

Default Loss Risk of CLOs and Private Credit Tranches

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Webinar, February 2025

Agenda

- *The goal of this presentation is to demystify the CLO asset class and recent innovations in private credit issuance, and lay out a robust approach that reflects all the specifics and complexity of these assets*
- What are CLOs, how do they work, what is the attraction to investors, and what are the analytical challenges they represent
- A complete walk-through example of modeling CLOs
- Extensions to tranche private credit vehicles
- Implications for broad analytical implications in the investment process
- Conclusions

Collateralized Loan Obligations (CLOs)

- The idea of a CLO is identical to that of a CMO, with the difference that the underlying pool of loans are commercial loans to businesses instead of mortgages
- The underlying loans are usually syndicated contracts among a couple of lenders and issued to a single borrower, which helps spread the risk at loan issuance even before securitization
- The loans are normally provided to borrowers with lower quality than high-yield publicly issued debt, that do not have access to public markets
- The loans typically carry a floating rate linked to a popular interest rate benchmark rate plus a margin that would depend on the credit risk of the borrower

How Do CLOs Work

- Several hundred loans are collected into a common pool that is put into a trust that serves as collateral for the CLO issuance
- The cash flows from the debt service are distributed across different classes of shares in the pool (tranches) that get assigned some or no amortization of the loans and, importantly, seniority in absorbing default losses of the overall pool
- The tranches that have low seniority, i.e. absorb default losses first, are called equity tranches, those with middle seniority called mezzanine tranches, and those with the highest seniority are called senior tranches
- Senior tranches may also be differentiated by levels of sub-seniority – i.e. AAA, AA, A, BBB.

Attraction of CLOs to Investors

- Provide speculative opportunities, particularly with lower seniority tranches
- At the higher end of the seniority spectrum, provide relatively reliable diversified pool of cash flows to investors that require yield – i.e. insurance and pensions
- For some regulated entities, like insurance companies, require less “risk capital charges” than other types of debt and therefore reduce the overall cost of capital
- They are considered a diversifier for multi-asset class investors since they give access to borrowers that are not issuing debt in the conventional public markets

Gather Loans Into A Pool

- Pooling many different borrowers in one master trust portfolio provides a baseline diversification of default risk



Spread Default Risk by Size of Potential Loss

- The diversified risk is then observed over a spectrum of default losses of different size



Sell Levels of Risk in Separate Tranches

- The spectrum of default losses is divided in segments which are contractually assigned to distinct investor tranches



- The segment of smaller but more likely losses is assigned to be absorbed by lower credit quality tranches, and the segment of higher but much less likely losses is assigned to higher credit quality tranches

