Factor/Style Investing

Uncorrelated Assets: An Important Dimension of an Optimal Portfolio

January 12, 2023

Recently, Dimensional Fund Advisors wrote critically on "liquid alts." They make some good points,[1] but they also draw some odd conclusions that if applied more generally would not be to their (or our) liking. Besides discussing their piece, below I take this opportunity to review the general rationale behind holding uncorrelated assets (in particular, equity "factors" held in a long-short manner[2]).

Essentially, using a few slices of historical mutual fund returns and a particular selection criteria they show that the universe of all liquid alt mutual funds has disappointed from 2006-2022 – not disastrous, just disappointing. Well, duh. That hedge funds (and their mutual fund cousins liquid alts) charge too much, don't hedge enough, and don't deliver enough alpha is very well known.[3]

But since when is the failure of "buying one of everything in a category" a verdict on everything in that category? When we wrote the original (and still champion) "Do Hedge Funds Hedge?" and found sobering results for broad hedge fund indices, we never said the task was impossible, just that the industry as a whole wasn't fulfilling it. Yet – and you can call me paranoid for thinking so – the clear implication of the DFA[4] piece is that no asset deemed a "liquid alt" deserves to be in a diversified portfolio.[5]

Let's try the above logic in another context. For instance, if I were to note, as many have for many years, that the average active stock picker underperforms the capitalization-weighted market index after fees and trading costs, does that then mean that you shouldn't be interested in DFA's (or AQR's) active stock picking?[6] Is that the conclusion the author of the DFA piece would endorse? I certainly wouldn't. I think DFA offers attractive active stock picking precisely because they understand the failings of the broad universe of active stock pickers and can execute a combination of efficient active factor tilts at low enough transactions costs and fees to make their *active stock picking* a wonderful part of a portfolio.[7]

Put differently, if a bunch of active stock pickers charge a 6% load and a 2% management fee for long-only stock picking, then overtrade and utterly fail to deliver, is that a black mark against what DFA (or AQR) does? Is it even a black mark against the idea that it could be done well if fair fees, competent trading, and some average skill (via fundamental stock picking or quant factors) are used? Nope, it is not.

It's certainly interesting to know what a "what if I bought every manager" portfolio looks like. The pond you're fishing in is inherently interesting, and we've written on it ourselves quite a few times. But sometimes it is the investment processes and products that correct the failures of the "everybody in the category" portfolio that is the entire point. For instance, I think correcting the many wrongheaded parts of active stock picking isn't a bad way to sum up what DFA does so successfully.[8]

The portfolio of liquid alts that the DFA piece constructs was indeed disappointing for those sixteen years. But they go a little too far in saying, "From June 2006 to June 2022, they underperformed broad indices with higher volatility than fixed income." Well, not too far like "wrong," but too far like "weird." Next, they'll point out that liquid alts are also shorter than Yao Ming but taller than Muggsy Bogues.[9] For many investors in alternatives, achieving volatility and returns in between stocks and bonds is an actual stated goal of a diversified liquid alts portfolio, not a damning verdict. But DFA isn't wrong that the sample they study is a disappointment. I think the main failing DFA highlights is not the returns or volatility they focus on, but instead it is the high correlation to equities. Again, that's very very old news and is quite avoidable in constructing a liquid alts portfolio from a subset of the whole universe – in other words, doing liquid alts correctly.

Their explanation of the underwhelming results goes on to say, "But slicing and dicing the same set of securities doesn't constitute expansion of the opportunity set, much like cutting my children's pancakes in the shape of a dinosaur isn't a culinary advancement." Well now. Come for the brutally non-self-aware illogic but stay for the condescension. What on Earth is DFA (or AQR) doing in their many long-only active equity portfolios (and, yet again, they are active equity portfolios as discussed in peeve #6 here) if not "slicing and dicing" the same opportunity set? To continue their analogy, you could also claim that a pancake is nothing more than "slicing and dicing" eggs, flour, and milk; but try explaining to your kids why they are getting the separate components this morning! DFA slices and dices the same opportunity set as so many others do, but unlike the universe of other pancake makers out there, they actually make a pretty good one.[10] Of course, they are unlikely to be the only ones to do it well.

