

Freshfields TQ

DeFi: the future of finance?

We explain what you need to know about Decentralised Finance (“DeFi”)



What is DeFi?

To its devotees, DeFi promises to democratise the provision of financial services through the use of smart contracts, cryptoassets and distributed ledger technology. To its detractors, DeFi presents a new battleground for 'legitimate' financial services firms against unregulated blockchain-fuelled impostors. While the reality will of course sit somewhere between these extremes, DeFi is forcing market players and regulators alike to reassess how financial services can, and should, be made available to consumers.

Against this backdrop, the following pages aim to provide the background to DeFi products and services, a comparison of DeFi against the more traditional 'centralised' finance (CeFi), and an overview of how regulators are so far grappling with this emerging industry.



DeFi promises to democratise the provision of financial services through the use of smart contracts, cryptoassets and distributed ledger technology”

Claire Harrop, Senior Associate



01 Defining DeFi

DeFi takes a multitude of forms, and currently defies strict definition (although we expect authorities to seek to do so over the coming months and years). However, at a very high level, DeFi involves the use of smart contracts, digital assets, protocols and algorithms to mimic different types of financial transactions, without relying on a trusted intermediary.

Broadly speaking, the term 'DeFi' refers to financial services provided in accordance with the following characteristics:

The financial services that may be replicated through DeFi are numerous and growing in line with the increasing sophistication of the technology and protocols that support DeFi. We outline a number of examples on the following pages, but the most popular examples of DeFi protocols replicate exchanges, credit products, derivatives and insurance.



01 DeFi 'versus' CeFi

DeFi seeks to disintermediate the provision of financial services and aims to provide an alternative to centralised control by financial institutions. A popular view among DeFi's proponents is that disintermediation would increase the efficiency, transparency, innovation and inclusiveness of the financial sector – ie the assumption that financial services are better off without intermediaries. While there may be a simple logic to this, the reality is more complex. The highly-intermediated financial services industry has not developed by accident and intermediaries often play an important role in the smooth functioning of the sector. For example:



We think that DeFi looks set to enrich, rather than replace, the existing financial infrastructure and seems likely to provide more choice to consumers where an intermediated or centralised service is not the only option. While, in our view, the threat posed by DeFi is likely not existential, the 'traditional' CeFi industry cannot avoid pushing towards the same end goals of DeFi – increasing the quality of services, reducing costs to customers and increasing inclusion.



02 Bringing DeFi to life

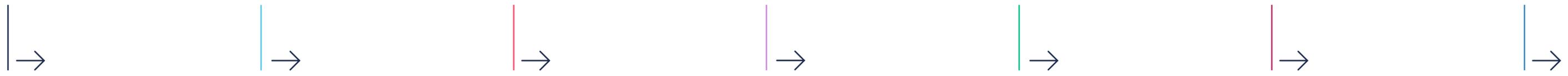
A fundamental principle of the cryptosphere is that digital value can be represented and secured through the use of cryptographic technology, without reliance on a trusted intermediary.

DeFi takes this a step further and adds another fundamental principle: digital value can be *transacted* and *controlled* through the use of cryptographic technology, again without reliance on a trusted intermediary.

The self-driving car analogy

To attempt a very crude analogy, it may be helpful to think of the jump from ordinary cryptoasset trading to DeFi activities as like switching from a normal car to a self-driving one. The engine and the fuel are likely to be the same, but things start to get more sophisticated when it comes to controlling the car:

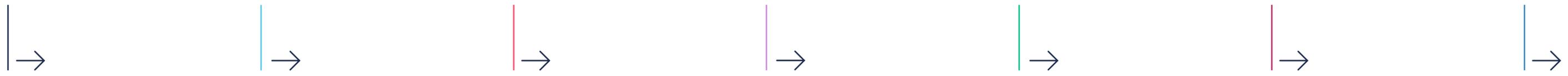
Stepping away from the self-driving car analogy, the fact that DeFi protocols are programmable and can be made to interact with one another means that there is potentially a huge variety of DeFi models. With the right regulatory environment, the possibilities for DeFi growth seem vast.



03 Where next for DeFi?

DeFi services represent the cutting edge of financial technology, and in many ways, DeFi shows the cryptosphere at its most potent and complex. Currently, DeFi activities appear to make up only a tiny fraction of the cryptoasset market, (which, in all respects other than news column inches, is dwarfed by the 'traditional' financial services industry or 'TradFi'). However the DeFi area is rapidly growing in popularity and sophistication, and some of the true opportunities and risks of this emerging trend are only starting to become apparent.

