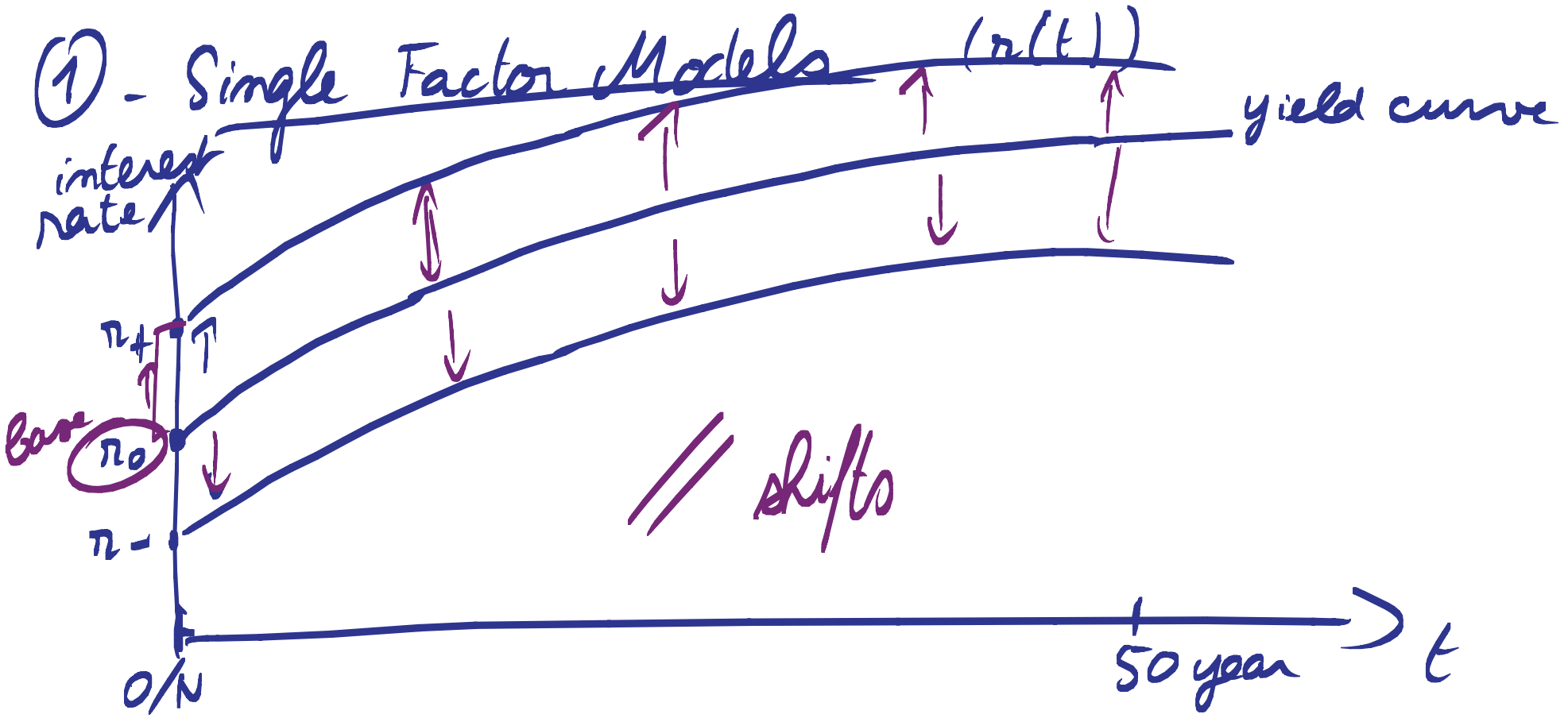
