KEY POINTS

- The Property (Digital Assets etc) Act 2025 confirms that digital assets are capable of being property, but fundamental questions remain about who owns assets deposited into DeFi lending vaults where smart contracts, rather than legal persons, exercise functional control.
- The absence of express contractual terms in most DeFi lending arrangements means courts would need to determine ownership from on-chain mechanics alone, creating significant uncertainty for participants.
- Genuinely decentralised DeFi structures cannot be subject to insolvency processes, potentially leaving participants without any chance of recovery on their collapse.
- Insolvency practitioners may face difficulty recovering assets locked in DeFi smart contracts and applying insolvency law to digital assets locked in DeFi structures.

Feature

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An analysis of the application of property and insolvency laws to DeFi lending structures

DeFi lending protocols now hold billions of dollars in digital assets, yet important questions remain about the legal architecture underpinning them. This article interrogates a deceptively simple question: when digital assets are deposited into a DeFi vault or market governed by autonomous smart contracts, who owns them and what are the depositor's rights in respect of them? In a genuinely decentralised structure, there may be no insolvency process through which to distribute assets to creditors, leaving lenders to bear the full risk of a protocol's collapse. Insolvency practitioners appointed over borrowers are also likely to face issues applying insolvency law to collateral deposited within markets. The practicalities of these structures and the way they interface with the law are still untested in England and are likely to continue to develop in line with the industry.

THE GROWTH OF DEFI STRUCTURES

Digital asset finance has seen a dramatic increase in adoption over the last few years. This has led to a corresponding increase in regulatory oversight for the centralised finance (CeFi) intermediaries that facilitate transactions and manage users' funds, such as cryptocurrency exchanges and lending platforms, and custodians, including in the UK where a new cryptoasset regulatory regime will come into force on 25 October 2027.

At the same time, transaction volumes on decentralised finance (DeFi) systems are also rising. These systems may fall outside the scope of cryptoasset regulatory regimes, including the new UK regime,[1] if they are truly decentralised; the UK's Financial Services and Markets Act 2000 (Cryptoassets) Regulations 2026 is not intended to bring within the scope of regulation truly DeFi models, which HM Treasury has defined as those where there is no legal person undertaking the activity by way of business.[2]

Significant attention has been given to the question of who is entitled to assets held by an insolvent custodian in a CeFi system, in the context of both CeFi insolvencies and evolving regulatory regimes, with particular focus on who has control of the assets and whether assets are held on trust by custodians for their depositors where legal ownership is determined to be held by them.

However, the analysis is likely to be different where assets are transacted through DeFi structures, where smart contracts take the place of custodians and other intermediaries. There are key legal questions with respect to property rights, with a particular focus on who owns the beneficial interest in assets tied up in a DeFi structure, particularly self-custodial lending platforms. DeFi lending structures raise additional interesting questions concerning existing common law concepts that are not always clearly answered even with respect to a CeFi structure.

In this article, we conduct an analysis of the various rights of the participants in a DeFi lending structure to the assets deposited in those structures in the event of an insolvency of a participant in the structure.

DEFI LENDING STRUCTURES

Platform architecture

DeFi lending protocols typically comprise a collection of open-source smart contracts designed to facilitate the lending and borrowing of digital assets on a public blockchain without relying on centralised intermediaries. The protocols are generally designed to be permissionless and non-custodial. While not all DeFi protocols are immutable (some retain administrative keys or upgradeability mechanisms that permit modification), the focus of this article is on protocols that are immutable, meaning that the assets held within them are managed programmatically by the smart contract code itself, rather than by any natural or legal person exercising control. Users may interact with these protocols directly (eg via a blockchain explorer such as Etherscan) or through various front-end interfaces (eg through a cryptoassets central exchange).