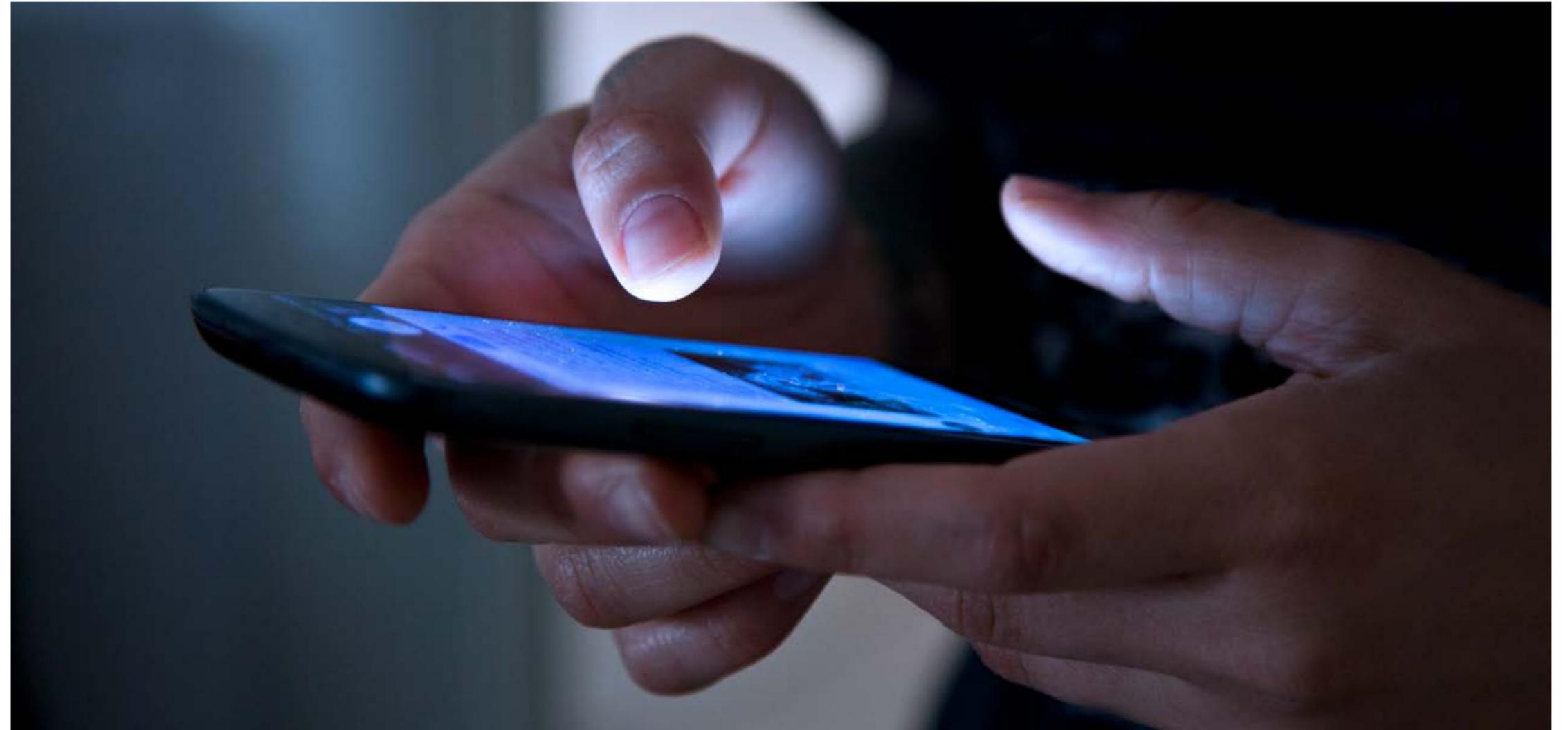




03 Into customers' pockets

The popularity of crypto-trading apps around the world provides fertile ground for the spread of mobile apps that incorporate DeFi solutions and DApps. A number of crypto-exchanges offer mobile apps already, and TradFi providers and tech companies that have already added crypto-trading to their offerings seem well-placed to follow suit. This could rapidly expand the reach of DeFi, and prompt even more investment in this space.

As we've covered in [this blog post](#), payments in the metaverse are already heading towards some form of digital currency and there may be demand for simpler payment methods (especially for smaller transactions) as a replacement for physical cash. If digital currencies do become the norm, then the potential demand for DeFi solutions (which might enable users to invest or save that digital money when not otherwise using it to buy digital flying unicorns or the virtual Empire State Building in the metaverse) could well increase.





03 Into the metaverse

Enthusiastic proponents of ‘web3’ or the ‘metaverse’ imagine seamless travel across virtual worlds that do not align with real-world jurisdictional boundaries. This gives rise to the possibility of two avatars spending their days together in the metaverse while their real-life counterparts sit on opposite sides of the planet. DeFi sits at the intersection of financial services and the metaverse and may represent both a way of making money and a way of spending money through the metaverse.

The two avatars (and their real-life counterparts) may have found each other because of their shared interests and experiences. While they may be geographically separated, they could nonetheless have similar financial needs, which could perhaps be best served by a DeFi solution that would allow them to purchase and receive services entirely in the metaverse.

It is not beyond the realms of imagination to think that DeFi mortgage providers (specialising in metaverse real estate) and other financial services businesses could spring up to capitalise on people spending more time (and money) in the metaverse. A DeFi mortgage provider could make use of DeFi ‘credit’ and ‘staking’ solutions to replicate taking the metaverse real estate – likely to take the form of a non-fungible token (NFT) – as collateral and, in the case of non-payment, realising the collateral automatically through a smart contract that returns the NFT to the mortgage provider for onward sale. Even outside the context of the metaverse, as NFTs become more prevalent, the ability to use these as collateral in DeFi transactions may become more desirable.





03 Into regulators' crosshairs

As DeFi solutions increase in popularity and reach, regulatory interest will also intensify. While most regulators are currently early in their journeys towards regulating DeFi, it is likely that priority areas will be:

Cyber risk – another topic that will be on regulators' minds will be the safety and security of DeFi protocols. Where a particular DeFi project has a large number of consumers (or rather, a high value of assets involved), cyber criminals are likely to be interested in exploiting weaknesses. It is not long since the DAO hack which resulted in the Ethereum hard-fork, where the DAO in question had vulnerabilities in its code. A variety of novel security risks are also emerging as DeFi proponents seek new mechanisms for interaction and exchange. Finally, in an increasingly decentralised world, questions will arise about responsibility and maintenance obligations pertaining to protocols. Thus, regulators will have concerns about familiar and wholly new risks associated with popular DeFi projects.

Who's responsible? – part of the fundamental concept of DeFi is the lack of a trusted intermediary. By its nature, this makes regulating it all the more difficult, despite the general consensus that the application of regulation should be technology-neutral. Regulators will need to grapple with whether the sector (or parts of it) need to be regulated and if so, how to do so. Traditional regulation focuses on the entities providing the service. In the DeFi context, we query whether regulators will seek to supervise those persons who create DApps (which could be tricky given the cross-border context and that a lone individual might create a DApp which goes viral), will create regulatory requirements that force DApps into more staid regulatory frameworks (in tension with their decentralised nature), or whether regulation might need a more fundamental re-think.

Governance – despite the claimed move away from centralisation, it is possible that the operations and activities of DeFi protocols are governed by very small groups of developers or individuals. Regulators will want to ensure that responsibility for governance failings (which may lead to more costly failures and customer detriment) is appropriately allocated between the various parties. Legislators in a small number of jurisdictions have already started to create new rules to ensure that DAOs can be found liable for failings.

Consumer protection – consumer protection is at the forefront of most regulators' minds and is one of the objectives of good regulation. DeFi tends to be permissionless and potentially accessible to all, including to those who might not fully understand the risks. Further, there are few intermediaries who fully understand DeFi and so any advice could be limited. Regulators will be mindful of the risks to retail investors of DeFi – in particular, complex products which might be leveraged or have an underlying which is very volatile.

