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# THE FIRST ALL-BLOCKCHAIN INSURER

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**I**F INSURERS HAVE BEEN tireless in experimenting with digital technologies, piloting multiple initiatives in search of one that will give them an edge, there's no mystery why. Insurance is about information—gathering it, evaluating it, and disbursing or receiving payments based on it. Clearly, an insurer might dramatically improve its results through the application of digital technology.

That many insurers have not yet achieved this is a function of an opposing force: the zeal with which most insurers guard their data. When an event requires an exchange of information, most insurers strive to share the least amount possible, in many cases using manual, paper-based processes. This is insurers' way of making sure that there are no sensitive leaks, and it reflects the fear that digital exchanges of data may not be secure. But what if there were a technology that changed this?

That's what some insurers are hoping will come from blockchains, which can be used to create and share completely digital re-

ords securely. Blockchains have the potential to make other digital technologies, such as advanced analytics, artificial intelligence (AI), and automation software, much more productive. We estimate that under an ideal set of circumstances—involving widespread deployment—blockchains could help the worldwide property and casualty (P&C) insurance industry reduce its combined operating ratio by 5 to 13 percentage points and generate upwards of \$200 billion more in technical margin from its current gross written premiums.

Certain blockchain hurdles remain, so the value capture is still a few years off. Still, the numbers indicate why blockchains can't be ignored and why somewhere, maybe in a place no one is looking, there is a company drawing up plans to become the first all-blockchain insurer.

## The Promise of an Emerging Technology

Blockchains, which have appeared on the business radar only recently, are digital led-

gers that are set up in a distributed fashion. When an update is submitted to a blockchain ledger, participants in the network are asked to approve the update as part of an automated process. Approved updates are timestamped, encrypted, and added to the block. The new block becomes part of the blockchain: an immutable record of all transactions and agreements of interest to the participants. (See Exhibit 1.) There can be hundreds, or even thousands of participants, or “nodes,” in a blockchain.

Indeed, a blockchain achieves its greatest value when there are multiple participants and its ownership and operation are distributed. In such cases, the distributed setup and the possibility of not having to pay a licensing fee (some blockchain software is available as open-source code) can keep the cost of operating the blockchain relatively low for each participant. This is true of both public blockchains, which are open to all, and private blockchains, which require an invitation and are the blockchains most insurers are considering today.

Blockchains offer the following seven major technical benefits:

- **A Single Source of Information for Tracking Assets.** Transparent asset tracking, among the biggest advantages of blockchain technology, has caught the

interest of a variety of industries, including securities trading and logistics.

- **Creation of a Trusted Immutable Record.** This is possible because of blockchains’ use of strong encryption and the inability of anyone to change a blockchain without clear notification.
- **Preservation of Privacy and Confidentiality.** Blockchains’ use of cryptography ensures that data can be seen only by the participant, or node, that “owns” the data.
- **Resilience.** Blockchains have the capacity to keep working even if one or more nodes go down. The ledger remains live (and up-to-date) on all the other nodes.
- **Efficiency.** The distributed approach of a blockchain means that the per-node cost of storing data is significantly lower than in a centralized setup.
- **Native Support for Automated Transactions.** In a blockchain, rules governing payments and contractual amendments can be coded into the software, reducing the need for manual transactions.
- **Real-Time Information Delivery.** As transactions are approved, new blocks

#### EXHIBIT 1 | How Blockchain Technology Works



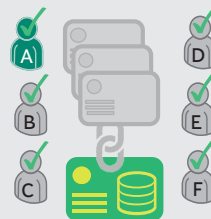
1 Party A has a new data update to the ledger



2 The data update is added to a digital “block”



3 All parties in the network see the new block



4 Parties confirm that the block is valid and add it to the chain

Source: BCG analysis.

and data changes show up on the ledger in something close to real time. This particular benefit is evident primarily in private blockchains, whose processes are less resource intensive than those of public blockchains. The cryptography algorithms used for public blockchains can require several minutes to run.

The benefits of blockchain technology, which are all relevant to the insurance industry, could make it possible for insurance providers to implement digital initiatives on a large scale—a goal that has thus far eluded them. Still, because of blockchain’s newness and its unfamiliarity in insurance settings, it is necessary to exercise a bit of imagination to understand the technology’s long-term potential.

