# Crypto-assets: Paradigm shift or short-term trend?

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# Foreword

2021 was an outstanding year for crypto-assets: Bitcoin surpassed the historic $1 trillion market capitalisation threshold for the first time, the NFT market skyrocketed 220-fold to reach trade volumes comparable to the traditional art market, and El Salvador became the first nation to adopt Bitcoin as legal tender. Some steps forward, but also some steps back: China has banned crypto-assets, the IMF has raised concerns on the systemic risks they post, and many have voiced concerns regarding the sustainability and transparency of this new asset class. Last but not least, crypto-asset valuations remain highly volatile, as observed by the price movements early 2022.

Against this dynamic backdrop, we are delighted to publish the first-ever market study of Luxembourg's crypto-assets industry. A joint initiative between LHoFT and PwC Luxembourg, with the active support of ALFI, the aim of this report is to shed some light on this fascinating new sector of financial services, by highlighting the drivers of growth, the opportunities arising and the challenges and issues that prevail to help Luxembourg market participants in their decisions on how to approach the asset class.

We have consulted over 120 industry professionals in Luxembourg whose operations may directly impact (and are impacted by) the fast growing crypto-assets market. These professionals have provided us with insights on their current strategic approach toward crypto-assets, as well as their predictions for the future development of crypto-asset related financial services in the Grand Duchy – all in painting a pragmatic picture.

In light of our findings, we have formulated some recommendations that may ultimately serve to enhance and clarify the Luxembourg financial sector's positioning towards crypto-assets in the context of rapidly growing interest from investors and international competition to capture early and sustained market share.

We hope this report will contribute to further discussion and to a proactive assessment of the opportunities and risks that crypto-assets may present in particular to Luxembourg's vast Asset & Wealth Management industry. We extend our thanks to those professionals that participated in our study, to ALFI for their support and to you, the reader, in taking interest in our findings.

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# Introduction

Crypto-assets have grown past the point of needing an introduction – with recent years seeing them elevated from a niche investment option for the tech-savvy, to what many now view as a new and promising asset class. In the same breath, however, crypto-assets are as much of a topic of debate as they are a subject of reverence. This debate has escalated to unprecedented levels in recent months - with a number of major entities (both private and sovereign) either adopting or outright banning the use of crypto-assets. Whether it be Tesla accepting then refusing bitcoin as a method of payment, China banning crypto outright then launching the government-controlled digital yuan, El Salvador introducing bitcoin as legal tender, or payment giants such as Visa, Mastercard and PayPal expanding their crypto capabilities - crypto-assets are fast rising up the global agenda.

As tends to be the case with emerging, innovative asset classes, crypto-assets have the potential to make a large impact on the investment landscape - unlocking a wealth of new investment opportunities. In light of this, institutional interest in crypto-assets has grown considerably, motivated by the realisation that crypto may represent an underutilised source of growth and diversification. Naturally, asset managers cannot ignore the swift growth in market capitalisation of leading crypto-currencies and DeFi Tokens, reflecting enthusiastic retail investor participation.

Crypto's explosive growth notwithstanding, there remains a number of questions as to the future development of the crypto-asset space - and the inherent opportunities and risks. Given Luxembourg's position at the forefront of financial innovation and the ongoing need to evaluate and adapt the financial centre's value proposition in an evolving macro context, it is crucial that local industry players maintain an updated view of emerging developments – and position themselves accordingly.

With this in mind, the LHoFT and PwC Luxembourg, with the active support of ALFI have collaborated to develop the first sentiment report on crypto-assets within Luxembourg's Asset & Wealth management industry, with the aim of identifying and quantifying the drivers that could ultimately further catalyse the institutionalisation of crypto-assets. In doing so, we hope to provide market participants with an objective, factual and clear view of the current state of the Grand Duchy's crypto-asset management industry - and the risks and opportunities that lie therein.

Going into this project, our working hypothesis was that financial players broadly recognised the commercial opportunity inherent in catering to crypto-assets and/or incorporating them into their own portfolios; all the while sensing that the burgeoning demand for these products was not being met. To test this, we relied on a dual approach. First, we performed a market analysis to assess the development of the crypto-asset market, the opportunities provided by this asset class and the major pitfalls that still surround it. Second, we enhanced our findings with a wide range of primary data gathered via a proprietary survey, in which 123 Luxembourg-based financial market participants provided their views on the state, and potential future direction, of the local crypto-asset ecosystem. Finally, we leveraged the combined findings of our analysis in order to formulate key recommendations for the Grand Duchy's financial centre.

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# Crypto-Assets Landscape

## Crypto-assets today: exponential adoption

Despite representing a relatively nascent asset class, crypto-assets have undergone an incredible transformation since the emergence of bitcoin in 2008 - evolving from a niche market primarily consisting of IT-savvy early adopters, to a global phenomenon to the tune of 3 trillion dollars for crypto-currencies, as of November 2021 (cf. exhibit 1). This surge has been driven first and predominantly by ravenous retail investor appetite in an environment characterised by the absence of asset-class specific regulation, paired with growing popularisation – and promotion – of the topic.

Meanwhile, institutional demand in Europe is becoming increasingly evident, with 56% of European institutional investors surveyed by Fidelity Digital Assets indicating that they have some level of exposure to digital assets - up from 45% in 2020 - and investment intent up 15% compared to 2020[1].

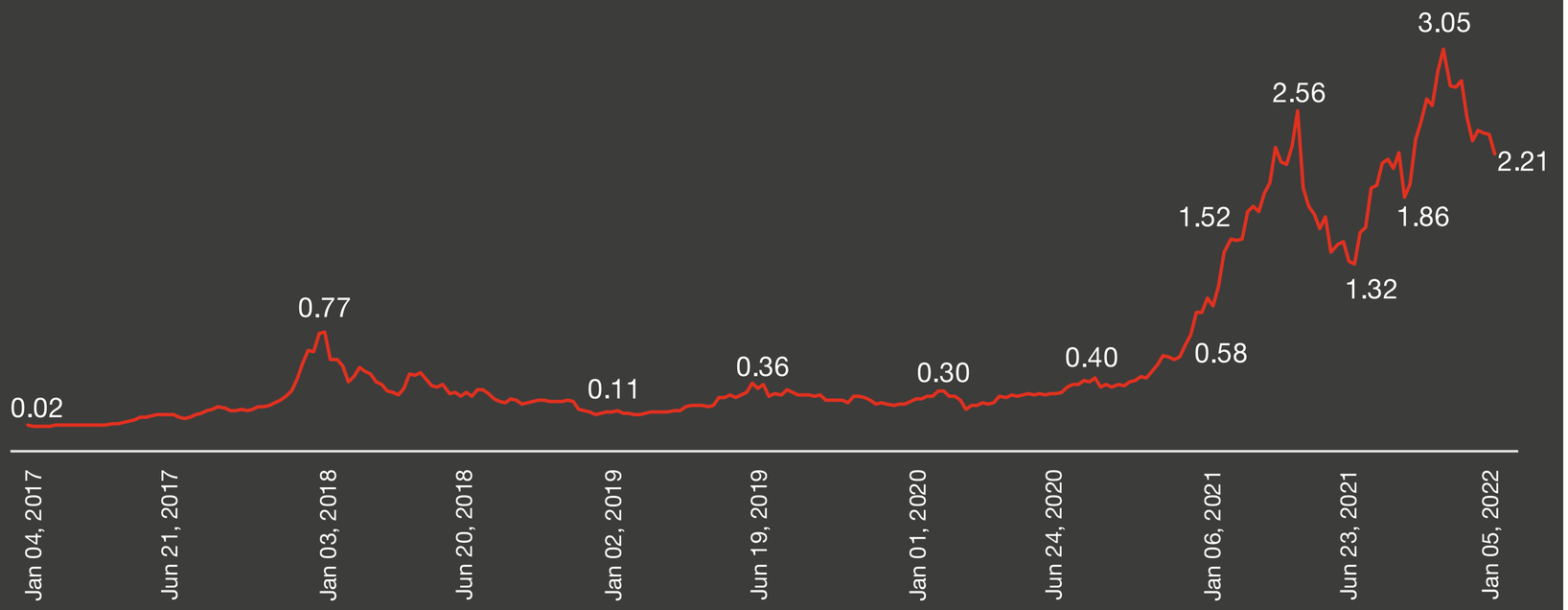
Nevertheless, retail investors still represent the backbone of this recent explosive growth, with the number of crypto-asset users doubling in the first half of 2021 alone to reach over 220 million[2]. That being said, this growth is not materialising solely in the form of a rapidly expanding user-base, but also in terms of the proportion of funds allocated to crypto-assets. According to a survey of over 1,300 crypto investors conducted by market research company Cardify, respondents on average deposited USD 263 into crypto-related accounts – above the average USD 250 allocated towards traditional investments, during the month of September[3]. The same survey also shows that only 15% of crypto investors self-assess as having a strong understanding of the “value and potential” of crypto-assets, while 37% indicate only getting exposure through word-of-mouth.

Moving from user-level data to a more macro view, 2021 inflows into crypto products and funds stood at USD 9.3bn, according to CoinShares Digital Asset Fund Flows Weekly report *(4/01/2022)* - far exceeding the total USD 6.7bn recorded in the entirety of 2020. That being said, while the correlation between inflows and market capitalisation persists, high volatility (with the prices of bitcoin and other crypto-currencies falling by around 20% in a 24-hour timeframe in some instances), regulatory developments and recent events in the economic and geopolitical landscape may have diminished the strength of this correlation.

1. Fidelity Digital Assets℠ 2021 Institutional Investor Digital Assets Study *https://www.fidelitydigitalassets.com/bin-public/060_www_fidelity_com/documents/FDAS/2021-digital-asset-study.pdf*
2. *https://crypto.com/images/202107_DataReport_OnChain_Market_Sizing.pdf*
3. *https://www.cardify.ai/reports/crypto-revisited*

## Exhibit 1:

Cryptocurrency market capitalisation (USD tn)



