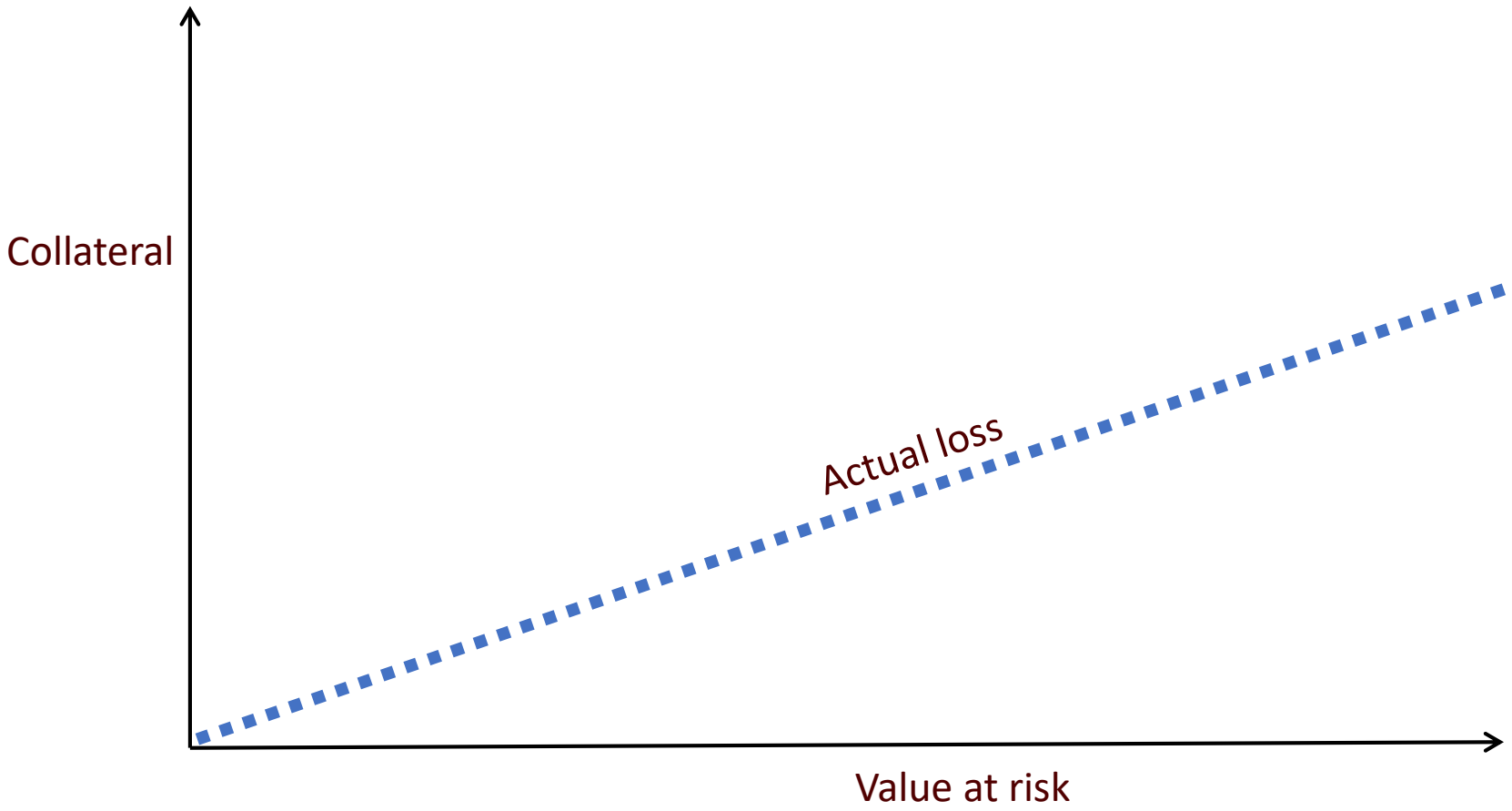
Impact of Bid/cleared Price on Risk

PERAST
CAPITAL MANAGEMENT

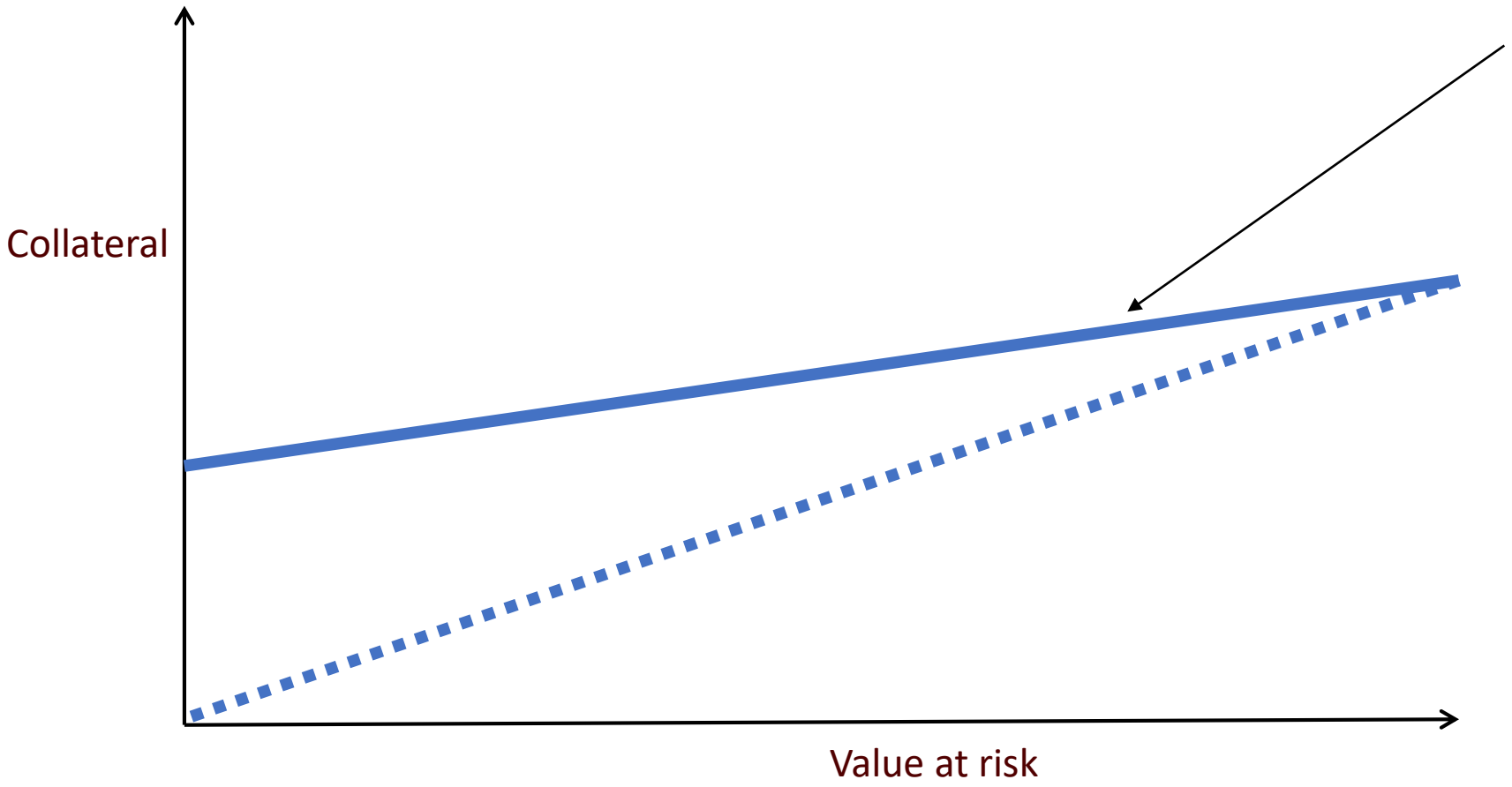
COLLATERAL AS A FUNCTION OF RISK



Everyone would agree that collateral should increase with increasing risk.

