

Is Return Easier to Estimate than Risk?

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Most traditional optimizers have two inputs – mean and variance. In fact, most portfolio optimization frameworks pit some notion of return against some notion of risk. The conventional wisdom in the finance practitioner community is that high quality, accurate estimates are available for the risk inputs, whereas the expected return estimates are highly proprietary and subject to big differences of opinion. However, basic statistical theory dictates that variance is estimated with greater error on average than mean estimates. On the surface, this mathematical fact would seem to contradict practitioners' conventional wisdom. "A Note on Statistics vs. Finance: Is Return Easier to Estimate than Risk?" by Dr. David Esch explains and rationalizes these different viewpoints on the relative precision available in these important inputs for portfolio optimization problems.

Upon deeper inspection, however, there is no contradiction, because while basic statistical theory and practitioners are generally talking about similar risk estimates, they are defining the term "mean" quite differently. It is indeed possible to estimate the long term mean over all time with greater precision than the variance. However, this mean estimate is of little investment value because the expected return at any specific time is likely to be quite different from the expectation over all time. The expected return at a specific time has very little data to inform an estimation process, since historical data is mostly in a different time window and not relevant. The information for timely expected return estimates is likely to come more from investor views, which may be entirely subjective. Multiple managers are likely to disagree since there is no hard data to validate or support any evidence — just the realized returns which arrive later and any "bias" in the estimates can be explained with the error distribution.

So neither financial practitioners nor mathematicians are wrong in their claims. They are simply referring to different things when using the term "mean." The confusion arises because of ambiguity in specifying the statistical model for returns — the unspecified part of the implied analysis is whether expected return varying through time or static. Rather than dismissing each other as "wrong," reconciling the academic and practitioner points of view is useful in coming to a holistic understanding of quantitative portfolio management, and in furthering both approaches.

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