

# Returns from Cost Centers: Quantifying Asset Owner Alpha from Better Risk Management and Trade Execution

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# Introduction

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Many large asset owners operate internally as if they were really an asset manager with just one client (themselves). *This blurring of roles masks a key difference in the economics of the situation.*

- For agent managers the cost of high-quality risk management efforts are borne by the manager, while the economic benefit of better risk control accrues to the investor client.

The same applies to the cost of improving trade execution. Managers bear the costs while clients get almost all the benefit.

- However, for a large asset owner with internal management both *the costs and benefits accrue fully to a single entity* making for a very different situation. In this presentation, we will provide two analytical models that quantify the return improvement arising from better risk control and lower trading costs.

“Best of breed” solutions will pay for themselves dozens of time over.

# Let's Start With Risk

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While volatility may be in the past or future, *risk* is always in the future.

- Risk is inherently uncertain. It cannot be measured only estimated.
- Like any statistical estimate risk values should always be presented with standard errors, which I'll call "*second order risk*".

This uncertainty arises from four sources:

- Our estimates of future volatility may be based on finite sample of past events. There is a minimum degree of sampling error. More history helps.
- Conditions in the future may be different from the past. The world is not stationary. More history makes things worse.
- There is the possibility that our model is incomplete. There are "unknown, unknowns" (see Knight, 1927).
- Our risk estimate applies to a finite time period during which the composition of our portfolio may change.

# Recent Literature on Estimation Error in Risk

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There is a vast literature on estimation error in optimization, but relatively little on *how estimation error in risk only* impacts investor portfolios.

Three relatively recent articles from people you probably know:

- diBartolomeo, Dan. “Why Getting Risk Right is Wrong”, [Northfield News April 2018 \(northinfo.com\)](http://northinfo.com).
- Shah, Anish “[Portfolio Risks under Estimation Uncertainty and Price Movement by Anish Shah :: SSRN](http://SSRN.com)”.
- Cataldo, James and Georges Tsafack, [Backtesting and estimation error: value-at-risk overviolation rate \(repec.org\)](http://repec.org)

# The Economic Impact of Second Order Risk (I)

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- Here is a simple example of how second order risk impacts an investor with \$25 Billion AUM, expected return 7% and volatility 10%
  - In the real world, we don't know what the future volatility will be, and as has been observed, varies through time.
  - Let's assume that over the fund's investment horizon, our estimate of 10% has a standard error of 3% (10 +/- 3).
  - To keep the arithmetic simple, I'll assume that our 10% estimate is correct on average with true volatility being 13% during the half of time when volatility is higher and 7% during the half of time that true volatility is lower.
  - That means the *minimum total variance* of expected return is  $(10^2 + 3^2)^{.5} = 10.44$ , *assuming estimation error is orthogonal to the magnitude of volatility*
  - Our estimate of future volatility is bounded from below by zero, so there must be some positive correlation between the 10 and the 3 (both must reach zero at the same time).

# The Economic Impact of Second Order Risk (II)

Assuming 20% correlation (conservative) between the first order and second order effects the effective volatility is 11% rather than 10%.

•See Bolster and diBartolomeo, 2002.

In terms of the expected geometric mean return, *that extra risk is equivalent to a loss of 10.5 basis points of annual return.* See Messmore, 1995.

Rubinstein shows ("Generalized Logarithmic Utility Model", *Journal of Finance*, 1976) that you can derive an investor's risk aversion from their choice of how volatile they make their portfolio. See also Wilcox 2000 and 2003, JPM.

For an investor *who thinks* they have a portfolio of volatility 10, the extra volatility (going from 10 to 11%) is the equivalent of losing 10.5 \*  $(200/(10*6))$  = about 35 basis points of return.

*On a \$25 Billion fund that's a loss of \$80 million a year that arises because the true risk is higher than what is expected.*

- Good risk management processes shrink the "+/- 3%" (second order risk) so the extra risk that translates into less compounding of returns is minimized.
- It pays for itself a hundred times over.*

# We Told You So (Two Years Ago)

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In early 2019, I wrote an essay “The Economic Cost of Good Enough Risk Management for Asset Owners” which makes similar arguments to today’s presentation, focusing on the difficulty of estimating risk for illiquid assets.