Challenges Presented by CLOs

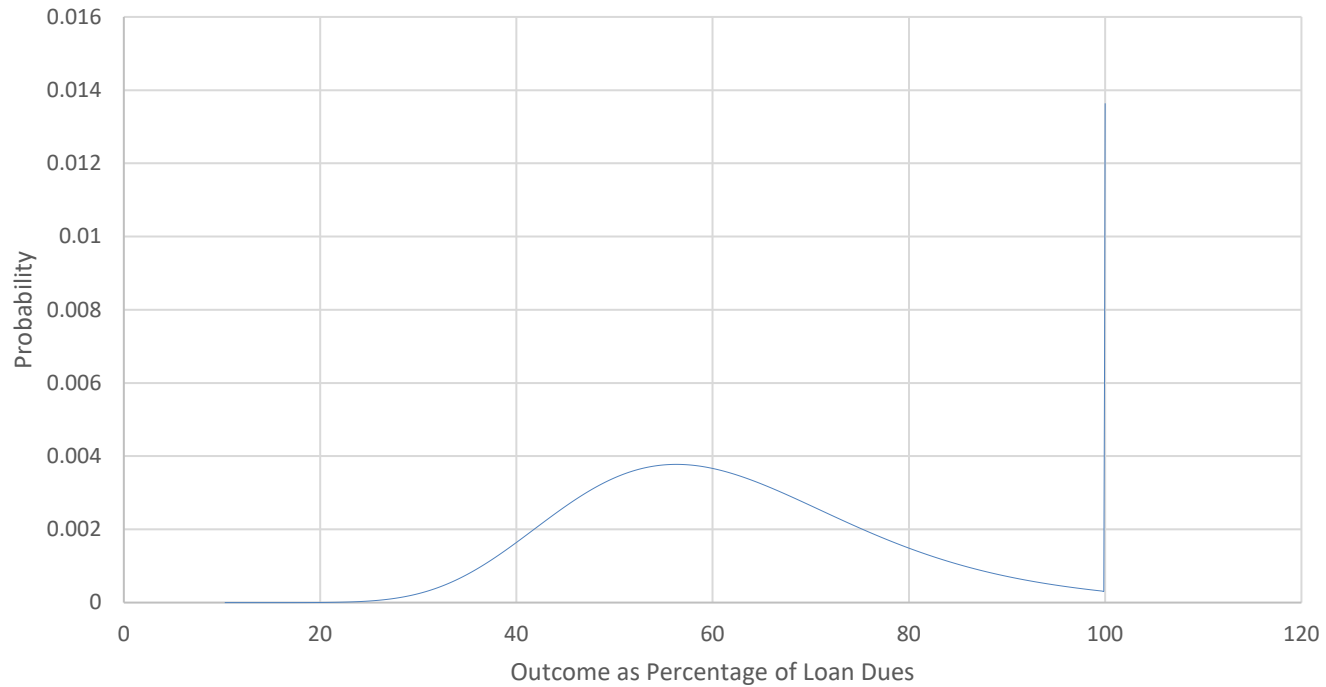
- Their complex structure obscures many characteristics that defines the size and probability of default losses in comparison to conventional debt. Most often there are more than a hundred separate loans in a single CLO trust.
- Specifically, the distribution of individual loan outcomes are not normal, borrower assets serving as loan collateral are correlated across loans, and the fact that the dues can be stochastic due to floating rates as well, all of which contribute to a high level of stochastic complexity to model
- While it is certainly possible to come up with a robust approach to model of this complexity as we demonstrate in the remainder of this presentation, up to this point there has not been much information in the public space how to do it, likely to maintain information asymmetry that favors the sponsors of the CLO vehicles

Analytical Tools

- Factor risk models to capture the distributional qualities of the collateral of each loan (*Northfield*)
- Robust simulation to model individual loan non-normal probability distributions reflecting floating rate outcomes and loan collateral outcomes, and, separately, the joint distribution of all loans in the pool (*Aspequity*)
- A coherent approach to allocate the outcomes and associated probabilities of the overall pool to individual tranches
- Modeling example - we will assume a simple structure where the notional is split in three tranches equity-mezzanine-senior in proportion 10:20:70

