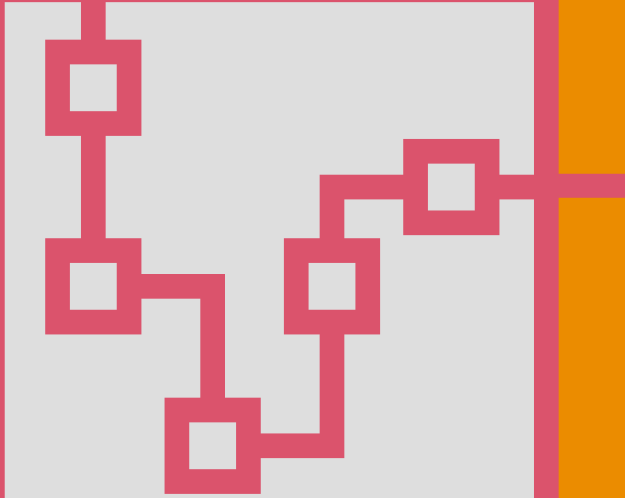


# French companies out to tackle blockchain

2021 edition



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In our latest study, “Time for trust: the trillion-dollar reasons to rethink blockchain” published in November 2020, PwC estimated that blockchain had the potential to boost global gross domestic product (GDP) by US\$1.76 trillion over the next decade, including by US\$58.5 billion in France, i.e., around 2% of the country’s current GDP. This means that more than 500,000 jobs could be created with blockchain in France by 2030.

But what is the real status of blockchain in the French business world in 2020? Are we beginning to see a division between, on the one hand, companies which have already completed their pilot and PoC phases and are moving on to business use cases for blockchain and, on the other, those still building teams to gather intelligence on the technology or to understand the principles and how the whole system works? Are there common denominators between companies that are ahead of the pack in terms of blockchain and cryptoassets? What difficulties are encountered when

deploying a blockchain project within a company, and what resources do companies have to overcome these hurdles? And what are the challenges facing blockchain before the technology can truly find its place within the French business world?

With these questions in mind, PwC France and North Africa set out to draw up a detailed, comprehensive overview of the market by surveying more than 80 French businesses. Respondents were either “pure players” in the blockchain ecosystem or “conventional” companies from a variety of industries currently developing a project based on blockchain technology. We used this overview to establish a scale – the first of its kind in France – drawing on broad-ranging indicators based on the types of blockchain chosen, financing requirements, obstacles encountered, reservations due to the uncertain regulatory situation, the use of emerging cryptoassets and the environmental impact of blockchain.

The first interesting finding is that 2020 marks a turning point, with pure players for the first time launching fewer blockchain projects than other companies, a sign that blockchain is no longer the preserve of a few insiders. The second major finding concerns the type of blockchain used, with French companies preferring public blockchain technology over consortium variants for the first time.

**The exponential growth in blockchain projects developed by conventional companies and the increasing popularity of public blockchains makes 2020 a turning point for the industry in France**

Most use cases continue to be found in the financial services industry, which alone accounts for 57% of projects. In this industry, 2020 also marks the advent of decentralised finance, or “DeFi” – even though it does not yet appear to have won over conventional companies and remains the preserve of pure players in the blockchain ecosystem (70% of pure players in the ecosystem plan to use DeFi applications over the coming months). 2020 also saw French companies build specialist teams and allocate resources to blockchain. On average, these represent five people and €100,000, respectively, for small businesses, and 20 people and €1 million for larger companies. The health and economic crisis does not appear to have dampened investment spending, as only 23% of the companies surveyed plan to reduce their outlay in blockchain technology and 31% actually plan to increase it in the coming months.

A total of 50% of projects were in the deployment phase in 2020 and only 5% were shelved in the year, which points to the maturity of the French ecosystem. For companies not specialising in blockchain technology, the main reasons for delays incurred in blockchain projects were linked to identifying the right business model (43%), internal reservations (29%), and governance challenges/regulatory issues (each accounting for 14%). As a young as well as complex technology, blockchain needs certain efforts in terms of education and training. This concerns both technical training on blockchain (smart contract developers, etc.) as well as more concerted attempts to educate a wider audience. That these efforts are partly lacking today certainly has an impact on companies, with 56% of those surveyed claiming that access to blockchain training was either difficult or very difficult.

On the other hand, executive board involvement has become virtually essential and a key factor driving the success of a blockchain project. Executive management teams are now the second most involved parties in company blockchain projects, behind the innovation departments championing the initiatives.

Stablecoins – stable digital tokens pegged to the value of a specific asset – have also emerged as a driver of cryptoasset development in the French ecosystem and appear to offer a genuine answer to cryptoasset volatility: 91% of the pure players and 70% of the other companies surveyed consider stablecoins important for the development of blockchain and cryptoassets in general.

**Despite the obstacles, a growing number of French companies are gradually accepting that blockchain technology is the way forward, particularly thanks to increased buy-in from executive management**

Going forward, there appears to be a great deal of confidence in the development of blockchain in France, with 91% of the pure players and 77% of the other companies surveyed expecting the technology to grow in France over the next three years. The respondents believe that this development will be driven by the regulatory environment, better education and training on blockchain-related subjects, more funding, more public initiatives and greater support for cryptoassets from banks.

If blockchain overcomes the many obstacles it faces within the French business world, it will be able to fully deploy its applications and represent a solid platform for growth among French companies. ■

## Les auteurs



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# Paris Blockchain Week brings together the international blockchain and digital asset ecosystem



Par **Karim Sabba** et **Charlie Meraud**

The advent of blockchain and digital assets in the past three years briefly reset the markers of the international tech world to zero. The biggest success stories were no longer necessarily found in the United States or China, and France quickly positioned itself at the forefront of several key fields.

## The French ecosystem today

Real leaders have emerged in France in certain industry verticals. Ledger is ahead of the pack in digital asset security, while Tezos and Nomadic Labs offer a genuine alternative to Ethereum. And Woorton has become one of the world's biggest market makers in less than three years.

Thanks to firms like PwC, most companies listed on France's CAC 40 index have blockchain projects at varying stages of development, which will soon be an integral part of their daily operations.

The only downside is the financing available for start-ups, with most funds raised through foreign investors. There are no venture capital funds focused on this technology in France, although multi-sector funds are starting to invest at seed level.

## The role of Paris Blockchain Week in the ecosystem

Our aim in launching this event was simply to facilitate meetings between the different international ecosystems.

Since its inauguration, we have seen new companies set up in France or launch local communities. Although we would not claim to have been at the origin of these initiatives, it's undoubtedly true that acting as an intermediary who understands the market helped accelerate the decisions made by certain businesses. At the very first Paris Blockchain Week, Binance was able to meet Cédric O.

Bitpanda created its local network thanks partly to its involvement in the event. We also organised meetings between the French government and several players in the industry.

In a fragmented, closed and young sector, it is vital that players are supported so that they can connect to the different communities in their industry vertical, be it finance, blockchain companies, protocol development or other fields.

## The position of the French ecosystem relative to other countries

In a bid to find speakers and partners, we participated in events held in New York, London, Berlin, Zug, Malta, Hong Kong, Seoul and Armenia.

What strikes us is that the industry around the world remains fairly closed to any cooperation with conventional businesses. We believe that France could better bridge the gap between the tech and blockchain world and the French industrial sector. "Corporate venture" and "intrapreneurship" culture is a step in the right direction. It's also noticeable that finance in the broadest sense of the word is the

sector which has been the quickest to show its interest – and whose interest has proved the greatest – in this new technology. However, while the focus is on trading and investment in Asia, the United States and the United Kingdom because of either retail or institutional investors, most projects in France concern internal process optimisation at banks.

## The challenges and the outlook for this ecosystem

Our wish is for French companies in the sector to build a more international profile. The ecosystem is still too small to rely solely on the French market.

The regulatory environment is also a key issue but must not come before execution and growth. Foreign start-ups have grown exponentially in the three years during which France was preparing the Digital Asset Service Provider framework (PSAN in French).