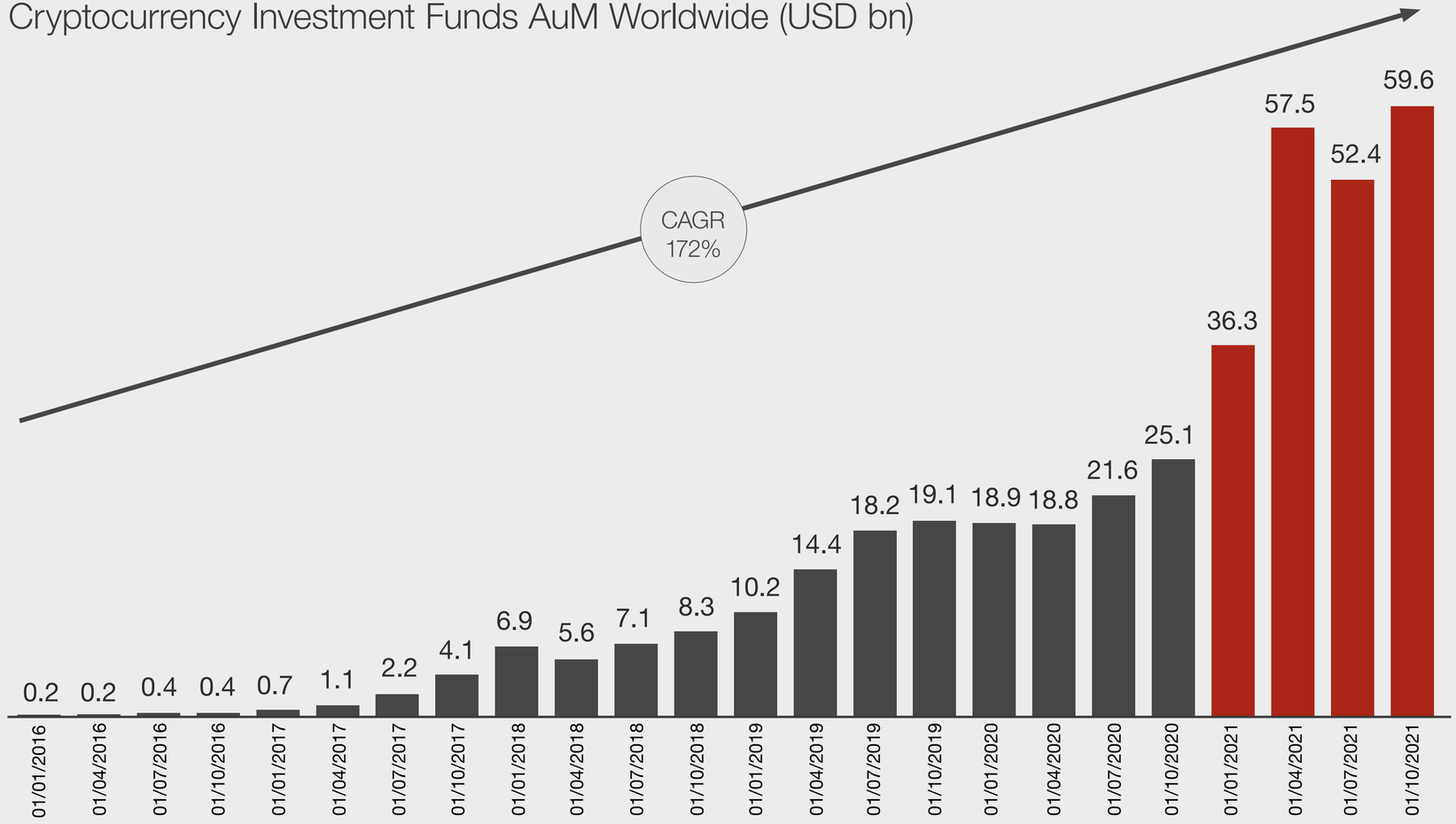

Sources: CoinGecko; BitInfoCharts

Given the above, it is unsurprising that recent years have seen the emergence of an entire crypto-assets ecosystem, with a number of financial entities bringing new products to market at a stunning pace. Major asset managers have begun to rethink their product shelves in an attempt to meet this burgeoning demand; with players such as Fidelity, BNY Mellon and State Street broadening their product scope to include support of crypto-currencies. There have also been increasing forays into crypto-assets via dedicated funds, with Paradigm and Andreessen Horowitz promoting crypto funds with a respective USD 2.5bn and USD 2.2bn in assets under management at the time of writing this report. While buy-in from pioneering VCs, family offices and hedge funds has served to further reinforce bullishness in the space, Alternative Investment Fund Managers (AIFM) serving institutional investors - specifically pension funds and insurance companies - have been operating in a very different environment. Regulatory restrictions, stringent mandates and risk management have resulted in a more prudent approach towards crypto-assets. However, recent regulatory developments, such as Germany's decision to allowing institutional investors to invest up to 20% of their assets in crypto-currencies (as long as it done through Spezialfonds) could see a surge in investments in crypto-assets.

European players have also modernised their product offering, albeit to a lesser extent than their overseas counterparts. For instance, in May 2021, Jacobi Asset Management received approval for the first ever tier one bitcoin ETF. Meanwhile, one of the largest European crypto ETP issuers, ETC Group, has announced that its total Assets Under Management (AuM) surpassed the USD 2bn milestone for the first time in November 2021 - with its Bitcoin ETP holding over USD 1.6bn in AuM. However, while players are unquestionably expanding their crypto-assets product offerings, the European crypto-asset management landscape is still in the early stages of its journey - with the region being home to only 20% of the total funds in terms of primary office location. This represents a relatively small proportion of the USD 59.6bn of AuM of crypto-currency funds worldwide.

## Exhibit 2:

Cryptocurrency Investment Funds AuM Worldwide (USD bn)




Source: Crypto Fund Research

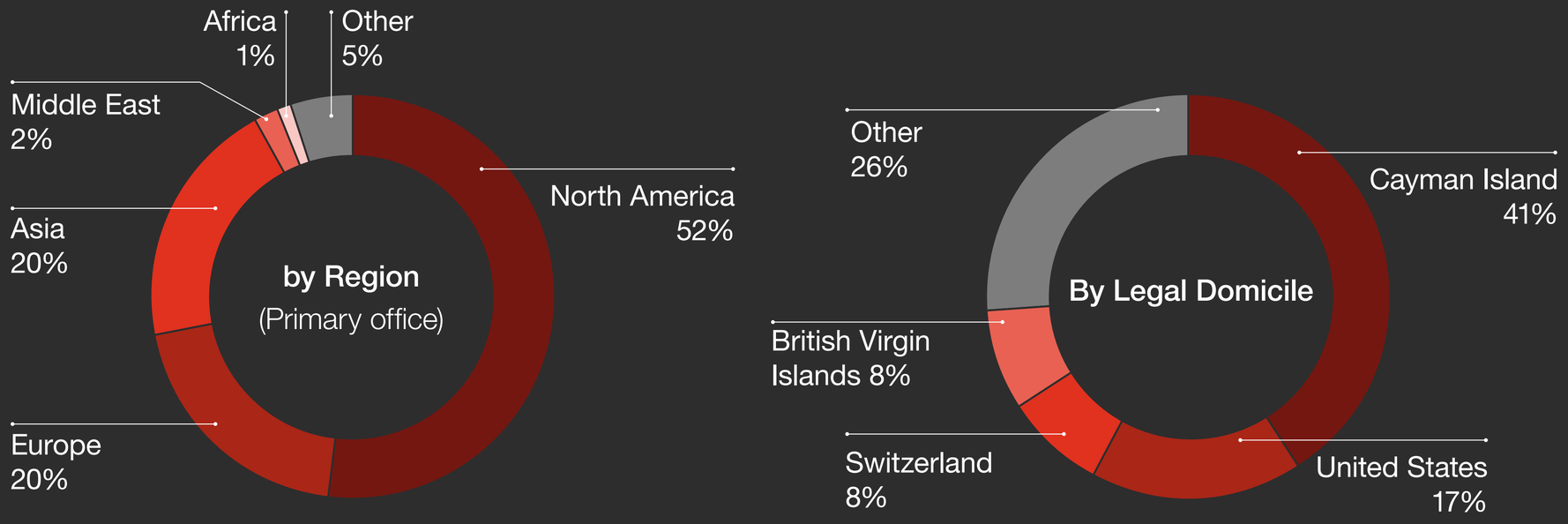
Given the aforementioned, it is fair to describe crypto-assets as a nascent space. Indeed, the majority of crypto-funds are currently small in scale; and AuM distribution across the existing crypto fund universe being highly uneven - with the top 5 funds holding 25% of global crypto AuM and 39% of funds holding less than USD 10mn in AuM. The geographical concentration of the global crypto market is equally pronounced, with over 50% of crypto-funds having offices in North America (predominantly in the US). The Cayman Islands currently holds the pole position in terms of fund domiciliation - housing 41% of total funds (cf. exhibit 3). This is mainly explained by the fact that hedge funds (which are commonly domiciled in the Cayman Islands[4]) make up almost half of the crypto fund universe. That being said, concentration in the market has decreased over the past years as a result of small players' strong performance[5].

In short, while the pronounced rise of crypto-assets is undeniable, its full extent has yet to materialise, and is largely dependent on their degree of future entrenchment in the financial landscape moving forward.

4. https://cryptofundresearch.com/q3-2021-crypto-fund-report/
5. https://cryptofundresearch.com/q3-2021-crypto-fund-report/

## Exhibit 3:

Crypto-currency Investment Funds, Q3 2021




Sources: Crypto Fund Research

# Crypto-assets still need to overcome key challenges

To understand the relatively limited entrenchment of crypto in the wider financial landscape, one needs to refer to a number of key structural and perceptual challenges that - should they remain unaddressed - may call into question the latent potential within the space. The top concerns cited by our survey respondents reflect what has been largely and publicly debated so far on the main pitfalls of crypto-assets. They refer to energy consumption, international agreement upon and implementation of viable AML/KYC processes, and their purportedly 'risky' nature. In addition, we believe that the fragmented regulation and the potential systemic risk stemming from crypto-assets are additional important challenges. It should be noted that future developments related to these topics may be out of the hands of market participants, making the responses illustrated below all the more salient.

## Energy Consumption

As cited by 31% of our survey respondents, the environmental impact of crypto-currency mining represents their primary reputational hindrance. This response is likely driven by the energy consumption of crypto-assets based, such as Bitcoin, which rely on a Proof-of-Work consensus mechanism. In fact, some public entities such as the Swedish Financial Supervisory Authority have strongly positioned themselves against energy intensive mining of crypto-assets arguing that this practice should be prohibited. It is estimated that the Bitcoin network alone consumes around 0.45% of the world's total electricity[6], nearing the total consumption of countries such as Belgium or Chile. This is not to say, however, that the crypto mining industry has not used green energy to power its operations[7]. Furthermore, new generations of crypto-currencies – such as Cardano, Solana or Tezos – no longer use Proof-of-Work as a consensus mechanism but are instead based on a Proof-of-Stake – which has proven to be considerably less energy-intensive. This trend is not solely limited to emerging crypto-currencies, either. In fact, Ethereum is expected to merge with Beacon Chain, which would see its entire network switch from Proof-of-Work to Proof-of-Stake - significantly reducing electricity consumption across one of the most popular blockchain networks. Further incentive for solving the energy consumption issue stems from the need to process more and faster transactions all the while accommodating expanding network sizes, all of which are ultimately linked to the overarching objective of establishing crypto-assets as reliable and credible mediums of transaction. As technology matures and big players innovate, the industry is demonstrating a clear commitment to developing cleaner solutions in order to assuage sustainability concerns.

6. Cambridge Bitcoin Electricity Consumption Index as of November 2021
7. According to a report conducted by the University of Cambridge, as of 2020 renewables accounted for 39% of crypto mining's total energy consumption.

## Exhibit 4:
Top 3 concerns on crypto-assets*

**31%** The elevated energy consumption of certain crypto-assets makes them unsuitable as an investment due to ESG considerations

AML risk is too high for crypto-assets **30%**

**25%** Crypto-assets are pure speculative instruments

Note: *Different statements have been proposed to the survey respondents. This ranking shows the top three statements which were selected by the highest number of respondents who "completely agree" with the statement.