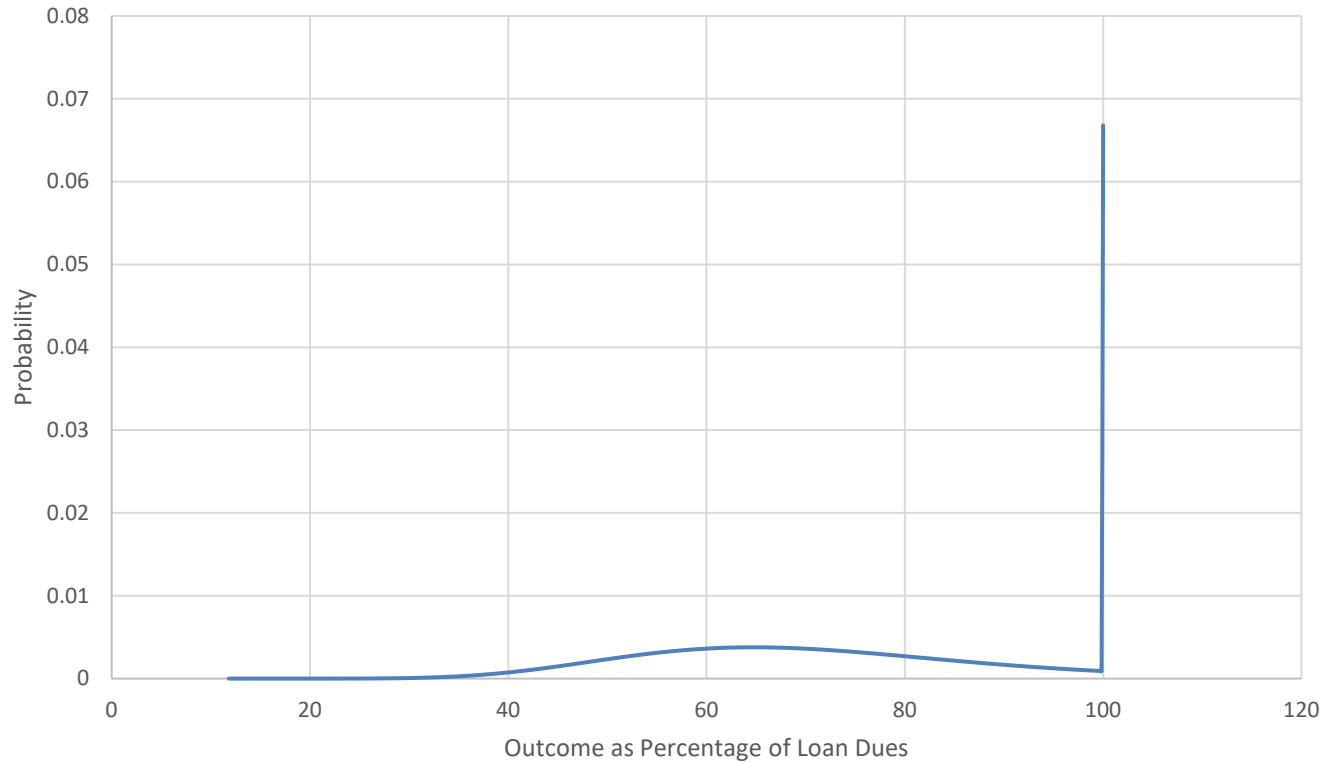
Individual Loan Outcomes in CLOs

Loan to a very highly levered borrower



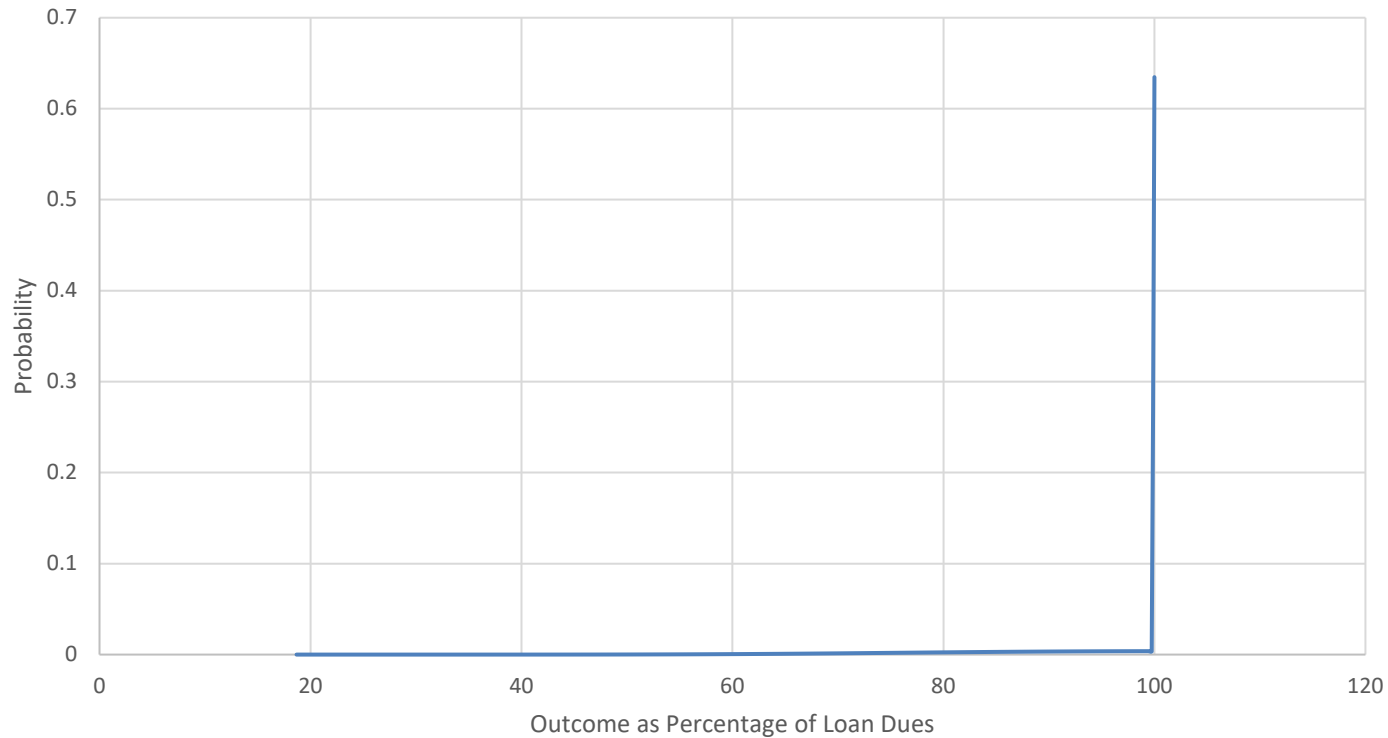
Individual Loan Outcomes in CLOs (cont'd)

