

/ Economic Situation and Strategy

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CO₂ reduction in portfolios: the long march into the unknown

Over the past few years, many asset managers and capital collectors have committed themselves to reducing the carbon footprint of their portfolios. If you want to keep your portfolio on a 1.5-degree path, you currently have to reduce the carbon footprint of your portfolio by around eight percent per year.

The idea behind this is as follows: There is a certain (unfortunately not perfectly determinable) level of CO2 concentration in the air that is just compatible with global warming of 1.5 degrees. This concentration is used to derive a residual budget of CO₂ emissions that is still permissible in order not to miss this concentration and thus the temperature target. The math behind this is ultimately a simple rule of three and can basically be calculated by any student from the seventh grade onwards. If we want to have exhausted the remaining emissions budget by 2050, for example (we could also aim for 2060, for example; the total quantity of emissions is relevant for the climate, not the distribution over time, as CO₂ remains in the atmosphere for 200 years after it is emitted anyway), according to current calculations, emissions must be reduced by around eight percent p.a. so that we end the year 2050 at around zero in order to then achieve a CO₂ concentration in the atmosphere that is just tolerable with the total emissions.

If all companies were to align their economic activity with this target, the world would be on a 1.5-degree path and the footprint of every portfolio would automatically follow this path. However, as this is not the case, it can also appear sensible and expedient for an investor who is indirectly responsible for emissions with his investments in bonds and equities to trim his portfolio to a 1.5-degree path by reallocating. This is because the investor will then indirectly (!!) finance those companies that are compatible with this desired path. In addition to the voluntary commitments, however, there are also increasing regulatory requirements that suggest adherence to such a path. It is reasonable to assume that the intensity of the regulator's intervention will continue to increase and that compliance with a 1.5 degree target could increasingly become a standard requirement for many investors, even if this means gradually moving away from the strategic allocation that was actually intended.

CO_2 reduction is very easy for investors in the first few years

If you now start to reduce the carbon footprint of portfolios, this can initially be achieved very simply by (partially) selling very carbon-intensive positions. It is not uncommon to find a few stocks in the portfolio that together account for 50 percent of all CO₂ emissions. Here it is easy to reduce the carbon footprint without significantly affecting the performance or risk of the overall portfolio after the (partial) sale of these stocks. But what happens when the "low-hanging-fruits" of the portfolio adjustment have been processed after a few years? It is already intuitively clear that at a certain point you run the risk of running into an invisible wall. However, when this happens depends heavily on the extent to which the portfolio companies succeed in reducing their CO₂ emissions themselves. Ideally, the CO₂ emissions of the companies held in the portfolio will fall so sharply in the coming years that major shifts will not be necessary. However, experience shows that this is not possible. The reality is as follows: Listed companies grow faster than entire economies. It is therefore particularly difficult for these fast-growing companies to achieve the desired reduction targets year after year. This would only be possible if the CO_2 intensity of production were to be reduced by significantly more than 10 percent year on year - a completely unrealistic idea. In real life, all that is left are shifts that present portfolio construction with ever greater challenges year after year.

Absolute and relative risks literally explode

But how big are these challenges? This question is not easy to answer, because nobody knows the future. However, the past is not such a bad guide on capital markets, especially when it comes to risks. Our test setup was as follows: For the years 2018 to 2023, we used the respective historical index members of the STOXX 600 Europe and the STOXX 600 North America year by year to simulate portfolios that could have actually existed in exactly the same way. In a first step, around 80-160 shares per region were randomly selected from the 600 shares in each of the two indices to represent the region in the portfolio. The shares were weighted according to their market capitalization; the portfolios were always fully invested. The CO₂ footprint was determined for each of the portfolios created in this way. In a second step, the CO₂ footprint was reduced to an extent selected by the random generator. The reduction was achieved by reallocating or selling the previously selected shares of the original portfolio without CO₂ restriction. The reallocations (and in very rare cases the complete sales) were carried out in such a way that the expected tracking error to the respective benchmark (STOXX 600 Europe or STOXX 600 North America) as well as to the original portfolio was minimized. For each region and each year, 2,000 runs were calculated and it was recorded how the relative performance to the original portfolio, the tracking error to the benchmark and the absolute risk compared to the original portfolio changed as a function of the CO₂ reduction.

