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THE INSTITUTIONAL INVESTORS DIGITAL ASSET SURVEY

2020 Review

Ria Bhutoria, Director of Research - Lumos Digital Assets SM

INTRODUCTION

Understanding the preferences of major institutions and their behavior toward the digital assets industry is a core driver of product and business development at Lumos Digital Assets[SM]. Lumos Digital Assets, Lumos Center for Applied Technology and Lumos Consulting collaborated with Greenwich Associates to survey almost 800 investors. This year's survey included over 300 more investors than last year's, with a deeper dive into investor segments and the European market. The responses and insights are instrumental in gauging institutional interest and adoption of digital assets, as well as understanding the key barriers to participation in the asset class.

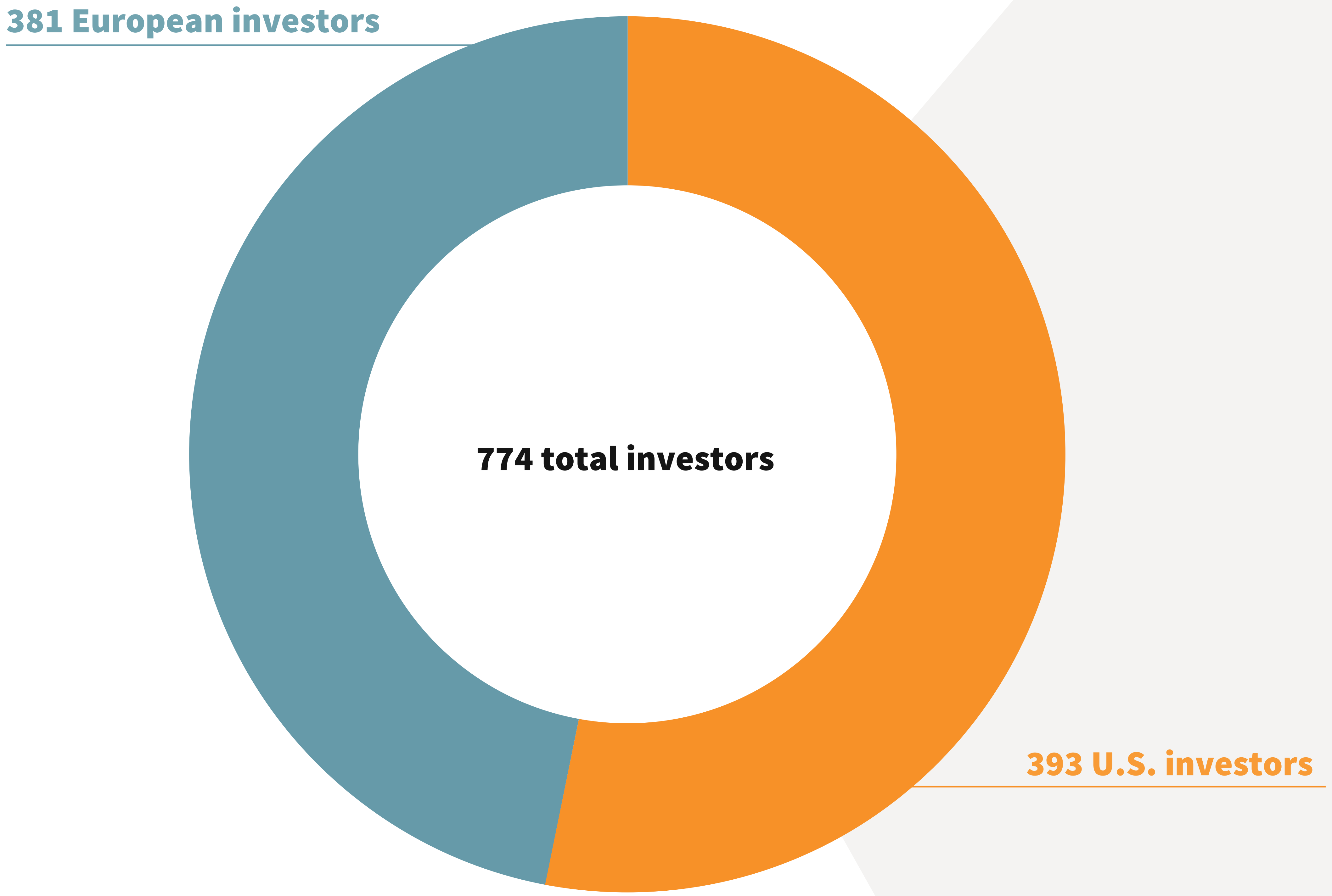
The most recent installment was conducted blind by Greenwich Associates from November 2019 to early March 2020; Greenwich interviewed almost 800 investors across the U.S. and Europe. In each region, the number of investors surveyed was roughly equal at almost 400 investors per region. The first installment of The Institutional Investors Digital Assets Survey covered the period of November 2018 to January 2019 and surveyed over 400 U.S. investors. Thus, the year-over-year comparisons depicted below compare only the responses of U.S. investors.

INTRODUCTION

The results show that European investors generally have a more progressive view of digital assets, made evident when comparing the responses across all categories. Among U.S. investors, we saw growth across all categories including familiarity, positive perception and appeal, current exposure, propensity for future investment and more in this year's results. The strength of concerns about digital assets among U.S. investors also declined relative to last year's survey. In this report, we provide key data points from the survey along with our incremental commentary and interpretation of the results based on our experience serving institutional investors in the digital asset industry.

> "This year's survey results confirm a trend we are seeing in the market toward greater interest in and acceptance of digital assets as a new investable asset class. Investor concerns are largely focused on issues that will resolve themselves as the market infrastructure evolves, and we are proud to be one of many service providers actively driving that evolution for the benefit of the ecosystem and traditional investors alike."

Tom Jessop, President, Lumos Digital Assets



METHODOLOGY

Our research with Greenwich Associates followed a similar methodology to last year's, driven by a detailed survey administered to better understand how institutions, advisors, and investors think about digital assets - not only overall, but also as a part of an investment portfolio. Greenwich Associates conducted the survey on behalf of Lumos Digital Assets, Lumos Center for Applied Technology and Lumos Consulting from **November 18th, 2019 to March 6th, 2020**, including interviews with 774 institutional investors. 393 respondents were based in the U.S. and 381 respondents were based in Europe.

The survey spanned a variety of investor segments, including high-net-worth individuals, financial advisors, family offices, crypto hedge and venture funds, traditional hedge funds, endowments and foundations. About 70% of survey responses were collected online and about 30% were collected via telephone.

The content in this report presents key data extracted from the survey results, in addition to analysis and commentary from Lumos Digital Assets. We combine our industry experience with this data to offer our perspective on trends that may have driven responses from the surveyed investors.

HIGHLIGHTS

In the sections below, we share the key highlights from the survey across multiple categories, from overall familiarity with digital assets to current and future allocations to the space. We also provide our perspective and interpretation of the survey results.

Current Exposure and Channels for Exposure

36% of institutional investors surveyed **currently invest in digital assets**.

Perception of Digital Assets

Almost **60%** of all investors surveyed have a **neutral or positive perception** toward digital assets.

Appeal of Digital Assets

Almost **80%** of investors find something appealing about digital assets. The most appealing characteristics are the lack of correlation with other asset classes, exposure to an innovative technology play and high potential upside.

Obstacles to Investment

The most common obstacles to digital asset adoption are **price volatility**, concerns around **market manipulation** and **lack of fundamentals** to gauge appropriate value.

Categorization of Digital Assets

More than 6 out of 10 investors feel digital assets have a place in portfolios. Almost 40% of investors believe digital assets belong in the alternative asset class. 20% of investors believe digital assets belong in an independent asset class.