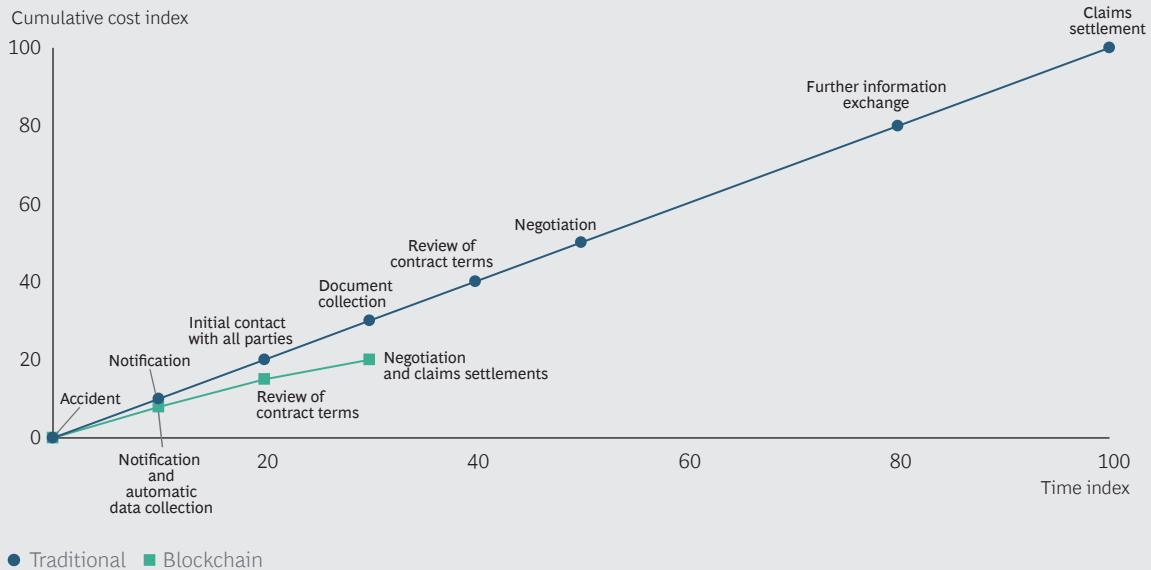
**Making Insurance More Efficient.** What would an “all-blockchain insurer” look like? Such an insurer would store all the transactional data relating to its contracts on a blockchain (or several blockchains). If a claim were filed with an all-blockchain insurer that required an exchange of information or a settlement, the transaction might well be conducted automatically. (Indeed, insurers involved in certain early blockchain pilots have started to talk about aspects of the insurance value chain

becoming “transactionless.”) By contrast, if such a claim were filed with an insurer that was *not* using a blockchain—which is to say, just about every insurer today—all the contracts would be on the insurer’s own system, and any information sharing with outside parties would likely involve manual processes and paperwork. The number of steps, and the costs, would be much higher.

Insurers can organize a blockchain that involves insurance only or they can incorporate aspects of the surrounding ecosystem. Most of today’s insurers are considering an *insurance-only blockchain*, which would involve rival insurers (and some regulators) forming a blockchain to share data in order to reduce manual work and lower transaction costs. Such a blockchain could help insurers accelerate the processes of getting know-your-customer information and of generating quotes. An insurance-only blockchain could also drastically reduce the cost of motor claim settlements and could achieve them in much less time than it takes to handle them traditionally. (See Exhibit 2.)

Although *insurance ecosystem blockchains* are at an earlier stage of development, there are some worth noting. For instance,

EXHIBIT 2 | Settling a Motor Claim, Traditionally and with Blockchain



Source: BCG analysis.

the marine cargo company Maersk is participating in such a blockchain with XL Group and several ports and customs authorities around the world.

Ecosystem blockchains can give insurers external data that can be used, for example, to do a better job of setting prices and limiting their exposure to fraud. Currently, risk assessment is based on an insurer's internal data and on the customer's history. Spotting fraud is the responsibility of insurance adjusters who use their observations and experience to flag suspicious claims.

Digital technology is not used to a significant extent in support of either premium pricing or fraud detection. With data from more entities included on a blockchain—the telemetric data from a car, say, or the car owner's police tickets and car repair history—a person's risk profile, including the likelihood of his filing a fraudulent claim, could be much more accurate.

Both insurance-only and ecosystem blockchains allow insurers to use smart contracts and thus to automate more operational activities. Consider the reduction in paperwork that could be achieved by putting flight insurance—a relatively simple type of insurance—on a blockchain. Today, administering the benefit—in the event of a policyholder's flight being delayed—involves considerable manual effort. The policyholder has to gather documentation from the destination airport about the exact arrival time, while the insurer has to verify the source and accuracy of the documentation and match it against the insurance contract. Only after those steps have been taken can payment be disbursed. All of the steps are manual, and, in many cases, the product does not generate a positive margin.