The sixteen years from June 2006 to June 2022 is an eternity in practical time, but sadly not in statistical time.[11] Indeed, some ex-ante very good investments can underperform for that long or (sadly) for even longer. Sorry to be the bearer of bad news. This possibility, that good strategies fail to deliver over what feels like the long term, is especially true when the long period in question starts and ends at different

extremes in valuation.

Now let's consider how much we really learn from even sixteen years. To quote from an utterly random and by no means intentionally chosen source:

The average monthly premium of the Market return over the one-month T-Bill return is substantial, as are average premiums of value and small stocks over Market. As the return horizon increases, premium distributions become more disperse, but they move to the right (toward higher values) faster than they become more disperse. There is, however, some bad news. Even if future expected premiums match high past averages, high volatility means that for the three- and five-year periods commonly used to evaluate asset allocations, the probabilities of negative realized premiums are substantial, and the probabilities are nontrivial for ten-year and 20-year periods.[12]

So, put simply, great long-term investments like the market portfolio (Stocks for the Long Run!) have a nontrivial chance of losing for *a score* of years. It seems like this would lead to some humility in drawing sweeping conclusions and making implicit recommendations from sixteen-year track records. To emphasize the point, if you look at the last sixteen years, certain esteemed (for real, no sarcasm) value-oriented DFA strategies are clear examples of why you shouldn't necessarily judge a good strategy by a tough stretch.[13] Sixteen years just ain't that long (sorry!) particularly when valuations change a lot.[14]

The following identity is one super simple, yet I think useful, way to think of any portfolio that deviates from an index:

Active = Index + (Active – Index)

In other words, any active portfolio[15] can be thought of as a chosen Index plus a long-short portfolio that is long the actively chosen stocks and short the index.[16] Now, standalone (Active – Index) is a very simple hedge fund or liquid alt. Of course, once you're going long and short you don't have to just short the index. A more generalized hedge fund would be (Active Long – Active Short). In the best of worlds (IMHO) it would be beta-balanced, attempting to be uncorrelated with major markets.

Are there any examples near and dear to both DFA and AQR's hearts (yet still randomly chosen with no agenda, of course) that might fit this bill? Well blimey, there is in fact a very relevant example. Consider the Fama-French 5-factor model augmented with momentum (so 6-factor) and using up-to-date, not lagged, value (two tweaks, adding momentum and using up-to-date prices, that anyone looking at the data would make :)).

Let's do a thought experiment. If you took this (twice tweaked) Fama-French 6-factor model, traded long-short (as the factors are naturally[17]), thought hard about minimizing trading costs, and charged a reasonable fee,[18, 19] do you think it would be a valuable addition to most portfolios? Do you think it would deliver positive and better average returns over the last sixteen years than the universe of liquid alts that DFA studied? Do you think this dollar-long dollar-short portfolio would be diversifying to a long-only market portfolio? Well, my answers to the above are yes, yes, and yes. If DFA disagrees, they should explain why they don't believe in their factors as much as we believe in their factors![20, 21] Assuming they agree, it becomes clear that just because the universe of all products they aggregate and study is disappointing, it doesn't mean you can conclude there are no investment products that can fulfill the goal (here the goal is very low correlated, positive expected return).

In sum, we believe you can build a fairly robust "liquid alt" by just using their factors.[22] That's just what factors are – relatively low-correlation, positive-expected-return, long-short portfolios – and DFA's are great. But repeat it with me: "Factors. Are. Hedge Funds."

Making a Long (Only) Story Short

So why might (might) you want a standalone portfolio of HML, SMB, RMW, CMA, and UMD (the Fama-French factors for value, size, profitability, investment, and momentum and not just a long-only tilt using these factors for guidance?