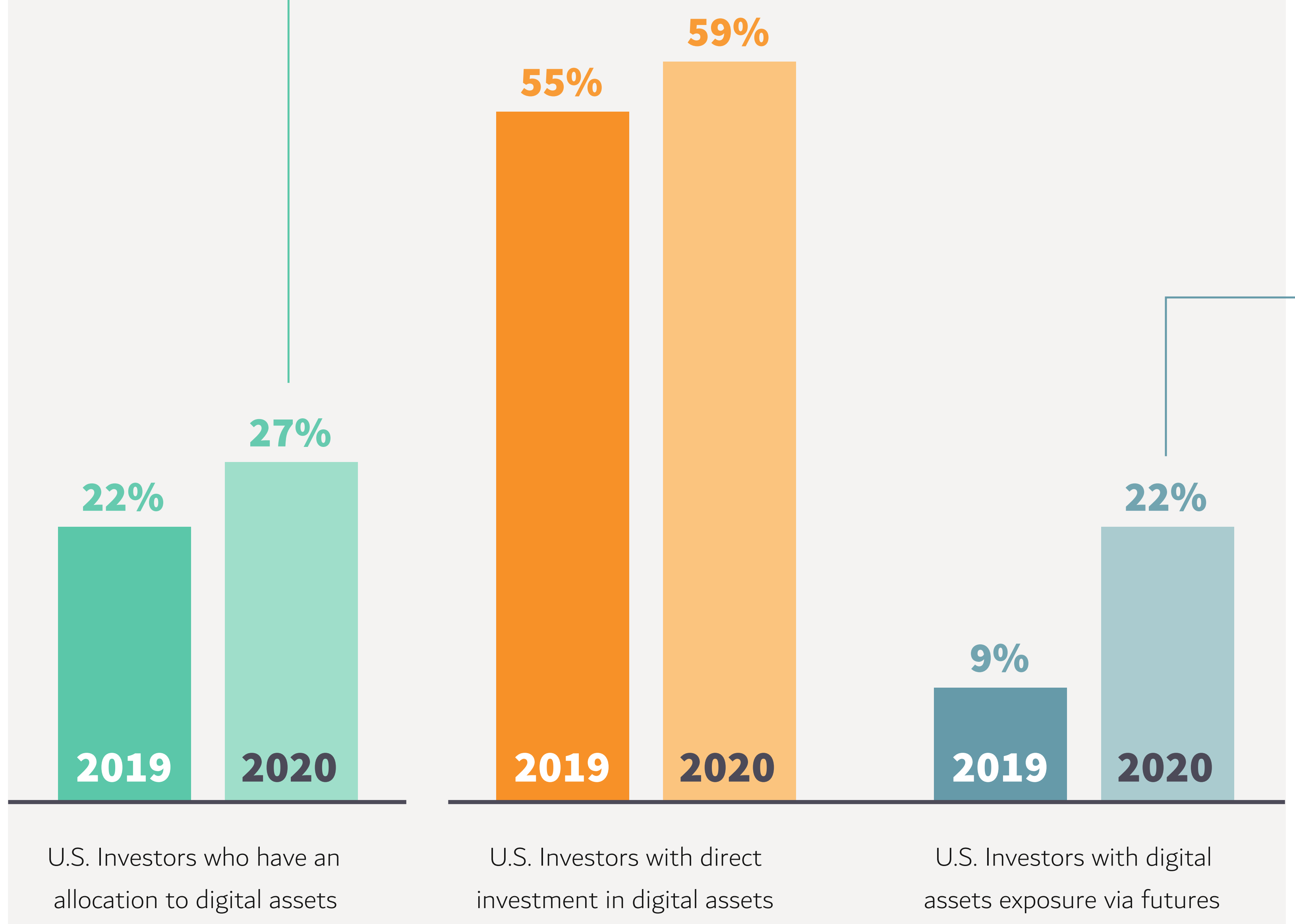
Digital Asset Investment Products

More than **80%** of investors indicated they would be **interested in institutional investment products** that hold digital assets.

CURRENT EXPOSURE & CHANNELS FOR EXPOSURE

36% of institutional investors currently invest in digital assets.

Current investment was led by crypto funds, high net worth individuals, financial advisors and family offices. When we mention "crypto funds" throughout the rest of this review, we are referring to hedge funds and venture capital funds that collectively focus on the digital asset and blockchain universe, and invest in digital assets and/or digital asset companies. The portion of US investors who have an allocation to digital assets increased to 27% from 22% in 2019. We believe there are multiple factors that may be driving ownership including, but not limited to the improved performance of digital assets in 2020, the entrance of incumbent custody, trading and derivatives service providers; the expansion of the types of regulated derivatives available to institutional investors; Facebook's announcement of and regulatory hearings around the consortium-based Libra project, which fueled awareness of digital assets; and bitcoin ETF applications.



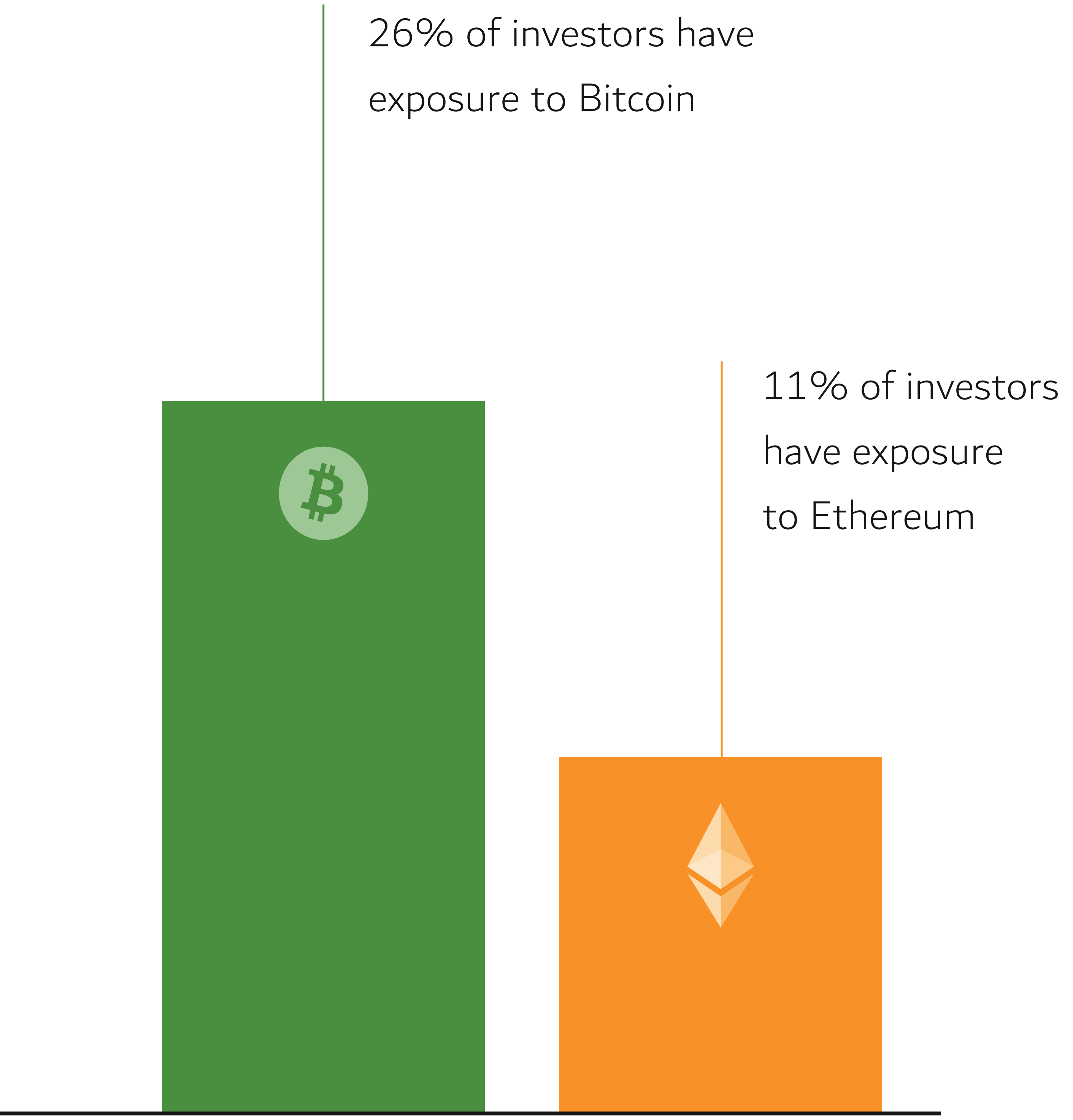
Of all U.S. and European investors surveyed who currently have exposure to digital assets, over 60% buy digital assets directly.

59% of U.S. investors with exposure to digital assets are invested directly, up from 55% in last year's survey. The increase in direct exposure may be the result of more education and maturing custody offerings.

22% of U.S. respondents invested in digital assets have exposure via futures, a substantial increase relative to 9% of U.S. investors surveyed in 2019.

We hypothesize that this may be because the number of crypto native and incumbent service providers offering cash and physically settled futures contracts grew in 2020. Investors may be increasingly using futures contracts as a tool for creating long exposure or to hedge direct exposure.

CURRENT EXPOSURE & CHANNELS FOR EXPOSURE



➤ Bitcoin continues to be the digital asset of choice with both traditional investors and crypto funds, with over a quarter of respondents holding bitcoin.

In addition to crypto funds, the segments that drove this metric included:

Financial advisors

High net worth individuals

The results were in line with our expectations as bitcoin is the largest digital asset in terms of market capitalization. It also has the longest track record, substantially more institutional infrastructure (e.g. custody, exchange, derivatives, investment products), and most of the publicity from mainstream media outlets.

➤ Overall exposure to Ethereum was 11%, the second largest digital asset by market capitalization.

It is held primarily by crypto hedge and venture capital funds.