The results are very consistent across all years and both regions. This shows that reductions in the CO_2 footprint of more than 50 percent compared to the original portfolio lead to massive deviations in performance compared to the original portfolio.

Performance and CO2 intensity 2023 USA



There are years in which a gradual reduction in CO_2 leads to a certain outperformance, but there are similarly many years in which exactly the opposite is the case, sometimes even to a very significant extent.





For example, portfolios in the USA in 2022 (Canada is also represented in the index with a few stocks) lost an average of around six percentage points in performance if the carbon footprint was reduced by 80 percent. Among the 2,000 simulated portfolios, there were only very few portfolio structures that benefited at all from a CO_2 reduction in that year.





A similar picture emerged in Europe; more important than the respective sign of out- or underperformance, however, is the enormous extent of the deviation from the performance of the original portfolio in percentage points after just one year! Many investors are probably not even aware of the relative risks they are taking when they describe the path to climate-neutral portfolios via reallocations.



In addition to relative risks, there are of course also absolute risks, which have systematically increased in almost all simulation runs over all years as soon as CO2 restrictions were introduced in portfolios.





In addition, our calculations show that CO₂ restrictions in portfolios not only lead to significant deviations in performance compared to the original portfolio; the tracking

error to the respective benchmark compared to the tracking error to the benchmark of a portfolio without restrictions also systematically increases as soon as CO2 restrictions are introduced. There are years in which the tracking error to the benchmark can very easily increase by two or more percentage points if the CO₂ reduction is more than 50 percent.

That doesn't sound dramatic at first. But if you consider that the average of the tracking error calculations of all simulated portfolios without restrictions was 3.5 percent, a surcharge of 2.5 percent or more on this tracking error is a kind of catapult start into a completely different relative risk dimension!



Change in tracking error depending on CO2 reduction Europe (2023)



In summary, it can be said that the decision to embark on the 1.5 degree path as an investor is not a sure-fire success. Investors will soon come across the limits of portfolio construction. This is particularly true if the portfolios deviate significantly from the targeted strategic allocation at the end of the process. It is not uncommon for exactly such allocation structures to have been derived with great effort in asset-liability management studies, which then lead to absurdity in real life. However, there is a solution to this problem - more on this in one of the next issues of Economics and Strategy.

