

Risk and Return in Segmented Markets with Expertise

Andrea L. Eisfeldt, University of California, Los Angeles and NBER

Hanno Lustig, Stanford University and NBER

Lei Zhang, The University of Hong Kong

Executive Summary

Complex investment strategies, such as those employed by hedge funds and other sophisticated investors, appear to generate persistent risk-adjusted returns ("alphas") and high Sharpe ratios, and to feature limited participation despite free entry. Examples of such strategies include investment in structured credit, mortgage assets, and long-short trades based on models of fundamental value relative to market prices.

Research by Andrea Eisfeldt, Hanno Lustig, and Lei Zhang explains why attractive tradeoffs between risk and return both exist and persist in complex asset classes. Their study also provides a detailed analysis of the key drivers of complex asset returns in order to precisely identify which assets can be expected to deliver consistently attractive returns to long-term investors.

The researchers emphasize that successful execution of any complex investment strategy requires sophisticated financial data and modelling. Since each investor must use their own proprietary model, each investor's portfolio is unique both to their model and to their execution technology. Differences in trading and hedging execution expose all investors in complex assets to idiosyncratic risk. However, some investors have better technologies than others. Expert investors' portfolios impose less idiosyncratic risk on their owners. In equilibrium, market-clearing returns must compensate these expert investors for the risk they face. Investors with lower-quality models and execution cannot earn a level of returns that warrant their entry to the market for investment advice. The activities of expert investors depress required returns below the level that would entice less-skilled investors to invest. In other words, expert demand and risk-bearing capacity act as a barrier to entry below a threshold level of expertise.

Strategies which impose more model and execution risk on investors earn higher equilibrium excess returns. These strategies provide attractive payoffs to experts but are avoided by less-sophisticated players. This research provides a specific example of a complex strategy involving a long position in an underlying asset with some "alpha" or mispricing relative to its systematic risk exposure, and a short position in a tracking portfolio. The long-short position is designed to "harvest the alpha" in the underlying asset while hedging out unnecessary risk exposures. Investors with more expertise have superior tracking portfolios which are more correlated with the underlying asset. As a result, their total net position is less risky and they earn alpha while bearing less risk.

Idiosyncratic risk has long been understood to be an important, practically relevant, limit to arbitrage. This work provides a precise link between asset complexity and exposure to idiosyncratic risk. The researchers compare the market-level equilibrium risk and return tradeoff across assets which are more

and less complex, defining complexity as the amount of fundamental risk in the asset's returns before expertise is applied. It is clear that assets which impose more idiosyncratic risk on investors will have higher equilibrium returns. However, since the risk is also higher for more complex strategies, it is not obvious that they also will exhibit higher excess returns adjusting for risk.

The researchers find that investor participation rates in different strategies decline at different rates as the strategies become more complex. Those strategies and asset classes for which an increase in risk is most harmful to investors with lower expertise display the clearest decrease in participation rates, and the clearest increase in Sharpe ratios, with complexity. Since each investor has a unique portfolio, each faces an individual Sharpe ratio. Market-level Sharpe ratios are weighted averages of participants' varied individual Sharpe ratios. For a complex asset to exhibit persistently low participation despite a high Sharpe ratio, it must be that the high compensation for bearing idiosyncratic risk rewards sophisticated investors more than unsophisticated investors per unit of effective risk. In this case, as complexity and therefore risk increase, participation declines as inexperienced investors are driven out. The selection effect of excluding less-expert investors attenuates the negative effect of increased risk on the market level Sharpe ratio. To clear the market at the higher risk level, excess returns must increase. This reduces the decline in participation, and its positive selection effect, somewhat. The research shows that overall, under natural conditions, the market equilibrium Sharpe ratio incorporating all of these effects is higher as complexity increases, but only if an increase in risk harms investors with lower expertise more than investors with high expertise. In other words, the only asset classes for which investors should expect a persistently favorable risk/return tradeoff are those which require expertise which becomes more valuable as the complexity of the strategy rises.

As an example of these principles in action, consider fixed income arbitrage strategies. Past research suggests that strategies that trade mortgage backed securities (MBS) earn higher alpha and Sharpe ratios than simple swap spread arbitrage strategies. This is because mortgages are highly complex securities containing embedded prepayment options. MBS payoffs are affected by consumer behavior, house prices, and credit conditions, as well as interest rates. There is no agreed-upon pricing model, and investors' strategy implementations vary widely as a result. By contrast, swap spread arbitrage follows a fairly straightforward long-short rule based on current LIBOR swap rates relative to Treasury yields and repo rates. The way this strategy is implemented is quite similar across investors. Accordingly, expertise is more valuable in MBS arbitrage, and the difference in the risk which investors face in MBS vs. treasuries is decreasing in investor expertise. To be sure, highly sophisticated investors face more risk in MBS than in Treasuries. However, the difference in effective risk across these two fixed income strategies is not as great for expert investors as it is for an inexperienced investor. Empirically, fixed income is an asset class which appears to reward investor sophistication, and to limit participation in a pattern consistent with the researchers' theory.