13 June 2025

Index construction: Portfolio construction for concentrated portfolios (part 3)

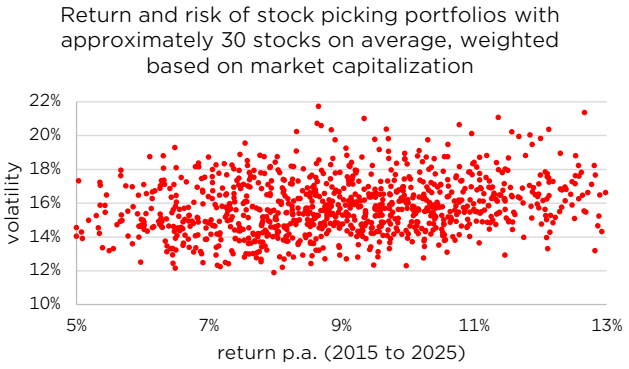
When traditional stock pickers and active managers compile portfolios of individual stocks, there are always competing concepts regarding how the individual stocks should be weighted. The simplest (and not necessarily a bad) solution is to equalize the stocks. There's a certain logic behind this. When an active manager selects individual stocks, the confidence regarding the "correctness" of the selection is usually similar for all stocks. This then argues in favor of actually weighting all stocks more or less equally, because from this perspective, there's no reason to choose significantly different weightings for the stocks in the portfolio when the confidence in the quality of the decision is similar.

However, there are also compelling reasons to choose a different approach. If you, as an active asset manager and stock picker, move very large volumes in the markets, equalizing the stocks is not necessarily a good idea. The shares of many very small companies have such low liquidity that equalizing the shares in absolute terms results in such high volumes that they cannot be meaningfully represented in terms of liquidity. This argues for deviating from equal weighting and, for example, basing the weighting of shares more on their market capitalization. There is also another reason to align the weighting with the market capitalization of the shares: equal weighting of shares leads to a sometimes quite significant deviation in performance from a (market capitalization-weighted) benchmark, since small stocks are massively overweighted compared to the benchmark, while large stocks are massively underweighted with equal weighting. The sectoral allocation of an active stock-picking portfolio can also deviate massively from the benchmark structure with equal weighting, and the risk of a high tracking error, as a measure of relative risk compared to the benchmark, increases enormously with equal weighting.

Given these considerations, many active asset managers prefer to weight selected stocks based on the company's market capitalization when constructing portfolios. And this is where a problem arises: If an active asset manager is responsible for a concentrated portfolio – and initially, there's nothing wrong with this, because it simply shows that the manager represents his or her opinion with a high degree of confidence – then the probability increases that a few very large companies can massively dominate the portfolio. It's certainly conceivable that a portfolio consists of, say, 30 stocks, but three stocks already account for 50 percent of the weighting. If these three stocks come from the same sector and possibly even include stocks that don't dominate the benchmark, a massive imbalance can arise.

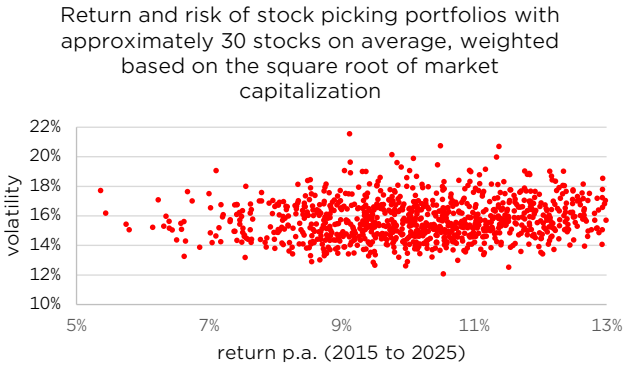
One solution to this problem would be to strike a balance between equal weighting and market capitalization, which we have already proposed in previous publications in this series: a weighting that is not based on market capitalization, but rather on the square root (or more precisely, the nth root) of market capitalization. This approach kills several birds with one stone: On the one hand, it links the weighting of the shares to the size of the company, thus taking into account aspects of liquidity and tracking error control; on the other, it reduces concentration risks, which mathematically inevitably arise from the use of concentrated stock-picking portfolios.