Loan to a highly levered borrower



Individual Loan Outcomes in CLOs (cont'd)

Loan to a very moderately levered borrower



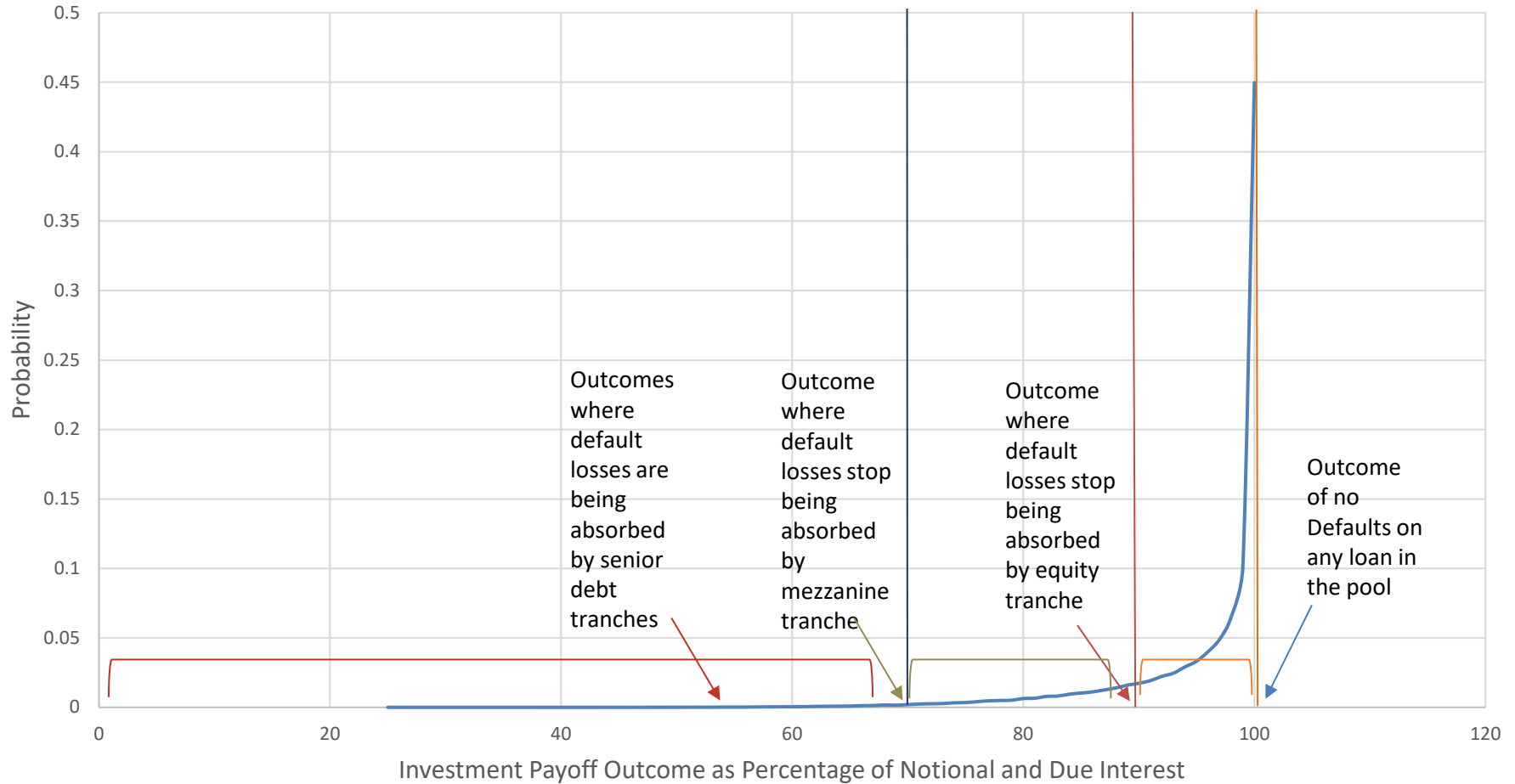
CLO: Full Collateral Pool Payoffs

Collateralized Loan Obligation (CLO): Probability Distribution of Total Loan Pool Payoff