We want to adequately cover actual losses in the event of default (to some degree of confidence).

COLLATERAL AS A FUNCTION OF RISK

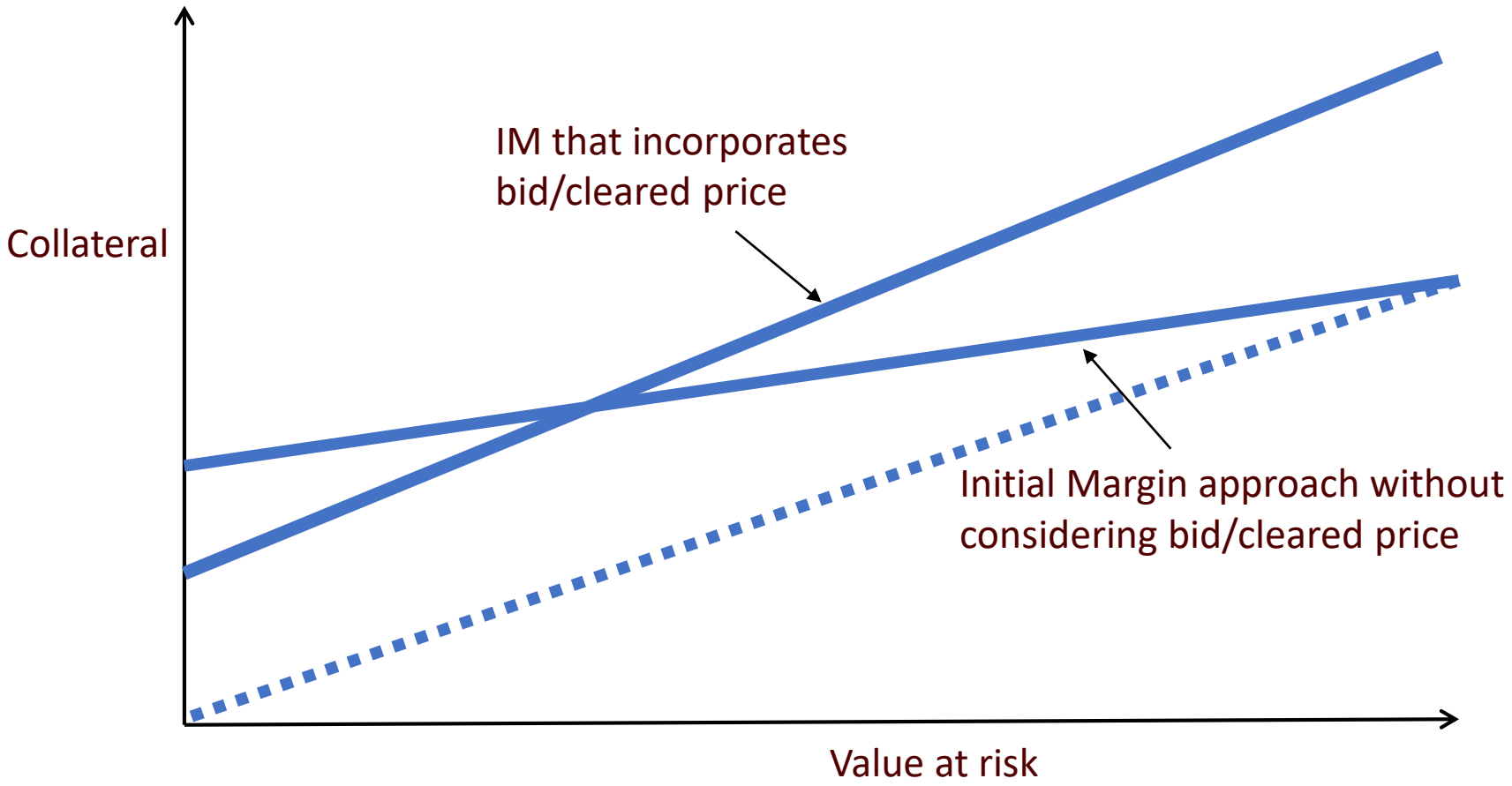


Let's set a rule to cover the loss 99% of the time.