But how would an alternative form of weighting based on the square root of market capitalization work compared to a market capitalization-weighted approach? To test this, we simulated the selection behavior of stock pickers with numerous runs and calculated the effects of a different portfolio construction in each case. The procedure was as follows: In the first step, 1,000 portfolios were generated from the values of the STOXX 600 Europe, all of which could have existed exactly as they were for the period from 2015 to 2025. The portfolios had an average of 30 stocks; these portfolios were weighted once based on market capitalization and then once based on the square root of market capitalization. The result is logical, yet also striking. It turns out that the distribution of the return-risk point cloud (each point represents the return-risk combination of a specific portfolio) is significantly more concentrated. In other words, there are simply far fewer outliers when it comes to return and risk.

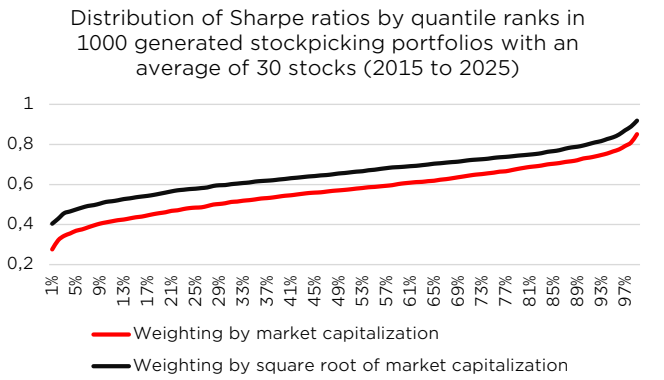


Source: LSEG Datastream and own calculations

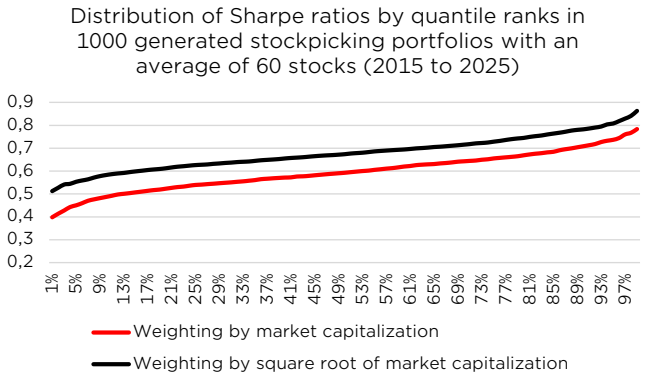
You get a much narrower distribution in both dimensions, which also means that, on average, you take on much less implicit risk with the root-based method. The distribution of Sharpe ratios is also more attractive for portfolios based on the root of market capitalization; this also applies to less concentrated portfolios with an average of 60 stocks.



Source: LSEG Datastream and own calculations



Source: LSEG Datastream and own calculations



Source: LSEG Datastream and own calculations

All these calculations and simulations speak a clear language: There may be good reasons not to apply equal weighting to concentrated stock-picking portfolios during portfolio construction. However, anyone who believes that a weighting structure based on market capitalization is a good alternative is also taking enormous implicit risks. The sweet spot in portfolio construction is likely to be a compression of the weightings over the square root of market capitalization.