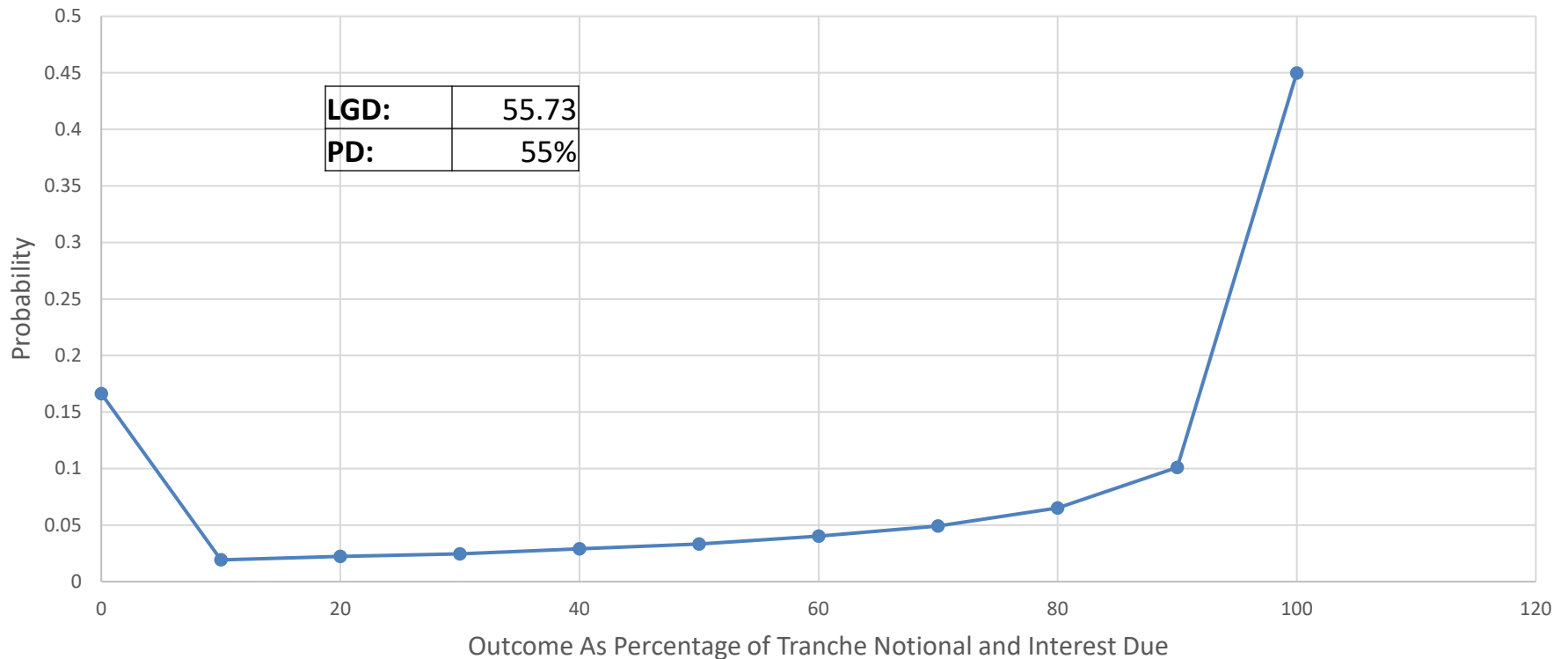
CLO: Default Losses Across Tranches

Collateralized Loan Obligation (CLO): Absorption of Default Losses by Tranches



