

Blockchain for FinTech

Results from a survey among professionals from the financial services sector, the information technology sector and academia

A report prepared by Blockchain Monitor

September 2017

It is said that **Blockchain** will change the structure of the financial industry. Many financial institutions, large corporations and small startups are researching and testing the use of **Blockchain technology** to disrupt current markets and establish new business models. At the same time, **Blockchain** is increasingly attracting attention from regulatory authorities. However, potential use cases, **opportunities and risks** associated with the technology are the subject of heated debate among industry participants: what is the killer application and what is merely hype?

In this report we present the results of a survey among more than one hundred professionals and senior-level management from the financial services industry, the information technology sector and academia. Among all the different areas where Blockchain can be applied, we find the highest impact in energy and **FinTech**. For **FinTech**, we note that currently the identification of use cases is in highest demand. This clearly indicates that many companies are still in the **early stages** of their Blockchain journey.

Three important **knowledge gaps** can be identified in the FinTech industry: (1) Individuals are perceived to be much

more knowledgeable on Blockchain topics than companies are, (2) Mid-Level Management is under-educated compared to Entry-Level Employees and Senior-Level Management, (3) Public Administration and Law show the strongest discrepancy between perceived Blockchain importance for the sector and current Blockchain competence.

Across various company sizes, regulatory uncertainty and insufficient knowledge have been identified as imposing the most significant **barriers to innovation** through the use of Blockchain technology. While smaller companies with up to 50 employees mostly use Blockchain to identify new business opportunities, larger companies follow a more holistic approach by accumulating knowledge, assessing the technology's potential for cost reduction and efficiency gains in existing processes, and reacting to competitive pressures.

When experts are asked about the most relevant use cases in regards to profit impact and level of complexity of implementation, we find **cross-border payments** to be of most relevance, followed by **micropayments**. The use case being worked on most, however, is **post-trade processing**, indicating the effect of the many press articles on Blockchain-based trading over the past year.

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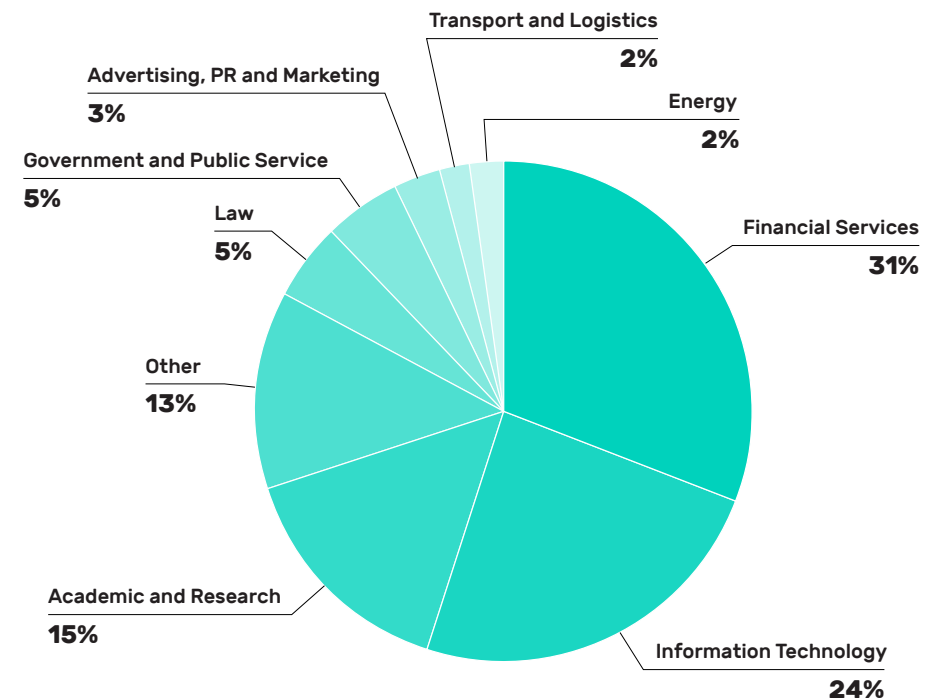
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We initiated the Blockchain Monitor to bring a substantiated view on Blockchain use cases and potential implications for the financial industry. We aim to help institutions focus on the use cases that matter most to them and try to enable an objective view – filtered from exaggerations caused by the hype surrounding Blockchain.

In order to provide meaningful guidance on Blockchain for the report's readers, we surveyed professionals from large financial institutions, startups, and Blockchain experts. To allow for more detailed statistics and comparisons between relevant groups of surveyed individuals, we also asked participants to provide detailed information on their professional background. This has allowed us to describe and compare survey results across hierarchical levels and self-assigned competence levels of respondents.

In addition to the descriptive statistics, we have developed two rankings to compare use cases for the financial industry. The rankings provide an objective approach to monitoring the industry's views regarding the most prominent use cases over time and will help give readers an informative overview of the most significant Blockchain developments for their industry.

The survey results include responses from 21 different countries, most of which are located in Europe.



Most represented industries by the respondents

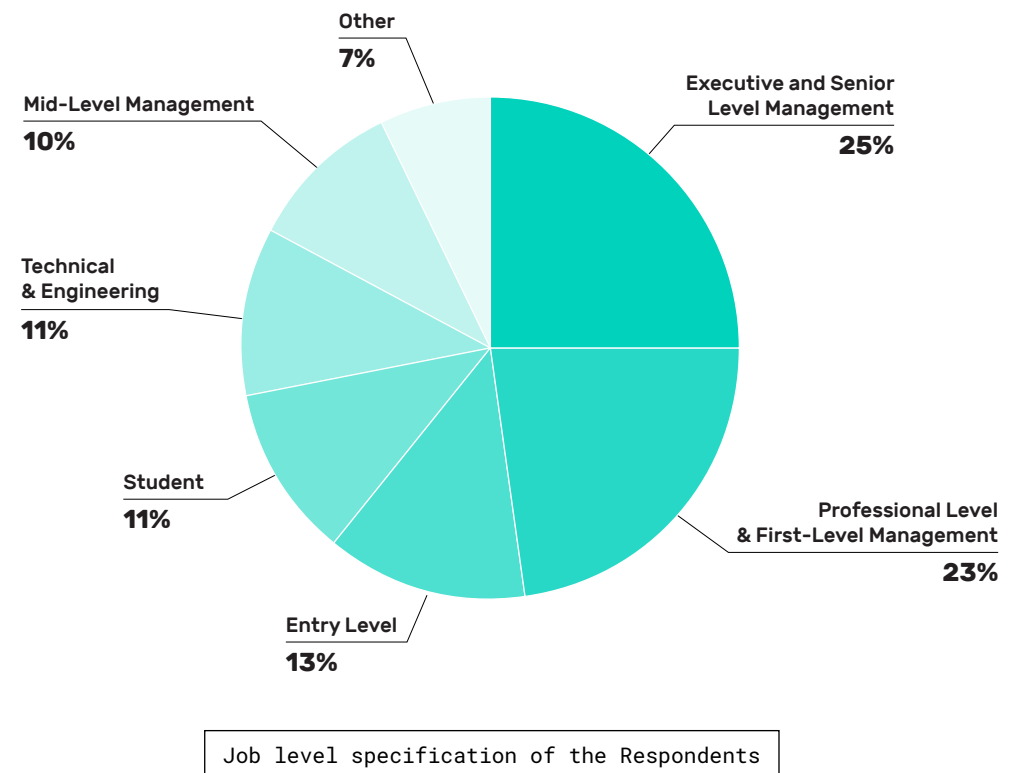
INTRODUCTION

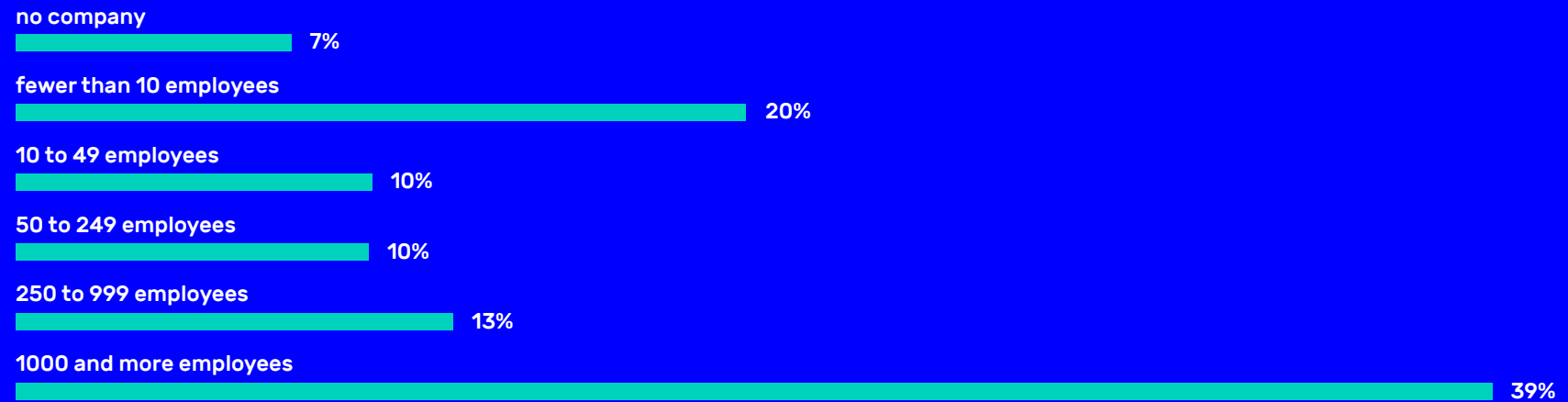
Specifically, 61% of the replies are from German respondents, followed by the second largest group of 8% of British respondents. In terms of age, the full sample ranged from 19 to 58 years. The average age of a respondent from the full sample is 34, whereas more than half of the respondents are aged between 26 and 37.

Most respondents work in Financial Services (31%) and Information Technology (24%) and another 15% in Academia and Research. Transport and Logistics, Energy, Advertising, Public Relations and Marketing, Law, and Government and Public Services add up to another 17%.