Consider again this identity for a long-only portfolio guided by the above Fama-French factors.[23]

Active = Index + (Active – Index)

Here are some reasons you might want to add the full long-short market-neutral factors to your portfolio in addition (or more likely in lieu of) the long-only active tilt above:

1. If the expected Sharpe ratio[24] of (Active – Index) is high relative to the expected Sharpe ratio of the Index itself, you'd optimally[25] want the (Active – Index) part in your portfolio to be at least as large as the Index part. But in practice, most active long-only portfolios (especially the diversified ones favored by firms like DFA and AQR) take low tracking error in the (Active – Index) component compared to the volatility of the index itself. In other words, if net of all costs the Sharpe ratio of (Active – Index) is in the ballpark of the Sharpe ratio of the index—and certainly if it exceeds it—a traditional long-only implementation won't get you enough factor exposure.
2. Again, (Active – Index) is a very constrained long-short portfolio (constrained to only short the index). If you think the full long-short HML, SMB, RMW, CMA, and UMD might be higher Sharpe ratio than just the long side of each factor minus the entire market, it's another reason to prefer your active stock picking to be done in long-short "hedge fund" or "liquid alt" form.[26, 27]
3. Points 1) and 2) above are likely relevant at any time — but at a time when value spreads are still extremely wide and traditional markets are still very expensive, being able to take more risk in the generalized type of (Active – Index) investment (like the factor

example in Point 2) above) versus market risk may be more important than usual.

4. I'm introducing another issue here, but I think it's important. The potential advantages of market-neutral investing are considerably more important for taxable investors. Simply separating alpha from beta[28] is surprisingly important for taxable investors. And, if you're taxable, once you are implementing this separation, it becomes very attractive to actively practice tax-loss harvesting, something again much much more effective if you run your active positions separately as a long-short portfolio.[29]

Of course, to be fair there are some reasons you might not want to move from active long-only to "index plus market-neutral long-short." I can think of at least two:

1. Costs. If the long-short portfolio is charging way more than it should, it can become a bad idea indeed. Similarly, if the cost of trading long-short is way higher it could turn ugly. Of course, we think these problems are, in turn, avoidable and very manageable, but that's just our view. Intellectual honesty demands it be mentioned.

2. To get more active factor volatility into the overall portfolio (the first reason given above to separate active into index plus long-short active minus index) you likely need some leverage. It's probably less than you think, and in our 24 years at AQR (and some at Goldman Sachs beforehand) it's faced no serious risk of ruin, though there has been some very rare excitement![30]

Long-short strategies simply allow more aggressive factor and portfolio diversification and thus, if (if!) your factors are good ones, likely offer better portfolio risk-adjusted return than long-only portfolios, which are inevitably dominated by equity market risk (and still dominated by equity market risk even after a long-only factor tilt is added, as tilts are not easily scaled up). For me, on net, it's difficult to believe in these Fama-French factors and not believe that they'd have more impact as a separate long-short portfolio added to an index fund vs. a constrained long-only active portfolio (and again, it seems *exceptionally* important for taxable investors). But, people are certainly allowed to differ on how they assess Pros 1) – 4) and Cons 1) – 2).

So why doesn't DFA think there's any use for an HML+SMB[31], RMW+CMA+UMD[32] market-neutral portfolio? Do they think it doesn't survive trading costs? That it has a huge positive beta? If so, we think they'd be wrong about both (in particular, some intentionally discouraging studies of the transactions costs of factor investing are easily rebutted). Do they think the Sharpe ratio of the market portfolio is extremely high versus the long-short factor portfolio? If so, they're bucking the empirical evidence pretty strongly. Frankly, I'm doubtful they believe these things. I'm thinking that offering such a portfolio just isn't their brand (thank God as it would be pretty good, I should be careful what I encourage!). Luckily, it's on-brand for some other three-letter firms!

Conclusion

The data presented in the DFA paper is indeed unappealing for their chosen universe of liquid alts, and I'd echo their implied recommendation not to allocate a big part of your portfolio to owning "one of every liquid alt that you can." For more than 20 years we've been beating the drum that the hedge fund (and by extension much of the liquid alt) world is offering expensive beta in disguise.

So, you definitely shouldn't buy the entire universe of liquid alts. And, again, you also shouldn't buy the whole universe of active stock pickers. But you might (IMHO) buy a liquid alt if you've seen the evidence and understand and agree with the argument that it is a long-term positive expected return and truly not very correlated to markets. And you (and I) might buy DFA's long-only active offerings, despite the legion of studies and basic theory that show the universe of such active long-only portfolios fail to beat the index.

