are crucial because the value of an investment is mainly affected by the volume of economic activity (growth) and its pricing (inflation). Market stress is relevant since it often plays a major role in asset dynamics, as in 2008 when financial stress was mainly due to the liquidity problem.

The recent crisis poses serious doubts on the effectiveness of diversification to reduce drawdowns in balanced portfolios. Nevertheless, recent portfolio construction schemes, like risk parity and maximum diversification, make of diversification the kernel of asset allocation. While most approaches diversify on asset class level, the new challenge in asset allocation suggests diversifying on fundamental factors that are believed to be the main drivers of asset price dynamics.

The factors approach provides a new, challenging, and powerful way to interpret financial markets. This new way forces the rethinking of asset segmentation and strategic asset allocation. Strategic decisions should be mostly rephrased in terms of asset environmental biases towards macroeconomic and stress factors, rather than on standard mean-variance optimization packages that need forecasting returns.

Rigorous portfolio construction which is explicitly related to the macroeconomic dynamics can help us to navigate portfolios in uncertain financial markets.

The cross-section of cryptocurrency returns has been analyzed in a number of papers: Urquhart (2016) shows that Bitcoin returns do not follow random walk, based on which he concludes the Bitcoin market exhibits a significant degree of inefficiency, especially in the early years of existence. Corbet et al. (2018) analysis, in time and frequency domains, the relationship between the return of three different cryptocurrencies and a variety of other financial assets, showing lack of relationship between crypto assets and other assets.

Liu and Tsyvinski (2018) investigate whether cryptocurrency pricing bears similarity to stocks: none of the risk factors explaining movements in stock prices applies to

cryptocurrencies in their sample. Moreover, movements in exchange rates, commodity prices, or macroeconomic factors of traditional significance for other assets play little to no role for most cryptocurrencies. The latter invalidates the view on cryptocurrencies as substitute to money, or as a store of value (like gold), and rather stresses they are assets of their own class.

The review of the literature in Corbet et al. (2019) summarizes the most interesting findings on the role of cryptocurrencies as a credible investment asset class and as a valuable and legitimate payment system.

Risk Premia

The concept underlying alternative risk premia is the potential reward to an investor for taking on some form of risk. As the name suggests, this risk is "alternative" to traditional market risk or traditional beta in the sense that it is non-correlating and tends to be structured in the form of a long/short investment.

Alternative risk premia tend to exhibit heterogeneous statistical properties, making them potentially diversifying building blocks to a broader multi-asset portfolio.

The risk of holding cryptocurrencies is discussed by Fantazzini and Zimin (2020). Cryptocurrency prices may drop dramatically because of a revealed scam or suspected hack, or other hidden problems. For example, on June 26th, 2019, the Bitcoin price lost more than 10 % of the value in a few minutes because of the crashes and technical problems of the Coinbase digital exchange. As a consequence, a crypto asset may become illiquid and its value may substantially decline.

Fantazzini and Zimin (2020) propose a set of models to estimate the risk of default of cryptocurrencies, which is back-tested on 42 digital coins. The authors make an important point in extending the traditional risk analysis to cryptocurrencies and making an attempt to distinguish between market risk and credit risk for them. The former, as typical in the finance literature, is associated with movements in prices of other assets. The latter is associated in traditional finance with the failure of the counterparty to repay, but as cryptocurrencies presume no repayments, defining credit risk for them is tricky. The authors' approach is to see the "credit" risk of cryptocurrency in the possibility of them losing credibility among users, and thus becoming value-less, or "dead".

The authors find, notably, that the market risk of cryptocurrencies is driven by Bitcoin, suggesting some degree of homogeneity in the crypto market.

Commonly Used Risk Premia

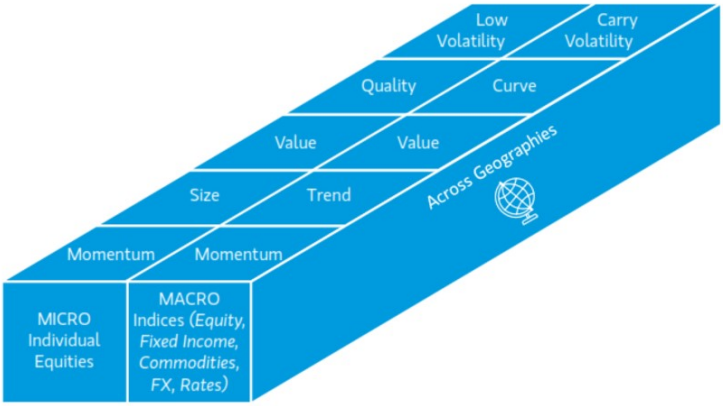

Fig.1 – Commonly Used Risk Premia. Source: Morgan Stanley Investment Management, 2019. Retrieved from www.morganstanley.com

The figure above highlights commonly used alternative risk premia, which often result from market behaviors or structural conditions. For example, herding behavior and instances in which investors "chase winners and sell losers" create momentum. Mean reversion of asset prices to fair-value anchors often leads to opportunities classified as value. Investor mispricing of asset yields may lead to carry opportunities. In commodities markets, for example, carry is defined as the price differential between futures contracts of different maturities. This figure may be positive or negative because of the demand dynamics and other factors. The large derivatives market often provides opportunities to design novel alternative risk premia, both behavioral and structural, related to asset volatility. For example, during market crises, investors seek safer assets, and low volatility stocks to outperform.