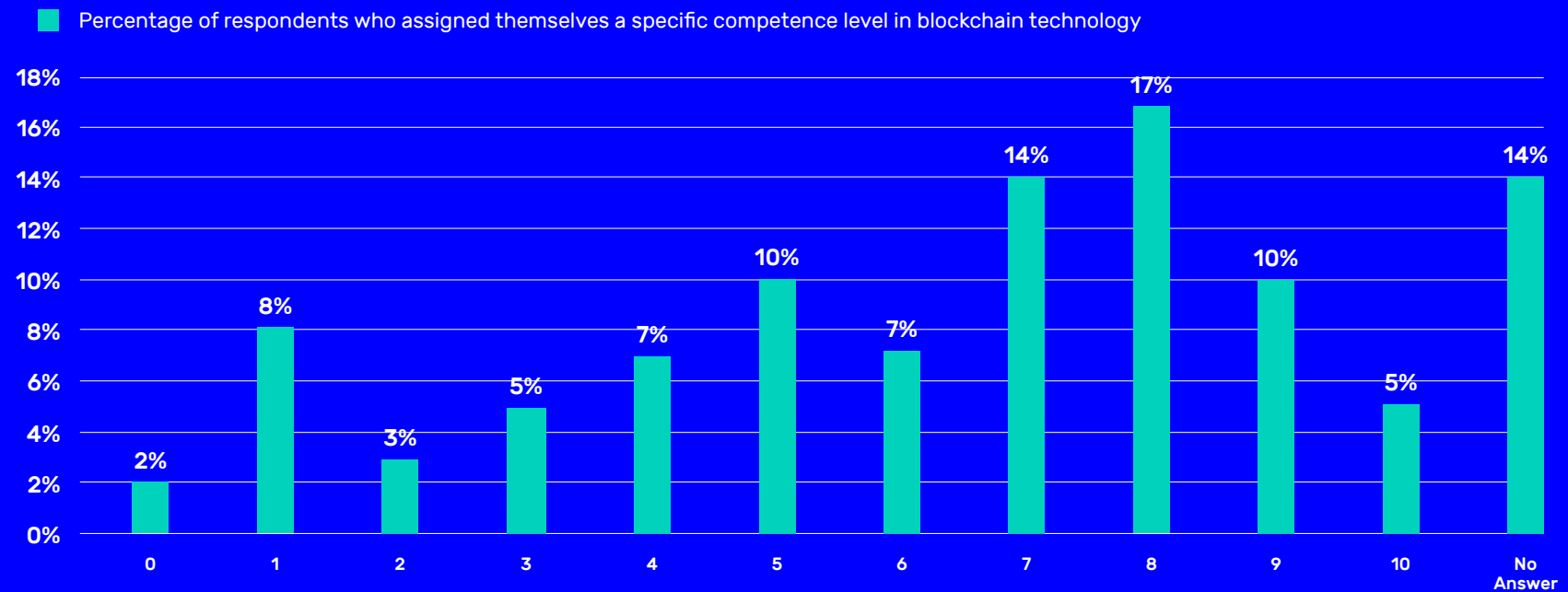
A majority of respondents thus work for large companies with 1,000 or more employees (39%). Small companies with fewer than 10 employees constitute the second largest share. One quarter of respondents specify their job level as Executive or Senior-Level Management. With respect to management positions, Executive and Senior-Level, Mid-Level (10%), and First-Level Management (23%) add up to a 58% share of responses to the survey. Further information comes from respondents with a Technical and Engineering background (11%).

The survey mainly targeted individuals with a connection to the Blockchain ecosystem. Hence the self-assigned competence level of respondents is rather high, as shown in the Figure. More than 50% of respondents estimate their individual Blockchain competence to be relatively high (6% or more). The average self-assigned Blockchain competence among all respondents is 5.12 on a scale from 0 to 10.






Company sizes of the respondents' employers



Self-assigned blockchain competence by respondents

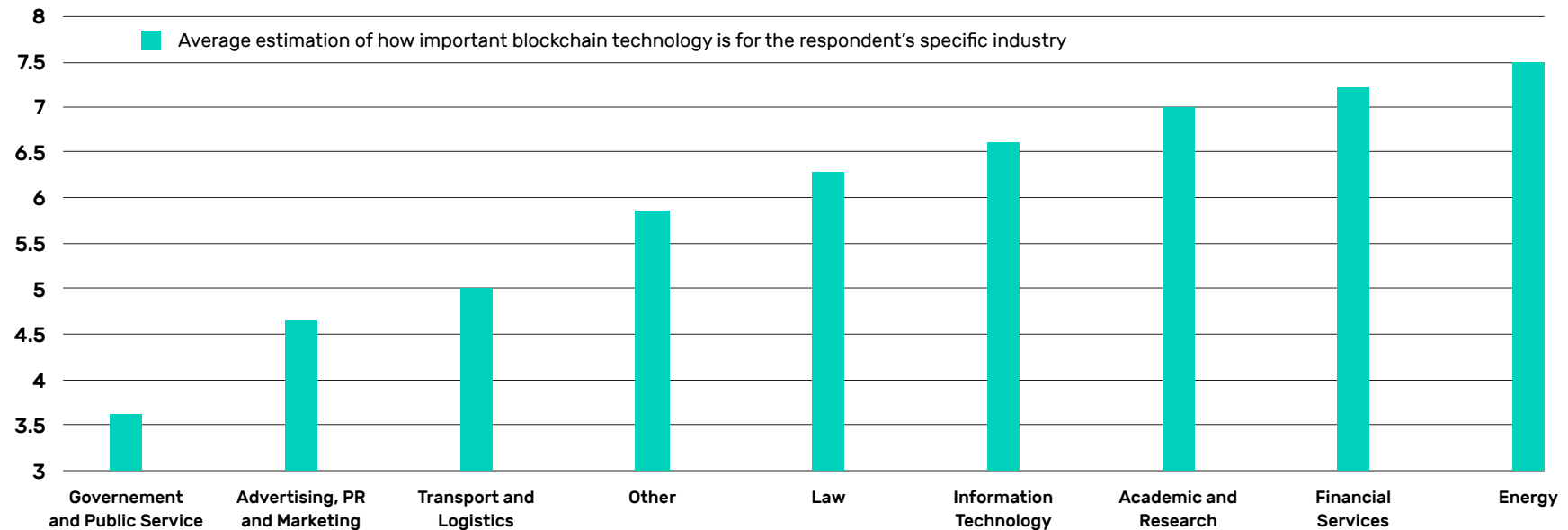


Blockchain has been recognized as a highly disruptive technology across several industries. The greatest impact of Blockchain is expected to be on the Energy and Financial Services industries, closely followed by Information Technology and Law. Respondents working in Transport and Logistics, Advertising, PR and Marketing, and Government and Public Services assign the technology a relatively low level of relevance for their industry.

GENERAL FINDINGS

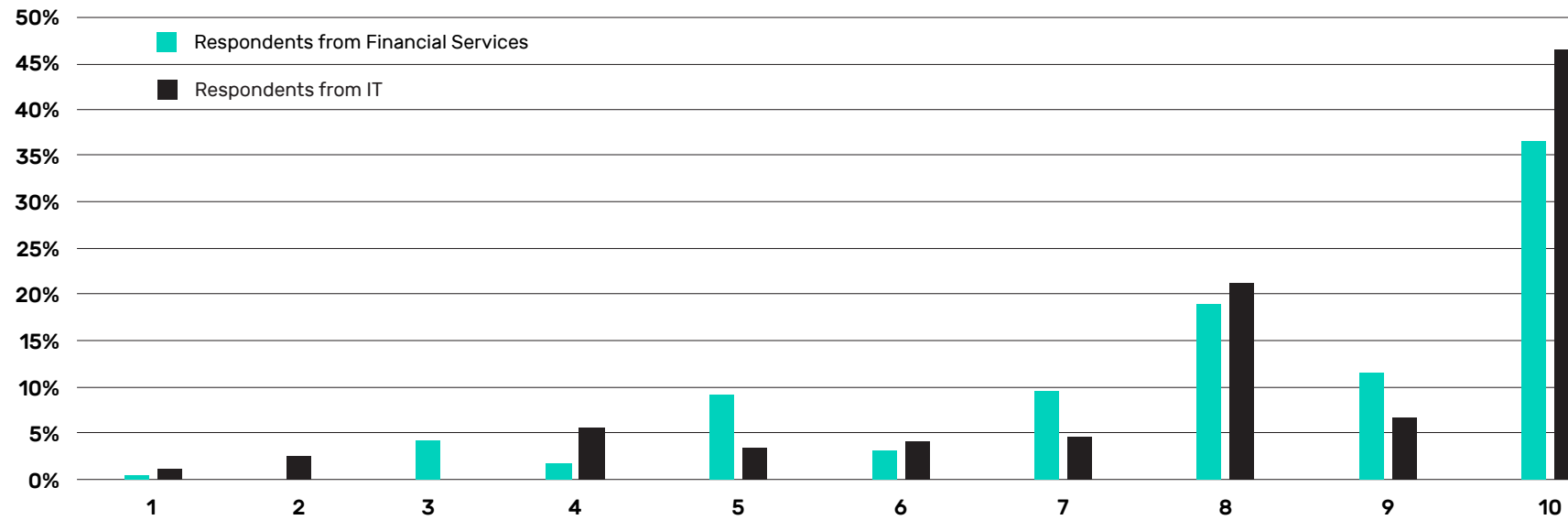
Respondents see the highest average impact in the Energy sector (7.5 on a scale from 0-10). This reflects current developments and publications focusing increasingly on Blockchain applications in that sector. As expected, the importance of Blockchain technology has also been assessed as high for Financial Services (7.2). Respondents also see Blockchain as important for Academia and Research (7), Information Technology (6.7) and Law (6.3).

Despite the fact that Transport and Logistics industry players like Maersk and the Port of Antwerp are currently investigating Blockchain to streamline supply chains, create uninterrupted product traceability and minimize counterparty risks through automated delivery-vs.-payment contracts, the impact on Transport and Logistics is seen as average (5). Government and Public Services (3.6) are not expected to experience a rapid change due to the emergence of Blockchain technology.



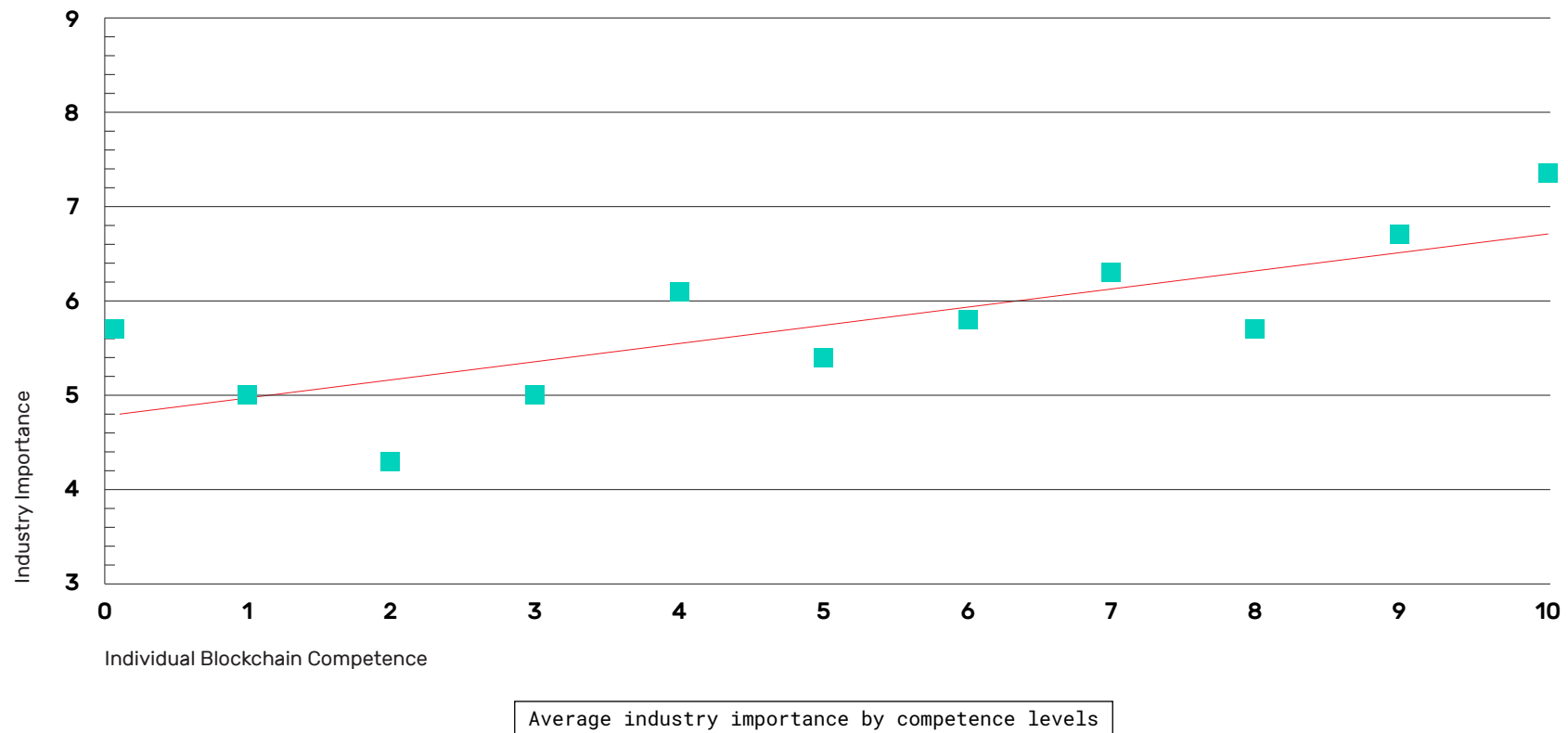
Perceived importance of blockchain technology for specific industries

More than 45% of respondents with an IT background consider Blockchain technology as highly important and a major game changer (10/10). In comparison, only 37% of respondents from the financial sector assess a 10/10 rating for their industry. Overall, 72% of respondents working in the FINANCIAL SERVICES industry assess the importance for the industry as 8/10 or higher.



