

Gauntlet is a risk management platform that uses quantitative analysis, modeling, and simulation to inform on-chain protocol management.

Q13) Some smart contract applications assist users to connect to smart contracts that implement a pawn-broker style of collateralized lending (i.e. only recourse in the event of default is the collateral).

a) What are the key risk differences between smart-contract and conventional pawn-broker lending?

In our risk management work, Gauntlet has extensively researched the unique mechanics of decentralized lending protocols. In our view, the risk profile of smart-contract lending differs from more traditional forms of collateralized lending due to three primary attributes:

1. **Automation.** Lending protocols often do not require human decision-making on a daily basis to function. Instead, these protocols use pre-defined rules and parameters to determine permissible transactions. Automation reduces risks related to human discretion while introducing potential risks of mechanism malfunctions or manipulations.
2. **Permissionless Access.** Lending protocol users generally do not need to share identity information or receive approval to initiate transactions with the protocol. In contrast to traditional lending, this means lending protocols typically have little information on their users and limited tools to filter potential users based on risk metrics. Permissionless access reduces risks related to breaches or misuse of user data while introducing potential risks of unwanted or adversarial users transacting with the protocol.
3. **Self Governance.** Since lending protocols have no specific leadership and exist on a public blockchain, they are typically managed by a loose collective of individuals through a pre-defined governance process. This means that adjustments to mitigate emerging market risks are crowdsourced from participants who use the protocol or observe its operations publicly. In our role as risk managers, Gauntlet frequently proposes updates to lending protocol parameters. An open governance process reduces the risks associated with opaque management decisions while introducing potential risks of adversarial governance or malfunctioning governance mechanisms.

Below are some examples of research Gauntlet has published on lending protocols that helped us form these views:

[An analysis of the financial risk to participants in the Aave protocol](#)

[An Analysis of the Market Risk to Participants in the Compound Protocol](#)

[When do dynamic DeFi rate curves reduce capital efficiency](#)

Q14) Some smart contract applications assist users to connect to automated market makers (AMM).

a) What are the key differences in risk between using an AMM and using the services of a crypto asset exchange?

Gauntlet has also researched the mechanics of automated market makers (AMMs). In our view, the risk profile of AMMs is not directly comparable to more traditional crypto exchanges due to a fundamentally different set of user types and capabilities. The points below summarize the key structural differences and describe how they affect risk considerations.

1. **Liquidity Pools.** Unlike traditional exchanges where the matching of buyers and sellers occurs in an order book, AMMs execute trades by allowing users to transact directly with a single pool of available assets. This means that prices traded by the AMM are determined by an internal formula and not the bid or offer of any given user. The liquidity pool structure makes AMMs simple to implement in a blockchain environment and creates unique characteristics further expanded below.
2. **Passive Liquidity Providers.** To supply the assets for the liquidity pool, AMMs rely on a type of passive market participant called a Liquidity Provider (LP), which does not exist in this form elsewhere. LPs are compensated for providing their assets with a portion of the trading fees generated by the platform, and possibly other forms of incentives. To receive this compensation, LPs must take the risk of their supplied assets being traded at unfavorable prices by the AMM. The risk of losses to passive LPs from automated trading of assets they supplied is unique to AMM trading. On the other hand, the ability of LPs to passively facilitate trading is a unique benefit, as market-making on traditional exchanges requires advanced infrastructure and active management.
3. **Bonding Curves.** The formula that determines prices for AMM trading is called the bonding curve. For example, the simplest bonding curve for two tokens is to always exchange them one-for-one. In practice, AMMs use more complex bonding curves that vary the prices of tokens based on their proportions of the liquidity pool. An optimized bonding curve should keep AMM trading prices in a natural equilibrium with outside markets, where deviations are quickly reverted by market forces. The design of bonding curves is central to understanding the risk profile in any given AMM, since it determines the exposure of LP assets to potentially unfavorable trades. Much of Gauntlet's research efforts on AMMs have focused on quantifying the properties and risks of different bonding curves.

Some examples of research Gauntlet has published on AMMs are shown below.

[When does the tail wag the dog? Curvature and market making](#)
[Optimal Fees for Geometric Mean Market Makers](#)
[Improved Price Oracles: Constant Function Market Makers](#)