This rule increases collateral for greater levels of risk, which is good.

However, can we improve this?

COLLATERAL AS A FUNCTION OF RISK



We can find a rule that more closely aligns with actual risk under various scenarios.

One quantifiable factor that is correlated with actual risk is volatility. This is considered in the current historical simulation (HS) initial margin (IM) approach.

Another factor correlated with actual risk is the bid/cleared price. This has not yet been discussed by stakeholders.

WHY IS VOLATILITY NOT ENOUGH?

Why does a volatility-only based IM work for other products but not FTRs?

Because their behavior cannot be accurately modeled using the random-walk models used elsewhere in financial markets.

- FTRs are spreads
- FTRs have much less price visibility than other products
- FTRs' price movements exhibit strong mean-reversion

Mean reversion means that a price move is dependent partly upon the current price level. Unlike a volatility-only based IM model, the risk of a mean-reverting product depends on *both volatility and starting price level*.

How can we test for mean reversion to determine if we need to consider price level in a margining model?

We randomly selected approximately 18,000 actual FTR awards and looked at their price movements as a function of their price level over four years.

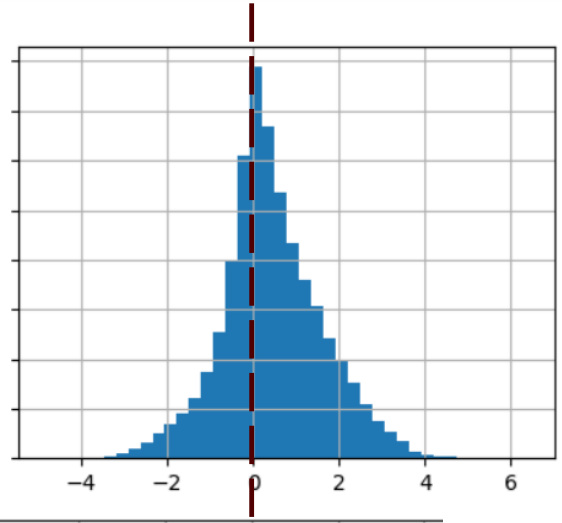
We are not considering volatility here, since that is already considered in the HS IM approach. In fact, we remove the impact of volatility through normalization.

We divided all 2-month price moves into six quantiles based on relative price level of starting points and examined the price moves.

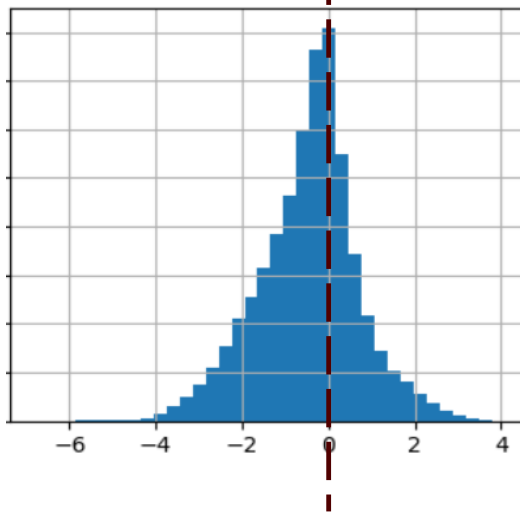
BID/CLEARED PRICE IS STRONGLY CORRELATED TO RISK

The price moves are clearly related to starting points:

Quantile of normalized starting price	Average normalized price move
1	0.45
2	0.26
3	0.13
4	-0.12
5	-0.26
6	-0.46

