

The Shortcut That Gives Banks a Fast Price Tag on Credit Risk

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May, 2026

Every day, banks must put a price on the risk that a counterparty can't pay, and the exact calculation is slow and costly. What if there were a faster way? This thesis tests one, mapping out where the shortcut holds up, and where it breaks down.

The price of a possible default

After the 2008 financial crisis, the rules for how banks measure risk were tightened. One uncomfortable lesson was that most losses came not from counterparties actually going bankrupt, but from the risk of bankruptcy rising and making contracts lose value beforehand. That risk has a price. In finance, it is called CVA, an adjustment that answers a single question: what is it worth that a counterparty might not be able to hold up its end? Take an interest rate swap, a common contract in which two parties exchange interest payments with each other. As long as both can pay, all is well. But if one collapses mid-contract, the other can lose money. CVA is the price tag on exactly that risk.

The bottleneck

The problem is calculating CVA. A large bank may hold tens of thousands of contracts, and the safest method is a Monte Carlo simulation, where a computer plays out thousands of possible futures for interest rates, values every contract in every future, and weighs it all together. The result is good, but the method is heavy and slow, and the calculation must be redone every time the bank wants to price a new deal.

Building a shortcut

We investigated a shortcut. Computing CVA from scratch every time is like re-cooking a meal from raw

ingredients for every single order, even when the dish barely changes. Instead, we built a small “library” of ready-made building blocks: standardized contracts whose CVA has already been calculated. The CVA of a real portfolio is then approximated by reaching for the nearest blocks off the shelf and adjusting them for the length of each contract and how favorable its terms are. Best of all, the recipe needs only three ingredients that every trading desk already keeps on hand: today's interest rates, a measure of how those rates tend to swing, and the market's own price for the counterparty's creditworthiness. No thousands of simulated futures, and no overnight wait.

How well it works

So how close does the shortcut get? On average, it landed within 20–24 percent of the exact answer, and a single tuning pulled that down to 16 percent. At first glance that may sound sloppy, but the number has to be read in context. CVA is never a single “true” value to begin with. Simply swapping one mathematical model of interest rates for another can move the benchmark by more than 30 percent for the same counterparty. When compared to that built-in fuzziness, a method that comes within 16–24 percent in a fraction of the time is doing remarkably well.

Why it matters

This is not a tool to replace careful long calculations, and on its own it would not satisfy a regulator. But it shines as a fast complement. Picture a trader on the phone, mid-deal, who needs to know within seconds whether a new trade is worth the credit risk it carries. Waiting hours for a full simulation is not an option, but a good estimate, right now, is. That is, in fact, almost exactly how real risk desks already run. The heavy, precise machinery grinds away overnight, while lightweight approximations like this one carry the load through the trading day.