Perceived industry importance by Financial Services and IT specialists

The more educated a respondent, the higher he or she perceives the industry importance of Blockchain technology. Respondents with a high competence level tend to estimate the importance of the technology for their industry higher. This can either mean that people with a deep insight into Blockchain are overestimating its impact, or that people with lesser insight do not see the full potential of Blockchain applications.



More educated respondents see greater impact

Respondents were allowed to choose as many drivers as they liked from a defined set in answering the question “What drives your Blockchain journey?” These drivers encompass Competitive Pressure, Counter New Market Entrants, Cost/Efficiency, Understanding the Hype, Create New Businesses, and other than proposed.

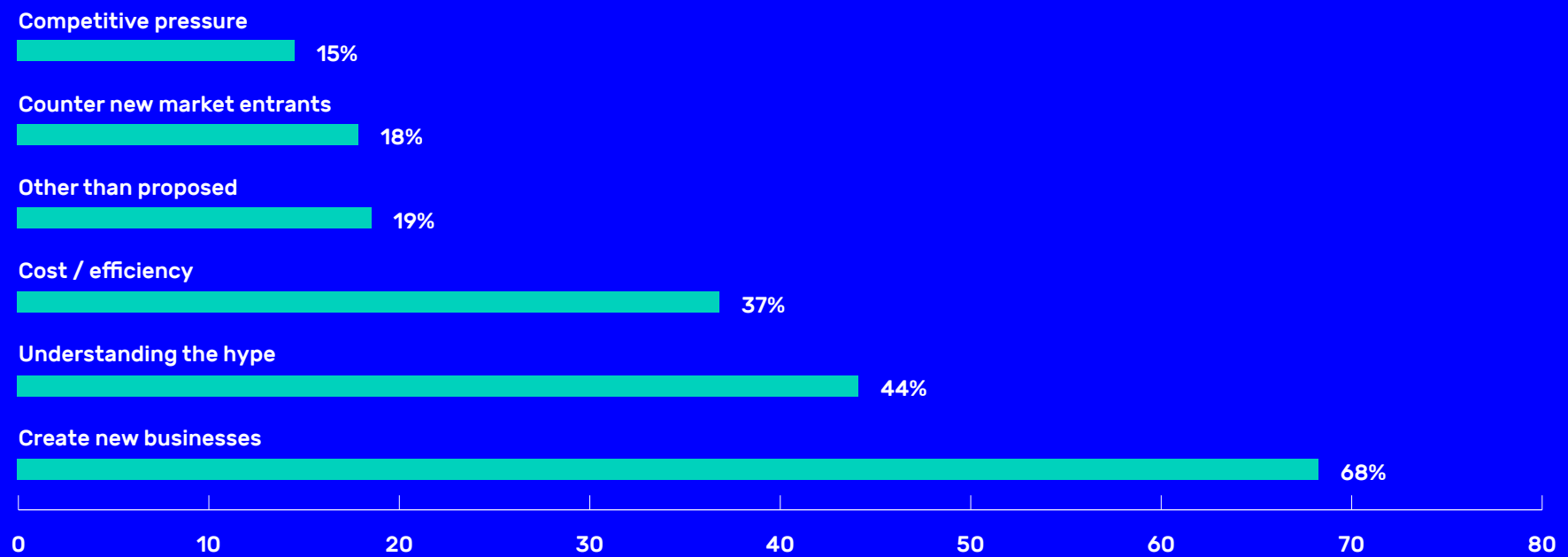
The question focused on the individual respondent, not representing his/her employer. We assume however that the choices made are representative of companies’ interests and personal interests alike. The choices Competitive Pressure, Counter New Market Entrants, and Cost/Efficiency are predominantly related to companies, while Understanding the Hype, and Create New Businesses may reflect both personal and corporate objectives.

The result is, clearly, that creating new business opportunities is the main driver for respondents wanting to engage in Blockchain.

We can also observe a strong urge to learn more about Blockchain indicated by a large portion of respondents still wanting to understand the hype about Blockchain.

Cost/Efficiency aligns well with general observations of companies collaborating in consortia. Interestingly, few respondents engage in Blockchain to counter new market entrants. This could indicate that companies do not fear being disrupted by Blockchain (contrary to what many media articles suggest). It will be interesting to see whether this assessment will change with increasing knowledge of Blockchain (c.f. the following section on insufficient knowledge being one of the major hurdles to engaging in Blockchain). Competitive Pressure has thus far generally not been a major driver to engage in Blockchain. This aligns well with the observation of companies jointly collaborating on Blockchain efforts instead of using Blockchain solely to their own competitive advantage. This is also compatible with the fact that most Blockchain applications are still in their infancy. Once they become more important for revenue streams, competitive pressure will likely increase.

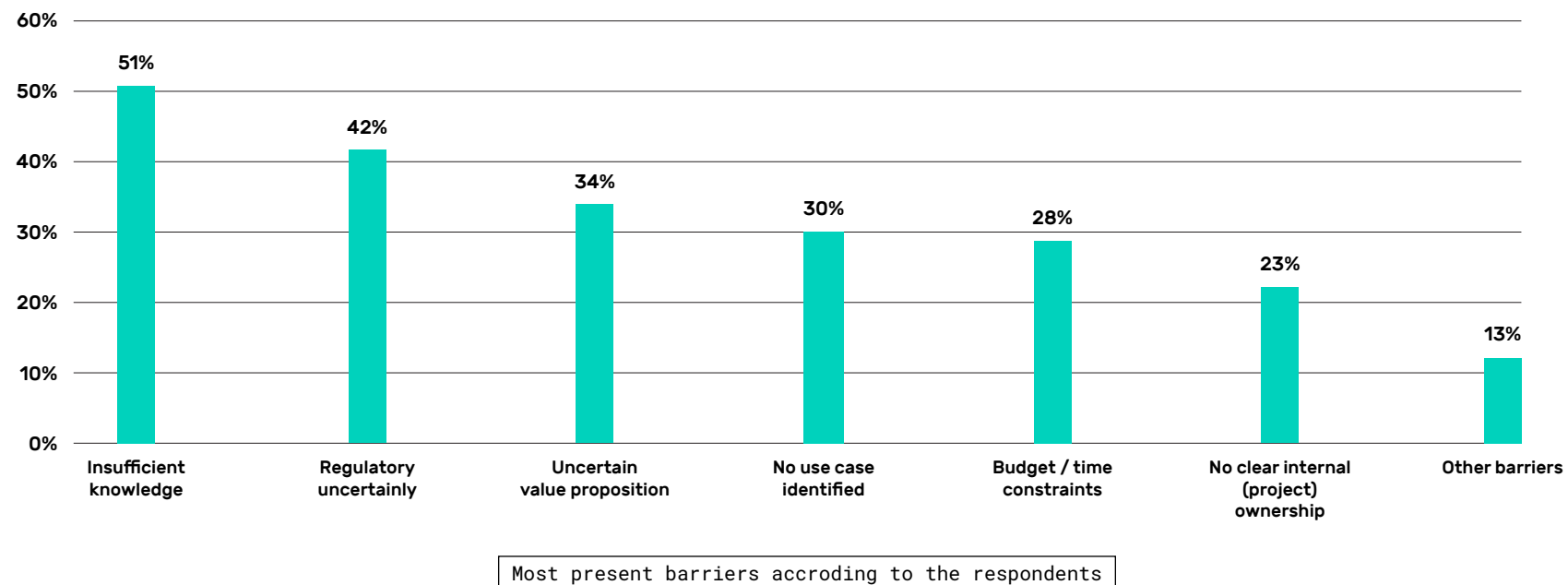
New business opportunities are the main
driver to engage in Blockchain



Most revealed journey drivers by the respondents

When it comes to implementing Blockchain-based solutions in specific financial settings, the proposed set of barriers for respondents to choose from included Insufficient knowledge, Regulatory uncertainty, Uncertain value proposition, No identified use case, Budget and time constraints, and No clear (project) ownership. Respondents were allowed to pick as many barriers as they liked. On average, respondents picked 2.2 barriers as being significant obstacles to the implementation of Blockchain-based solutions within companies.

About half of the respondents (51%) identified insufficient knowledge as a major barrier to innovation, followed by regulatory uncertainty (42%). It can thus be concluded that Blockchain technology expertise is still scarce and that companies are anxious to acquire experts for internal exploration and development but are hesitant to do so until the regulatory environment is established. This is a major hindrance, since regulators, especially in Germany, follow somewhat of a wait-and-see approach to what evolves within the industry.