➤ 91% of institutional investors that plan to make an allocation to digital assets expect to have at least 0.5% of their portfolio in digital assets within five years.

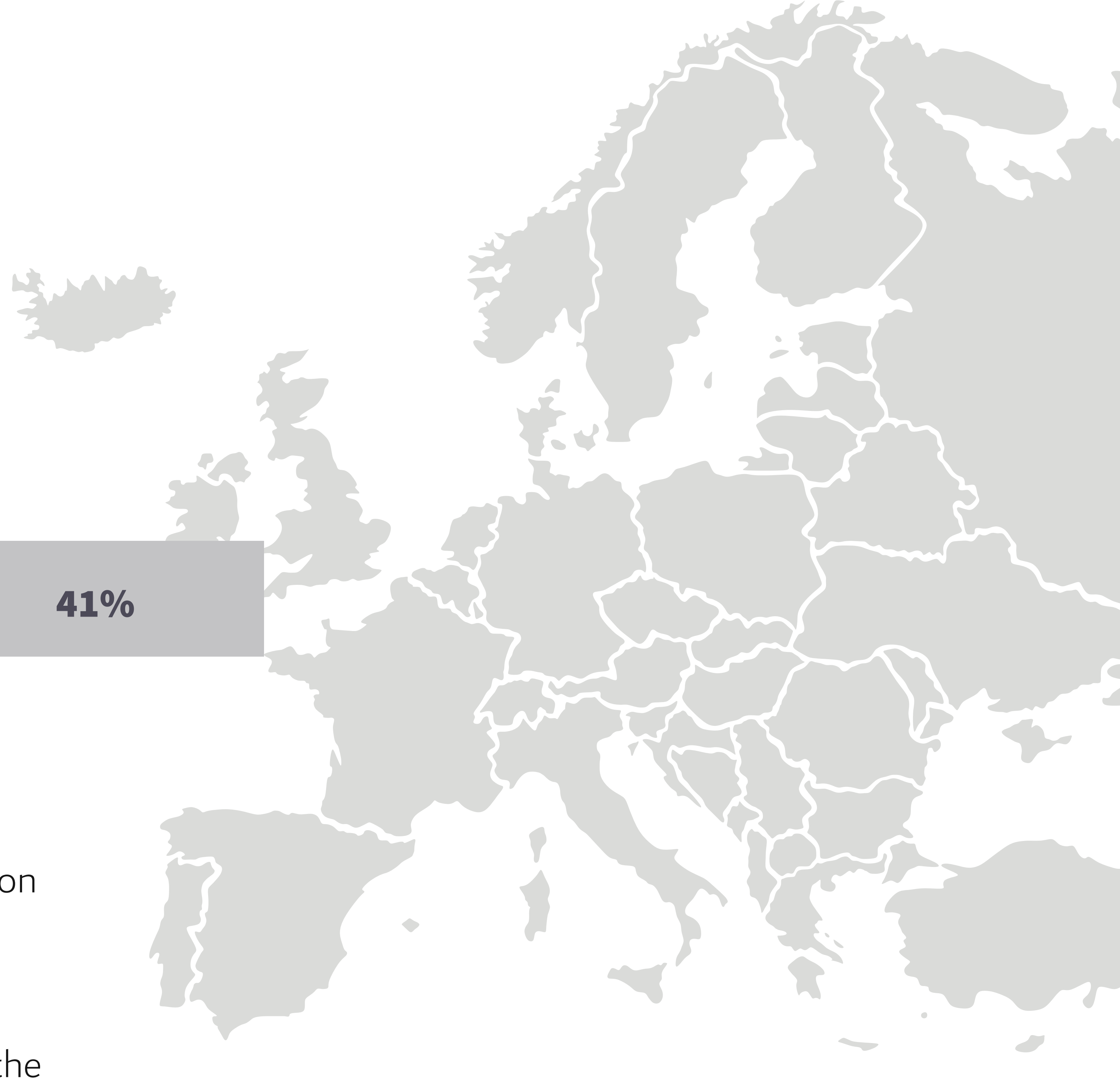
In the U.S., this portion has grown by eight percentage points relative to last year's survey. We believe allocations could rise as:

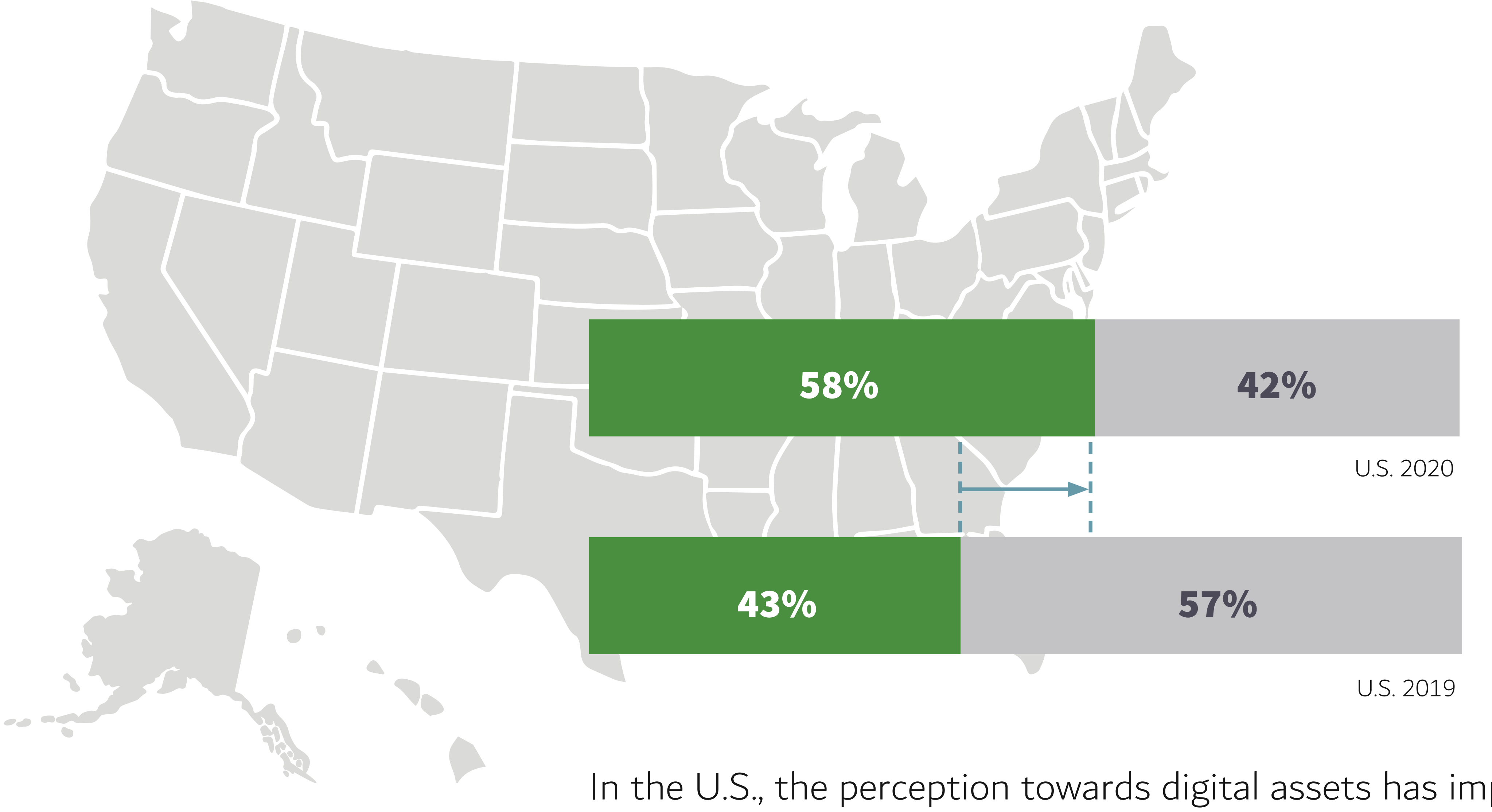
- Obstacles to investment decline, with broadening ownership lowering volatility
- Growing liquidity on regulated exchange that are helping address concerns about market manipulation
- The development of robust and tested fundamental analysis and valuation frameworks

PERCEPTION OF DIGITAL ASSETS

Almost 60% of all investors surveyed have a neutral or positive perception of digital assets.

59% of European investors surveyed have a **positive or neutral** perception of digital assets. European investors who have a **positive perception** of digital assets was 35%, higher than the 24% of U.S. investors.





Positive or neutral

Negative

In the U.S., the perception towards digital assets has improved since 2019, with the portion of U.S. investors expressing a **neutral or positive perception** rising from 43% to 58%. **Positive** perception of digital assets increased six percentage points from 18% to 24% of investors in this year's survey.

Multiple developments may be driving improvements, including improving returns (for example, bitcoin's price nearly doubled in calendar 2019), maturing market structure and traditional institution coverage of digital assets.