Dr. Christian Jasperneite

Market data

Stock marktes	As of 13.06.2025 09:47	Change versus 06.06.2025 -1 week	12.05.2025 -1 month	12.03.2025 -3 months	12.06.2024 -1 year	31.12.2024 YTD
Dow Jones	42968	0,5%	1,3%	3,9%	11,0%	1,0%
S&P 500	5967	-0,6%	2,1%	6,6%	10,1%	1,4%
Nasdaq	19662	0,7%	5,1%	11,4%	11,7%	1,8%
DAX	23474	-3,4%	-0,4%	3,5%	26,0%	17,9%
MDAX	29717	-3,8%	-0,2%	3,6%	11,0%	16,1%
TecDAX	3813	-3,3%	0,4%	2,0%	10,2%	11,6%
EuroStoxx 50	5287	-2,6%	-1,9%	-1,3%	5,0%	8,0%
Stoxx 50	4525	-1,4%	0,2%	-1,2%	-0,8%	5,0%
SMI (Swiss Market Index)	12170	-1,6%	-0,4%	-5,4%	0,0%	4,9%
Nikkei 225	37834	0,2%	0,5%	2,8%	-2,7%	-5,2%
Brasilien BOVESPA	137800	1,2%	0,9%	11,3%	14,9%	14,6%
Indien BSE 30	81029	-1,4%	-1,7%	9,5%	5,8%	3,7%
China CSI 300	3864	-0,3%	-0,7%	-1,6%	9,0%	-1,8%
MSCI Welt	3945	0,8%	4,0%	8,3%	12,2%	6,4%
MSCI Emerging Markets	1203	1,7%	3,5%	8,2%	12,6%	11,8%
Bond markets						
Bund-Future	131,32	54	154	424	22	-212
Bobl-Future	118,13	-70	-23	148	213	27
Schatz-Future	107,36	14	24	78	190	37
3 Monats Euribor	1,95	-1	-19	-57	-177	-76
3M Euribor Future, Dec 2025	1,77	-4	-6	-34	-99	-13
3 Monats $ Libor	4,46	3	4	11	-105	9
Fed Funds Future, Dec 2025	3,84	5		17	-22	-7
10 year US Treasuries	4,35	-15	-11	4	2	-22
10 year Bunds	2,48	-8	-16	-38	-4	12
10 year JGB	1,41	-4	2	-10	43	33
10 year Swiss Government	0,26	-9	-11	-55	-54	-2
US Treas 10Y Performance	614,24	1,2%	1,3%	0,9%	4,2%	3,8%
Bund 10Y Performance	565,71	0,8%	1,6%	4,1%	3,1%	0,2%
REX Performance Index	460,38	0,3%	1,0%	3,1%	4,5%	1,7%
IBOXX AA, €	3,03	-8	-10	-25	-45	0
IBOXX BBB, €	3,39	-9	-19	-29	-64	-7
ML US High Yield	7,63	-7	-12	-2	-33	-2
Commodities						
MG Base Metal Index	421,08	0,4%	0,6%	-4,3%	-3,0%	3,8%
Crude oil Brent	72,81	9,5%	12,0%	2,1%	-11,4%	-2,6%
Gold	3415,87	2,8%	5,5%	16,4%	46,9%	30,1%
Silver	32,54	0,0%	-0,1%	-1,9%	8,0%	9,6%
Aluminium	2519,58	3,0%	1,8%	-7,3%	0,1%	-0,3%
Copper	9787,51	0,3%	2,5%	0,4%	-0,3%	13,1%
Iron ore	95,46	-0,7%	-4,3%	-5,9%	-10,3%	-7,9%
Freight rates Baltic Dry Index	1904	16,6%	46,0%	22,1%	3,7%	91,0%
Currencies						
EUR/ USD	1,1549	1,2%	4,0%	6,1%	7,3%	11,2%
EUR/ GBP	0,8510	1,1%	1,1%	1,0%	0,7%	2,9%
EUR/ JPY	165,95	0,8%	0,9%	2,3%	-2,0%	1,8%
EUR/ CHF	0,9365	-0,2%	0,0%	-2,6%	-2,9%	-0,5%
USD/ CNY	7,1809	-0,2%	-0,3%	-0,9%	-0,8%	-1,7%
USD/ JPY	143,50	-0,9%	-3,3%	-3,2%	-8,4%	-8,7%
USD/ GBP	0,74	-0,3%	-2,7%	-4,4%	-5,3%	-7,7%

Source: LSEG Datastream

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