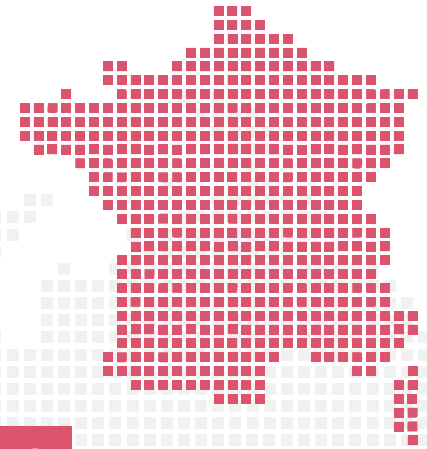
To sum up, the French ecosystem can hold its head high in Europe. We firmly believe that more inspiring success stories will emerge in the coming years, with or without the support of Paris Blockchain Week. ■

# Key survey findings in figures



**80** RESPONDENTS

**57%** pure-player blockchain companies  
**43%** “conventional” companies



**1 country surveyed: France**

## BLOCKCHAIN PURE PLAYERS



### Profil des participants

**78%** CEOs, Chairpersons or Founders  
**10%** COO/CTOs  
**7%** CMOs  
**5%** CFOs



### Company profile

**55%** 5-20 employees  
**31%** less than 5 employees  
**6%** 20-50 employees  
**6%** more than 100 employees  
**2%** 50-100 employees

## “CONVENTIONAL” COMPANIES



### Participant profile

**35%** CEOs, Chairpersons or Managing Directors  
**24%** Chief Information Officers (CIOs) or IT Directors  
**20%** COOs, Chief Technology Officers (CTOs) or Chief Innovation Officers (CIO)  
**16%** Blockchain Leaders or Heads  
**5%** Other



### Company profile

**55%** Listed companies  
**31%** Mid-sized companies (<5,000 employees)  
**6%** Small companies: (<250 employees)  
**6%** Large companies (>5,000 employees)  
**2%** Micro companies (<10 employees)

# Blockchain: new horizons



To establish a detailed, comprehensive overview of the status of blockchain in the French business world, we surveyed more than 80 companies – both pure players in the ecosystem, operating notably in crypto/digital asset trading, blockchain development, mining and tokenisation, as well as “conventional” companies from a variety of industries developing a blockchain-related project.

The PwC France and North Africa report presents a summary of the responses given by these participants on a broad spectrum of issues, including the progress of blockchain projects, their analysis of the current situation of the industry, their outlook, the current regulatory environment and obstacles to

development. In this report, we chose to analyse the findings following the path of a blockchain project within these companies, i.e., from project launch to commercial rollout, and then to management.

This blockchain project lifecycle approach also led us to consider questions as to the type of blockchain chosen, the financing required and the obstacles encountered. We then decided to look at two major challenges currently facing blockchain technology in further detail: the incomplete regulatory environment and the emergence of cryptoassets as a new asset class.





Since its creation, blockchain has undergone various phases of democratisation and take-up within companies. After fairly discrete development in the first few years of its existence, a certain feeling of euphoria about the technology set in during 2017-2018, primarily among pure players. This notably led to a sharp, across-the-board rise in the price of cryptoassets, increasing market capitalisation from around €15 billion at the end of 2016 to more than €600 billion in January 2018.

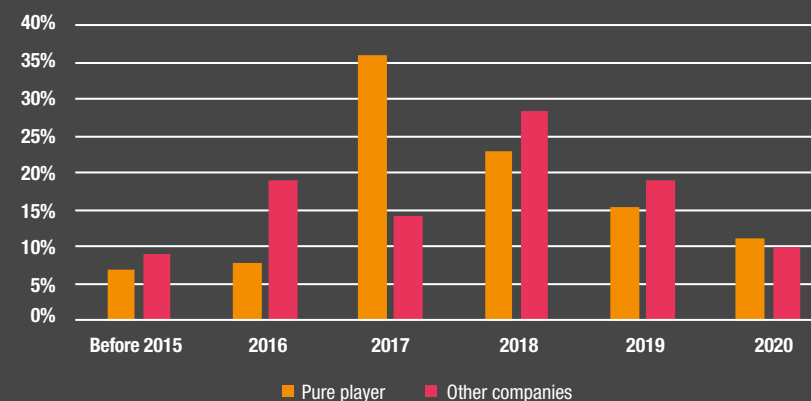
A large number of projects were developed during this period, notably via initial coin offerings (ICOs), where cryptoassets are issued in exchange for other cryptoassets or fiat currency. Two iconic ICOs were completed between 2017 and 2018: one by EOS which raised the equivalent of more than €3 billion, and another by Tezos which raised almost €200 million in just a few days. Some important ICOs were also carried out during this period in France, including by Napoleon X, NeuroChain and LGO.

These years saw the birth of the majority of blockchain projects carried out by pure players (almost 60% of respondents). The movement also caught on within large French companies – for which blockchain was not a core business – although we noted that almost 40% of blockchain projects by the conventional companies we surveyed were launched before this period. While blockchain projects launched by both pure players and conventional companies were mostly in the research and development phase in 2017 and 2018, many of these undoubtedly transitioned to the commercial rollout phase in 2020.

This can be seen in the section on the progress of blockchain projects. 2020 is also a turning point in that it is the first year in which the number of projects initiated by non-specialist companies exceeded the number launched by pure players.

## 2020: The first year in which blockchain projects initiated by conventional companies exceeded those launched by pure players

Blockchain project launches by year





# Blockchain: a technological revolution at the heart of businesses

**Although blockchain technology can be applied in a broad spectrum of industries, certain sectors account for the large majority of blockchain projects currently being developed. When it comes to choosing the type of blockchain to use, both pure players and conventional companies now appear to prefer public blockchains.**

## **Blockchain has wide-ranging impacts beyond the financial sector**

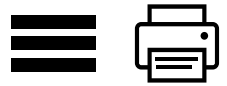
Finance remains the sector on which the various contributions of blockchain technology have had the greatest impact.

To illustrate, 57% of blockchain projects currently being developed in France concern the financial sector (banking, insurance, investment funds, etc.). The reasons for using blockchain technology in this sector are varied, although most projects (53%) appear to involve a change in business model, which leads to a disruption in an existing business and potentially to the creation of a new business.

The Société Générale Group is a case in point, with the Group creating Société Générale Forge, an entity operating in the blockchain-based digital asset market. In 2019, Société Générale Forge issued a bond for almost €100 million in the form of security tokens on the public Ethereum blockchain. This first major initiative by a large French bank also revealed the process optimisation benefits (significant decrease in transaction time, reduction in brokerage fees, etc.) offered by blockchain technology. In fact, process optimisation is the second use case for blockchains in the financial sector (27% of projects) after changes in business models.

Retail and consumer goods industries take second place behind the financial sector in terms of the number of blockchain projects, accounting for 24% of all such initiatives launched in French companies. The aims of the projects are to optimise existing processes as well as improve the customer experience and traceability.





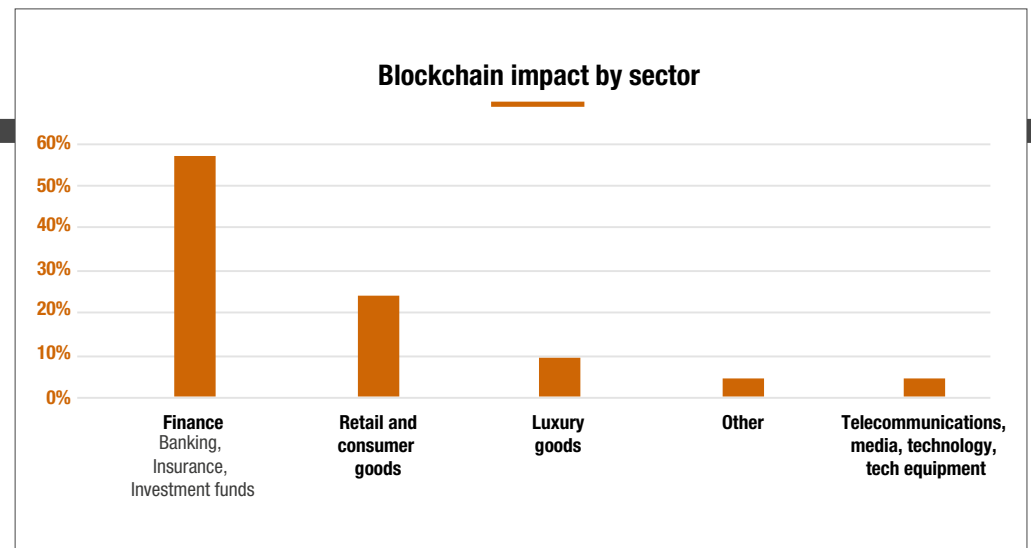
One of the major benefits of blockchain is that it offers improved product traceability – especially for food products. Traceability is also the driver of blockchain initiatives in the luxury goods sector. Today, Vacheron Constantin uses blockchain technology to assign its collection timepieces a tamper-proof digital certificate allowing owners to access comprehensive information about the history of their products.

business services (US\$18.9 billion), communications and media (US\$6.3 billion), financial services (US\$3.5 billion), and energy (US\$1 billion).

It is also interesting to note that 60% of non-pure players in blockchain developed between two and six blockchain projects in 2020, reflecting the wide range of possible blockchain applications within a given industry.

Although the financial services sector currently has the most mature blockchain projects, our “Time for trust: the trillion-dollar reasons to rethink blockchain” forward-looking report carried out in parallel shows that by 2030, the industries that will benefit the most from blockchain are likely to be public administrations, education and healthcare (estimated benefits of US\$29 billion), followed by

**57% of blockchain projects currently being developed in France are in the financial sector**





### Consortium blockchains are losing ground to public alternatives

Once a company has taken a decision to launch a blockchain project, it must then decide what type of blockchain to use. A blockchain project – for both pure players and other companies – can be developed on different types of blockchain. There are three main categories, which each offer their own advantages: public, consortium and private blockchains.