With a blockchain, the entire process could be automated. The late arrival (confirmed by airport data) would trigger an automatic payment that might appear in the insured person's account by the time he finally arrives at his destination. Fizzy, a service of the French insurance company AXA, already offers flight insurance that uses blockchain technology in this way.

**Quantifying Blockchain's Potential.** To get a sense of blockchain's economic potential, we analyzed the extent to which this emerging technology platform might benefit P&C insurers. We looked for possible savings in the three main areas of insurance—distribution, risk management, and operations. Our analysis, which takes into account data from some early industry pilots, suggests that the first all-blockchain insurers could substantially lower their combined operating ratios.

In terms of personal-insurance lines, we considered motor insurers. A motor insurer would be able to use the data on a blockchain to lower its loss ratio, reduce the cost of adding new customers, and substantially improve its ability to detect fraud. Smart contracts would help lower the insurer's operations costs. All told, an all-blockchain motor insurer could have a combined operating ratio 10 to 13 points lower than that of a traditional motor insurer. (See Exhibit 3.)

In commercial insurance, we considered marine cargo insurance. We expect that an all-blockchain marine cargo insurer could lower its costs in both risk management and operations. Risk management could be improved, for instance, if the satellite-tracking system of an insured cargo company were on the same blockchain as the insurance contract. In that case, the insurer might be able to automatically detect an increased risk—if, for instance, an entire load of cargo were concentrated in a single port—and dynamically adjust premiums. Operations costs could be substantially reduced if the local port authority (with which, in the event of a claim, there is considerable information exchange) were a participant on the blockchain. We calculate that a blockchain could help such an insurer reduce its combined operating ratio by 10 to 13 percentage points.

In reinsurance, the combined data on a blockchain could be analyzed to show risk concentration if, for example, insured property or cargo were in a politically unstable country or jurisdiction. And a blockchain could be helpful in automating risk trading among insurers and reinsurers involved in

### EXHIBIT 3 | How Blockchains Could Improve Insurers' Combined Operating Ratios

Area of improvement	Distribution (marketing and sales)	Risk management (underwriting and claims)	Operations (including IT)
Personal-insurance lines 10 to 13 percentage points	<ul style="list-style-type: none"> <li>Improvement comes from better pricing, thanks to data stored on the blockchain and to faster retrieval of KYC information</li> </ul>	6 to 8 percentage points  2 percentage points	<ul style="list-style-type: none"> <li>Smart contracts are used for automated claims detection and settlement</li> </ul> 2 to 3 percentage points
Commercial-insurance lines 10 to 13 percentage points	<ul style="list-style-type: none"> <li>Automated underwriting is enabled by KYC data on blockchains</li> <li>Adaptive risk management is based on IoT data on blockchains</li> </ul>	6 to 8 percentage points	<ul style="list-style-type: none"> <li>Data collection processes, including with port authorities, is digitized</li> <li>Claims settlement processes are automated</li> </ul> 4 to 5 percentage points
Reinsurance 5 to 6 percentage points	<ul style="list-style-type: none"> <li>Risk concentration (with blockchains identifying the risks) is detected automatically</li> </ul>	Around 1 percentage point	<ul style="list-style-type: none"> <li>Reinsurance processes are automated</li> </ul> 4 to 5 percentage points

Source: BCG analysis.

Note: Green boxes show the level of improvement in terms of the combined operating ratio; KYC = know your customer; IoT = Internet of Things.

a specific contract. The B3i consortium, a blockchain partnership that has grown to include dozens of reinsurance companies and brokers, expects participating reinsurers to improve their loss ratios by 0.5 percentage points and their combined operating ratios by 4 to 5 percentage points.

Globally, the P&C industry had more than \$2 trillion in gross written premiums in 2016. Applying the possible improvements in the combined operating ratio to that total suggests that there could be upwards of \$200 billion more in technical margin from blockchain use in this sector of insurance alone. With the exception of life insurance, which puts more emphasis on investments and less on transactions, virtually all sectors of insurance could see similar benefits.

### Obstacles to Adoption

For the moment, the idea of an all-blockchain insurer—one that can reduce the administrative burden in insurance transactions and assess risk more accurately—is just that: an idea. There are both managerial and technical obstacles to the adoption of blockchain technology. The following aspects of the business present managerial challenges:

- Partnering.** Creating a blockchain that draws in outside participants requires

some careful calculus—especially if the outside participants are competitors. Companies have to be willing to give up certain aspects of their operations that they may have seen as differentiating them from the competition. Whom to approach, what to propose, and how to proceed when starting a blockchain all require considerable thought.

