# BITCOIN BAM (BTCBAM) WHITEPAPER

# INDEX

*Hello world,*

Bitcoin Bam so-call BTCBAM is the forked chain from Bitcoin that has some similar features to Bitcoin, moreover some specific features that have fixed from Bitcoin's blockchain problematic features. Thus, this paper will introduce the business model of BTCBAM and the technical analysis of emphasized blockchain. According to the emphasized introduction, it is obvious to mention Bitcoin, Blockchain, Proof of Work and Stake models, Mining, Crypto Algorithm technics. On the other hand, the BTCBAM has been established itself as a solution to some problematic Bitcoin features. Therefore, the problematic issues of some blockchains will be explained within the circle of this paper's research topic.

Firstly, the paper will focus on blockchain. Bitcoin has been established by Satoshi Nakamoto. It is a peer-to-peer electronic money system that works with a proof of work model or we can call it CPU power majority as well. The transactions on the blockchain network approve by the nodes of the Bitcoin blockchain which has to be more than %51 of the total network participants. The node of Bitcoin indicates the individual participant of the Bitcoin network with its CPU power. All participants of the blockchain determine the total CPU power of the blockchain network which can also call as nodes of blockchain. The blockchain network of Bitcoin runs on the determined sequence that the new transactions or network orders broadcast to all network nodes. Then, the nodes of the blockchain collect emphasized broadcasts into a block. Each node of the Bitcoin network works on finding a difficult algorithm so call they race on it for its block. Then, the winner of the race broadcasts its block to all nodes what calls the proof of work model. The nodes accept the block if all transactions in it are valid and not already spent. The proof of work model is a race of nodes' CPU power that all nodes have to use its CPU power to finding the difficult algorithm block. Thus, the majority of nodes waste their electricity. This is the first problematic feature of Bitcoin's blockchain network.

On the other side, there are some another proof consensuses which work on blockchains networks. Proof of Stake, Delegated Proof of Stake, Proof of Capacity, Proof of Elapsed Time, Proof of Identity, Proof of Authority, Proof of Activity, Proof of Burn occurs as the consensus mechanism on the blockchain networks. The paper going to prologue upon those consensuses mechanisms, then the proof of stake which works also on BTCBAM going to explain in turn. The Delegated Proof of Stake is a Proof of Stake consensus that works by selected delegates who validates blocks on behalf of all nodes in the blockchain network. The next consensus is Proof of Capacity. The Proof of Capacity is the storage capacity of network participants related consensus that works with mathematical puzzles. Every participants' storages so-call hard disks fill with mathematical solutions of emphasized puzzles. The participants of the blockchain networks can utilize it for producing new blocks. Thus, the first user wins the race who finds the fastest solution. Users with the largest hard disk capacity have more chance to create a new block.

The introduction goes with the next consensus which is Proof of Elapsed Time. The consensus chooses the producer of the new block based on the time they have spent waiting. The process will go randomly and fairly. Proof of Elapsed Time mechanism provides a random waiting time to network nodes and the fastest node will be the winner after emphasized waiting time. The next one is Proof of Identity. Proof of Identity compares the private keys of nodes with an authorized identity. Every identified node can create a new block which is the de jure block. The Proof of Authority mechanism is a modified version of POS Consensus. In the Proof of Authority consensus, the nodes that become validators are the only ones who have allowed the create a new block. The next consensus mechanism is Proof of Activity. Proof of Activity consensus is the combined version of POW and POS Consensuses. The nodes that have the most stake have a higher ratio to create a new block. And the nodes also race to find the fastest solution to create a new block. The Proof of Burn consensus mechanism has minimum energy consumption compared to POW Consensus. The POB uses virtual mining rigs to validate the transaction. Then the nodes of the POB consensus network burn the coins which show their involvement level. The more they burn, the higher the participant level.

The paper going to continue with the Bitcoin Bam's Consensus Mechanism.

**PROOF-OF-STAKE:**

**Fundamental Background:** Proof-of-Stake (PoS) protocols were developed as energy-saving alternatives to PoW. Instead of computational power resources, leaders are selected based on their stakes, i.e., contributions to the blockchain network. Particularly in the PoS consensus mechanism, the stake of a node is the number of digital tokens, e.g., coins in cryptocurrencies, that it holds or deposits. Instead of consuming a lot of energy for the searching process as in the PoW, a leader will be selected based on its stakes to perform the mining process and add a new block to the chain. To simulate the stake-based leader selection process, the Follow the-Satoshi (FTS) algorithm has been adopted in many PoS-based blockchain networks such as Cardano, Sp8de, and Tezos. In these networks, all the tokens are indexed. The FTS algorithm is a hash function that takes a seed (i.e., a string of arbitrary lengths such as the previous block's header or a random string created by some other selected nodes) as the input. The FTS algorithm then outputs a token index. Using the index, the algorithm searches the transaction history to -nd and select the current owner of that token to be the leader. Therefore, the probability pi that node i is selected to be the leader in a network of N participants is pi = si P N j=1 sj , where si is the stake of participant i. This means that the more stake a node holds, the higher chance it is selected to be the leader. Besides the advantage of low energy consumption, the PoS mechanisms have faster transaction con-rmation speed than that of the PoW mechanisms. In a blockchain network, the con-rmation of a transaction depends on two main factors, namely transaction throughput and block con-rmation time. The transaction throughput is the number of transactions per second Tx/s a network can process, which is vital to the performance of the network especially when there are many pending transactions. Tx/s can be calculated by Tx/s = Blocksize / (Txsize × Blocktime)

The -first Proof-of-Stakes (PoS) network, Peercoin, was developed as a PoX consensus mechanism with the aim to reduce the computational requirements of PoW. Participants with higher coin age, i.e., product of network tokens and their holding time, have higher

chances to be selected. Speci-cally, each node in Peercoin solves a PoW puzzle with its own di-culty, which can be reduced by consuming coin age. In the more recent PoS networks, the solution searching is completely removed, and the block leaders are no longer selected by computational power. Instead, they are selected based on the stakes that they are holding. With the stake-based leader selection process, a node's chance to be selected to be a leader no longer depends on its computational power, and thus energy consumption of PoS mechanisms is signi-cantly reduced compared with that of PoW. Moreover, the block generation and transaction con-rmation speeds are kept at relatively low constant rates by the PoW networks to ensure security because there are many different blocks proposed by the miners. In contrast, since only one block is made in each round of PoS mechanisms, the block generation, and transaction con-rmation speeds are usually much faster, and thus PoS mechanism starts to become popular recently. SYSTEM MODEL Consider N stakeholders with stakes S = (s1, . . . ,sN ) and M stake pools with costs c = (c1, . . . , cM ) and fees α = (α1, . . . , αM ) in the network. The pool costs are charged for joining the pool and maintaining its operations. The pool's fee is the pro-t margin of the pool's owner, which is usually 3% in real-world stake pools, e.g., Stakecube. When the stakeholder i invests an amount s m i in the pool m, the expected reward r m i is given by r m i = ρm m i (1 − αm)R − cme −s m i , where ρm is the proportion of pool m's stake in the total network stake, m i is the proportion of player i's stake in the total stake of pool m, and R is the block reward. The pool charges a fee of αm percentage from each stakeholder's reward and a cost of cme −s m i . It is worth noting that the cost is inversely proportional to s m i , which incentivizes the stakeholders to invest more stake into the pool. Let N−i denote the set of all the stakeholders except stakeholder i, the stake proportion of pool m is ρm = s m i + σm + P k N−i s m k τ ,where τ = PN i=1 PM m=1 s m i P is the total stake of the network, k N−i s m k is the stakes invested in pool m by all the other stakeholders except stakeholder i, and σm is the current stake of pool m. Thus, ρm is the chance that the pool m is selected to be the leader and can receive the block reward R. When pool m receives the reward, it calculates each stakeholder's share based on how much the stakeholder invested in the pool, which is m i = s m i s m i + σm + P k N−i s m k , for stakeholder i. The cost and fee of the pool are then deducted from each stakeholder's share before it is -nally delivered to each stakeholder.

**BLOCKCHAIN HASH ALGORITHMS**

In this paragraph, the paper going to introduce a list of hashing algorithm which has been used on the blockchain networks. The reason for emphasized introduction is our quest to better clearance about Bitcoin Bam and its hash algorithm SHA-256. Cryptocurrencies make use of different algorithms named hashing algorithms. By the way, Hash is a “message digest” -a number generated from a string of text, the hash itself is smaller than the text, it’s almost impossible to generate another string of text with the same hash value. There is a long list of hashing algorithms which is not necessary to list all of them. Thusly, in this paragraph, they are the list of hashing algorithms what has been used on famous and most blockchains. The list begins with SHA-256 and continues with Ethash, Scrypt, Equihash, Cryptonight, X11.

**Ethash**, Ethereum’s hashing algorithm. It uses Keccak, a hash function that is standardized to SHA-3. The cryptocurrencies that use Ethash algorithms are Ethereum, Ethereum Classic, KodakCoin, Ubiq.

**Scrypt**, this algorithm is more simple and quicker than the SHA-256 Hashing Algorithm. The Blockchain Networks which use Scrypt are Dogecoin, Litecoin, Gulden, PotCoin, FeatherCoin, Bitmark, Tagcoin, Ekrona, Midascoin.

**Equihash** is a POW hashing algorithm that provides the minimum computer hardware requirements for its participants. The Blockchain Network that uses this hashing algorithm is Zcash, Zcoin, Zclassic, Bitcoin gold, Komodo, ZenCash.

**CryptoNight** is also a Proof of Work hashing algorithm. It is also for standard computers. The Blockchains that use it, Bytecoin, Monero, Dashcoin, Digitalnote.

**X11**, this algorithm has been developed by Dash developers. It is also for Proof of Work Consensuses. The Networks that use X11 algorithm are Monetaryunit, Karmacoin, Startcoin, Dash, Xcurrency.

**SHA-256** stands for Secure Hash Algorithm that belongs SHA-2 family. It generates 256-bit signatures. This hashing algorithm has been used by Bitcoin. The other Blockchain Networks that use SHA-256 are BitcoinBam, Bytecoin, Joulecoin, Ixcoin, Terracoin, Battlecoin, 21Coin, Peercoin, Namecoin, Unobtanium, Betacoin.

SHA-256 functions are used routinely in cryptography for things like Message authentication, Digital Signatures, and many more. So they need to be fast, quick both to verify and compute. A hash function takes some string and gives output in the same format. A one-way hash can be generated from any piece of data, but the data cannot be generated from the hash.

The Sha-256 algorithm is based on the Merkle-Damgard construction method, according to which the initial index is divided into blocks immediately after the change is made, and those, in turn, into 16 words. SHA-256 or other hash algorithms have two different attacks that we should be concerned about collision and pre-attack. The collision is the situation where different entries are chopped in the same synthesis value. Finding a collision for an SHA-256 via a raw force attack is possible because it has a limited amount of different hash values that it can produce. There are a total of 2256 results for hashing, so collisions are very unlikely to occur and we are not concerned with such a possibility. On average, a good attacker using the birthday paradox to his advantage is likely to find a collision in “only” 2128 tests for SHA-256 and we need much better to find a collision to consider a broken algorithm. If there is a simpler method for finding collisions than crude forcing because of the cryptanalysis, we consider that there is a defect in the algorithm. In 2005, Chinese cryptographers burst SHA-1: they developed a method to find collisions 2000 times faster than brute-forcing. Their method has been surpassed by other cryptographic work and the machines have become much more powerful over the last 7 years, but finding a collision

would still have a lot of computing resources and luck. If we think theoretically about a cryptographic system similar to Bitcoin but developed before 2005 and using SHA-1 as the main hash algorithm, which could lead to a breakdown of the function to the system 7 years after the first document was published how to find collisions faster than brutal forcing. First of all, Bitcoin would not be theoretically sure if it was using SHA-1, but the attacks would still not be relevant to the practice and the search for holes that could be exploited in a system would not be easy. In Bitcoin, hashing is mostly used in extraction and transactions. For transactions, it is necessary to sign the transaction hash to transfer the value of the parts to another user. If someone was able to find a way to create a transaction that would result in the same hash value as the original, that person can add himself as the receiver of the coins so then he is able to steal.

An example of the difference in size between SHA1 Vs SHA256 can be seen in the following example hashes:

SHA1 — da39a3ee5e6b4b0d3255bfef95601890afd80709

SHA256 -e3b0c44298fc1c149afbf4c8996fb92427ae41e4649b934ca495991b7852b855

Ledger — Trust + Cryptography = Crypto currency.

**THE PROS OF USING SHA 256:**

· Block size indicator (byte): 64

· Maximum allowed message length (bytes): 33

· Characteristics of the message digest size (bytes): 32

· The standard word size (bytes): 4

· Internal position length parameter (bytes): 32

· The number of iterations in one cycle: 64

· The speed achieved by the Protocol (MiB/s): approximately 140

**BITCOIN BAM IS THE FORKED VERSION OF BITCOIN**

In this paragraph, what does that mean a forked version and the fork term going to explain to achieve a better clearance about BTCBAM technical features. Forks are a much-discussed yet often misunderstood part of blockchains. While forks follow familiar patterns, each fork is unique and results in a different outcome. It's important to know the context and details around each fork in order to take advantage of the drastic and sudden changes that often ensue.

A blockchain fork is essentially a collectively agreed-upon software update. Blockchains depend on decentralized groups of computers all working collaboratively. Each individual computer, commonly referred to as a "full node," runs the software needed to verify the blockchain's public ledger and keep the network secure. The more full nodes that concurrently run the software, the more secure the network.

Crucially, each full node needs to run the same piece of software in order to access the same shared ledger. In other words, each full node running Bitcoin's core software (i.e. Bitcoin Core) has access to the Bitcoin blockchain's ledger and can therefore verify Bitcoin transactions and access Bitcoin transaction history. But a full node only running Ethereum's core software (i.e. Go-ethereum) cannot access the Bitcoin blockchain.

The version of the software also matters. If the Bitcoin Core developers (or anyone else who is able to convince enough full nodes to switch to their software) update the Bitcoin code to install new features or change important parameters, the updated software may not be compatible with the older version of the software. Forks that are incompatible with older versions of the software are called "hard forks." Hard forks typically change consensus rules (i.e. block size, mining algo, consensus protocol) in a way that makes previous versions of the software incompatible. For example, Ethereum's upcoming Casper update will change consensus protocol rules as Ethereum begins its shift from Proof of Work to Proof of Stake.

When Ethereum eventually introduces their Casper update, the update will be a hard fork. Full nodes that choose not to update their software will no longer be compatible with the updated Casper nodes. Thankfully, Ethereum hard forks are not usually contentious, and the majority of the network agrees to update. Otherwise, a full node running the updated Casper software would not have the exact same ledger as a full node running the older version. Since each node would have different consensus rules, they would be essentially running a separate blockchain.

However, there are some forks that are compatible with older versions of the software. “Soft forks” are software updates that still work with older versions. For example, Bitcoin’s SegWit update was a soft fork. When SegWit activated, a new class of addresses (Bech32) was created. But those using older P2SH addresses were not affected by the addition. A full node running version 0.1 of the Bitcoin Core software could send a non-SegWit transaction to a node running updated SegWit software and the transaction would still go through. As long as at least 51% of the hashing power switches over to the updates soft fork, the older versions of the software will still work (if the older versions propose invalid blocks, they will temporarily form “old chain only” versions of the ledger that quickly get overtaken).

**Contentious Hard Forks**

Not all forks are unanimously agreed upon by the community of full nodes. In fact, most of the most famous (and notorious) forks were considered contentious hard forks.

A contentious hard fork occurs when a significant portion of full nodes disagrees about which version of the software to run. For example, the Ethereum DAO hack (where $55 million worth of ETH were stolen) caused a heated debate within the community. Many full nodes wanted to reverse the hack and return the stolen funds. However, many others argued that reversing the hack would fundamentally undermine the legitimacy of the

blockchain. The two sides could not come to an agreement. The community that was against reversing the hack eventually split off and formed a new blockchain, Ethereum Classic.

Importantly, the owners of the original cryptocurrency will often receive proportional amounts of the new cryptocurrency created in the contentious hard fork. After the Ethereum Classic fork, ETH owners all received ETC proportional to the amount of ETH they owned.

**Changing Narrative**

The Ethereum price plunged after the DAO hack and Ethereum Classic contentious hard fork. Because of this, contentious hard forks were typically viewed as detrimental to the main chain.

However, that changed when Bitcoin Cash forked from Bitcoin. Bitcoin Cash was the result of a multi-year debate regarding the best way to increase the number of transactions within the Bitcoin network. Although several solutions were proposed, none received overwhelming adoption. One proposal advocated for, among other things, a larger block size. This eventually created a contentious hard fork which was called Bitcoin Cash.

**Context and Timing Is Key**

Hard forks often create price volatility. It's important to know the context and details around each fork in order to take advantage of these sometimes drastic and sudden changes. At Digital Asset Research we keep track of all the important events for crypto managers and are making our results available as part of our new Crypto Catalyst Calendar. These events include forks, but also include mainnet launches, airdrops, legal and regulatory events as well as anything else that might affect the price of a digital asset.

**BTCBAM BUSINESS MODEL AND ROAD MAP**

**Our mission** is to become a cryptocurrency payment provider on marketplaces.

**Our vision** is to become the most consequential and preferred global payment provider on e-commerce and marketplaces while accompany also with local businesses.

**INVESTMENT PARTNERSHIP WITH SPEKTRAL INVESTMENT BANK**

The BTC BAM Mining System has developed a global coin called BTC BAM, a cryptocurrency. BTC BAM is a coin produced in physical crypto money mines using the bitcoin infrastructure, that is, blockchain. As of September 21, 2020, it started to be published on the Coinsbit stock exchange, which is in the top ten in the ranking of crypto money exchanges. BTCBAM also started to be listing at one of the strongest markets in Asia called Probit exchange market in early Feb 2021. Spektral Investment Bank is the -first investment bank with technical and security-based capital. Bank has a unique capital structure composed of pre-valuated exclusive license rights of pharmaceutical patents and calcite mines with pre-performed reserve detection reports. With 800 million EU worth of in-kind capital, Spektral Investment Bank prioritizes bioceutical & pharmaceutical innovation And tokenization of mining securities in order to provide robust collaterals for high-risk-bearing cryptocurrency-based operational leverages hence o-ering a signi-cant risk reduction for dynamic -nancial options. Spectral Investment Bank is also a 25% partner of the BTCBAM coin produced using the blockchain infrastructure. The bank also uses BTCBAM coin as a collateral platform. Coins do not represent equity, shares, units, royalties or rights to capital, pro-t or income in the network or software or in the entity that issues coins or any other company or intellectual property associated with the network or any other public or private enterprise, corporation, foundation or other entity in any jurisdiction. The coin is not therefore intended to represent a security interest. This paper is not a listing prospectus or an o-ering memorandum and is not intended to be perceived as a securities o-ering or proposal to invest in securities in any jurisdiction. This paper is issued for reference purposes only. Nothing in this document shall

be construed as -nancial assistance, invitation, or compulsion to investment activity of whatever nature. The coin o-ering involves and relates to the development and use of experimental software and technologies that may not come to fruition or achieve the objectives speci-ed in the paper. The purchase of coins represents a high risk to any contributors.

**WE ARE AS BEING BITCOIN BAM BLOCKCHAIN**

-First investment exchange and coin to be fully bank-backed!

-The opportunity to increase the number of coins with the Proof of Stake (POS) method

-Debit card application with visa card agreement

-Ecommerce web site called btcbamstore; payment options with BTCBAM

-Coinpayments integrated; send, store, and receive payments in BTCBAM

**ALL ABOUT BITCOIN BAM (BTCBAM) PROJECTS**

BTCBAM coin is currently one of the 54 most reliable coins in the World*, using the same algorithm as Bitcoin (SHA-256). While there are over 8 thousand coins / tokens in the world, it is one of the 340 coins using the blockchain platform. For this reason, it is taking firm steps towards becoming a new Bitcoin with its strong and secure infrastructure compared to ERC-20 based tokens that can be easily produced in the rapidly growing crypto money industry.

*https://en.bitcoinwiki.org/wiki/List_of_SHA-256_crypto_currencies

Spektral Investment Bank Btcbam Partnership Investment Opportunity, Kosovo-based Spektral Investment Bank is the first investment bank with technical and security-based capital. The Bank has a unique capital structure consisting of pre-valued exclusive license rights for pharmaceutical patents and calcite mines and pre-made reserve determination reports.

With 800 million EU in-kind capital, the Spektral Investment Bank prioritizes bio-medical and pharmaceutical innovation and tokenization of mining securities to provide solid guarantees for high-risk cryptocurrency-based operational leverages, thus offering a significant risk reduction for dynamic financial options. This is the first real-world example of an operational merging between a cryptocurrency investment bank and a blockchain project.

BTCBAM, one of the most successful blockchain projects developed by the Turks, signed cooperation and collateral usage agreement with Spektral Investment Bank to establish Europe's first crypto investment exchange.

Spektral Investment Bank also provides in-kind collateral guarantees for the coin, which has a total of 7 blockchains to be produced by the BTCBAM team.

Spektral Investment Bank acquired 25% of BTCBAM and Bitturex. In return, the Kosovo Investment Bank will provide full-scale project envelopes for each project to be listed on Bitturex.

The bank will also provide guarantees for tokenization of projects that receive crypto funds to maximize their commercial potential.

## WHERE CAN BLOCKCHAIN TECHNOLOGY REACH WITH BTCBAM?

The rapid development of blockchain technology and its numerous emerging applications has received huge attention in recent years. The distributed consensus mechanism is the backbone of a blockchain network. It plays a key role in ensuring the network's security, integrity, and performance. Most current blockchain networks have been deploying the proof-of-work consensus mechanisms, in which the consensus is reached through intensive mining processes. However, this mechanism has several limitations, e.g., energy inefficiency, delay, and vulnerability to security threats. To overcome these problems, a new consensus mechanism has been developed recently, namely proof of stake, which enables to achieve the consensus via proving the stake ownership. This mechanism is expected to become a cutting-edge technology for future blockchain networks. In this paper, you will learn about the proof of stake mechanism and BTCBAM coin, which has a blockchain algorithm and uses a proof of stake mechanism.

## THE PROS AND THE APPLICATIONS

Although blockchain technology attracts a lot of attention due to the successful implementation of cryptocurrencies, its benefits extend far beyond. The key benefits of blockchain technology are as follow:

- **Decentralization:**

Blockchain networks are not controlled by a central controller. Thus, they do not have any single point of failure. Instead, all the nodes reach an agreement on the state of the network by participating in the distributed consensus mechanisms.

• **Transparency:**

Data stored in a blockchain is visible to all network participants.

• **Immutability:**

Once the data are stored in the blockchain, it is extremely difficult to be altered. Moreover, thanks to the distributed consensus mechanisms, the network can achieve consensus on the data even in a trustless environment.

• **Security and Privacy:**

Using cryptographically secure mechanisms, the privacy and security of the network participants can be significantly enhanced. Users in the network use a pair of public and private keys for identification and verification. When a user makes a transaction, a digital signature is used.

**BTCBAM TO LEAD THE DIGITAL TRANSFORMATION**

During the research and development activities that started 5 years ago, crypto money sector analyzes were made. As a result of these analyzes, two main points were determined as goals. The first of these was that in very few of the stock exchanges that provide trading services, the investment owner had its own cryptocurrency, and another was that coins could not find enough place in daily life. BTCBAM was built on the basis of these two goals and took its current form with the influence of other elements.

In this direction, the first step was to integrate the BTCBAM coin into life with its visa and master card features.

The BTCBAM Application is integrated with the BTCBAM coin and the exchanges it is traded on. Therefore, when you need cash, you can instantly sell your BTCBAM coins on the stock exchanges where they are traded and you can order to transfer them to your card with the mobile application when you need / want to use them.

BTCBAM Card is a prepaid (debit) card that is loaded with money (debit) before using it, can be spent as much as it is loaded, and allows you to shop advantageously with many member merchants. The loaded amount can be spent on the internet and at all POSs in stores. Money upload and withdrawal transactions can also be made from ATMs. You can also use it on crypto exchanges.

**COINPAYMENTS WILL MOVE BTCBAM TO SHOPPING SITES**

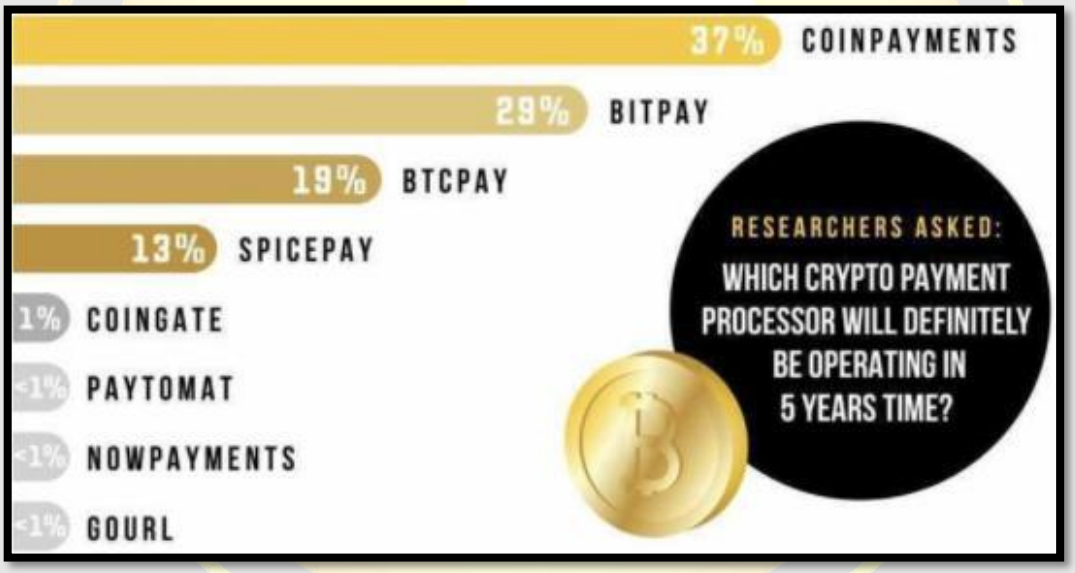
Coinpayments is The World's Most Trusted Crypto Payments Partner. Over $ 10 Billion In Crypto Payments Since 2013. Now BTCBAM coin is also included in coinpayments as a payment instrument. Thus, primarily in the crypto industry as a clearing tool Canadian e-commerce giant Shopify has added a series of acceptable cryptocurrencies in partnership with CoinPayments.

Canadian e-commerce giant Shopify has partnered with CoinPayments to allow its customers to pay merchants in more than 1,800 digital currencies as opposed to an older basket of only 300, based on its ongoing partnership with BitPay. The fact that the BTCBAM coin is low in Coinpayments will also pave the way for it to be a valid coin in the Shopify infrastructure.

**BTCBAM – COINPAYMENTS PARTNERSHIP**

**About CoinPayments**

CoinPayments is the easiest, fastest and most secure way for merchants worldwide to transact in cryptocurrencies. It is the first and largest cryptocurrency payment processor with more than US $10 billion in total transactions to date, while supporting more than 2,000 coins, and is the preferred crypto payment solution for merchants and Ecommerce platform providers worldwide. Founded in 2013, CoinPayments is dedicated to providing clients with fast, secure and user-friendly crypto payment APIs, shopping cart plugins, digital wallets, and a host of other solutions supporting cryptocurrency payment applications.