The architecture of a typical DeFi lending protocol involves four layers: (i) lenders, who supply assets (eg USDC or another stablecoin) to vaults; (ii) vaults, which are smart contracts that allocate supplied assets into underlying lending markets based on predetermined strategies; (iii) markets or

peer-to-peer matching algorithms, which facilitate the lending and borrowing activity; and (iv) borrowers, which borrow assets (eg USDC) from the market in exchange for collateral assets of equivalent value that are "locked" by a smart contract.

Deposit mechanisms

When a lender deposits assets (eg USDC or another stablecoin) into a vault, the mechanism by which the deposit is recorded varies by protocol. Some protocols issue a receipt token in return, held by the lender, which functions like an on-chain accounting unit representing a proportional claim on the assets held through the vault. Other protocols do not issue receipt tokens and instead record the lender's position through internal accounting mechanisms within the smart contract itself. In protocols that issue receipt tokens, the user's redemption rights may extend not only to the vault itself but also directly to the underlying markets to which assets have been allocated, allowing users to redeem via the underlying position in the market if a vault has insufficient liquidity to support a redemption.

Borrowing and collateralisation

Borrowers in the structure may borrow a loan asset (typically USDC) in exchange for posting collateral, which may be any digital asset accepted by the relevant protocol. The collateral is "locked" within a smart contract, though it is programmatically associated with the borrower's address and position and does not move unless a liquidation event is triggered. The mechanism by which lenders and borrowers are connected varies by protocol. Some protocols operate a marketplace model, where vaults allocate supplied assets into discrete lending markets based on predetermined strategies, and borrowers access liquidity from those markets. Other protocols employ alternative matching functionality, such as peer-to-peer matching algorithms or liquidity pools, to connect lenders directly with borrowers without the intermediary market structure.

DeFi lending markets are typically over-collateralised by design, with a pre-set liquidation loan-to-value (LLTV) ratio (which sets the threshold at which DeFi collateral becomes eligible for liquidation). The mechanism by which rates adjust in response to market stress is itself significant in a lending pool structure where rates are variable – where a large number of depositors seek to withdraw simultaneously, borrowing rates tend to increase, incentivising repayment and thereby naturally rebalancing liquidity within the system. If a borrower's collateral value changes such that the LLTV ratio crosses the liquidation threshold, the market will trigger partial or total liquidation to restore the position to the required LLTV unless the borrower tops up their collateral.

Contractual framework and institutional arrangements

In the majority of cases, there are no express contractual terms governing ownership rights in a vault. The prevailing approach across much of the DeFi ecosystem is that "code is law": the smart contract code itself defines the rights and obligations of participants, and all relevant information (including data relevant to assessing liquidity risk, collateral levels, and market stress) is visible on-chain. It is unlikely, however, that the English courts would accept that such rights and obligations are determined solely by code.

A DeFi lending arrangement frequently involves only two key categories of legal person: lenders and borrowers. While the vault and market smart contracts serve as the programmatic infrastructure through which lending and borrowing is effected, smart contracts are not legal persons. As long as all participants are solvent and trading normally, and lenders are able to recover all deposits in full, there is often no need to consider the precise nature of ownership interests. However, if any of the participants were to become insolvent, then the question would need to be answered. English courts have not yet tested the application of established legal concepts to these novel technologies.

HOLDING DIGITAL ASSETS UNDER ENGLISH LAW

Following renewed scrutiny of the foundational principles governing how assets are held under English law, it is now well established that property rights are capable of subsisting in digital assets, including fungible blockchain-based tokens of the kind typically deposited into and borrowed from decentralised lending protocols.[3] However, understanding the traditional bases of asset holding is essential to assessing how existing legal frameworks apply, and where they may need to adapt, to accommodate this new class of assets. The following paragraphs summarise the principal ways in which assets can be held, each of which carries distinct implications for the treatment of digital assets.