Source: PwC Market Research Centre

## AML Concerns

Second, the often unregulated and somewhat opaque nature of the crypto market has given rise to a number of concerns ranging from the security of crypto exchanges, to the soundness of stablecoins. In its 2021 report[8], the Financial Action Task Force highlighted a steep increase in the use of crypto-assets for the collection of ransomware proceeds and for the purpose of committing and laundering the proceeds of fraud[9]. In fact, US IRS' criminal investigation unit seized USD 3.5bn in cryptocurrencies in the 2021 fiscal year alone, accounting for as much as 93% of total assets seized by the unit's non-tax investigations that year[10]. As such, the current non-existence or patchy nature of KYC and AML requirements in cross-border crypto transactions remains an obstacle to broader adoption among institutional investors. Furthermore, the utilisation of anonymous crypto-currencies such as Monero or Z-Cash - which are banned by certain exchanges - or the use of mixers such as Tornado introduce additional challenges to fulsome AML/CTF implementation. Nevertheless – and against the overall perception of the market – it is estimated that only around 0.5% of crypto-currency transactions in 2020 (≈10bn)[11] were tied to illicit activity. This notwithstanding, however, the development of appropriate and clear regulation and improved governance could ultimately assuage AML concerns.

## High Risk of Crypto-assets

A quarter of our respondents still see crypto as a purely speculative investment. There may be several reasons that explain this. First, crypto-assets have started with crypto-currencies, whose first intended use was that of an electronic mode of payment. However, the inherent volatility[12] of these assets – alongside particularities inherent in Distributed Ledger Technology (DLT) infrastructure such as transaction fees being tied to network congestion[13] - have prevented them from being adopted for everyday use. This volatility has led to the widespread perception of these assets as inherently risky, dissuading risk-averse investors.

Second, crypto-currencies are not backed by a central authority, thus they face major credibility issues, which has put into question their fundamental value, increasing the perception of their valuation risk. This credibility issue is also tied to a nascent, fragmented regulatory framework.

## Fragmented Regulation

The regulatory environment around crypto-assets is currently highly fragmented and does not yet guarantee the level of investor knowledge and protection provided by other asset classes. Indeed, the current absence of a clear and harmonised regulatory framework is significantly complicating the development of a homogenous European crypto-asset market. As is the case with other developments in the global investment landscape, the absence of a commonly accepted taxonomy gives rise to legal ambiguities and varying interpretations across jurisdictions - leading to regulatory gaps/arbitrage, overlaps and conflicts. This has further served to reinforce the widely held perception of crypto-assets as a risky, speculative investment.

The EU has already taken clear steps towards addressing these regulatory shortcomings and bringing much-needed objectivity and harmonisation to the region's crypto-asset ecosystem. The proposed Markets in Crypto-Assets (MiCA) regulation represents a stepping stone towards a coherent and innovative-friendly crypto-assets regulatory framework. Expected to come into force by 2023/24, MiCA will apply to any individual/entity that issues crypto-assets or provides crypto-asset services. Given the rate and scale with which the crypto-asset space is expanding, however, two years can seem like an eternity. Certain European states (namely Switzerland, Germany and the UK) have decided to ratify their own regulations in an attempt to gain a first-mover advantage and grab the crypto opportunity with both hands.

On the other hand, some governments have taken the opposite route, taking actions aimed at limiting their use and reducing their availability. Recent actions pursued by the Indian government to heavily regulate crypto-assets, and China's decision to outright ban them, are just a few examples.

In Luxembourg, there is as of yet no formal regulatory stance on crypto-assets, but the "Virtual Assets - FAQ" document published late November 2021 and updated in January 2022 has clarified that UCITS funds and UCIs addressing non-professional customers and pension funds are forbidden to invest directly or indirectly in Virtual Assets. The document also sets out the conditions under which AIFs may invest in crypto-assets, as well as the requirements for the AIFM and the specific AML considerations. Finally, in a recently released FAQ document on virtual assets for credit institutions issued by the CSSF, the regulator states that credit institutions may directly invest in virtual assets and open accounts that allow customers to invest in virtual assets. On the other hand, credit institutions cannot open bank accounts in virtual assets, must submit a business case as well as an application file to the CSSF in order to provide virtual assets services and must set up an effective investor protection framework. This FAQ also clarifies that fund depositaries can be mandated to act as depositaries for investment funds investing directly in virtual assets. Looking forward, as the industry develops, so too will regulatory momentum from authorities and policymakers in order to clarify rules, help address the aforementioned challenges and create a sound governance system around crypto-assets.

8. Second 12-month review Virtual Assets and VASPs
9. *https://www.fatf-gafi.org/media/fatf/documents/recommendations/Second-12-Month-Review-Revised-FATF-Standards-Virtual-Assets-VASPS.pdf*
10. *https://www.nbcnews.com/tech/security/irs-seized-35-billion-cryptocurrency-year-agency-says-rcna6157*
11. *https://go.chainalysis.com/rs/503-FAP-074/images/Chainalysis-Crypto-Crime-2021.pdf*
12. understood here as price fluctuation
13. *https://www.coindesk.com/tech/2021/02/26/a-guide-to-saving-on-bitcoins-high-transaction-fees/*

# Growth catalysts

While the aforementioned challenges cannot be overlooked, there are also a number of key drivers that have been propagating the aforementioned expansion of the crypto-asset industry and asset base.

## Technological Advantages

Arguably, the fundamental growth driver of crypto-assets is the technology that underpins them. Without entering into excessive detail, crypto-assets can be owned and transferred by individuals without intermediation, and the transfer of ownership is securely recorded on a type of decentralised database. This has the potential of reducing costs through the absence of reconciliation burdens and the circumvention of intermediary brokers. While typical daily transaction costs on layer 1 of major crypto networks are still significantly higher than in traditional exchanges, layer 2 solutions - such as *Lightning network or Polygon* - have the potential to decrease transaction fees.

Furthermore, the interconnection of the 'blocks' strongly secures the transaction process. This can also ease the burdensomeness of audit work and increase the overall transparency of transactions. However, technologies that rely on big data, artificial intelligence and quantum computers also hold immense promise, and could even challenge the added value of crypto-based architecture in terms of security and efficiency.

Finally, crypto-asset's underlying DLT has a wide range of applications beyond the realm of financial services; with an increasing proportion of non-financial corporations exploring use cases for DLT in areas such as logistics. Leveraging a DLT backbone to record and store data generated via clearly defined processes can enhance traceability. That being said, implementing a decentralised ledger is not a cure-all; as data tampering may still occur at the input layer (garbage in, garbage out).

## Changing Investors' Profile

Demographic changes represent the second major driver propagating the past, present, and likely future growth of the crypto-asset space. As highlighted in a BIS working paper[14], millennial and digital native investors show a far greater penchant for crypto-currencies than previous generations. This large disparity in crypto-asset uptake is perhaps best explained by the amount of time the younger generations spend on social media and online in general - thus rendering them more susceptible to the unregulated onslaught of targeted crypto-asset advertisements. Furthermore, given that Millennials and Generation X are set to be on the receiving end of the greatest ever intergenerational wealth transfer - estimated to be around USD 30tn in the US alone - we could expect retail demand for crypto-assets to increase moving forward. Therefore, as these generations slowly replace Baby Boomers and Generation X in the investment community, we may see a surge in investor appetite for crypto-assets.

That being said, the full rate and scale of this shift is largely dependent on the extent to which crypto-assets maintain their strong appeal-via-novelty over time, as well as the extent of regulatory and legislative shifts in favour of these assets. In addition, given the younger generations' strong proclivity for sustainable investments - with 99% of millennial investors surveyed by Morgan Stanley in 2021 voicing an interest in sustainable investment (compared to 79% of the general population)[15] - crypto-asset players will be further incentivised to consider sustainability matters, not least by developing ESG-compliant crypto-assets products.

14. https://www.bis.org/publ/work951.pdf
15. https://www.morganstanley.com/assets/pdfs/2021-Sustainable_Signals_Individual_Investor.pdf

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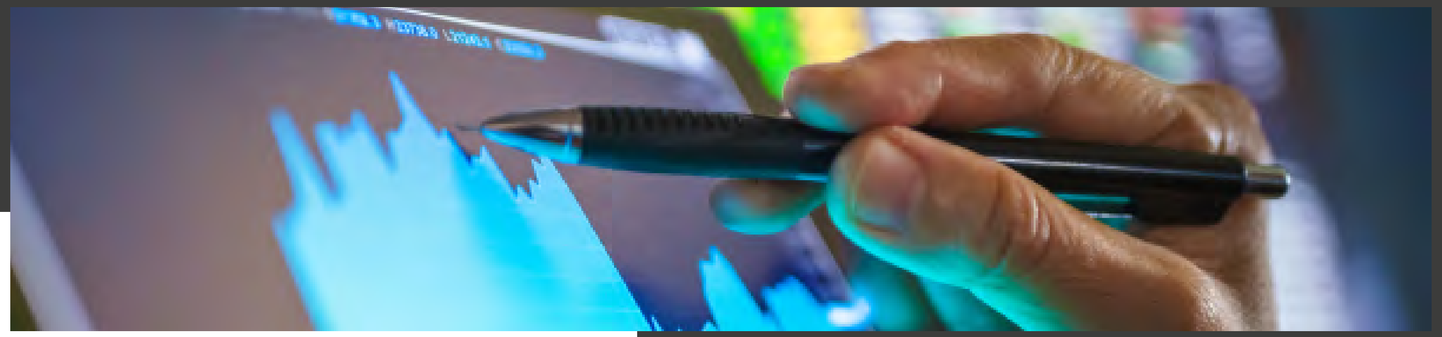
# Luxembourg Players Cautiously Optimistic



Luxembourg is a perfect microcosm of the global financial services landscape, domiciling the entire spectrum of the fund industry - from asset managers and asset servicers to fund administrators and lawyers. In light of this, setting up a survey of Luxembourg financial sector participants represents the perfect opportunity to paint an accurate picture of the key challenges and opportunities faced by the sector in regard to crypto-assets; which will in turn help readers gauge the current and future direction of this innovative and disruptive asset class.

Overall, the survey results indicate a mix of enthusiasm and pragmatism around crypto-assets within Luxembourg's financial services landscape, with 61% of our respondents embarking or planning to embark on their crypto journey - either assessing, developing or already providing crypto-asset products/services. Despite the relative nascency of the asset class with respect to its traditional counterparts, almost 20% of respondents already view crypto-assets as a strategic priority for their business. Perhaps more strikingly, our respondents expect the importance of crypto-assets to increase in the short to medium term, with 43% expecting crypto-assets to become a strategic priority in the coming two years. That being said, a significant portion of respondents remain hesitant - with 39% of respondents having no real plans to engage in crypto-assets activities for the time being, and only 28% seeing high potential in the asset class from an investment strategy standpoint.

## Exhibit 5:

When do you expect crypto-assets to become a strategic priority for your business?