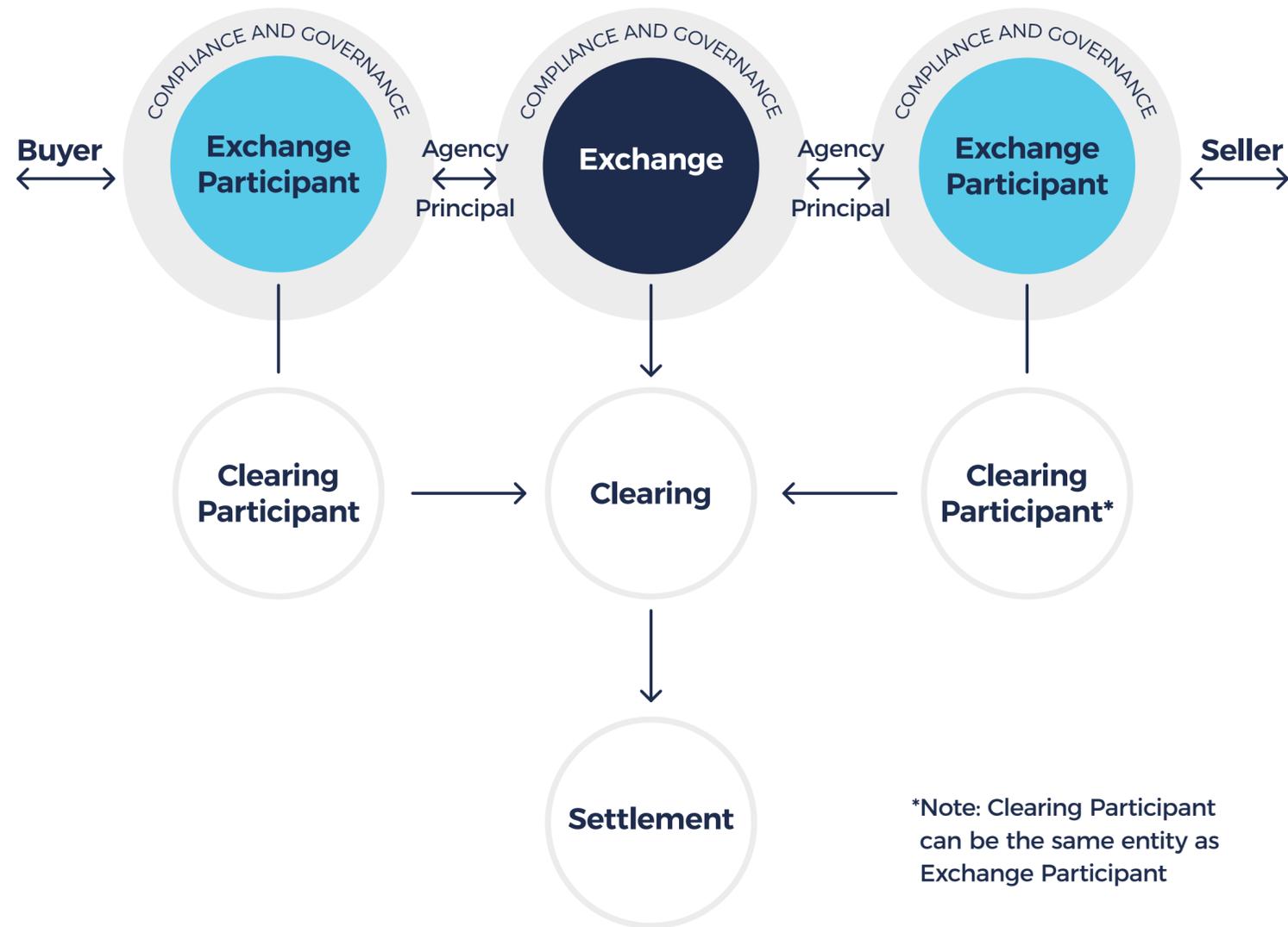
Money laundering and terrorist financing – the decentralised nature of DeFi potentially allows persons to undertake financial transactions without a clear framework for the applicability of KYC requirements. Without a responsible entity (or a clear regulatory authority), it is unclear how suspicious activity reports will be determined and who these will be reported to. The Financial Action Task Force recently provided guidance on how DeFi and DApps are covered under the FATF Standards. This may form a blueprint for regulatory approaches to limiting the money laundering risks presented by DeFi. FATF noted that creators, owners and operators or other persons who maintain control or sufficient influence in the DeFi arrangements, even if those arrangements seem decentralised, may fall under the FATF definition of a 'virtual asset service provider' (VASP). However, there may not be a central person that meets the definition of a VASP and countries should monitor for emerging risks in such situations.

Fraud and misleading promotions – one of the most immediate concerns relates to the potential for fraud and misleading promotions that capitalise on the public's lack of familiarity with DeFi constructs. We expect early rulemaking to focus on misappropriation, conflicts of interest, misleading disclosures, misuse of information, and manipulative trading activities.

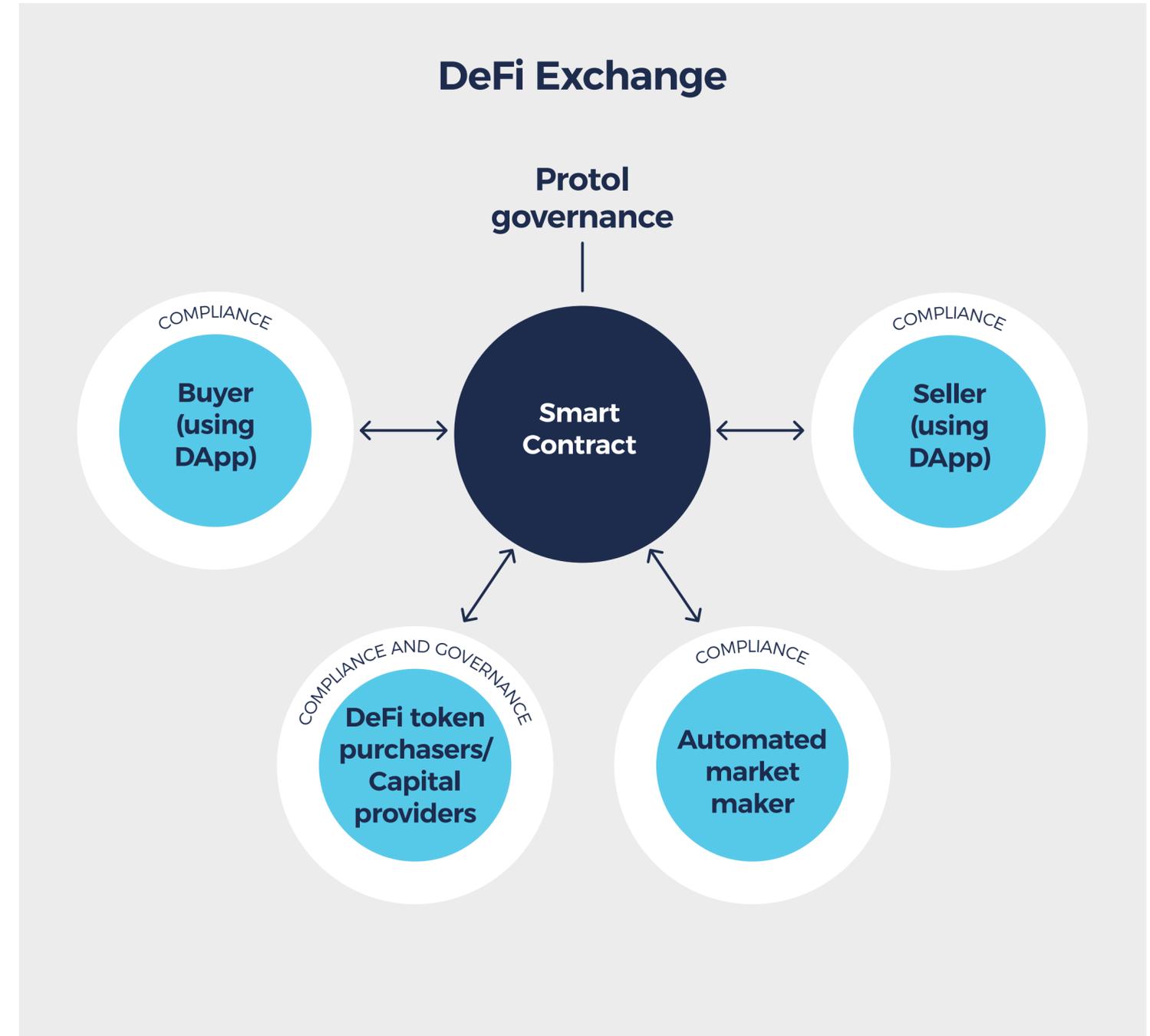
Financial stability – BIS is monitoring for the emergence of financial stability risks relating to DeFi. Although BIS has indicated that DeFi risks do not currently pose a wider financial stability threat, this could change quickly, and the position could be different in other jurisdictions. Compared to ordinary cryptoasset trading, the power that smart contracts have to automatically effect transactions without external input (and the ability of participants to take on leverage) could mean that a collapse of one participant could quickly lead to a broader contagion.