CoinPayments is allowing merchants to accept Bitcoin and over 1860+ altcoins in their store through easy to use plugins, APIs and POS interfaces.

With nearly three million user accounts and merchants across 200+ countries,

CoinPayments.net is the most comprehensive multi-cryptocurrency platform in the world.

CoinPayments offers an industry-low transaction fee of only 0.5%

The CoinPayments gateway leads the crypto payment industry by being the first and largest crypto payment processor and is available on all major e-commerce platforms in the world including:

- WooCommerce
- Shopify
- Magento
- Prestashop
- Opencart

and many more.

CoinPayments also has an asset conversion tool allowing merchants to quickly and efficiently convert their digital assets within their digital wallet without having to transfer to exchanges.

Take advantage of our global crypto payment gateway made easy and accessible for everyone — whether you're a business owner, crypto user, or even from another planet.

**What is PayByName?**

It is a feature on CoinPayments that provides you with a unique and convenient money tag so you can receive payments from all coins.

Instead of inputting a destination wallet address for a specific cryptocurrency, the sender can instead use the receiver's PayByName tag, allowing the recipient of the transaction to receive absolutely any coin supported by CoinPayments.

All PayByName name tags are prefixed by the $ symbol, so for example, Coinpayments own tag is $CoinPayments. It's just that easy to use $PayByName!

**How Does PayByName Work?**

We all know wallet addresses can be lengthy, to say the least. Just look at this example of a BTC address:

3Jpk464Enx4YA58HJHdtT82hwgUfig4geC

And this example of a typical Ethereum (ETH) address:

0x44c572587a76c50b760db52592b1623984a63eeb

All those characters make the prospect of human error seem all too easy and quite frankly, using wallet addresses are not that simple, especially for beginners.

Cue the CoinPayments PayByName feature.

A feature that helps you easily get rid of messy wallet addresses for certain transactions.

If you're working inside the platform's ecosystem and want to send or receive money between yourself and anyone else inside CoinPayments, you can do so by using a pre-assigned name you and your sender/receiver have each chosen for yourselves instead.

CoinPayments CEO Jason Butcher recently joined Norbert Strappler on The eCom Ops podcast to discuss the evolution of cryptocurrencies and how they're reimagining the future of commerce, easing operations, and streamlining transaction fees for merchants and users alike. Today, we're breaking down some of the key takeaways from the discussion.

**Cryptocurrency adoption is at all-time highs**

According to recent data, cryptocurrency adoption has settled into its fourth stage — acceptance. Today, there is a larger amount of cryptocurrency users than ever before.

The rise of cryptocurrency adoption comes as no surprise in an online environment where #Bitcoin trends almost daily and “crypto” is among the top searched terms globally, according to Google Trends. With more notable figures acknowledging cryptocurrencies and traditional artists capitalizing on the world of blockchain with NFTs, the increasing rate of adoption doesn’t appear to be slowing down any time soon.

“Last month, we processed over $650 million in crypto transactions, whereas a year before that number was probably half of the volume,” said Butcher.

As a form of payment, Bitcoin remains the top transacted cryptocurrency for CoinPayments this year, accounting for 81% of all transactions, he noted. Whereas in the past, Bitcoin users typically held onto their assets, there has been a shift in the collective mentality and a rise in spending in recent years.

**Variety for consumers: the ability to choose**

The global adoption of cryptocurrency payment represents the newest form of payments innovation, noted Butcher.

“The usage of credit cards took about 50 years for adoption,” he said. In their early days, speculators may have questioned why anybody would pick a credit card to conduct a transaction over cash. However, now, credit and debit cards have become the default way to pay.

Forward-thinking merchants need to consider accepting cryptocurrency payments for their products and services, then. According to Butcher, accepting cryptocurrencies as payments represents an important development in the world of commerce: giving consumers the freedom of choice.

“It’s the consumer that chooses what they want to make the payment in,” he said. “I believe the consumer and merchant should have the choice and option of accepting all forms of payment.”

**Payments innovation is in the works**

Jason Butcher was elected to the Emerging Payments Association (EPA) advisory board for 2021, symbolizing an important development: the first time that a cryptocurrency company has been represented on the board since the organization was established in 2008.

Based in the UK, the EPA actively engages in connecting the global payments ecosystem to encourage innovation across the developing industry. With over 130 members from across the payments chain, the EPA aims to “strengthen and expand the payments industry to the benefit of all stakeholders.”

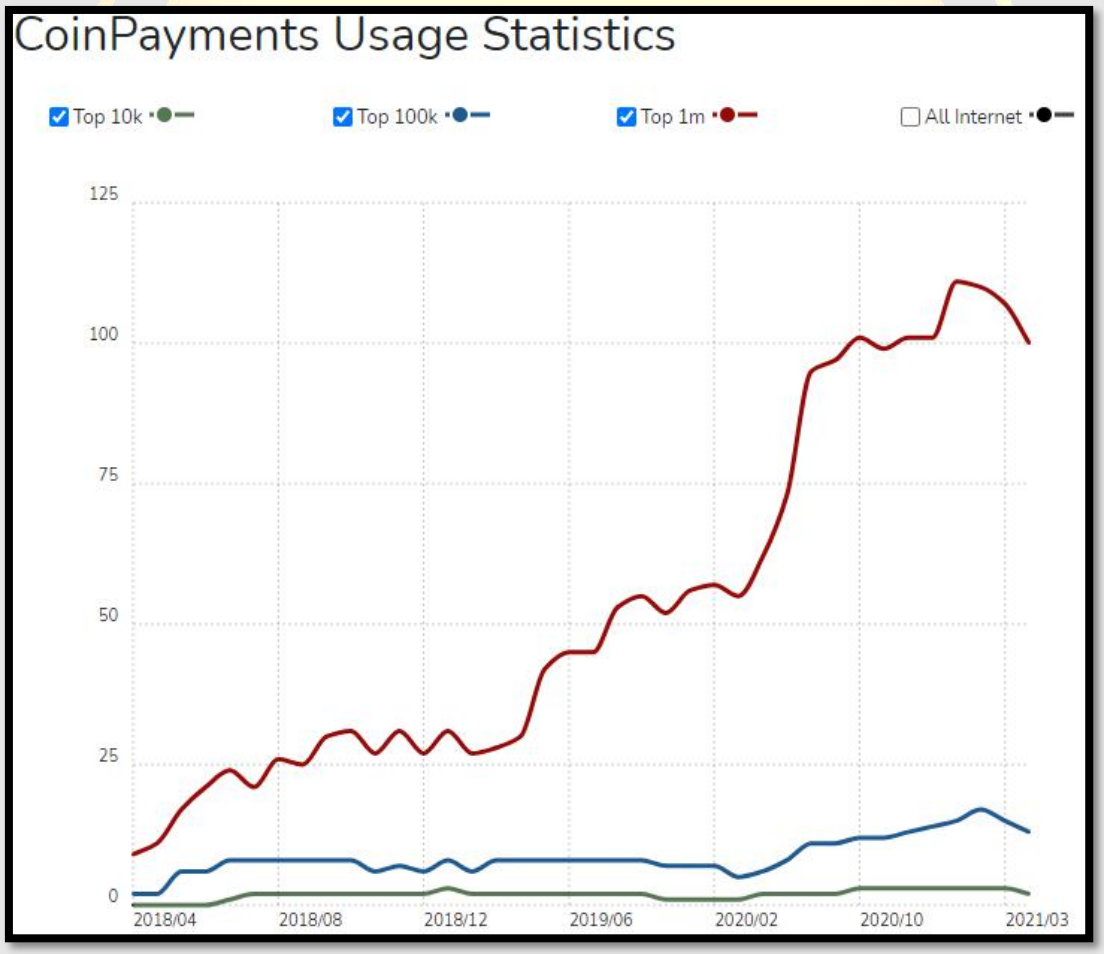
“The EPA has a good foothold into the FCA and regulatory bodies, representing about 300,000 people that work in the payments industry in the UK,” he said. For that reason, the EPA has a strong voice as an influential leader in the payments space, a voice that will spread across the world as it continues to grow.

Moreover, Butcher offered some insight into how CoinPayments is leveling up to cater to the growing global market of cryptocurrency users. Initiatives are now in the works to better serve the community in 2021.

“We’re working on launching a credit card, which is a little different from most other crypto-cards out there that are debit card programs,” he said. “We’re also working on a global distribution fiat settlement solution, so everybody will be able to convert their crypto to fiat if they choose to and send those funds to their bank accounts.”

Another exciting development is the global expansion of CoinPayments. The company recently announced the addition of a blockchain expert in Brazil to help push crypto adoption in the region.

“This move only represents a glimpse of what’s to come in the future of CoinPayments.”



**PROTECTS OF COINPAYMENTS – RAINFORESTS**

That is why CoinPayments is again joining forces with Rainforest Partnership, an international nonprofit organization dedicated to protecting tropical rainforests, this June 22 to take part in the fight to rebuild our planet.

CoinPayments is enabling its community to donate to the cause using cryptocurrencies in just a few clicks. We make it easy!

Last year, CoinPayments' amazing community helped fundraise over $70,000 in cryptocurrency donations for Rainforest Partnership, spearheading rainforest conservation on a global scale.

**PROTECTS OF COINPAYMENTS – UNIFY**

CoinPayments is thrilled to have partnered with UNIFY.org to provide cryptocurrency donations to hundreds of charitable initiatives worldwide.

With the latest uprising of consciousness that the self-governance movement "Blockchain" has caused; increasingly more people are experiencing an urgent call to action within themselves.

Lending knowledge and opportunities has been a primary motivating force here at CoinPayments, and to celebrate our 5th year in business in the city where we got our first start, we have partnered with UNIFY, for this year World Peace Day.

To do good, we must look in our own backyard first, and as Vancouverites who share a city block with some of the most fragile people of Vancouver's Downtown Eastside, we wish to contribute in an initiative called "Radical Acts of Kindness".

Millions of people around the globe will simultaneously be providing acts of compassion in all major city hubs, raising the entire earth's vibration at once.

This event will see some few thousand locals equipped with all they can spare; Haircuts, Period Pads, Meals, Toiletries and yes, even some Cryptocurrencies!

**ITS OWN E-COMMERCE MARKET BTCBAM STORE**

The BTCBAM coin, which has been accepted to the Coinpayments platform, is preparing to open its own online shopping site in a way that will turn the customers' use of crypto money in their shopping into an opportunity. The agreement was made with the platform's online shopping infrastructures such as Shopify and Woocommerce and etc. Gives cryptocurrencies a great opportunity of being used in markets.

**E-COMMERCE AND RELATED SECTORS ANALYSIS**

**Forbes' Analysis**

E-commerce sales in this country and around the world surged in March, proving once again that the shift in online shopping triggered by the pandemic isn't slowing down, according to the latest Adobe ADBE +2.6% Digital Economy Index.

Adobe, for the first time, included global numbers in its report. It is predicting that global e-commerce sales will reach $4.2 trillion this year, with U.S. consumers accounting for close to one-quarter of that spending.

Stimulus checks and rising vaccination rates pushed U.S. e-commerce sales to record levels in March. Adobe estimates that Americans spent an extra $8 billion online, compared to normal projections for the period, between March 11, the day the American Rescue Plan stimulus law was signed, and March 31. The extra spending, according to Adobe, was almost like having a Black Friday level sales event in March. Black Friday 2020 generated $9 billion in online sales.

The changes we're seeing are things that are going to carry forward for generations," said Jason Woosley, vice president, commerce and developer experience, at Adobe. "There's just too much momentum and durability."

Adobe surveys found that 9% of U.S. consumers, 8% of Japanese consumers, and 15% of United Kingdom consumers said they had never purchased anything online before March 2020. "This is a brand new audience for e-commerce," Woosley said. "It's likely these consumers are here to stay." U.S. consumers spent $78 billion online in March, up 49% year-over- year, the highest growth since July 2020. For the first quarter of 2021, U.S. e-commerce sales grew 39% year-over-year, to $199 billion. Adobe expects U.S. e-commerce spending this year to total between $850 billion and $930 billion, and to top $1 trillion in 2022.

Global e-commerce sales reached $876 billion in the first quarter, up 38% year-over-year. In the United States, the promise that new stimulus checks were in the mail apparently led more consumers to use buy now, pay later options for their online purchases. Buy now, pay later purchases were up 166% year-over-year in March. Toys, furniture and bedding, video games, and auto parts were the top purchases made by U.S. consumers in March, according to Adobe. Grocery sales continued to see strong growth in the U.S. in March. Sales between March 7-21 were up 17% compared to a two-week period in August, 2020.

Surveys of consumers in the United Kingdom, Japan and the United States showed online shopping is becoming the preferred method of grocery shopping for a growing number of consumers. Over half of the consumers in all three countries said they believe they are saving money by shopping for groceries online.

In the United States, 32% of consumers said they now feel more comfortable visiting stores in person than they did in 2020, while 23% said they feel less comfortable doing so.

**Business Insider's Analysis**

The impact on ecommerce retail spending has not been felt evenly across the world.

Ecommerce sales will continue to accelerate in many individual national markets, but not overall. Global totals will show a downshift for ecommerce mainly because of substantial deceleration in two large markets: China and India.

Comparatively, Germany's mobile sales are growing faster than ever and more than half of UK ecommerce sales will comes from mobile - specifically smartphones.

And in countries like the United States and France, ecommerce has been revised upwards due to account for a boost from the pandemic.

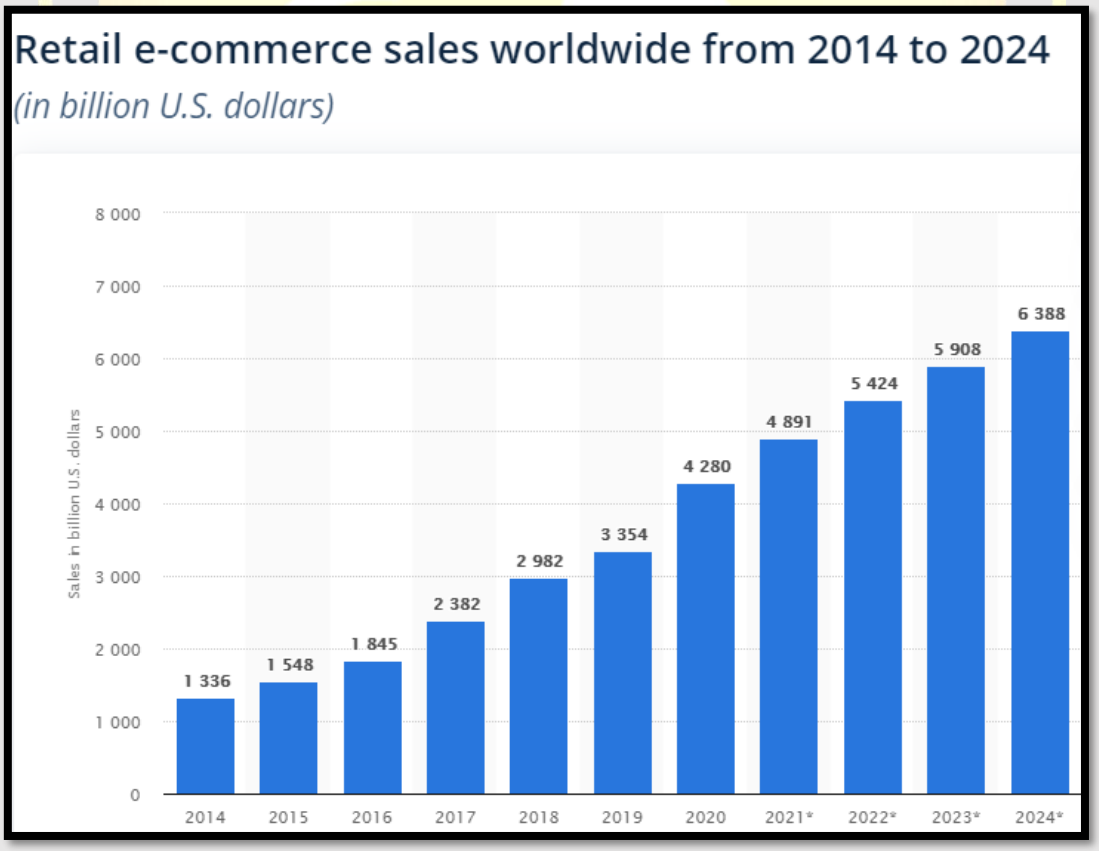
**Global Ecommerce Sales & Statistics**

Following the outbreak of the COVID-19 pandemic, Insider Intelligence decreased its retail sales forecast to a 16.5% growth rate—reducing the overall outlook for retail ecommerce sales by $190.79 billion. Overall, ecommerce sales will bring in $3.914 trillion this year.

Asia-Pacific and North America have led the regional totals for both brick-and-mortar and ecommerce sales, followed by Western Europe. Due in part to China's dominance, Asia-Pacific has gained a significant lead in ecommerce with 62.6% share, over North America and Western Europe, who are expected to have shares of 19.1% and 12.7%, respectively.

While some regions experienced tremendous growth in certain sectors of retail, we have adjusted our ecommerce estimates down to $3.914 trillion, as the deceleration of global retail in 2020 has surely impacted overall global retail sales.

In the Global Ecommerce 2020 Report, eMarketer explores where certain countries and regions are expected fall in respect to retail ecommerce sales, how the pandemic has shaped our estimates, and how ecommerce will fair both globally and nationally for the remainder of the year.



**Mastercard Analysis**

E-commerce a Covid Lifeline for Retailers with Additional $900 Billion Spent Online Globally

As Covid-19 kept consumers around the world at home, nearly everything from groceries to gardening supplies was purchased online. According to Mastercard's latest Recovery Insights report, this amounted to an additional $900 billion being spent in retail online around the world in 2020. Put another way: in 2020, e-commerce made up roughly $1 out of every $5 spent on retail, up from about $1 out of every $7 spent in 2019.[1]

For retailers, restaurants and other businesses large and small, being able to sell online provided a much-needed lifeline as in-person consumer spending was disrupted.

Roughly 20-30% of the Covid-related shift to digital globally is expected to be permanent, according to Mastercard's Recovery Insights: Commerce E-volution. The report draws on anonymized and aggregated sales activity in the Mastercard network and proprietary analysis by the Mastercard Economics Institute. The analysis dives into what this means by country and by sector, for goods and services, and within countries and across borders.

"While consumers were stuck at home, their dollars traveled far and wide thanks to e-commerce," says Bricklin Dwyer, Mastercard chief economist and head of the Mastercard Economics Institute. "This has significant implications, with the countries and companies that have prioritized digital continuing to reap the benefits. Our analysis shows that even the smallest businesses see gains when they shift to digital."

While the digital transformation has been neither universal nor consistent – due to geographical, economic, and household differences – the report uncovers several key overarching trends:

- Early digital adopters go into overdrive: Economies that were more digital before the crisis—such as the UK and US —saw larger gains in the domestic shift to digital that look more permanent than the countries that had a smaller share of e-commerce before the crisis, such as Argentina and Mexico. Asia Pacific, North America, and Europe were the strongest regions in driving e-commerce adoption.

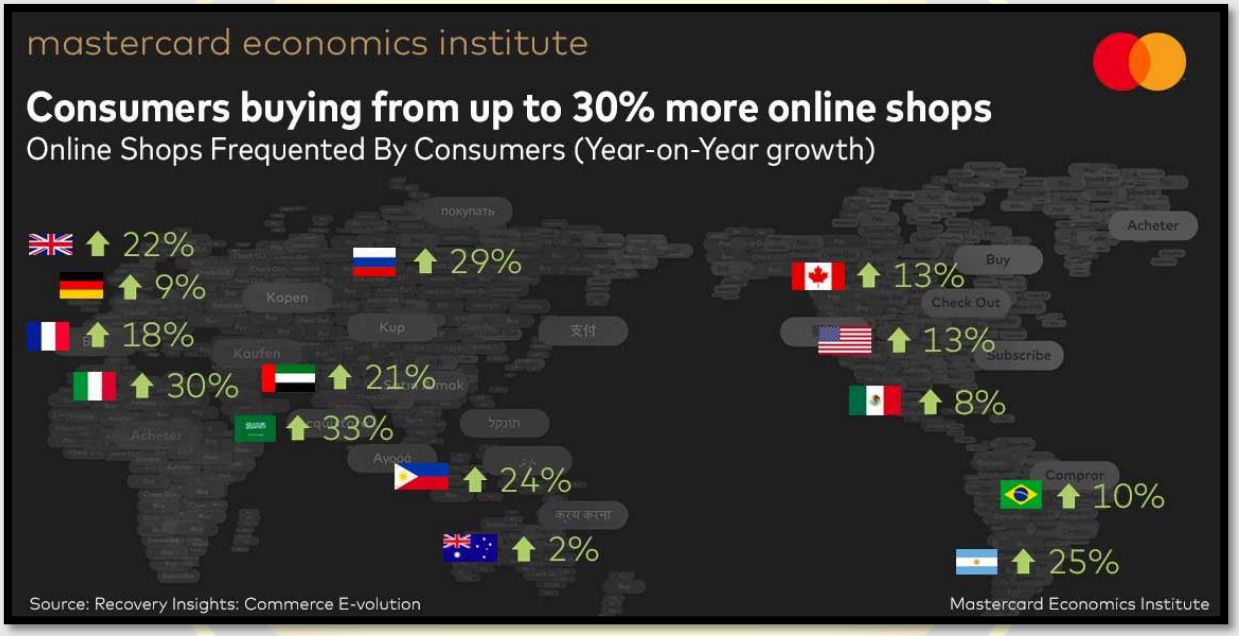
- Grocery and discount store digital gains look sticky: Essential retail sectors, which had the smallest digital share before the crisis, saw some of the biggest gains as consumers adapted. With new consumer habits forming and given the low pre-Covid user base, we anticipate 70-80% of the grocery e-commerce surge to stick around for good.

- International e-commerce rose 25-30% during the pandemic: International e-commerce got a boost both in sales volume and the number of different countries where shoppers placed orders. With infinitely more choices at their fingertips, consumer spending on international e-commerce grew around 25-30% year over year from March 2020 through February 2021.

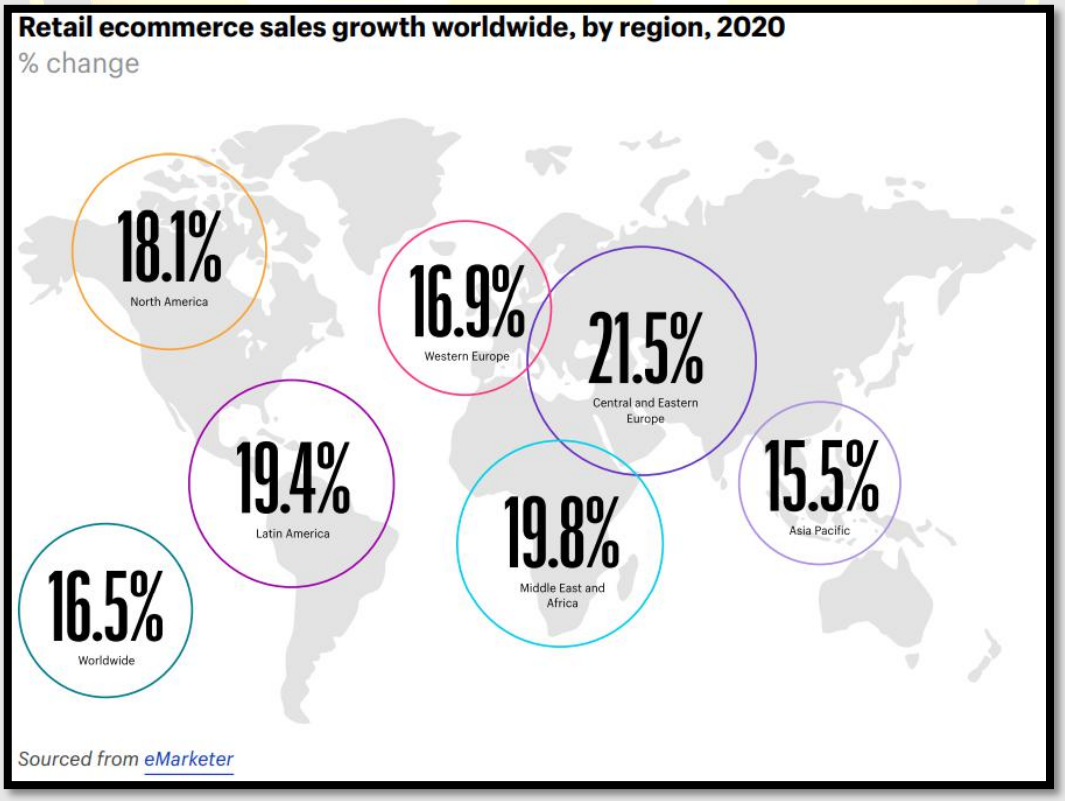
- Consumers increase their e-commerce footprints, buying from up to 30% more online retailers: Reflecting expanded consumer choice, our analysis shows that consumers worldwide are making purchases at a greater number of websites and online marketplaces than before. Residents in countries like Italy and Saudi Arabia are buying from 33% more online stores, on average, followed closely by Russia and the UK.
- Shift to electronic payments accelerated in the US: Even in store, Covid-19 accelerated the transition to digital—with more consumers moving from plunking down cash to touch-free payments. According to our analysis of payment forms at brick-and-mortar retail stores and restaurants, we saw non-cash payments jump by

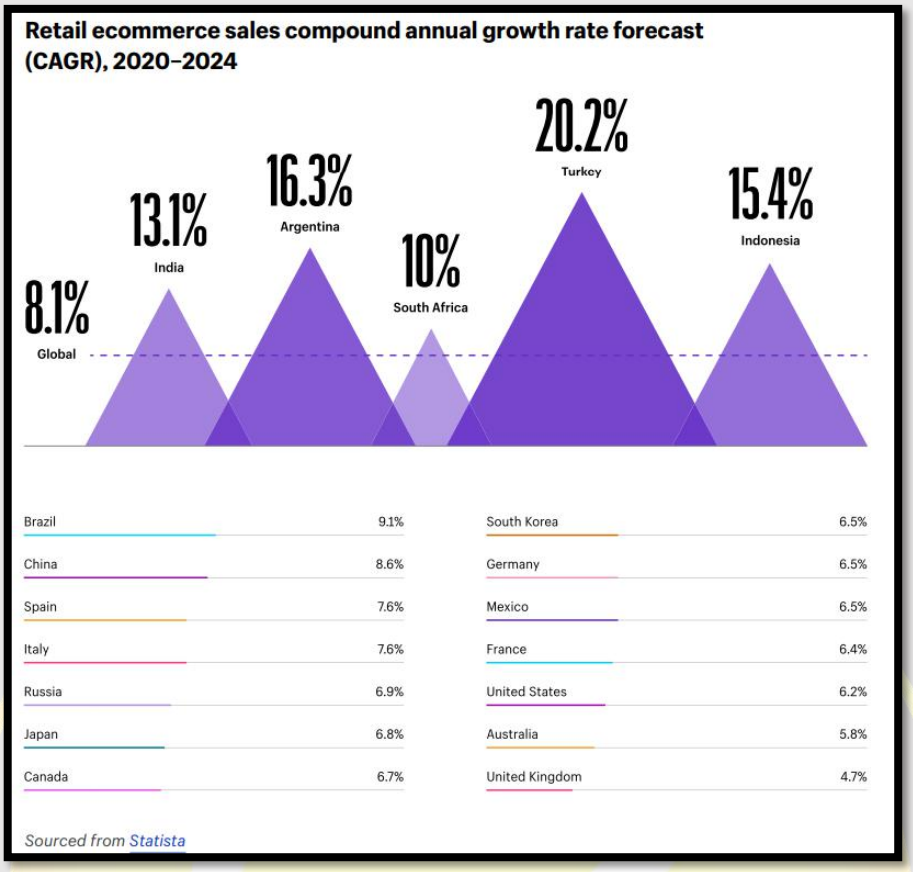
an additional 2.5 percentage points beyond the ongoing trend. This led to an acceleration of the shift from cash to electronic payments by a full year.