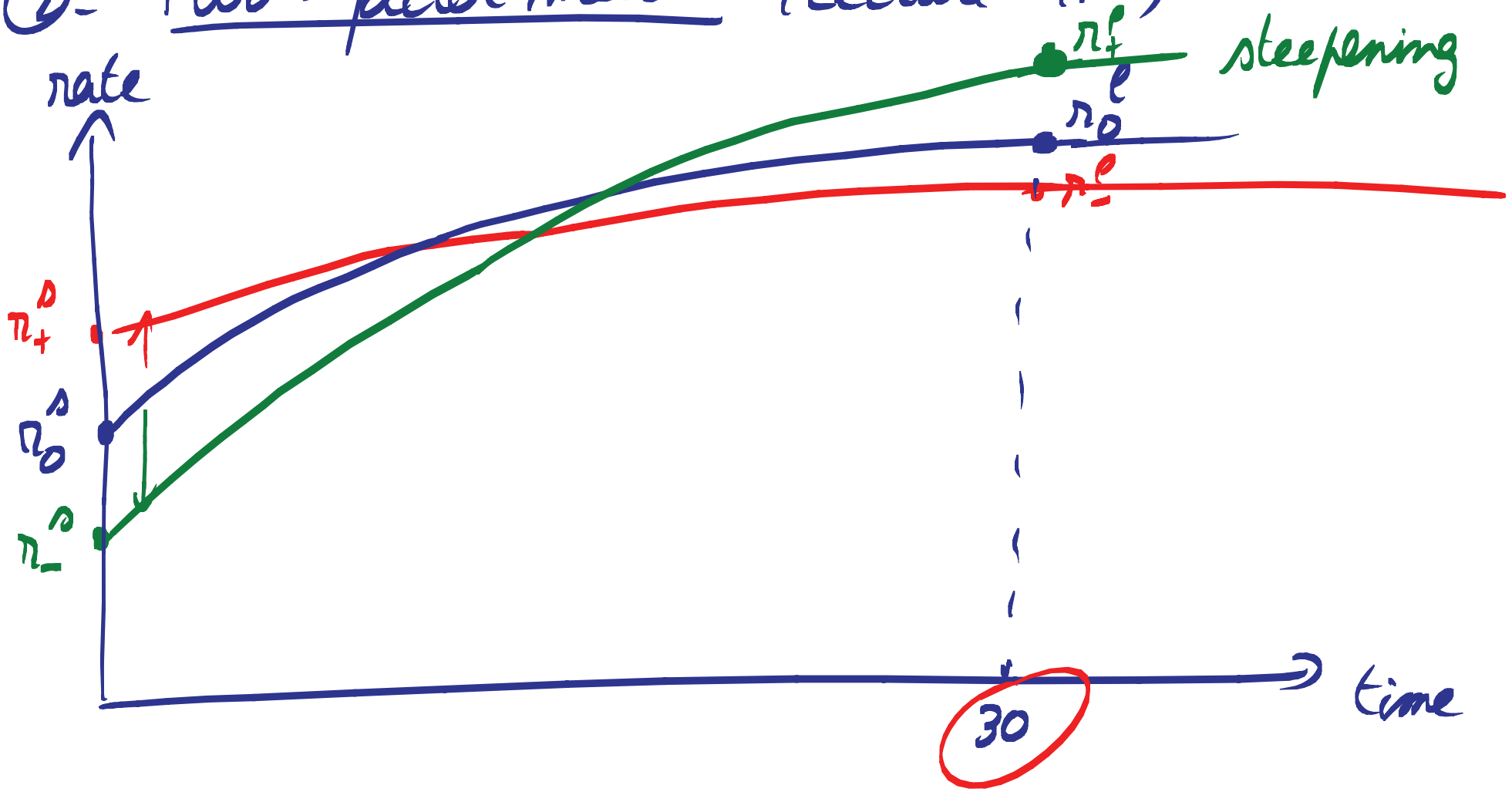
A Rough Guide to Interest Rate Models