Insufficient knowledge is the main barrier
for Blockchain innovation

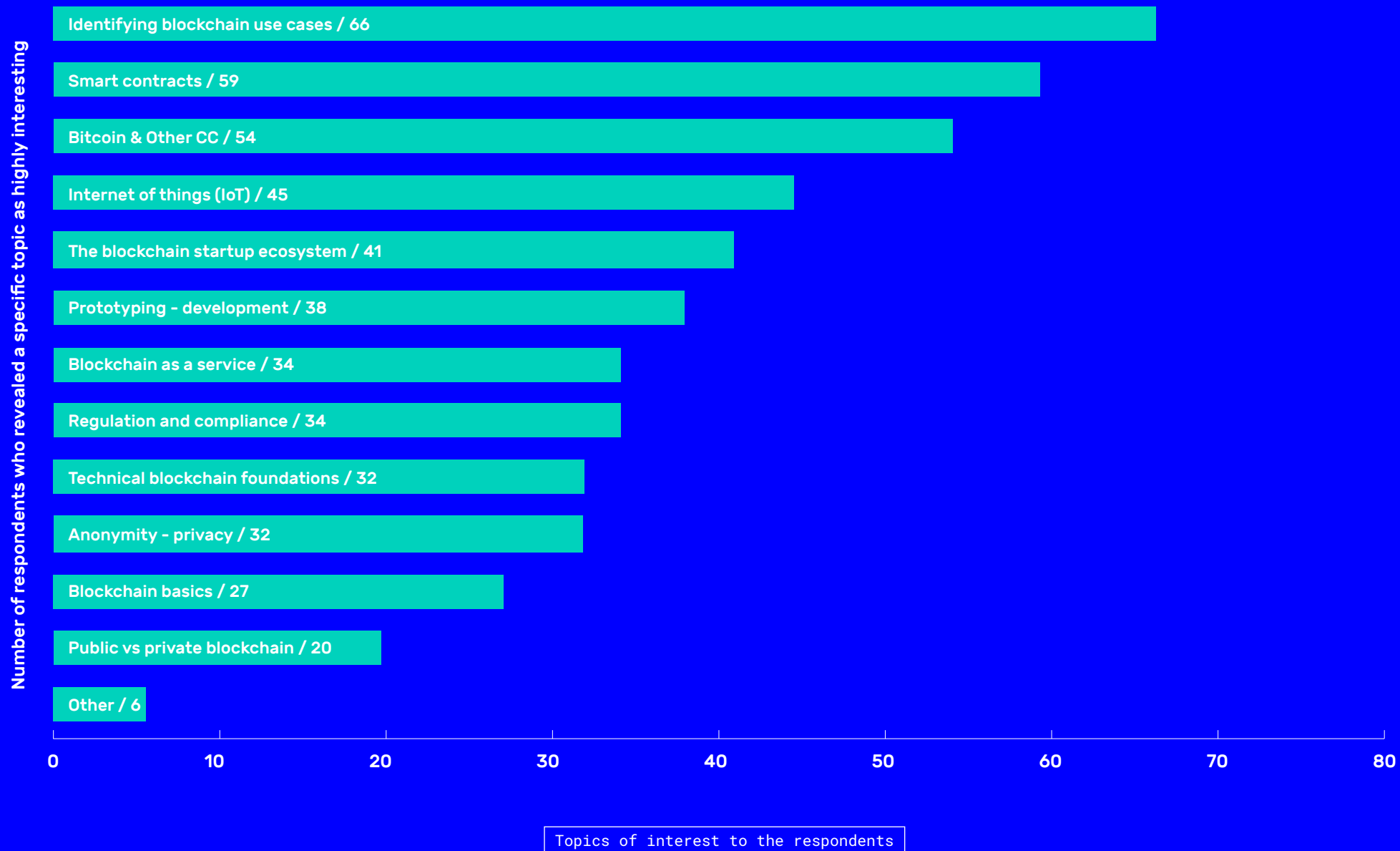
Blockchain Monitor asked respondents to state their individual Blockchain-related focus of interest from a proposed set of issues (multiple answers were allowed). Respondents were most interested in Blockchain use-case identification (66), which leads to the main takeaway that most respondents are still in a phase of learning and education. Still, many respondents are already interested in delving deeper into Blockchain and working on implementations, especially regarding Smart Contracts, which is deemed the second most important area, probably because it promises both huge cost reductions and the opening of new markets. High relevance seems to be assigned to Bitcoin and other cryptocurrencies, which is not surprising since Bitcoin is the first use case of Blockchain technology.

Given that respondents identified insufficient knowledge as a major hurdle, it is interesting to note that Blockchain basics (27) and technical foundations of the technology (32) do not constitute focal topics for the respondents. This suggests that respondents may perceive a lack of knowledge on the part of their co-workers rather than themselves.

As Blockchain is considered a backbone technical infrastructure for the Internet of Things (IoT), we observe 45% of respondents showing a focus on the intersections of Blockchain and IoT. Furthermore, the topics of Regulation and Compliance (34), as well as Public vs. Private Blockchain arrangements (20) are relatively uninteresting – this aligns with respondents currently focusing mainly on new business opportunities and potentially focusing on regulatory and privacy issues later on. In the case of Public vs. Private Blockchains this may also indicate that respondents have already made a choice whether to build on a public or a permissioned infrastructure.

Respondents were also asked to suggest topics that were not listed but which they considered urgent and relevant. The results show that the Smart Contracts platform Ethereum appears to get significant attention from financial services managers.

Blockchain journey is still in its infancy: identifying use cases considered most important



Many Blockchain use cases can be identified for the FinTech sector. The big question is which use cases are most relevant and which are less so? We tackle that question in this section by presenting two rankings that highlight the most relevant use cases for the financial services industry. We thus find cross-border payments to be of most relevance, followed by micropayments. We compared this to the use cases that are actually worked on and found that the industry is, overall, much in line with expert opinion. Exceptions are KYC processes, micropayments and crowdfunding.

RANKINGS OF USE CASES

Respondents were asked to estimate a proposed set of use cases according to the two dimensions of potential profit impact and complexity of realization. The profit impact constitutes the revenue potential or efficiency gains and cost savings from streamlining processes by applying Blockchain technology in specific settings. A use case's complexity of realization includes the effort to implement the technical architecture, regulatory barriers and uncertainties, as well as the feasibility of enlisting the critical number of financial players and institutions as participants. The following rankings constitute an order of the use cases according to the respondents' estimation about the positive effect on profit potential and the negative impact of complexity of realization. From there, we can analyze the low-hanging fruit, i.e. use cases that require comparably simple implementation efforts with a comparably high profit impact. We are thus able to rank the use cases by "what should be done?" To contrast this result, we also asked respondents what they think "will actually be done in financial institutions". Comparing the results of the rankings indicates whether the financial industry is currently misguided or on the right path of innovation.

Asking respondents to rate use cases in relation to complexity of realization and potential profit impact allows us to chart them in a matrix. Thus, a low value of complexity is most favorable combined with a high profit impact.

The lowest-hanging fruit is Cross Border Payments. According to respondents, the technology is said to be implemented fairly easily, and to be highly impacting. This result is in line with expectations, as systems that streamline cross border payments, such as Ripple, already exist. Therefore, applying Blockchain technology in the realm of international transactions implies either copying and adjusting existing networks and systems, or tethering the internal processes and structures to existing providers. This is a comparably basic implementation effort and highlights the effectiveness of Blockchain technology's p2p-network structures at overcoming national and jurisdictional borders.

The implementation of Micropayments and Crowdfunding has been estimated to require the least complex effort. Although these use cases do not offer a high profit impact for financial institutions, the perception among respondents is that they should still be implemented first. Crowdfunding via ICOs presents an alternative funding vehicle for companies, thus far startups especially. The role of financial institutions in this area can be advisory in nature, i.e. consulting on ICO-financing executions for mid-sized and large companies, since ICOs are currently not yet a valid funding option for larger companies. As opposed to start-ups, ICOs are currently

Low-hanging fruit: which use cases should be implemented?

not a valid funding option for larger companies however. With regards to Micropayments, considerable revenue streams for banks are barely recognizable. Micropayments are made possible on Blockchains with transaction costs at a fraction of a cent. Instead of offering micropayment services, financial institutions could promote certain services they provide to customers and receive micropayments in return.

In contrast, Post-trade Processing can be considered the most complex application, but which in return produces the highest profit impact. Traditional architecture in Post-trade Processing is highly complex, with numerous parties involved. It has historically grown, as more players entered the market to serve the specific needs of brokerage, custody, risk mitigation, and other types of processing. Respondents realize the potential of Blockchain to essentially replace intermediaries and create a trustless environment for efficiently processing securities transactions. Decentralized verification processing introduces new levels of efficiency in the transaction execution, overcoming costly risk mitigation.

A cluster of use cases with moderate complexity of realization and a comparably moderate profit impact can also be identified: Bonds and Loans, Asset Tokens, and Asset Securitization. These represent further financing options for companies, which can be highly improved by the application of Blockchain technology. Blockchain-based Bonds and

Loans can be administered via the Blockchain, thereby enabling secondary markets. Asset Tokens reflect the fact that any form of value can be represented and transferred via a specifically created Blockchain-token (a Blockchain-compatible and tradable representation of a physical or non-physical valuable object). In this area, Asset Securitization involves the ownership structure and transaction history of assets, which can be displayed via the Blockchain.

Another identified cluster has a moderate profit impact with a comparably higher complexity of realization. This cluster includes Blockchain applications for scenarios in Trade Finance, Derivatives, and Know-Your-Customer (KYC). These application scenarios have as a prerequisite a critical size of network participants/industry players to unravel their full potential for efficiency gains. With regards to Trade Finance, processes involved in letters of credit, bills of lading or guarantees can be automated and made increasingly cost-efficient via the use of Blockchain and smart contracts. In the long term, financial institutions that act as costly intermediaries in trade finance settings will potentially become redundant, as the Blockchain enables transaction and verification in a trustless environment minimizing counterparty risk for the trading entities. There are several means and scenarios whereby trade finance processes can be streamlined using Blockchain technology.



Use case assessment: The low hanging fruits

As with Trade Finance, KYC requires a critical number of institutions to share verified information about potential clients and customers. Utilizing the immutability of Blockchains, the verification status and thus the validity of relevant documents can be stored, checked, and shared. This reduces the redundant verification processes inherent in several banks gathering one customer's information multiple times. KYC is the only non-payment related application in our proposed set of use cases, and according to respondents does not significantly impact profitability.

The use case of Derivatives includes automated Blockchain-based derivatives that are basically generated by and rely on smart contracts. Processes can thereby be automated and secondary markets implemented. Furthermore, Blockchain facilitates real-time collateral management for derivatives. Other than in the case of Trade Finance and KYC, a network of financial institutions, solely, is not necessary to create Blockchain-based derivatives. Financial institutions can theoretically offer derivatives in existing Blockchain systems and are experimenting to a degree with that. However, derivatives trading and offerings on interbank-governed Blockchains certainly imply a complex (multi-) ledger approach. It can be concluded that network effects are an essential component in respondents' evaluation of specific

use cases. Accordingly, this prerequisite increases the complexity of implementation significantly, compared to the first cluster.

An innovative procedure developed by Blockchain Monitor allows for the reduction of the two dimensions of complexity of demand and profit impact to a one-dimensional ranking of use cases that companies should focus on for implementation. Cross-border Payments thereby constitute the highest valuation. Furthermore, as Micropayments are implementable fairly simply, respondents see the opportunity for new business models and profit centers for financial institutions. The features of Blockchain presenting a transparent track of ownership of real and digital goods in the form of a Blockchain-compatible asset token are highly promising applications, according to respondents. These include the interrelated topics of Asset Securitization, Asset Tokens, Clearing and Settlement, Crowdfunding and Bonds and Loans. Those use cases have been evaluated quite similarly. Moreover, the increased complexity of use cases that require a comprehensive infrastructural arrangement with a critical number of players is ranked less important. The least important Blockchain use cases in the financial industry are reportedly Trade Finance, Derivatives, and KYC applications.

Rank	Use Case	Value
1	(Cross-border) Payments	570
2	Micropayments	543
3	Asset securitization	537
4	Asset tokens	536
5	Post-trade processing – Clearing and Settlement	534
6	Crowdfunding	532
7	Bonds & loans	523
8	Trade finance	523
9	Derivatives	521
10	Know-Your-Customer (KYC), information storage and validation	514

Use case ranking: Which use cases should be implemented?

Focusing on the responses of senior-level management allows us to rank use cases with regards to whether they will actually be implemented and gives us an understanding of what is currently being developed and tested by financial institutions. Comparing this ranking with that of the low-hanging fruit further allows us to determine whether companies are on the right track, or need to refocus their efforts.

With a comparably high edge, post-trade processing proves to be the use case in the financial industry that is currently most worked on. This can be explained by the tenor of last year's publications and press releases by numerous banks and other financial players involving successful trades of securities on the basis of Blockchains.

Cross-border Payments and Asset Securitization, which partly interrelate with Post-trade Processing, constitute use cases that are considered highly relevant and are being worked on. Here, the industry is well aligned with expert opinion. This is also true for Bonds and Loans as well as Trade Finance, which do not experience significant changes compared to the low-hanging fruit ranking, which seems to be of low importance. For many banks, Trade Finance does not constitute an essential part of the revenue stream. Furthermore, banks take risky positions in these settings and will potentially be disintermediated in the mid-term by bank-less Blockchain solutions. As with Bonds and Loans,

the profit impact of processing these products on the basis of Blockchain and automating payments via smart contracts seems to be rather insignificant in the industry.