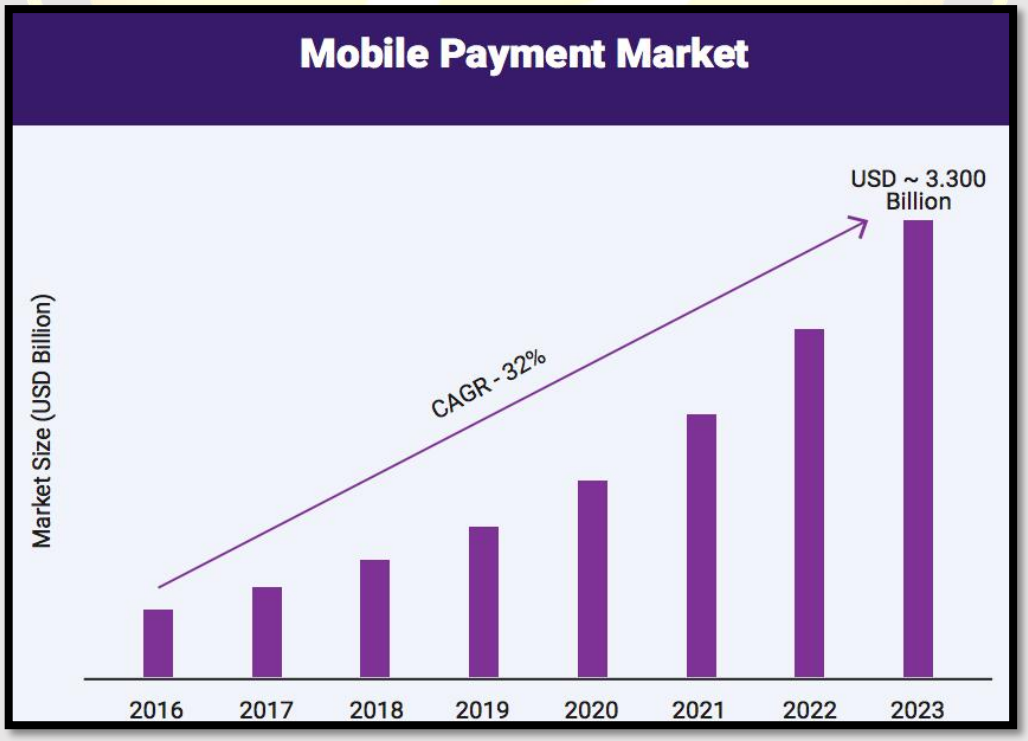
Mastercard launched Recovery Insights last year to help businesses and governments better manage the health, safety and economic risks presented by Covid-19. The initiative draws on Mastercard's analytics and experimentation platforms, its longstanding consulting practice and unique data-driven insights to deliver relevant and timely tools, innovation and research.




Shoppers worldwide fuel ecommerce supercycle
At the height of the COVID-19 pandemic, 10 years of ecommerce growth happened in just 90 days.
U.S. ecommerce penetration, %
10 years' growth
in 3 months
40%
30%
20%
10%
0%
2009
2011
2013
2015
2017
2019
Q1 2020
Sourced from McKinsey


Retail ecommerce sales growth worldwide, by region, 2020
% change
18.1%
North America
16.9%
Western Europe
21.5%
Central and Eastern Europe
19.4%
Latin America
19.8%
Middle East and Africa
15.5%
Asia Pacific
16.5%
Worldwide
Sourced from eMarketer


Retail ecommerce sales compound annual growth rate forecast (CAGR), 2020–2024
8.1%
Global
13.1%
India
16.3%
Argentina
10%
South Africa
20.2%
Turkey
15.4%
Indonesia
Brazil 9.1%
China 8.6%
Spain 7.6%
Italy 7.6%
Russia 6.9%
Japan 6.8%
Canada 6.7%
South Korea 6.5%
Germany 6.5%
Mexico 6.5%
France 6.4%
United States 6.2%
Australia 5.8%
United Kingdom 4.7%
Sourced from Statista


Mobile Payment Market
Market Size (USD Billion)
USD ~ 3.300 Billion
CAGR - 32%
2016
2017
2018
2019
2020
2021
2022
2023

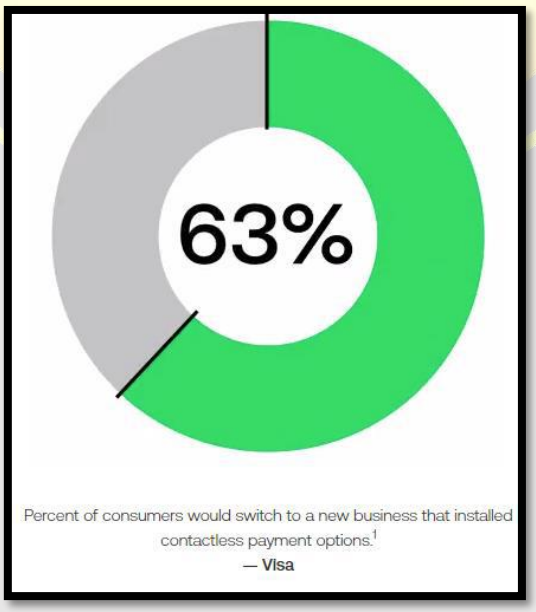
**CONTACTLESS PAYMENT ADOPTION**

**Accelerates**

In response to the pandemic-driven need to reduce face-to-face commerce and limit contact with payment devices, consumers have adjusted their payment preferences. As a result, the growth of contactless payments has accelerated around the world. With expanded use cases, contactless payments are going to find even more market traction in 2021.

Contactless payments — the ability to pay by tapping a physical card, wearable or smartphone enabled by RFID or NFC technologies over a card reader — were already on the verge of widespread global adoption. However, usage accelerated quickly due to the pandemic and will continue to gain further consumer acceptance in 2021.

Around the world, consumers are choosing to shop with businesses that offer contactless at the point of sale. “Contactless payments have become a driving differentiator: If all other factors were equal (price, selection and location), nearly two-thirds (63%) of consumers would switch to a new business that installed contactless payment options,” according to The Visa Back to Business Study.



**McKinsey Analysis**

**The Accelerating Winds Of Change In Global Payments**

The COVID-19 crisis is having a significant and widespread effect on global payments across sectors. The most striking and potentially lasting impact is an accelerating pace of change in the industry.

For the global payments sector, the events of 2020 have reset expectations and significantly accelerated several existing trends. The public health crisis and its many repercussions—among them, government measures to protect citizens and rapid changes in consumer behavior—changed the operating environment for businesses, large and small, worldwide.

For the payments sector, global revenues declined by an estimated 22 percent in the first six months of the year compared to the same period in 2019. We expect revenues to recover (only to a degree) in the second half of 2020, ending 7 percent lower than full-year 2019. Over the past several years, payments revenues had grown by roughly 7 percent annually, which means this crisis leaves revenues 11 to 13 percent below our prepandemic revenue projection for 2020. Given the impact of COVID-19 on the operating environment, we are diverging from our usual approach of delivering perspectives on the current year's global payments landscape relative to the prior year. Instead, we focus primarily on the state of the payments ecosystem in 2020 and explore the actions payments providers need to take to compete effectively in the "next normal." The insights in this report are informed by McKinsey's proprietary Global Payments Map, which for over 20 years has provided a granular, databased view of the industry landscape.

**A Half Decade Of Change İn A Few Months**

For global payments, 2020 stands in dramatic contrast to the year before, which was a relatively stable year. Global revenues grew at nearly 5 percent in 2019, bringing total global payments revenue to just under $2 trillion (Exhibit 1). Payments also continued to grow faster than overall banking revenues, increasing its share to just under 40 percent, compared with roughly one-third only five years earlier. Any stability was quickly disrupted in early 2020 by changing geopolitics coupled with reactions to the COVID-19 pandemic, both public (physicaldistancing measures, limits on business activity) and private (anticipatory and causal shifts in consumer and commercial behavior). As a result of the publichealth crisis, payments revenues in the first six months of 2020 contracted by an estimated 22 percent (roughly $220 billion) relative to the first six months of 2019. We expect full-year 2020 global payments revenue to be roughly $140 billion lower than in 2019—a decline of about 7 percent from 2019—a change equal in size to prior years' annual gains, which leaves revenues 11 to 13 percent below our prepandemic revenue projection for 2020.

**What We Already Know**

Once COVID-19 moved from a local outbreak to a global pandemic, many governments moved to protect their citizens, leading to lockdowns with various degrees of limitation. The immediate consequence was, of course, a steep reduction in discretionary spending and a severe demandside shock, along with reductions in cash usage. Discretionary spending initially sank by 40 percent globally. The impact was especially great on the travel and entertainment category, which was off 80 to 90 percent. While some categories of spending rebounded, consumers' well-documented shift from the point of sale (POS) to digital commerce accounts for the reduced use of cash. Overall, in retail, the impact was not a decline but a shift in buying behavior. In the first six months of the year, consumers spent $347 billion online with US retailers, up 30 percent from the same period in 2019—corresponding to six times the annualized 2019 growth rate of online retail.1 Amazon's

secondquarter 2020 numbers recorded 40 percent year-over-year growth, boosted in particular by the tripling of grocery sales.

In Europe, differences in shopping behavior between geographies were strongly reduced and differences between age groups eroded as many consumers (in particular, older shoppers) turned to online shopping for the first time. Consequently, all forms of electronic peer-to-peer and consumer-to-business payments have been boosted. In many regions, this has mostly benefited debit cards, which typically align with lower-value transactions and are a logical cash substitute for contact-averse consumers. Switzerland reported an increase in share of debit-card spending from 65 percent to 72 percent between January and May 2020,2 mostly at the expense of cash. Higher limits for contactless payments also triggered rising adoption rates across the globe, making inroads beyond debit's typical domain of smaller-value transactions. For credit cards, the picture is more nuanced; consumers in certain geographies seemed to be paying off credit-card balances in preparation for challenging times ahead.

In Australia, for example, credit-card share among total card spending fell by five percentage points between February and June 2020, in favor of debit cards.3 In Asia, however, alternative payments, such as instant and mobile payments, grew, while credit cards retained their strong incumbent position supporting e-commerce and POS transactions.

Logically, given the steep reduction of in-person purchases, cash transactions and ATM usage declined—the latter after an initial wave of withdrawals by anxious consumers. Germany and the United States each saw spikes in cash withdrawals in the days leading up to lockdowns. The fear of contracting COVID-19 through hightraffic ATMs and, in some cases, the refusal of merchants to accept cash (often despite legal obligations) nudged consumers toward electronic payment options to complete purchases. ATM usage fell by 47 percent in April 2020 in India, while the United Kingdom experienced 46 percent declines per month on average from March to July 2020. By the end of 2020, we expect a shift of four to five percentage points in the share of global payment transactions executed via cash—down

from 69 percent in 2019—propelled by evolving behavior in both mature and emerging markets. This is equivalent to four to five times the annual decrease in cash usage observed over the last few years. The reduced use of cash benefits banks overall: the cost of cash handling exceeds cashrelated revenue inflows, and electronic payments generate incremental revenue.

The pandemic has accelerated the move from “physical” to “virtual” banking. Banks in multiple geographies are closing branches (or in some cases will not reopen branches they closed due to the pandemic), as well as ATMs. In Australia, the top four banks have removed 2,150 ATM terminals and closed 175 bank branches since June.4 These accelerated behavior changes in response to the COVID-19 crisis caused a fundamental shift in adoption of technologies, such as real-time account-to-account payment infrastructures, that had been developed over recent years. Investments in instant payments have begun to reap greater benefits, both in POS and e-commerce usage of instant solutions.

The trend comes in response to customer expectations for speed, price differences, and greater adoption of customer-facing applications, such as specialists like GrabPay in Singapore or bank solutions like MobilePay in Denmark. In the United Kingdom, as payment speed becomes more important, consumers and businesses have increasingly opted to settle bills online; for example, the average daily value of transactions processed by the Faster Payments service rose by more than 10 percent from the fourth quarter of 2019 to the end of March 2020. In India, banks stepped up their digital propositions, integrating bill payment, e-commerce links, and Unified Payments Interface (UPI)—the nation’s local real-time payment system—into mobile banking apps to present three digital options in a single customer interface. UPI spending increased by roughly 70 percent over the first seven months of 2020.

At the same time, governments have tried to protect the economy as a whole and the well-being of companies as well as citizens. Additional easing of monetary policies led to lower interest rates, further deteriorating interest margins. Monetary authorities reduced

benchmark rates in Europe and the United States and then in emerging markets, including Brazil, India, and South Africa, to limit the impact of pandemic-related recession, making net-interest-margin (NIM) compression a global phenomenon. Large and small markets alike are experiencing rate cuts of 100 to 300 basis points. Overall, we expect global interest margins to contract on average by approximately one-quarter percent in 2020, compared with a sixbasis-point reduction in 2019, shrinking payments revenues globally by approximately $82 billion. Digitization benefits must first fill this gap before generating growth.

Cross-border payments flows also have been severely affected by the pandemic, as well as by geopolitical dynamics. In 2019, cross-border payments totaled $130 trillion, generating payments revenues of $224 billion (up 4 percent from the previous year). In the first half of 2020, many cross-border fundamentals radically changed:

● International travel all but ground to a halt, with more than 90 percent of countries imposing restrictions. Transaction-fee margins on remaining volume also declined, due to waivers offered to stimulate demand to offset the impact of a reduction in leisure and business travel flows, which fell by more than 70 percent.

● During the pandemic, interregional trade saw greater impact than intraregional. Drops in interregional flows for Asia (−13 percent), Europe (−20 percent), and the United States (−23 percent) directly cut into cross-border payments volumes, while the prices of oil and other commodities fell sharply.

● Business-to-consumer payouts (often salary disbursements) and remittance payments slowed, because of restrictions on movement of cross-country workers and growing unemployment.

● Cross-border e-commerce volumes provided a notable exception to the gloomy news: the second quarter brought double-digit growth as initial logistic challenges were resolved. UPS and PayPal, for example, reported double-digit growth on cross-border shipment volumes and value of merchandise sold.

● Increased volatility and uncertainty have enabled growth in foreign-exchange-related revenues and pushed up treasury-related transactions as companies scramble to mobilize surplus cash.

In addition to the health crisis, certain geopolitical forces that began to materialize in 2019 have grown stronger since. Many companies are realizing the strategic weaknesses in their existing global supply chains, given trade frictions and potentially recurring public-health disruptions, leading to the exploration of nearshoring and other rebalancing. McKinsey analysis reveals potential shifts of as much as $4.6 trillion of global trade flows over the next five years (see chapter 3, “Supply-chain finance: A case of convergent evolution?”, for more). The value-chain shifts that began before the crisis are yet to take full effect—because of the complexity of moving such supply chains and the challeng e of building new ones—so this is a longer-term trend.

**The Rest Of 2020 And Beyond**

The second half of 2020 presents a quite different outlook. Broadly, we see some pressures from the first half continuing but with pronounced

Our forecast uses McKinsey’s nine COVID-19 macroeconomic scenarios.5 According to a survey of more than 2,000 executives around the world, the most likely outcome is the “muted recovery” scenario (A1), a combination of virus recurrence and a muted economic recovery, with regional differences.

Applying the A1 scenario to global payments, we forecast that most categories of payment transactions are poised for sharp and rapid rebounds as lockdowns are lifted and behavioral shifts from cash to electronic payments are largely sustained. On the downside, interestdependent revenue components are likely to remain suppressed for an extended period, mostly affecting banks that provide payment services. For specialists and fee-based

revenues, much will depend on differences in spend patterns (for both businesses and consumers) before and after the crisis. For instance, dining, travel, and entertainment expenditures, which often carry higher transaction fees, are unlikely to rebound in the near term.

As we indicated, not all players, countries, and products will arrive at the same end state (see sidebar “A regional overview of the year in payments”). At a regional level, the following differences are notable:

• Asia–Pacific (excluding China) could suffer larger declines, as its revenue model is more affected by NIM contraction, faces increasing government pressures on mass-market transaction fees, and has greater exposure to long-term affected industries, such as travel, tourism, and international remittance payments.

• Europe may be poised for a swifter rebound, for two reasons: First, NIMs were already so compressed before COVID-19 that there was little room for further squeezing; second, volume growth is being fueled by the acceleration of digital migration in Southern and Eastern Europe, and by government stimulus measures.

• In North America, the revenue benefit from an accelerated shift to digital channels has been more than offset by credit-card economics— outstanding balances are down roughly 29 percent from 2019 levels, and increased delinquencies are a possibility. Considering credit cards are the largest source of the region’s payments revenue, at roughly 44 percent, the decline in outstanding balances alone will outweigh the benefits of increased use of digital channels.

• In Latin America, which is characterized by a significant unbanked population, cash usage will likely remain resilient. Among the banked, Visa-supported mobile wallets such as PLIN

and Yape have gained more than a million users since December 2019, with the pandemic accelerating this trend.

• Overall, the greatest recovery opportunities reside in countries with low electronic penetration (Brazil, India, Indonesia, Thailand), as the next normal provides impetus for electronification. However, countries starting from a high level of digitization (France, Germany, the United Kingdom) are also seeing COVID19-induced behavior push cash usage to the minimum—fueling payments-revenue growth.

Overall, while the global health crisis leaves banks and specialists with meaningful revenue concerns, the real challenge—as well as the real opportunity— lies in embracing the acceleration of change. If that issue is addressed properly, the global impact on payments could be significantly more positive than the outlook for GDP (see sidebar "The relationship between GDP and payments revenue").

**Looking Forward: New Rules For Engagement**

Long-term forecasting is unusually difficult in the current global environment, given the looming uncertainty on multiple fronts: economic recovery, interest rates, global trade, and a murky time frame for public-health breakthroughs. One thing seems clear, however. The imperative to accelerate transformations to a digital-first and more agile organization has never been greater, and it exists globally

Still, the current global context removes many of the long-standing impediments to embracing transformation. As financial institutions enter this period of change, we propose five major themes to which payments and bank executives should be particularly attentive:

• Choose where you play wisely. The composition of your customer portfolio matters more than ever, as restructuring of consumer and commercial commerce reshapes where value is captured in payments. Growth is notably accelerating in the small and medium-size

enterprise (SME) segment, B2B–to consumer (B2B2C) business models, and new customer arenas, such as cross-border e-commerce. The role of platforms also is growing fast, with ecosystems a new growth segment. The shift to digital makes it possible for providers to create far more tailored solutions, and customers have shown a willingness to pay for these if sellers demonstrate value.

• Services and solutions, not financial products. Commercial customers expect bank and payments partners to enable greater sales by improving end-customer experience and the adoption of new business models—for instance, marketplace onboarding, B2B2C credit, and loyalty services—that do more than move money and manage cash flow. For consumers, the payment step is moving into the background of the shopping journey, and they expect support with conducting commerce and avoiding negative consequences, not merely a means to pay.

• Sales excellence. Transaction banking and acquiring are nearly a decade behind the technology and telecom sectors in sales and customer-management practices. These other industries have an entirely different skill set and language for sales and service: sales motions, agile sales, inside sales, customer success—all made possible by data and algorithms delivering the best adapted solutions for the market. Closing this decade-wide gap over the next two years will deliver significant value.

• Transaction-banking client experience. New challenges in supply chains and growing trade pressures are accelerating what has been a slow disruption in international payments and trade. Delivering the long-promised step-change improvement to corporate clients will require fundamental organizational change, particularly for siloed banks.

• Changing the focus from “time value of money” to “money value of time.” Becoming digital by default requires significantly redefining the institution’s operations through the lens of customer journeys. To plan that digital transformation, most players have built road maps spanning the next five to six years. But given the modified revenue context, continued

investment requirements, and market expectations spurred by the new environment, winners will find a way to deliver on this transformation within 18 to 24 months. In chapter 4 of this report, we explore the various models that such a payments modernization could leverage.

**The Rise Of Merchant Services**

The shift to electronic transactions has placed front and center the need for merchant acquiring companies to update and differentiate their service offerings.

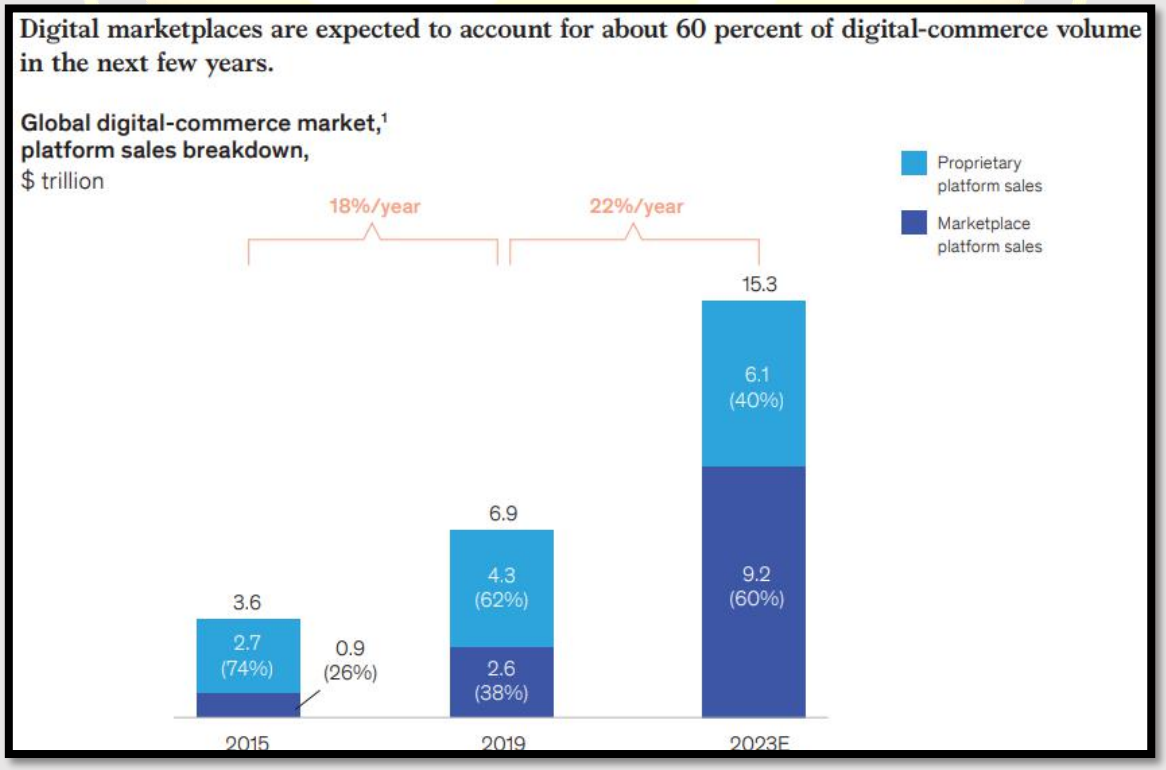
Globally, merchant acquiring has evolved over the past decade from a legacy processing and hardware business to a full-stack software and merchantservices solution. This shift, coupled with the fragmentation of the merchant-facing payments value chain, is dramatically affecting the economics and business models of merchant acquisition as it was done in the past, favoring instead the value-added approach of the new merchantservices players.

The evolution of merchant services typically involves a pattern in which revenues from merchant processing are being commoditized, and in response, players seek to differentiate, either by expanding their product suite or by building scale— mostly through acquisitions— across geographies, distribution (e.g., integrated software vendors, bank led), and delivery channels (e.g., digital, point of sale). Although the trends and trajectory are similar across regions, certain geographies are further ahead. As acquirers shape their priorities for the next decade, the transformations spurred by 2020's public-health crisis will play a big part in the way they rethink their vertical focus, platform strategy, and investment priorities.

**New Winners And Complex Needs Compel A Reevaluation Of Focus And Value Propositions**

One of the COVID-19 pandemic's most visible impacts on financial services has been the dramatic acceleration in shifts toward e-commerce and digital payments. This is true not only in more mainstream verticals, such as fashion and groceries, but also in merchant segments like healthcare, professional services, and education, which historically have not received a material portion of payments through B2C digital channels.

This has led to an unprecedented digitization of small-business commerce across geographies, mostly through marketplace platforms. Marketplace Platforms like Amazon, eBay, Etsy, Flipkart, and Shopify have seen seller sign-ups increase by 70 to 150 percent since the start of the pandemic, based on their most recent filings and public statements, while proprietary platforms are losing share. In healthcare, there has been a surge in provider participation for services like telemedicine, which in turn is highlighting a growing need for B2C digital payments in professional services, education, and other areas.

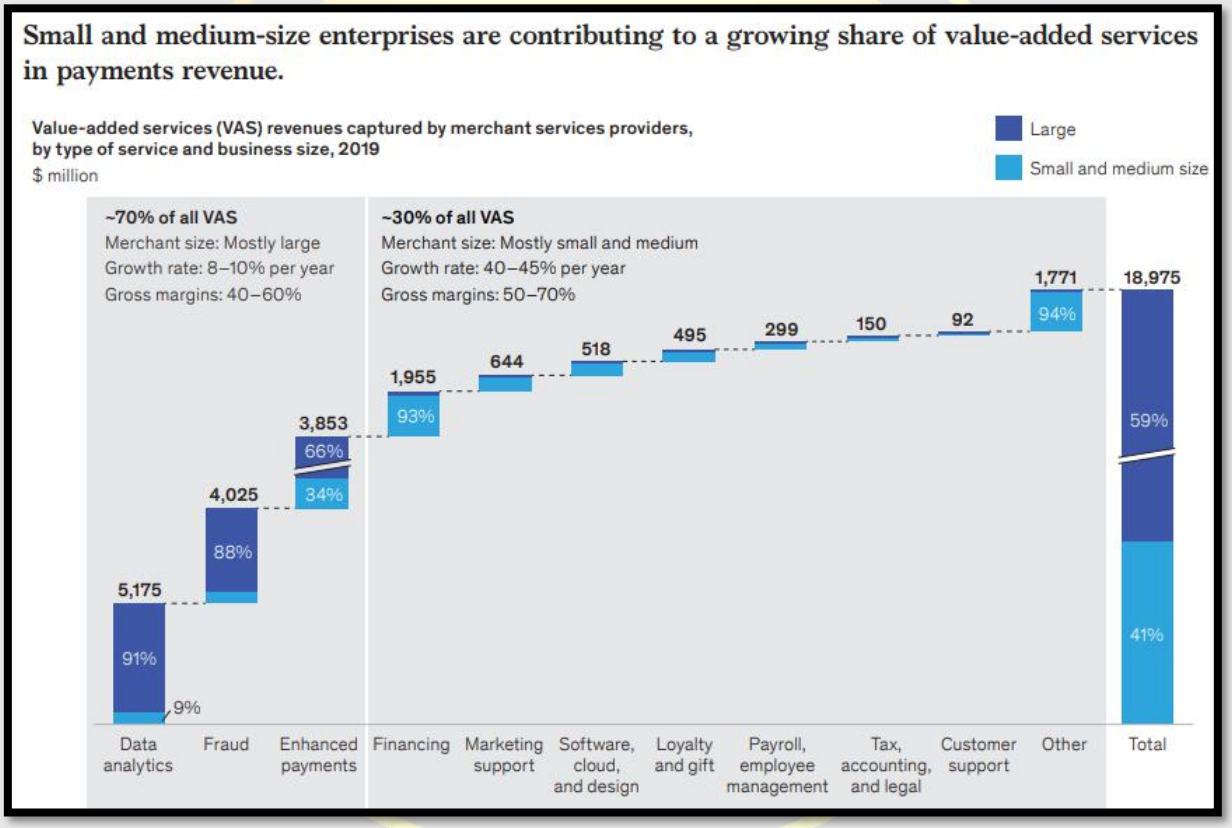


This shift to digital is driving up merchants' payments-acceptance costs, which are expected to rise by an incremental $8 billion to $15 billion (about 6 to 10 percent) as commerce migrates to these higher-cost channels. Just as importantly, merchants also face higher decline and fraud rates on digital transactions, with ramifications for customer experience.