- **Legal ownership** is the most fundamental basis of holding an asset under English law. The legal owner holds title to the asset and has the right to use, transfer, charge, or dispose of it. In the context of digital assets, legal ownership is most closely associated with control of the private cryptographic key that enables transactions on a distributed ledger.
- **Beneficial ownership** arises where one party holds legal title to an asset on behalf of another, who enjoys the economic benefit. This separation of legal and beneficial interests is the hallmark of the trust, a concept deeply embedded in English law. Where digital assets are held by an exchange or custodian on behalf of a client, questions of beneficial ownership become critically important, particularly in the event of the custodian's insolvency.
- **Trust structures** effect a separation between legal and beneficial ownership and are widely used across personal and commercial contexts. Express, resulting, and constructive trusts each arise in different circumstances and impose differing obligations on the trustee. The English courts have recognised that assets held on a commingled, unallocated basis for the benefit of multiple parties are capable of being held on trust.[4]
- **Bailment** applies to tangible moveable property and involves the transfer of possession without a transfer of ownership. While English law does not presently recognise a legal concept of a bailment of digital assets, the Law Commission and other commentators consider that the English court

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is likely to develop the concept of "quasi-bailment", by analogy, which will be applicable to digital assets, where it can be shown that the parties intended to create a legal relationship whereby the bailee would obtain control of the digital assets in circumstances where the bailor would have superior title and that the bailor actually had superior title. However, at this time, there has been no such accepted application of quasi-bailment to digital assets.

HOW ARE ASSETS HELD IN A DEFI STRUCTURE?

The question whether digital assets are capable of constituting property under English law has now been resolved by statute. Prior to 2025, the position rested on an increasingly confident but piecemeal body of case law.[5] In 2023, the Law Commission published its final report on digital assets, recommending that statute confirm the existence of a third category of personal property, distinct from things in possession and things in action, capable of encompassing digital assets that do not fit comfortably within either traditional classification. The Property (Digital Assets etc) Act 2025, which received Royal Assent on 14 May 2025, gave effect in part to that recommendation by confirming that a thing is not prevented from being the object of personal property rights merely because it is neither a thing in possession nor a thing in action.

The Act does not create a new property right in digital assets; rather, it removes the argument, which had occasionally been advanced, that the common law was incapable of recognising property rights in intangible assets falling outside the chose in action category. The significance of this statutory intervention for DeFi lending structures is twofold: first, it places beyond doubt that the digital assets deposited into vaults and markets (and, where applicable, any receipt tokens issued in return) are each capable of being the subject of proprietary claims; and second, it provides a firmer foundation for the application of trust and co-ownership concepts to pooled digital asset arrangements, since those concepts presuppose that the relevant assets are "property" in the legal sense.

Any analysis of ownership, beneficial interest, or priority in a DeFi insolvency must therefore proceed on the basis that digital assets are property, and the remaining questions, who owns them, on what basis, and with what priority, are questions of the application of established property law principles to novel factual circumstances.

Deposited assets

In a CeFi structure, the custodian will typically hold assets deposited with it in wallets that it controls, in that it alone can instruct transfers of assets and depositors will have no control over those assets until they are withdrawn. In that case, the English court is likely to consider that the custodian has legal ownership in the assets in its wallets and may also be the beneficial owner, depending on the terms governing the relationship with depositors.

Similarly, a DeFi vault may hold assets deposited with it in the smart contract, pending (often immediate) transfer of those assets to the relevant market to be allocated to borrowers. Accordingly, even though there is no custodian relationship agreed, the lender loses factual control of assets when they are "deposited" in the vault. If assets are held in other ways then the analysis may be different.

Similarly, a market may have factual control of the assets held by it at any time, either because it holds the assets in its smart contract controlled by it or because the assets remain locked with only the market able to instruct transfers.

The factual control exercised by the vault or the market does not resolve the question of ownership, however, because, at the time of writing, English law does not recognise that an entity without legal personality can hold property. The concept of ownership by the vault or market in a DeFi structure is therefore used by analogy only, describing functional control rather than legal control for the purposes of property rights. This could lead to the result that the legal title in assets in the vault or on the market, while being controlled programmatically, is held by no one. Alternatively, the lender or borrower could retain superior legal ownership of assets that it has deposited even though it has not retained factual control.