PERCEPTION OF DIGITAL ASSETS

What factors may have led to an increase in the positive perception of digital assets?

Custody was one of the significant obstacles to investment in digital assets given digital assets safekeeping is a unique challenge unlike that of traditional assets like stocks or bonds.

Today, there are multiple institutional custodians offering robust digital asset custody solutions.

With this underlying infrastructure in place, the focus of service providers has shifted to supplement core custody offerings with integrated products and services to offer clients a more cohesive investment experience.

Another factor that may have positively influenced perception was the incremental research on digital assets from familiar and respected institutions.

In early 2019, Cambridge Associates ***published a report*** titled "Cryptoassets: Venture into the Unknown," which contained a positive outlook for the crypto industry and a suggestion to investors to begin exploring it. Cambridge Associates is an investment firm with almost $400 billion in assets under advisement from institutional investors such as pensions, endowments, and family offices.

Similarly, Deutsche Bank, a German multinational investment bank, published "Imagine 2030" – a special edition of its Konzept publication, presenting "Cryptocurrencies: the 21st Century Cash" as one of twenty-four contrarian ideas for the next decade. J.P. Morgan also published another ***Perspectives report*** on blockchain technology and cryptocurrencies. One of the takeaways was that, "the crypto market continues to mature, and cryptocurrency trading participation by institutional investors is now significant" [I].

PERCEPTION OF DIGITAL ASSETS

➤ European investors have a more favorable perception of digital assets relative to their U.S. counterparts.

One factor could be that certain countries in Europe such as Switzerland, Luxembourg and Malta have developed more progressive frameworks that provide a clear playbook to projects and companies in the digital asset industry. In November 2019, the German legislature passed a bill that provides for banks to deal in bitcoin and other digital assets, and since coming into effect in January 2020, this law requires new providers to obtain a license from BaFin, the German financial regulatory authority [II]. In the U.K., the Financial Conduct Authority has been prescriptive on taxonomy of digital assets, which has been useful in reducing ambiguity on the treatment of different digital ***assets***.

Another factor that may be driving greater interest among European investors is the prevalence of long-term negative rates in the region. A common objection against investing in gold as well as bitcoin has been that the assets don't inherently generate a yield. In a negative-yielding environment, that perceived drawback becomes a feature, as individuals and investors look to assets that can potentially help them protect their wealth against erosion.

APPEAL OF DIGITAL ASSETS

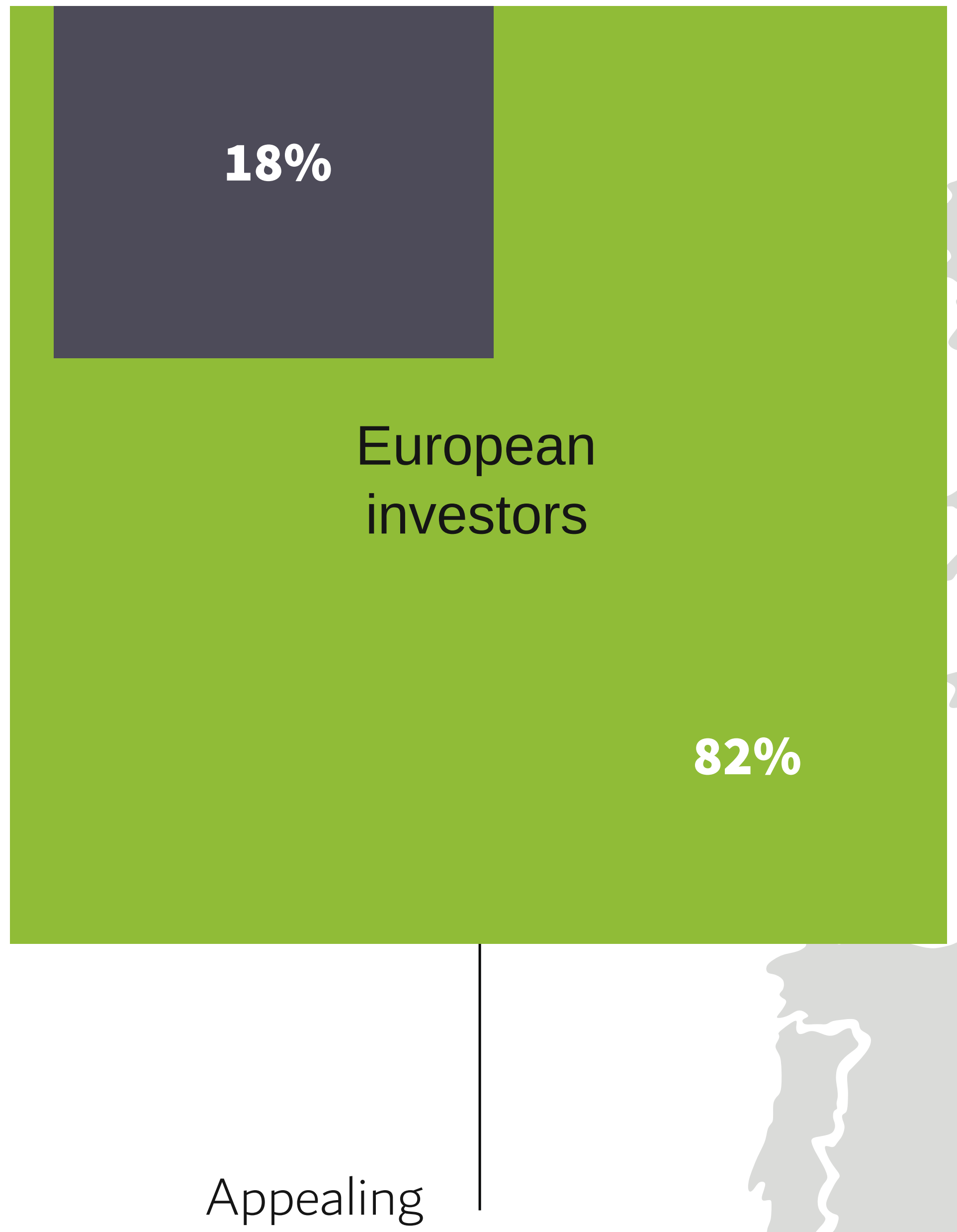
➤ **Almost 80% of investors** surveyed find something appealing about digital assets.

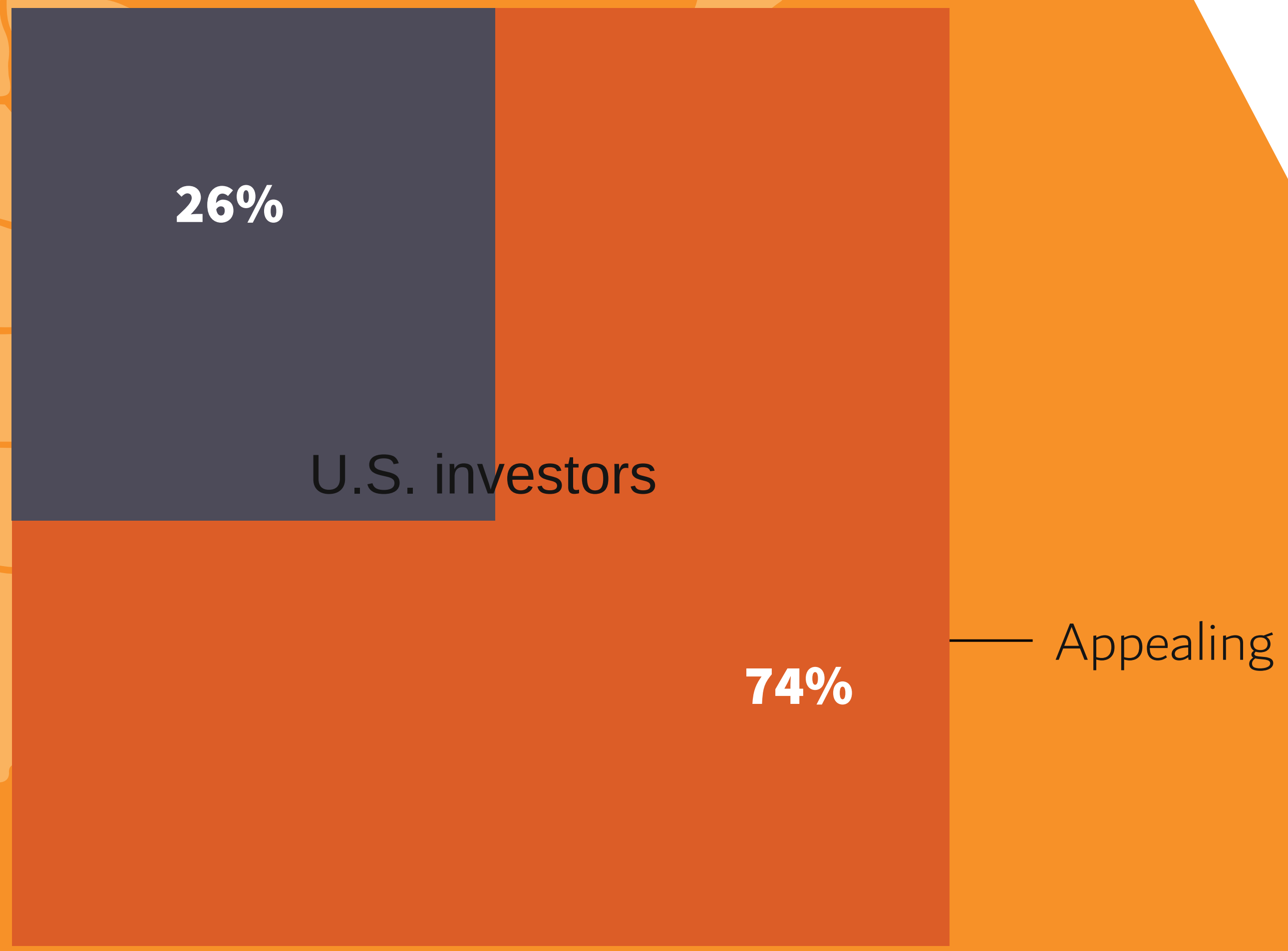
According to survey results, the most appealing characteristics are the lack of correlation, innovative technology play and high potential upside. In the United States, the portion grew by six percentage points to 74% in this year's survey. Similar to last year and across regions, the three almost equally compelling characteristics of digital assets to U.S. and European investors