As these at-scale marketplaces and platforms consolidate their share of digital sales, they naturally seek to lower their cost of acceptance, which in turn adversely impacts margins for acquirers. At the same time, however, digitization of commerce has created greater willingness to pay for enhanced services and solutions. Merchants are willing to accept higher fees for demonstrated value, such as improved authorization rates, a more seamless payments experience, or improved cart conversion through point-of-sale financing. Even in sectors like grocery, where acquirer margins have approached structural floors over the past few years, merchants are willing to pay 20 to 30 percent higher rates for better payments performance, particularly when the impact on the business is positive and significant. Higher-margin verticals, such as fashion and accessories, are seeing increased demand for financing solutions and affiliate marketing products. As an example, within the fashion and accessories verticals in the United States, the number of merchants signed up for buy-now, pay-later solutions has nearly tripled.

Leading acquirers are starting to transform in two distinct directions: adding targeted value propositions and becoming marketplaces themselves. Industry-focused value propositions address market needs for service and risk levels, fees, value-added features, partnerships, and backend integration. This approach is not necessarily industry specific; acquirers are increasingly segmenting industries into groups based on specific needs, such as a pay-later segment, delivery segment, prebook segment, and repeat visit segment. Just as importantly, acquirers themselves are beginning to resemble marketplaces by offering solutions like payments disbursement, financing and onboarding for small and medium-size enterprises (SMEs), commerce marketplace knowyour-customer services, sub-merchant account creation and management, and SME-facing risk and identity solutions

Most large acquirers have invested heavily in core payment-enablement services like authentication, fraud, and alternative-payment-method (APM) acceptance and in creating omnichannel acceptance and settlement, but relatively few have capitalized on the opportunity to deliver enhanced value-added services to large retailers (Exhibit 2). Given the growing willingness of large retailers to pay for such services and to seek these from their current providers, this is a significant opportunity for current portfolio monetization and margin protection. The focus of these investments in addon services will be influenced by the vertical focus of each merchant-services provider.




**The Acceleration Of SME Digitization Has Further Underscored The Value İn The Long Tail**

Even prior to COVID-19, most of merchant-services providers' revenue growth came from the long tail of SME customers. Most acquirers have targeted this opportunity through indirect distribution channels (e.g., integrated software vendors and web-store providers), as scaling through direct channels poses a more complex challenge. In markets with

bankowned acquirers, this transition to indirect channels has been slower, given the ability of bank-owned acquirers to sell directly within their own base.

Regardless of the channel, however, SMEs have accounted for about three-quarters of all new revenue growth in the merchant-services space over the past three years, especially in established markets. (Serving SMBs requires hyperregional strategies for distribution and scale.

In mature markets, acquirers are increasingly focusing on distribution through ISOs (independent sales organizations), ISVs (integrated software vendors), and other indirect channels, relinquishing 40 to 80 percent of revenue margins as residuals to their channel partners. As COVID-19 has accelerated a flight to digital for SMEs across verticals, some of banks' ISV-led models have been taken a financial hit. Within the restaurant space, for example, at-scale food-delivery apps like Just Eats, Uber Eats, and Zomato have gained scale, and transaction volume has shifted from the in-store ISV to the food-delivery applications, meaning those transactions are no longer processed by the restaurant's acquirer or processor. Under those conditions, acquirers need to rethink their approach to partnerships and develop models that deliver more value to merchants through their ISV partners—for instance, merchant cash advances, point-of-sale financing solutions, analytics, and omnichannel reconciliation.

In emerging markets, ISVs are steadily gaining share, but most of the sales still leverage traditional agent-based or direct models. Bankowned acquirers have an advantage in many of these markets but often lag in sales and product sophistication. In these markets, acquirers still have the opportunity to invest in building a point-of-sale platform-based business that enables them to serve a broad swathe of merchant needs and monetize the SME relationship in a more holistic fashion.

**Trade barriers and government intervention hinder market expansion and enable local wins**

The economic slowdown has increased many governments' willingness to accept additional investment avenues, somewhat counterbalancing the impact of recent trade disputes. The competing priorities of regional governments are likely to interfere with companies' ability to enter into new markets organically. Acquirers will need to consider regional sponsorships, acquisitions, or joint ventures to enter priority markets.

This "slow-balization" is also expected to fuel the growth of regional supply chains. This will create a need for regionally integrated solutions, especially in B2B payments. Acquirers that have been slower to pursue the value pools in B2B digital commerce, due to its multi-geography complexities, may now be able to pursue opportunities at a regional level.

**Preparing For 2021 And Beyond**

As acquirers and merchant-services players reorient to prepare for the next decade, several key areas require focus:

• Investing to transform into a platform business for larger merchants. Most large merchants are grappling with the accelerated shift to e-commerce, which has created more pronounced payments digitization needs at the point of sale, including contactless payments, enhanced authorization, fraud and chargeback mitigation solutions, financing at point of sale, sub-merchant onboarding, and payments remittances. Acquirers have a unique opportunity to shift from being a traditional payments acquirer or processor and bring together proprietary and partner solutions into a single platform for larger merchants, which also enables bundled economics and better value creation.

• Investing in SME channels in emerging geographies to capture share. The shift toward ISV-led models across markets is imminent; acquirers need to assess their strategic posture to address this trend. The build-out and scaling of direct-to-SME models will be capital intensive but potentially more lucrative if acquirers can create SME-focused one-stop-shop platforms. Investing in these channels and value propositions over the next 18 to 36 months,

before these markets tilt toward ISV-led models, will position them to compete much more effectively.

• “De-cluttering” infrastructure. The spate of acquisitions has led to often redundant data and software platforms that are burdening at-scale merchant acquirers, hindering their ability to compete with next-generation players that have built more integrated, scalable solutions. There is a dramatic need for rationalization of software, data platforms, infrastructure, etc. to enable acquirers to support merchants efficiently across geographies, verticals, and devices.

• Aligning and simplifying organizations to mirror emerging and at-scale merchant profit pools and needs. Segmenting customers into enterprise (and within this marketplace models, pure-play subscription, travel, at-scale retail) and SMEs (and within this direct, bank-led, ISO/ISV/VAR led, partner-led) and organizing the business around segments based on how customers buy is critical to compete effectively. Such alignment will enable acquirers to invest appropriately in sales effectiveness and commercial enablement, thereby improving go-to-market and pricing approaches as well as progress tracking.

• Directing investments to digital ISVs and payments-adjacent offerings. With traditional processing revenues under sustained pressure, acquirers should focus investment on scaling integrations with digital ISVs and creating payments-adjacent offerings where they have a value-added play (e.g., POS financing, rewards redemption at point of sale, SME financing) Acquirers should better monetize their role within the value chain as an enabler between issuers/service providers and merchants, e.g., explore the material opportunity to act like a marketplace or and “app-store.”

• Differentiating through data. Differentiate solutions on data and monetize data more effectively to enable enhanced authentication, fraud, and chargeback use cases. The shift to digital has created a much greater demand for enhanced authorization, real-time data

connectivity, better data-enabled fraud, submerchant underwriting decisions etc. Acquirers possess a gold mine of data but the complexity of disparate platforms, unclear data strategy, poor data architecture, and limited buildout capabilities have impaired the ability to effectively monetize this asset.

• Avoiding complacency on alternative payment methods. The growth of APMs, fueled by evolving regulation, ongoing innovation and retailer interest, will necessitate their inclusion in acquirer portfolios. APM strategies must evolve to a point where acquirers have a clear view on when and how to directly integrate vs. license through APM aggregators or other consolidators. In addition, as APMs capture a growing share of transactions, acquirers will need to refine pricing/revenue/fraud models to drive value.

• Rationalizing customer processes. As the number of devices, interfaces, payment means, and channels continues to increase, acquirers are in a privileged position to aggregate, triage, and monetize a “guaranteed best route” experience. A customer journey-based view of payments evolution is critical to its enablement.

**Revamping Bank Operating Models For Payments**

The payments segment is performing well for banking—but not for banks. Under pressure from multiple forces, successful banks will develop a new operating model better suited to changing times.

Payments remains among the best-performing financial-services product segments around the globe. Despite the direct impact of COVID-19- related lockdowns, leading payments players have rebounded surprisingly quickly, and many aspects of commerce resumed relatively uninterrupted in most regions almost as soon as lockdowns were lifted. Payments

providers' central role in the economy—and their business potential—is illustrated by their healthy total shareholder returns (TRS) even amid the economic downturn.

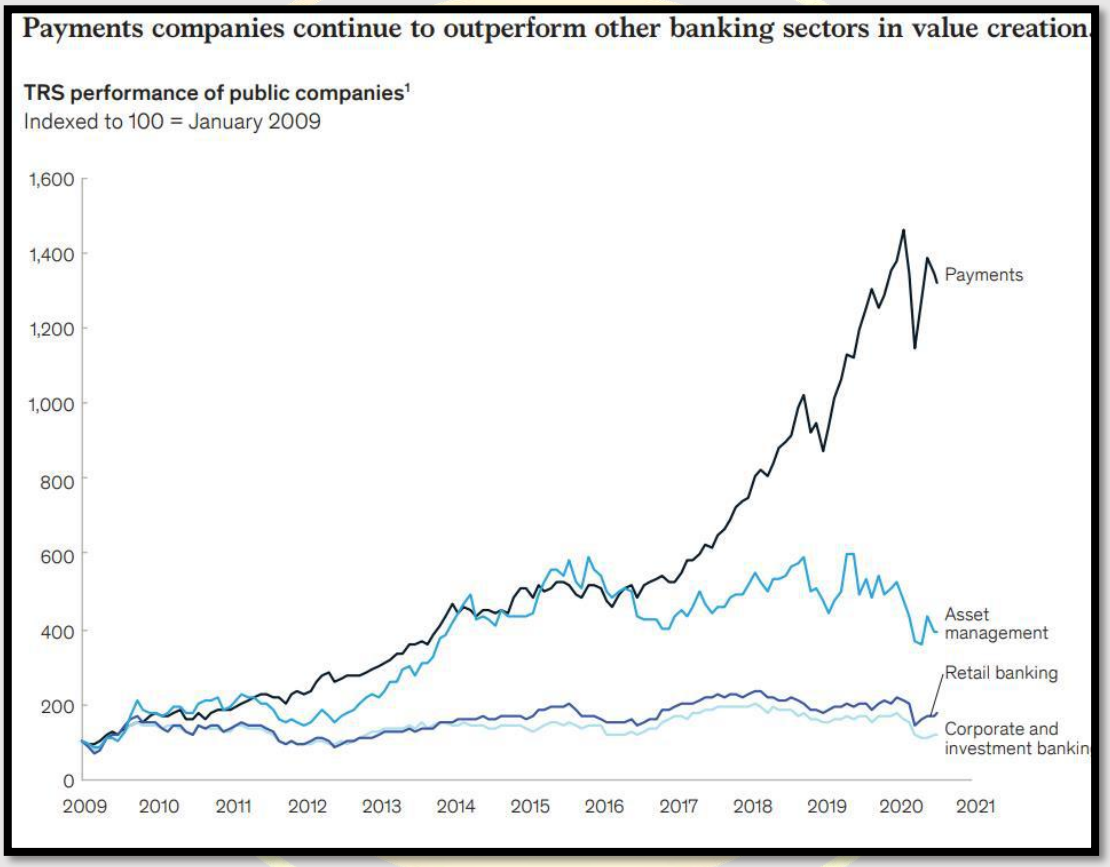
Although some segments of the payments industry—including travel-related services, international remittances, and specialty integrated point-of-sale solutions—face deeper and longerterm impact, digital payments volumes have soared overall, partially driven by accelerated consumer migration to digital channels and payments forms. This momentum is expected to persist as a next normal develops.

Unfortunately for banks, historically the main providers of payments services, this momentum does not extend to most of them. Traditional revenue sources, such as interest margins on current accounts, revolving credit lines, interchange revenues, and cross-border fees, are under pressure in the current environment. Interest rates are at historically low levels globally and are not expected to rebound soon. Credit-card losses are exacerbated by the economic downturn. And interchange and cross-border payments fees are pressured by regulation and competition. As a consequence, the bank side of the payments revenue model has substantially declined over the past year, especially because of compressed net interest margins and attrition of bank-specific fees such as interchange. Recovery is not imminent.

In a highly competitive market where it remains difficult to charge substantial transaction fees, the payments P&L outlook for many banks is challenged in the near to midterm, absent significant cost rationalization. Success for banks will depend on thoughtfully assessing capabilities, determining the role of payments in market strategies, and appropriately aligning payments operations to achieve the required performance improvements. More than traditional cost optimization, this may involve unit carve-outs, payments as a service, outsourcing, and/or partnerships to ensure appropriate performance.

**Investment Needs Challenge Banks' Ambitions**

Payments remain a substantial factor in banks' operating cost base, sometimes representing as much as 30 to 40 percent, partly because of the high technology spend associated with providing payments services. A disproportionate share of effort and resources is required to maintain and improve infrastructure, manage upgrades, implement rule changes, and rationalize legacy technology. This often leaves insufficient resources for sorely needed digitization efforts and investment in new customer services and applications. The complex nature of integrations between payments and many other bank systems add to the cost of change.




All signs point to the expectation that for banks, the cost of ownership of payments services will remain high, given the ongoing number of regulatory, IT, and market-driven sector changes (e.g., instant payments, open-banking adoption, PSD2—and perhaps 3—proliferation of alternative payments methods). The majority of these investments focus on staffing supporting projects, ensuring compliance with external requirements, and shielding

the customer experience from disruption, rather than freeing up capacity to allow banks to develop new products and enable new customer experiences.

However, given that payments represent the most frequent touchpoints between a bank and its customers, the need for digital investment to remain competitive also is growing. In the context of lower bank payments revenues, concern is increasing over the ability of leading banks to continually harness the capital resources required to pursue market leadership, particularly given the demonstrated investment capabilities of the leading nonbank payments specialists.

COVID-19's impact on the top and bottom lines of bank P&Ls (including payments) and the need to continue investing in technology to offer a compelling value proposition require banks to determine the strategic role and their level of ambition in payments. While some banks view payments as a differentiating factor, others do not see their payments value proposition as a core component of their unique product offering.

Given the industry's rapid evolution, payments leadership requires the willingness to commit significant investment. As a point of comparison, leading payments specialists each committed between 3 and 13 percent of their revenues to capital expenditures in fiscal year 2019, representing annual budgets ranging from $250 million to nearly $1 billion. While a "fast follower" strategy to capture real growth—for instance, by casting one's organization as a disruptor or service champion at a lower price tag—certainly has appeal, it too places added requirements on the operational capabilities and systems of banks and still triggers the need for investment.

In this context, the one truly negative option is to do nothing in the face of market upheaval. Whatever role payments play in a bank's overall strategy, the industry's rapid changes coupled with the increasing investments required to play in this space require banks to rethink their payments operating models.

**Changing The Operating Model: Four Options**

Today, for banks to retain their central position in customer journeys and the payments business, they will need to reflect on the fundamentals of their operating model. Incremental efficiency gains will no longer be enough to maintain banks' structural advantages in the space. We believe cost improvements of 30 percent or more will be needed for banks to create the necessary headroom for investment and acceptable profitability. And although that target might seem daunting, we believe it is within reach.

The urgency to fundamentally rethink the payments operating model is heightened by the confluence of several market factors. These are increasing pressure on margins; growing international standardization, enabling potential scale gains and the emergence of technologies supporting change; and growing regulatory pressure to revamp operations to enable services like instant banking and open banking.

But change to what? Four potential operational models, each with appeal to banks facing particular strategic circumstances, offer potential. These are a carve-out and scaling of payments, a partnership to share payments utilities, offers of payments as a service, and outsourcing of selected payments services.

**Moving To A Decision**

Changing the operating model of a business that typically represents one-quarter to one-third of the bank's business is difficult (see sidebar, "Lessons from experience"). Nevertheless, for most banks, it is a necessary step to ensure long-term success in a critical and rapidly evolving market

Deciding on a bank's future payments operating model first requires determining the bank's level of ambition in payments. Bank leaders should ask themselves what is critical to their bank in the payments arena. Is it strategically important to retain control of customer

touchpoints and data, or is it enough simply to ensure provision of a full suite of essential payments products? Which payments products and services are critical to differentiation? Is the bank meeting this desired standard today?

Given the high investment required to lead in payments in the future, banks should also take a brutally honest look at their current level of payments capabilities and consider these questions: What is our stand-alone potential for improvement? What are the bank's realistic prospects for in-house development and innovation, including its ability to earmark sufficient investment funds?

For banks that are ambitious in payments and at a solid starting point in terms of in-house payments capabilities, we consider carve-outs of the payments business as a potential development for the mid- to long term. Carving out the payments business could create long-term value by attracting top-notch talent free of the constraints of banking labor agreements, creating a clearer path to scale by attracting other banks' volumes, and building out stand-alone operations in an environment that generates high-multiple valuations.

If the bank lacks the investment capabilities required to keep pace with the competition or hasn't committed to being unique in its payments offerings, an attractive alternative is to investigate the wide array of available outsourcing plays. A full complement remains incomplete in many markets outside the United States, however, although some players are developing in this space. Before choosing which route to take, banks should ask themselves several questions: What scope of partnering and outsourcing is my bank willing to consider, and in which areas? How much cost savings could be gained from each outsourcing option? Is there a reliable payments supplier in the market to outsource to, or is there a need to build a common utility? What will be the impact of the transaction on my HR and social situation? How would the bank mitigate associated risks, ensure sufficient input in future product decisions, and retain flexibility for potential future changes?

**THE ANALYSIS OF CRYPTOCURRENCY IN PAYMENTS AND GLOBAL PAYMENT SOLUTIONS**

**Blockchain In Financial Services In Emerging Markets—Current Trends World Bank Analysis**

Blockchain, or distributed ledger technology, is a digital, distributed, immutable transaction ledger that replaces a central authority (or 'middleman') with algorithms. By doing so it offers numerous opportunities for cost savings while opening new market segments for existing financial institutions and new players alike.

Distributed ledger technology is still in an early stage of development and deployment, yet it is widely thought to have the potential to deliver a new wave of innovation to the financial technology, or fintech, ecosystem by providing a 'trustless' distributed system to exchange value.

This does not mean that the new system is not trustworthy. Instead, blockchain's unique technology eliminates the need for 'trusted' intermediary to guarantee the authenticity of and register a transaction, and thus could have the same transformative impact for the transfer of value that the Internet had for the transfer of information. As described by the World Economic Forum, it is the future "beating heart" of the financial sector.

Bitcoin, a cryptocurrency that emerged in 2009, provided the first widespread use of blockchain. Since then, the technology has been synonymous with digital currencies. Yet the early abuse of bitcoin by criminal enterprises may have hindered the development of blockchain. Many other digital currencies have since emerged, including ether, the crypto-currency token used on the Ethereum distributed applications platform, the closest challenger to Bitcoin.

Today a number of experiments are taking place in the financial industry that attempt to broaden the use of blockchain beyond its use as a digital fiat. These range from relatively straightforward solutions such as Money transfers, to more complex financial instruments enabled by the introduction of ethereum and smart contracts, such as trade clearance and settlement.

The framework also makes supports the idea that blockchain technology could have a strong impact in markets currently neglected or underserved by financial institutions, with a less competitive market structure and high verification costs. These conditions are typical in emerging markets.

Current developments show that use cases that are relatively simple to design and implement are appearing. For instance, digital wallet AliPay is adding a bitcoin option for its customers. Visa has partnered with blockchain company Chain to build Visa B2B Connect, an enterprise blockchain infrastructure to facilitate international financial transactions for their corporate clients. Established financial institutions are more likely to use blockchain for intra-organizational projects intended to reduce organizational complexity, improve efficiency, and reduce costs. Banks and major financial institutions are working both collaboratively and independently to develop blockchain technology, as seen in the proliferation of global consortia (see below). Emerging markets, despite getting a later start on blockchain than the United States and Western Europe, have been catching up, with strong performances in 2016–17, in particular by Asia. And governments and regulators are taking notice, and trying to fashion appropriate responses. In India, the legalization of bitcoin is a hotly-contested policy issue between the Ministry of Finance, which would like to tax it, and the Reserve Bank of India, which has declared bitcoin illegal and in breach of antimoney laundering provisions.71 The Indian situation is an example of how distributed ledger technology has the power to act as a disrupter, but also as an enabler to market players, changing business models and influencing the governance of the global financial system.

Recent venture capital developments also indicate that the financial industry is mobilizing around the potential impact of blockchain on their business, and is beginning to invest in related research and development and is testing applications.72 Investment in blockchain

is gaining momentum, with approximately $1 billion of venture capital investment over the last 24 months ($500 million in 50 venture capital deals in 2016 alone) and the trend is expected to grow rapidly.

A 2017 McKinsey survey found that the global banking industry is expected to spend $400 million on blockchain related projects by 2019. Some 70 percent of financial organizations are in the early stages of experimentation with the technology and most executives expect to see material impact in mainstreaming it in the next five years. A first rough estimate of limited applications, driven mostly from a cost reduction perspective, suggests significant value creation on the order of $70 to $85 billion.

This note seeks to: examine current macrotrends of the blockchain ecosystem in the financial services industry and areas where the technology is being actively tested; analyze the implications of the technology on business models; and identify use cases with the most dynamic uptake, from the perspectives of both efficiency in existing processes, and of market creation.

**Potential Impact Of Blockchain On The Financial Services Sector—Current Developments And Trends**

The drive for efficiency in existing businesses. Most of the attention surrounding blockchain has centered on the United States and Western European countries, particularly on the financial services industry, where the technology is expected to have a major impact due to its ability to reduce transaction costs.

As a result, blockchain innovation has been closely linked to the efforts of large financial institutions that focus on process efficiency initiatives. These firms have started testing distributed ledger technology solutions to address specific problems or improvements in their business processes, including data reconciliation, clearance, settlement, regulatory compliance, and entry into new segments or markets.

Consistent with the conceptual framework mentioned above, major global banks and financial intermediaries are working closely with blockchain companies to explore use cases that are relevant to their business and learn how the new technology may impact their legacy systems and infrastructure. They are also entering into consortia (some more than one) to mutualize development and potential transition costs, as well as race to establish standards for the emerging technology.

Most corporate initiatives so far have taken the form of enterprise or permissioned (private) blockchains, as companies attempt to manage a trade-off between leveraging the new but still unproven innovation and preserving the integrity of their existing business concerns. Post-Trade Distributed Ledger Group brings together global banks, custodians, central securities depositories, clearing houses, exchanges, regulators, government agencies, and central banks from all continents to share information and ideas about how distributed ledger technologies can transform the posttrade landscape. The newly launched Enterprise Ethereum Alliance (EEA) aims to leverage large corporate investments in the private Ethereum blockchain, bringing together Fortune 500 companies, startups, and other stakeholders.

Interest in comparing alternatives to blockchain is also great, evidenced by broad industry participation to the R3 consortium, an alternative distributed consensus ledger. This group has grown to include more than 70 global banks, despite the highly publicized departures by Goldman Sachs and Santander in 2016, which reportedly were due to governance conflicts. Corda, its underlying protocol, is technically more of a messaging protocol. Ripple, which

offers a blockchain-like technology and network for faster settlement of international payments, has more than 75 banking clients globally.

In addition, financial services firms have also entered the blockchain space as investors, with corporate venture capitalists becoming the most active investors in bitcoin and blockchain technology in 2016–17. Create new markets. On the other end of the spectrum, blockchain is a disruptive technology that offers the possibility of reengineering economic models and enabling the development of markets and products that were previously unavailable or unprofitable.

A great number of these new market opportunities that distributed ledger technology makes possible are related to: (i) its offer of an alternative to fiat money, addressing in a new manner challenges of currency instability and political risk and, (ii) its ability to establish a digital identity in a rapid and cost-effective manner and thereby allow the financial inclusion of previously underserved consumer segments.

This development also creates opportunities for new startups and entrepreneurs or established players from non-financial industries with a strong customer base, such as telecommunications or ecommerce companies. Such actors are rapidly moving to introduce new business models and services, and are transforming in the process the value chain and challenging traditional players such as banks. Consistent with the framework mentioned in EM Compass notes 40 and 41, the majority of these initiatives focus on value-added yet fairly simple design applications.

These efforts have originated mainly with new companies entering established markets, targeting emerging markets directly or indirectly. They are not exclusively based in developed markets, although the best funded ones are, for now, U.S.-based. A huge portion of the total venture capital investment has been captured by a handful of startups in the digital wallet and capital market services space ($625 million).76 Regardless of their origin,

these new players are targeting segments closely related to the economic activity of developing markets, such as remittances and trade finance.