Simplified centralised clearing model typical for securities



DeFi Exchange





CeFi Exchange

DeFi Exchange

Description

Centralised exchanges connect buying and selling interests in a range of tradable products, and require traders to trust an exchange operator (which may be a single entity or a collection of entities

performing different functions) to their funds, provide price information, match buyers and sellers, process and settle transactions, and engage in transaction monitoring.

Decentralised exchanges allow peer-to-peer trading in digital assets and may allow traders to transact against a pool of capital contributed by other users/operators.

They require traders to trust that their transactions will be automatically processed by smart contracts.

Asset types

Any type of asset, ranging from traditional securities, commodities, foreign exchange, futures, and options contracts to digital assets.

Assets that are native to or tokenised on a blockchain (including stablecoins, NFTs and cryptoassets).

Transaction processing (price discovery and matching)

Exchanges match buyers and sellers in different ways, including:

- Order-driven markets, which display an order book showing all bids and offers available.

- Quote-driven markets, which show the bids and offers of market makers or specialists.
- Brokered markets, which rely on brokers to acquire quotes for interested buyers and sellers.

While DeFi exchanges can operate order books, more commonly a DeFi exchange will use automated market makers (algorithms that continuously price buy and sell transactions based on orders and available liquidity). Traders can contribute

to overall liquidity by buying and selling assets or can lock up funds as liquidity for potential trades, effectively acting as market makers (and earning a yield paid by other traders).

Custody

In order to function efficiently, traded assets are commonly held by institutional service providers – either directly with a central securities depository or indirectly

through institutional custodians, although arrangements vary widely between different markets and jurisdictions.

DeFi exchanges do not rely on user funds or assets being held in custody (although custody-like arrangements may be used where a holder of digital assets locks up

their funds to provide market liquidity, as described above).

Participants

Again, practice varies significantly, but in many cases trading on centralised exchanges can only be conducted through a broker or other market participant.

DeFi exchanges allow pure peer-to-peer trading (with automated smart contracts sitting in the middle to execute trades) including allowing retail

investors to participate.

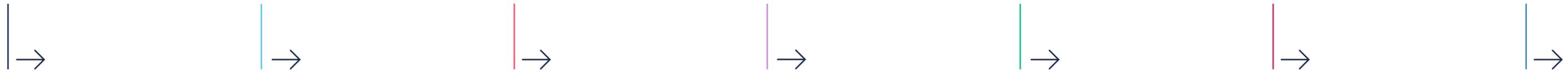
Settlement

Exchanges typically operate (or are closely aligned with) complex post-trade and settlement arrangements to ensure the buyer receives the purchased assets

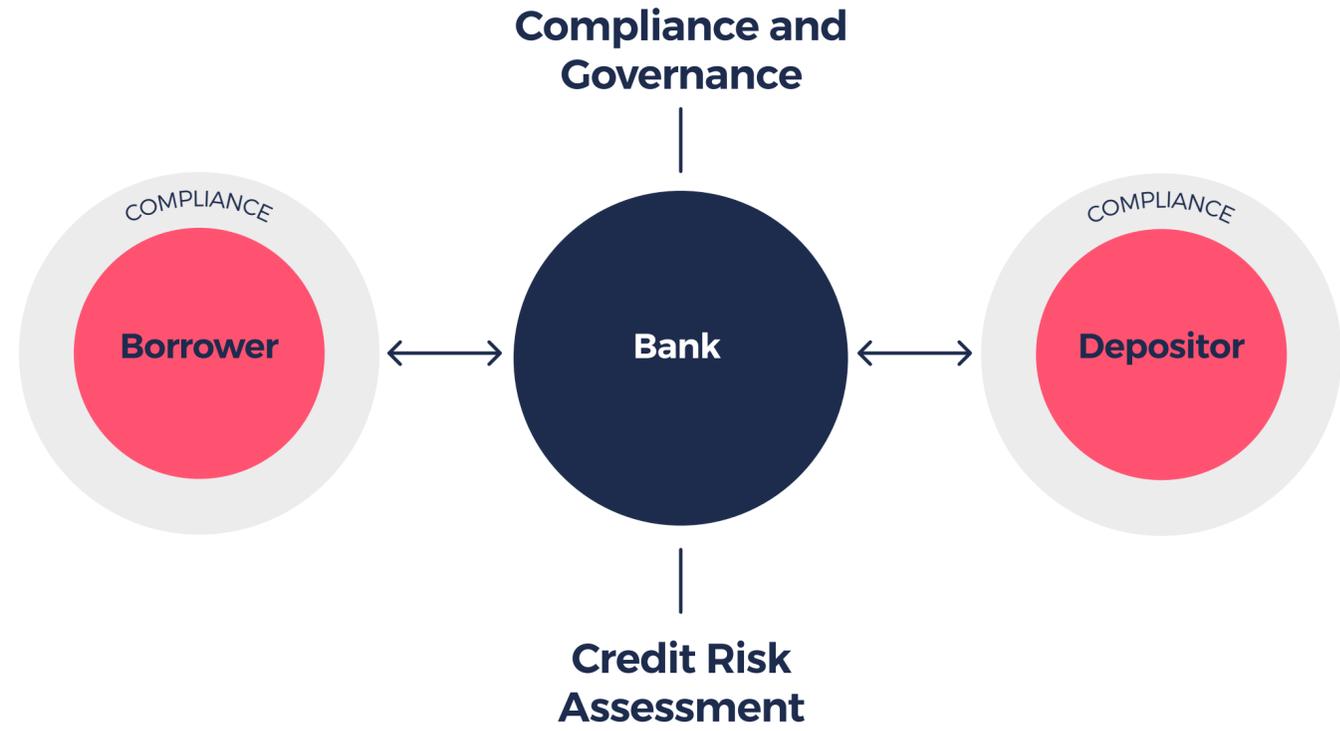
and the seller receives the corresponding cash flows. This typically occurs a number of days after the original trade is struck (eg on a ‘T+2’ basis).

