Title:

Efficient Economic Scenario Generation

Description:

Typically, time series models are used for Economic Scenario Generation (ESG). These models are usually defined by algorithms which iteratively sample key economic variables to generate plausible future paths for variables such as interest rates, inflation, equity returns, and credit spreads.

Modern AI algorithms are based on the use of tensors, mathematical objects that define a multilinear mapping over vector spaces, to efficiently generate outputs such as text, images, and video using Graphical Processing Units. These operations are performed in using software packages such as torch and tensorflow. In principle, it is possible to encode ESG models as tensors. Doing so may allow us to generate scenarios more efficiently.

In this initial project we will look to define a tensor which generates data consistent with that generated by simple ESG models for interest rates and inflation. This will provide a “proof-of-concept” example for assessing the merits of tensor-based approach to ESG. Our primary objective is to assess the computational cost of generating trials from iterative sampling schemes vs. tensor representations of our models.