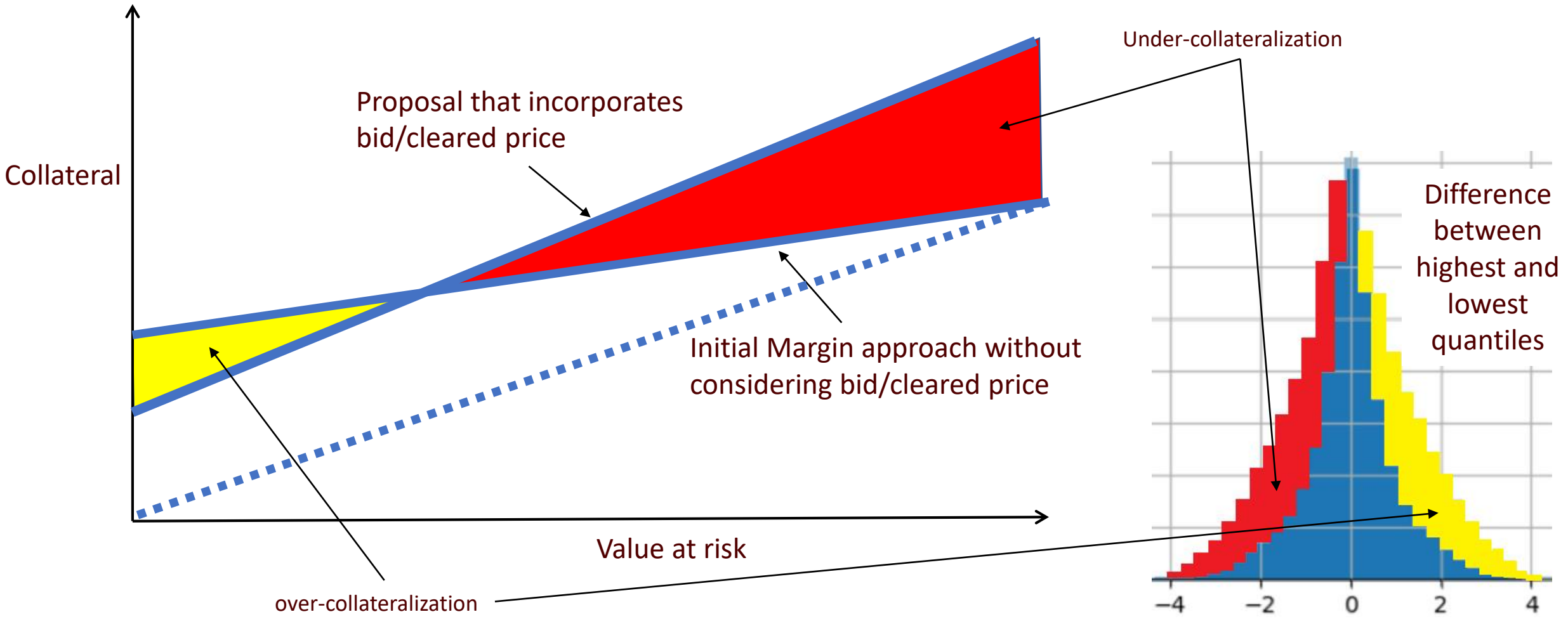


For the quantile in which the starting prices were lowest, the price move distribution is very skewed positive, indicating prices tended to move up.



For the quantile in which the starting prices were highest, the price move distribution is very skewed negative, indicating prices tended to move down.

BID/CLEARED PRICE IS STRONGLY CORRELATED TO RISK



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BID/CLEARED PRICE IS STRONGLY CORRELATED TO RISK

The bid price (for bidding in an auction) and the cleared price (for awarded FTRs) *must be considered* in conjunction with volatility to properly align margin requirement with risk.

This makes intuitive sense: if you buy high, the risk of losing money is higher than if you buy low.

Any margining model that does not consider bid/price level is severely cross-subsidizing the collateral requirements for high-risk and low-risk FTRs.

If a single symmetrical model were used for all quantiles of bid/cleared starting price, the data show that approximately 26% of FTRs would be under-collateralized, and another 26% of FTRs would be over-collateralized.

This is true only if the average collateralization requirement is used. Even more inefficient would be parameterizing the margin model such that the 26% of undercollateralized FTRs become properly covered. Then collateral increases for *all* FTRs and almost *all* FTRs are over-collateralized.

Conclusion: If we want to efficiently cover risks and avoid cross-subsidization, we *must* consider the bid/cleared price in the margin model. It is easily observable, not too difficult to incorporate, and clearly correlated to risk.