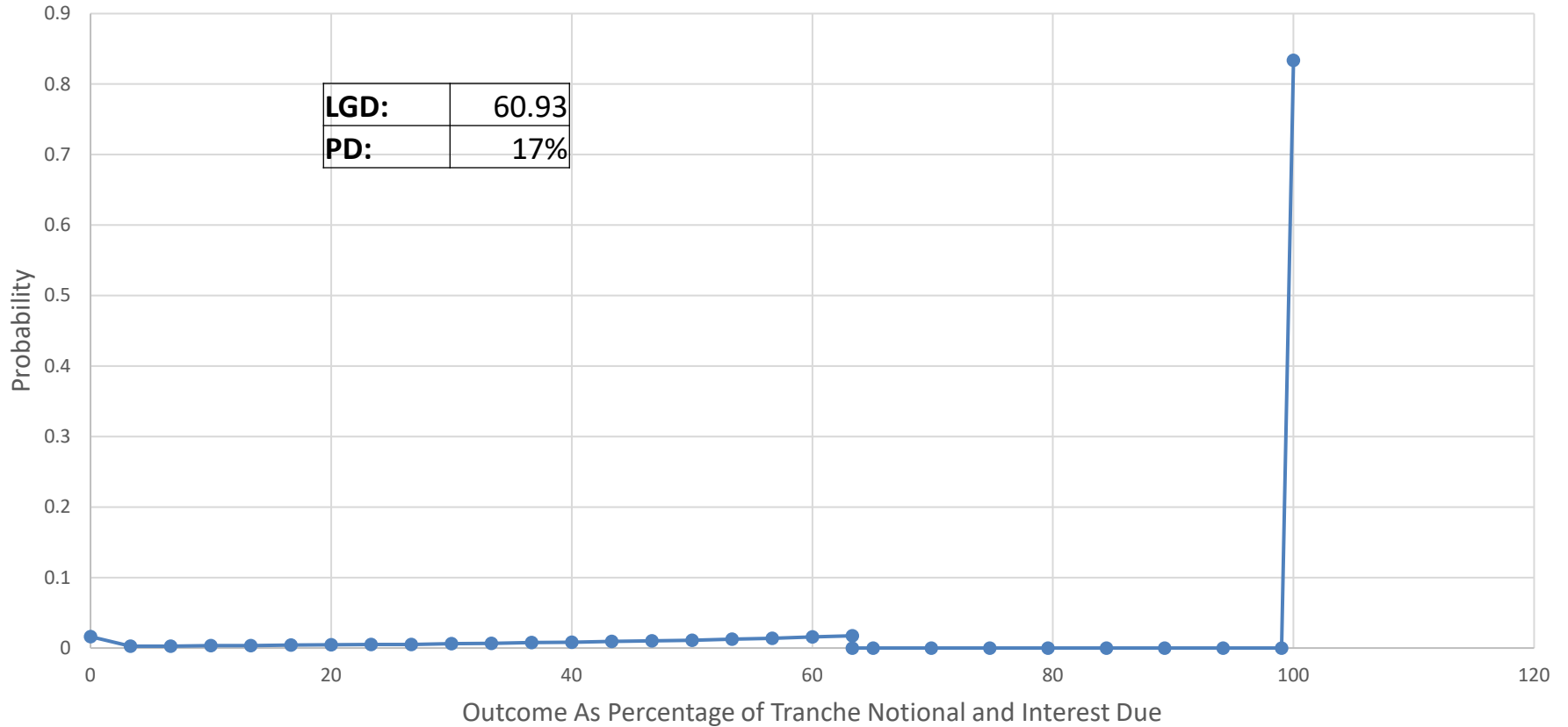
CLO: Equity Tranche Outcome Probabilities

Probability Distribution of Equity CLO Tranche Outcomes As Percentage of Tranche Notional and Interest Due