The division between trading and settlement falls away for most cryptoasset transactions, with the settlement being effected by the trade.

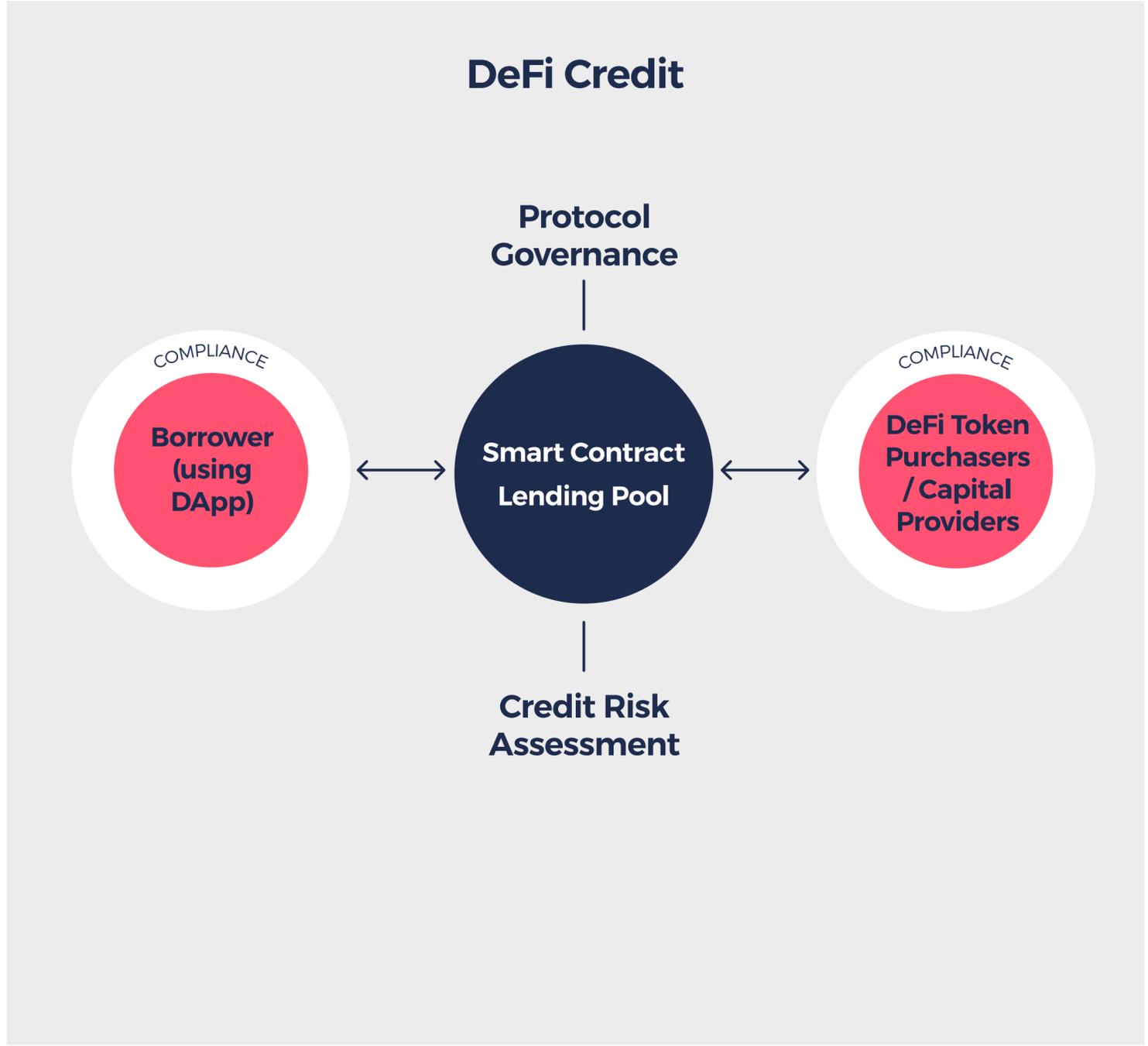




CeFi Credit



DeFi Credit





CeFi Credit

DeFi Credit

Description

Credit products take a multitude of forms, but the classic form of CeFi credit is a cash loan provided by a bank. The bank loans out money subject to payment of interest, and profits from the net interest margin (the difference between the interest rates it pays to depositors and the rates it receives from borrowers).

DeFi credit products typically operate more like securities lending products than money lending. However, rather than banks sitting in the middle of depositors and borrowers, DeFi allows anyone to become a lender and generate interest on the loan.

Parties

A typical loan will be provided by a single institution, although larger loans may be provided by a syndicate of lenders. A loan may also be originated by one or more banks and sold on to other lenders at a later date.

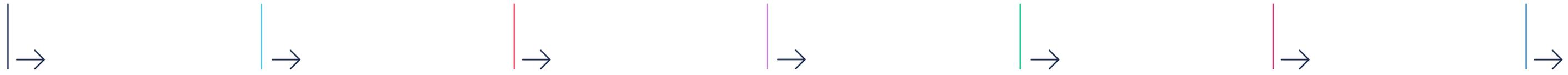
Lenders will contribute to a pool of assets that are available to be borrowed. The lenders to the pool may change from day to day, and to maintain liquidity it is common for algorithms to assist in managing supply and demand (ie attracting enough lenders and borrowers) through changing interest rates.