Where a protocol issues receipt tokens, those receipt tokens represent a claim on the vault's assets (including any accrued interest) rather than a claim to specific assets. Given that the intention is for deposited assets to be fungible (ie alternative assets to the value of those deposited rather than the specific deposited assets would be transferred to the user on redemption), if the assets are held in the vault's smart contract then the claim may be characterised as a beneficial co-ownership share in the vault's assets, shared with other depositors to the vault, up to the value of the receipt token claim. Where a protocol does not issue receipt tokens, the lender's claim would instead be determined by reference to the protocol's internal accounting mechanisms.

Ownership of collateral

The position of collateral posted by a borrower in a DeFi lending protocol is equally uncertain, though in the typical DeFi structure the relationship in question is between the borrower and the market, as the vault has no relationship with borrowers.

Borrowers will typically post collateral (any supported digital asset) in order to borrow an asset. That collateral is likely to be locked within the market smart contract, where it is programmatically associated with the borrower's address and position. It does not move unless a liquidation event occurs, but the market is able to carry out such a liquidation in defined circumstances where the borrower's position falls below the required collateralisation threshold without further recourse to the borrower. Accordingly, the borrower does not retain practical control.

While the borrower retains the ability to repay the loan and thereby unlock the assets posted as collateral, it cannot otherwise deal with collateral while it is locked. The market, however, can effect transfers of the assets subject to set parameters. The question whether the borrower retains sufficient control to assert a proprietary interest is therefore perhaps less clear than it is for a depositor because it is arguable that the borrower retains a beneficial interest in the collateral, subject to the protocol's security-like interest. The answer is likely to lie in

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the relevant protocol, but the absence of express contractual terms or documentation governing these relationships means that the court would need to infer the parties' intention from the on-chain mechanics alone.

CONSEQUENCES OF INSOLVENCY

The technical legal questions of ownership are likely to be relevant only where all participants in the CeFi or DeFi structure are unable to redeem their deposits and collateral, ie if the structure or a borrower becomes insolvent.

Insolvency risks

In practice, a structure could only become insolvent if borrowers have defaulted on repayments and liquidations have not produced the expected value, meaning that all claims cannot be satisfied. Where receipt tokens have been issued, this means that all such tokens cannot be redeemed. The ramifications of this would be that the vault and the market (or, in protocols without a marketplace model, the relevant matching mechanism) would not be able to satisfy all redemption demands from lenders or return valuable collateral to borrowers who repay their debts.

This could trigger a run on the vault, which may leave some creditors unpaid in full if liquidity is too low to cover all claims. Creditors who do not recover are likely to consider whether they can start insolvency proceedings to facilitate the collection and distribution of the structure's assets among its creditors.

In a CeFi case, the target of those proceedings will be the custodian or exchange operator. However, in a DeFi case, we expect a court to look critically behind a structure that is stated to be DeFi to identify whether there is a legal person controlling or benefitting financially from it. HM Treasury has anticipated that structures calling themselves DeFi may not truly fit that definition, noting that the FCA will determine whether a DeFi structure has sufficiently controlling parties who should be subject to regulation.[6] If there is such a controlling party then it would be at risk of insolvency if all claims cannot be paid in full.

The appropriate jurisdiction for any such insolvency process will depend on the same factors that apply when considering the correct jurisdiction for insolvency processes generally. The English court may assert jurisdiction if the relevant entity is either incorporated in England and Wales or can be shown to have its "centre of main interests" in the UK, being the place where the entity conducts the administration of its interests on a regular basis and which is ascertainable by third parties.

Alternatively, the English court might assert insolvency jurisdiction based on the factors that it would ordinarily consider for any winding-up of an unregistered company, namely that there is a "sufficient connection" to the jurisdiction. In this context, those factors would include whether any asset is located in England and Wales, whether there is any centralised control in England and Wales, whether a particular asset is controlled by a particular participant in England and Wales, and whether the law applicable to the relevant transfer is English law.[7] In short, the court would need to be satisfied that there was a reasonable possibility that any winding-up order would benefit those parties applying for it.