**18%** Already consider crypto-assets as a strategic priority

**43%** Expect crypto-assets to become a strategic priority within the next 2 years

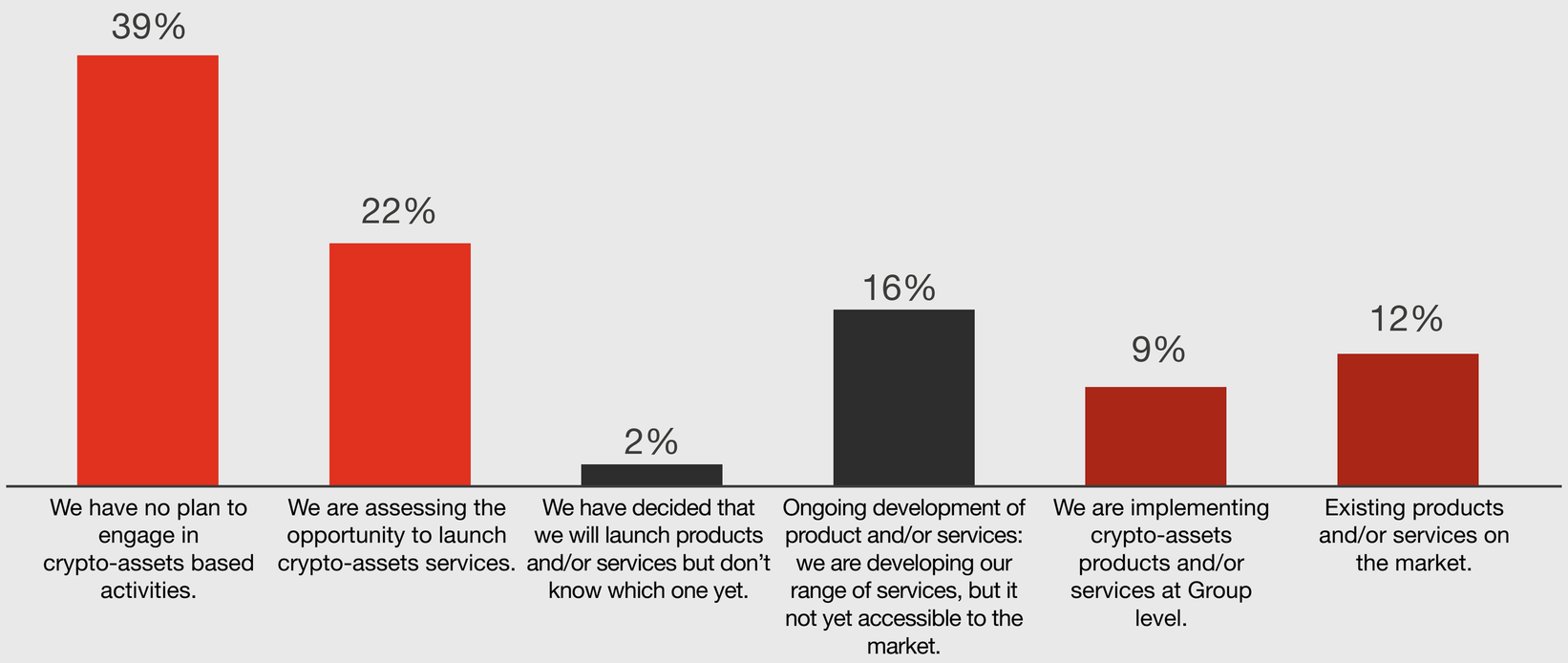
**39%** Do not expect crypto-assets to become a strategic priority

Source: PwC Market Research Centre

In light of this, it is perhaps unsurprising that our survey findings demonstrate a fairly mixed perception of Luxembourg's crypto-asset market development. Indeed, while 45% of survey participants believe the Grand Duchy's market to be in line with the average level of development across Europe, one third of our respondents still consider Luxembourg to be lagging most EU countries.

## Exhibit 6:

Where do you stand in your crypto-asset journey?



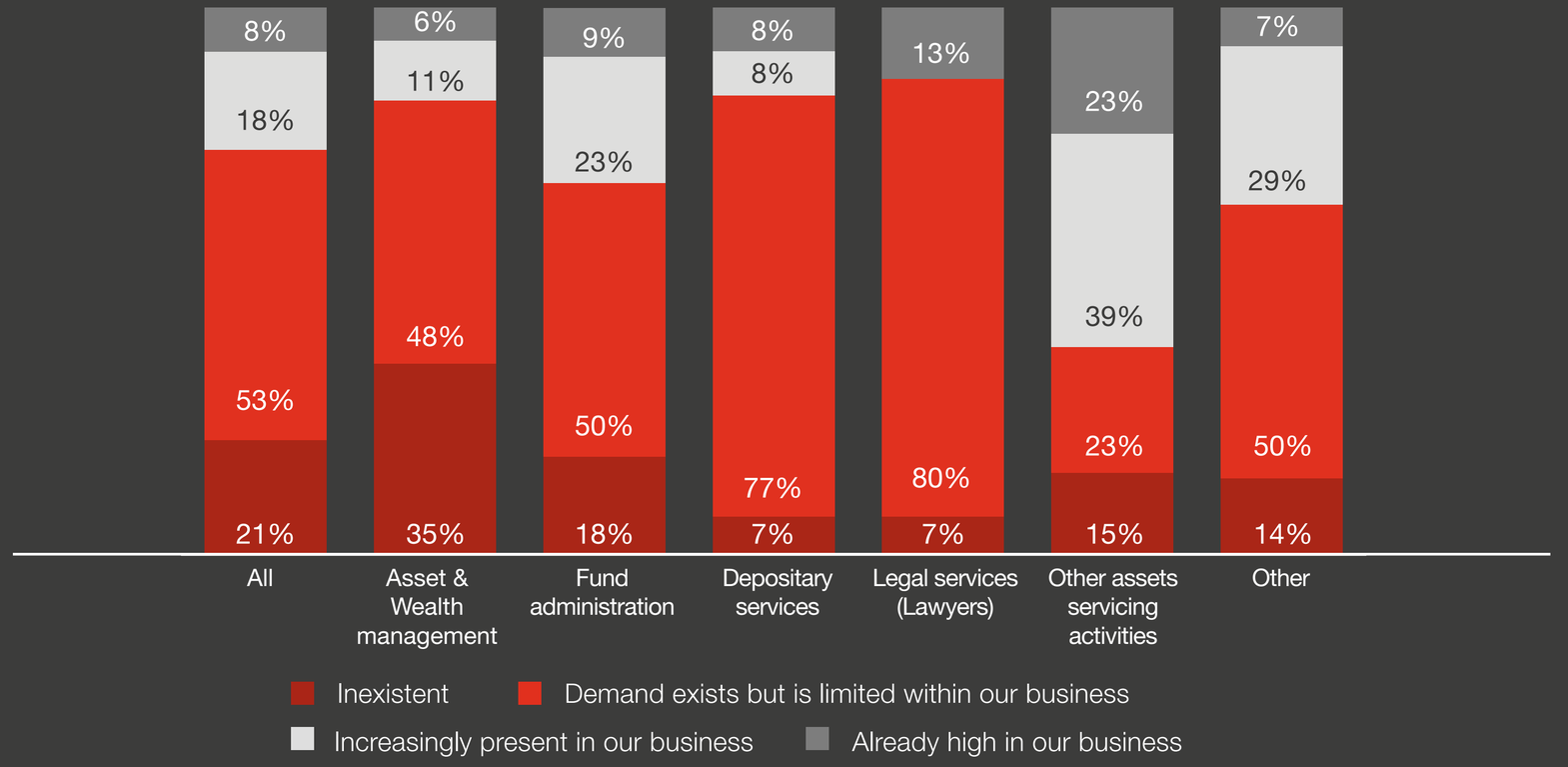

Source: PwC Market Research Centre

# Low demand as one of the primary hindrances in Luxembourg's crypto-asset space

The level of development of a country in terms of crypto-assets is directly linked not only to the number of active players in the field, but also to the level of demand driving business adoption. 70% of our respondents share this view, identifying the satisfaction of customer demand as the main driver behind the development of crypto-asset products. In Luxembourg, this demand is seen to be rather limited, with 74% of our survey respondents assessing the current demand for crypto-assets to be limited or inexistent. This current limited level of demand may explain why most respondents consider Luxembourg to be aligned or lagging behind other countries in terms of crypto-assets development. It also explains why 39% do not yet engage in crypto-asset related activities.

## Exhibit 7:

How would you assess current demand for crypto-asset products/services from your customers?



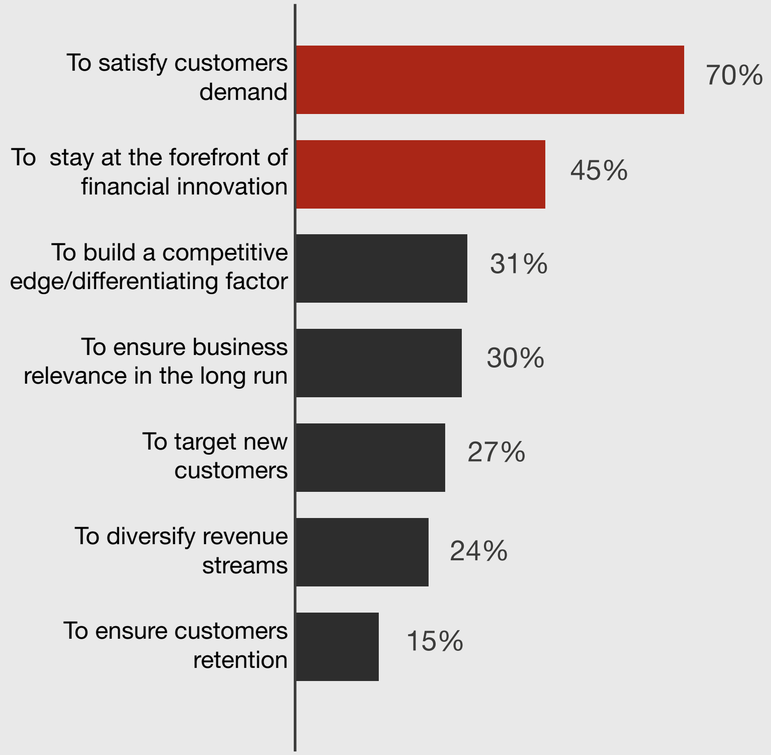

Source: PwC Market Research Centre

However, these results mask important disparities, namely: the perceived lack of demand is largely contained within Luxembourg's Asset & Wealth Management (AWM) sector - which alone accounts for 35% of those sectors which currently see no demand for crypto-assets. Given this, it is of no surprise that 70% of the AWM respondents saw no investment rationale in crypto-assets. This high degree of pessimism among our AWM and Fund Administration respondents is possibly attributable to the fact that the demand for crypto-asset services is currently addressed by smaller players. In fact, of the respondents within the "other asset servicers" category, 23% encompass fintech players who are already seeing a high demand in their businesses. Moreover, 93% of both Depositary and Legal services have also seen – at least – a limited demand for crypto-assets within their respective sectors and are thus more optimistic about the opportunities they have to offer.

Overall, we are not likely to see any significant moves in the Luxembourg crypto-assets market as long as demand remains relatively weak. Further, we are increasingly seeing other countries in Europe such as Switzerland and the UK taking quicker and more active steps. Should this persist, it could potentially limit the level of demand addressed to local players, despite efforts by some of these players to stay at the forefront of financial innovation. Already, 45% of the survey respondents are demonstrating a motivation to engage in more crypto-assets activity, which is not only an indication of the responsiveness of Luxembourg players to push factors, but a growing desire to engage in crypto activities as a way of staying innovative and being perceived as such. Please note, the survey was conducted in October 2021. The CSSF has released several publications since the survey was closed that have helped clarify the regulatory framework and which may have an impact on respondents' attitude and approach to crypto-assets.