Credit risk mitigation

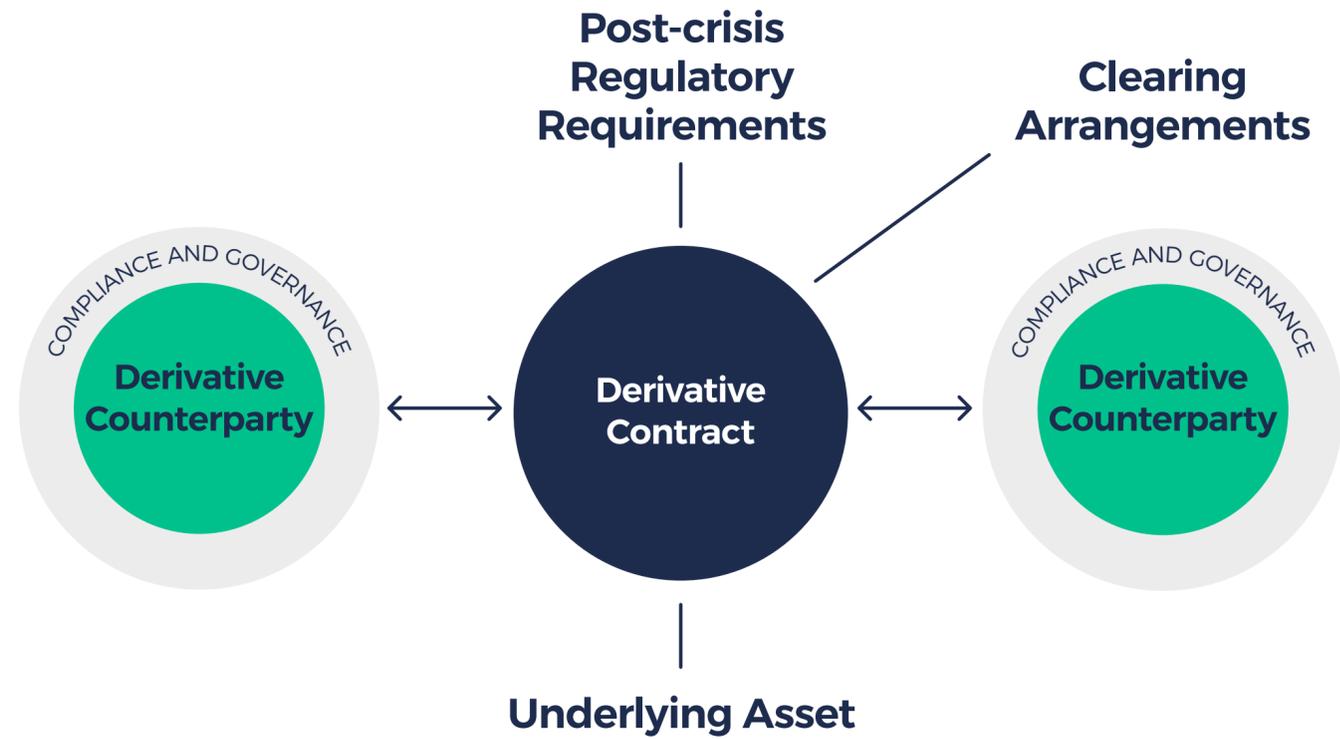
The bank makes an assessment as to the borrower's creditworthiness to avoid losses through defaults, and may additionally seek collateral (ie an asset that provides security for the loan and which can be seized and/or sold if the borrower defaults).

Without an intermediary to conduct credit checks, in most cases the borrower is required to put up collateral (DeFi protocols often require overcollateralisation). The borrower's collateral is controlled by the DeFi protocols rather than by any particular lender, so the lender doesn't have to take steps to enforce against the borrower in the case of default.

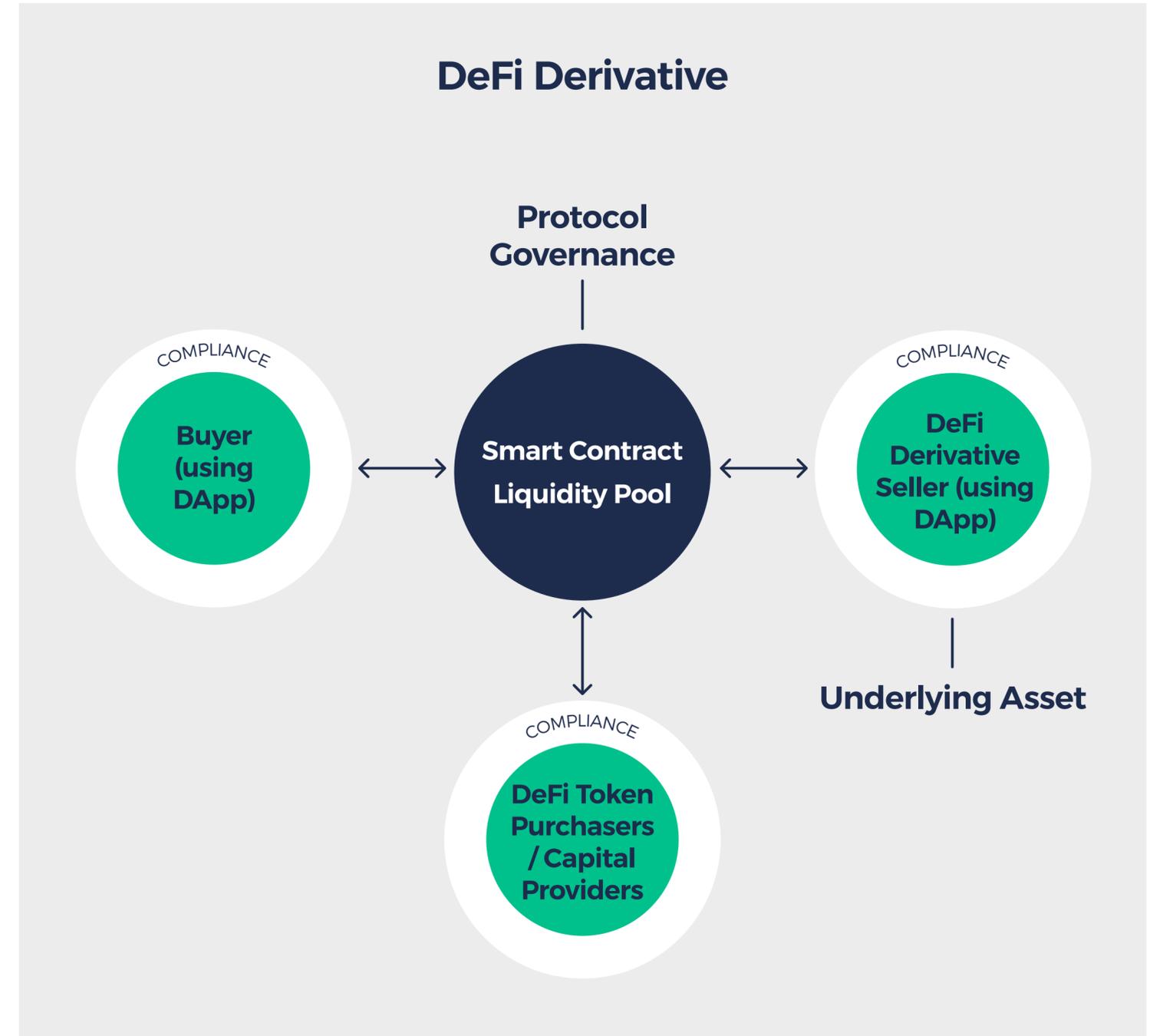
DeFi can also mitigate credit risk by allowing 'flash loans' in which assets are borrowed and repaid (with interest but without collateral) in between block cycles.

