

# Economic Situation and Strategy

28 March 2024

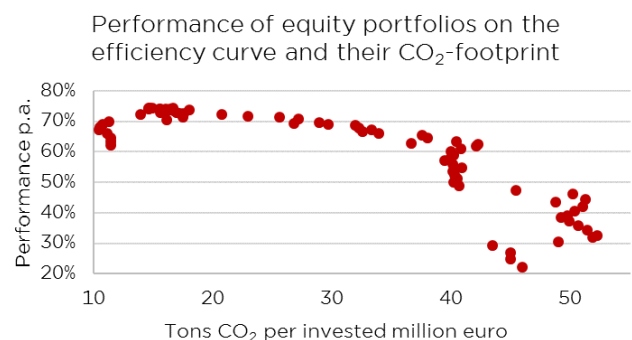
## Low-CO<sub>2</sub> Portfolios and Performance: Do They Go Together?

For years, there have been discussions regarding whether the performance of portfolios is related to their CO<sub>2</sub> intensity. It is often postulated that a higher CO<sub>2</sub> footprint of a portfolio also implies higher costs for companies, such as in the form of increased expenditures for European, Chinese, or Californian emission rights. Therefore, an orientation towards low-emission stocks should be beneficial for performance. Empirically, it can also be demonstrated that CO<sub>2</sub>-reduced portfolios have indeed outperformed, on average, compared to "dirty," CO<sub>2</sub>-intensive portfolios in recent years. However, the question arises as to whether this is a universally applicable relationship or whether there is a specific characteristic of this time period. After all, this period was characterized by significant capital inflows into "green" assets and the rise of low-CO<sub>2</sub> tech stocks. It would be implausible, though, to assume that this trend will continue indefinitely. One could argue that markets are fundamentally efficient, and at some point, criteria such as different CO<sub>2</sub> intensities are already largely priced in.

## CO<sub>2</sub> and Performance: The Empirical Evidence

Since the market is generally efficient, it would be surprising if there was some kind of a CO<sub>2</sub> premium in the market that didn't need to be "paid" for in one way or another. The assumption would therefore be that this premium may potentially be "purchased" with higher volatility. To test this, we determined the CO<sub>2</sub> footprint for equity portfolios on the efficient frontier, and in a second step, examined which volatilities are associated with the CO<sub>2</sub> footprint. Determining the efficient frontier is not as

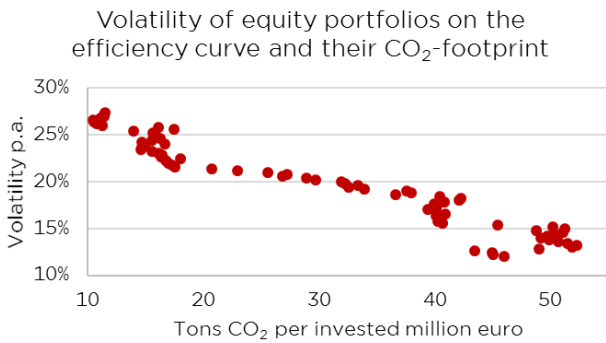
straightforward as one might think. What appears simple and logical in textbooks is only computable in practice if certain conditions are predefined. This includes, for example, the investment universe (in our case, the largest 100 stocks from Europe and the USA, which additionally have a complete CO<sub>2</sub> dataset since 2018). Additionally, it must be determined in advance what maximum weights are allowed for individual stocks, as extremely high weights for individual stocks would not be feasible in practice, even if this retrospectively would have been the most efficient solution. Therefore, in our calculations, we defined the maximum weight for a stock to be three percent.



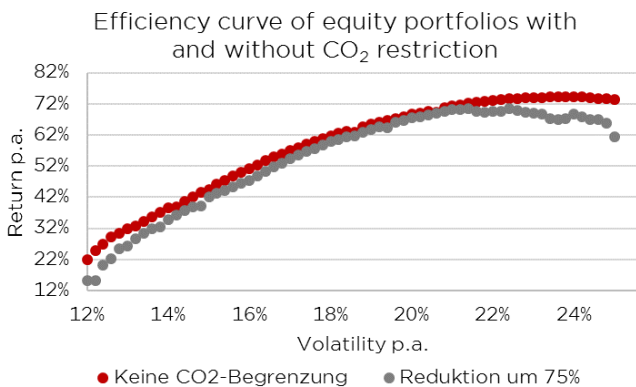
As a result, it appears that over the past six years, a lower CO<sub>2</sub> footprint would have tended to lead to higher returns. The very high annual returns may initially appear to be an error. However, it's important not to forget that this concerns the efficient frontier – these are the perfect combinations of stocks that would have been located on the efficient frontier if one had god-like abilities in selection and portfolio construction. It is impossible for a human to actually achieve the efficient frontier, but portfolios up to this frontier would have been technically pos-

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sible. Unfortunately, the suspicion that the good performance of the "clean" portfolios comes at a price in the form of higher risk is confirmed.