## Exhibit 8:

What would be your primary purposes when developing crypto-assets products and services?




Source: PwC Market Research Centre

# A need for further regulatory guidance and momentum

Another factor hindering the development of crypto-assets in Luxembourg is the lack of regulation and clarity provided by financial authorities. This is by no means a Luxembourg-specific trend; a lack of regulatory guidance is having a clear slowing effect on the adoption of crypto-assets across Europe, with 31% of financial service players believing the lack to an EU framework to be the main constraint to the further development of the crypto-asset market.

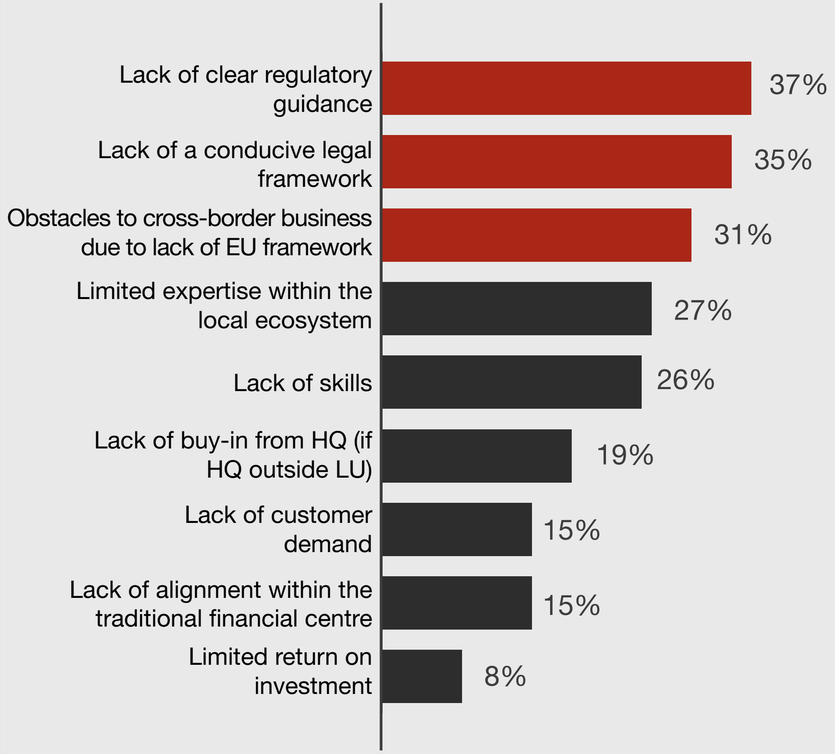
Luxembourg is rather favourably positioned in this respect, given that international financial players highly appreciate the country's regulatory environment, its alignment with the EU framework and the security it offers to investors looking for a well-regulated environment for their assets. This is why the increased harmonisation of regulations in Europe (for instance the EU passport of UCITS) - which is closely linked to the development of the AWM industry - is necessary to bolster the rapid acceleration of the crypto-asset market.

Not only this, but limited expertise within the local ecosystem and lack of sufficient skills are cited as further major constraints to the wider adoption of crypto-assets by a respective 27% and 26% of respondents. Areas such as fund administration and fund custody will need to properly develop new sets of competencies to adequately address these shortcomings. The contribution of ILNAS in Luxembourg[16], in this respect, could help to develop and harmonise technical, interoperability, safety and governance standards within the EU, thus meeting this demand for local expertise. Collaboration between industry incumbents and innovative fintech specialists such as those hosted by the LHoFT could also serve to further accelerate the implementation of suitable technological and process solutions.

16. *https://portail-qualite.public.lu/dam-assets/publications/normalisation/2021/ilnas-national-technical-standardization-report-blockchain-and-dlt.pdf*

## Exhibit 9:

Most significant constraint to the crypto-assets market in Luxembourg




Source: PwC Market Research Centre

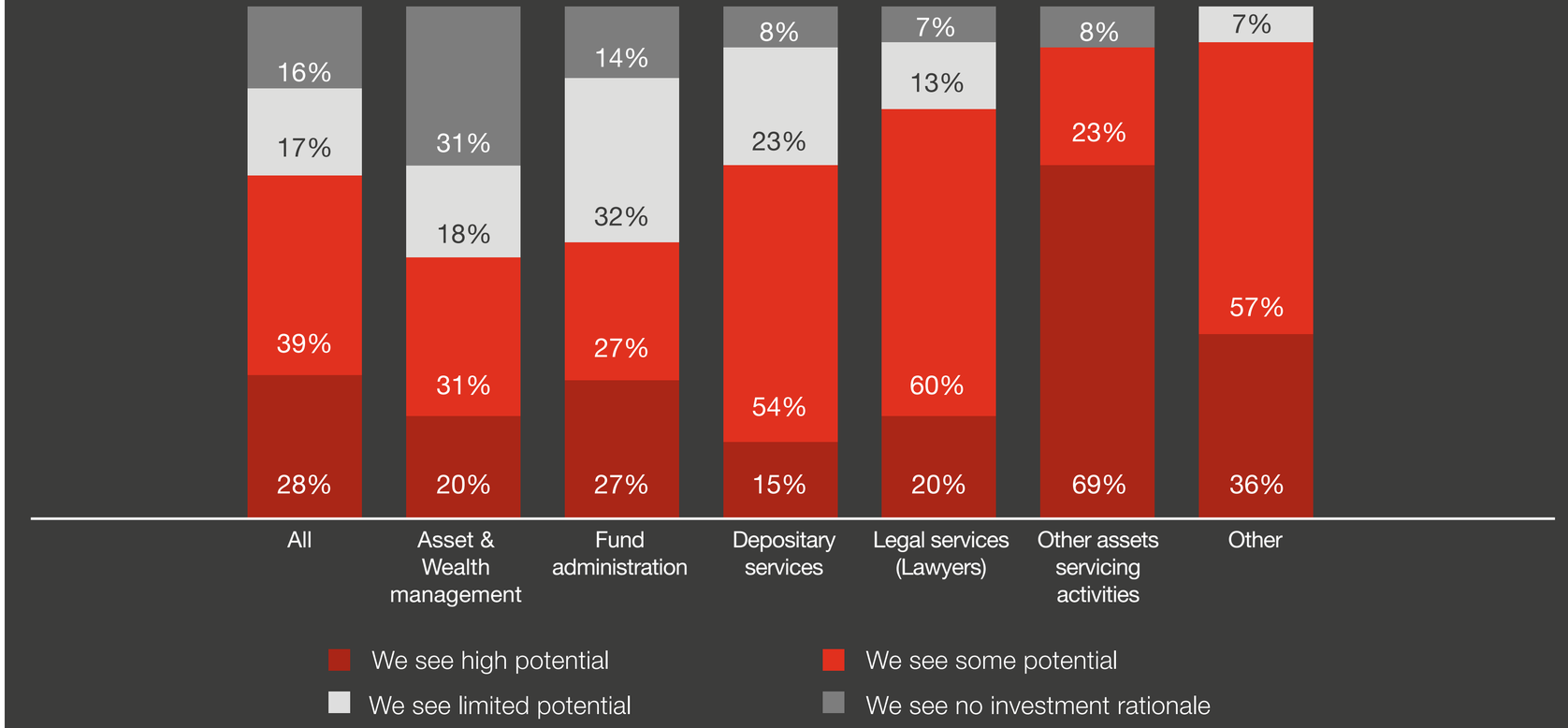
# Survey participants see potential on crypto-assets as a diversifier

As abovementioned, our survey results highlight the limited demand for crypto-assets in the Grand Duchy, as well as the local ecosystem's current challenges in attracting a user base. Nevertheless, that is not to say that investors are unaware of the investment potential and benefits inherent to the asset class. According to our survey, more than two thirds of respondents believe in the potential of crypto-assets as part of an investment strategy. Given the past performance of crypto-assets, it is not surprising to see financial players seeking additional exposure.

That being said, it must be noted that this demand for crypto-assets is far from uniform, and varies greatly from sector to sector. Indeed, while depositary services, Legal services and other assets servicers see investment potential in crypto-assets; about half of respondents from the AWM and fund administration sectors see investment rationale as limited or even non-existent investment rationale for crypto-assets. However, this is possibly explained by the fact that crypto investors may not view these sectors as particularly essential in the crypto-asset industry.

## Exhibit 10:

What is your view on crypto-asset potential from an investment strategy standpoint?




Source: PwC Market Research Centre

Despite this disparity, our respondents largely agreed on the inherent diversification potential of crypto-assets, with 77% of them highlighting diversification as the most valuable attribute of the assets. While other attributes such as the asset class' inflation hedging properties and risk-adjusted return potential have been recognised by 38% and 23% of respondents respectively, its distinctiveness appears to lie in the diversification potential provided by its relative nascency in the financial landscape.

Without debating the diversification power of crypto-assets, one needs to recognise that the correlation between Bitcoin, as the most dominant crypto-currency, and the stock market is increasing. The 100-day correlation coefficient of Bitcoin and the S&P 500 climbed to 0.33 in November 2021, recording its highest reading of this year[17]. The increasing inflows from digital-savvy investors and institutional investors into cryptos and the very bullish financial markets globally might be reasonable explanations for this positive correlation. Having said that, this correlation still remains low when compared to other traditional asset classes, with Global strategies, Hedge Funds, International equity, Long short Equity or Managed Futures all experiencing correlations above 0.8 with the S&P 500[18].

17. https://www.bloomberg.com/news/articles/2021-11-23/bitcoin-morphs-back-into-risk-asset-as-stock-correlation-climbs#:~:text=The%20100%2Dday%20correlation%20coefficient,the%20same%2C%20and%20vice%20versa
18. https://www.guggenheiminvestments.com/mutual-funds/resources/interactive-tools/asset-class-correlation-map

## Exhibit 11:
Most attractive features from an Asset Management perspective

77% ---→ Diversification benefits

38% ---→ Inflation hedge

23% ---→ Risk-adjusted return

17% ---→ Other

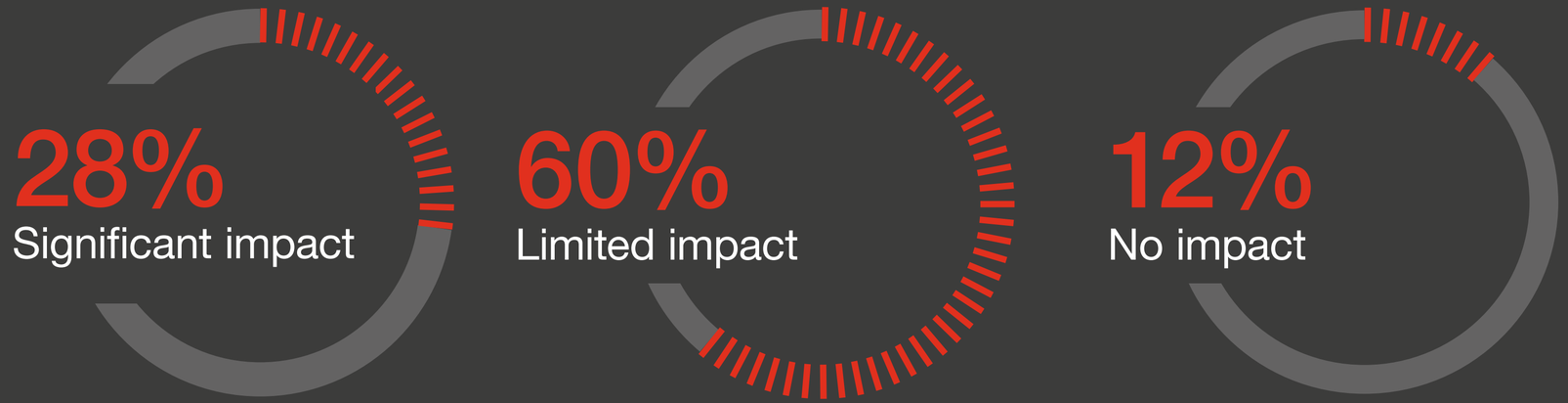
Source: PwC Market Research Centre

# Players see neither a big impact on their business nor a rapid adoption of crypto-assets in the coming two years

Given the results detailed above, it is unsurprising that a majority of respondents do not yet expect crypto-assets to significantly impact their business. Around 28% believe that it will have a notable impact whereas the rest currently see either a limited impact or no impact. These responses signify that crypto-assets cannot yet be considered a deeply rooted and powerful trend.