Uncorrelated to other assets (36%)

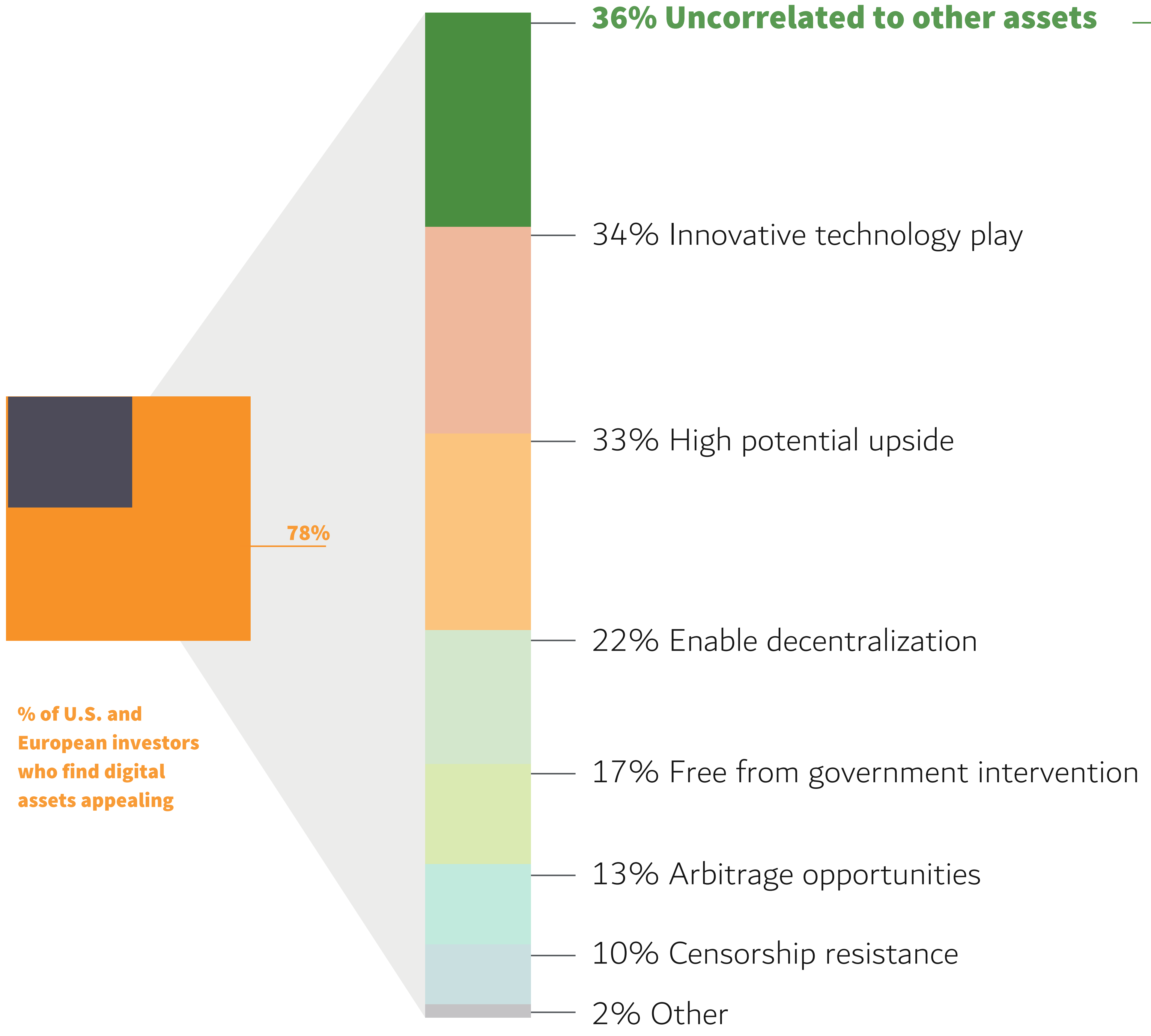
An innovative technology play (34%)

High potential upside (33%)





APPEAL OF DIGITAL ASSETS

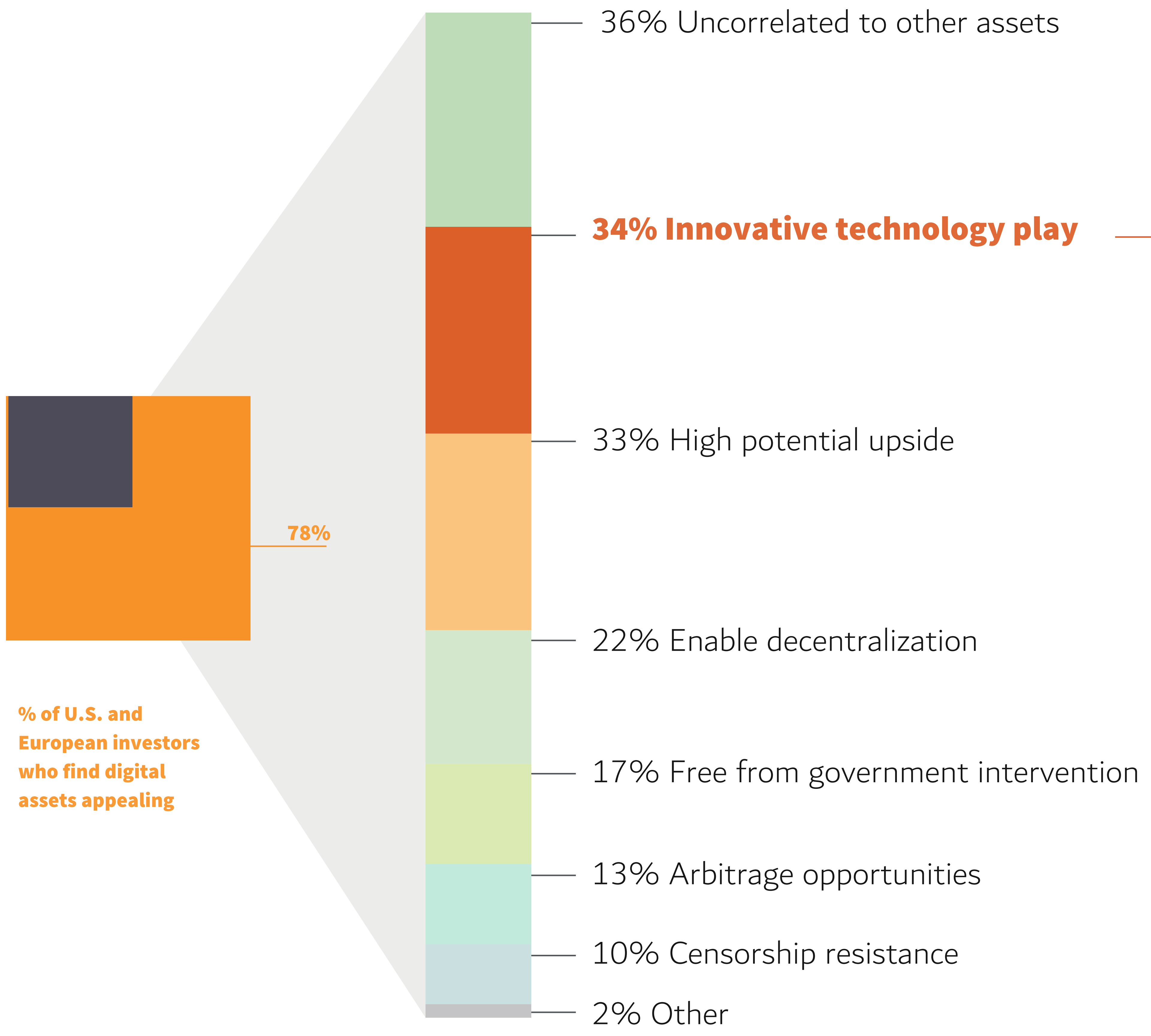


Investors are always looking to improve risk-adjusted returns. However, we consider certain external factors that could explain why investors surveyed chose historical **lack of correlation** as the most attractive characteristic of digital assets in this year's survey. For example, recessionary ***fears*** were top of mind in the back half of 2019 and concerns have picked up in light of pandemic-induced economic shutdowns globally. At the same time, ***investment professionals*** are questioning the viability of the conventional 60-40 equity-bond portfolio in meeting targets. Uncorrelated digital assets could augment a diversified portfolio in the wake of a new standard. As Ray Dalio mentioned in his widely read piece, ***Paradigm Shifts***:

> "The worst thing one can do, especially late in a paradigm, is to build one's portfolio based on what would have worked well over the prior 10 years[III]."

It's important for us to highlight that the survey concluded before macro events led to broad de-risking in mid-March 2020, which drove the flight from assets (especially those that are relatively more liquid) to cash causing the correlation of all assets to go to one. Digital assets sold off with traditional markets, seemingly damaging one of the most frequently cited value propositions – lack of correlation. However, after a period of elevated correlation, we are starting to see digital assets like bitcoin move independently once again. Continuing with bitcoin as a proxy, since the price reached local lows in March and entered a period of higher correlation with traditional markets, bitcoin has recovered nicely. In fact, in comparison to equities (SPY), fixed income (BND), real estate (IYR) and gold (GLD), it is the best performing year to date (as of June 2, 2020). While it is too early to know with certainty if this trend will hold, especially in a subsequent period of panic in traditional markets, it is an encouraging sign and one that we will continue to track and revisit once we have a longer timeline of data.

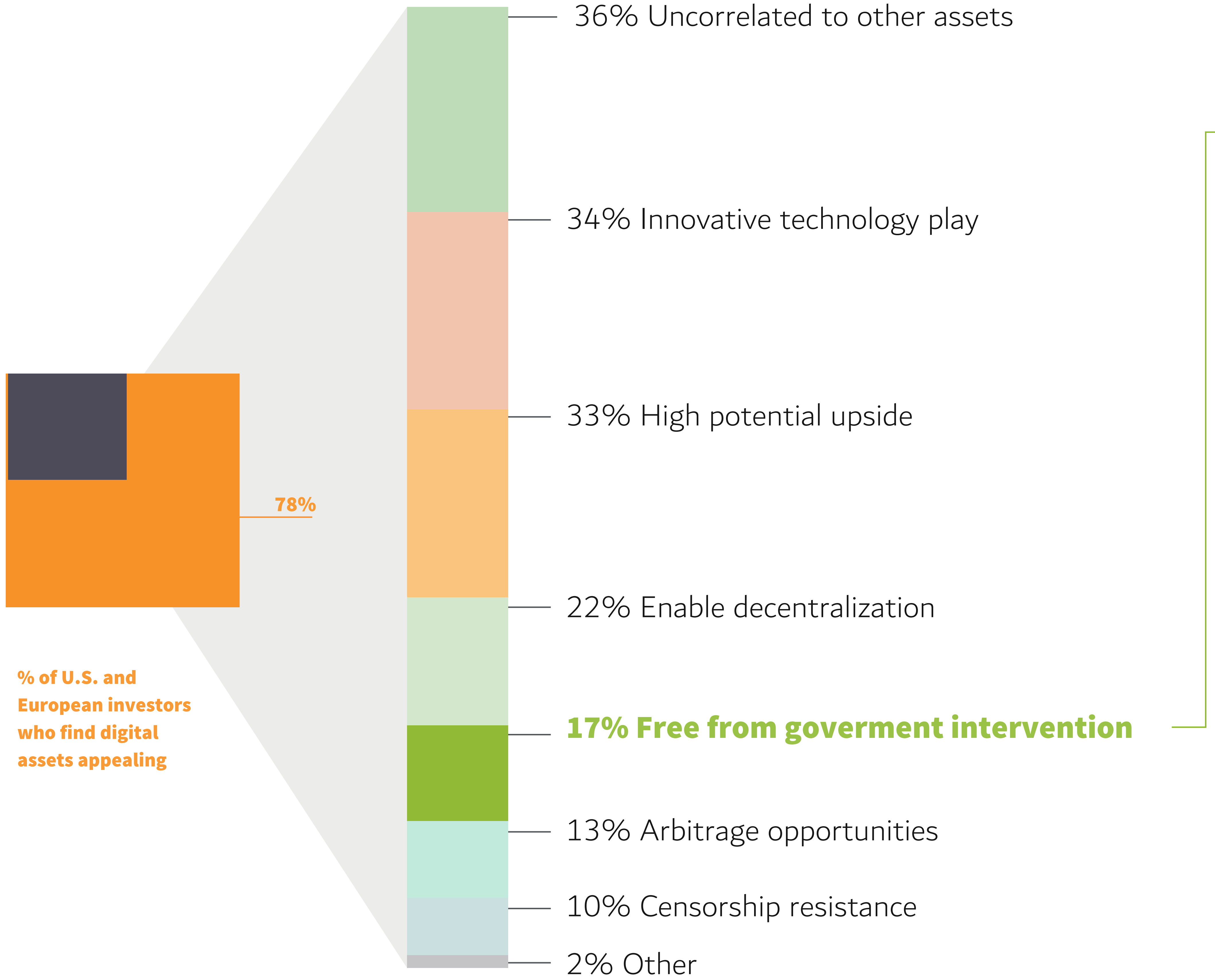
APPEAL OF DIGITAL ASSETS



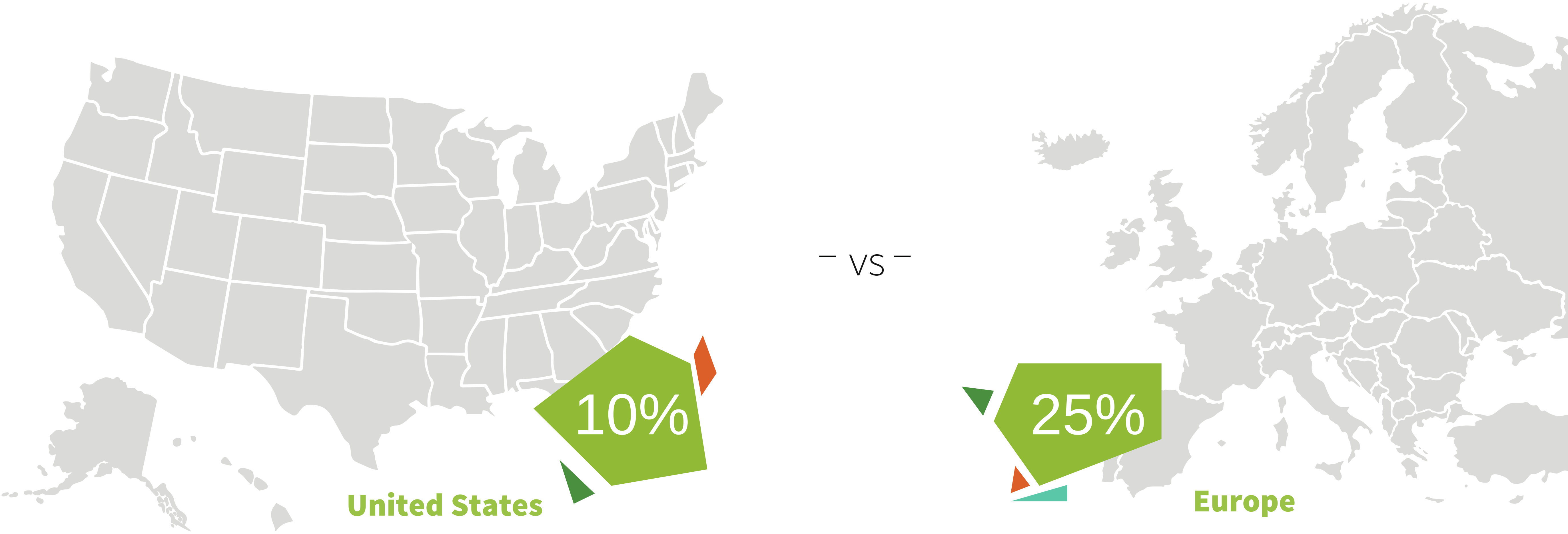
Investments in digital assets are often compared to investments in early-stage technology startups. Novel use cases facilitated by digital assets and underlying technology have captured the attention of investors globally as an **"innovative technology play"** that may disrupt certain industries. Like early stage companies, the rapid appreciation in the value of certain digital assets has piqued the interest of many investors who have fewer asymmetric opportunities on which they can capitalize [IV].