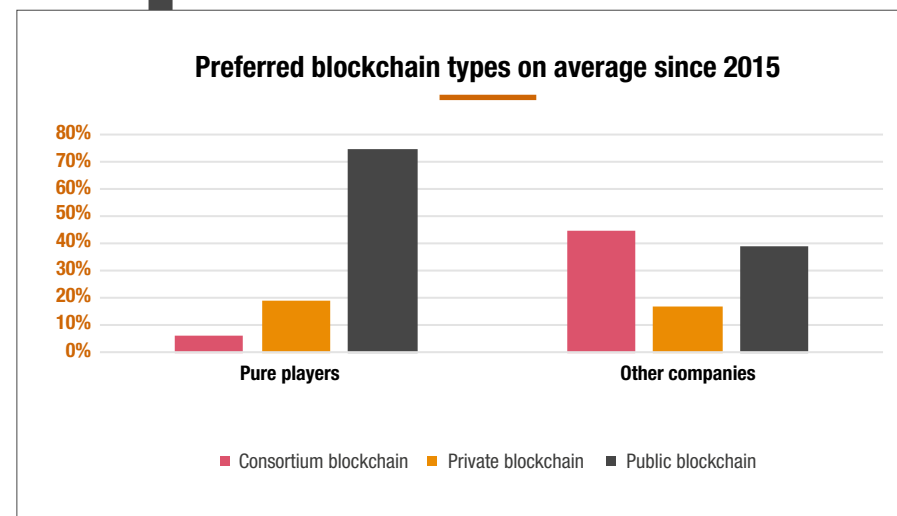
Consortium blockchains, on which a new node must be validated by consensus and data reading rights can be given to certain nodes only, are particularly favoured by companies seeking an added layer of control over the shared data. Consortium blockchains also enable companies to pool costs and therefore automatically limit the immediate impacts on cash when large-scale projects are created.

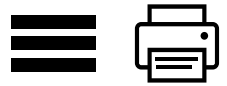
In all, 44% of blockchain projects launched by companies since 2015 use consortium blockchains. Although consortium blockchains – like private blockchains – were preferred by companies when the first blockchain projects were developed (2015-2018), we can see that they have been gradually losing ground to public blockchains since 2019. Consortium blockchains, which represented on average 60% of blockchain projects developed by non-pure play companies up to 2018, have been used in just 33% of projects launched by those companies since 2019. This relative decline has benefited public blockchains, which today account for 67% of new blockchain projects.

### Public blockchains represent 67% of all recently launched blockchain projects

Whereas conventional companies initially opted for consortium blockchains before turning their attention to public alternatives, pure players have always preferred public blockchains, which host 75% of their projects.

The use of public blockchains has also increased among these players, accounting for virtually all (almost 90%) of new projects.





**In search of a blockchain that can meet the needs of businesses**

Once the decision to use a public blockchain has been taken, the next step is to decide which to use among the wide variety of public blockchains that currently exist, each with its own specific properties.

Our survey found that Bitcoin, Ethereum and Tezos were by far the most popular public blockchains. Bitcoin, the first and certainly still the most widely known blockchain, not only allows values to be exchanged but also enables data to be anchored, which can be particularly useful for transaction traceability thanks to an immutable evidence trail.

Ethereum's benefits derive from the possibility of creating many different kinds of smart contracts – autonomous contracts between two or more parties that can be programmed electronically

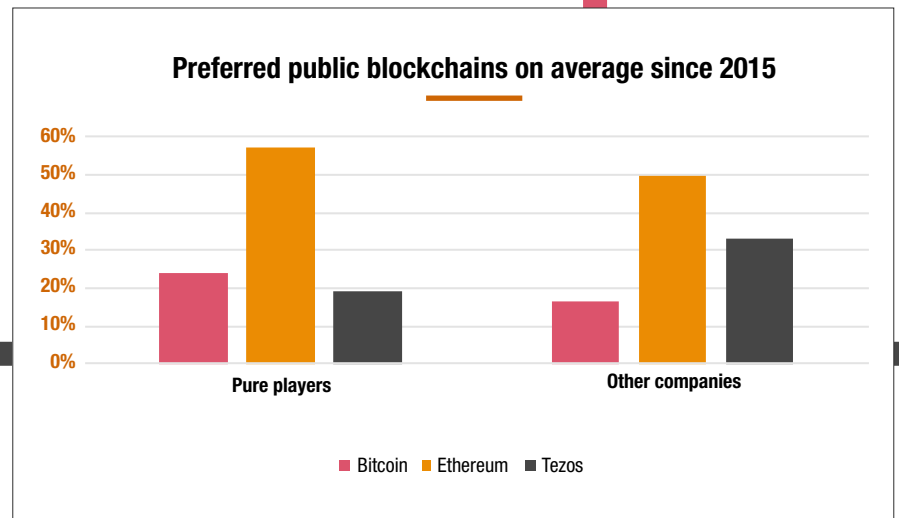
and are executed automatically in response to certain events encoded within the contract.

Ethereum also has the advantage of a particularly rich ecosystem, with a strong community of developers and firms specialising in its direct and indirect development through purpose-built applications. Ethereum played a pioneering role in the development of smart contracts, giving it a non-negligible edge on this market. The platform has also shown its capacity for reinvention: Ethereum 2.0 uses a proof-of-stake consensus and offers an optimised block validation process, for example.

The Tezos blockchain is also a smart contract platform, but differs from Ethereum in its decentralised governance model, formal verification possibilities and method for validating data (baking as opposed to mining).

The Tezos blockchain has gained certain recognition from public authorities and for the role played by the Tezos Foundation, which supports various businesses in deploying projects on the Tezos blockchain.

Although Ethereum comfortably dominated the market in 2017, the Tezos blockchain deployed in 2018 is gaining increasing currency with conventional companies and pure players.



We asked companies in our survey about the criteria they considered essential when choosing a blockchain for their projects. The ranking below shows that companies were primarily concerned about a blockchain's intrinsic capabilities. Their responses also highlight companies' need to trust a blockchain's ability to deal with security risks. In particular, this involves auditing the smart contracts deployed by the companies in order to ensure that (i) the desired functionalities are duly reflected in the smart contract and will be executed correctly, and (ii) the smart contract is robust enough to head off vulnerability risks and attacks.

In addition to these concerns, respondents also considered criteria not directly related to the intrinsic features of the blockchain, such as its reputation and energy consumption.

On this last point, we specifically questioned pure players and conventional companies about the importance of blockchain's environmental impact. Pure players and conventional companies appear to be aligned on these issues, with 70% of each saying that the environmental impact of their blockchain project was an important criterion.

Once the importance of this criterion has been acknowledged, an even greater problem arises as to how to measure this impact: the impossibility of gauging the environmental impact of a blockchain project is an observation made by both conventional companies (87%) and pure players (73%). ■

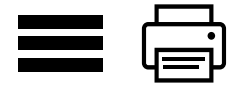
**Smart contracts are central to conventional companies' blockchain projects**



## Priorities for companies when choosing a blockchain

- 1 Scalability **31%**
- 2 Blockchain functionalities **22%**
- 3 Level of security offered by the blockchain **17%**
- 4 Blockchain reputation **14%**
- 5 Governance **10%**
- 6 Energy consumption **6%**

# Blockchain projects face funding challenges



**Funding is a challenge for all firms – both pure players and conventional companies – and raises questions as to the importance given to blockchain technology in the business world and investor interest in this emerging industry.**

**Companies that do not specialise in blockchain technology have maintained their blockchain project budgets despite the crisis**

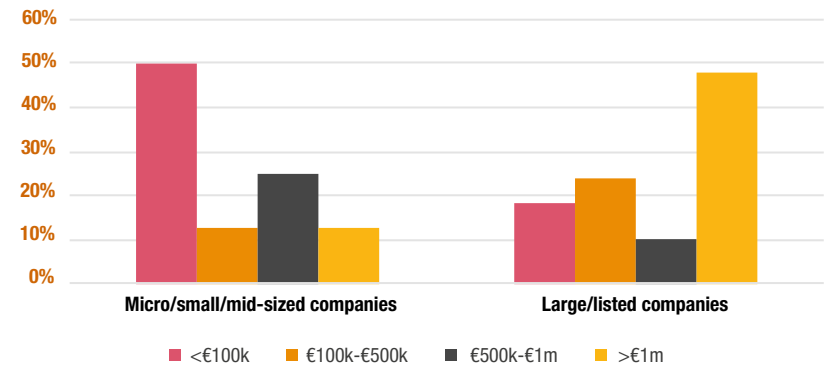
Allocating a blockchain budget and specialist team (within the strategy, IT or innovation department, depending on the organisation) has become essential if companies want to deploy strategic projects based on blockchain technology. On average, blockchain budgets represent €100,000 for micro and small businesses, and €1 million for larger companies. Teams are generally comprised of five members in micro and small businesses, and 20 in larger companies.