Micropayments and Crowdfunding show a strong divergence from the low-hanging fruit ranking. The reason might be that these do not constitute business cases of traditional banking and large institutions. Crowdfunding emerged when banks avoided risky investments and loans during the 2008/09 financial crisis. On the other hand, retail investor funding and ICOs are interesting use cases for venture capital. Micropayments offer negligible revenue streams for large institutions, as opposed to niche payment providers, which explains why it is not a standard use case being worked on.

A more interesting contrast with the "what should be done" ranking are KYC processes. These are deemed a highly relevant use case by senior-level management in the financial services industry, with an evaluation of 549. KYC is a compliance-relevant topic, for which banks and financial institutions have experienced significantly increasing costs over the past years. It can be assumed that respondents with a non-financial background underestimate the potential savings attributable to reducing redundant information processing in the industry, which would explain the large gap relative to the "low hanging fruit" ranking.

Actual implementation of use cases: senior management's expectations

Rank	Use Case	Value
1	Post-trade processing – Clearing and Settlement	711
2	(Cross-border) Payments	623
3	Asset securitization	576
4	Know-Your-Customers (KYC), Information storage and validation	549
5	Derivatives	523
6	Asset Tokens	501
7	Trade finance	490
8	Micropayments	485
9	Bonds & loans	443
10	Crowdfunding	432

Use case ranking: Which use cases are actually being implemented?



Companies have much lower perceived Blockchain competence compared to individual experts within the companies. Thus, small teams need to drive Blockchain innovation within companies. But there is still a long way to go to spread Blockchain knowledge within the multiple departments of large corporations, because insufficient knowledge is identified as the most important barrier to Blockchain innovation. Another difference is that small businesses focus on new business opportunities, while large corporations follow a more holistic approach.

COMPANY SIZE MATTERS

The importance of Blockchain technology, as perceived by respondents, differs across the company size of the respondents' employers. Most prominently and in accordance with previous findings, companies with 10 to 49 employees are mainly seeking new business opportunities and therefore estimate the technology's importance to be relatively high (9.1). Respondents who do not work in a company (7.4) and those who work in companies with fewer than 10 employees (7.25) rate the technology's importance significantly higher than respondents in mid-sized companies (50-249 employees: 5.14; 250-999 employees: 5). Respondents who work in large companies assess the importance of Blockchain at 6.2, slightly below the average of 6.5.

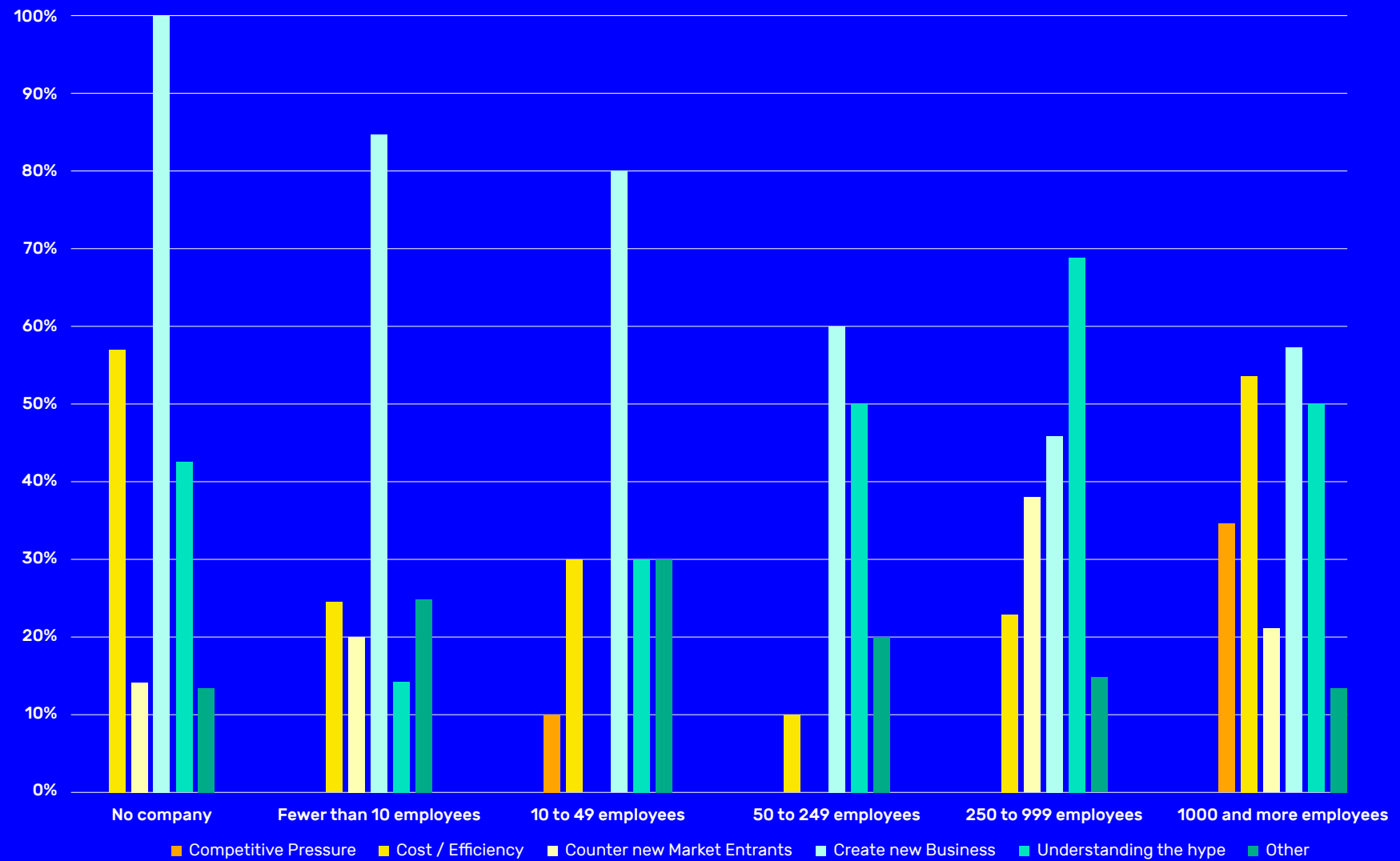
It is evident that respondents with no company engagement and small companies with up to 49 employers see a huge potential for the technology to disrupt their industry and potentially change the competitive landscape. The availability of open source code and open platforms like Ethereum lowers the barriers for individuals and small companies to engage and develop on top of existing technical infrastruc-

ture. Furthermore, the huge potential for the automation of business processes via smart contracts will allow small teams and individuals to create lean solutions that harness the advantages of Blockchains and challenge incumbent businesses and infrastructures. In comparison, the low assessment of the industry importance of the technology by mid-sized and large companies may stem from the perception that Blockchain is more hype than substance. Their current technical infrastructures are relatively complex and would require huge efforts to be reorganized towards Blockchain systems and infrastructures. Hence, an adoption by mid-sized and large companies would be a costly and potentially time-intensive undertaking, which is associated with a slow and stepwise adoption by established industry players and may inform the perception of low urgency.

We observe differing patterns of Blockchain engagement in relation to company size. Small businesses tend to embrace new business opportunities most and are less concerned about other drivers, such as cost/efficiency, new market entrants etc.

	No company	Fewer than 10 employees	10 to 49 employees	50 to 249 employees	250 to 999 employees	1000 or more employees	Average full sample
Average number of choices	2.3	1.7	1.8	1.4	1.9	2.3	1.9

Identified barriers by company size



Respondents' journey drivers by company size

Large corporations however follow a more holistic approach and rank all drivers as equally important. Reasons may be found in greater innovation budgets at large corporates that allow for more holistic approaches; it may also indicate that corporates are already heavily invested in research in different areas and have not yet decided on focus areas to pursue. Another interpretation is that large corporations have existing business models where Blockchain can be used to save costs, for example, while startups need to focus on new business models. The average number of choices by respondents, broken down by their employer's company size, confirms our assumption of a rather holistic approach by large companies to their Blockchain journey (2.3 choices). The average number of choices made by respondents of the full sample is 1.9.

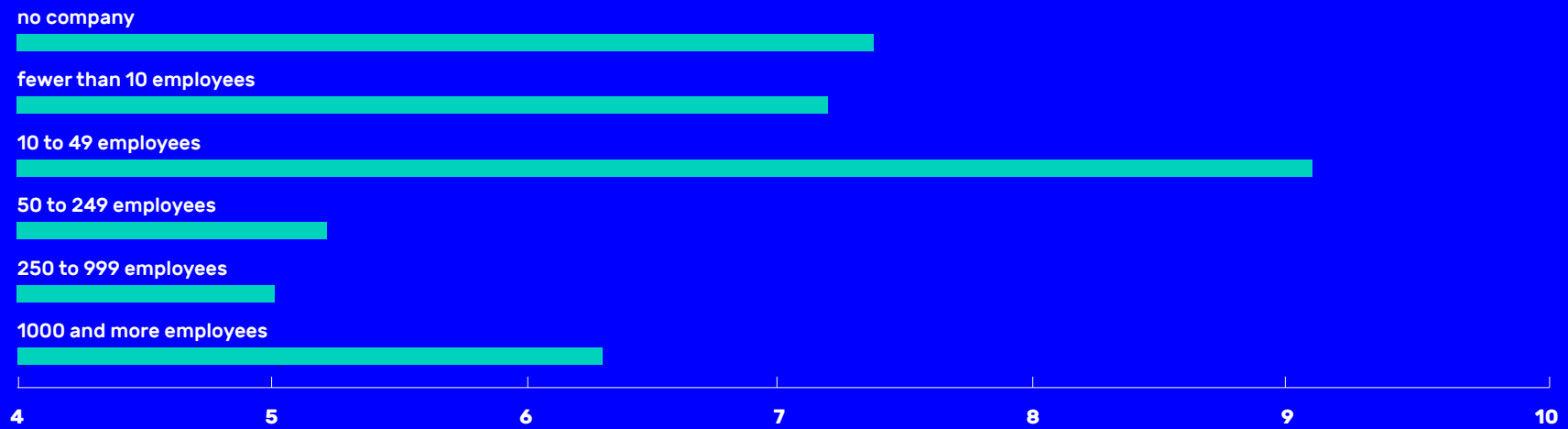
Overall, for large companies Blockchain technology is definitely considered an urgent concern, and its potential to yield new business areas (Create New Businesses) and optimize incumbent corporate structures and processes (Cost/Efficiency) is being explored.