- Know-How.** Most insurance companies have had limited exposure to blockchains. They are not clear on how a blockchain might help them strategically, and they may lack the technical expertise to set up a pilot. These are gaps that need to be bridged.
- Governance.** Public blockchains (including the one Bitcoin uses) are accessible to all and often follow the governance approach used by open-source communities. By contrast, the blockchains that make sense for insurance companies are private: limited to invited insurers, partners, and customers. This requires a different kind of governance, which can be tricky because of the need to balance benefits as the number of stakeholders rises.

Furthermore, achieving successful control over the following technical aspects can be challenging:

- **Scalability and Computational Power.** Scalability is a big issue for blockchains. The processes by which new blocks of data are securely approved for inclusion on the ledger—so-called consensus mechanisms—are extremely computer intensive in public blockchains. This diminishes blockchain’s theoretical speed and cost advantage. By contrast, participants in private blockchains can address this problem upfront.
- **Security.** Despite blockchains’ use of basically impenetrable encryption technology, the shared ledger could still be vulnerable should the surrounding interfaces be improperly secured. An intruder could hack into secondary software (for instance, into wallets) and, once in the system, steal the blockchain encryption keys.
- **Robustness of the Software.** For the most part, blockchains have been implemented as proof-of-concept projects in small-scale environments. It isn’t clear how well a blockchain would perform if it were being counted on to process millions of transactions or had thousands of participants. As they look to go beyond pilots and get more out of blockchain technology, insurers will have to make sure that they are working with mature and proven software.
- **Standards and Protocols.** Blockchain is a young concept, and the pioneers in the field have put forth a variety of standards for launching and operating individual blockchains. The standards are not always compatible, and the technologies, or “protocols,” that are supposed to ensure interoperability aren’t used consistently. It’s worth noting that regulators have not yet authorized any blockchain standards.

## The Way Forward

Given the obstacles, some insurers are probably wondering whether it pays for them to be blockchain trailblazers. They may prefer to hold back until there are clear signs that

blockchains for the insurance industry are going to come into wide use.

It is our opinion that a wait-and-see approach is shortsighted and leaves insurers vulnerable. Disruption could come from any one of three directions: insurance technology startups (insure-techs) that are already in front on digital technology and are looking for ways to extend their lead; companies from other sectors, such as ride-sharing businesses, that have the data needed to assess certain kinds of risk and could use a blockchain to build an insurance offering; and fast-moving incumbents that adopt blockchains to improve their existing operations.

Instead of assuming that they will be able to catch up if the early blockchain initiatives prove their value and touch off a race for blockchain leadership, insurers should start developing the necessary capabilities now.

In particular, they should act on the following imperatives:

- **Identify business priorities on the basis of the size of the prize.** Companies must assess their own starting points and develop a sense of where blockchain capabilities could help them more than any other solution. For some companies, the right starting point might be to improve their capabilities in risk management. For others, the right starting point might involve operational improvements.
- **Prioritize use cases.** What particular problem does the insurer have that a blockchain might be able to solve? It could be fraud detection or inefficient “manual” interactions with customers, including updates or information requests sent by snail mail. The use case decision process will be specific to each insurer.
- **Select the right technologies.** Each insurer will want to use the technologies that reflect its particular priorities. For instance, a maritime insurer looking to do a better job of risk analysis may

want to invest in a blockchain and technologies that can track assets globally, such as sensors and other Internet of Things devices. A motor insurer may prefer to invest in a blockchain and AI software if AI seems likely to improve its ability to spot fraud automatically.

- **Experiment.** This is mostly about mindset, but it is a crucial point. While the obstacles to blockchain adoption present challenges that every insurer will have to surmount, the answers will vary by company. There are different ways to solve the challenges of know-how and governance and to bring scalability, security, and robustness to a

blockchain initiative. Companies must put a lot of ideas to the test so that when the time comes, they will have a sense of what works for them.

**W**ILL BLOCKCHAIN TECHNOLOGY start to transform insurance in the next year? In five years? Could it fall short of ever becoming a real game-changer?

No one can say for sure. And that's exactly why insurers must have a plan for blockchain: it could surface in unexpected ways and hand a competitive advantage to early adopters. If there's any industry that should understand the importance of preparing for contingencies, it's this one.

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