The current crisis raises the question of whether blockchain budgets will be maintained going forward.

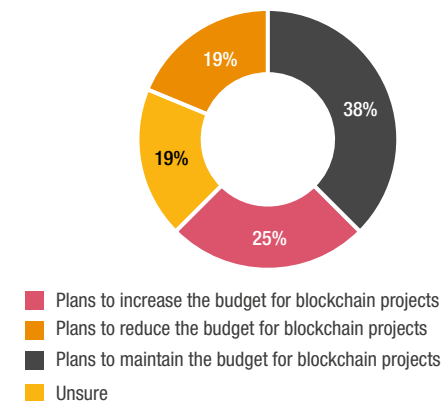
**31% of conventional companies are planning to increase their blockchain budget despite the crisis**

We observe that blockchain projects have proved extremely resilient during the pandemic, with only 23% of companies that have developed a blockchain project planning to reduce their blockchain budget, compared to 46% intending to maintain it. In fact, 31% of companies are actually planning to increase their blockchain budget by between €500,000 and €1 million.

**Average budget for blockchain projects in non-specialist companies**

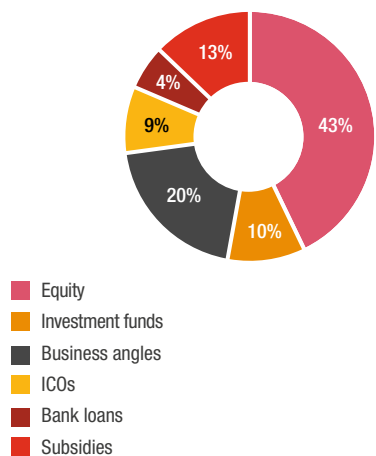


**Blockchain budget outlook**

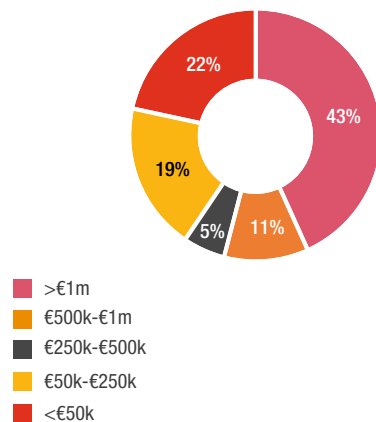




### Funding methods for French blockchain pure players



### Funds raised by pure players



### Pure players are returning to more traditional funding methods

The broad diversity of entities comprising the pure player ecosystem means big differences in the funding they receive: while 43% of pure players at the top of the scale received funding of over €1 million, another 41% received less than €250,000.

Looking beyond the amounts raised by pure players, fundraising approaches point to a declining trend in ICOs (only 10% of planned capital raising is now expected to be carried out using ICOs). For the moment, this trend does not appear to have been curbed by the introduction of a specific regulatory framework aimed at increasing confidence among ICO participants. The different funding approaches used by the pure players in our survey may also result in them receiving fiat currencies (legal currencies such as the euro or dollar) or cryptoassets. In this respect, 69% of funding received is in the form of fiat currency, versus 31% in the form of cryptoassets. For

funding in cryptoassets, it is interesting to consider pure players' strategies in using these assets. We observed that 50% of pure players receiving cryptoasset financing converted all of these assets to fiat currency, while 25% kept the cryptoassets received (bitcoin, ether, etc.) and 25% converted the cryptoassets to fiat (generally USD) stablecoins. The large proportion of pure players converting their cryptoasset funding to fiat currency can notably be explained by the fact that cryptoassets cannot be used to meet a company's day-to-day expenses.

### 84% of pure players intend to seek refinancing in the next 12 months

We also observed that pure players seldom sought bank loans as a method of financing, reflecting the complex relationship between these entities and French banks. Loans aside, even opening an account for these crypto firms can prove

particularly difficult. The French decree dated 21 November 2019 on Digital Asset Service Providers (PSAN in French) attempts to remedy this by introducing a right to open an account for these firms.

Fully 84% of the pure players in our survey intend to seek refinancing in the next 12 months, at which time we will be able to gauge whether financing arrangements have been impacted by the Covid-19 crisis and whether investor confidence has declined. We will also be able to observe the state of the complex relationship between banks and players in the blockchain sector. Alongside these refinancing plans, pure players – who typically have around 20 employees – mostly intend to increase their headcount over the next few years. ■

# The challenges encountered by blockchain in the business world

After several years spent on R&D, blockchain projects are gradually moving into the commercial rollout phase. This necessarily raises questions as to the obstacles likely to be encountered on the way and the resources available to companies to overcome them.

**2020: from R&D to commercial rollout**

Knowing the state of progress of blockchain projects at any time is vital to prevent them from stagnating in the research and development phase without advancing to commercial rollout, and ultimately being shelved. Understandably, the time-to-market is shorter for pure players, with almost 70% of projects launched by these firms already in the commercial rollout phase. Among pure players with projects being rolled out, more than 40% are already profit-making despite the relative immaturity of the sector. Most pure players' annual revenues are below €1 million, although 35% are generating revenues in excess of this figure.

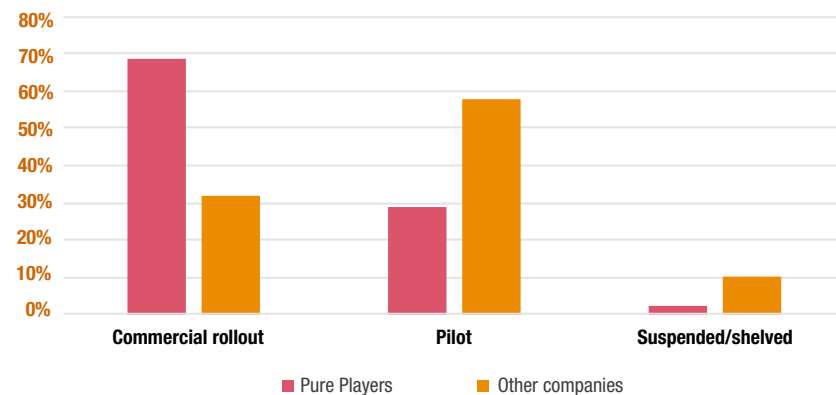
For other companies, blockchain projects need more time to be deployed, as they frequently have an impact on the companies' (often longstanding) business systems, with just over 30% of projects in the commercial rollout phase. The fact that only 5% of blockchain projects have been

**40% of pure players are already profit-making**

shelved by conventional companies in France is further proof that the technology has genuinely gained fresh momentum.

The development of a blockchain project within a company is not without its challenges: we observed that various obstacles had been encountered by both pure players and other companies which delayed project implementation. Almost half of blockchain projects being developed by the conventional companies in our survey were progressing more slowly than expected, while this was true for 38% of projects being developed by pure players.

**State of progress of blockchain projects**



## Obstacles to the development of blockchain projects within companies

The immaturity of the industry and lack of knowledge about the technology among external stakeholders are some of the main difficulties when it comes to developing a blockchain project, with 42% of pure players considering that the industry's lack of maturity is an obstacle to their development. This same problem is also found in conventional companies, with almost

30% attributing delays to reservations within the organisation.

Developing a blockchain project – either within a pure player or a conventional company – is not without its hurdles. As seen above, these challenges result from a variety of factors, including the relative immaturity of the sector, the lack of general knowledge about blockchain, and the difficulties resulting from specific technical issues.





## Main reasons for delays in blockchain projects within conventional companies

- 1 Business model identification **43%**
- 2 Internal reservations **29%**
- 3 Governance issues **14%**
- 4 Regulatory environment **14%**

**Identifying the business model and defining the ROI of blockchain projects is a major challenge for 43% of conventional companies**

Without calling the utility of blockchain technology into question, companies face particularly difficulties when attempting to measure a project's return on investment. This does not mean that their projects will not be profitable, but rather that the returns

they will generate are difficult to quantify using set indicators. Most of these difficulties are linked to the immaturity of the sector.

**Internal reservations account for almost 30% of delays in projects within conventional companies**

Attempting to convince all stakeholders within a company of the pertinence of a given blockchain project can be

an obstacle to development. When we compared attitudes of different departments, we found that certain finance departments had reservations as to the development of blockchain projects. The difficulty in identifying the right business model as mentioned above is undoubtedly one of the reasons for this. Reservations may also result from the numerous issues raised by blockchain technology and cryptoassets, particularly in terms of internal control, transaction security, and the relevant accounting treatment.

On the other hand, we note that innovation departments and executive management appear to be strong supporters of blockchain projects. Innovation departments were behind close to 60% of blockchain projects within the companies in our survey, followed by executive management, which was the impetus for more than 30%. Although innovation departments can be the first point of entry for a project idea, they cannot be the sole contributors to project implementation. Executive management's significant involvement reflects a deep-seated belief in the strategic importance of blockchain technology for the company.