Another difference between small and large companies can be found regarding the barriers to innovation. Insufficient knowledge and expertise hinders 69% of mid-sized companies (250 to 999 employees) and roughly 60% of small businesses with 50 to 249 employees from implementing Blockchain solutions. About 42% of respondents consider Regulatory Uncertainty as a major barrier for implementing

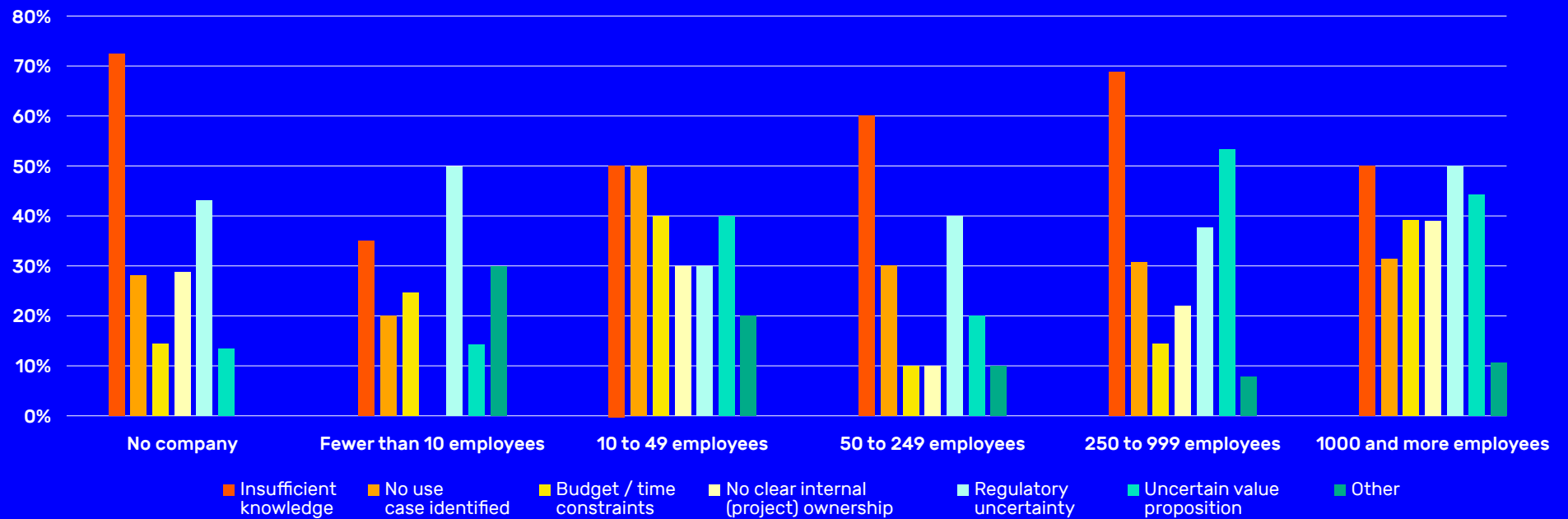
Blockchain-based solutions. This could imply that currently developed solutions are not being implemented due to Regulatory Uncertainty, which imposes a significant obstacle, especially for large companies (1,000 or more employees) and small businesses with fewer than 10 employees. In fact, 50% of the respondents working for large companies, and 50% of the respondents working for small companies (fewer than 10 employees) consider unclear legislation as the major hurdle.

For 30% of respondents, use cases are not identified, which prevents them from implementing Blockchain solutions. For 34%, the value proposition of Blockchain-based solutions is uncertain. According to the respondents, Budget and Time Constraints (28%), as well as Internal Allocation of the Project Ownership (23%) do not constitute a primary barrier. However, they constitute an undeniable barrier for large companies, according to 39% of respondents who work in a company with more than 1,000 employees.

Further breaking down the barriers of most concern across company sizes, large companies of 1,000 or more employees seemingly face a more extensive set of barriers and consider all of them important. Within large companies, implementing Blockchain solutions and securely replacing or complementing incumbent structures and processes is more complicated. Building a Blockchain solution from scratch definitely differs from building Blockchain solutions to replace existing processes on a large scale.



Perceived importance of blockchain technology across company sizes



Perceived industry importance of blockchain by job level



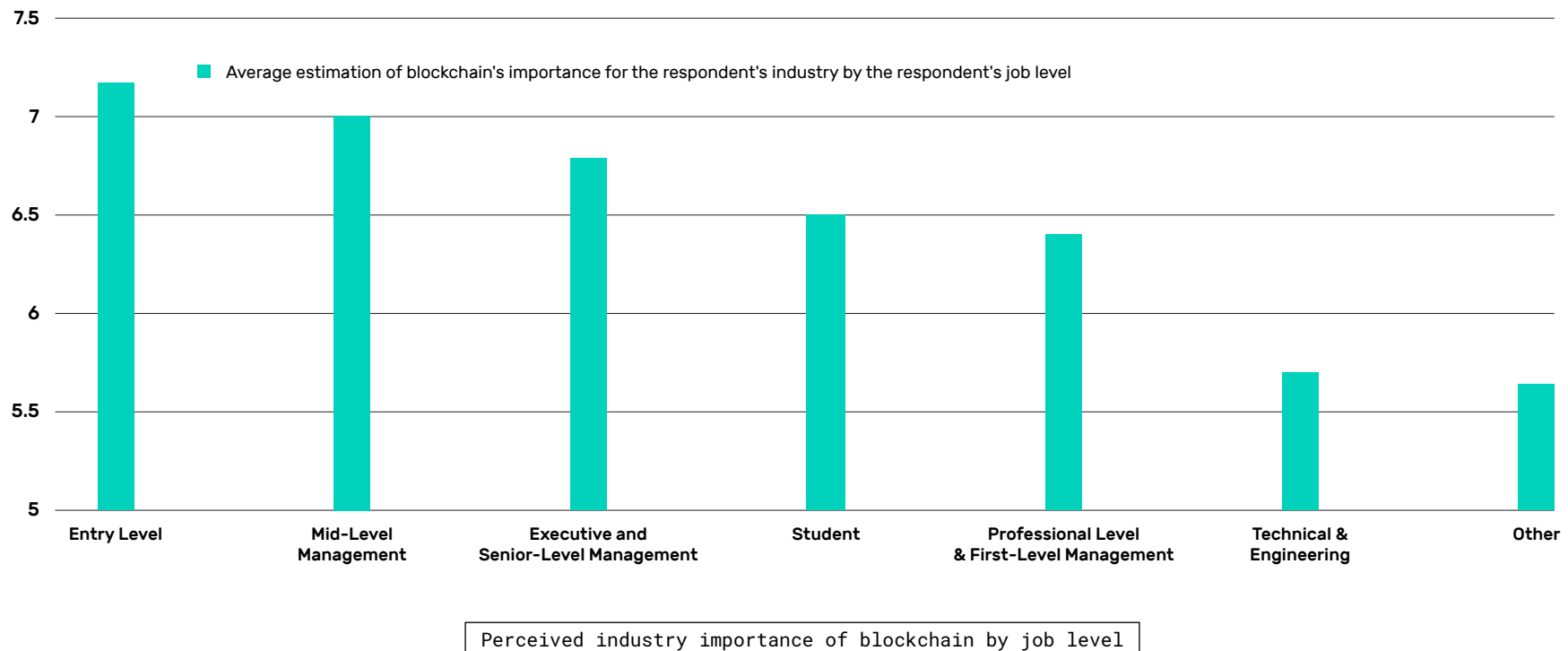
The importance of Blockchain technology for the financial services industry is perceived inconsistently across job levels. The relatively high perceived industry importance by managers in executive positions is crucial and an important indicator of the pace of Blockchain adoption within the financial services sector. Across all job levels, except for middle management, creating new businesses with Blockchain is the most important driver for respondents to engage with and become educated regarding Blockchain.

JOB LEVELS MATTER

Entry Level (7.2), Mid-level (7.0) and Senior Level managers (6.8) estimate the importance of the technology for their industry as rather high, above the overall average importance of 6.5. First-level managers (6.4) and respondents with technical or engineering backgrounds (5.7) estimate the technology's importance as relatively low. The rather low rating by engineers and respondents with a technical background seems surprising at first. But by breaking down Blockchain to its technological tiers of cryptography and p2p network systems, it becomes clear that the innovative character of Blockchain stems from the combination of existing technical and mathematical components. Hence it is likely that, for technicians, Blockchain does not impose

a significant hurdle. Moreover, it can be concluded that companies' managers have a more detailed perception of how an application of the technology can significantly streamline complex and multilateral settings and products.

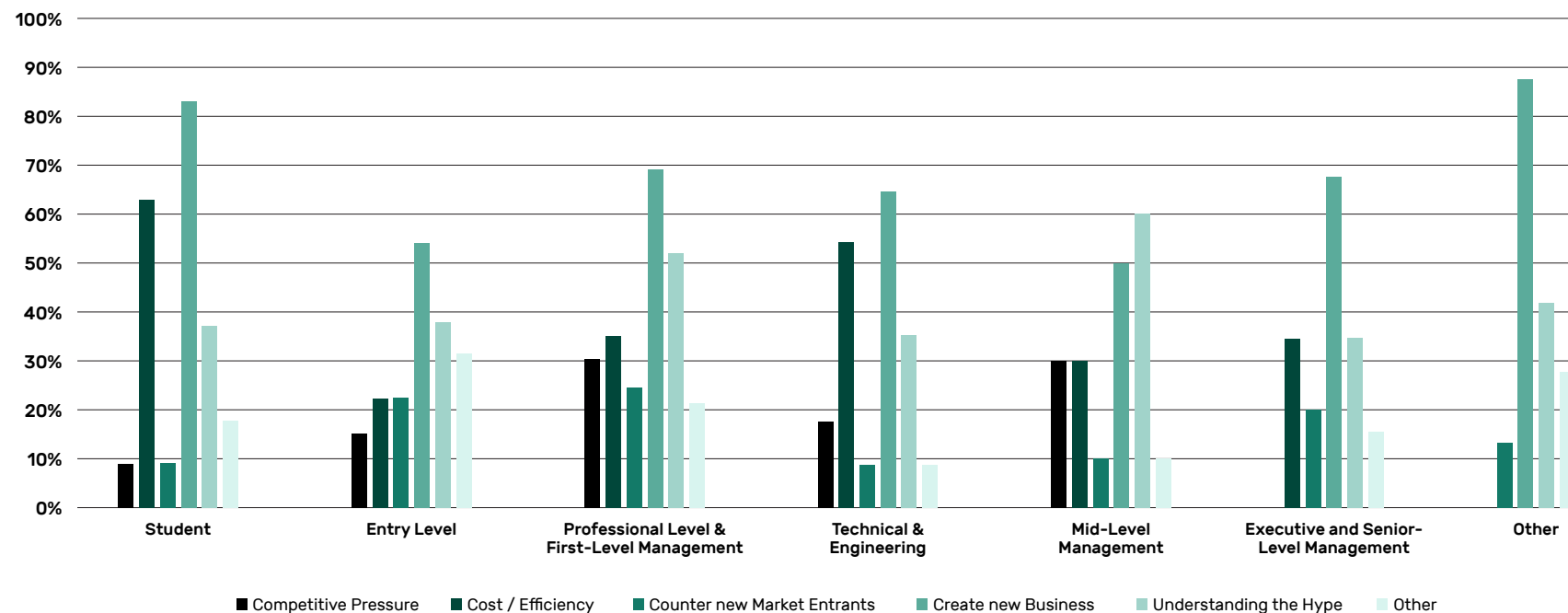
Breaking down the main drivers to engaging with Blockchain by the respondents' job levels, "understanding the hype" is consistently relevant. Among Mid-level (60%) and First-level managers (52%), education about the functionalities and use cases of the technology is most relevant. Entry-level managers (38%), Technicians and Engineers (36%), and Senior-level managers (36%) seem relatively more aware and educated.



Creating new businesses with Blockchain technology is the major driver for engaging in Blockchain across all job levels (except for respondents in Mid-level management positions). Thus, nearly 69% of respondents in a First-level and Professional-level position, 68% in an Executive and Senior-level position, and 63% in an Engineering or Technical position are interested in developing new business applications with the help of Blockchain. In addition, it is noticeable that First-level Management and Executive and Senior-level management strongly disagree that Competitive Pressure is a substantial factor for driving Blockchain awareness. Senior Management does not see competitive

pressure as a reason to engage in Blockchain initiatives at all. This might be attributable to a lack of knowledge, ignorance, or to a surfeit of confidence in internally developed solutions at the executive level.

