Don't overexpose yourself with risk neutral PFEs and EPEs

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As per regulations and common risk management practice, the credit risk of a portfolio is managed via its potential future exposures (PFEs), expected exposures (EEs), and related measures, the expected positive exposure (EPE), effective expected exposure (EEE) and the effective expected positive exposure (EEPE). Notably, firms use these exposures to set economic and regulatory capital levels. Their values have a big impact on the capital that firms need to hold to manage their risks.

Due to the growth of CVA computations, and the similarity of CVA computations to exposure computations, firms find it expedient to compute these exposures under the risk neutral measure.

Here we show that exposures computed under the risk neutral measure are essentially arbitrary. They depend on the choice of numéraire, and can be manipulated by choosing a different numéraire. Even when restricting attention to commonly used numéraire exposures can vary by a factor of two or more. As such, it is critical that these calculations be done under the real world measure, not the risk neutral measure.