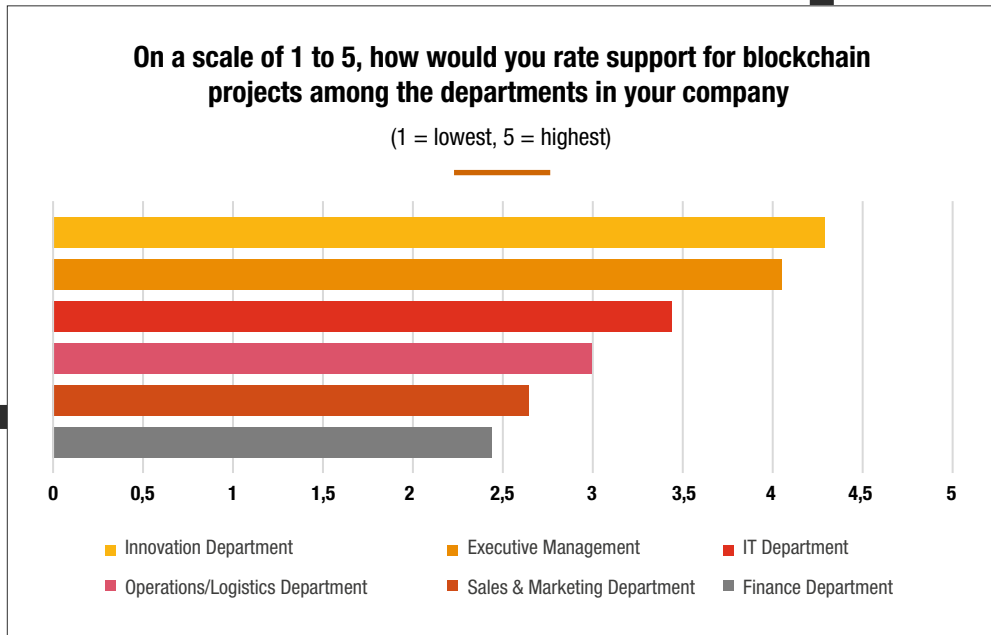
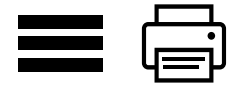
## Convincing companies' finance departments is blockchain's next challenge

**Difficulties in identifying a suitable governance model**

Governance issues encountered by the companies in our survey concern both the positioning of a company within a consortium blockchain and internal corporate governance for a blockchain project. When several companies join forces (sometimes even rival companies), it can sometimes be difficult to determine who will have access to the data and how. This difficulty should be considered in light of the declining popularity of consortium blockchains discussed earlier in this report

**Regulatory uncertainty**

Despite France's lead in establishing an innovative regulatory framework adapted to the distinctive features of blockchain technology and cryptoassets (described later in our report), uncertainties may exist as



to how these regulations will evolve going forward, particularly as regards issues not yet fully covered by regulatory provisions. This can lead to a certain degree of apprehension within companies and slow progress in blockchain-related projects.

**A strong need for blockchain training in companies**

As a young as well as complex technology, blockchain requires certain efforts in terms of education and training. This concerns both technical training on blockchain (smart contract developers, etc.) as well as more

concerted attempts to educate a wider audience.

That these efforts are partly lacking today certainly has an impact on companies, with 56% of those surveyed claiming that access to blockchain training was either difficult or very difficult.

While certain training programmes on blockchain and cryptoassets have been introduced into France's business schools, universities and training centres over the past few years, their content remains fairly superficial. To develop a blockchain project, for example, a degree of knowledge is needed about the challenges posed by

decentralised systems, cryptography and the specific features of the languages used to develop smart contracts (e.g., Michelson for Tezos, Solidity for Ethereum).

**Resources available to companies overcome these obstacles**

Various means can be employed by companies to steer their blockchain projects to a successful conclusion – despite the difficulties. These include auditing smart contracts, adapting the internal control environment to the distinctive features of blockchain and cryptoassets, entering into alliances with pure players, and identifying firms registered with the AMF.

We discussed above the aims of smart contract audits deployed by companies. These include ensuring that (i) the desired functionalities are duly reflected in the smart contract and will be executed correctly, and (ii) the smart contract is robust enough to head off vulnerability risks and attacks. Putting in place an internal control environment adapted to the many distinctive characteristics of the blockchain is a solution to several difficulties, such as the security of cryptoassets owned by the company and of transactions carried out with those assets.

**Only one company in five has audited a smart contract it developed**

For example, a predefined procedure for generating wallet key pairs and a secure system for holding cryptoassets will allow companies to manage blockchain-related risks more effectively.

We noted that one company in five had audited a smart contract it uses, illustrating the progress that can be made by the industry in increasing trust and security.

In addition, since companies may find it difficult to acquire the expertise necessary to develop a blockchain project, a solution may be to enter into a partnership with pure players, which can bring expertise and agility. In fact, 38% of companies developing a blockchain project intend to enter into an alliance with a pure player in the coming months.

Lastly, the regulatory framework established in France – which we discuss later in more detail – can also play a key role in determining cooperation with another party (notably via registration as a Digital Asset Service Provider). ■



# The regulatory framework for blockchain and cryptoassets is not yet complete

**The regulatory environment could either encourage or hinder the development of blockchain technology in France. It therefore plays a vital role in the success of a company's blockchain project. France has been a leader in blockchain regulation and its approach has helped drive regulatory efforts at a European level.**

**A regulatory framework is needed that is suited to the distinctive characteristics of blockchain and cryptoassets**

Regulations introduced in France attempt to address the legal, accounting and tax issues raised by blockchain and cryptoassets without curbing innovation or the emergence of new French and European blockchain players. Even though 57% of conventional companies and pure players consider current blockchain and cryptoasset regulations inadequate for the needs of the industry, the regulatory framework in France is one of the most advanced in the world.

In view of the many distinctive features of blockchain and cryptoassets, applying pre-existing regulations to this new industry was extremely problematic and the need for the industry to have its own regulatory framework was quickly apparent.

**Only 20% of the pure players surveyed plan to apply to the AMF for an ICO visa**

While certain aspects of this new industry had been previously addressed, for example in the Blockchain ordinance<sup>[1]</sup> of 8 December 2017 allowing blockchain technology to be used to register and transfer financial securities, the PACTE law of 22 May 2019 introduced a specific framework based chiefly around two separate systems: the ICO visa and the Digital Asset Service Provider (PSAN in French) regime.

**The ICO visa is a victim of the sluggish market**

A major phenomenon in the blockchain and cryptoasset universe in 2017 and 2018, ICOs exploded during this period without a specific regulatory framework. This gave rise to some successful projects but also to certain fraudulent schemes that capitalised on the legal loopholes available at that time.

To close this legal gap, France's PACTE law sought not only to define ICOs<sup>[2]</sup> but also introduced an optional visa to be granted by the French financial markets authority (Autorité des marchés financiers – AMF) for public offerings of tokens by issuers having applied to the AMF and provided a certain number of guarantees<sup>[3]</sup>. ICO issuers can use the visa granted for a public offering or for prospective investors in an ICO, thereby helping to reinforce issuer transparency. Details of how the ICO visa is granted are set out in Book VII of the AMF's General Regulation<sup>[4]</sup>.

It should be noted that France is the only country to have introduced a specific regulatory framework for ICOs.

Although only three companies had been granted an ICO visa by the AMF at the date of this report, this does not mean the regulations are ill-suited to the industry – on the contrary, they appear to increase trust without hindering initiative – but reflects the wider global context. Amid a steep fall in prices for cryptoassets from 2018 onwards and due to a lack of regulation at that time, the number of ICOs as well as the sums raised have declined significantly, both in France and internationally. Especially popular in 2017 and 2018, ICOs are the collateral victims of the general decline in cryptoasset prices since 2018. Only 20% of the pure players surveyed plan to apply to the AMF for an ICO visa.

[1] Ordinance no. 2017-1674 of 8 December 2017 on the use of distributed ledger technology to register and transfer financial securities.

[2] Any proposal to the public to subscribe for tokens. Article L. 552-3 of the French Monetary and Financial Code, created by Act no. 2018-486 of 22 May 2019.

[3] Issuers must notably be incorporated as a legal entity in France or be registered in France; they must have implemented a process enabling the monitoring and safeguarding of the assets raised by the ICO; and they must draw up an information document for the public which will be reviewed by the AMF.

[4] Decree of 25 May 2019 approving the amendments to Articles 711-1 to 715-2 of the AMF's General Regulation.



### Digital Asset Service Providers: a welcome innovation

The Digital Asset Service Providers regime (DASP, or PSAN in French) is another important feature of the PACTE law, introducing a specific status for Digital Asset Service Providers in France. The regime covers ten services, but only two must be registered with the AMF: keeping and purchasing/selling digital assets in exchange for legal currencies. As part of the registration process, the AMF verifies compliance with laws on money laundering and the financing of terrorism together with France's Prudential Control Authority (*Autorité de contrôle prudentiel et de résolution – ACPR*).