For example, Paul Tudor Jones, founder and CEO of Tudor Investment, announced a change in his firm's investment mandate in May 2020 allowing the fund to make allocations to bitcoin. In an investor letter titled **"The Great Monetary Inflation"**, he also expanded on his bitcoin investment thesis, writing, **"given that Bitcoin has positive returns over the most recent time frames, a deeper dive into it was warranted"** - corroborating the idea that positive performance does serve as fuel catalyzing further exploration into bitcoin and other digital assets by investors.

APPEAL OF DIGITAL ASSETS



While lower on the list, an interesting takeaway is that 25% of European investors surveyed find the fact that certain digital assets are free from government intervention to be appealing, whereas only 10% of investors in the United States feel that way.



As we mentioned above, in Europe, record low interest rates (at or below zero) have persisted for many years. For example, the European Central Bank (ECB) cut its deposit rate to negative 0.5% in September 2019 to combat persistently low inflation [V]. Interest rates are also negative in countries outside the eurozone, such as Switzerland and Denmark. The merits and shortcomings of zero or negative interest rate policies are beyond the scope of this report, but the fact is that such unorthodox policies have led to unorthodox challenges for investors. This could be a reason the "free from government intervention" feature of digital assets may be more enticing to European investors than U.S. investors.

OBSTACLES TO INVESTMENT

➤ In this year's survey, investors cited the most common obstacles to digital asset adoption as price volatility, concerns around market manipulation and lack of fundamentals to gauge appropriate value.

Obstacle	Total (Global)	By Region: U.S. (392)	By Region: Europe (381)
Price volatility	**53%**	56%	49%
Concerns around market manipulation	**47%**	47%	46%
Lack of fundamentals to gauge appropriate value	**45%**	49%	41%
Security concerns by clients	42%	41%	42%
Complexity (difficult to understand by client)	41%	41%	41%
Security concerns by institutions	41%	39%	43%
So new—limited track record	40%	44%	36%
Concerns around regulatory classification	39%	39%	39%
Underdeveloped market infrastructure	38%	36%	41%
Complexity (difficult to understand by institution)	36%	37%	36%
Concerns around private key management	35%	33%	37%
Lack of clarity around qualified custody	34%	32%	37%
Lack of clarity around tax treatment	28%	29%	28%
Limited use cases	23%	20%	25%
Lack of clarity around regulation	22%	18%	26%
Limited education resources	20%	17%	22%
Difficult to hedge positions when appropriate	18%	12%	24%
Transactions are irreversible	11%	8%	13%
Other	7%	8%	6%

➤ European investors are slightly less concerned than their U.S. peers.

➤ The strength of concerns among U.S. investors decreased noticeably across most factors.

In 2019, the top three concerns to investment cited by U.S. investors were price volatility (69%), the limited track record (58%) and lack of fundamentals to gauge appropriate value (57%). These numbers fell to 56% citing price volatility (down 13%), 49% citing lack of fundamentals (down 8%) and 44% citing the limited track record of digital assets (down 14%). U.S. investors citing "concerns around market manipulation" as an option fell from 53% to 47% year over year.

OBSTACLES TO INVESTMENT

Concern about ***market manipulation*** was the second most common barrier cited by investors surveyed. One reason that market manipulation concerns may have been top of mind among those surveyed is that it was the main obstacle cited by the SEC in its rejection of multiple bitcoin ETF applications in 2019 [VI].

Investors once again cited lack of fundamentals as an obstacle to adoption in this year's survey. We believe "fundamentals" in the context of digital assets refers to information, metrics and models that provide insight into the health and growth of digital assets and networks. Given digital assets are in their infancy, standardized valuation models and metrics that investors can use to evaluate and value digital assets are lacking. Additionally, it's worth highlighting that the performance of digital assets may still be detached from "fundamentals," due to higher levels of speculative and sentiment driven trading activity. Further, analysis is incrementally challenging, because it requires the development of unique frameworks for each digital asset and network. This is why fundamental analysis of digital assets is a burgeoning area of study among investors and analysts. As the pool of professionals analyzing digital assets expands and as the asset class grows, we believe the effect of fundamentals on returns will evolve, and standardized analysis and valuation methods will emerge, just as they did for what we now refer to as traditional assets.

As confirmed by survey results, the volatility of digital assets continues to be an impediment for many investors. While the volatility of daily returns of the largest and most mature digital asset, bitcoin, was down in 2019 relative to 2018 (average rolling 180-day volatility of returns was 4.70% in 2018 and 3.85% in 2019), it continues to remain elevated compared to traditional assets. In its February 2020 Perspectives report, J.P. Morgan found that bitcoin's realized volatility is "far from the all-time highs seen in the early years of trading" but its level is still five times that of equities or commodities. Additionally, the survey concluded before the downturn in traditional and digital asset markets in response to the coronavirus pandemic, and it's important to note that bitcoin's average rolling 180-day volatility of daily returns has been elevated since March 2020, averaging 4.78% over the three month period from March 1, 2020 to May 31, 2020 according to Coin Metrics data.

In the uncertain economic environment, near to mid-term volatility could remain elevated in traditional and digital asset markets, but our perspective is that the day-to-day volatility of digital assets should come down over time, as the ownership base continues to expand and as volume and price discovery shifts to U.S. and European regulated spot and derivatives platforms that limit leverage.

CATEGORIZATION OF DIGITAL ASSETS

Over 6 in 10 investors believe digital assets have a place in a portfolio.

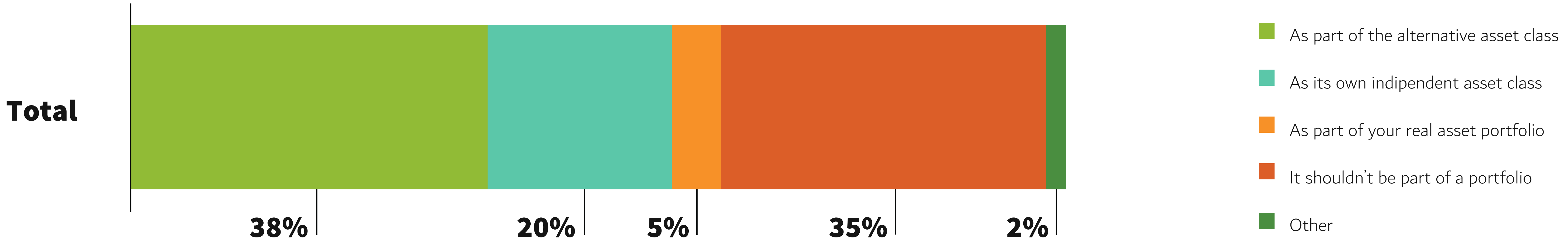
➤ Almost 40% of investors believe digital assets belong in the alternative asset class.

Alternative assets are those that do not fit into classic public stock and bond categories, such as infrastructure, real estate, private equity, and commodities. Alternative strategies refer to the use of unconventional strategies in interacting with traditional assets. One of the key characteristics of alternatives is that they exhibit low correlation to classic markets (e.g. the S&P 500®). As highlighted earlier in the piece, investors find low correlation to be one of the most appealing features of digital assets.