## Exhibit 12:

To what extent do you expect crypto-assets to impact your business?



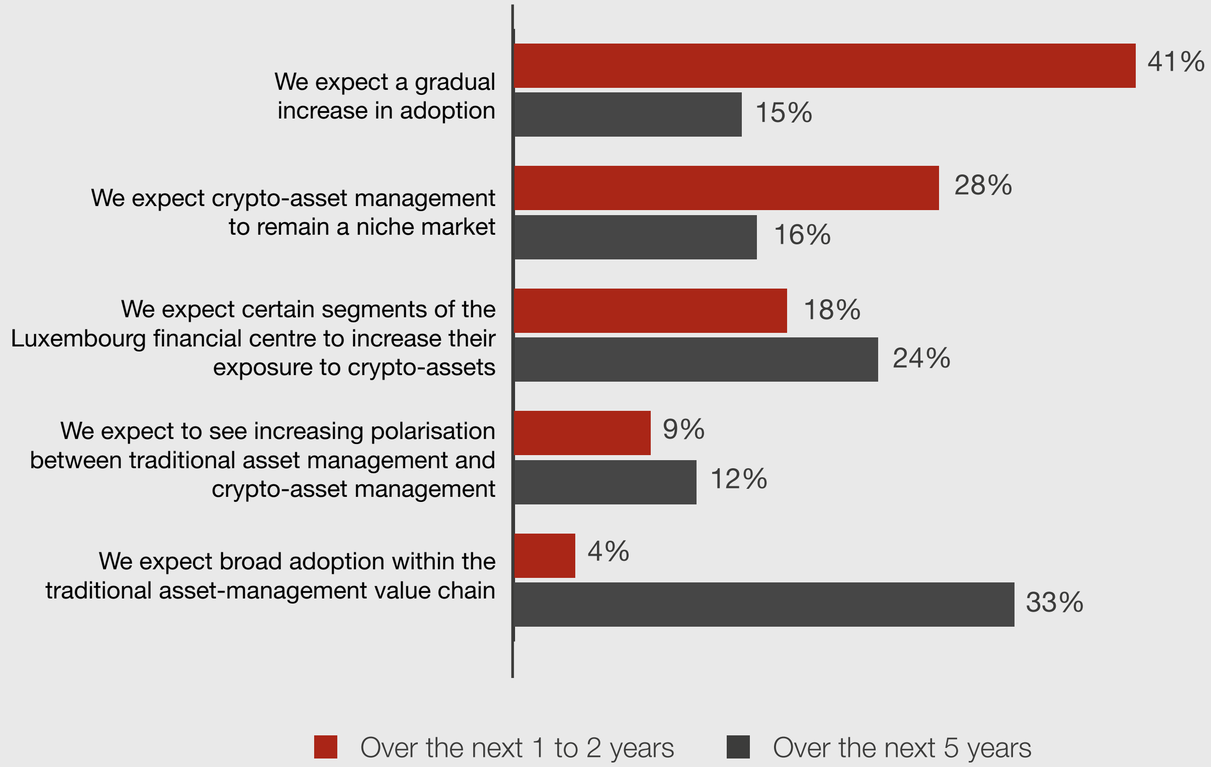

Source: PwC Market Research Centre

Then, when asked about their broader opinion regarding the market evolution going forward, our respondents do not expect to see a massive adoption of crypto-assets in the short term, with 41% of survey participants expecting a gradual increase in the adoption of crypto-assets in the coming two years, with only 4% expecting a broad adoption within the traditional asset management value chain during the same time frame. When looking at the long term, however, a more optimistic outlook emerges - with 33% of respondents expecting a broad adoption of crypto-assets within the traditional asset management value chain in the coming five years.

It thus appears that respondents are mindful of the current immediate but limited commercial opportunities, the lack of regulation creating uncertainty and the challenges that need to be overcome. In the long run, however, our respondents are more optimistic. While only 16% believe it will still be a niche market in the next 5 years, 24% believe that some segments of the Luxembourg financial centre will adopt it within the same period, and 33% anticipate a broader adoption.

## Exhibit 13:

How do you see the crypto-assets management industry evolving in Luxembourg?




Source: PwC Market Research Centre

# Custody Services and Private Banking to benefit from Crypto-Assets

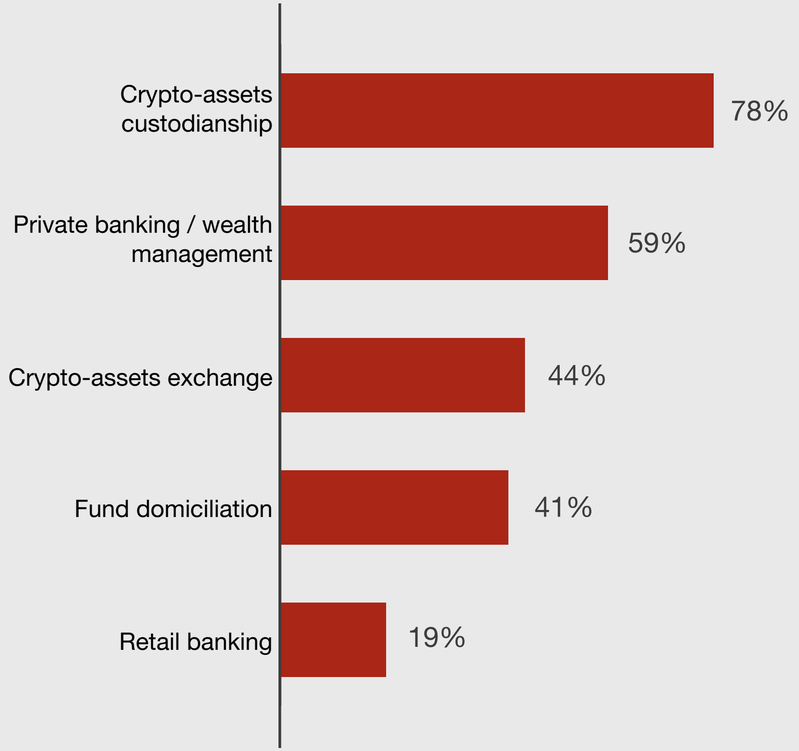
When asking where the opportunities lie from a business perspective in Luxembourg, it appears that there are mainly two sub-industries that could increase their exposure to crypto-assets, namely crypto-assets custodianship and private banking.

Indeed, as the demand for fund exposure to these assets is set to continue or increase, there will be a need for the right custodianship services. In fact, the provision of Crypto Custody services will be fundamental to meet the needs of the various market stakeholders interested in using crypto services and to capture these business opportunities. The custody services can see business opportunities not only for crypto-currencies but also for stable coins, central bank digital currencies, security tokens and Non Fungible Tokens (NFTs).

Second, as diversification is widely regarded as the most attractive benefit according to our survey, private bankers and wealth managers may increase their exposure to crypto-assets in order to provide their clients with a well-balanced, diversified portfolio. Indeed, private bankers are coming under pressure by crypto oriented clients who want to find a way to access the crypto market even when some national authorities have taken a tough line on crypto-assets.

## Exhibit 14:

Which segments will Luxembourg increase their exposure to crypto-assets over the next 5 years?



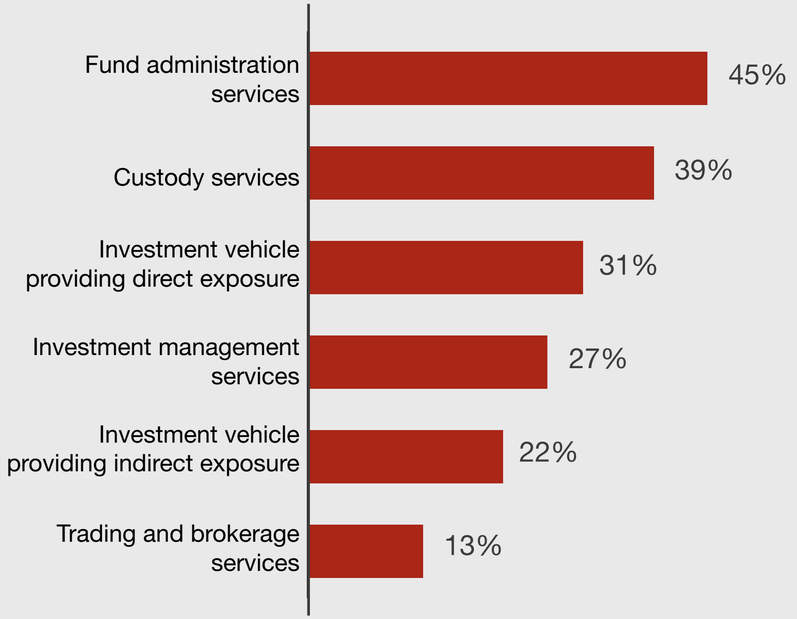

Source: PwC Market Research Centre

This imperative is reflected in recent decisions taken by players. Indeed, survey respondents who have engaged or plan to engage in crypto-assets mention fund administration and crypto-asset custody services, but also the setup of investment vehicles providing direct or indirect exposure as priorities. This shows that financial players are building on some of Luxembourg core strengths, and that the development of a genuine crypto-custodian & depositary sector in Luxembourg would benefit from the country's existing infrastructure and reputation in terms of asset safekeeping.

With a view on gaining direct or indirect exposure, 70% of respondents consider that alternative funds are the most appropriate structure, and 65% would favour unregulated structures. The respondents' overwhelming preference for AIFs and unregulated structures over ETFs or UCITs, to some extent, reflects the regulatory uncertainty or vacuum that exists in the crypto space.