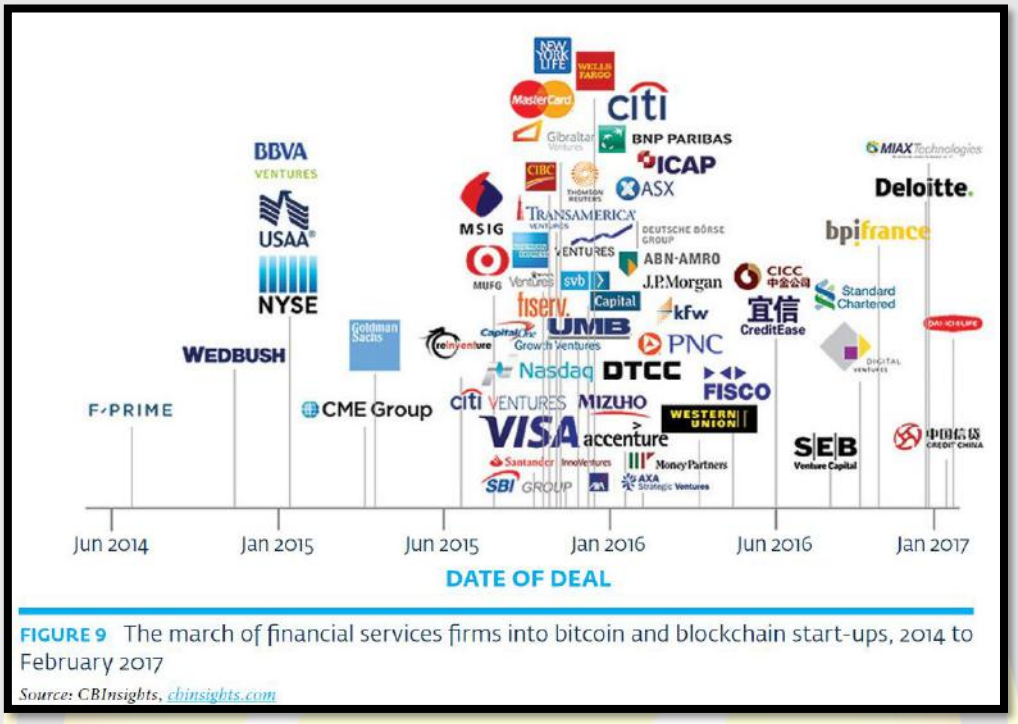



FIGURE 9 The march of financial services firms into bitcoin and blockchain start-ups, 2014 to February 2017

*Source: CBInsights, cbinsights.com*

**Blockchain in Financial Services in Emerging Markets—Selected Regional Developments**

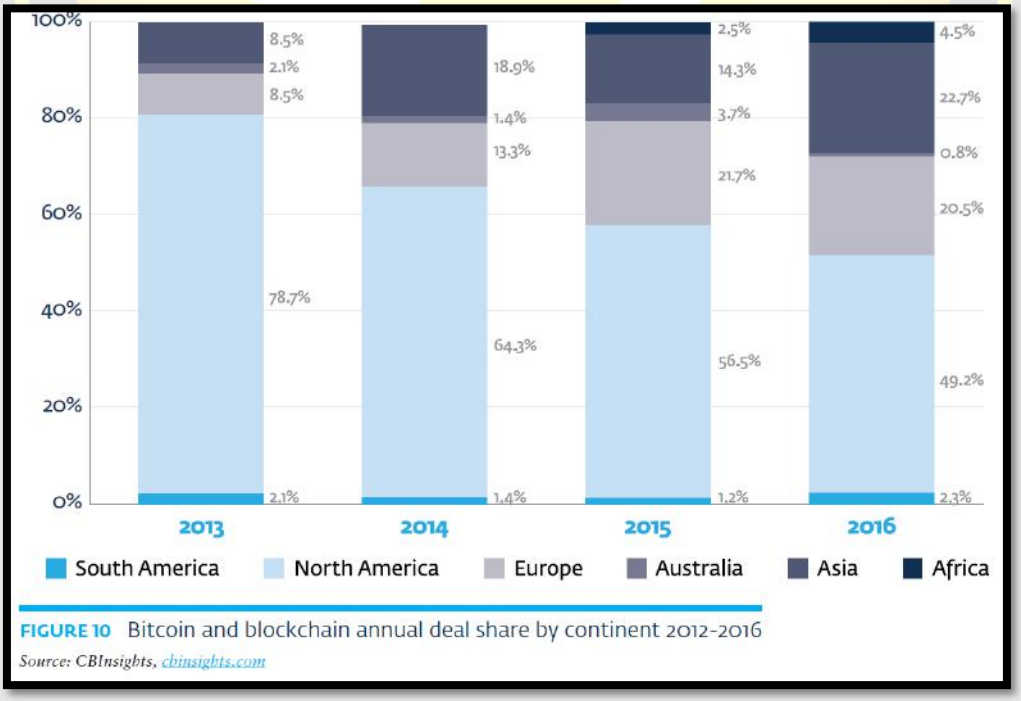



FIGURE 10 Bitcoin and blockchain annual deal share by continent 2012-2016

*Source: CBInsights, cbinsights.com*

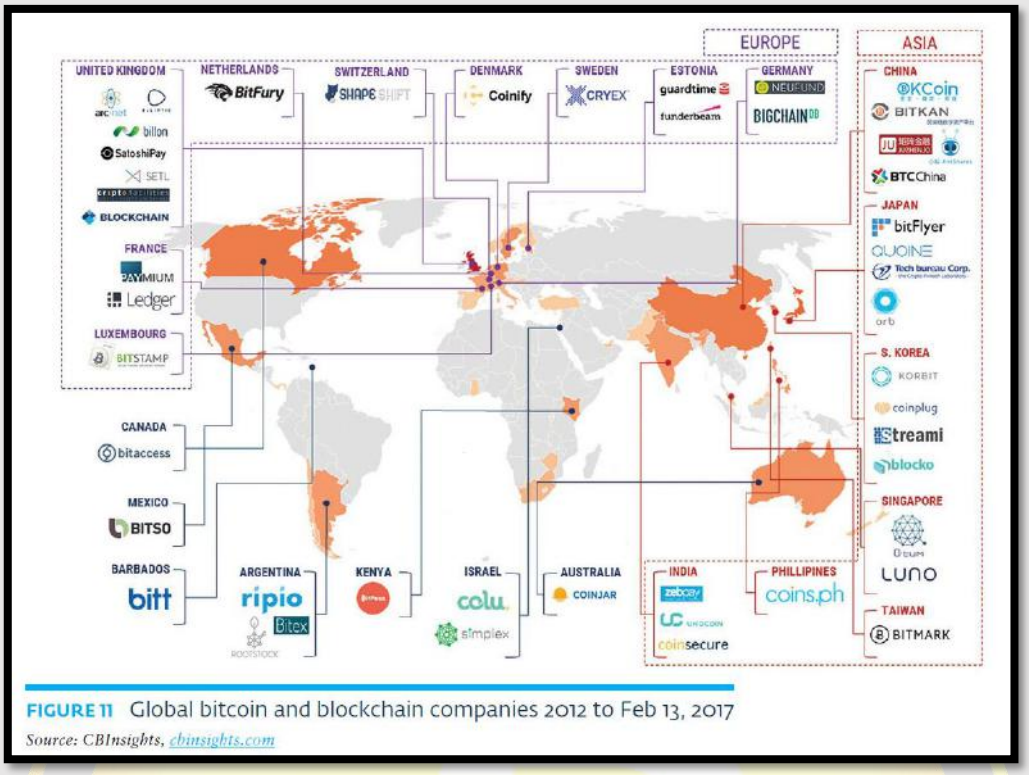
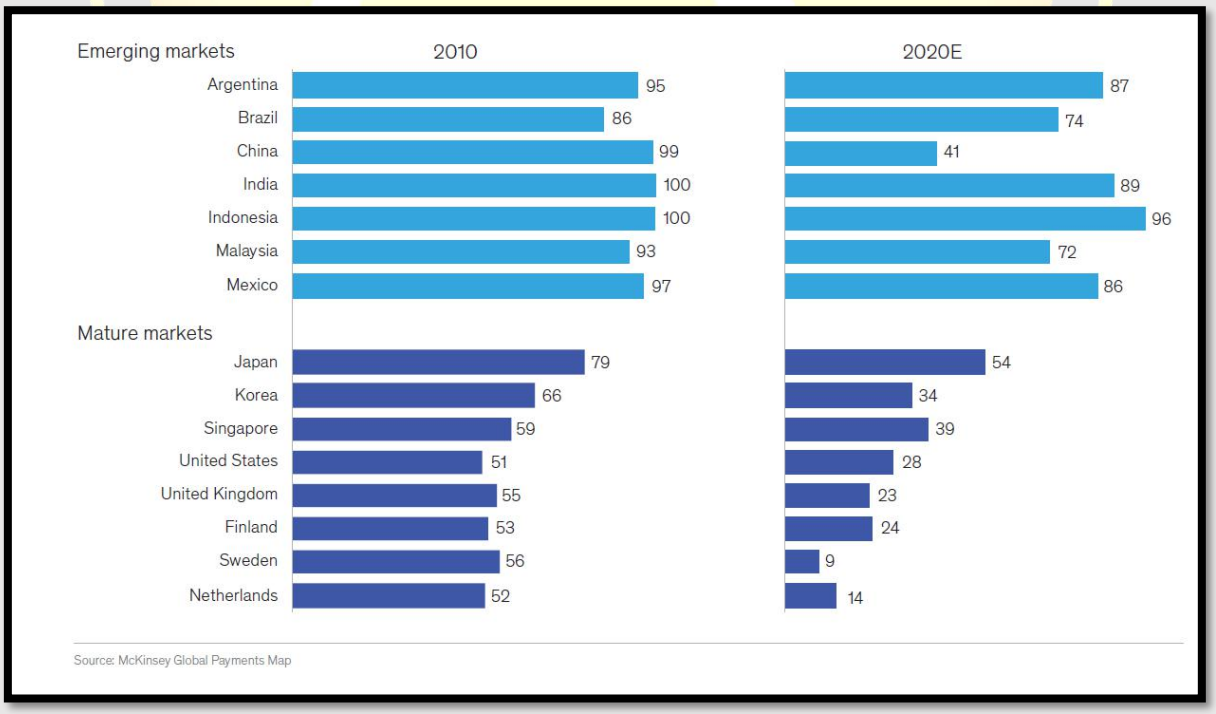



FIGURE 11 Global bitcoin and blockchain companies 2012 to Feb 13, 2017

*Source: CBInsights, cbinsights.com*

## McKinsey Global Payments Report



Once COVID-19 moved from a local outbreak to a global pandemic, many governments moved to protect their citizens, leading to lockdowns with various degrees of limitation. The immediate consequence was, of course, a steep reduction in discretionary spending and a severe demandside shock, along with reductions in cash usage. Discretionary spending initially sank by 40 percent globally. The impact was especially great on the travel and entertainment category, which was off 80 to 90 percent. While some categories of spending rebounded, consumers' well-documented shift from the point of sale (POS) to digital commerce accounts for the reduced use of cash.

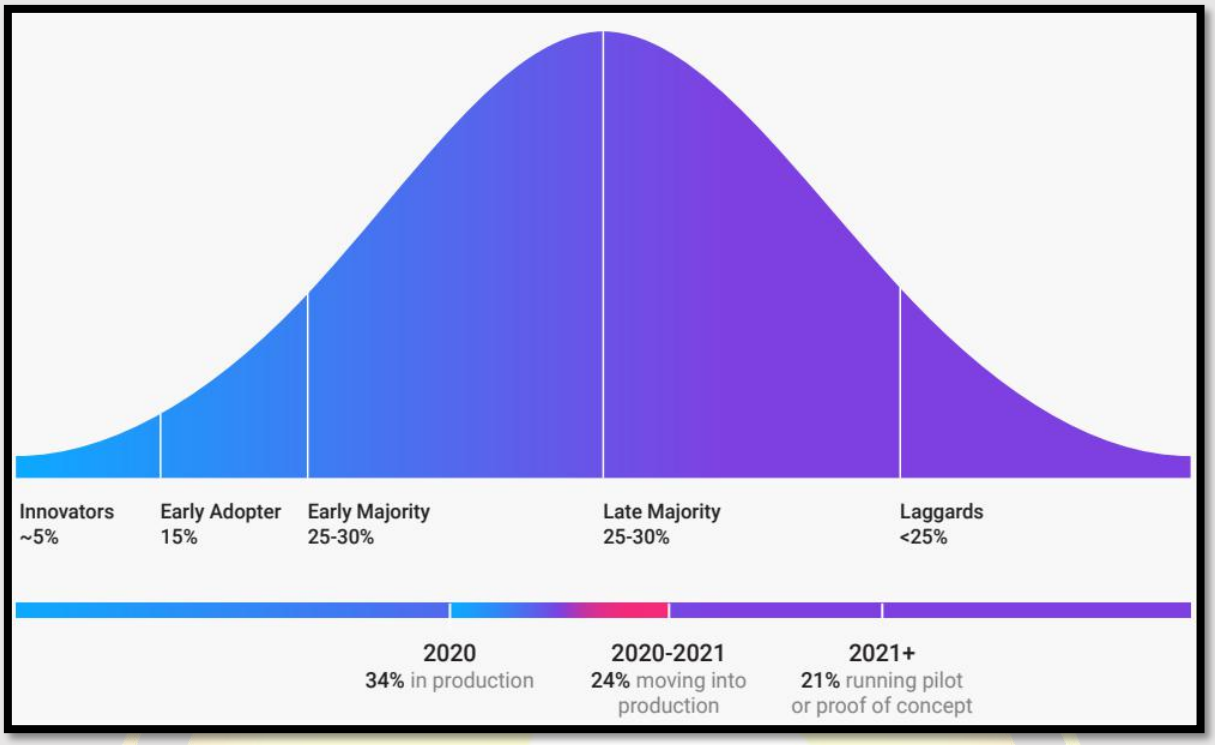
Overall, in retail, the impact was not a decline but a shift in buying behavior. In the first six months of the year, consumers spent $347 billion online with US retailers, up 30 percent from the same period in 2019—corresponding to six times the annualized 2019 growth rate of online retail.1 Amazon's secondquarter 2020 numbers recorded 40 percent year-over-year growth, boosted in particular by the tripling of grocery sales. In Europe, differences in shopping behavior between geographies were strongly reduced and differences between age groups eroded as many consumers (in particular, older shoppers) turned to online shopping for the first time.

Consequently, all forms of electronic peer-to-peer and consumer-to-business payments have been boosted. In many regions, this has mostly benefited debit cards, which typically align with lower-value transactions and are a logical cash substitute for contact-averse consumers. Switzerland reported an increase in share of debit-card spending from 65 percent to 72 percent between January and May 2020,2 mostly at the expense of cash. Higher limits for contactless payments also triggered rising adoption rates across the globe, making inroads beyond debit's typical domain of smaller-value transactions. For credit cards, the picture is more nuanced; consumers in certain geographies seemed to be paying off credit-card balances in preparation for challenging times ahead. In Australia, for example, credit-card share among total card spending fell by five percentage points between February and June 2020, in favor of debit cards.In Asia, however, alternative payments, such as instant and

mobile payments, grew, while credit cards retained their strong incumbent position supporting e-commerce and POS transactions.

Logically, given the steep reduction of in-person purchases, cash transactions and ATM usage declined—the latter after an initial wave of withdrawals by anxious consumers. Germany and the United States each saw spikes in cash withdrawals in the days leading up to lockdowns. The fear of contracting COVID-19 through hightraffic ATMs and, in some cases, the refusal of merchants to accept cash (often despite legal obligations) nudged consumers toward electronic payment options to complete purchases. ATM usage fell by 47 percent in April 2020 in India, while the United Kingdom experienced 46 percent declines per month on average from March to July 2020. By the end of 2020, we expect a shift of four to five percentage points in the share of global payment transactions executed via cash—down from 69 percent in 2019—propelled by evolving behavior in both mature and emerging markets. This is equivalent to four to five times the annual decrease in cash usage observed over the last few years. The reduced use of cash benefits banks overall: the cost of cash handling exceeds cashrelated revenue inflows, and electronic payments generate incremental revenue.

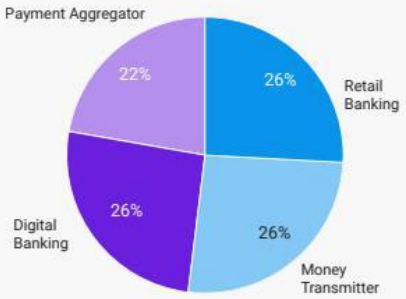
The pandemic has accelerated the move from “physical” to “virtual” banking. Banks in multiple geographies are closing branches (or in some cases will not reopen branches they closed due to the pandemic), as well as ATMs. In Australia, the top four banks have removed 2,150 ATM terminals and closed 175 bank branches since June.



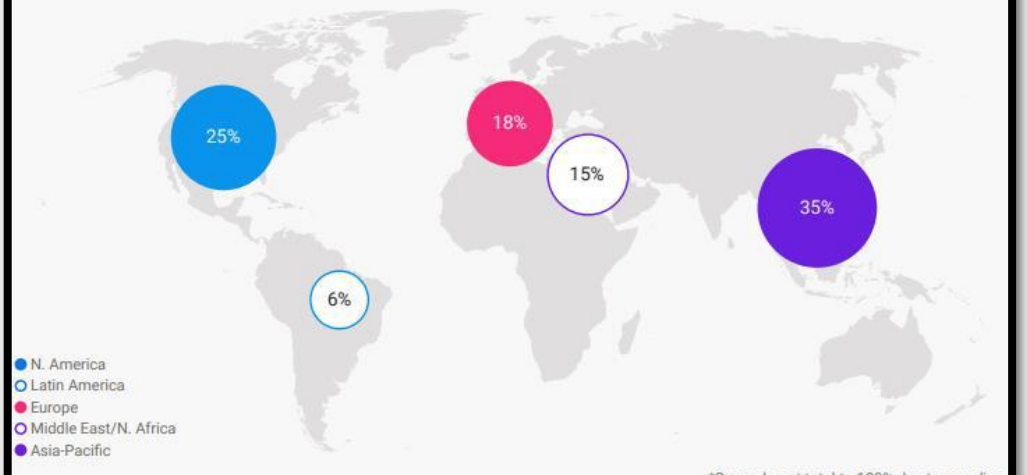

## Survey Respondents

Conducted in August and September of 2020, the Blockchain in Payments Report analyzed data from 854 respondents across 22 countries who are directly involved with payment services at their organization. In order to have a country mix that represented the addressable market for blockchain in payments, the responses were weighted based on total inflow and outflow of remittances at the country level. The survey was conducted by a third-party and did not target Ripple customers. The analysis was carried out jointly by Ripple and Celent.

### Company Industry

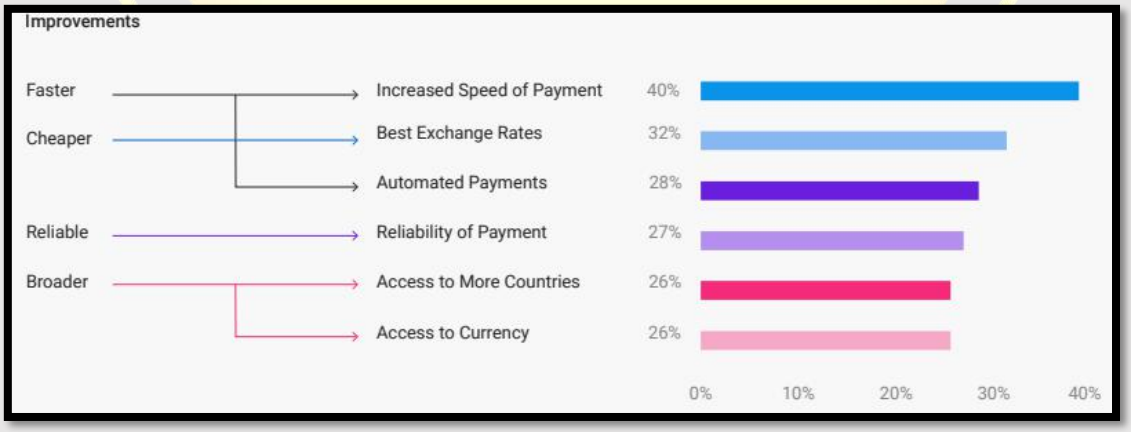



### Company Locations

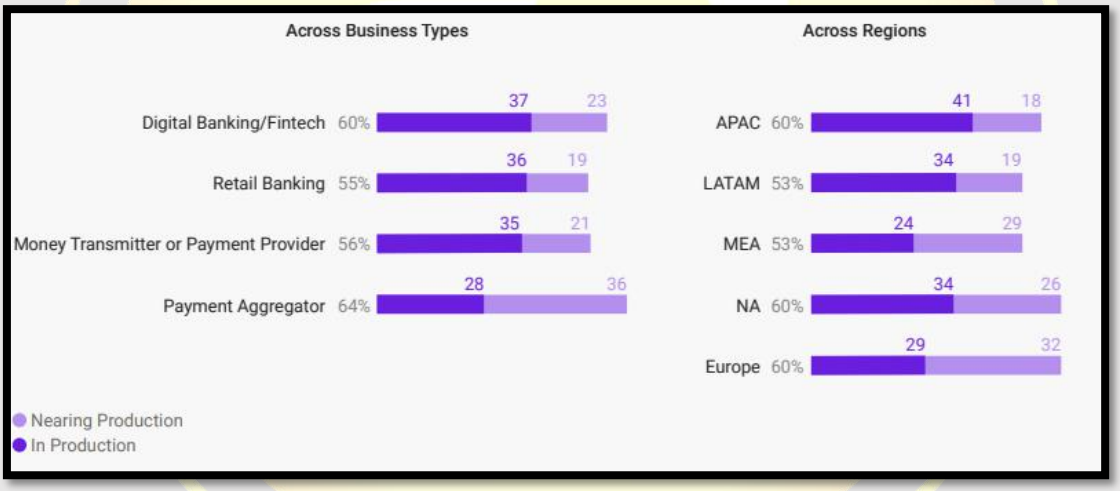


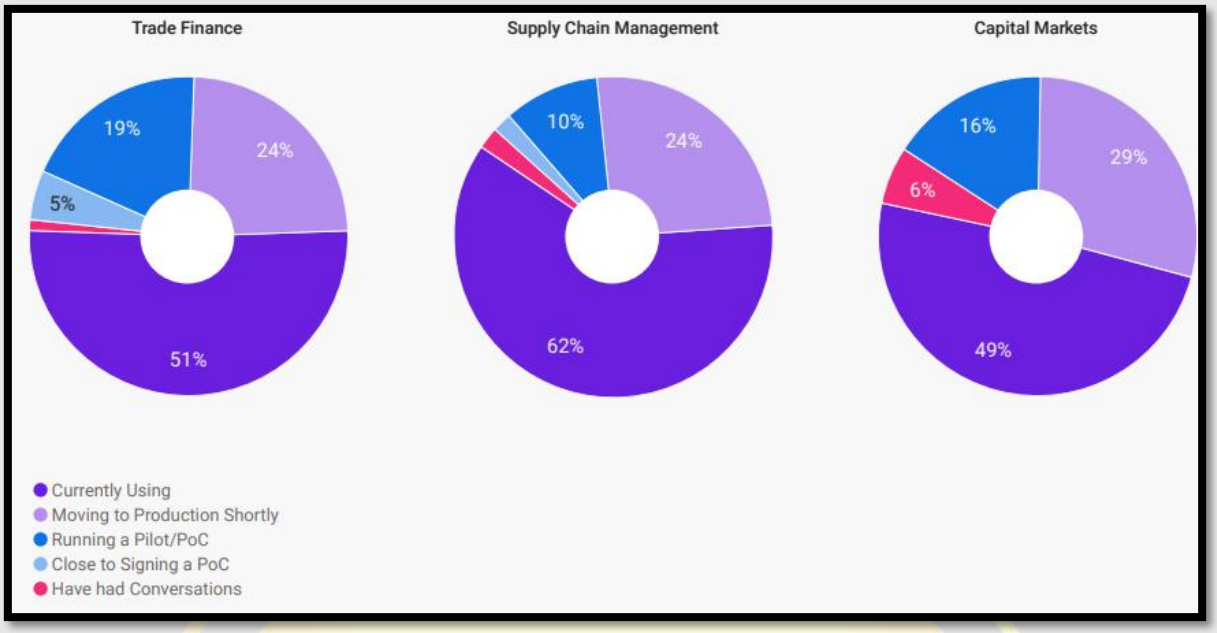

*Sums do not total to 100% due to rounding

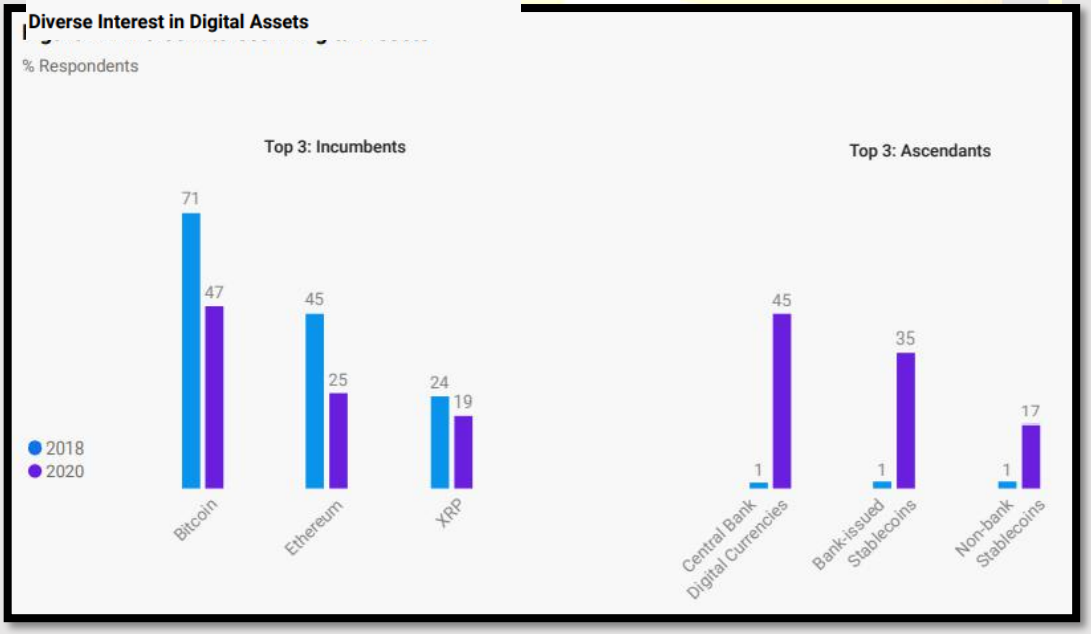

Company Size (in Revenue)
20%
15%
10%
5%
0%
<$500K
$500K–<$5M
$5M–<$50M
$50M–$<250M
$250M–<$500M
$500M–<$1B
$1B–<$5B
$5B–<$10B
>$10B
Don't Know
Respondent Title
C-Level Executive 27%
VP or SVP 12%
Director 16%
Senior Manager 45%
0%
10%
20%
30%
40%

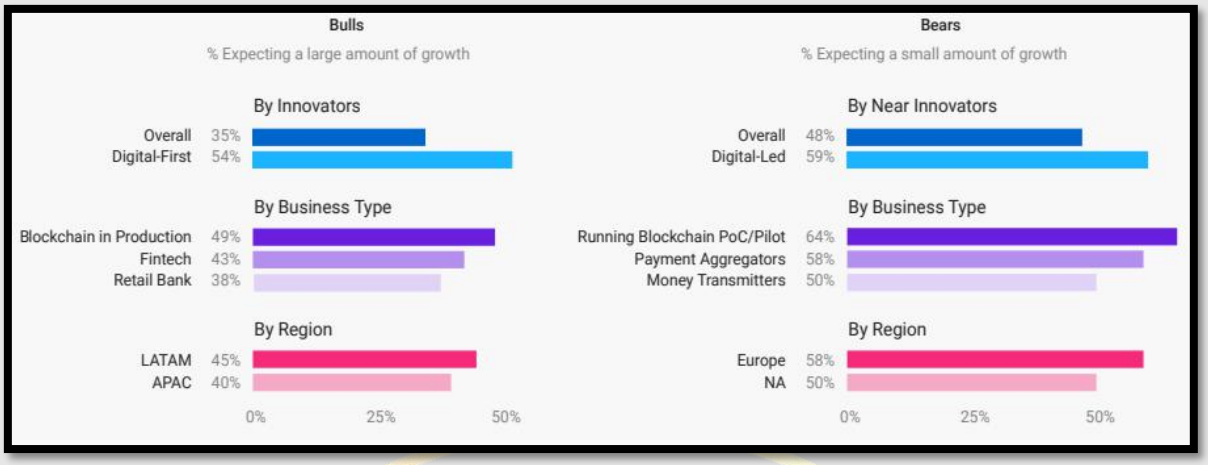

Improvements
Faster
Cheaper
Reliable
Broader
Increased Speed of Payment 40%
Best Exchange Rates 32%
Automated Payments 28%
Reliability of Payment 27%
Access to More Countries 26%
Access to Currency 26%
0%
10%
20%
30%
40%

| Overall | APAC | LATAM | MEA | Europe | NAM | Ranking |
|---|---|---|---|---|---|---|
| **Process** Transparency | **Process** Improved Data Quality | **Growth** Networking | **Security** Customer Authentication | **Security** Increased Data Security | **Process** Transparency | 1 |
| **Process** Improved Data Quality | **Process** Transparency | **Growth** New Revenue | **Growth** Market Share | **Security** Fraud Reduction | **Cost Savings** | 2 |
| **Security** Increased Data Security | **Security** Increased Data Security | **Cost Savings** | **Process** Transparency | **Process** Instant Settlement | **Security** Customer Authentication | 3 |
| **Cost Savings** | **Cost Savings** | **Process** Transparency | **Cost Savings** | **Process** Transparency | **Process** Fewer Delays | 4 |




Trade Finance
Supply Chain Management
Capital Markets
19%
24%
5%
51%
10%
24%
62%
16%
29%
6%
49%
Currently Using
Moving to Production Shortly
Running a Pilot/PoC
Close to Signing a PoC
Have had Conversations


Diverse Interest in Digital Assets
% Respondents
Top 3: Incumbents
Top 3: Ascendants
71
47
45
25
24
19
45
1
35
1
17
1
2018
2020
Bitcoin
Ethereum
XRP
Central Bank Digital Currencies
Bank-issued Stablecoins
Non-bank Stablecoins




**SWIFT's International Payment Report and Blockchain Analysis**

Improving operational efficiency and reducing transactional costs for international payments has become one of the key priorities for banks in their response to: increasing customers' expectations and regulatory requirements, whilst maintaining their competitive position.