For companies and legal persons, there is a rebuttable presumption that the COMI is located at the place of the registered office. The registered office presumption can be displaced where evidence demonstrates that the debtor's central administration is conducted elsewhere and this is ascertainable by third parties. Courts will look beyond a mere "letterbox" address to consider factors such as the location of board meetings, the nationality and residence of directors, the principal place of business operations, and, critically, the views of creditors as to where the debtor's principal operations are based.

Determining COMI for digital-asset service providers often presents particular difficulties. They frequently have assets, creditors, subsidiaries, teams, and operations spread across numerous jurisdictions, and no single headquarters. Under the EU Markets in Crypto-Assets Regulation[8] framework, digital-asset service providers apply for authorisation in the member state where their registered office is located and, under the EU Recast Regulation on Cross-Border Insolvency,[9] insolvency proceedings would be opened in that member state on the basis of the COMI presumption. Outside that EU framework, however, the court will need to carry out an analysis of the factual circumstances of the company in question.[10]

Where a DeFi structure is truly decentralised, there could be no claims or insolvency in respect of them, meaning that participants will trade on them entirely at the risk that they may not recover in full or at all. Where there is a run on the vault or market, participants may be paid on a first-come, first-served basis unless the protocol has a trigger for a distribution to all participants on a *pro-rata* basis when it becomes unable to satisfy all claims, potentially leaving participants without a full return.

What a lender or borrower could claim in the insolvency of an owner depends on the nature of the right that it holds. If it has retained a beneficial interest in the assets that it deposited with the smart contract, it may have a priority right to those assets or to a share in a pool of assets.

The developing concept of quasi-bailment may apply in the future to the custodian's position in a CeFi structure, giving the lender or borrower a proprietary right to the assets that had been deposited, subject to those assets being available to be returned. However, the lack of legal personality in a DeFi structure means that it is difficult to see how quasi-bailment could ever apply to a true decentralised scheme, even with the adaptations needed to enable it to apply to a CeFi structure.

If assets are determined to be owned or controlled by the vault or market (or its owner where the structure is not truly remote) then the lender or borrower will simply have an unsecured claim for the value of the assets it deposited.

If there is an owner or controller behind the structure that is liable for its debts then there could be a recovery either in or out of an insolvency, particularly where the owner has assets outside the DeFi structure. However, where the DeFi structure is genuinely remote and it is not possible to commence an insolvency process, it is likely that at least some creditors will be left without payment.

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Insolvency of a lender or borrower

The position of an insolvency practitioner appointed over a borrower whose assets are locked as collateral in a DeFi smart contract raises a series of practical and legal difficulties that are largely without precedent. In principle, an officeholder (whether a trustee in bankruptcy, a liquidator, or an administrator under English law) steps into the shoes of the insolvent party and is entitled to take control of the debtor's property for the benefit of that party's creditors.

An immutable smart contract governing the collateral will not recognise the officeholder's appointment or any court order. It will only release the collateral in accordance with its programmed conditions: typically, repayment of the borrowed amount plus accrued interest. The officeholder would therefore need either to repay the loan from the estate's other assets in order to unlock the collateral (which may not be commercially sensible or even possible) or to wait for the collateral to be liquidated by the protocol's automated liquidation mechanism and attempt to recover any surplus. In neither case could a court order directed at the smart contract itself achieve anything, because the smart contract is not a legal person capable of complying with (or being held in contempt of) such an order.

There is also the question of whether mandatory set off under r 14.25 of the Insolvency (England and Wales) Rules 2016 would apply to the collateral. The difficulty in the digital asset lending context is identifying whether mutual dealings exist at all. If the collateral still belongs to the borrower, then there can be no mutual dealings. Whereas if the borrower has only an unsecured claim to assets to the value of its collateral (whether through the holding of a receipt token, where issued, or through the protocol's internal accounting) then it is probable that set-off would apply. The question of ownership will be paramount to this analysis.