The list of registered DASPs is published by the AMF on its website. At the date of this report, the AMF had registered five companies as DASPs but had not yet issued any authorisations. A large number of applications for registration are currently being reviewed by the AMF and details should be published shortly. It is in fact essential that

cryptoasset trading platforms are regulated so that the ecosystem can develop and reinforce credibility and trust both for clients and for the various stakeholders (particularly banks) and investors.

More than 60% of the pure players surveyed had initiated DASP registration or planned to do so in the coming weeks.

**More than 60% of the pure players surveyed had initiated DASP registration or planned to do so in the coming weeks**

### A specific accounting framework

From an accounting perspective, France's accounting standards-setter (*Autorité des normes comptables – ANC*) published a standard on 10 December 2018<sup>[1]</sup> detailing the basis for accounting for ICO transactions. In the case of a token issuer, the ICO is to be recognised as a liability, or as income or deferred

income, depending on the specific characteristics of the ICO and the commitments undertaken by the issuer with regard to the subscribers of its tokens. In the case of a token holder, tokens are to be recognised as an intangible asset or as a cash instrument, depending on the use expected to be made of the tokens by the holder. These rules are only applicable to utility tokens and not to security tokens, which are to be accounted for as financial instruments.

A new standard – which was pending approval by the French Finance Ministry at the date of this report – was published by the ANC on 24 July 2020 to clarify the different accounting treatments applicable to transactions involving digital asset services. In particular, this standard concerns the accounting treatment applicable to loans and borrowings of tokens and token derivatives. It sets out a clear response to the important question of how firms holding digital assets on behalf of third parties should account for these cryptoassets: the assets should not be recognised in the balance sheet if various conditions

are met, i.e., the digital assets are separate, they cannot be used by the custodian without the prior agreement of its clients, and the appropriate means have been put in place to return these cryptoassets to the clients.

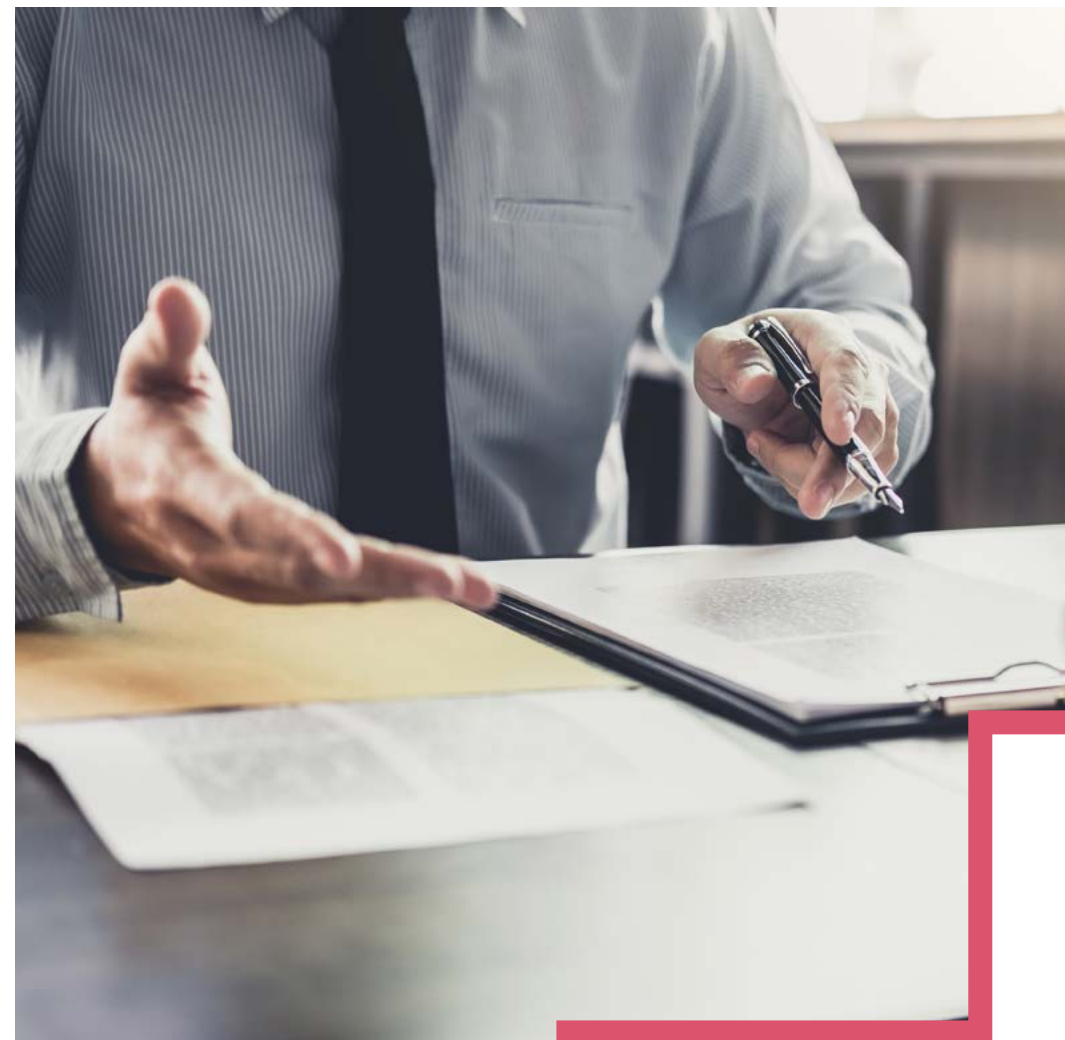
The complex and constantly changing nature of this issue means that new problems are continuously arising, such as the accounting treatment applicable to staking or to transactions related to decentralised finance.

[1] Standard no. 2018-07 of 10 December 2018 amending ANC Standard no. 2014-03 of 5 June 2014 on the amended general accounting plan.

### Towards a European regulatory framework

A proposal for an EU regulation on markets in cryptoassets (MiCa) was published by the European Commission on 24 September 2020. The proposal alone confirms the need for a specific European regulatory framework for the industry. It attempts to address various aims in terms of protecting investors, maintaining financial stability, and guaranteeing legal security while encouraging innovation. It is interesting to note that many aspects of the proposal were inspired by the regulatory framework in place in France.

The proposed regulation is a first step in addressing various issues such as the introduction of specific regulations for stablecoin issuers and cryptoasset service providers. The proposal also raises certain questions, notably about the proportionality between the requirements that will be imposed on firms in this industry and the size of those firms, which remains particularly small for the time being. ■



# The emergence of cryptoassets as a new asset class



Initially presented as purely speculative assets and then as underlying assets inherent to blockchain technology, cryptoassets now tend to be considered as a new asset class with a wide variety of use cases, from decentralised finance to current reflections on the creation of a digital euro. The growing uses for cryptoassets also raise certain questions regarding their volatility or the security of the different methods used to keep them.

## Barriers to using cryptoassets

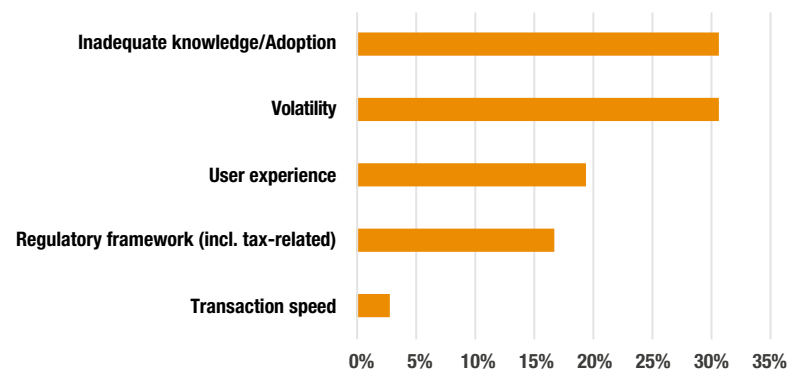
Our report considers the development of blockchain alongside the emergence of cryptoassets as a new asset class with multiple use cases.

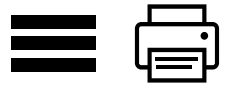
However, the diversification of new uses for cryptoassets is not unfettered: cryptoasset payments, for example, are far from being widely accepted. Cryptoassets are in fact seldom used as a means of paying employees, both within conventional companies and within pure players: only 3% of conventional companies with a blockchain project and 6% of pure players grant part of their employees' variable compensation in cryptoassets. However, pure players are particularly willing (58% of respondents) to pay their employees in cryptoassets in the future, and this trend is also apparent (albeit to a lesser extent) in conventional companies (8%). Whether these intentions come to fruition is obviously dependent on changes in the regulatory framework on cryptoassets and on the acceptance of cryptoassets on a much wider scale.

## Lack of acceptance by the general public: the main obstacle to payments in cryptoassets

Besides compensation in cryptoassets, we also asked pure players and other companies about obstacles hindering the development of cryptoasset payments. Inadequate knowledge of cryptoassets among the general public as well as volatility were identified as the two main hurdles.