## Exhibit 15:

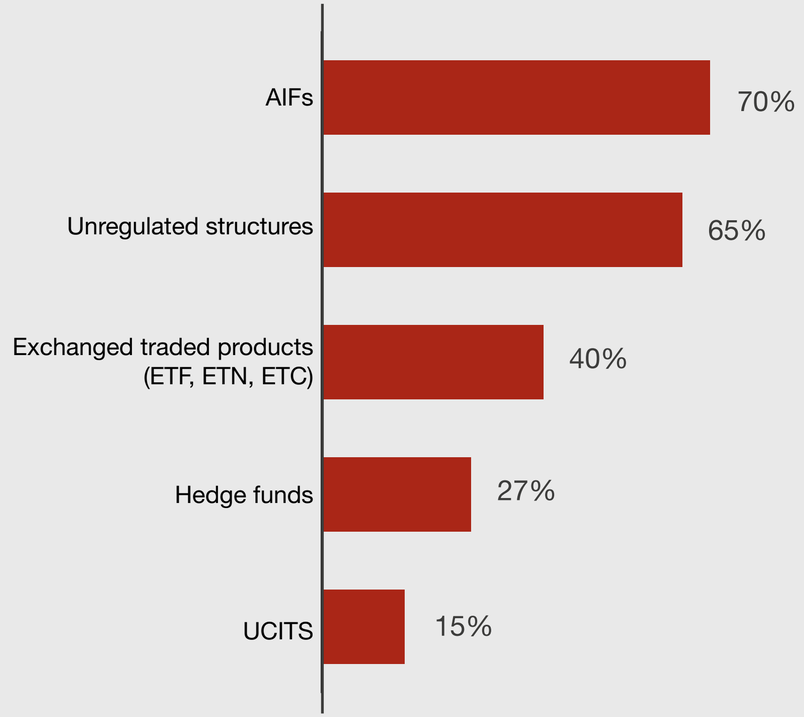
What kind of crypto-assets products/services are you delivering or planning to deliver?




Source: PwC Market Research Centre

## Exhibit 16:

Which type of vehicles would you consider as most appropriate for crypto-assets management?




Source: PwC Market Research Centre

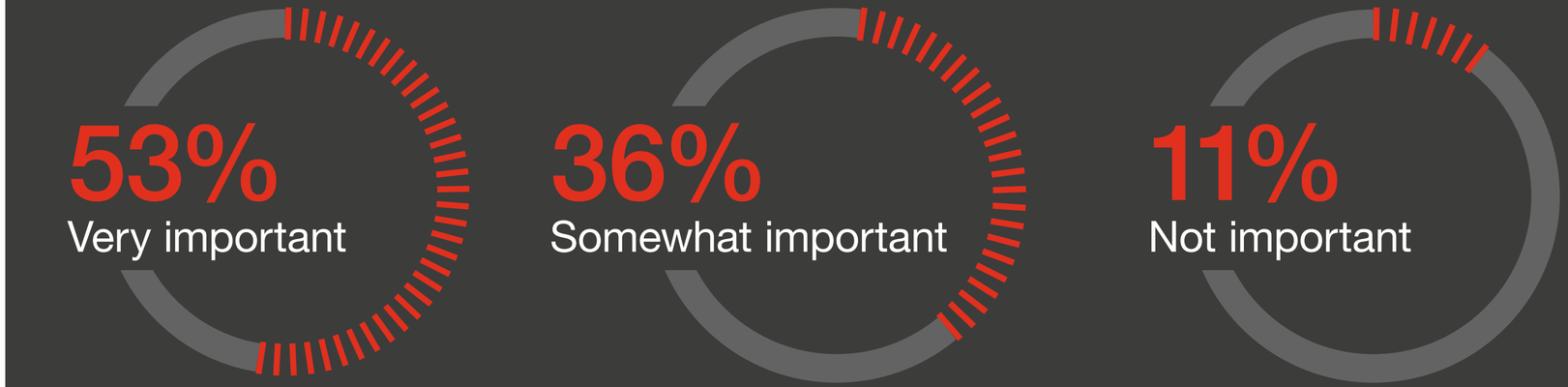
In short, while the majority of our survey participants acknowledge the investment potential inherent to this new asset class (cf. Exhibit 10), there is currently no evidence to support the notion that crypto-assets will become a game changer for the industry. In the event that Luxembourg would look to increase its positioning in the area, survey participants believe it is essential for the country to take a more active stance in the broad crypto-assets space, with 89% of respondents agreeing on the high importance of government action. Unsurprisingly, financial players require clear guidance by the regulator in order to take the right set of actions.

To conclude, financial players have shown a moderate degree of optimism regarding current and future crypto-asset uptake at the time of the survey (October 2021). It appears that opportunities do exist in the short term to satisfy a limited but existing demand, and that this demand varies among the different segments of the asset management industry. They also expect that Luxembourg will be impacted by crypto, but for this, clear regulatory guidance is needed; be it from the European Commission and/or the Luxembourg government itself. Finally, although financial players expect a broader adoption of crypto to be a longer-term trend, only 33% expect a broad adoption of crypto within the traditional asset management value chain to materialise.

While crypto-assets bear the hallmarks of a lucrative and disruptive asset class, a number of perceptual challenges and structural hindrances have thus far prevented the full-scale realisation of this potential. It seems clear that crypto-assets have yet to prove themselves in the eyes of institutional investors.

## Exhibit 17:

How would you assess the need for Luxembourg to take a more active stance in the broad crypto-assets space?




Source: PwC Market Research Centre

# 3 Next Steps

Luxembourg has always been characterised by its agile regulatory environment, positioning its financial markets at the forefront of innovation in a constantly evolving landscape. In fact, Luxembourg has long been viewed as a first mover and trendsetter in the global asset management landscape, namely due to the early adoption of the UCITS directive - one of the primary contributing factors to Luxembourg's position as Europe's largest fund domicile. This innovative potential is what today makes Luxembourg a primary financial choice for major asset management firms across the globe. As our survey shows, a vast majority of respondents (89%) believe that the Grand Duchy needs to take a more active stance.

In this respect, there are clear opportunities for the country's authorities to foster a constructive dialogue with all relevant stakeholders, strengthening core competencies, and providing market participants with the support and security they need.

## 1. Maintain ongoing dialogue with market participants

Countries such as Switzerland, Germany or the United Kingdom have already stepped up their game in the crypto-asset market through the introduction of their own crypto-asset regulations or frameworks. In November 2021, the CSSF communicated its general guidance on Virtual Assets (the «Guidance»). Updated in January 2022, the guidance represents the regulator's first dedicated frequently asked questions document (the «Published FAQ») on Virtual Assets addressed to the professionals of the fund industry. The publication serves to partly clarify the rules for crypto-assets, and a publication for credit institutions was also published in December 2021. The publication restricts the crypto-asset to the alternative fund industry in order to foster investor protection, and also imposes strict rules and guidelines that have been welcomed by the industry.

## Exhibit 18:

Do you agree you have a clear understanding of the existing legal and regulatory framework around crypto-assets in Luxembourg?

| 45% | 39% | 16% |
|---|---|---|
| Agree | Disagree | Neither agree nor disagree |

Source: PwC Market Research Centre

In January 2022, the CSSF has published a white paper on Digital Ledger technologies and blockchain aimed at providing non-binding guidance for interested professionals in that area. Indeed, at the time of the survey (October 2021) nearly two fifths of the respondents did not have a clear understanding of the existing legal and regulatory framework around crypto-assets in Luxembourg. They also identify a “lacking clear regulatory guidance” and “lacking conducive legal framework” as the two most significant roadblocks for promoting crypto-assets in the country.

## 2. Enhance coordination and cohesion between stakeholders

Stakeholders play a vital role in the crypto-asset industry in Luxembourg and their full collaboration would be crucial to its development. Authorities, asset managers, custodian banks, research institutions and Institutional Investors must work in unison and communicate effectively to assess the current market, future potential and how to address the main constraints and concerns.

Studies and findings that could arise from such collaboration could prove indispensable in enabling and supporting actors in making informed decisions. To suggest just a few, continuous monitoring of crypto-asset demand or an analysis of the crypto-asset impact on the financial industry - particularly related to the understanding of the underlying risks associated to crypto-assets or the analysis of the crypto-assets valuation drivers - can be beneficial both for regulators and financial market participants. Institutions such as the University of Luxembourg, as well as ALFI, and the CSSF are being proactive in delivering information to the industry through whitepapers, reports and other publications showing how Luxembourg institutions are key in driving a constructive dialogue between market participants.

Luxembourg currently boasts a number of public organisations with the shared mission of fostering innovation within the country’s financial sector; between whom (regulation permitting) a co-ordinated effort could see the increased demand for and supply of crypto-assets. Some initiatives, such as Public Private steering committees in charge of overseeing targeted investments or sandboxing – be it industry or regulatory – could be a means to catalyse collaboration between participants, facilitating the adoption of crypto-assets by industry players.

## 3. Foster financial literacy through a comprehensive education plan

Crypto-assets and their underlying blockchain technology are still a rather complicated concept to grasp from a theoretical and practical standpoint. Furthermore, the sector and its technologies are undergoing continuous and rapid evolution, requiring an ongoing effort from market participants who wish to remain on top of the state of the art. As mentioned in the first section of this paper, the vast majority of crypto investors have at best a moderate understanding of the technology underlying their holdings. Should they remain unaddressed, knowledge gaps post a significant hindrance to the development of the market. In general, financial literacy has been proven to be not only a key component of human capital, but also a skill that enables citizens to take more informed decisions with direct impact on their financial well-being. Luxembourg has already initiated a variety of initiatives to empower citizens with financial skills (LetzFin for instance). Pedagogical goals should necessarily include education on crypto-assets, and could also encompass a broader range of financial matters such as sustainable finance or cyber financial risks. Indirectly, this enhancement in financial literacy would in turn improve the ability of the European Union to develop local, financially related technological skill pools - thus limiting the region’s dependence on overseas service providers.

# Conclusion

The rate at which the global crypto-assets industry is expanding is undeniable. The global asset management landscape has been shifting accordingly, with major players adapting their product shelves in order to keep pace with the wheels of change. However, this growth is far from uniform, and varies greatly across regions, industries and investor types. Indeed, while retail investors have been displaying burgeoning demand for crypto-assets, their institutional counterparts have been far more prudent – adopting more of a 'wait-and-see' approach amid mounting regulatory and perceptual challenges.

In light of this, the future of the crypto-asset space is anything but clear-cut; with a number of challenges - namely energy consumption, AML concerns, and regulatory fragmentation - hindering its proliferation and uptake. As such, the future of this nascent industry is largely dependent on the extent to which these challenges are addressed or overcome – which in turn hangs on the materialisation of a number of key factors: namely market maturity, regulatory institutionalisation, and the widescale adoption of crypto-assets among major players.

Against this uncertain and heterogeneous backdrop, this report aims to bring some much-needed clarity – using Luxembourg as a lens through which one can gain an accurate view of the perceived strengths, challenges and opportunities inherent to this nascent asset class.

As highlighted by the results of our survey of 123 Luxembourg-based financial players, Luxembourg's financial ecosystem is cautiously optimistic with regards to crypto-assets. Indeed, while 61% of Luxembourg players are embarking or planning to embark on the crypto journey – with many citing diversification benefits as their main reason to do so - as much as 74% of our survey respondents have as of yet experienced limited or non-existent demand for these assets. This may explain why 39% of respondents have no real plan to engage in crypto-assets activities and only 28% see high potential in the asset class from an investment strategic standpoint.

