REVELATION
INVESTMENT RESEARCH, INC.

Downside Risk Alert within Different Market Cap Universes

Client Question
How can Downside Risk Alert scores and rankings best be used by strategies that utilize distinct market cap universes?

RIR Reply
Downside Risk Alert covers stocks that range in capitalization from roughly $200 million through the mega caps to accommodate clients running a wide variety of equity strategies. Clients managing large cap strategies have noticed that DRA's best deciles provide many buy candidates, but there are fewer large cap sell/avoid candidates to be found in DRA's worst deciles. Clients managing small cap strategies have noted the opposite pattern. Since DRA is designed to predict downside risk, it should be no surprise that larger stocks tend to have better ranks than smaller stocks to some degree. DRA systematically prefers stocks characterized by higher free cash flow, greater revenue stability, less need for external financing, and lower stock price volatility – investment attributes more commonly found in large cap than small cap stocks.

Table 1 contains a matrix where we take the roughly 2,300 stocks in the MSCI Investible Market Index and independently rank them into 10 groups by market cap (y-axis) and the as-provided DRA decile ranks (x-axis). There, we show the average percent of stocks across each market cap group and each DRA decile rank. DRA's ranking preference for large cap stocks over small cap stocks is clear. The average DRA decile rank for the largest market cap decile has been 3.4 compared to 7.4 for the smallest decile.

Given the correlation between DRA scores and company size, how might clients with equity strategies that target distinct market cap segments best use DRA to guide their buy and sell decisions? RIR recommends that clients managing large or small cap strategies should consider *neutralizing* the market cap tilt in DRA's as-provided scores. The purpose of re-ranking DRA scores is to normalize DRA's decile ranks into uniform sized 10% groupings within the investable peer group of a particular strategy. Since market cap is the most common universe screen used by RIR clients, we have added normalized DRA decile ranks for four different market cap universe to the DRA version 3 production file:
1. Largest 500 Market Cap Stocks (Large Cap)
2. Largest 1000 Market Cap Stocks (Large+Mid Cap)
3. Stocks Excluding Top 500 Market Cap Stocks (Mid+Small Cap)
4. Stocks Excluding Top 1000 Market Cap Stocks (Small Cap)

Table 2 shows DRA's decile rank distribution and performance on an as-provided and re-ranked basis. Clearly, <u>DRA's return discrimination is strong within all market cap universes regardless of which DRA decile rankings are used.</u> However, note how <u>re-ranking DRA makes it much easier to apply RIR's general guidance to give purchase preference to stocks within the top 20% of DRA's scores and to avoid/sell stocks within the bottom half of DRA's scores</u>. When using normalized DRA decile ranks, stocks in the top 20% of DRA's score directly correspond to deciles 1-2 and stocks scored in the bottom half correspond to deciles 6-10. By contrast, when using DRA's as-provided decile ranks among the largest 500 stocks for instance, a disproportionate 24% of stocks are found in decile 1 while only 26% of stocks are found in deciles 6-10 (highlighted with blue oval).

In conclusion, DRA is designed to be a powerful downside risk predictor within most any market segment, but DRA's as-provided decile ranks may not be uniformly distributed within many investment strategy universes. Fortunately, the more granular DRA scores can be used to generate uniform fractile ranks within any universe. We recommend that any DRA user who is limited to investing in a cap-based or style-based market segment strongly consider re-ranking the DRA score into deciles within their investable universe. Since many investment strategy universes are primarily defined by market capitalization, we have added normalized DRA decile rankings for four commonly used market cap-based universes to the DRA production file.

Table 1 – Market Cap & DRA Deciles in MSCI U.S. IMI – 12/2002 – 09/30/2020

Company Distribution		1 (Best)	2	3	4	5	6	7	8	9	10 (Worst)	Avg DRA Decile
	1 (Large)	29%	18%	14%	11%	8%	7%	6%	4%	3%	1%	3.4
	2	19%	14%	13%	11%	10%	9%	8%	7%	6%	3%	4.3
	3	16%	14%	12%	10%	10%	9%	8%	8%	7%	5%	4.6
	4	11%	12%	12%	11%	11%	10%	9%	9%	8%	7%	5.0
Market Cap	5	8%	10%	10%	11%	11%	11%	11%	10%	10%	8%	5.5
	6	5%	8%	10%	10%	11%	11%	11%	11%	11%	11%	5.9
	7	5%	8%	9%	10%	11%	11%	11%	12%	12%	12%	6.1
	8	4%	7%	9%	10%	10%	11%	12%	12%	12%	13%	6.2
	9	2%	5%	7%	9%	10%	11%	12%	13%	14%	15%	6.6
	10 (Small)	1%	3%	4%	6%	8%	10%	12%	14%	18%	24%	7.4

Table 2 – DRA as provided & re-ranked in Large & Small Mkt Cap Universes w/in MSCI U.S. IMI – 12/2002 – 09/30/2020

Largest 500 Mkt Cap

	IC	Excess Return relative to Largest 500 Universe										% Of Stocks per DRA Decile									
		1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
DRA Decile as provided	0.11	1.7	0.8	0.5	-0.1	-0.3	-1.8	-1.8	-1.0	-3.4	-8.3	24%	16%	13%	11%	9%	8%	7%	5%	4%	2%
DRA Score re-ranked into Deciles	0.11	2.5	1.5	0.7	1.3	0.5	0.3	0.1	-1.3	-1.7	-4.0	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%

Largest 1000 Mkt Cap

	IC	Excess Return relative to Largest 1000 Universe										% Of Stocks per DRA Decile									
		1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
DRA Decile as provided	0.12	2.4	1.6	0.9	0.5	-0.4	-1.0	-1.7	-1.5	-3.3	-7.9	18%	14%	12%	11%	10%	9%	8%	7%	6%	4%
DRA Score re-ranked into Deciles	0.12	3.0	1.8	1.6	1.2	0.8	0.2	-0.5	-1.6	-1.8	-5.1	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%

Excluding Largest 500

	IC	Excess Ret relative to Univ Excluding Large 500 MCap Stks										% Of Stocks per DRA Decile									
		1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
DRA Decile as provided	0.15	4.3	3.2	2.5	2.0	1.1	1.1	0.0	-1.0	-2.5	-6.5	6%	8%	9%	10%	10%	11%	11%	11%	12%	12%
DRA Score re-ranked into Deciles	0.15	4.0	2.8	2.1	1.6	0.9	0.4	-0.3	-1.5	-2.6	-7.4	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%

Excluding Largest 1000

	IC	Excess Ret relative to Univ Excluding Large 5000 MCap Stks										% Of Stocks per DRA Decile									
		1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
DRA Decile as provided	0.15	4.6	3.7	3.1	2.3	1.8	1.6	0.5	-0.7	-2.1	-6.3	4%	7%	8%	9%	10%	11%	12%	12%	13%	14%
DRA Score re-ranked into Deciles	0.15	4.1	2.8	2.5	1.5	1.3	0.8	-0.7	-1.6	-2.8	-7.6	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%