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*'We tend to overestimate the effect of a technology in the short run and underestimate the effect in the long run.'*

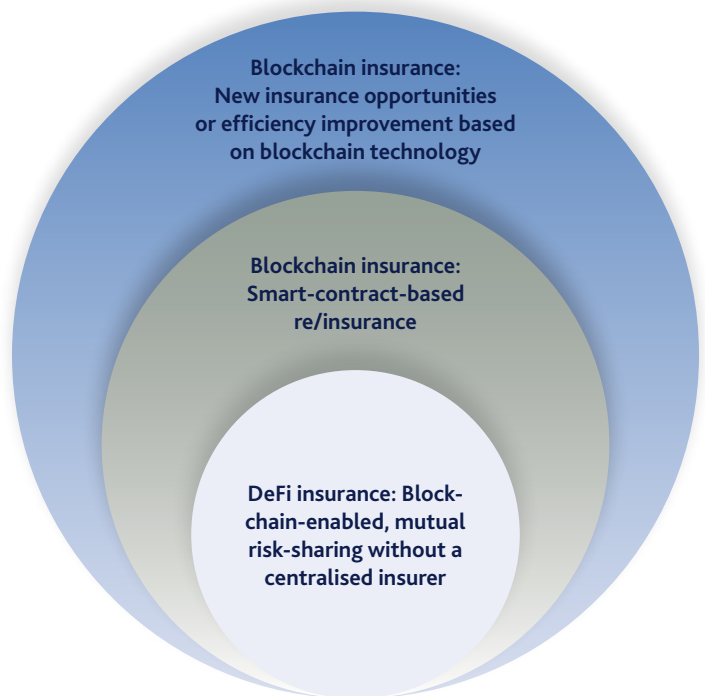
Amara's Law

Decentralised finance (DeFi)<sup>1</sup> and blockchain technology<sup>2</sup> have the potential to improve the efficiency of traditional insurance, enable new business models and open up new opportunities in insurance. They may also improve the accessibility, affordability and attractiveness of insurance and make insurance more inclusive. Case studies and empirical evidence, however, suggest that the potential benefits of DeFi and blockchain applications in insurance (DeFi/blockchain insurance hereafter) have not yet been fully realised.

## Overview of DeFi/blockchain insurance

DeFi/blockchain insurance has three layers, defined from the supply side, as shown in Figure 1.<sup>3</sup> In the narrowest sense, DeFi insurance refers to a blockchain-enabled, mutual risk-sharing arrangement without a centralised financial intermediary. More broadly, blockchain insurance includes insurance products that use smart contracts and/or other blockchain techniques as the means to deliver conventional insurance services. In the broadest sense, blockchain insurance also includes insurance activities that use blockchain techniques to improve operational efficiency and/or to develop new business opportunities.

**FIGURE 1: DEFI/BLOCKCHAIN INSURANCE**



Source: The Geneva Association

Figure 2 provides an overview of the DeFi/blockchain insurance marketplace. DeFi/blockchain insurance **investors** mainly include incumbent insurers, tech entrepreneurs and digital giants.<sup>4</sup> In terms of **coverage**,

1 DeFi describes the infrastructure, processes and technologies developed to disintermediate financial services (see Feng et al. 2022; Feng 2023). It is a set of alternative financial markets, products and systems that operate using crypto assets and smart contracts based on blockchain or similar technology (see FSB 2022). DeFi deploys smart contracts to execute a variety of financial services activities on a blockchain without financial intermediaries, with payments often made through crypto assets in digital wallets (see Oliver Wyman 2022).