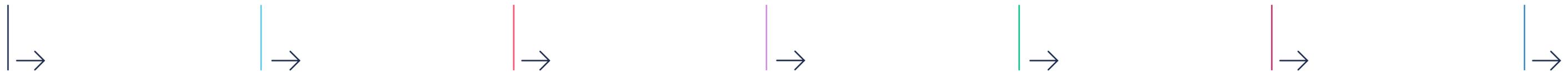


CeFi OTC Derivative



DeFi Derivative





CeFi Derivative

DeFi Derivative

Description

Derivatives are typically contracts between two parties, the value of which are based on (or derive from) an underlying asset or selection of assets.

Because of their contractual nature, derivatives can take a huge variety of forms, but some of the most common derivatives in the financial markets are futures/forwards and options contracts.

DeFi derivatives can be programmed and composed into virtually any configuration. For example, a derivative could create a synthetic asset that behaves as a stock, commodity, swap or another digital asset.

Underlying assets

Common underlying instruments include bonds, commodities, currency pairs, interest rates, market indexes, and stocks.

While DeFi derivatives can be programmed to provide synthetic exposure to the same types of underlying assets, there is significant interest in

the scope for derivatives with an NFT underlying, or derivatives that could be used as a financing option for DAOs.

Parties

Derivative contracts can be entered into by anyone, and many derivatives are traded over-the-counter (ie bilaterally and negotiated on a custom basis, rather than at a centralised exchange), but there is also a significant market in centralised

standard exchange-traded derivatives. Over-the-counter markets consist largely of investment banks that write derivatives for their clients (normally sophisticated and professional investors).

DeFi protocols have been used to allow anyone to create a synthetic asset that tracks the value of (or provides a short position in) underlying assets – including cryptoassets, financial instruments, fiat currencies and commodities.

Risk management

Since the 2008 financial crisis, derivatives markets have been subject to significant reforms intended to reduce the systemic risk created by trading derivatives. These reforms have led to requirements for more derivatives to be centrally cleared,

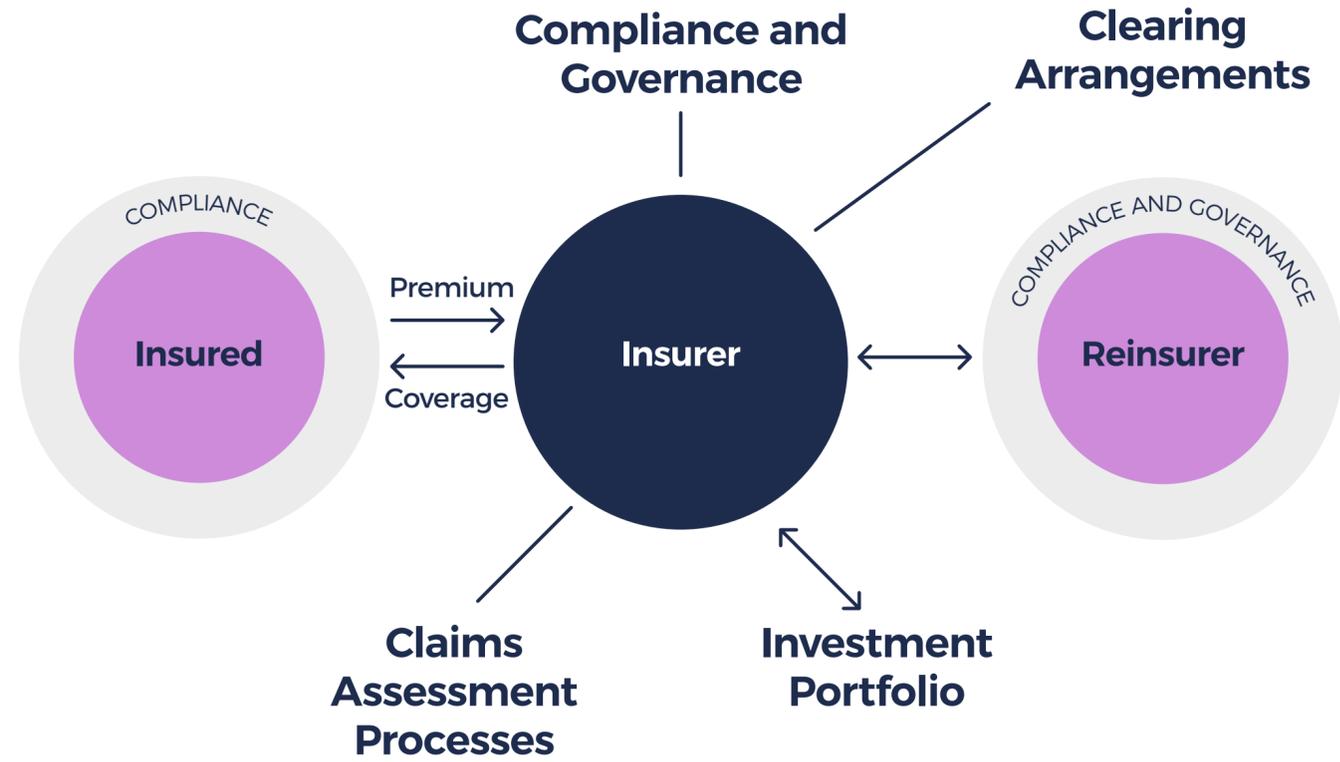
increased capital requirements for non-centrally cleared derivatives, stricter margin requirements for non-centrally cleared derivatives, tighter documentation requirements and increased transparency and trade reporting.