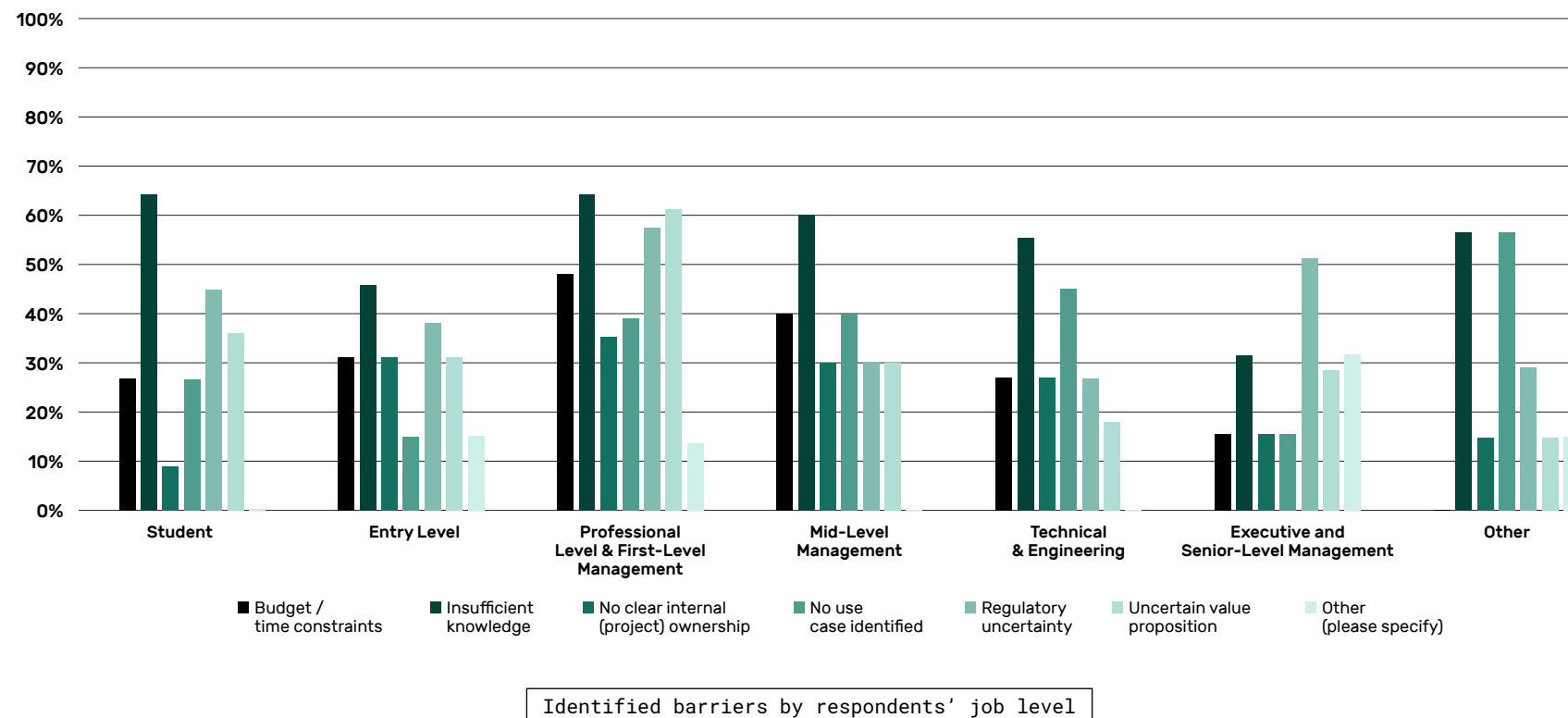
Apart from Technicians and Engineers (54%) and Students (63%), the potential of Blockchain to drive efficiency and reduce costs in existing settings (Cost/Efficiency) is rather uninteresting, ranging from 23% choices by Entry-level managers to 36% choices by Executive and Senior-level managers.



Revealed journey drivers by respondents' job levels

With respect to the barriers for Blockchain innovation and implementation, their relevance is perceived differently across respondents' job levels. 32% of respondents in Executive and Senior-level management positions consider insufficient knowledge as not being an outstanding barrier. This is a rather low percentage, compared to lower hierarchical levels such as Entry-level (46%), First-level (65%), Mid-level (60%), and Technicians and Engineers (55%). Further indicating a lack of knowledge about Blockchain functionalities and

use cases, a lack of perception of where to apply the technology is present across First-level (39%), Mid-level (40%), and Technicians and Engineers (45%). Most concerned with regulatory uncertainty are First-level managers (57%), and more importantly with respect to decisional power, Executives and Senior-level managers (52%). Budget and time constraints do not appear to be much of a barrier for decision makers (16%), in contrast to First-level (48%) and Mid-level managers (40%).



Three important knowledge gaps can be identified: (1) Individuals are perceived to be much more knowledgeable on Blockchain topics than companies are, (2) Mid-level management is under-educated compared to Entry-level employees and Senior-level management, (3) Public Administration and Law show the strongest discrepancy between Blockchain importance for the sector and present Blockchain competence.

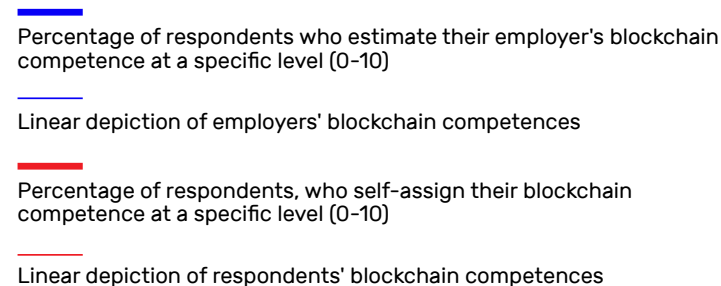
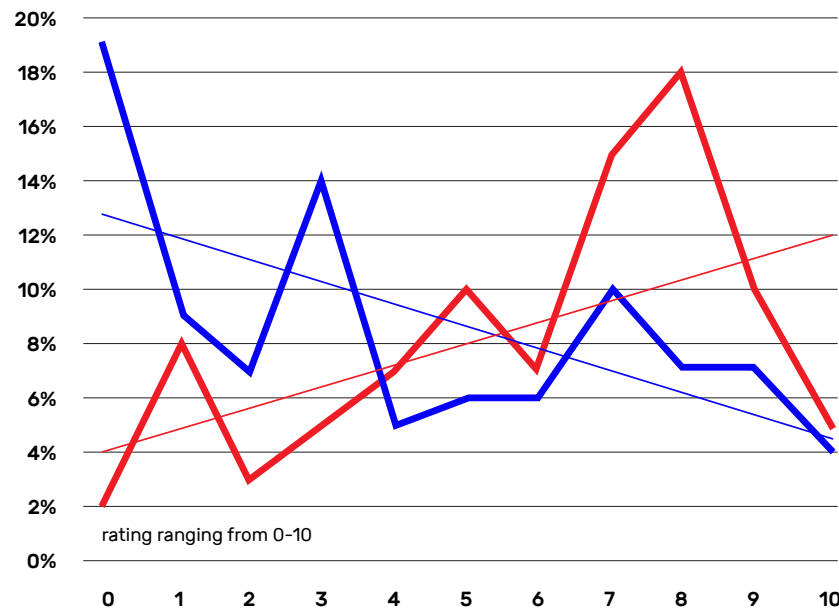
SEVERE KNOWLEDGE GAPS CHARACTERIZE THE BLOCKCHAIN SPACE

Respondents were asked to rate their personal Blockchain competence and the competence of the company they work for on a 0 to 10 scale. One remarkable finding is that the highest average rating of individual Blockchain competence is to find among those individuals outside of the traditional hierarchical corporate management structures.

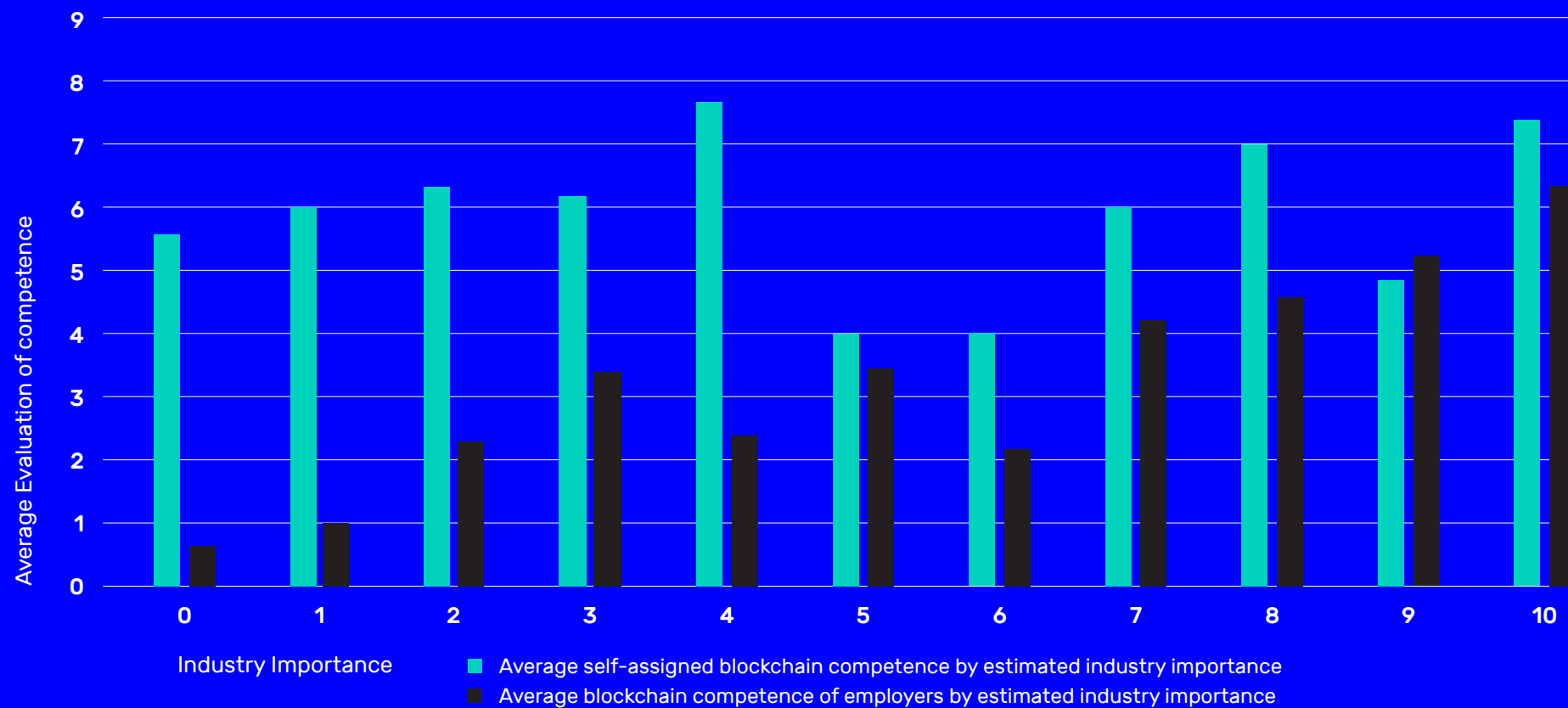
Ratings referring to the Blockchain competence of the respondents' employers allow for comparing individual and corporate competence levels and disclose a significant divergence. The ratings of the competence at the individual and corporate level run diametrically opposed: Most individuals perceive themselves as rather competent while employers' competence is mostly rated rather low with 19% of respondents evaluating their company's knowledge about

Blockchain technology as zero. Only 3.8% of respondents consider companies' Blockchain competence at the highest level 10/10 points.