This is not to say that crypto-assets do not share the potential of other asset classes. However, in order for this potential to materialise (and for these assets to be widely accepted as a solid long-term investment), financial players first need a harmonised regulatory environment which provides them with a degree of protection and certainty comparable to that of more established asset classes. This will prove absolutely key in assuaging aforementioned concerns, providing all investors and fund promoters alike with clarity regarding the long-term viability of these assets.

Should regulatory momentum shift in favour of crypto-assets, and Luxembourg's crypto-asset management industry develop and expand as a result, the country's fund administration, custody services and private banking sectors stand to see the greatest benefit – given their sheer prominence in the Grand Duchy. This could see the country adapt its services and value proposition - as it has continuously done in the past - to serve the demand for fund exposure to these assets.

Last but not least, this report presents three recommendations which Luxembourg players should consider taking in order to grab the crypto-asset opportunity with both hands and position the country at the forefront of this space. First, authorities should maintain an ongoing dialogue with market players in order to gain an up-to-date view of industry needs and innovation trends and provide support as and when needed. Second, there is a reinforced need to enhance coordination and cohesion between stakeholders, not only between incumbents and traditional players but also through public-private initiatives.

Third, the criticality of appropriate financial education. Luxembourg has initiated great initiatives through the ABBL, ALFI, and the CSSF in this area. We believe that a level of agility to include education on the likes of crypto-assets would benefit both investors and market participants ensuring we are well placed to effectively assess the challenges and opportunities posed in a rapidly evolving finance industry.

While the asset class' nascency and myriad of structural and perceptual ambiguities render its future largely uncertain - and a number of puzzle pieces must fall into place before the full picture is revealed - it is all but certain that the crypto-assets landscape of tomorrow will be near unrecognisable compared to that of today.

# Profile of Survey Respondents

A survey conducted in Q4 2021

**123**
Respondents from AWM and various fund servicing sectors, based in Luxembourg, with geographical focus mainly on Europe.

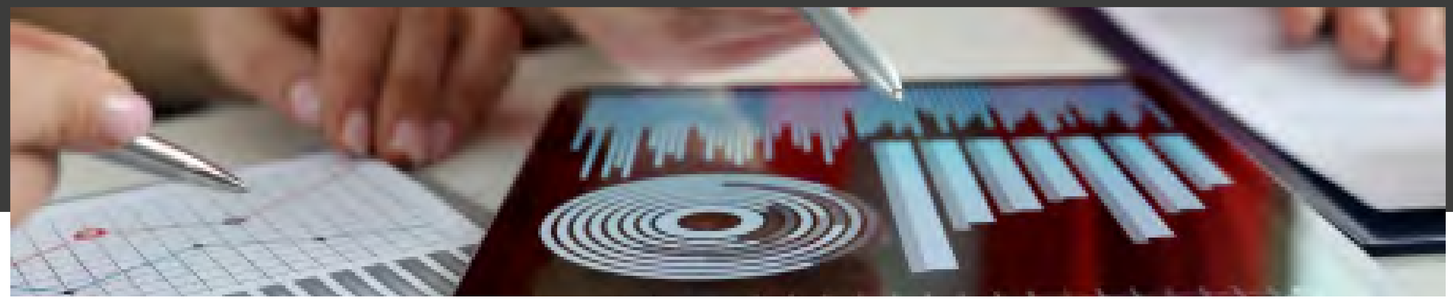
**62%**
Consider themselves as expert or with good knowledge of crypto-assets.

**57%**
Had more than USD 10 bn assets under management/ custody/administration as of 2020.

## Primary Business Types

- **37%** Asset & Wealth Management
- **18%** Fund administration
- **12%** Legal services
- **11%** Depositary services
- **11%** Other asset servicing activities
- **11%** Other

# Annexes



## What are crypto-assets?

**Crypto-assets are a cryptographically secured digital representation of value or rights that operate as a functional unit of exchange within a distributed ledger infrastructure. As of today, we can distinguish between four main types of crypto-assets, each having respective subsets; Crypto-currencies, Tokens, Stablecoins, and Central Bank Digital Currencies.**

**Crypto-currencies** are crypto-assets whose primary purpose is to function as a medium of exchange. Contrary to fiat currencies, they are not issued by a central authority, not backed by the full faith of a government and their issuance mechanism is decentralised across the participants of their network. Furthermore, they don't have any underlying assets and their value is primarily driven by supply and demand as well as the level of trust of end users. Main representatives include Bitcoin and Litecoin.

**Tokens** are a broad subset of crypto-assets including at least 3 categories, namely Utility tokens, Security tokens, and Non-fungible tokens (NFTs). Tokens differ from crypto-currencies due to the presence of an underlying asset (be it a digital commodity such as computing power, a financial instrument or a piece of art respectively) as well as an identifiable issuer in most cases. More specifically, utility tokens provide users with access to a platform product or service and derive their value from that access. They also support functionalities and services of blockchain-based platforms. Security tokens on their side refer to financial instrument-backed tokens, featuring potential income-generating elements and rights vis-à-vis their issuer. Accordingly, they are expected to fall under existing securities law and regulation. Lastly, non-fungible tokens are a unique digital representation of value in which the scarcity element is secured and demonstrated through a distributed network. Main representatives include Ether, tZero and Sorare cards respectively.

**Stablecoins** are crypto-assets designed to maintain a stable value against a defined underlying asset, be it a fiat currency, a commodity, another crypto-asset or through algorithmic rules. Their primary purpose is to facilitate transactions while removing the volatility risk inherent to crypto-currencies and can be issued by private companies or financial institutions, for example. Main representatives include USDC, USDT, DAI.

**Central Bank Digital Currencies (CBDCs)** are fiat currency backed stablecoins issued by national or supranational Central Banks. As such, their primary purpose is to provide a digital cash which is legal tender and backed by the full faith of their issuing government(s). Main representatives include the DC/EP in China.

The focus of this report has been on crypto-assets meeting the definitions of crypto-currencies, utility tokens, NFTs and stablecoins (excluding security tokens and CBDCs). Although the MiCA (Markets in Crypto-Assets Regulation) regulation will introduce a novel taxonomy for crypto-assets, the classifications used in this report are without prejudice to future legal developments.

# Global Developments

## September 2021

- The Banco de España has warned all active crypto-currency brokers that they must register by 29th October for AML purposes and that clients will be liable for capital gains tax of up to 26% on the increase in value of their holdings. Failure to register could lead to fines of up to EUR 10 million.
- Around 60 South Korean crypto-exchanges were shut down at the end of September, ahead of a deadline to register as legal trading platforms with the Korean Financial Intelligence Unit. The four main exchanges in South Korea had met both requirements (accounting for 97% of trading volume), while a further 25 had obtained the ISMS certification but were unable to open real-name bank accounts.
- SIX Digital Exchange received formal approval from FINMA to operate as a stock exchange and a central securities depository for digital assets in Switzerland. The authorisation enables SDX to go live with a fully regulated, integrated trading, settlement and custody infrastructure for digital securities based on distributed ledger technology.
- The Bank for International Settlements Innovation Hub has launched its first green finance project to explore the tokenisation of green bonds. Working with the Hong Kong Monetary Authority, the BIS has formed a consortium with six partner companies that will design the digital infrastructure for the Genesis project, aiming to build a prototype digital infrastructure to enable green investments.

# Global Developments

## October 2021

- FATF has issued updated and final guidance on virtual assets and Virtual Asset Service Providers (VASPs). The guidance offers further clarification on the definition on VASPs, and explains how the FATF standards apply to stablecoins, P2P (peer-to-peer) transactions, NFTs (non-fungible tokens) and DeFi (decentralised finance).
- Estonia's Financial Intelligence Unit (FIU) revoked 2,000 virtual asset service provider licenses (VASPs) granted to crypto firms. The FIU called for stricter capital requirements for the industry; a minimum of EUR 350,000 in cash or securities, compared to the present EUR 12,000 and a total reset of crypto regulations in the country.
- FINMA has, for the first time, approved a Swiss find that invests primarily in crypto-assets and can only be distributed to qualified investors. The investments must be made through established counterparties and platforms based in a member country of the Financial Action Task Force (FATF) and subject to AML regulations.
- The Financial Conduct Authority is working with the Bank of England on the Digital Regulatory Reporting Initiative, a blockchain-based project tackling the growing costs of compliance checks, estimated between GBP 1.5 and GBP 4 billion a year. The aim is to leverage blockchain and API technology to implement machine readable and executable regulation with compliance checks completed in near real-time.
- The Hong Kong Monetary Authority has proposed a wholesale system for the issue of a central bank digital currency and a second system for commercial banks to distribute retail e-currency. The monetary authority is aiming to implement a retail e-Hong Kong dollar by the middle of next year.
- South Korea's Finance Minister Hong Nam-ki has announced that the country will start taxing gains made via cryptocurrency investments in January 2022. A 20% tax will be imposed on gains over KRW 2.5 million (USD 2,125) made from crypto trading in a one-year period.

# Global Developments

## November 2021

- The G7 has published a set of Public Policy Principles for Retail Central Bank Digital Currencies (CBDCs) alongside a Finance Ministers and Central Bank Governors' Statement on CBDCs and digital currencies. This reaffirms the G7's support regarding transparent CBDC designs and digital payments with sound economic governance.
- The U.S. Treasury Department has released a report on stablecoin risks. The primary objective of the report is to request laws that would expand regulatory oversight over stablecoin issuers, with new registration and licensing requirements.
- The Ministry of Economic Development, the Ministry of Energy, and the State Duma are attempting to make crypto-currency mining in Russia a legalised business regulated as an entrepreneurial activity. The Ministry of Economic Development is particularly adamant that implementing taxation procedures on crypto mining could boost the state revenue budget.
- In Luxembourg, the Virtual Assets – FAQ was published by the CSSF late November 2021, clarifying that UCITS funds and UCIs addressing non-professional customers and pension funds are not allowed to invest directly or indirectly in Virtual Assets. The document also sets out the conditions under which AIFs may invest in crypto-assets and the specific requirements and considerations they need to follow.

# Global Developments

## December 2021

- South African Financial Sector Conduct Authority (FSCA) is planning to introduce new rules concerning the trading of cryptocurrencies in order to protect retail investors. This new regulatory framework is expected to come into place in 2022 and has been proposed following two major crypto scams.
- Australian Government will create a licencing framework for cryptocurrency exchanges and is currently considering the launch of a retail central bank digital currency as part of the biggest payments industry reform of the century.
- The EU ambassadors have agreed on a mandate to negotiate with the EU Parliament on the transparency of crypto-asset transfers. This update aims to introduce an obligation for crypto-asset service providers to collect and make accessible all information regarding the sender and beneficiary of the transfers of digital assets.
- Top executives working for six of the major cryptocurrency companies in the US pressured congress to provide clearer regulation for the industry – making it the first-time senior executives of cryptocurrency companies explain their business to US lawmakers.
- In Brazil, a new cryptocurrency bill was approved by the Chamber of Deputies and is awaiting review by the senate for approval. This proposed legislation aims at providing clarity to cryptocurrency regulation in the country.
- In Luxembourg, the CSSF released a FAQ document for credit institutions which states that these may directly invest in virtual assets and open accounts that allow customers to invest in virtual assets under certain circumstances.

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