Because of their inherent flexibility, derivatives are often very broadly defined under national legislation and regulatory regimes – despite this (or in cases, perhaps because of it), it is not always clear whether the risk management measures

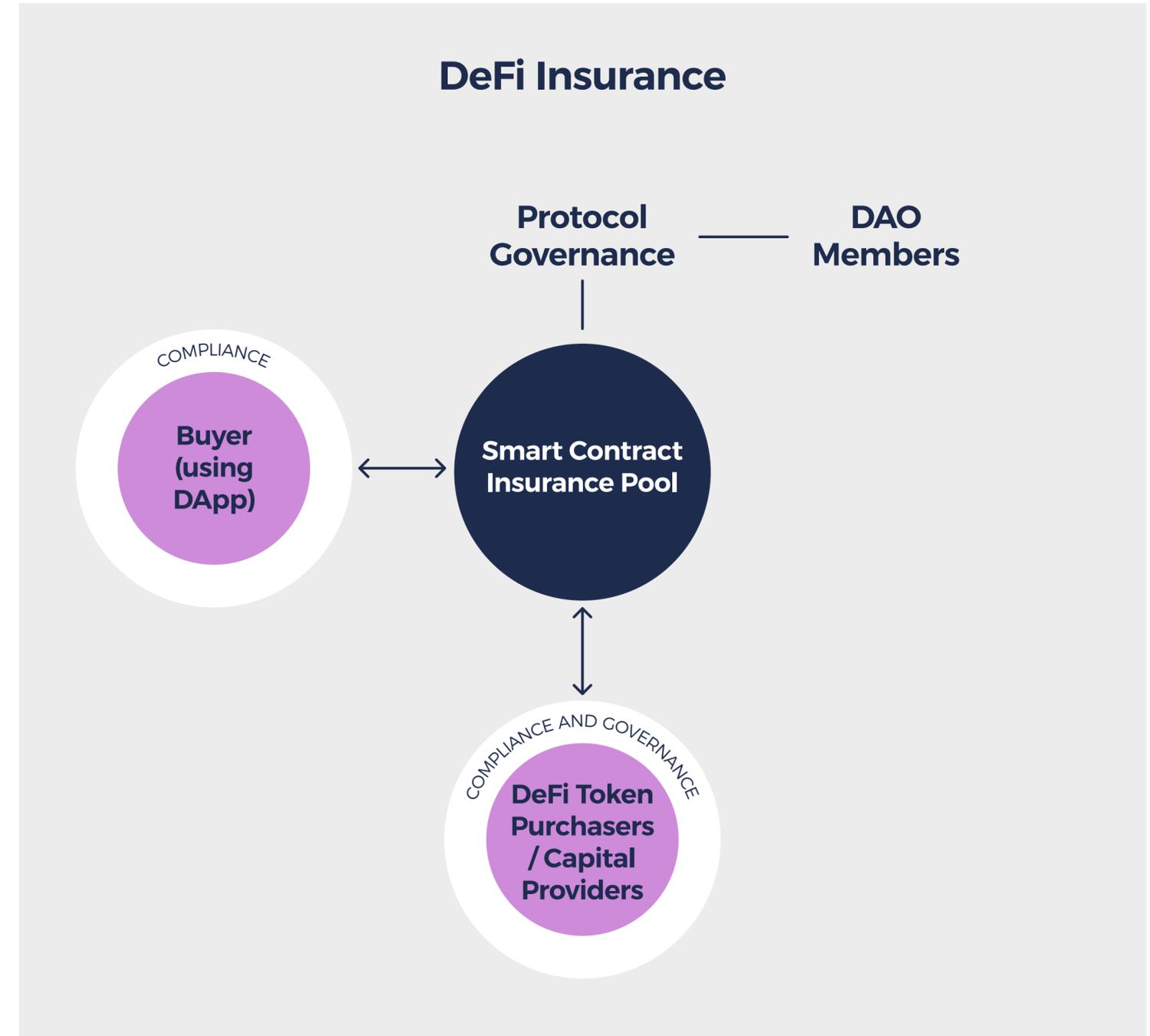
imposed by post-crisis regulations would apply to DeFi derivatives.

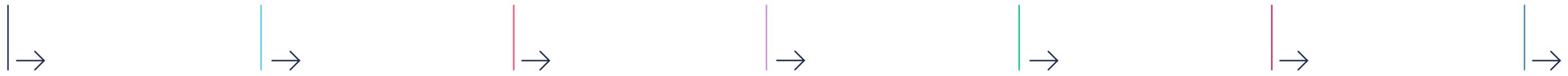


CeFi Insurance



DeFi Insurance





CeFi Insurance

DeFi Insurance

Description

Traditional insurance allows for the pooling of risks, with insurance companies receiving premium payments in exchange for the provision of financial protection against defined losses.

Insurance is a heavily regulated sector and insurance companies are typically subject to extensive supervision

Businesses have emerged that closely approximate insurance arrangements through the use of a DAO structure. One DeFi 'insurer' protocol focuses on the coverage of smart contract risks and crypto exchange hacks. The DAO controls a pool of assets comprised of 'premium'

payments and member contributions, from which amounts are paid out in the event of a successful claim (typically in respect of a defined loss]. DAOs do not typically have legal personality so their regulatory status is currently unclear.

Claims assessment process

Provided the insurer assesses that an insured party's claim meets the agreed criteria, the insurer will be required to pay out under the insurance contract (subject to the policy terms and limits).

Members of the DAO vote on whether a claim is a covered claim. If so, the DAO will make a pay-out to the insured party if the claim is verified. Alternatively, claims might be automatically verified through a source of truth, or 'oracle.'

Timing

Policy underwriting and claims pay-out timelines can vary significantly. These are typically manual processes.

Cover and claims can be almost instant.

Premium payments risk management

Insurers typically use historic data to predict the likelihood and quantum of claims, and price their premiums accordingly. This gives rise to an increased risk of mis-pricing premiums for new and

emerging risks (eg the risks faced by a business using emerging technologies).

The insured party typically loses their premium if they don't make a claim

DeFi applications can make use of staking protocols instead of simple premium payments – under a staking model if no claim is made, the stake can be returned (with interest) to the insured party.



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