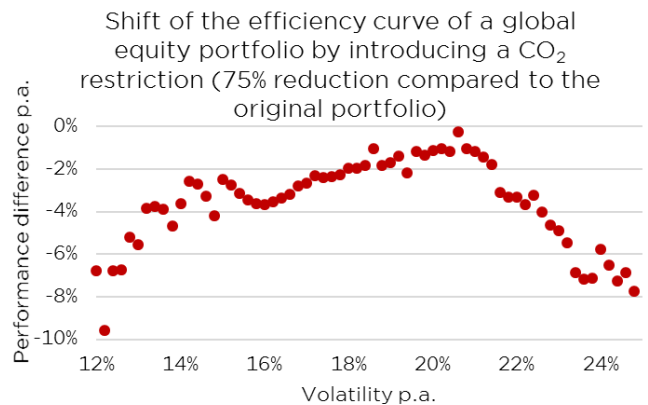
When comparing the CO<sub>2</sub> footprint to the risk for portfolios on the efficient frontier, it becomes evident that the "clean" and thus well-performing portfolios are indeed also the risky portfolios, characterized by high volatility. Once again, the old financial market wisdom proves true: there is no "free lunch." There is always a catch somewhere. To better delineate this catch of low-CO<sub>2</sub> portfolios, we calculated how the efficiency curve and the feasible space shift when a CO<sub>2</sub> restriction is introduced.



For the calculation, we recorded the respective footprint for each portfolio on the efficient frontier, and then subsequently constructed a portfolio that, at the same volatility level, has a 75% reduced CO<sub>2</sub> footprint. The result is quite striking: Across the entire curve, the average shift of the feasible space is over three percentage points, with even more significant performance losses occurring at the extremes (with particularly high and particularly low volatility).

In other words, it is not trivial to decide to continuously reduce the CO<sub>2</sub> footprint of portfolios. With the same

level of risk, one can expect substantial long-term average performance losses, which can only be compensated for by accepting higher risks. In short, as an asset manager, significant degrees of freedom are sacrificed when subjecting oneself to the restriction of a strong CO<sub>2</sub> reduction at the portfolio level. This does not necessarily mean that it becomes impossible to outperform the benchmark – the benchmark typically lies well below the efficient frontier of the feasible space. However, for stock pickers, it becomes increasingly challenging year after year to outperform the benchmark without having to increase risk when the CO<sub>2</sub> footprint is gradually reduced.



Now one could argue that at least the price one pays serves a good purpose, as the cost of capital for "green" companies tends to decrease while it increases for "dirty" companies. But here too, there is resistance in the argumentation, as one could also argue that precisely the companies that are "dirty" and have a high transformation leverage are the ones that actually need particularly favorable access to the capital market. But is there a solution? One possibility would be to add securities to the portfolio that have a decidedly negative CO<sub>2</sub> footprint, for example, by securitizing the retirement of European emission rights. The advantage of this methodology is clear: it restores flexibility in portfolio construction and avoids the risk of being forced to deviate from the intended strategic allocation, allowing the feasible space to be utilized up to the edge of the efficiency curve.