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[1] Though not many that we have not led the industry in repeatedly making since at least 2001. We have generally done so while discussing "hedge funds" and analyzing hedge fund indices, but it is pretty much the same story. I won't defend the entire category of "liquid alts" as it's a hodgepodge of many different things, some of which I believe in, and some of which I don't.

[2] I won't defend the entire category of "liquid alts" as it's a hodgepodge of many different things, some of which I believe in, and some of which I don't.

[3] I actually called Jack Bogle, a long time friend, to apologize for the last of those four links where Forbes compares our efforts to demystify, actually hedge, and change the pricing of hedge funds to what Jack built at Vanguard. That comparison goes too far even for me! Jack was, of course, quite gracious about it.

[4] I'm not sure if they still use "DFA" at all versus "Dimensional", but I grew to know and love them as DFA, so they'll always be DFA to me.

[5] If they genuinely meant "the whole pond isn't so great so be careful while fishing" I really couldn't object – and again we have been making this same point for 20+ years. But they don't seem to make the analogous point about the active stock picking pond they fish in (well, they say it stinks but they then recommend their own active stock picking), and I don't think I'm imagining that this isn't really their point – their real point is STAY AWAY! And relabeling aside, it is active stock picking. I wrote peeve #6 back in the day arguing this in general, though it clearly applies to DFA and to AQR, and it's still true. Some try to talk around this. Quoting David Booth from DFA's website "The number of managers that can successfully pick stocks are fewer than you'd expect by chance. So, why even play that game? You don't need to." Absolutely true. But, David, you (and we!) do play that game. You have succeeded more than not, quite fabulously long-term, and you've indeed picked stocks better than chance. You can relabel it all you want for marketing purposes but you're an active stock picker, not an indexer (or whatever else you might call it). It's just, IMHO, a darn good kind of stock picker (we hope this applies to us too!). You are, dare I say it, a regular old active stock picking quant (albeit an OG one). If you don't want to be called active, then only buy MKT-RF (i.e., the market factor) and only charge two basis points for it.

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[7] True story: I've told my wife and kids that if I and AQR were gone, Vanguard and DFA are the places they're allowed (by my ghost) to invest!

[8] We should note that the group of liquid alts DFA constructs is kind of a weird hodgepodge. They consider funds characterized as managed futures, long-short equity, and equity market neutral. Managed futures have indeed traded pretty uncorrelated to traditional markets. But, long-short equity is known to have a beta of around 0.50, a very high correlation to long-only equity markets, and is known to have been underwhelming after accounting for this beta, especially in the later part of the sample. Equity market neutral is a very broad and ill-defined category with at least some quantitative "factor" type funds, often but not always run to a very low correlation to the market, and "arbitrage" funds (e.g., merger arbitrage, convertible arbitrage) that often do come with some degree of a market beta. Also, a fair amount of their universe is likely still coming off a rather vicious drawdown in the value factor (well off the bottom but still well below long-term trend) and desultory returns for managed futures (until they were needed most in 2022).

[9] They make yet another odd comparison noting the volatility of their constructed portfolio of liquid alts is "10x" the volatility of the risk-free asset. I was unaware this was a multiplicative comparison we made in investing. Should we also note it's infinitely more volatile than the volatility of the risk-free asset in excess of the risk-free return? My head hurts.

[10] Hopefully you blame their original piece for necessitating me to beat this analogy of theirs to death, but I know I'm taking a chance!

[11] "Statistical time" is a new phrase I just made up. I hope you find it of some significance.

[12] Out of context that quote is a little confusing, as it may sound like it's the volatility that's relevant. It's the expected return over the volatility (aka the Sharpe ratio). In the context of the broader paper this is clear. Also, if you're a masochist who wants to be more depressed about how long good things can stay lousy, try this one.

[13] My only point here is that even a premium that both DFA and AQR believe in for the long term, like value vs. the capitalization weighted market, can lose to the broad market for sixteen very long years. Note that a long-only strategy lagging the overall market is the direct analog to a market-neutral long-short strategy losing money (more on this connection below).

[14] Changing valuations has certainly hurt U.S. large cap value over this period, and that same effect is also likely present in at least part of the "equity market neutral" category examined in DFA's paper (it certainly is at AQR!).