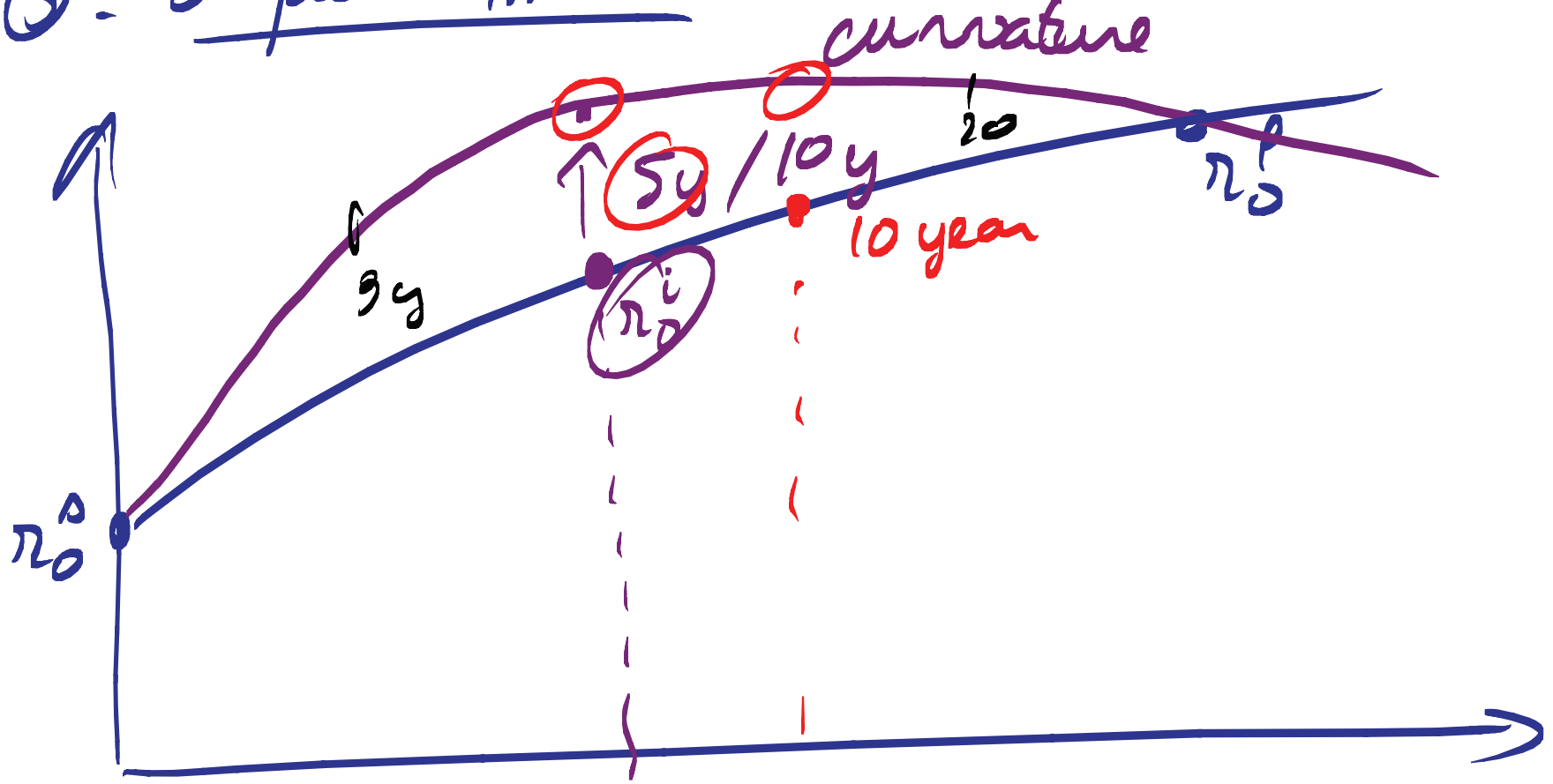
① - Single Factor Models



② - Two-factor model (Lecture 4.2)



③. 3-factor model

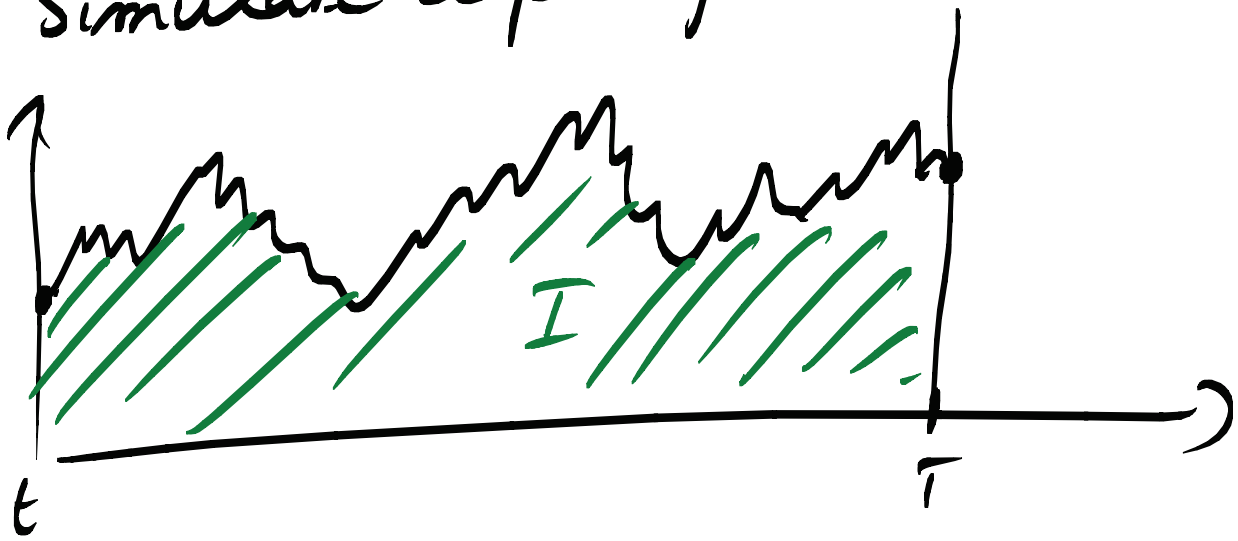


→ 4 factor

- 1st factor -> // shift ≈ 85% of the variance of the curve.
- 2nd factor -> steepening / flat. ≈ 9% of the variance
- 3rd factor -> curvature ≈ 4%
- 4th factor to n^{th} factor, $n > 4$ < 2% of the variance.

Overview of the algorithm

① Simulate a path for the short term rate $r(t)$



② $I = \int_t^T r(s)\,ds$

③ $e^{-\int_t^T r(s)\,ds} \leftarrow e^{-I}$ discount factor

④ Repeat steps ① to ③ many many times

⑤ Average over all the realizations