While the term "alternative risk premia" is fairly new, investors have had exposure to these sorts of returns through hedge fund strategies like quantitative equity, macro and managed futures. While having an understanding of alternative risk premia is important, what is attractive and compelling to investors is to think about their utility. In our view, these premia can be thought of as an extension of factor-based investing and can serve as building blocks for portfolio construction.

Original factor-based investing started with the Capital Asset Pricing Model (CAPM), which sought to explain investment performance using a risk-free rate and a single market risk factor or premium. Over the years, it become increasingly apparent, through the groundbreaking research of Eugene Fama, Kenneth French and Mark Carhart, among others, that a single market risk premium was not the only driver of asset returns and that investors could exploit additional factors within or across asset classes. More recent research suggests that investors can harvest "alternative" risk premia that persist because of human behavior and the structure of certain investment markets.

Alternative risk premia are of interest to investors because unlike stocks and bonds, they are generally unrelated to broader macro fundamentals. Therefore, they can provide diversification benefits when included in portfolios alongside traditional investments.

Digital Assets behavioral finance and economics

A large strand of the literature explains market phenomena that work against the neo-classical predictions, from the perspective of unquantifiable risk, or ambiguity. Most commonly, ambiguity is associated with the impossibility to assign probability values to events that may or may not occur. In the case of cryptocurrencies, this type of uncertainty may arise for two reasons:

- the technology is rather complicated and complex to unsophisticated traders;
- the fundamental value of cryptocurrencies is unclear.

Shiller (2003) notes that market participants are humans and can make irrational systematic errors contrary to the assumption of rationality. Such errors affect prices and returns of assets, creating market inefficiencies. Studies in behavioral economics highlight inefficiencies, such as under- or over-reactions to information, as causes of market trends and, in extreme cases, of bubbles and crashes. Such reactions have been attributed to limited investor attention, overconfidence, mimicry and noise trading, explanations of many of which find roots in Kahneman and Tversky's (1979) prospect theory, which postulates that decision makers evaluate outcomes from the perspective of their current endowment (and are predominantly loss-averse) and "revise" probabilities of outcomes when making decisions (predominantly overweighting probabilities of bad outcomes and underweighting those of good ones).

The loss-aversion theory led Shefrin and Statman (1985) to formulate the "disposition effect" in investment decisions: investors in traditional assets tend to keep assets that lose value too long and sell those that gain in value too early.

Three features distinguish cryptocurrency markets: investors are non-institutional, risk (volatility of returns) is high, and the fundamental value is unclear. Under these conditions behavioral biases should be even more pronounced than in traditional asset markets. Haryanto et al. (2020) studied the disposition effect and the herding behavior in the cryptocurrency realm by investigating the trading behavior at a crypto exchange: they find a reverse disposition effect in bullish periods where the Bitcoin price increases while a positive disposition effect is observed in bearish periods. They also find that in different market conditions herding moves along with market trend (in the bullish market a positive market return increases herding, while in the bearish market a negative market return has the same effect).

The reverse disposition effect in the bullish market indicates investors exhibit more optimism and expect returns to further grow, which is consistent with the exponential price growth in a bubble in the absence of a clearly defined fundamental value. This lack of clarity regarding the fundamental value is also supported by the asymmetric herding behavior: when the price grows in a bullish market, investors look at other market participants to see whether others also think the price will continue to grow (similarly but with the opposite sign for the bearish market).

Factors that influence the prices of Digital Assets

The contribution by Moosa (2020) highlights that the Bitcoin was in a bubble up to the end of 2017. The analysis claims that the volume of trading in Bitcoin can be explained predominantly in terms of price dynamics considering past price movements, particularly positive price changes, and that the path of the price is well described by an explosive process.

The price dynamics and speculative trading in cryptocurrency is examined by Blau (2017) with the main finding that speculative behavior cannot be directly connected to the unusual return and volatility of the cryptocurrency market. Cheah and Fry (2015) study the role of speculation in the cryptocurrency market from the viewpoint of Bitcoin's basic value.

Dwyer (2015) investigates empirically the Bitcoin economy with the fundamental finding that Bitcoin is likely to limit authority regulation revenue from inflation. Branvold et al. (2015) examines the role of different cryptocurrency exchanges in the price discovery procedure, representing that the information allocate is dynamic and significantly evolving over time.