Noticeably, those respondents who do not estimate a high impact of the technology on their industry, consider themselves overly educated, compared to their employers. With an increasing importance level for the industry, the gap between individual and employers' competence is decreasing, suggesting that companies for which Blockchain is perceived important are also more active on that topic. In general there was found to be a large knowledge gap with individual ratings averaging at 6 compared to companies at 3.8.



Self-assigned competence vs. employers' competence in blockchain

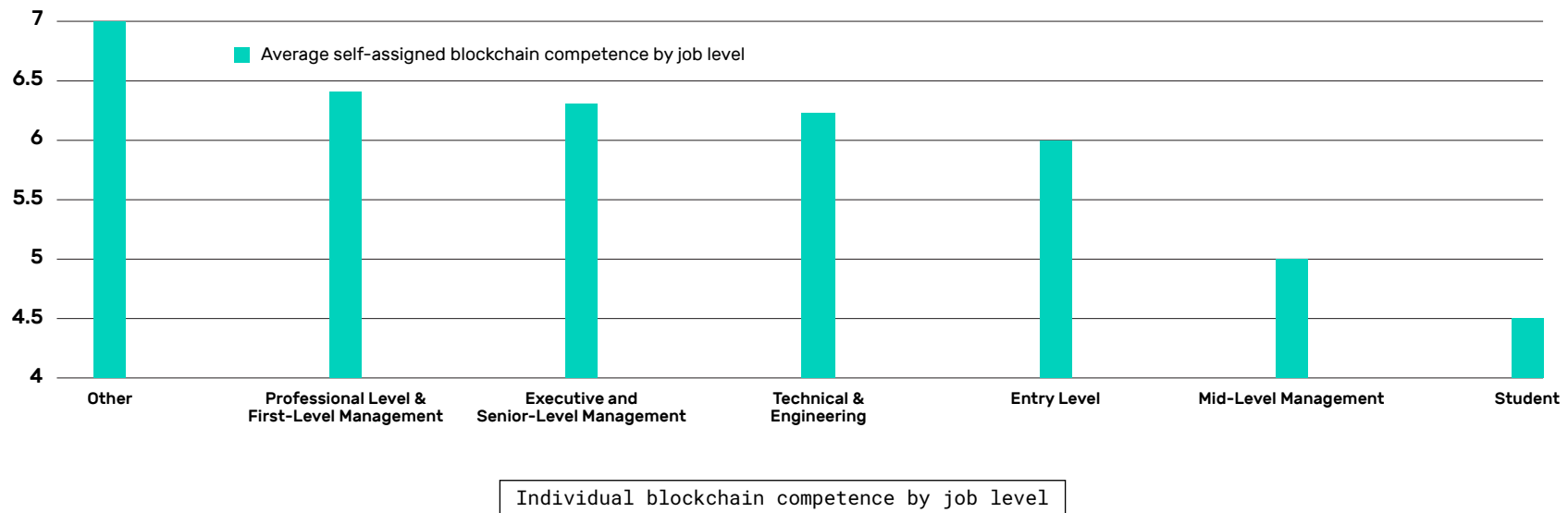


Individual and employers' blockchain competence levels estimated industry importance

Considering competence at hierarchical levels, we observe that self-assigned Blockchain competence is relatively high among senior executives, first-level management and technical experts, but relatively low in middle management. The highest self-assigned competence level can be found among “other” respondents: the average rating among the latter (mostly business owners and founders) is 7/10. Professionals and first-level managers (6.4) as well as senior-level management (6.3) consider themselves relatively educated.

We attribute the high self-assigned competence of these two groups of respondents to their tech savviness and familiarity with the relevant technologies and the perceived high strategic importance of Blockchain, which compels senior-level management in particular to gain expertise about Blockchain.

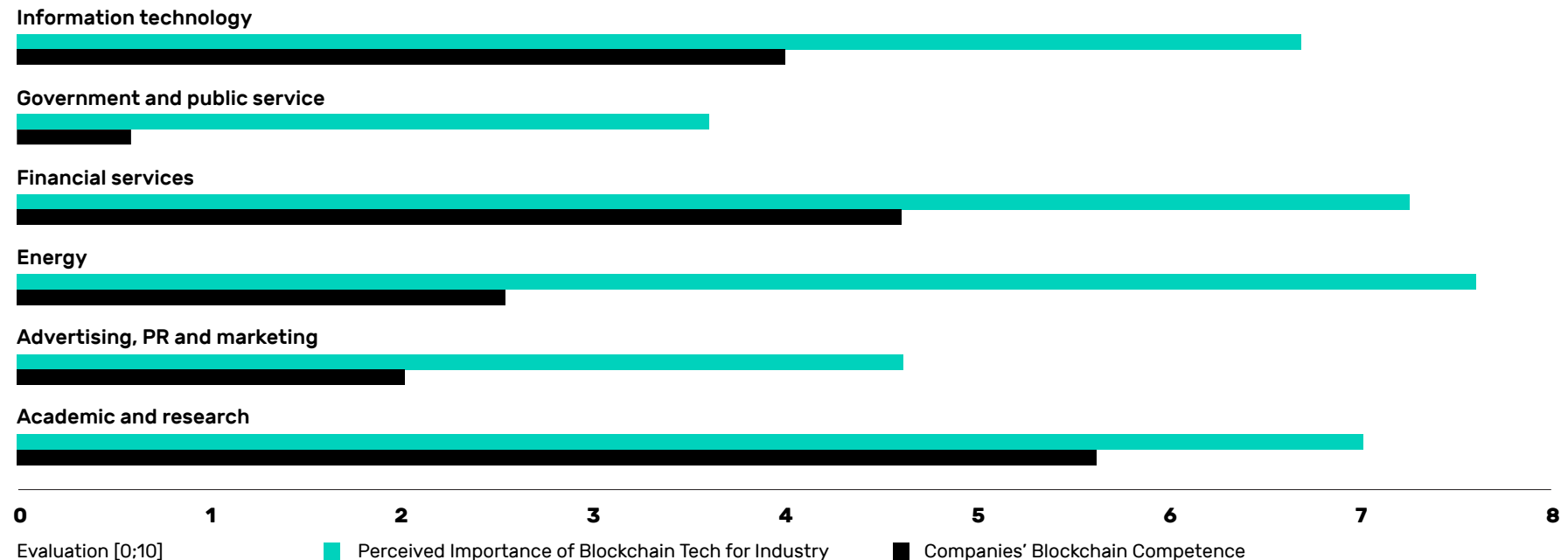
We can observe a – slightly puzzling – gap of self-assigned competence in mid-level positions. As middle management bridges the gap between the strategic decisions of senior management and daily operations, middle management will need to better understand both the strategic and technical implications of Blockchain. Arguably, they have the biggest knowledge gap to fill and are likely faced with the challenging task of identifying the first steps for implementing Blockchain – on top of their day-to-day business. A potential conclusion may lie in Blockchain being a rather strategic issue and hence driven by senior management on the one hand, while on the other hand, Blockchain seems to capture the interest of young professionals looking for new and exciting opportunities to work on and shape their career. Middle management, however, might simply be too preoccupied with day-to-day business.



Knowledge gap in middle management

The most significant knowledge gap, rated the highest across all industries, is found in the Energy sector. But respondents working in that sector evaluate their employers' competence in this regard at a fairly low level (2.5 vs. 7.5). A similar large knowledge gap was found for the Law sector: 1.5 vs. 6.2. For the Government and Public Services sector the perceived competence about Blockchain and its use cases is rated the lowest (0.5) across all industries, also signifying a large knowledge gap – even compared to the relatively low rating of importance of this sector (3.5).

The knowledge gap for the IT industry and financial services is relatively low. The results reflect common expectations, as the topic has been identified as highly relevant in these sectors for at least a year in the financial industry, and even longer in the IT sector. Interestingly, the lowest knowledge gap can be found in the Academic and Research sector, where competence scores highest across all sectors at 5.5 and perceived relevance at 7.



Identifying the knowledge gaps across industries

Knowledge gap by industry

The Blockchain Monitor provides regular reports on the financial industry's sentiment with regard to Blockchain applications and relevant issues. We thereby provide an ongoing sentiment index about the relevancy of different use cases and topics the industry focuses on.

We identified the financial industry as most prominent in identifying use cases and business opportunities, and investing in experimentation. It can be assumed that financial institutions have developed numerous prototypes, using different technology platforms like Hyperledger and Ethereum, to replicate financial products and streamline costly intermediary infrastructures. However, this does not consistently reflect the industry as a whole. As insufficient knowledge constitutes the main barrier for financial service providers to innovate using Blockchain technology, it can be concluded that industry players assess the priority of the topic differently. Large companies assess the barriers of innovation and engage with the technology using a rather holistic approach, as opposed to smaller companies, which most prominently seek new business opportunities. Apart from the early movers which individually and collaboratively invest in experimentation, a significant part of the industry is still at a stage of knowledge accumulation. The industry's identification and experimentation phase is likely to continue unless solutions based on Blockchain satisfy regulatory and technical requirements for a stable infrastructure to underpin financial services.

The main driver for accumulating knowledge about the technology is the prospect of new business opportunities. Consequently, the average rating of knowledge about the technology is significantly higher for individual respondents, compared to their employers. With respect to job levels, the survey reveals a lack of knowledge in middle management, whereas managers at the Entry level, First-level, and Executive level are more educated on the topic.

OUTLOOK

Across industries, the knowledge gap is likely to decrease, especially for the Energy, Law, and Government and Public Services sectors. Just as “Blockchain technology” became a buzzword in the financial industry over the past two years, those industries will in all probability experience similar recognition. Particularly in the Energy sector, such developments can be observed today. As Blockchain technology and smart contracts will fundamentally change the way human society deals with contracts, identity, patents, copyright, and voting, the sectors of Law and Governmental Services will likely be impacted more intensively in the near future.

The relevant use cases of Blockchain technology for financial institutions and service providers will receive further recognition in the near future. Thus, the phase of identifying use cases will most likely be completed soon, initializing a broader phase of experimentation and prototyping, standardization, and collaboration. Consequently, financial institutions can focus on implementing the use cases that have been identified as low-hanging fruit, characterized by potentially high profit impacts and comparably low complexity of realization. Most prominently, these include utilizing Blockchain infrastructure to efficiently process international payment transactions. Use cases of Micropayments and Crowdfunding (i.e. via ICOs) do not yield an appreciable revenue stream for financial institutions.

It would appear that one of the most relevant and complex use cases of Blockchain technology, i.e. to underpin Clearing and Settlement processing, is being addressed today, jointly with industry players in concert with regulators. Clearing and Settlement processing is clearly the predestinated application of Blockchain technology in the financial industry, as it diminishes the need for costly intermediaries and mitigates risks with a trustless and secure transaction environment for increasingly liquid assets and securities.

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Blockchain Monitor

<http://www.blockchain-monitor.com>

The Blockchain Monitor is a collaborative initiative by the Blockchain Research Lab and technology startup Upchain GmbH. Its goal is to distinguish the valuable potential of Blockchain technology from mere hype and identify the most relevant use cases by conducting surveys among professionals in the field.

Blockchain Research Lab conducts research on the economic and business potential of Blockchain technology. Upchain GmbH focuses on developing Blockchain prototypes and helping large companies implement Blockchain solutions.

With our focus on delivering the most sophisticated and relevant insights possible, we are constantly seeking to improve the quality and methodology of our research. If you would like to give us feedback, recommendations, or just get in touch, drop us a line.

ABOUT US