On average, 34% of the cost of an international payment is related to Nostro trapped liquidity caused by the absence of real-time data to optimise intraday liquity management. Meanwhile, 9% of the cost is linked to investigations or exceptions mainly driven by a lack of standardisation in the end-to-end payment's process, and by the related Nostro account reconciliation.

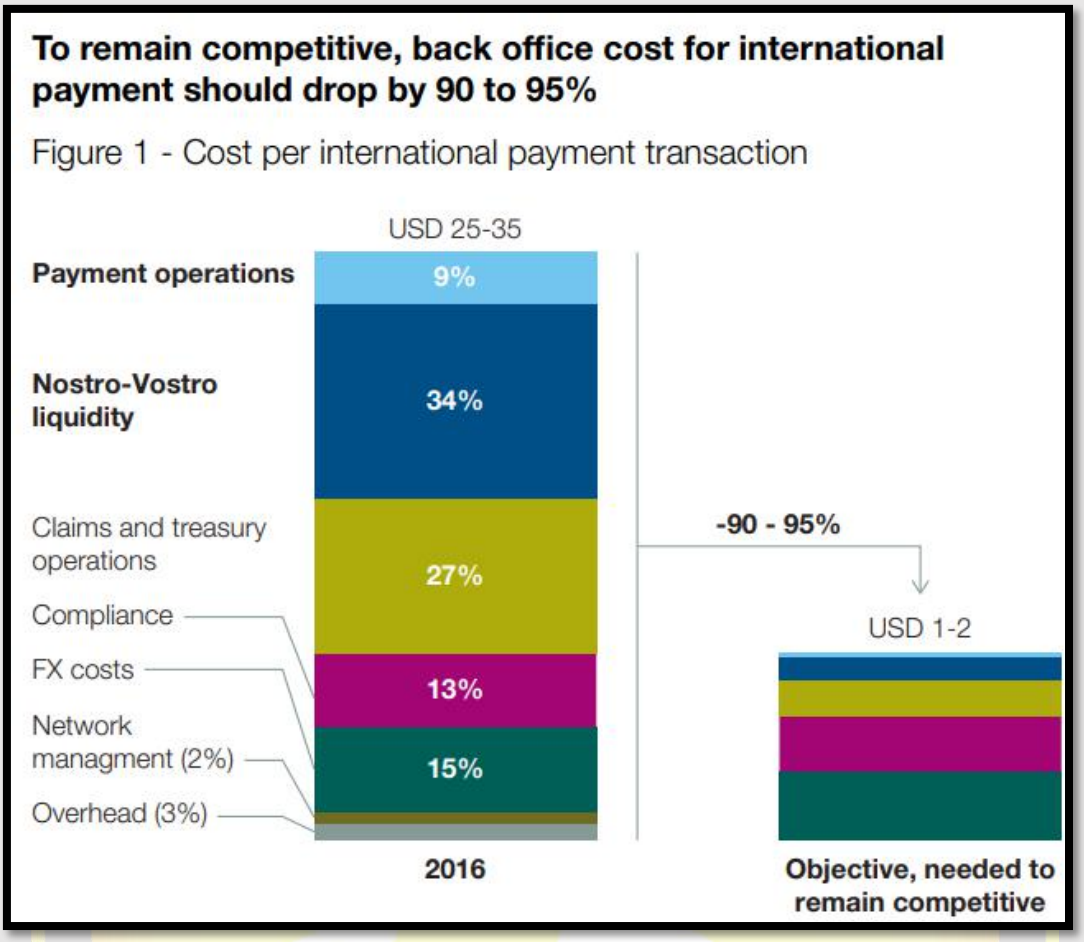
Overfunding of Nostro accounts or alternatively excessive use of credit lines particularly regarding payments settled in a different time zone is mainly driven by the lack of visibility and predictability on intraday in and out flows.

A real-time information mechanism at transactional level would not only reduce costs by enabling liquidity optimisation; it would also enhance banks' ability to provide a better service to their customers by enabling earlier release of payments whilst reducing recalls and liquidity risks.

Many banks have initiated projects to implement real-time liquidity management that will deliver substantial financial benefits beyond their compliance with new regulatory requirements. These include financial savings such as lower funding costs and a reduction of related risks, especially during times of higher market volatility

To achieve this, banks need the ability to monitor their intraday liquidity usage through a real-time confirmation of each entry on their various Nostro accounts, as well as improving their intraday forecasting through systematic early identification of incoming movements.

Real-time Nostro reconciliation is an integral part of this process, which requires timely matching of all movements on the account. It should enable banks to improve operational efficiency leading to a reduction in the cost related to open entries, including an end of day overdrawn balance or potential charges and interests.




**Data Gaps**

Real-time Nostro liquidity and reconciliation management require banks to collect transaction-by-transaction debit and credit confirmations in real-time.

Despite the new intraday liquidity rules implemented in some jurisdictions and derived from the recommendations expressed by the Basel Committee on Banking Supervision advocating for improvements in intra-day reporting industry practice, there are still important data gaps.

Results of the last market consultation on intraday liquidity carried out at Sibos Geneva in October 2016, reveals that whilst progress has been made, the industry is still facing data challenges: – Too few transactions reported on a realtime basis (18% of responses). – Lack of timeliness of the reporting (19% of responses). – Lack of granularity in the information provided including the required time stamps (21% of responses). – Limited business practice for the usage of credit notifications in support of intraday liquidity (15% of responses). Many large account servicers have invested heavily in their real-time reporting capabilities for top currencies. However, the majority is still facing challenges to provide the real-time feeds requested by their customers for some transaction types. Any intraday projection from these account owners will be based on their internal forecasting system and not on the timed confirmations from their account servicers. This will potentially have an impact on their ability to calculate their realtime balance. Transactions leading to such issues will typically include book transfers with no underlying payment instruction, or cash entries related to transactions managed by other business lines such as payments related to corporate actions.

**The Lack Of Data Centralisation And Integration**

A number of institutions have not yet centralised the management of their Nostro accounts. Legal entities within the same group may use different payment hubs distributed around the world to send their instructions and receive confirmation messages from both their internal and external clearing service providers.

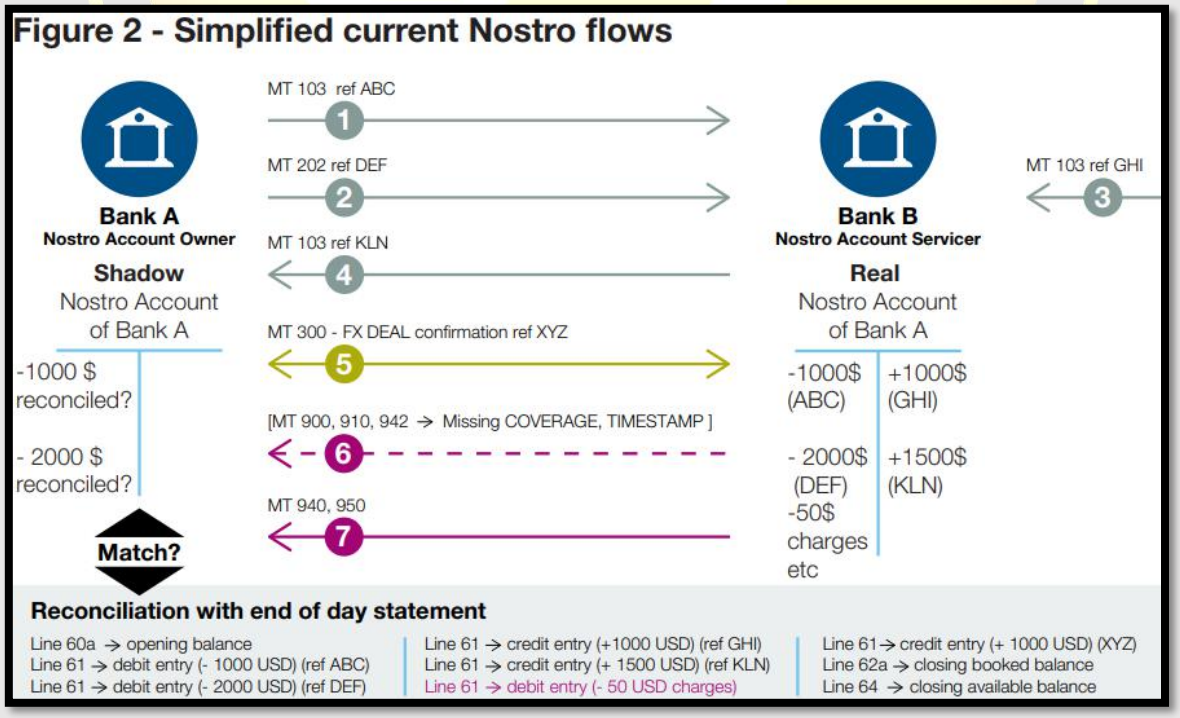
A number of institutions have not yet centralised the management of their Nostro accounts. Legal entities within the same group may use different payment hubs distributed around the world to send their instructions and receive confirmation messages from both their internal and external clearing service providers.

**Exceptions and Investigations**

Exceptions and investigations have a multiplier effect on the overall payment cost. Issues related to pending transactions on Nostro accounts (payments and receipts that have not yet settled or cash receipts that have not been pre-advised) which are reported through the end of day statement are only identified towards the end of the day.

From a funding perspective, especially close to the cut-off for a specific currency, it is a key need for banks to identify potential pending transactions or unexpected ones. Investigations related to post-settlement or to unmatched items (either unreconciled or unconfirmed entries) also result in a highly manual resolution process.

Treasury operations in particular, invoicing of both regular and exceptional payments processing fees based on bilateral price agreement leads to a complex monthly reconciliation process resulting in a number of expensive claims managed manually.



**How Does The Poc Fit Into The Gpi Initiative**

**1. Today**

SWIFT gpi brings to banks' corporate customers same day use of funds, transparency, traceability, and unaltered transmission of remittance data for their international payments. The improved visibility of payment status is also expected to reduce the volume of investigations. It already provides the foundational layer thanks to the use by all gpi member banks of a Unique End-to-end Transaction Reference (UETR) to link the real-time status on the payments with the entry status on the related Nostro Account - potentially leading to an impact on the intraday balances.

**2. Tomorrow**

Building on the successful launch of gpi in early 2017 and the rapid adoption by the community, SWIFT will release three new gpi services towards the latter part of 2018, to be adopted by all gpi banks: the cover service, extended tracking of gpi payments, and the Stop & Recall service; further consolidating gpi as the new normal for correspondent banking.

As from November 2018 gpi will enhance banks liquidity management function through extended tracking of key payment types allowing banks and their customers to identify their incoming payments flows as soon as they have been initiated.

Additionally, as part of the gpi innovation stream, SWIFT conducted its first gpi Industry Challenge in 2017 to encourage FinTech companies to build overlay services leveraging the gpi platform, solving incremental challenges faced by corporate treasurers. During the early part of 2018, the two winning FinTechs will work with SWIFT on a proof of value based on the two winning ideas.

**3. Future**

This proof of concept is part of the fostering innovation stream of gpi, focussed on the exploration of new technology developments to enhance correspondent banking services and operational processes. Going forward SWIFT will continue to evaluate new technologies through gpi, and that will ultimately benefit the entire community - not just gpi banks.

**Business Objectives**

The aim of the PoC is to demonstrate whether a real time DLT solution could help resolve the identified issues that include:

– Less than optimal funding positions across Nostro accounts due to lack of real-time visibility of the account's entries, and monitoring of the related intraday expected and available balances;

– Operational savings through increased efficiency of Nostro reconciliation.

**End-To-End Nostro Account Entries Workflow**

There is a need to demonstrate that the distributed ledger solution provides real time visibility of relevant information for both the Account Owner and the Account Servicing institutions related to:

– The status of a transaction entry in the Nostro Account as well as of any related account entries (e.g. charges);

– The status of the underlying payment processing that could have an impact on the entry status in the Nostro account (e.g. rejected payments or cancellations) or that could delay the booking process (e.g. payments under investigation or on hold);

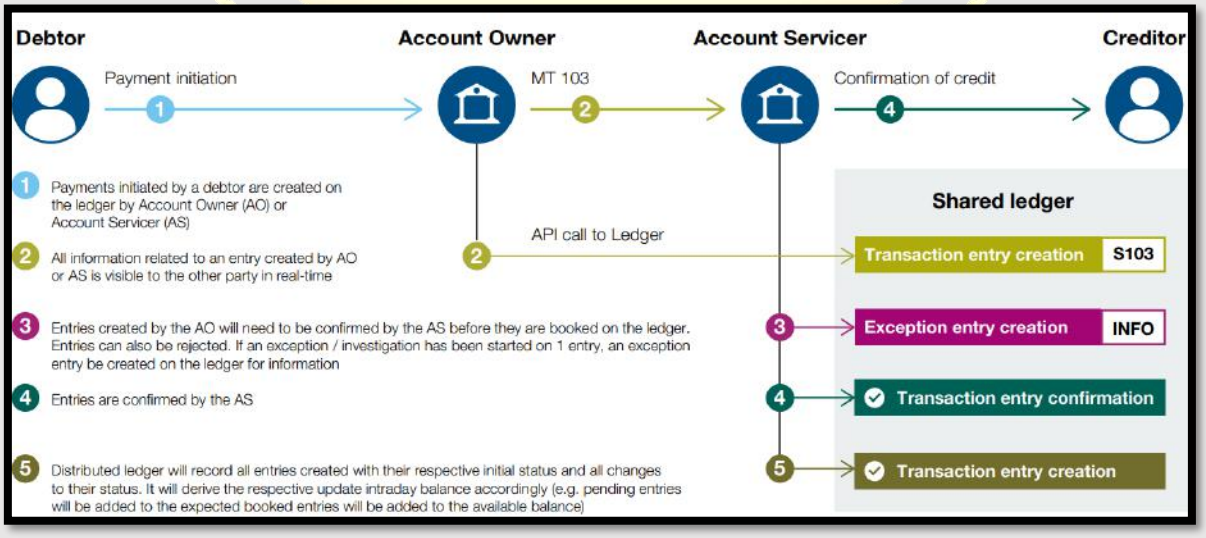
– The impact on the related Nostro account intraday balance (expected and/ or available balance).

All entries such as charges related to the same transaction (e.g. customer payment) shall be identifiable through the use of a common reference in order to support the reconciliation process.

The life cycle of entries in the DLT Nostro account should be directly synchronized with the payment process because any event in the process could have an impact on the related entry. Therefore, the DLT solution should cater for the creation of exceptions entries to identify in near real-time the underlying reason for pending entries.

It should also enable the account owner to identify whether it could delay the confirmation process and have an impact on the intraday account balance.

The end-to-end account entries workflow concept was tested during the PoC for a representative number of transaction types and use cases.



**Using The SWIFT DLT Sandbox To Meet The Poc Technical Requirements**

The Nostro proof of concept was built within the SWIFT DLT sandbox environment. The sandbox environment is a use case agnostic DLT platform providing the foundations for building proof of concepts and experimenting together, with the SWIFT community. It is a first step towards a potential SWIFT DLT platform, combining leading distributed ledger technology with SWIFT assets to deliver a unique offering tailored to the needs of the financial industry.

Hyperledger Fabric 1.0 was selected as the underlying technology for the SWIFT DLT sandbox for its support of the following features:

– It is a private permissioned ledger solution which is able to strictly control access to the ledger(s).

– It supports selective data distribution, allowing not only secure data access but also physical data storage to relevant nodes only.

– It supports native integration with a certification authority, allowing for all access keys used for parties identification and transaction signing to be certified, providing trust in key authenticity and in the identity of parties.

– It provides a smart contract platform – chaincode in Hyperledger Fabric terminology - that can be leveraged to implement business logic and workflows.

Next to those technical reasons, Hyperledger is an open source initiative driven primarily by the needs of the financial industry. SWIFT, as well as a number of the participants to the proof-of-concept, being Hyperledger members, made the latter a good fit.


**Figure 5 - Key industry requirements**

The SWIFT DLT sandbox has been built to meet six of the eight industry requirements identified by SWIFT. The below section summarizes for each one of them:

– How this requirement is translated for Nostro reconciliation use case.

– How this requirement is being met in the proof of concept using SWIFT DLT sandbox

**DLT Sandbox Implementation**

Two types of users are defined – SWIFT and participants – with a different set of privileges. SWIFT users are responsible for the administrative and management function (e.g. user management and provisioning, creation of genesis block, smart contract provisioning) while the participants users have access to the actual business functionalities.

Participant membership is managed through a Closed User Group (CUG) while a Role Based Access Control (RBAC) service defines business roles for participants in the CUG.

Two roles have been defined - Account Owner and Servicer – and the combination of the participant identity together with the role assigned determines what actions are allowed. For example, only the Account Servicer may confirm a pending payment to effectively debit or credit the account. Both CUG and RBAC functionalities are implemented through chaincodes on the ledger.

The strict segregation between SWIFT and business participants together with the CUG and RBAC functionalities deliver a comprehensive governance framework where roles and responsibilities are clearly defined and strictly enforced.

**DLT Sandbox Implementation**

To ensure confidentiality of the Nostro accounts, the DLT sandbox relies on the following controls:

1. Access to a particular account is limited to its Owner and to its servicer. The Account Owner and Account Servicer roles define the type of actions that can be performed on the account.

2. Information about a particular Nostro account is only stored (and is only accessible) on the nodes of the Account Owner and of the Account Servicer, and on the ordering service nodes. This is enforced using the "channel" functionality of Hyperledger Fabric 1.0. A channel is being defined for each bilateral business relationship; effectively creating a dedicated ledger storing all information related to the accounts those two institutions hold with each other. This generates a significant number of channels. If there are n participants, the theoretical maximum is n*(n-1)/2 channels if all participants have a business relationship with each other.

3. As part of the consensus process, a transaction on the Nostro account is only seen and approved by the Account Owner and of the Account Servicer, and checked by the ordering service operated by SWIFT.

Further to these 3 controls, encryption of the data was not implemented as part of the PoC due to timing constraints, but would be considered for any production implementation.

**DLT Sandbox Implementation**

The Nostro reconciliation proof of concept was built leveraging existing newly developed market practices and existing ISO message standards. In particular, the data model used to store all transactions on Nostro accounts is based on the ISO 20022 BankToCustomerStatement (camt.053). ISO 20022 was selected over the MT equivalent (MT950) for its increased richness and granularity. Data quality is an essential requirement to be able to improve transaction reconciliation - one of the key business objectives of the proof of concept.

Next to the data model, the business workflows supporting all 34 use cases covered as part of the proof of concept were implemented using chaincode based on the ISO 20022 standards and in line with the SWIFT intraday liquidity standard rulebook.

Thanks to the data model and the workflow being inspired by ISO 20022, API calls that were created to support the various interactions with the ledger were also defined using ISO 20022 data elements.

Although APIs were developed, they were not exposed to participants for this proof of concept because all interactions were done through a web interface. APIs allow for deep integration with back office applications that are becoming more ISO 20022 compatible.

**DLT Sandbox Implementation**

The DLT sandbox relies on a two level participant identification scheme whereby:

– Participants are identified and addressed through a legal identifier. The BIC was used as part of the proof of concept. Membership to the CUG is defined at the participant level.

– Keys used by participants to access/ sign transactions are certified by a SWIFT controlled Certification Authority, through the issuance of Certificates. Those keys are tied to the participant through their distinguished name (DN) that contains the business identifier code identifying participant ownership for each of the keys.

Note as part of the PoC, all keys used are stored on disk. For a production implementation, hardware security modules (HSM) that offer suitable protection against key theft would be considered.

**Dlt Sandbox Implementation**

To cater for the data privacy, strong identification and scalability requirements of the financial industry, the architecture of distributed ledger solutions had to adapt significantly. Emerging technologies are moving from fully distributed architecture to hybrid models whereby some of the components are distributed, others are centralized. Hyperledger Fabric is not different in that regard and was reflected in the DLT sandbox. While the participant nodes storing information on the Nostro accounts are fully distributed, they rely on a number of “central” components operated by SWIFT.

In particular, the following infrastructure is operated by SWIFT:

– A set of nodes in charge of the user and role management. Those nodes have no access to data related to Nostro accounts.

– A central certification authority in charge of issuing certificates and of maintaining a certificate revocation list.

– An ordering service in charge of ordering transactions, within a channel, into blocks.

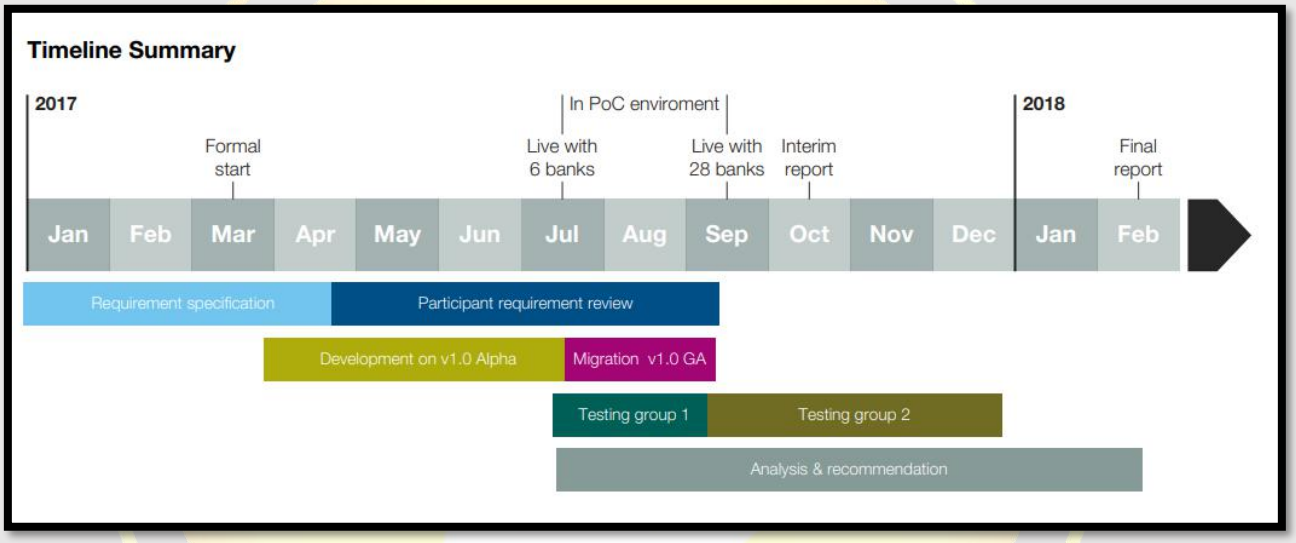
To ensure a resilient setup, resiliency for the participant nodes as well as for the SWIFT operated components was foreseen. For example, the ordering service was operated as a cluster of 4 nodes.

The resiliency of each participant relies on other nodes from the same participants, on the nodes of its Accounts Servicers/Owners for the accounts it owns/services, or on the ordering service.

**DLT sandbox Implementation**

To make sure that consensus is reached within a few seconds for each transaction, irrespective of participant location, the consensus algorithm parameters of the SWIFT DLT sandbox were fine-tuned so that consensus would take place every 2 seconds.

Further to that aspect, the DLT sandbox environment was scaled to support the number of participants (34) and of the related number of channels (528)




In total, 34 banks contributed to the proof of concept segmented in two groups working independently from each other.

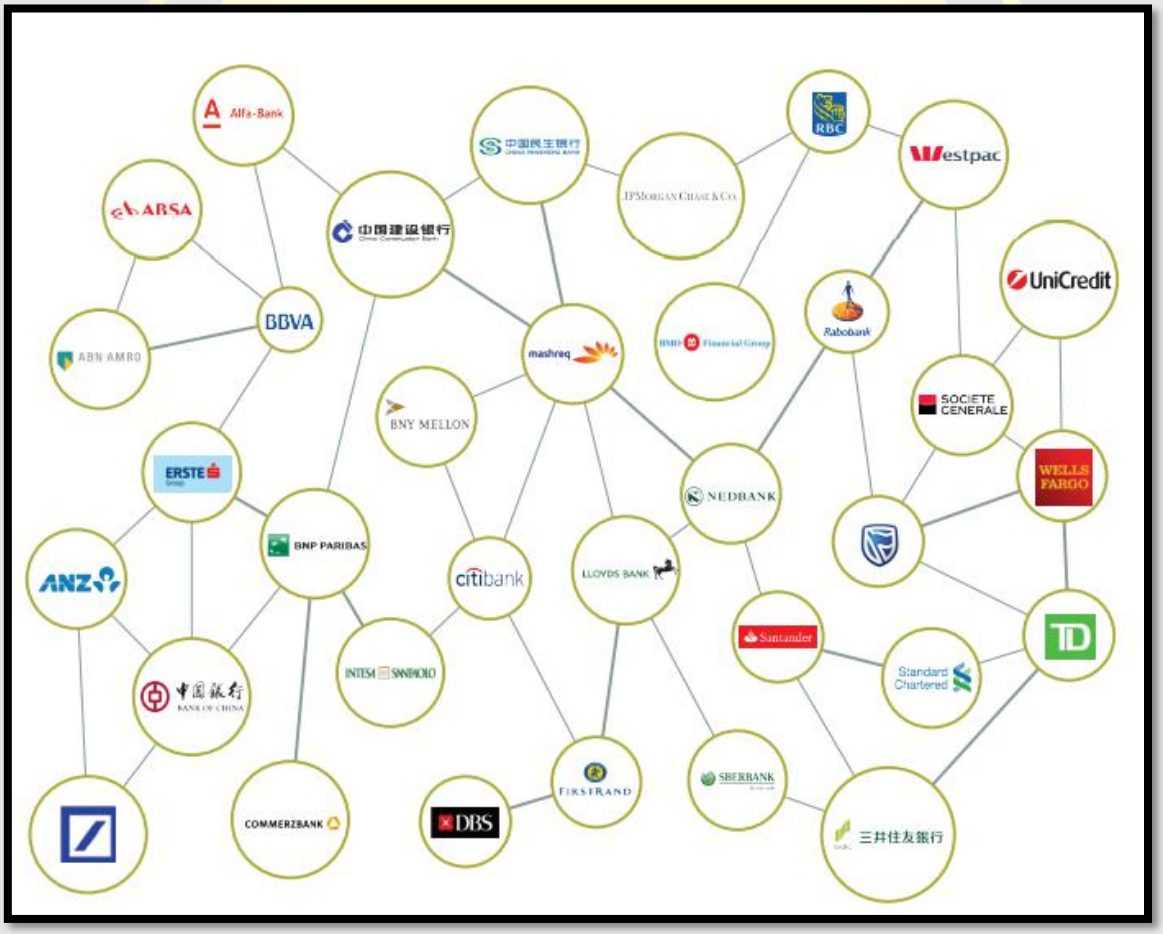
The initial six financial institutions formed the founding group who worked with SWIFT to explore and define the standards, data model, business and functional specifications, that resulted in the creation of the concept model.