The valuation of a digital currency that is, at least in principle, able to be used as a medium of exchange needs to take a wide variety of considerations into account. These include:

- The expected real return of holding the digital currency (that is, the nominal interest rate minus expected price inflation), relative to other options;
- Any risks associated with holding the digital currency relative to other currencies, including risks of theft or fraud, and price volatility;
- The relative benefits of using the digital currency as a medium of exchange when compared to traditional systems, including availability, transaction fees and degrees of anonymity;
- Any time constraints or costs associated with switching wealth between the digital currency and more traditional assets (including sterling);
- Any non-monetary concerns, such as an ideological preference for one particular currency;
- A view on how much other people value the currency (based on the above factors) and how this is expected to change in the future.

A price discovery analysis has been done by Makarov and Schoar (2018) and their findings show that shocks across markets are independent of each other, which means the variance-covariance matrix is diagonal. They constrain these shocks to have the same variance, for ease of interpretation. In theory, if price deviations were short lived, each row should have the same coefficient, since these are loading on the efficient (common) price.

Conclusions

This digital transformation results from what economists who study scientific progress and technical change call a general-purpose technology—that is, one that has the power to continually transform itself, progressively branching out and boosting productivity across all sectors and industries (Mühleisen M., 2020).

The European Central Bank (Chimienti et al., 2019) has been analyzing the digital asset phenomenon with a view to identifying and monitoring potential implications for monetary policy and the risks crypto-assets may pose to the smooth functioning of market infrastructures and payments, as well as for the stability of the financial system. The financial system may be subject to risks from crypto assets to the extent that both are interconnected; spillover effects may also be transmitted to the real economy. In particular, crypto assets may have implications for financial stability and interfere with the functioning of payments and market infrastructures, as well as implications for monetary policy.

The European Central Bank (ECB) analysis shows that, while these risks are currently contained and/or manageable within the existing regulatory and oversight frameworks, links with the regulated financial sector may develop and increase over time and have future implications.

Accordingly, the analysis concludes that the ECB should continue monitoring crypto assets, raise awareness of their risks and develop preparedness for any future adverse scenario.

Crypto asset risks primarily originate from:

- The lack of an underlying claim;
  Since crypto assets have no underlying claim, such as the right to a future cash flow or to discharge any payment obligation, they lack fundamental value. This makes their valuation difficult and subject to speculation. As a result, crypto assets may experience extreme price movements (volatility risk), thereby exposing their holders to potentially large losses. Depending on the circumstances of a possible price crash, the effects may be passed on to the creditors of the holders (if the positions involve leverage) and other entities.
- their (partially) unregulated nature;
  Crypto assets, can hardly fulfil the characteristics of payment and financial instruments and, as such, fall outside the scope of current regulation. Given that they are unregulated, their holders do not benefit from the legal protection associated with regulated instruments. For instance, in the event of bankruptcy or hacking of a crypto asset service provider that controls access to customers' holdings of crypto assets (e.g. custodian wallet providers), the holdings would neither be subject to preventive measures (e.g. safeguarding and segregation) nor benefit from schemes or other arrangements to cover any losses incurred. In view of the current state of law, there is limited scope for public authorities to regulate crypto assets. Any such intervention may be further complicated by the lack of governance and distributed architecture of crypto assets, as well as their cross-border dimension.
- the absence of a formal governance structure.
  As the use of DLT allows crypto assets to dispense with an accountable party, the roles and responsibilities for identifying, mitigating and managing the risks borne in

the crypto asset network cannot be clearly allocated. From this characteristic derive, among others, heightened money laundering and terrorist financing risks, to the extent that there is no central oversight body responsible for monitoring and identifying suspicious transaction patterns, nor can law enforcement agencies target one central location or entity (administrator) for investigative purposes or asset seizure. In view of the lack of formalized governance, it may also be difficult to address operational risks, including cyber security risks, and the risk of fraud. In fact, in the broader crypto asset ecosystem, the provision of certain services (e.g. trading) is often centralized. In such cases, the service providers can be identified and held accountable. However, this is not always possible in decentralized models, which minimize the role of intermediaries.

Potentially large and unhedged exposures of financial institutions to crypto assets could have financial stability implications, all the more so since there is currently no identified prudential treatment for crypto-asset exposures of financial institutions. In its statement on crypto-assets, while conceding that banks currently have very limited direct exposures, the Basel Committee on Banking Supervision (BCBS) sets expectations for banks that acquire crypto-asset exposures or provide related services, including due diligence, governance and risk management, disclosure and supervisory dialogue.

Publicly available aggregated data already provide some tools for measuring crypto asset risks and their linkages with the regulated financial system. These data, subject to passing quality checks and being complemented with other data from commercial sources, provided the basis of a crypto asset dataset as the first step in the ECB approach to monitoring this phenomenon.

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