### Obstacles to the development of payment in cryptoassets





### Stablecoins offer an answer to cryptoasset volatility

Stablecoins have grown in popularity as a response to cryptoasset volatility. Stablecoins can be defined as stable tokens pegged to a specific asset. This asset may be a legal currency such as the euro or dollar, or any other existing asset like gold or Brent crude, including other cryptoassets. Stablecoins are therefore a digital representation on the blockchain of the value of one or more assets that fluctuate outside of the cryptocurrency space. In all, 91% of

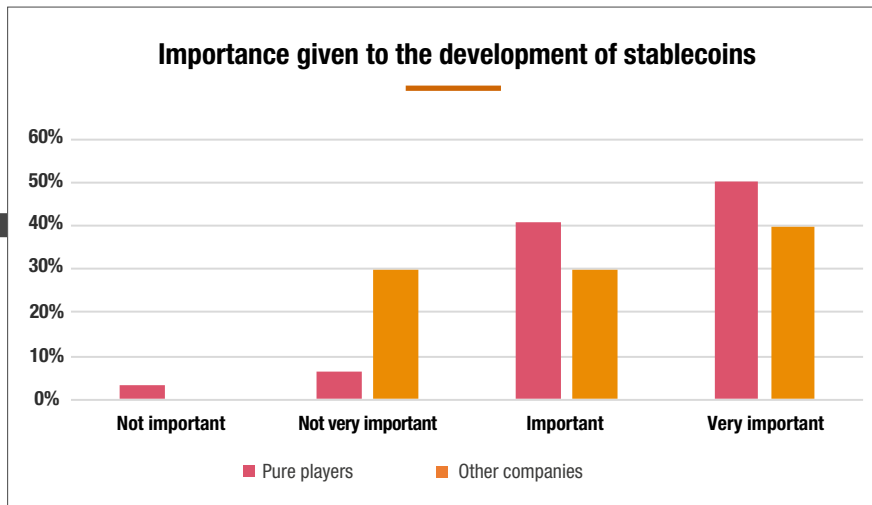
pure players and 70% of conventional companies consider stablecoins an important development in blockchains and cryptoassets in general.

For 33% of pure players and 25% of conventional companies, inadequate knowledge among the general public is also an obstacle to payments in cryptoassets, reflecting a lack of trust in this emerging universe. A pertinent regulatory framework could therefore help to build recognition for reliable industry players and thus reinforce trust.

### The boom in decentralised finance (DeFi)

The emergence of this new blockchain-supported functionality was mentioned earlier in this report. Decentralised finance allows traditional financial instruments to be recreated using decentralised architecture, based on smart contracts and public blockchains. DeFi is the ability to deliver financial services without relying on centralised financial intermediaries, using the functionalities offered by blockchain technology.

For the time being, DeFi does not appear to have won over conventional companies and remains the preserve of pure players in the blockchain ecosystem. Almost 70% of ecosystem pure players plan to use DeFi applications in the coming months. We discuss below two major uses of decentralised finance: peer-to-peer lending and automated market-making.





## The different applications of decentralised finance

### Peer-to-peer lending

Several decentralised applications allow users to lend and borrow cryptoassets in a transaction which is fully automated via a smart contract. A holder of a cryptoasset can choose to place it in a smart contract and in return earn interest at a rate that depends on supply and demand for the cryptoasset in question. Another user can then borrow the cryptoasset by paying an interest rate and putting up another cryptoasset (different from the asset borrowed) as collateral<sup>[1]</sup>. These fully collateralised loans eliminate the need to assign borrowers a credit score in order to limit default risk, the traditional procedure undertaken by banks. The requirement to put up collateral for a loan imposes certain limits on this system, as users can never borrow an amount that they are unable to put up collateral for. However, judging by the growing level of transactions on these peer-to-peer lending platforms, it appears that these types of transaction meet certain market needs. Holders of cryptoassets can in fact meet their short-term

liquidity requirements by borrowing stablecoins without having to transfer ownership of their cryptoassets. In this way, they can continue to benefit from any future increases in the price of those assets.

### Automated market-making

Automated market-makers, or AMMs, are decentralised applications allowing users to carry out automated trades between cryptoassets without transiting through a centralised exchange. The traditional order book of the centralised exchange is replaced by a liquidity pool hosted by the smart contract, which manages trades between a specific cryptoasset pair.

Liquidity providers are encouraged to add funds to these smart contracts in return for a percentage of fees from the trades that happen in their pool. The rate of exchange between two assets is set by the smart contract and is based on a mathematical formula that takes into account the relative market price of the assets and the level of liquidity held in the smart contract. The biggest AMM today is Uniswap, which has total liquidity pools of around US\$2.7 billion. Currently, tokens traded on AMMs

are generally linked to projects wholly within the blockchain ecosystem and do not represent traditional financial assets like corporate equities or bonds. However, if blockchain technology continues to mature, an increasing number of traditional financial assets could be tokenised. In such a scenario, these newly tokenised financial assets could benefit from the same type of infrastructure – i.e., fully automated and based on smart contracts – which is currently being built within the scope of DeFi applications. In the future, shares in large companies could therefore be traded in a decentralised manner through AMMs, and automated lending and borrowing transactions could be carried out through smart contracts. This possibility would represent a huge upheaval in the processes currently used to manage collateral

For the time being, the token ecosystem which is currently being developed on public blockchains remains clearly separate from the traditional financial market infrastructure. In the future, however, these two worlds could gradually merge, resulting in more efficient global financial markets.

## 70% of pure players plan to use decentralised finance applications in the coming months

The two critical components of DeFi are therefore peer-to-peer lending and automated market-making. These new financial applications could signify the beginning of an alternative financial system that capitalises fully on the efficiency gains offered by blockchain technology. DeFi affords us a glimpse of a future in which the promise made by the most fervent supporters of this technology becomes a reality, i.e., blockchain becomes as revolutionary for exchanges of value as the internet was for exchanges of information. ■

[1] Cryptoassets put up for collateral must be different to the cryptoassets borrowed, otherwise the operation would have no economic utility for the borrower. For example, borrowers can put up ethers as collateral in order to borrow stablecoins.



# State of play and outlook for blockchain in the french business world

**Blockchain is already present in many French companies, but will the technology pass the test and help drive growth in French companies weakened by the current crisis?**

**Businesses operating in the blockchain sector have proved resilient during the Covid-19 crisis**

2020 has been shaped by the Covid-19 crisis and its wide-ranging economic impacts. The pandemic has shed light on numerous weaknesses in infrastructure, and has especially underlined the crucial role of networks in companies' operations and of interdependent relations. Blockchains help to rethink how these infrastructures can be managed. Fault-tolerant technology such as blockchain aims to reduce the impact of local failures on networks as a whole.

Although – like other industries – the blockchain sector has been weakened to some extent by the current crisis, it is nonetheless interesting to observe that this impact has been contained and that the sector has actually proved resilient to this crisis up to now. Based on our survey, we estimate that 44%

of companies developing a blockchain project were not impacted by the current crisis. Out of the other 56% of companies developing a blockchain project, the impacts of the crisis have understandably been negative for 74% of them, resulting essentially in project delays

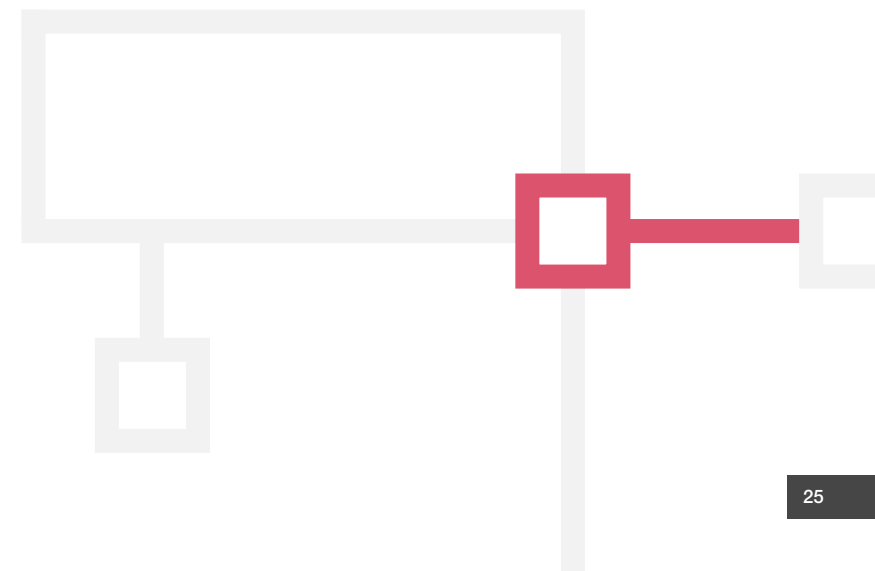
**44% of companies developing a blockchain project were not impacted by the Covid crisis**

However, it should be noted that more than one-quarter of companies developing a blockchain project that were impacted by the Covid-19 crisis consider this impact to have been positive. The crisis in fact highlighted the need to rebuild trust between different types of players by facilitating their exchanges and transactions and making them more reliable and secure: this is exactly what blockchain can offer. A blockchain platform is essentially a decentralised database that features a customisable governance system by design, and which shares the single history of a transaction in a transparent and secure manner.