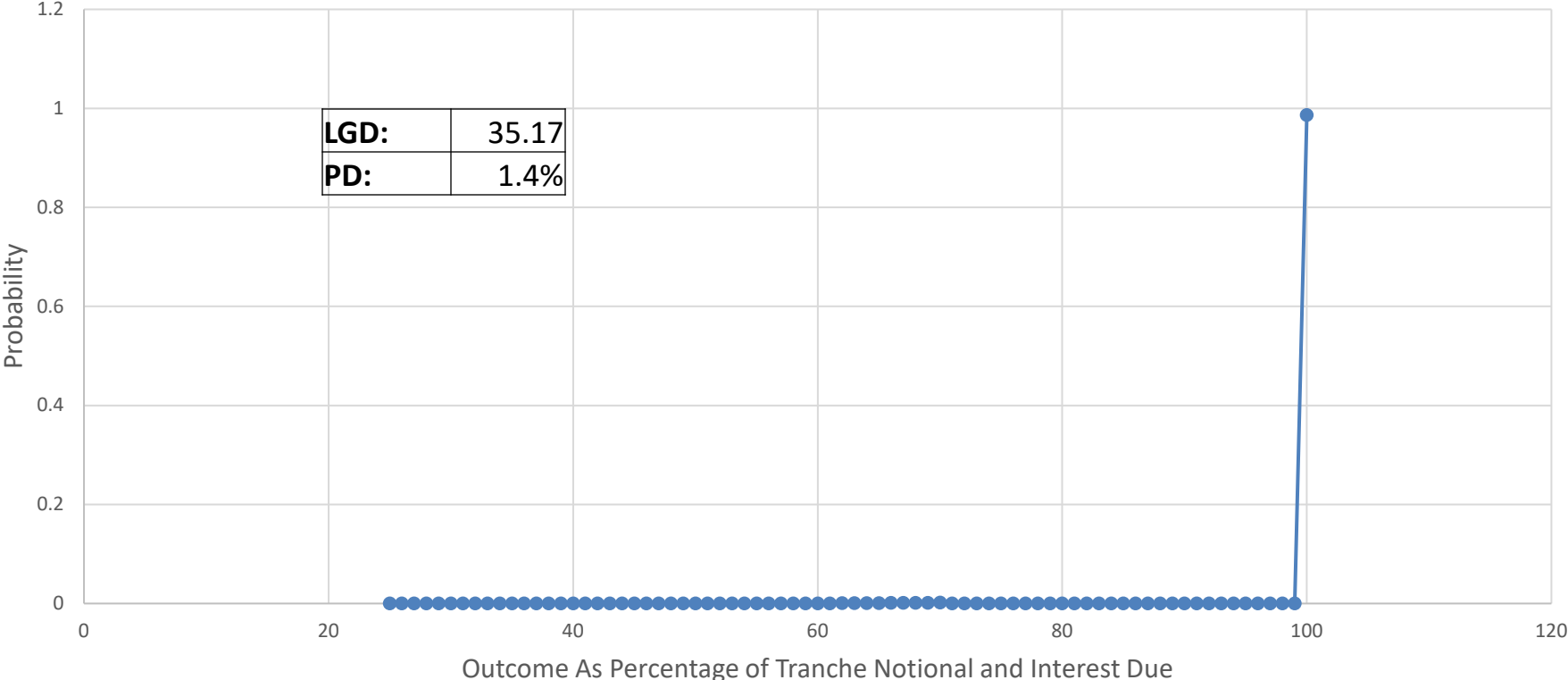
CLO: Mezzanine Tranche Outcome Probabilities

Probability Distribution of Mezzanine CLO Tranche Outcomes As Percentage of Tranche Notional and Interest Due



CLO: Senior Tranches Outcome Probabilities

Probability Distribution of Senior CLO Tranche Outcomes As Percentage of Tranche Notional and Interest Due



Private Credit Analogues

- Private credit has made significant inroads in sourcing institutional capital using vehicles which are similar to CLOs. These are the so called "rated feeder" bonds that are attractive to insurance companies while allowing private credit management companies to tap into a trillion-dollar long-term capital.
- For insurers, “conventional” credit risk capital charge is 30%, and for rated feeders it is about half, which make them a substantial reducer of the insurance company opportunity cost of capital.
- Tens of billions of dollars of notional of rated feeder vehicles have been issued since 2020.
- There is some concern among regulators which have increased capital risk charges for equity tranches. More changes may be upcoming.

Modeling Applications

- **Estimating credit risk:** probability of default (PD), loss given default (LGD), default correlations, etc.
- **Risk factor models:** Northfield has pioneered including numerous hard asset classes in our risk factor model coverage
- **Valuation:** The output of this analysis feeds directly in the proprietary EXPLO valuation model, providing the much-needed regular periodic MTM valuations for regulated investors
- **ALM:** The output is also immediately useful to project the probability and size of liquidity shortfalls and surpluses for liability-driven investors
- **Regulatory transparency**

Conclusions

- Transparent and robust modeling approach that levels information asymmetry
- Robust technology and methodology for actionable results in a timely fashion
- Broad applications throughout the investment process
- An alternative to expensive rating agencies models and services
- Helping investors, bankers, private creditors, and regulators communicate in a common framework that harnesses diversification, catering to differing risk preferences, and reducing the cost of capital of institutional investors

Questions and Answers:

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