[15] Remember (as if I'll let you forget) all portfolios that differ from the index they're judged against are active portfolios (again, #6 here).

[16] I used this identity in two papers almost twenty years ago. Among other things, I argued that if (if) hedge funds (or liquid alts) today were fully hedging and taking volatility that exceeds the tracking error in the equivalent long-only active portfolio, higher fees were justified (and consistent with this, the manager's ultimate capacity falls by more per dollar, so to be fair the fees have to be higher). I also wrote that most hedge funds don't actually come near fully hedging; so while mathematically correct, and applicable to specific managers ad hoc, it's not a general justification for high hedge fund/liquid alts fees.

[17] The "M" in HML and SMB is "minus", after all.

[18] As many of you know, I've campaigned hard to get a new economic law named after me, which would be "There is no investment product so good that there's not a fee that can make it bad." I have to date utterly failed. On the other hand, I'm getting #volatilitylaundering some real traction!

[19] I'm calling it a 5- and 6-factor model, but one of those is the market portfolio which you obviously wouldn't include if attempting to create a market-neutral alternative, so for creating a liquid alt this would really be a 4- or 5-factor model.

[20] A separate issue is whether such a portfolio is necessary. For instance, you could be getting all the benefit of the uncorrelated 6-factor hedge fund through your long-only active tilts (I have mentioned these tilts are active, right?). I find that a reasonable worry, but pretty unlikely if you look at history. More on this issue coming up next.

[21] A pretty weak but standard attempt to respond would be to overstate the size of transaction costs and underestimate the ability to minimize them. I've got $100 that says if there's a response this is how it would go, again ignoring its refutation.

[22] Though of course we'd have tons of our own tweaks and certainly wouldn't stop at just U.S. equities, or just these factors (BAB anyone?), or even just equities (the same ideas can be applied to many macro decisions).

[23] Different managers likely have their own ways of translating these factors into how they'd tilt against a long-only benchmark.

[24] The shortcomings of simple Sharpe ratios as a be-all-end-all measure are well-known. Feel free to replace "Sharpe ratio" with whatever form of generalized return to risk measurement you think best.

[25] Clearly "peer risk" is not part of what I'm considering "optimal" here!

[26] Robeco writes an interesting piece arguing that shorting the market is enough. I don't doubt their empirics (though answers can vary when you get into deeper, richer models), but I kind of doubt it's true ex ante going forward (on first principles it's very hard to believe that taking advantage of less of the active opportunity set is a better, or even equal, exercise to more general long-short portfolios). But, the jury is out and I have to get back to this one at some point!

[27] Why a fairly large amount of academic research is focused on long-short portfolios while at the same time these same academics often diss shorting as dangerous "hedge fund like" activity is a topic for another day. Well, actually, I just covered it… Let's repeat together once more: "Factors. Are. Hedge Funds."

[28] I.e., instead of active long-only equity portfolios like those run by DFA or AQR where shorting isn't allowed, instead own an index fund and a long-short active portfolio that yield the same positions as the standalone long-only active portfolio.

[29] The move to index plus market neutral can be largely accomplished by 130/30 type structures too.

[30] Avoiding risk of ruin is not the same as avoiding having investors who can't take the bad periods when factors fail in long-short investing but somehow can take bad periods when these same factors fail in a traditional long-only factor tilt (of course they fail sometimes, they need to succeed on average, not always). We accept this difficulty can be empirically true, but that doesn't mean it should be true! In fact, to get philosophical, if it were easy to do and stick with, then the opportunity would likely go away faster. Every successful long-term investment is a partnership between the manager and the client, and both can make it a success or a failure!

[31] This is the one we flat out differ on. There clearly is no standalone size effect. That doesn't mean some factors don't work better in small stocks, or that size net of quality isn't a positive. But, analyzed properly (accounting for less frequent trading in the small), SMB is just a zero excess (after market exposure) factor, and everyone should really start admitting that. Oh, and looking at SMB in total (not beta-adjusted) returns is not allowed. SMB defenders tend to go for this comparison, not beta-adjusted, too often. Pretty much step one in our entire field is "you don't get credit for market beta."

[32] They'd use UMD just for trade screening of course

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