- <https://www.northinfo.com/Documents/850.pdf>
- What I did not say at the time was risk management concerns for an asset owner was also applied to an investment bank where risks are on “our balance sheet,” not a client’s balance sheet (unlike an agent asset manager).
- *I guess I should have mentioned that.* The example in the essay was based on the retirement plan of an investment bank that just happened to be among those that lost a collective \$11 Billion in the Archegos margin call meltdown.
- For more discussion of what went wrong in the Archegos mess, see my article in *Intelligent Risk*. [PRMIA Intelligent Risk - July, 2021 by PRMIA Org – issue](#)



# Efficient Trading Operations

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- The exact same kind of economic arguments that apply to risk management also apply to trading efficiency.
  - For an agent asset manager, improving trading execution might make a small positive impact on returns, but the managers bear the cost of the systems and personnel needed to make execution of trades as efficient as possible.
  - For an asset owner, both the total costs and the total benefits of lower trading costs accrue to the investor, so the economic impact is orders of magnitude more important than for agent asset managers.
  - There are three types of costs to be considered
    - Direct (broker fees, trading personnel and trading systems costs)
    - Market impact (when you trade in size you move market prices so your trades become more expensive)
    - Opportunity costs. If you pursue active strategies you have to believe you can add return. When trading costs are high you cannot pursue trades that would be profitable if trading costs were lower.

# When In Doubt, Ignore the Hard Stuff

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Most asset owners that manage money in-house are large. The key argument for internal management is to save on asset manager fees.

However, the arguments for putting time and effort into building efficient internal trading requires quantifying market impact and opportunity costs.

- Conventional “TCA” analysis only sees events from the time a trade is placed into the market and when it is completed.
- TCA does not capture the “why” the trade was done or whether a proposed trades was not done at all.
- Many studies suggest that most traders execute trades far, far too quickly than is economically justifiable, [Implied Risk Acceptance Parameters in the Execution of Institutional Equity Trades \(northinfo.com\)](#)
- You have to admit that opportunity costs are beneficial if you have negative alpha strategies.

# A Framework for Market Impact

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For large investors, the largest part of costs associated with executing trades is market impact, not the direct costs of systems and personnel.

Estimating annual market impact costs involves four dimensions:

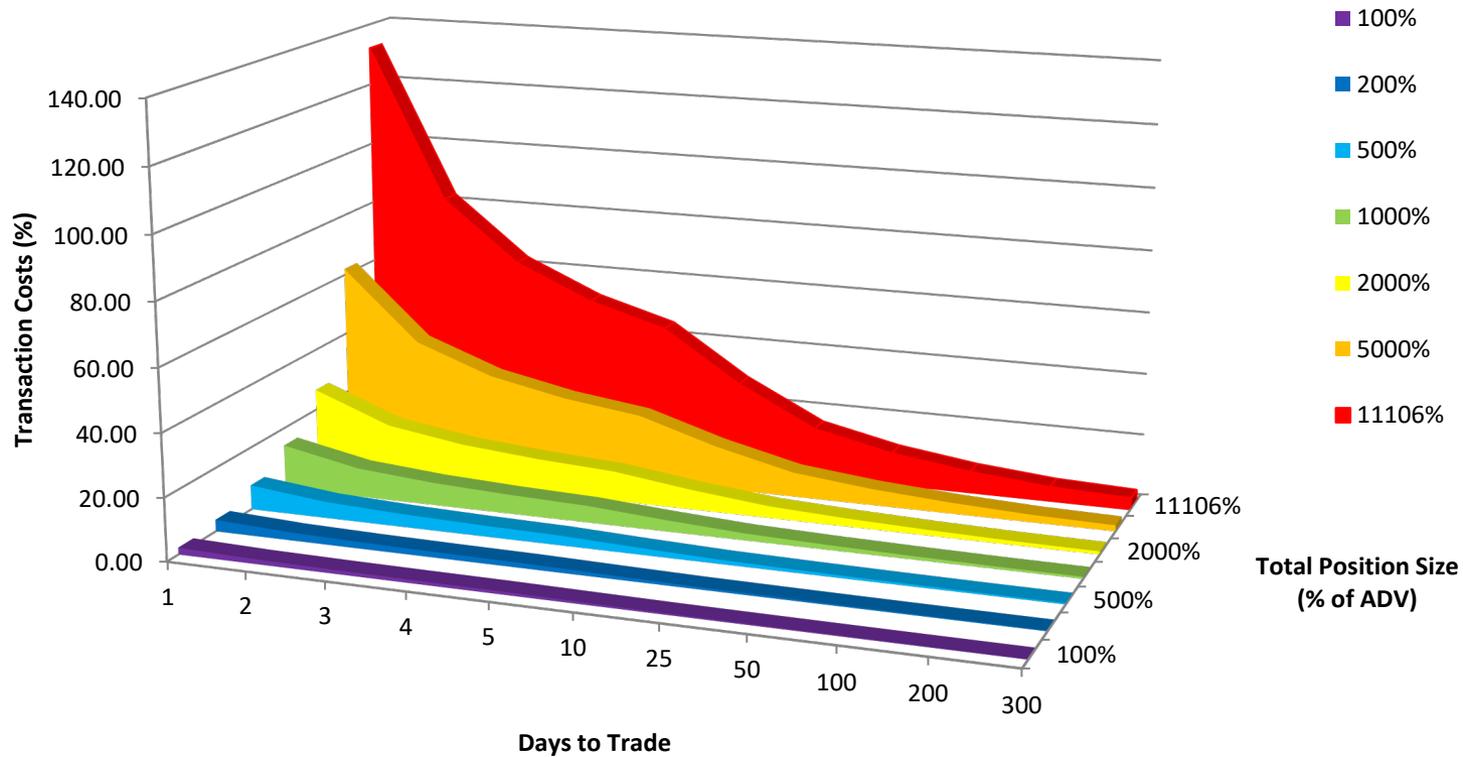
- Size of the portfolio
- Annual percentage turnover
- Which securities are involved (mix of liquid and illiquid)
- Allowable trade completion times (function of strategies behind trades)

The graphic on the next slide creates an “annual market impact cost” as a percentage of AUM from sample inputs.

- The plausible costs are up to **20% of AUM** for high turnover strategies with very large portfolios.
- Obviously, nobody would follow such strategies but this is an enormous sum of money for a large fund.

# “Show and Tell with Big Positions”

## Vale (2257127)



# Optimal Execution Management

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The direct cost of trading (systems, personnel, broker fees) is the smallest part of the total cost.

There are many subtleties in managing transaction costs properly, so as to minimize the total costs while executing on intended strategies.

- Don't trade faster than necessary to execute a strategy.
- Understand how to trade-off transaction costs with the expected benefit of an active strategy
  - diBartolomeo (2012), [Smarter Rebalancing: Using Single Period Optimization In a Multi-period World \(northinfo.com\)](#)
  - Sneddon (*Journal of Investing*, 2008) is the basis of the Complete Attribution system offered by Northfield.

# A Major Benefit of Internal Trading

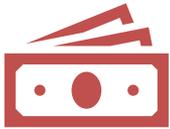
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In 1992, Northfield pioneered a technique which became known as Centralized Portfolio Management.

- CPM allows a *single portfolio to be managed and traded* with an optimal blending of multiple strategies, reducing fees, transaction costs, and possible taxes while improving alpha (if present).
- CPM has been widely used for taxable institutional investors in Australia by Vanguard and several other firms.
- CPM has been implemented for taxable private investors by firms like Parametric.
- [A Radical Proposal for the Operation of Multi-Manager Investment Funds \(northinfo.com\)](#)
- [Northfield News June 2018 \(northinfo.com\)](#)

# Conclusions

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**Asset owners who manage their money with an internal asset management effort often choose to emulate the practices of successful agent asset managers.**



**The economics of being an asset manager with external clients and being an asset manager managing their own assets are vastly different.**

Call for very different allocations of resources for risk management and efficient trading.



**Large asset owners who devote material effort for “best of breed” control of risk and trading costs will be rewarded tens if not hundreds of times over relative to the required investment in staff time and systems.**