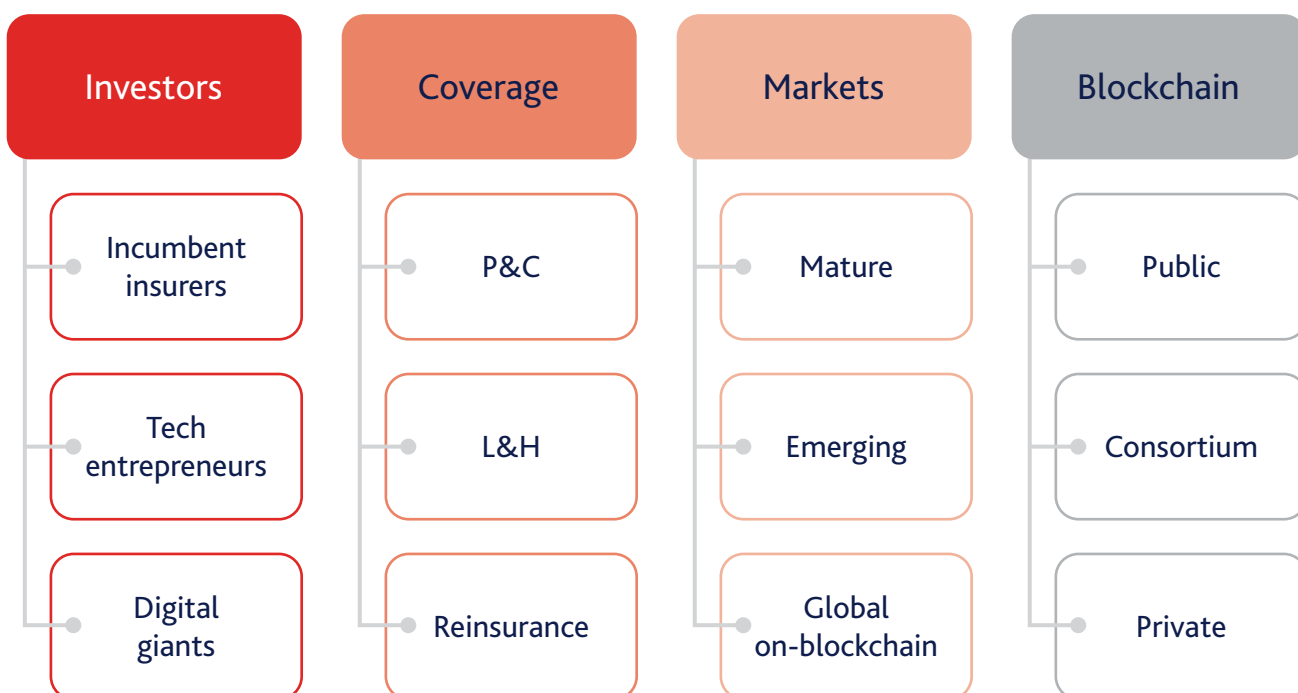
2 Blockchain is a distributed database or so-called ledger that is shared among the nodes of a computer network. It is best known for its role in cryptocurrency and DeFi systems. See BIS 2022.

3 Using crypto assets and central bank digital currencies for premium and claims payments or as an asset class for investment is not considered DeFi/blockchain insurance here, nor are crypto-asset-based savings and other financial products.

4 Schmit 2022.

DeFi/blockchain insurance provides property & casualty (P&C) insurance, life & health insurance and reinsurance. It has been developed in both mature and emerging **markets** and, importantly, some applications purely serve the global online market. Regarding the **blockchain technology**, DeFi/blockchain insurance has been developed based on public, consortium and private blockchains.

**FIGURE 2: DEFI/BLOCKCHAIN INSURANCE MARKETPLACE**



Source: The Geneva Association

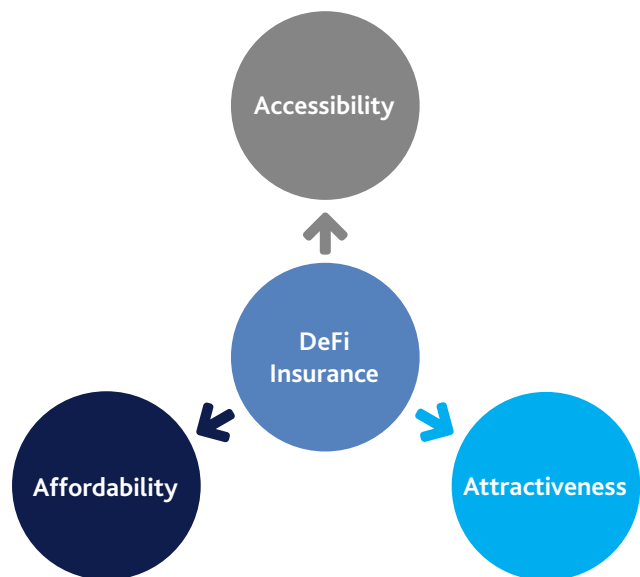
DeFi/blockchain insurance is mainly present in large, competitive markets; remains niche; and is concentrated in specific non-life segments such as crypto-related risks. The expected efficiency gains and new business opportunities have not yet materialised, and enthusiasm about and confidence in investing in DeFi/blockchain insurance have suffered from recent crypto failures. So far, DeFi/blockchain insurance has neither driven major growth of the insurance market nor significantly improved financial inclusion.