Dr. Christian Jasperneite

## Market data

| Stock markets                  | As of               | Change versus         |                        |                         |                       |                   |
|--------------------------------|---------------------|-----------------------|------------------------|-------------------------|-----------------------|-------------------|
|                                | 28.03.2024<br>16:08 | 21.03.2024<br>-1 week | 27.02.2024<br>-1 month | 27.12.2023<br>-3 months | 27.03.2023<br>-1 year | 29.12.2023<br>YTD |
| Dow Jones                      | 39732               | -0,1%                 | 1,9%                   | 5,5%                    | 22,5%                 | 5,4%              |
| S&P 500                        | 5312                | 1,3%                  | 4,6%                   | 11,1%                   | 33,6%                 | 11,4%             |
| Nasdaq                         | 16399               | 0,0%                  | 2,3%                   | 8,6%                    | 39,3%                 | 9,2%              |
| DAX                            | 18510               | 1,8%                  | 5,4%                   | 10,6%                   | 22,4%                 | 10,5%             |
| MDAX                           | 27068               | 2,2%                  | 4,2%                   | -0,3%                   | 1,3%                  | -0,3%             |
| TecDAX                         | 3461                | 1,2%                  | 1,0%                   | 3,6%                    | 6,1%                  | 3,7%              |
| EuroStoxx 50                   | 5090                | 0,7%                  | 4,2%                   | 12,4%                   | 22,2%                 | 12,6%             |
| Stoxx 50                       | 4432                | 0,7%                  | 3,1%                   | 8,6%                    | 15,4%                 | 8,3%              |
| SMI (Swiss Market Index)       | 11718               | 0,1%                  | 2,4%                   | 5,4%                    | 8,6%                  | 5,2%              |
| Nikkei 225                     | 40168               | -1,6%                 | 2,4%                   | 19,3%                   | 46,2%                 | 20,0%             |
| Brasilien BOVESPA              | 128075              | -0,1%                 | -2,7%                  | -4,6%                   | 28,5%                 | -4,6%             |
| Russland RTS                   | 1126                | 0,1%                  | 2,6%                   | 5,4%                    | 12,4%                 | 3,9%              |
| Indien BSE 30                  | 73651               | 1,4%                  | 0,8%                   | 2,2%                    | 27,7%                 | 2,0%              |
| China CSI 300                  | 3521                | -1,7%                 | 0,7%                   | 5,5%                    | -12,2%                | 2,6%              |
| MSCI Welt                      | 3437                | 0,1%                  | 3,2%                   | 8,2%                    | 27,2%                 | 8,5%              |
| MSCI Emerging Markets          | 1037                | -1,1%                 | 0,9%                   | 2,7%                    | 7,5%                  | 1,3%              |
| <b>Bond markets</b>            |                     |                       |                        |                         |                       |                   |
| Bund-Future                    | 133,37              | 111                   | 111                    | -527                    | -356                  | -385              |
| Bobl-Future                    | 118,23              | 44                    | 214                    | -152                    | -47                   | -105              |
| Schatz-Future                  | 105,70              | 4                     | 57                     | -87                     | -42                   | -85               |
| 3 Monats Euribor               | 3,91                | 0                     | 0                      | 1                       | 90                    | 3                 |
| 3M Euribor Future, Dec 2024    | 3,00                | -3                    | -2                     | 73                      | 21                    | 70                |
| 3 Monats \$ Libor              | 5,56                | -2                    | -4                     | -5                      | 42                    | -3                |
| Fed Funds Future, Dec 2024     | 4,67                | 5                     | 0                      | 85                      | 154                   | 84                |
| 10 year US Treasuries          | 4,19                | -8                    | -13                    | 40                      | 66                    | 33                |
| 10 year Bunds                  | 2,29                | -9                    | -14                    | 42                      | 6                     | 29                |
| 10 year JGB                    | 0,71                | -3                    | 2                      | 11                      | 42                    | 9                 |
| 10 year Swiss Government       | 0,69                | 4                     | -20                    | 1                       | -48                   | -1                |
| US Treas 10Y Performance       | 591,23              | 0,8%                  | 1,3%                   | -2,2%                   | -1,8%                 | -1,6%             |
| Bund 10Y Performance           | 556,91              | 0,9%                  | 1,5%                   | -2,5%                   | 2,0%                  | -1,5%             |
| REX Performance Index          | 442,88              | 0,3%                  | 0,4%                   | -2,1%                   | 1,0%                  | -1,1%             |
| IBOXX AA, €                    | 3,26                | -9                    | -19                    | 26                      | -25                   | 19                |
| IBOXX BBB, €                   | 3,84                | -8                    | -19                    | 15                      | -66                   | 9                 |
| ML US High Yield               | 7,85                | 1                     | -15                    | 8                       | -108                  | 5                 |
| <b>Commodities</b>             |                     |                       |                        |                         |                       |                   |
| MGBase Metal Index             | 389,07              | -2,5%                 | 2,1%                   | -0,3%                   | -5,8%                 | -0,5%             |
| Crude oil Brent                | 87,34               | 2,1%                  | 4,9%                   | 8,9%                    | 11,7%                 | 12,4%             |
| Gold                           | 2215,60             | 1,8%                  | 9,0%                   | 6,6%                    | 13,2%                 | 7,3%              |
| Silver                         | 24,54               | -0,9%                 | 8,9%                   | 1,2%                    | 6,7%                  | 1,2%              |
| Aluminium                      | 2251,77             | -0,1%                 | 5,1%                   | -3,7%                   | -3,0%                 | -4,0%             |
| Copper                         | 8744,39             | -1,1%                 | 4,4%                   | 1,8%                    | -2,3%                 | 3,3%              |
| Iron ore                       | 109,84              | -1,0%                 | -12,7%                 | -19,3%                  | -12,8%                | -19,5%            |
| Freight rates Baltic Dry Index | 1845                | -17,6%                | -2,8%                  | -11,9%                  | 26,7%                 | -11,9%            |
| <b>Currencies</b>              |                     |                       |                        |                         |                       |                   |
| EUR/ USD                       | 1,0795              | -1,0%                 | -0,6%                  | -2,4%                   | 0,2%                  | -2,3%             |
| EUR/ GBP                       | 0,8546              | -0,3%                 | -0,1%                  | -1,6%                   | -2,7%                 | -1,4%             |
| EUR/ JPY                       | 163,31              | -1,0%                 | 0,2%                   | 3,5%                    | 15,3%                 | 4,5%              |
| EUR/ CHF                       | 0,9740              | -0,3%                 | 2,1%                   | 3,2%                    | -1,4%                 | 5,2%              |
| USD/ CNY                       | 7,2270              | 0,3%                  | 0,4%                   | 1,2%                    | 5,0%                  | 1,7%              |
| USD/ JPY                       | 151,33              | -0,2%                 | 0,5%                   | 6,7%                    | 15,0%                 | 7,3%              |
| USD/ GBP                       | 0,79                | 0,3%                  | 0,5%                   | 1,3%                    | -2,8%                 | 1,0%              |

Source: Refinitiv Datastream

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