CONCLUSION

The analysis in this article highlights a number of significant unresolved legal questions arising from the intersection of DeFi lending structures and established English law principles.

Under English law, legal ownership of digital assets is most closely associated with control of the private cryptographic key that enables transactions on a distributed ledger. In a DeFi lending structure, however, the concept of "control" is considerably more nuanced and will depend on the circumstances.

DeFi protocols are generally designed to be permissionless and non-custodial, meaning that assets held within them are managed programmatically by the smart contract code itself, rather than by any natural or legal person exercising control. Where a DeFi structure is genuinely remote, ie where no legal person can be identified as standing behind it, then the ownership analysis becomes genuinely novel. There may be assets that are controlled programmatically but owned by no one, or alternatively, ownership may never have passed from the lender despite the lender not having retained factual control over the relevant asset. In either case, if the structure has an asset shortfall, then the lender is left without the use of the assets and, in an insolvency scenario, may be left without valuable recourse to the vault or the market and with no obvious access to an insolvency estate against which to assert a claim.

We are likely to need to work through the collapse of one or more DeFi structures in order to obtain any clear guidance or precedent that is of general application. In the meantime, investors should be aware of the risk that there could be no recovery in the event of a DeFi collapse and consider their positions accordingly.

As DeFi adoption continues to grow, the pressure on legislatures and courts to provide clarity in these areas will only increase. The English courts have not yet tested the application of established legal concepts to these novel technologies, and the answers, when they come, are likely to have far-reaching implications for the structuring and risk management of DeFi lending arrangements. ■

1 The Financial Services and Markets Act 2000 (Cryptoassets) Regulations 2026 (SI 2026/102), enacted on 4 February 2026 and expected to come into force on 25 October 2027 and which provides the basis for a new crypto regulatory regime in the UK, will not extend to DeFi system operators.

2 HM Treasury, *Future financial services regulatory regime for cryptoassets (regulated activities)*, Policy Note (April 2025), para 2.10.

3 *Tulip Trading Ltd v Bitcoin Association/ or BSV* [2023] 4 WLR 16; *AA v Persons Unknown* [2019] EWHC 3556 (QB); [2020] 4 WLR 35 at [56]-[59]; *D'Aloia v Persons Unknown & Ors*[2024] EWHC 2342 (Ch); *Osbourne v Persons Unknown Category A* [2023] EWHC 39 (KB); *Jones v Persons Unknown* [2022] EWHC 2543 at [23]; *DPP v Briedis* [2021] EWHC 3155; *Tulip Trading v Van Der Laan* [2023] EWCA Civ 83, [2023] 4 WLR 16 at [24].

4 *Wang v Darby* [2021] EWHC 3054 (Comm).

5 In *AA v Persons Unknown* [2019] EWHC 3556 (QB), the court recognised that cryptoassets satisfied the four criteria for property identified in *National Provincial Bank v Ainsworth* [1965] AC 1175, being definable, identifiable by third parties, capable in their nature of assumption by third parties, and having some degree of permanence, and were therefore to be treated as property.

6 HM Treasury, *Future financial services regulatory regime for cryptoassets (regulated activities)*, Policy Note (April 2025), para 2.10.

7 For example, under the Hague PRIMA Convention 2025, which provides that the governing law of a cross-border security transaction is that of the jurisdiction where the intermediary maintaining the account to which the securities are credited is located.

8 (EU) 2023/1114.

9 (EU) 2015/848 (MiCA).

10 "Fully decentralised" platforms fall outside the scope of MiCA under the recital 22 of MiCA.

Further Reading:

- When code meets compliance: the institutional turn of Decentralised Finance (2026) 2 JIBFL 105.
- Cryptoassets as loan security (2025) 4 JIBFL 237.
- Lexis+® UK: Books: Cryptoassets for private clients: A practitioner's guide: Decentralised finance versus centralised finance.