## DeFi/blockchain for more inclusive insurance

DeFi/blockchain insurance may narrow the insurance protection gap for low-income populations through semi-formal microinsurance programmes.<sup>5</sup> Conventional informal insurance used by un(der)insured people includes family protection and various community-based, mutual risk-sharing programmes. It is decentralised, flexible, disintermediated, non-regulated and relies on local, trusted networks. By contrast, the modern, centralised, formal insurance model is highly intermediated, commercially driven and establishes trust based on capital, professionalism and reputation. The lower people's income, the more they tend to choose informal insurance for risk management.

DeFi/blockchain enables peer-to-peer insurance solutions that meet the demands of un(der)served socio-economic groups. Such groups in the context of insurance usually include those that are geographically remote, or have low incomes or poor financial literacy. Their protection gaps include agricultural risk, health/maternal risk and longevity risk. DeFi insurance enables such individuals to form a risk pool without the approval or involvement of insurance intermediaries. Insurance services can be provided completely online, from underwriting to claims, greatly improving the **accessibility** of insurance to individuals living in remote areas. The operational costs associated with insurance may also be reduced, improving the **affordability** of insurance for low-income populations. Finally, the fact that DeFi/blockchain insurance products could be purchased via smartphone applications or mobile phone networks improves the customer experience and **attractiveness** of insurance coverage for individuals with poor financial literacy. Figure 3 illustrates the 'Triple-A Impact' of DeFi/blockchain insurance on financial inclusion. Cryptos are particularly useful for inclusive insurance targeted at the unbanked population (i.e. individuals without a bank account). Smart contracts are also expected to improve the trust between un(der)served individuals and DeFi/blockchain operators and developers.

**FIGURE 3: THE 'TRIPLE-A IMPACT': HOW DEFI/BLOCKCHAIN IMPROVES FINANCIAL INCLUSION IN INSURANCE**



Source: The Geneva Association

The consensus among regulators and re/insurers is that digital technology/insurtech should play a critical role in improving the inclusivity of insurance.<sup>6</sup> However, in practice, it remains unclear whether – and if yes, how and to what extent – DeFi/blockchain will facilitate it. This due to its very early stage of development and the immaturity of the technology.

## The outlook for DeFi and blockchain in insurance

In the short term, and practical hurdles notwithstanding, addressing specific pain points in insurance, such as issues around trust, operational cost and transparency, should be the major focus for DeFi/blockchain insurance. This will require the development and implementation of DeFi and blockchain technology in close collaboration with other insurtechs, using appropriate management approaches. Technically, however, this will not be straightforward as blockchain is generally not a technology that can be easily explored to patch existing IT systems.

<sup>5</sup> The efficiency and transparency gains of DeFi/blockchain insurance may improve financial inclusion beyond microinsurance. For example, blockchain-based health insurance reduces the information asymmetry between hospitals, patients/policyholders and insurers, which improves the affordability and availability of health insurance for middle and middle-lower classes in developed countries. See Larios-Hernandez 2017.

<sup>6</sup> IAIS 2018; MAPFRE 2020; Swiss Re 2020.

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In the long term, DeFi/blockchain technology could become an integral part of the insurance value chain. It could become a resource, platform and ecosystem for building new business models and seizing new opportunities. In the long run, insurers may recognise blockchain as a new ecosystem, i.e. a new surface for building and selling insurance products, which could insure both pure on-blockchain risks and off-chain conventional risks. Ultimately, it could also formalise the current informal risk-sharing systems used by the un(der)insured and narrow the insurance protection gap.

### Challenges and recommendations

Realising the potential benefits of DeFi/blockchain insurance comes with regulatory, business and technical hurdles and risks. These include regulatory caution about the experimental nature of DeFi/blockchain insurance, the immaturity of the blockchain ecosystem, the lack of digital literacy, issues with scalability and integration with legacy IT systems, and data privacy concerns.

Incumbent re/insurers should carefully balance the short-term cost of investing in technology with the long-term potential of DeFi/blockchain insurance. They should dynamically weigh the pros and cons of DeFi/blockchain insurance by continuing to test the waters with pilots due to: 1) the potential of DeFi insurance to disintermediate and transform traditional insurance business models, at least in the long run and 2) the potential new revenues generated by providing improved services (e.g. risk assessment, pricing, risk management, claims management).

For incumbent re/insurers, starting with a DeFi/blockchain insurance pilot that addresses pain points of existing business models or developing a new line of business in a new market are likely to be valid strategic options. Startups should identify business opportunities where DeFi/blockchain technology has a competitive advantage, such as crypto-related covers and e-credit insurance in supply chain finance.

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