INTRODUCTION TO PORTFOLIO ANALYSIS

In-Sample vs. Out-of-Sample

Bad News: Estimation Error

- Limitation to data-driven portfolio allocation:

Use in Practice	Use In Theory
Estimated mean $\hat{\mu}$	True (unknown) mean μ
Estimated variance $\hat{\sigma}^2$	True (unknown) variance σ^2
Optimized weights based on estimated mean & variance: $\hat{w}$	True optimal portfolio: w

Good News: Opportunities

- Do not ignore estimation error
- Use split-sample analysis to do a realistic evaluation of portfolio performance

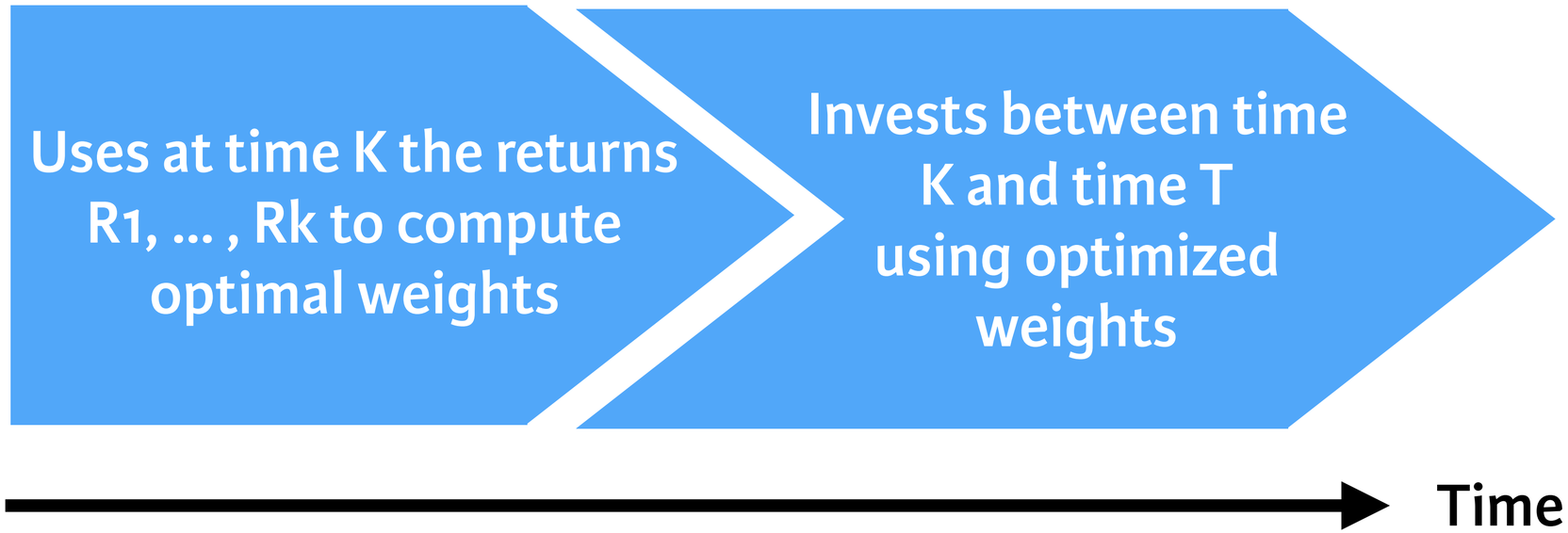
R_1	R_2	...	R_K	R_{K+1}	R_{K+2}	...	R_T

Estimation sample used to find the optimal weights

Out-of-Sample evaluation to give a realistic view on portfolio performance

No Look-Ahead Bias In Optimized Weights

- Split-sample design matches with the investor who:



- Function `window` to do split-sample analysis in R