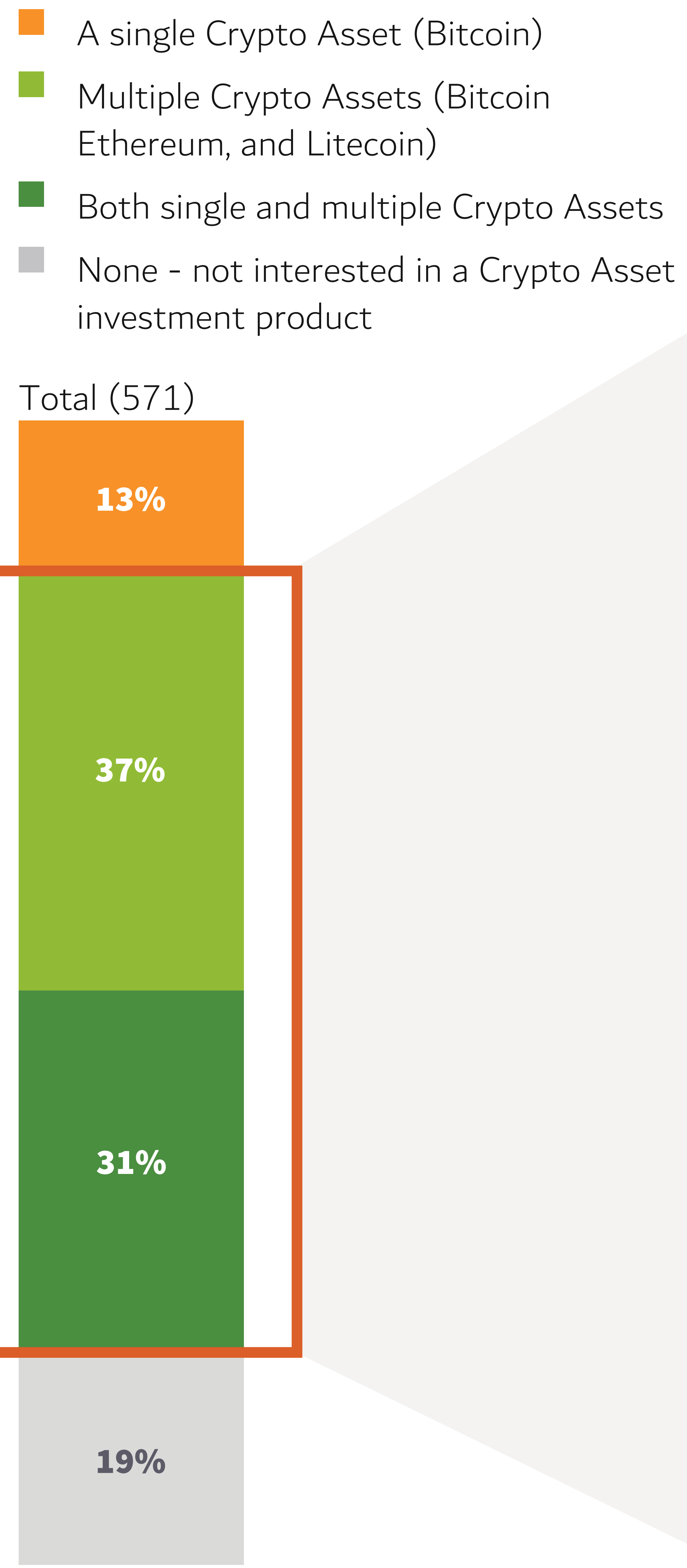
CATEGORIZATION OF DIGITAL ASSETS

The view that digital assets belong in the alternative bucket may be a driver of investment in digital assets in the near to mid-term. In the Greenwich ***2019 Continental European Institutional Investors Study***, institutions said the biggest challenge they face over the next 12 months will be achieving the correct asset allocation to address rate of return and funding issues while effectively managing risk. In that study, an institution based in Sweden highlighted that it has "placed more focus on alternative investments, given the recent volatility in equity markets and the low yield in fixed-income markets" [VII].

Categorization of Digital Assets



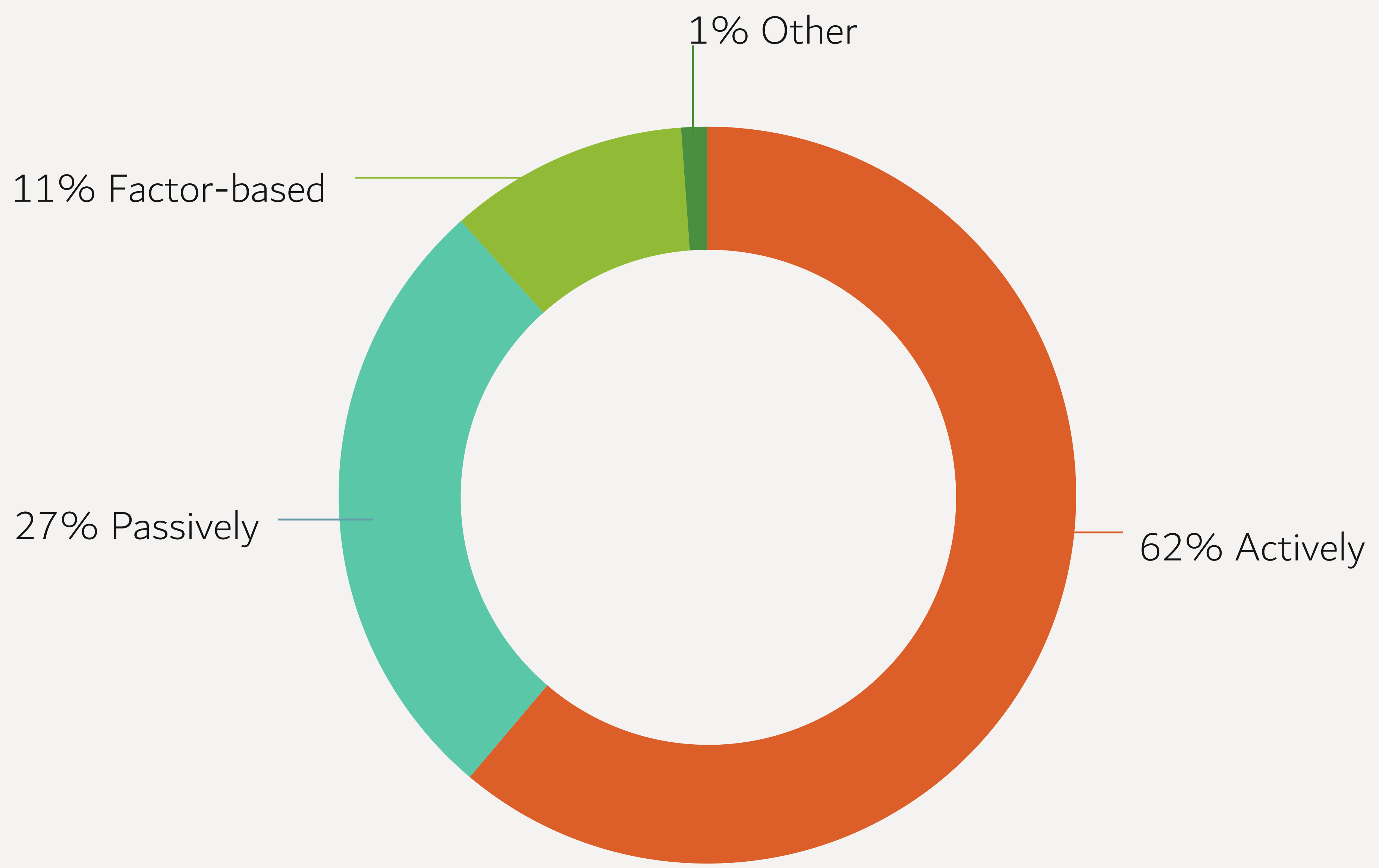
Digital assets such as bitcoin have certain advantages over assets historically known as alternatives such as hedge funds, private equity or real estate in that it is liquid, has low transportation, transaction and storage costs and has unique return drivers. These factors could be driving 20% of investors to believe digital assets belong in an independent asset class.



DIGITAL ASSET INVESTMENT PRODUCTS

➤ Over 80% of investors indicated they would be interested in institutional investment products that hold digital assets.

Of this group, almost half indicated they would prefer to hold an investment product that provides them with exposure to multiple digital assets.



The majority (62%) prefer an **actively managed product or fund** (of the investors who expressed an interest in a multi-asset investment product). A smaller portion (27%) indicated interest in a **passively managed product** (e.g. an index fund).

DIGITAL ASSET INVESTMENT PRODUCTS

The incremental preference for actively managed multi-asset products versus passively managed products may be driven by the knowledge that **most digital assets are still highly correlated**, which limits the diversification benefits of exposure to a basket of assets. Additionally, many **passive multi-asset products are market cap weighted** and composed predominantly of bitcoin and ether.

Active managers, on the other hand, may be able to **opportunistically select assets** versus weighting components by market cap as well as deploy strategies that provide returns regardless of the direction the market moves. Another factor to consider is that active strategies may be able to **more effectively smooth out volatility**, which continues to be one of the main obstacles for investors.

Opportunistically select assets

Smooth out volatility

CONCLUSION

The survey results are an encouraging reinforcement of the trends we have gleaned from our conversations with clients and prospects. There is increasing momentum in digital asset investment and interest across multiple investor segments.

The factors most frequently cited as driving adoption of digital assets include:

- **Adoption and usage of underlying networks**
- **The recovery in digital asset returns relative to 2018/2019 lows**
- **The launch of institutional grade infrastructure**
- **The introduction of incrementally sophisticated products for expressing an interest in digital assets**
- **The growth in talent and service providers focused on the space**

We also believe the macroeconomic events are and will continue to be a key tailwind driving interest and investment, as investors reevaluate their investment strategies and determine how to best position their portfolios heading into what may be a completely new paradigm.

We are excited to see how the industry will mature and evolve over the next year and look forward to playing a role in furthering the adoption of digital assets.

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