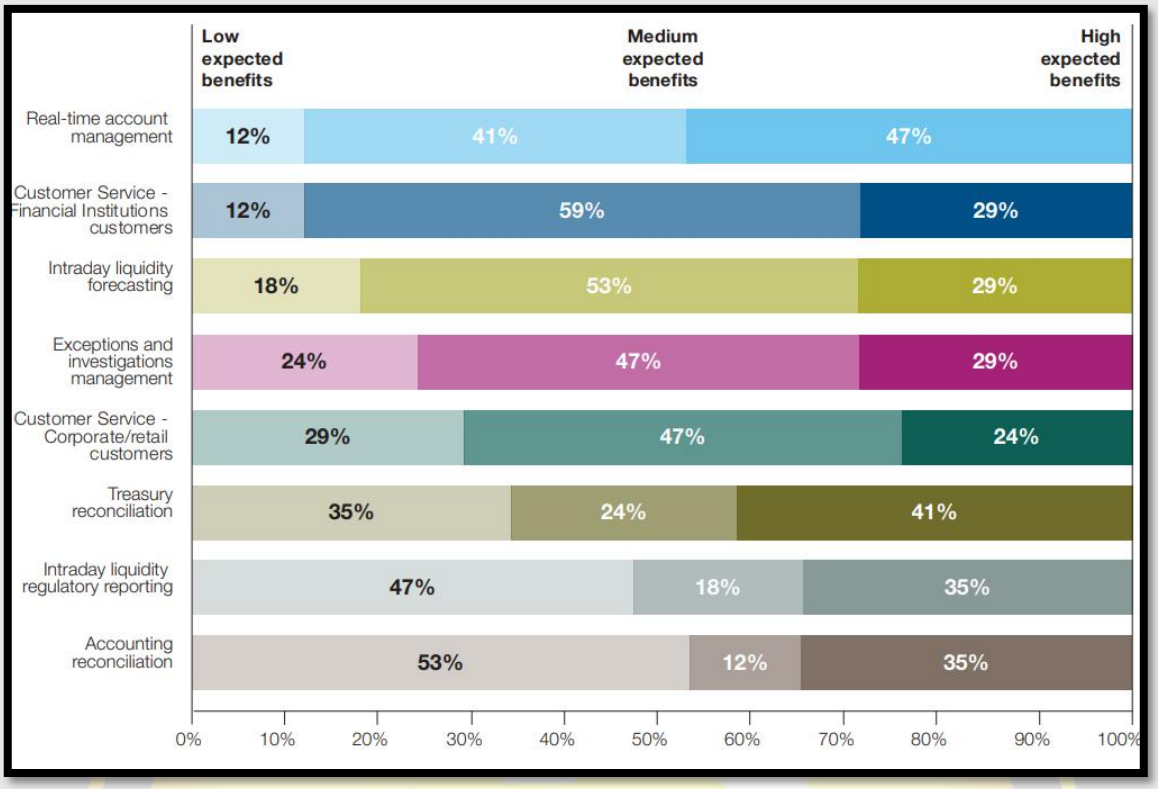
The founding group was the first to test the application and to provide feedback. The participating banks also provided a number of change requests to improve the user's

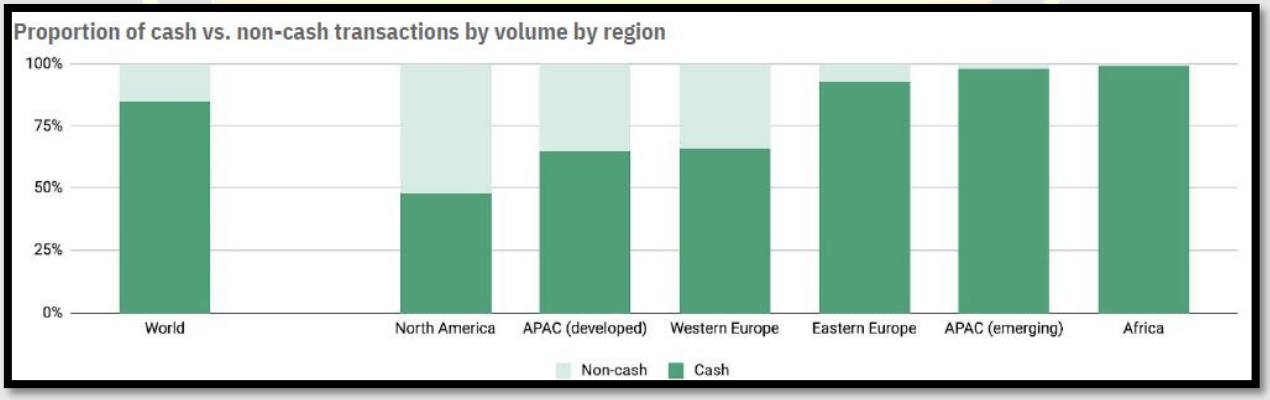
experience of the application, of which, a certain number were implemented prior to the start of the final phase of testing with the validation group in September 2017.

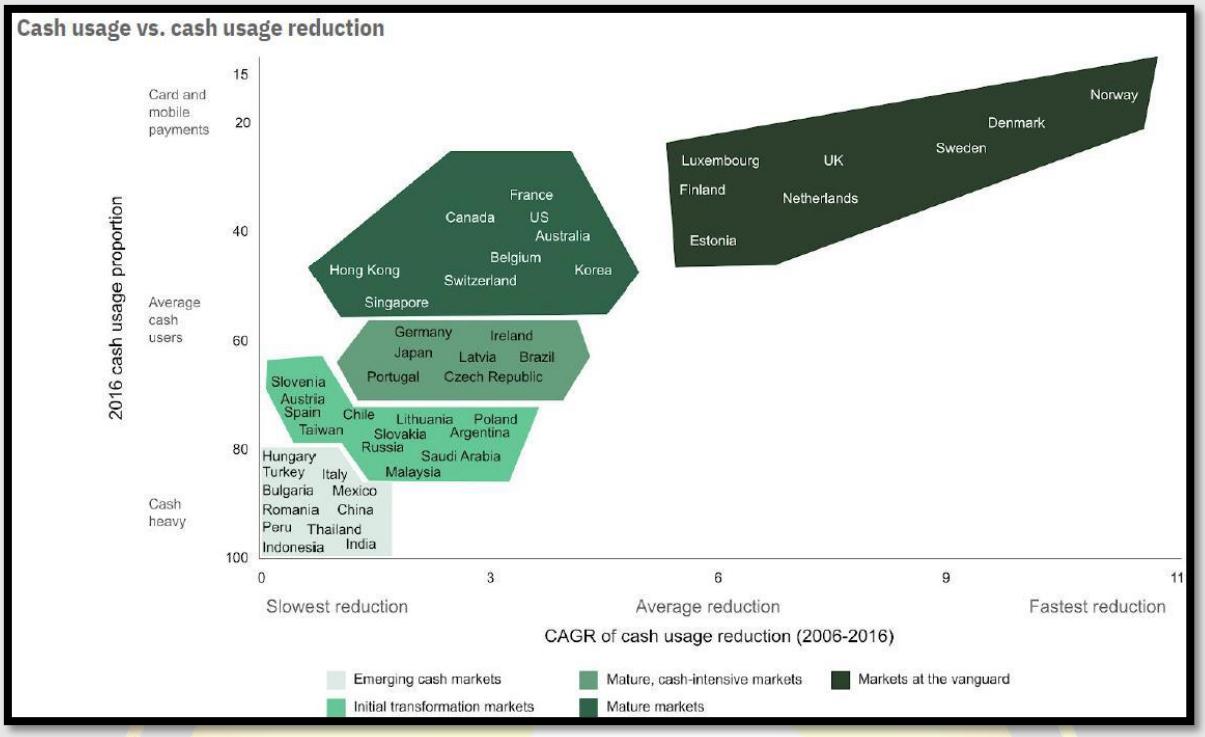
The validation group of 28 financial institutions were tasked with executing the same set of tests to provide independent conclusions on the enhanced solution.

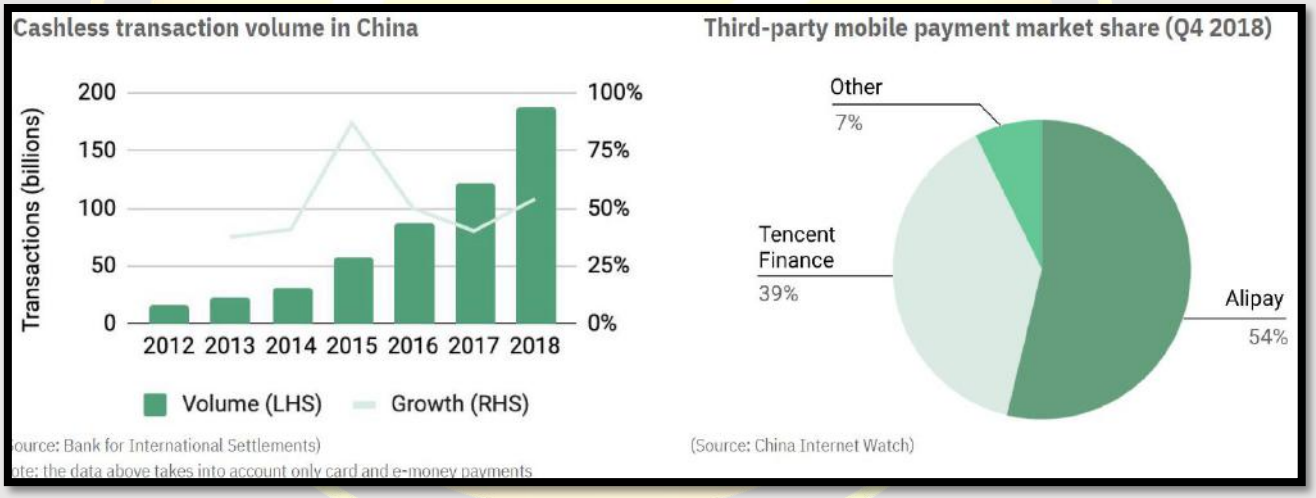
The size of the group also provided an opportunity to see how the distributed ledger technology scaled with the increase in the number of Nostro relationships.

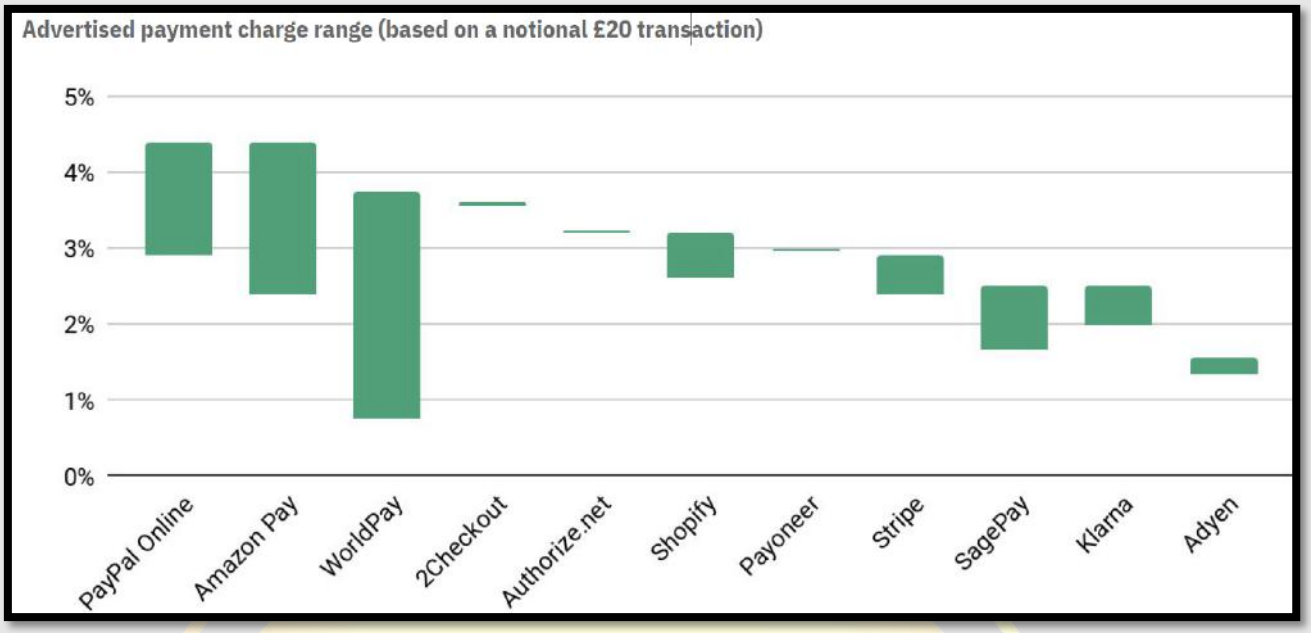


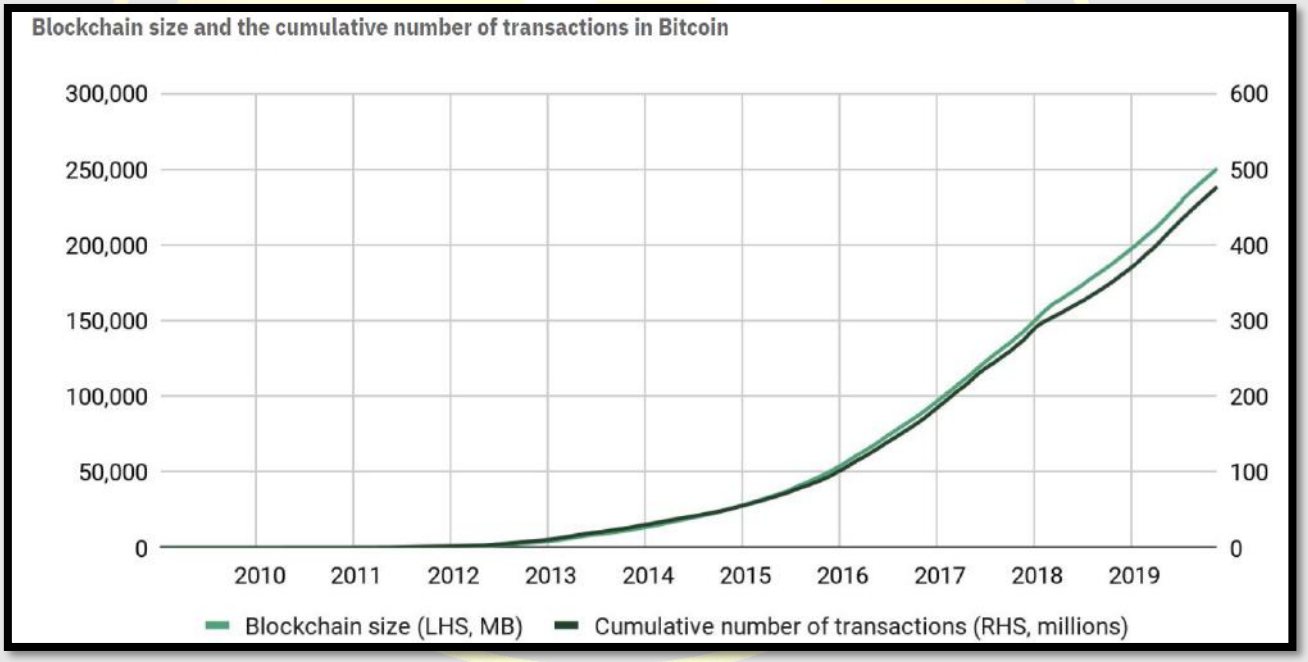

Low expected benefits
Medium expected benefits
High expected benefits
Real-time account management
12%
41%
47%
Customer Service - Financial Institutions customers
12%
59%
29%
Intraday liquidity forecasting
18%
53%
29%
Exceptions and investigations management
24%
47%
29%
Customer Service - Corporate/retail customers
29%
47%
24%
Treasury reconciliation
35%
24%
41%
Intraday liquidity regulatory reporting
47%
18%
35%
Accounting reconciliation
53%
12%
35%
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%


Proportion of cash vs. non-cash transactions by volume by region
100%
75%
50%
25%
0%
World
North America
APAC (developed)
Western Europe
Eastern Europe
APAC (emerging)
Africa
Non-cash
Cash


Cash usage vs. cash usage reduction
2016 cash usage proportion
Card and mobile payments
Average cash users
Cash heavy
15
20
40
60
80
100
Norway
Denmark
Sweden
Luxembourg
UK
Finland
Netherlands
Estonia
France
Canada
US
Australia
Belgium
Hong Kong
Switzerland
Korea
Singapore
Germany
Ireland
Japan
Latvia
Brazil
Portugal
Czech Republic
Slovenia
Austria
Spain
Chile
Lithuania
Poland
Taiwan
Slovakia
Argentina
Russia
Saudi Arabia
Hungary
Turkey
Italy
Malaysia
Bulgaria
Mexico
Romania
China
Peru
Thailand
Indonesia
India
0
3
6
9
11
Slowest reduction
Average reduction
Fastest reduction
CAGR of cash usage reduction (2006-2016)
Emerging cash markets
Initial transformation markets
Mature, cash-intensive markets
Mature markets
Markets at the vanguard


Cashless transaction volume in China
Transactions (billions)
200
150
100
50
0
100%
75%
50%
25%
0%
2012 2013 2014 2015 2016 2017 2018
Volume (LHS)
Growth (RHS)
ource: Bank for International Settlements)
ote: the data above takes into account only card and e-money payments
Third-party mobile payment market share (Q4 2018)
Other
7%
Tencent
Finance
39%
Alipay
54%
(Source: China Internet Watch)


Advertised payment charge range (based on a notional £20 transaction)
5%
4%
3%
2%
1%
0%
PayPal Online
Amazon Pay
WorldPay
2Checkout
Authorize.net
Shopify
Payoneer
Stripe
SagePay
Klarna
Adyen


Blockchain size and the cumulative number of transactions in Bitcoin
300,000
250,000
200,000
150,000
100,000
50,000
0
600
500
400
300
200
100
0
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
Blockchain size (LHS, MB)
Cumulative number of transactions (RHS, millions)

**EU REGULATORY FRAMEWORK – Europpe Parliement Commitie**

**Anonymity**

The key issue that needs to be addressed in order to adequately capture cryptocurrencies and cryptocurrency players, particularly users, in legislation is to unveil the anonymity, varying from complete anonymity to pseudo-anonymity, that surrounds them.This is the biggest problem for combating money laundering and countering terrorist financing: the anonymity prevents cryptocurrency transactions from being adequately monitored, allowing shady transactions to occur outside of the regulatory perimeter, allowing criminal organisations to use cryptocurrencies to obtain easy access to "clean cash" (both cash in/out). Relating to terrorist financing, the story of Ali Shukri Amin who provided instructions over Twitter on how to use Bitcoin to mask the provision of funds to Daesh is a striking example of the risks brought by the anonymity surrounding cryptocurrencies.

Anonymity is also the major issue when it comes to tax evasion. Entering into taxable cryptocurrency transactions without paying taxes is tax evasion. But, when a tax authority does not know who enters into the taxable transaction, because of the anonymity involved, it cannot detect nor sanction this tax evasion. This makes cryptocurrencies a very attractive means for tax evaders.By some commentators instruments such as Bitcoin were even described as "tomorrow's tax havens".

This being said, and as apparent from our overview of cryptocurrencies above, it should be noted that some cryptocurrencies are pseudo-anonymous, which basically means that if great effort is made298 and complex techniques are deployed, it is possible for authorities to find out users' identities. Although this can already be a help in the fight against money laundering, terrorist financing and tax evasion in some cases, it does not allow a

standardized approach to tackle money laundering, terrorist financing and tax evasion more widely: discovering identities in this way is too complex and costly to become the general answer to tackling this issue - and moreover, it will not certainly lead to any result. New initiatives like the Investigation of Transactions in Underground Markets ("TITANIUM") project299, may change this at some point, but it is still to early to tell to what extent. In any event, a more structural regulatory approach is desirable.

**Cross-Border Nature**

In addition to anonymity, the intrinsically cross-border nature of cryptocurrencies, crypto markets and crypto players is a major challenge for regulators. One of the issues is e.g. that crypto markets and crypto players can be located in jurisdictions that do not have effective money laundering and terrorist financing controls in place. The cross-border nature of cryptocurrencies, crypto markets and crypto players probably means that rules will only be adequate when they are taken at a sufficiently international level.

**Often No Central Intermediary**

Another factor of importance challenging the fight against money laundering, terrorist financing and tax evasion is that there is often no central intermediary, such as an issuer, that would normally be the focal point of regulation. Therefore, an important question is to which players in the crypto market should regulation be attached, absent a central intermediary.

**Cryptocurrencies Are Falling Between The Cracks**

The existing European legal framework is failing to deal with the aforementioned issues. There are simply no rules unveiling the anonymity associated with crypto-currencies, making the question whether they are taken at the right level or to whom they apply a superfluous one.

Because of the absence of rules unveiling anonymity, more substantive rules that currently could already have cryptocurrencies in scope completely miss effect. This is particularly true for the legal framework on exchange of information in the field of taxation.The framework simply cannot be activated: to exchange information, authorities must have it in the first place. For the same reasons, the current EU framework on tax avoidance, relating inter alia to exit taxes in the context of assets transfers by corporates, miss effect when it comes to cryptocurrencies, because of their anonymous and easy-to-hide nature. To be able to tax, the tax administration should know of the taxable basis and when it comes to cryptocurrencies this is just extremely difficult.

Another example relates to the freezing and confiscation of property. Substantively, it is arguable that cryptocurrencies are already in scope of the relevant European rules. Property within these rules refers to property of any description, whether corporeal or incorporeal, movable or immovable, and legal documents or instruments evidencing title or interest in such property. Well, it is acceptable that cryptocurrencies are within the remit of this definition: they could be seen as incorporeal moveable property. Yet, leaving a few examples of success stories aside, the rules largely miss effect. The reason, again, is the same: to be able to freeze and confiscate cryptocurrencies it is necessary to know that a criminal has them, and this is what the anonymity surrounding cryptocurrencies prevents.

So, the crux of the matter is how we can unveil the anonymity related to cryptocurrency transactions so as to be able to track the illegal transactions

**A Difficult Dividing Line With Cybersecurity, Data Protection And Privacy**

It is accepted that encryption, which is basically what happens in the context of cryptocurrencies, is an effective way for citizens and businesses to defend themselves against the abuse of IT technologies, such as hacking, identity and personal data theft, fraud and the improper disclosure of confidential information. However, encryption can also be

used by criminals, e.g. the use of cryptocurrencies for money laundering or terrorist financing, complicating law enforcement authorities' criminal investigations. Therefore, it is a thin line between preserving strong encryption for the protection of cybersecurity, data protection and privacy on the one hand, while offering opportunities for legitimate law enforcement access to information for the purpose of criminal investigations with appropriate safeguards on the other hand, as was recognized by the European Commission. We raise this issue, but will not elaborate on cybersecurity, data protection and privacy aspects in this research. That would exceed the scope.

**Don't Throw The Baby Out With The Bathwater: The Technology**

Cryptocurrencies run on ingenuous technology. From a law enforcement perspective, introducing mechanisms of accountability of crypto players should prevent this technology from being used largely for nefarious purposes, but at the same time not prevent technological innovation from happening. Therefore, legislative action should always be proportionate so that it addresses the illicit behaviour while at the same time not strangling technological innovation at birth. This is an aspect of particular relevance for this research. Cryptocurrencies run on blockchain or other technology. This technology is perfectly legitimate and offers many advantages for innovation in multiple legitimate sectors, including the business and public sector. It has for instance been suggested that blockchain technology could be an adequate defense mechanism against digital ransomware. The idea is that through blockchain technology sensitive information can be kept in a decentralized manner instead of centralized (as it is now). Keeping information in a decentralized manner makes it harder to link the information to the person it relates to. It is then also harder to know who to address for the ransom. Moreover, there would be numerous copies of the info, making it extremely difficult for criminals to hold them all to ransom. Another deterring factor could be that attacking a decentralized system of information would be easily visible to its participants. Another example of a legitimate use case of blockchain technology for the greater good can be found in China, where blockchain is being used to combat tax fraud in the context of a partnership between Tencent and the Shenzhen national taxation bureau.

If cryptocurrencies are used for criminal purposes, it is therefore not the technology that needs to be addressed. On the contrary, it is the illicit use that should be targeted. Exceptionally, however, an exception can be made in well-defined cases, such as the mixing technique used in the context of Dash and Monero's Ring CT, stealth addresses and Kovri-project. This approach is recognized by the European Commission in the build-up to its proposal to amend AMLD4, as will be discussed hereinafter. In that context, the Commission stressed that the proposed measures have no negative effects on the benefits and technological advances presented by the distributed ledger technology underlying virtual currencies, including innovative ways for governments to reduce fraud, corruption, error and the cost of paper-intensive processes, set in place new, modern ways in which governments and citizens interact, in terms of data sharing, transparency and trust, and provide novel insights into establishing ownership and provenance for goods and intellectual property.

**ADEQUACY OF THE REGULATORY FRAMEWORK**

Now that we have a clear picture of the current and upcoming regulatory framework for combating money laundering, terrorist financing and tax evasion via cryptocurrencies, it is high time to analyse whether that framework is adequate to address the many challenges cryptocurrencies bring.

The existing framework is not adequate. This we have already analysed above.

How does the upcoming AMLD5 score and what would be a good way forward?

We will hereinafter try to answer that question on the basis of a number of more technical sub-questions394. The questions are the following.

• Is the definition of virtual currencies sufficient to capture the cryptocurrencies that can be used to launder money, finance terrorists or evade taxes?

• Is it enough to include only custodian wallet providers and virtual currency exchanges in the list of obliged entities?

• Does the AMLD5 framework allow to pull enough cryptocurrency users into the light?

• Would it make sense to extend the scope of the Funds Transfer Regulation and/or the Cash Control Regulation as to include cryptocurrency transactions?

• Is there a need for a more comprehensive approach, introducing license requirements for cryptocurrency players?