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This is because blockchain technologies offer governments, businesses, not-for-profit organisations and the general public a way of ensuring secure critical industries, reliable and effective decision-making processes, and optimised processes and transactions. This is achieved through the two major general contributions of blockchains:

- reduced risks and costs related to the duplication of data thanks to a highly secure data sharing process;
- a clear allocation of roles and responsibilities among the players involved in these processes.





We set out below several major benefits brought by blockchains, particularly important in view of the Covid-19 crisis:

### 1 - Supply chain security

Secure supply chains and continued sovereignty in a context of interdependence

- Give each participant the possibility of monitoring supply chain flows in a transparent manner, including complex supply chains such as for medical devices, while improving the overall responsiveness of the supply chain.
- Create a platform for certifying the origin of product components or services.
- Create a digital identity for each of the different players in the supply chain.
- Produce a map of Tier-N suppliers so that sovereignty can be protected in the event of a systemic crisis.

### 2 - Data optimisation

Augmented data for simulations, decisions and forward-planning

- React more swiftly by improving cooperation between individuals, businesses, hospitals, research centres, universities and public authorities.
- Identify the spread of a virus as early as possible through open-data platforms.
- Incorporate a model for managing access to this data by those producing it, using pseudonymity-based approaches in compliance with privacy laws.

### 3 - Earmarked government aid

Earmarked government aid

- Automatically receive government aid based on the eligibility criteria defined in smart contracts; ensure that they are used appropriately and measure the impact virtually in real time (payments channelled via the blockchain).

### 4 - Stronger cooperation

Stronger cooperation between players and strategy alignment

- Manage value chain governance transparently, ensure secure data transfers, and create value within a business or sector.
- More generally, ensure the integrity of systems for exchanging value and information between citizens, businesses, governments and members of civil society.

### 5 - Process optimisation

Optimised recurring business processes allowing you to focus on unforeseeable events

- Implement self-executing contracts to automate repetitive processes (e.g., payments, invoicing, etc.) through smart contracts.
- Avoid the same micro-processes being carried out several times by different company departments, sometimes for different ends (or even by different stakeholders within separate organisations).

### 6 - Financing solutions

Digital finance as a concrete financing strategy

- Raise funds by issuing digital tokens and diversify investor profiles.
- Manage investments within the company or alliance by measuring their impact and release additional tranches depending on the result.

### 7 - Risk prevention

Risk prevention

- Limit fraud risks by certifying goods and services (including intermediaries) as well as the stakeholders operating around these goods and services (retailers, technical servicers, etc.).
- Improve Know Your Customer (KYC) compliance and control thanks to the storage, traceability, sharing and certification of the digital identity of customers as well as suppliers.
- Combat fake news affecting the business by certifying press releases and any other digital news release.



## The strengths of the French ecosystem

One of France's strengths in blockchain development is its rich blockchain ecosystem comprising a wide variety of players, from start-ups to public institutions. Led by different focus groups and industry associations, this ecosystem – along with an adapted regulatory environment – helps make France a blockchain technology leader. In fact, 70% of respondents in our survey consider France to be ahead of or on a par with other countries. This dynamic ecosystem also serves to encourage pure players to build an international profile, with more than 90% of those surveyed intending to develop international projects (mostly in Europe) within the next two years. The MiCa regulation for cryptoassets which is due to come into force in the near future will facilitate the emergence of major European players, particularly from the French ecosystem.

## 2021: new horizons for blockchain

Nous avons interrogé les entreprises du secteur de la blockchain sur les perspectives du secteur et avons ainsi pu avoir un éclairage sur les nouveaux secteurs d'activité qu'ils anticipent :

### Les actifs numériques ont un rôle à jouer dans la relance et plus largement dans l'économie de demain

We asked companies operating in the blockchain sector about their outlook for the industry. Based on this, we are able to highlight the new business areas they expect to develop, such as tokenisation deployment, and decentralised finance. We also asked for the views of companies which had not yet developed any blockchain-related projects.

First and foremost, we noted a great deal of confidence in the development of blockchain technology in France: 91% of pure players and 77% of other companies are confident about blockchain development in France in the next three years.

This confidence can be seen in particular in the desire expressed by non-specialist companies to develop new blockchain projects (66% plan to launch a new blockchain project in the next 12 months).

We have already presented the distinctive features of the French regulatory environment, which is innovative and a leader in numerous areas relating to blockchain technology and cryptoassets.



The companies we surveyed also identified priorities which they believe would help develop the blockchain environment in France:

- 1 A favourable regulatory environment
- 2 Better education on blockchain subjects
- 3 Financing
- 4 Development of public initiatives
- 4 Relations with banks



This priority reflects (i) the requirement for this regulatory environment to promote the development of blockchain use cases, and (ii) companies' need for legal security faced with changing regulations and the introduction of a regulatory framework at European level.

We have also already detailed the imperatives in terms of education about blockchain, with the need for improved training that would help hone technical expertise in these subjects and put pay to certain stereotypes. Public initiatives should be interpreted in the broad sense of the word and include a favourable political discourse about the ecosystem, the development of blockchain use cases within public administrations, and the launch of a digital currency by the central bank.

At the beginning of our study, we discussed the industries on which blockchain technology and its applications have had the greatest impact. We also surveyed companies in industries that are likely to be

impacted by blockchain in the next 12 months. We noted that finance remains the sector of choice for blockchain projects, followed by the retail and consumer goods industry. We also observed the emergence of new industries impacted by blockchain such as energy and real estate.

The potential applications of blockchain in the energy industry are huge, as we can see in various initiatives developed by EDF, for example to verify the conformity of materials used to build nuclear power stations, certify laboratory tests, provide guarantees of origin and traceability for electricity, and invoice costs relating to electric vehicles.

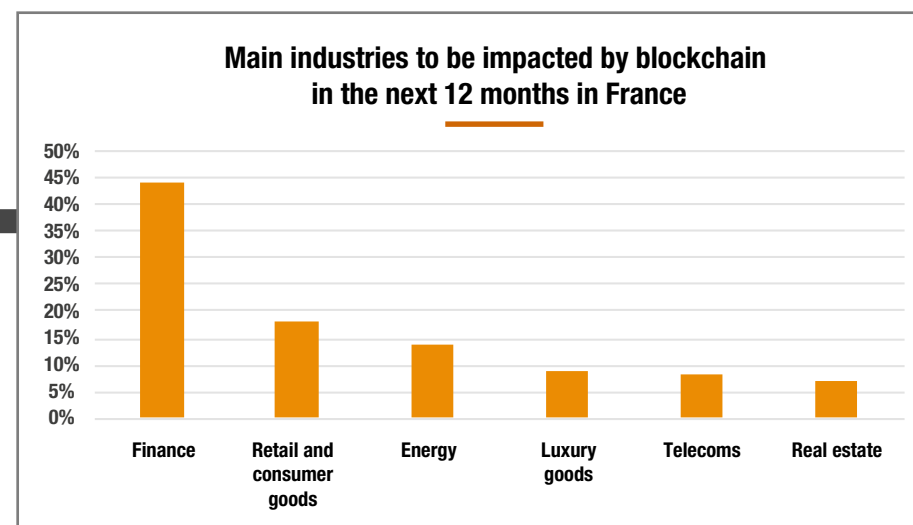
The real estate sector is also fertile terrain for blockchain technology, notably via tokenisation, which is the digital representation of an existing asset in the form of a token. Blockchain could provide liquidity and help simplify the real estate market.

**Emergence of new industries impacted by blockchain, including real estate, energy and telecoms**

There is an extremely wide range of potential uses for tokenisation, including for example for traditional financial securities, which in this case would be represented on the blockchain in the form of tokens. This belief is widely held by French companies operating in the blockchain sector, with 77% of those surveyed convinced that the tokenisation of securities on the blockchain will be widely used in France within the next two years.

**A growing number of companies plan to use blockchain technology in the coming years**

A total of 50% of French companies not yet having developed a blockchain project plan to do so in the next two years, despite the current crisis. Transparency and certification are the most appreciated features of blockchain for their projects. ■



This report looked at blockchain's strategic position in the French business world today. We highlighted the obstacles encountered by this new technology in French companies. Blockchain's relative immaturity, inadequate knowledge and training, technical complexities, regulatory uncertainty and the difficulty in identifying an appropriate business model are challenges that the technology will have to overcome in order to live up to its full potential and help boost business growth in France through its many applications.

As a technological revolution on the verge of disrupting many different industries, blockchain is of increasing interest to both public decision-makers and economic players.

The combination of a dynamic ecosystem, appropriate financing, an innovative and pertinent regulatory framework, and better education and training can undoubtedly help to meet these challenges and make French businesses an integral part of the blockchain revolution.

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