• Is it not best to outright ban some activities or aspects linked to cryptocurrencies?

• Is the European level the appropriate level to tackle money laundering, terrorist financing and tax evasion via cryptocurrency transactions?

It is not our intention to give the definitive answer to all the questions raised. What we do intend is to give our analysis and to fuel the further debate.

**Is The Definition Of Virtual Currencies Under AMLD5 Sufficient?**

As a recall, the definition of virtual currencies under AMLD5 is the following: "a digital representation of value that is not issued or guaranteed by a central bank or a public authority, is not necessarily attached to a legally established currency, and does not possess

a legal status of currency or money, but is accepted by natural or legal persons, as a means of exchange, and which can be transferred, stored and traded electronically".

**Conclusions On The Basis Of The Taxonomy**

Referring back to our taxonomy of cryptocurrencies, we can conclude that almost all of the cryptocurrencies scrutinized fit within this definition. All of the cryptocurrencies are:

- a digital representation of value;
- decentralized, i.e. not issued or guaranteed by a central bank or a public authority;
- not attached to a legally established currency;
- not possessing the legal status of currency or money;
- electronically transferable, storable and tradeable.

The one element that could give rise to discussion is that of the cryptocurrencies having to be a means of exchange. The AMLD5 does not provide further guidance of what this means, but an acceptable interpretation is that the cryptocurrencies should be able to be used to facilitate the sale, purchase of trade of goods between parties and represent a standard of value that is accepted between the parties.

**Two questions arise.**

Firstly, what if a cryptocurrency is not accepted as a means of exchange now, but there is no intrinsic limitation preventing it from becoming a means of exchange in the future? This is for instance relevant for cryptocurrencies that are apparently not used as a means of exchange now, such as IOTA and NEO. But that may change. All depends on the willingness of parties to accept the cryptocurrency as a standard of value in their mutual dealings. As

soon as that happens, they become a means of exchange and tumble into the scope of the definition of "virtual currencies" under AMLD5. Therefore, from the perspective of combating money laundering, terrorist financing and tax evasion, there is no big issue: normally, committing one of these offences via cryptocurrencies implies having done an exchange, implying the cryptocurrency used is a means of exchange and is included in the scope of AMLD5.

Secondly, what if a cryptocurrency is a medium of exchange, but also and foremost an investment instrument? This is an extremely relevant question, as it is very clear from high volatility and various warnings from financial supervisors that some cryptocurrencies are considered an investment instrument by users, not in the least Bitcoin, which still has the highest market capitalisation of all cryptocurrencies. If the answer to this question would be that these cryptocurrencies are out of scope, this would mean that AMLD5's fruits all in all are very little. We argue against such an interpretation. AMLD5's definition requires cryptocurrencies to be accepted as a means of exchange. It does not say that this should be the only or predominant function of the cryptocurrency. Therefore, it does not matter if the cryptocurrency is also or predominantly an investment instrument. Also in that event, the cryptocurrency is included in the scope of AMLD5. Furthermore, an argument can be derived from the fiat currency framework: a fiat currency can also be acquired and held for investment (speculation) purposes; this does not change the fiat currency's primary status of being a fiat currency.

Therefore, we conclude that AMLD5's definition of virtual currencies is sufficient to combat money laundering, terrorist financing and tax evasion via the cryptocurrencies included in our taxonomy. Of course, that taxonomy is not exhaustive. Nevertheless, we believe that it is fairly representative for the cryptocurrencies that are out there, both from the perspective of market capitalisation and from the perspective of distinctive features. Therefore, we believe that our conclusion here, and the conclusions that follow below, should also be representative, although it cannot be ruled out that some conclusions may not or not to the same extent apply to cryptocurrencies that were not in scope of this research.

**Other virtual currencies than cryptocurrencies**

Virtual currencies within the scope of AMLD5 are those that can be transferred, stored and traded electronically. There is no requirement that virtual currencies are bi-directionally transferable or tradeable against fiat currencies. This means, for instance, that virtual currencies that can be acquired with fiat money and then used only in the virtual world to buy goods or services and/or that are transferable or tradeable only against other virtual currencies, are also included in the scope of the AMLD5 definition of virtual currencies.

However, legal doctrine rightly analysed that this inclusion in the scope of AMLD5's definition of virtual currencies does not help a lot looking at the list of obliged entities. The analysis is that the list of obliged entities, and especially the reference to virtual currency exchanges as defined by AMLD5, shows that the scope of the anti-money laundering regulation of virtual currencies is limited to certain bi-directional scheme virtual currencies only. Other virtual currency schemes are not in scope, including virtual currency to virtual currency exchanges and virtual currencies used to attain goods and services without requiring exchange into legal tender or similar instruments, or the use of a custodian wallet provider. This leaves a blind spot, allowing such activities to still result in money laundering or terrorist financing activities outside of the scope of AMLD5.

**Is it a problem? Well, yes and no.**

No, because it is arguable that some types of virtual currencies are of minor to no importance for money laundering or terrorist financing, for instance virtual currencies that can only be obtained and used in the virtual world and have no interaction with the real economy. This makes them not very useful for money laundering or terrorist financing purposes. Schemes allowing to acquire virtual currencies with fiat currency, but where the acquired virtual currency can only be used in the virtual environment suffer the same defect for purposes of money laundering or terrorist financing, given that no money can flow out of the system. Of course, it is possible that in such a scheme the acquired virtual currency can

be used as a means of payment (e.g. when a person consents to receiving payment in virtual currency). Nevertheless, it is assessed that such a method is fairly unsuited for larger scale money laundering operations. Therefore, arguably predominantly the schemes allowing to acquire virtual currency against fiat money and allowing to sell virtual currency against fiat money pose the biggest threat, as they can be linked to cash both at the entry into and the exit from the virtual sphere.

Yes, because the world of cryptocurrencies is a fast moving one and the network of acceptance of virtual currencies can grow, the Impact Assessment rightfully points out. If virtual currencies effectively become widely accepted and used, there might come a point in time when there will no longer be a need to convert virtual currencies back into fiat currencies. In other words, with a growing network of acceptance, the need to "cash-out" of virtual currencies and exchange them for fiat currencies might decrease over time. This trend would, according to the Impact Assessment, increase further if virtual currencies would become less volatile.

Therefore, it is important to closely follow-up and monitor the use cases of virtual currencies, and especially whether the use of virtual currencies within a virtual setting and without having to cash-out again becomes increasingly important. When that would actually happen, the regulatory framework should follow and include these cases into its scope. Or, as the IMF points out more broadly, the changing nature of the technology requires that regulation be flexible and can be adapted to evolving circumstances.

**Does the AMLD5 framework allow to pull enough cryptocurrency users into the light?**

This bring us to the next question in need for an answer: does the AMLD5 framework allow to pull enough cryptocurrency users into the light? This question boils down to finding out how anonymous their actions can still be on the crypto market after AMLD5.

First, and as already mentioned before, under AMLD5 users that hold their virtual currencies via a custodian wallet provider or enter into virtual currency transactions via a virtual exchange platform can no longer be anonymous, because of the customer due diligence requirements vested upon the custodian wallet providers and virtual currency exchange platforms.

However, users using hardware or software wallets and for instance trade via a P2P network or via any other way than through a virtual currency exchange platform, can still operate anonymously.

For those crypto players deliberately left out of the scope of AMLD5, the legislator is of course aware of this risk. The solution proposed to address it is that national FIUs should be able to associate virtual currency addresses to the identity of the owner of virtual currencies and that the possibility for users to self-declare to designated authorities on a voluntary basis should be further assessed.

Concretely, however, as aforementioned, no immediate action is taken. The only achievement is a requirement for the Commission to include in its next supranational risk assessment, which is due by 26 June 2019, if necessary, appropriate proposals, including, where appropriate, with respect to virtual currencies, empowerments to set-up and maintain a central database registering users' identities and wallet addresses accessible to FIUs, as well as self-declaration forms for the use of virtual currency users. This seems to point in the direction of a system of voluntary registration, instead of mandatory registration

(which was also an option brought forward by the Impact Assessment), if at all any system will be retained following the next supranational risk assessment. Bearing in mind the timing of that assessment and that of potential subsequent AMLD amendments coming into force, it is clear that nothing is to be expected from Europe very soon.

This is a very soft approach towards unveiling anonymity of users and linking them to cryptocurrencies and cryptocurrency transactions. First, it is not sure that a system of registration will be introduced. Secondly, if ever a system would be put in place, it would be a voluntary one. It can very much be doubted if the category that should be targeted the most, users of cryptocurrencies for illicit purposes, would voluntarily register as a user. That would be like trusting the thief to come to the police station voluntarily after committing a theft. All in all, the approach taken is therefore not very convincing if the legislator is truly serious about unveiling anonymity of cryptocurrency users to make the combat against money laundering, terrorist financing and tax evasion more effective. A mandatory registration and a pre-set date as of which it applies, is to that end a much better approach, albeit of course more intrusive.

In this respect we also note that some cryptocurrencies that are now on the market, such as Dash and Monero, are fully anonymous, whereas others, such as Bitcoin and the like are pseudo-anonymous, basically meaning that if great effort is made and complex techniques are deployed, it is possible for authorities to find out users' identities. These fully anonymous cryptocurrencies are designed to stay in the dark and outside of the scope of authorities. After AMLD5 this will no longer be possible to the fullest extent: the cryptocurrency users that want to convert their cryptocurrency into fiat currency via a virtual currency exchange or hold their portfolio via a custodian wallet provider, will be subject to customer due diligence. But, as aforementioned, there is still a whole world outside of these new obliged entities under AMLD5. It goes without saying that this may sound particularly interesting for criminals seeking for new ways to launder money, finance terrorists or evade taxes. If a legislator does not want to outright ban these cryptocurrencies - and for not imposing such a ban a good argument is that cash is also fully anonymous and lawful - the only way to find

out who uses them is to require users to register mandatorily. For reasons of proportionality it could then be considered to make the registration subject to a materiality threshold.

Of course, naivety is not in its place here. The adequacy of a mandatory registration of users, whether or not of fully anonymous or pseudo-anonymous cryptocurrencies, depends on the users' compliance with the registration requirement. Such compliance will partly depend on an adequate sanctioning toolbox in the event of breach, which is a necessity. But how do we detect a breach? Is this at all possible outside of the context of randomly bumping into it, at least when fully anonymous cryptocurrencies are concerned? This remains a loose end, even in a system of mandatory registration, and even when a ban would be imposed on technology fully anonymising cryptocurrencies, which will elaborated below.

An interesting line of thought here is again self-regulation: crypto intermediaries could decide for themselves not to accept fully anonymous cryptocurrencies in the course of their business. That could give them a reputational advantage over others, possibly also leading to a commercial advantage. If that would become a more general trend, it could have an influence on the assessment of whether or not a hard law approach, via registration of users, is necessary.

**BTCBAM MAKES A DIFFERENCE WITH ALTERNATIVE EARNING OPPORTUNITIES**

Among the cryptocurrencies that offer staking services and have maintained this for a long time, there are Tezos (XTZ), Cosmos (ATOM), EOS, Algorand (ALGO). In addition to these, the extremely popular one is Ethereum (ETH).

Currently, 24 cryptocurrencies can be staked on the cryptocurrency trading platform Binance. These coins include Algorand (ALGO), TomoChain (TOMO), Harmony (ONE), DASH, Cosmos (ATOM), Polkadot (DOT) and Komodo (KMD).

BTCBAM coin is also among the coins with a staking feature. Thus, in addition to investing and earning its investors, it also provides the opportunity to earn additional money with staking.

BTCBAM coin, the first project of the BTCBAM team, will continue to bring new coins to the cryptocurrency sector with its strong partnership, Spectral Investment Bank partnership, and guarantorship as well as experience. Stay tuned to BTCBAM and don't forget to take advantage of the Investment Opportunity.

**PROBLEM** The concept of mining started with the invention of Bitcoin about 10 years ago. It was pretty easy in the beginning. However, over time, it became di-cult to beat other miners to -nd suitable hashes of a transaction block. Not many users were mining Bitcoin in 2009, which probably explains the ease of mining. The growing popularity of Bitcoin, coupled with the corresponding di-culty of the mathematical puzzles that come with validating a transaction, means that miners need relatively large computing power to increase their chances of defeating other miners in solving transactions and thus gaining block rewards. This fact turned mining into a big business. For this reason, large companies with su-cient budget allocation set up mining rigs with great computing power. These companies receive

most of the block rewards. The situation described above means that the pro-stability of mining is now protection of these companies.

**SOLUTION** Individuals lacking su-cient capital and equipment investment cannot make reasonable pro-ts from mining. This is quite unfortunate, as the revenues from mining should not be the protection of those who own the capital. Access to machines with increased computing power should therefore be a priority to make mining a profitable enterprise for everyone. BTC BAM solves this problem by oering everyone access to machines that identify hashes of transactions much faster

**POOL MINING** As highlighted above, the di-culty of computing mathematical puzzles of an operation has increased significantly over time. The miners came up with the idea of consolidating resources in pools. Pool mining means sharing computing power to increase the chance of validating transactions on the blockchain. However, the higher the chance, the lower the profitability as it is shared proportionately among all the miners who contribute computing resources. The available share for each miner depends on the hash rates it provides. For this reason, those who start mining first earn more profit than those who start later.

**CLOUD MINING** It has been found that miners with insu-cient capital and equipment investment can still mine BTC profitably. But what if you have insu-cient resources and are not familiar with mining? Is it possible to access pro-table mining resources regardless of your location? Well, if you answered yes to all these questions, cloud mining might be what you need. Thanks to cloud mining, you can lease computing power and mine BTC without the need for hardware. However, in order to get a high income, you need to make a very high rental transaction, and it is possible to -nd the equivalent of such an investment among other investment tools.

**BTC BAM MINING POOL** BTC BAM is mining bitcoin with its blockchain infrastructure. We use computational power to join mining pools to increase the chances of profitability. Then we share the earnings with our users. The amount distributed to each user depends on the package that particular user purchases in the Mining Pool. The mining platforms that help us minimize the cost of mining while maximizing pro-ts. We will expand our investment to countries that will further reduce production costs in a short time. BTC BAM has incorporated Artificial Intelligence into its operations to make mining even more pro-table. Developed by our smart and professional IT Team, the artificial intelligence algorithm monitors and analyzes current market situations and makes a predictive analysis of the future. We can now calculate the probabilities of cryptocurrency values using this AI algorithm. Our mining activities are not only about mining rewards, but also about increasing e-ciency. Transactions are adjusted to issue more valuable coins due to market changes.

**TRADABLE BTC BAM**, trading BTC BAM coins and with 120 coins / tokens It also has the option to trade.

**ONLINE STORE** Where products and services that can be purchased with BTC BAM coin are o-ered, buyers and sellers will be able to make transactions using BTC BAM coin. All member stores are BTC BAM Corporate Members. Also, request information for corporate membership options.

**CREATIVE IDEA** The BTC BAM platform will apply for VISA and MASTER CARD to be distributed to its members as of the date it is traded on the contracted BITTUREX exchange, and will allow the use of coins in shopping.

**GREAT CHANCE TO INVEST** Join us at the beginning and get better rewards. Investing in BTC BAM in the early stages of the bidding period will provide you with an attractive return on investment. The de-ationary feature of the BTC BAM token provides users with a reasonable profit margin

**BTCBAM VALUES** Meet With Our Special Clients The BTCBAM coin, which was obtained by real mining with the blockchain infrastructure, is now the -rst and only in the world to provide collateral to exchanges, investors, and entrepreneurs, which has an investment bank partnership. This coin is primarily deationary, meaning it cannot associate value with ination. However, its deationary nature does not depend on any economic principle. BTCBAM coin has not been reserved, and each coin obtained includes the assets of the company as well as the coins deposited in the BTC BAM Mining System member accounts

**AT THE BEST EXCHANGE**

BTCBAM Coin is rapidly increasing the number of exchanges it is traded on. After listing on Coinsbit and EIO on Probit next target of BTC BAM, the world's leading exchange Binance.

**STAKE OPPORTUNITY** Stake provides an extremely simple and pro-table investment opportunity. In other words, in staking, network participants earn a reward in relation to the amount they stake, that is, the amount they lock, in return for their promise to keep the coins in their wallets for a certain period of time.

**SOCIAL RESPONSIBILITY** BTC BAM Mining System transfers a predetermined percentage for each coin to various social responsibility projects. The wealth distributed will consist of the income of the mining pool. However, users who wish to reserve the right to transfer the number of coins deducted from their individual pro-ts to social responsibility projects. This amount will be used for different uses as shown in the pie chart below

**ABOUT BTCAM COIN**

The BTC BAM platform plans to distribute a maximum of 10 million BTC BAM in the -first 12 months, which can be acquired through investment or partnership. All prizes are paid in BTC BAM. BTC BAM coins distributed are reected daily on the person's BTC BAM platform.

Concurrent negotiated that BITTUREX through Crypto Currency Exchange Platform coins sold by the instant market value. Or it is stored on the member's BTC BAM platform. In addition, BTC BAM Mining System reserves the right to distribute 1 million BTC BAM for future listing, marketing campaigns and other platform uses.

**WHAT'S OUR TECHNICAL DETAILS**

Algorithm SHA-256 Block Type SHA-256 (Secure Hash Algorithm) is one of the 6 sets of cryptographic hash algorithms under SHA-2. It was developed by the US National Security Agency (NSA), an expert on cryptology. SHA-256 is used in bitcoin mining proof-of-work calculations and bitcoin address creation. It is one of the most secure encryption functions known.

**THE TOTAL NUMBER OF COINS WILL AMOUNT TO 21,000,000** (EXACTLY THE SAME AS BITCOIN)

**BLOCK TYPE:** PROOF-OF-WORK

**COIN NAME:** BITCOINBAM

**COIN ABBREVIATION**: BTCBAM

**ADDRESS LETTER:** B

**ADDRESS LETTER TESTNET:** K

**COIN UNIT:** BAMOSHI

**BLOCK REWARD:** 26 COINS

**BLOCK HALVING:** 210000 BLOCKS

**COIN SUPPLY:** 21000000 COINS

**Coinbase maturity:** 2 ( + 1 default con-rmation) blocks

**Target spacing:** 5 minutes

**Target timespan:** 10 minutes

**Transaction confirmations:** 1 blocks

**Last block with reward:** 6720000

**Time until last block:** 63 years, 10 months, 18 days, 8 hours

Actually, Why We Best Mining System While the BTCBAM Mining System provides a unique service with its -rst coin called BTCBAM, on the other hand, it is preparing to put its mark on the sector with a total of 7 projects. BTCBAM coin, produced with blockchain technology, will guide many different initiatives with its successes as it is an exemplary project in this -eld. Many projects will come before us that will bene-t from our experience as a venture partner. We would like to share with you some of the projects that will be prepared by the -rst quarter of 2021. Establishing BTC BAM Online Store Establishment of international branches Asia and South America Advanced IT solution for partners using Blockchain technology.

**BE THE BEST AS HIGHLIGHTED ABOVE**, the dificulty of computing mathematical puzzles of an operation has increased significantly over time. The miners came up with the idea of consolidating resources in pools. Pool mining means sharing computing power to increase the chance of validating transactions on the blockchain. However, the higher the chance, the lower the profitability as it is shared proportionately among all the miners who contribute computing resources. The available share for each miner depends on the hash rates it provides. For this reason, those who start mining first earn more pro-t than those who start later.

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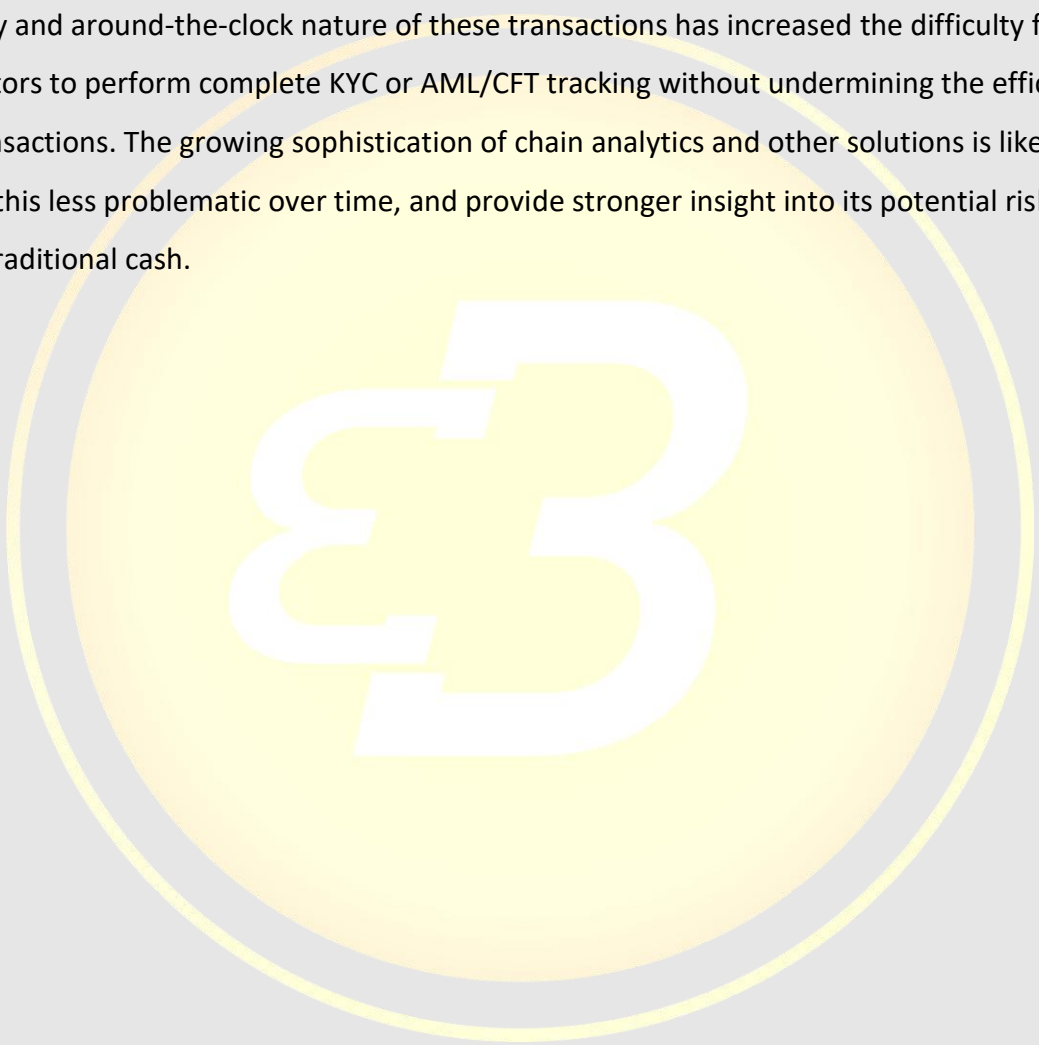
**LEGAL DISCLOSURES**

Potential buyers of BTCBAM coins should examine and analyze all and any risks and uncertainties pertaining to cryptocurrencies, the BTCBAM project, their activity, and operations. Before buying BTCBAM coins, make sure you read and understand the Whitepaper and this risk notice. Ensure that you are aware of all risks before purchasing the BTCBAM coins. The risk notice lists some of the potential risks that you have to account for. You should use third-party -nancial counsel before joining any business undertaking.

Legal Aspects This paper discloses the BitcoinBAM project and the procedure of raising funds to develop a decentralized platform for further services available with BTCBAM Mining System

This paper provides information in connection to an opportunity for the acquisition of coins that will grant purchasers economic exposure (Target Assets) by means of periodic profit distributions. The Coins will not (i) provide legal ownership over the Issuer's shares or the Target Assets; (ii) represent a debt owed by the issuer to the coin holders; nor (iii) provide voting/governance/typical shareholding rights related to the Issuer. This paper does not constitute a prospectus, an offering memorandum, and/or other offering document relating to the Issuer and has not been reviewed or approved by any financial regulator or securities commission in any jurisdiction. Investing in coins involves several risks. Prior to investing in coins, prospective purchasers should carefully consider the section "Risk Factors" of this paper. Prospective purchasers should consider carefully whether a purchase of coins is suitable for them considering the information herein and their personal legal and financial circumstances. Unless otherwise indicated or the context otherwise requires, all references in this paper to "Issuer", "we","our", "ours", "us" or similar terms refer to the Issuer

Anti-Money-Laundering and CounterFinancing of Terrorism and Know-YourClient From the regulators' perspective, one of the main concerns of cryptocurrency, in general, is that initial purchasers and subsequent traders may not have undergone an anti-money-laundering and Know-your-client process and transactions may not be subject to ongoing AML/CTF monitoring. As a result, regulators are increasingly establishing licensing regimes for cryptocurrency operators and requiring them to establish AML/CFT and KYC relevant policies similar to current requirements on traditional financial firms. Practically, however, the speedy and around-the-clock nature of these transactions has increased the difficulty for the operators to perform complete KYC or AML/CFT tracking without undermining the efficiency of transactions. The growing sophistication of chain analytics and other solutions is likely to make this less problematic over time, and provide stronger insight into its potential risks than traditional cash.



**INVESTMENT RISKS**

**General Risk Factors;** The company provides not only any guarantees with respect to value growth but also on world exchanges. The company does not guarantee that the use of BTCBAM Coins will meet the requirements of the user, which will be continuous, accessible at any time, safe, and error-free. Any links to third-party sites cannot be approved by the company for any products, services, or information presented on them. The company does not guarantee the accuracy of the information provided on such sites. In addition, the company should not control user agreements and privacy policies of third-party sites.

**Risk Factors Relating to Legal and Regulatory Framework;** The risk of the Customer incurring financial losses due to the entry into force of new or changes to existing regulations. Legal risk also includes the possibility of the Investor incurring financial losses due to the absence or ambiguity of regulatory acts directly or indirectly regulating activities in the securities market. Investments in crowd investing projects are associated with a high level of risk, this Notice describes the most common types of risk, their list, however, is not exhaustive.

**Economical Risks;** The company is not liable for losses incurred by the Client as a result of economic risks:

**1.1. Price risk** - the risk of the Investor incurring financial losses due to adverse changes in the prices of financial instruments and investment items;

**1.2. The instability of financial markets** - a decrease in the liquidity of financial instruments, items, and objects of investments and the impossibility of their implementation.

**Legal Risks;** The risk of the Customer incurring financial losses due to the entry into force of new or changes to existing regulations. Legal risk also includes the possibility of the Investor

incurring financial losses due to the absence or ambiguity of regulatory acts directly or indirectly regulating activities in the securities market.

**Technical Risks;**

1. The client assumes the risks associated with malfunctions of software, telecommunication equipment, and other technical problems;

2. The client is obliged to store passwords and be sure that third parties will not get access to the Personal Account;

3. Any user should take care of the safe storage of their private keys from crypto-wallets since there is a risk of theft of account data and the transfer of tokens without permission.

4. The client is aware that the information transmitted in unencrypted form (via email, instant messaging service) is not protected from unauthorized access.

**Risk of False;** When buying coins, it is possible that a third party can impersonate a coin issuer and provide a fake cryptocurrency address to steal cryptocurrency or fiat funds from the buyer. The user must request the latest information about the services from the developer of this blockchain.

**Force majeure circumstances;** The company is not liable for losses incurred by the Client as a result of force majeure circumstances: military operations, terrorist acts, natural disasters, foreign exchange interventions, decisions of authorities and management, and other circumstances related to force majeure

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