Dr. Christian Jasperneite

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Band-Future 152.58 -38 -189 136 -174 -464 Schaz-Future 105.10 -23 -78 4 -21 -144 Monts Enthor 3.95 4 4 4 105 6 Monts Enthor 3.95 4 4 4 126 6 Matribo Future, Dec 2024 2.99 8 38 -11 -9 69 Monts S Libor 5.58 1 0 -6 66 -1 Ioyear US Treasuries 4.35 4 2.5 -8 40 48 10 year Vids 2.47 9 21 -6 -1 4.7 10 year Vids 0.72 -1 9 -2 2.2 10 10 year Vids 0.75 7 17 7 17 15 10 year Vids 0.76 -1.0% 3.5% -2.28% REX Bind Performance 582.70 -0.1% -1.5% 1.7%							
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3 Monats Eurbor 3.95 4 4 4 4 126 6 M Enibor Future, De 2024 2.99 8 3.8 -11 -9 60 SM Datio S Libor 5.58 1 0 6 66 -1 Fed Funds Future, De 2024 4.64 11 56 10 88 81 10 year US Treasuries 4.35 4 25 -8 40 48 10 year US Treasuries 4.35 4 25 -8 40 48 10 year US Treasuries 4.35 4 25 -8 40 48 10 year US 0.72 -1 9 -2 22 10 10 year GM 0.75 -2 -10 -57 17 15 Bin 100 Performance 58/20 -10% 1.6% 3.5% -2.8% Bin 10 Performance 58/48 -0.2% 1.3% 2.7% -1.6% BOX As 6 3.44 1 10	Schatz-Future	105,10	-23	-78	4	-21	-144
SM Earbor Future, Dec 2024 2.99 8 38 -11 -9 69 Monta's Likor 5.58 1 0 -6 66 -1 Fed Funds Future, Dec 2024 4.64 11 56 10 88 81 10 year US 4.35 4 25 -8 40 48 10 year VB 0.72 -1 9 -2 22 10 10 year SMs Government 0.87 -5 -2 10 -57 17 US Treass 10Y Performance 582,70 -0.1% -1.5% 1.7% 0.3% -3.0% Bud 10Y Performance 582,80 -0.2% -1.0% 1.6% 3.5% -2.8% IBOXX AA, € 3.44 1 10 -2.9 -1.8 37 IBOXX BB, € 3.44 1 10 -2.9 -1.8 37 IBOXX BB, € 3.44 1 10 -2.9 -1.8 37 IBOX BB, € 3.266 1.4	3 Monats Euribor	3.95	4	4	4	126	6
Instruction 125 0 13 14 5 65 Fed Funds Future, Dec 2024 4.64 11 56 10 88 81 10 year US Treasuries 4.35 4 25 -8 40 48 10 year US Treasuries 4.35 4 25 -8 40 48 10 year US Treasuries 0.72 -1 9 -2 22 10 10 year SWiss Government 0.87 -5 -2 -10 -57 17 US Treas IOY Performance 582,70 -0,11% -1.5% 1.7% 0.3% -3.0% Bud IOY Performance 582,70 -0,31% -1.6% 5.5% -2.28% REX Performance Index 440,78 -0.3% -0.3% 1.3% 2.7% -1.6% BOXX AA, € 34.4 1 10 -29 -18 37 BOXX BBR, € 4.03 -1 4 -49 -44 27 ML US High Yield 7.59 </td <td>3M Euribor Euture, Dec 2024</td> <td>2.99</td> <td>8</td> <td>38</td> <td>-11</td> <td>-9</td> <td>69</td>	3M Euribor Euture, Dec 2024	2.99	8	38	-11	-9	69
Johnson Jacob 1 0 <	3 Monate \$ Libor	5.58	1	0	-6	66	-1
rear Finites Fundie, Dec. 2024 4,64 11 350 10 85 81 10 year US Treasuries 4,35 4 25 -8 40 48 10 year US Treasuries 2,47 9 21 -6 -1 47 10 year CB 0,72 -1 9 -2 22 10 10 year KB 0,77 -5 -2 -10 -57 17 US Treasury Performance 582,70 -0.1% -1.5% 1.7% 0.3% -2.2% Bind 10Y Performance 582,70 -0.1% -1.5% 1.7% 0.3% -2.2% Bind 10Y Performance 549,48 -0.2% -1.0% 1.6% 3.5% -2.2% BiDXX AA, € 3.44 1 10 -29 -18 37 BOXX BBB, € 4.03 -1 4 -49 -44 27 MLUS BBB, € 4.03 -1 4 -49 -44 27 MLUS DEL 3.2%	E d Ern de Entrem Des 2024	5,58	1	50	-0	00	-1
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10 year JUS 14 25 -8 40 48 10 year JGB 2,47 9 21 -6 -1 47 10 year JGB 0,72 -1 9 -2 22 10 10 year JGB 0,72 -1 9 -2 22 10 10 year JGB 0,72 -1 9 -2 22 10 10 year JGB 0,72 -1 9 -2 22 10 10 year JSWis Government 0,87 -5 -2 -10 -57 17 US Treasity Performance 549,48 -0.2% -1.0% 1.6% 3.5% -2.3% REX Performance 3.44 1 10 -29 -18 37 IBOXX AA, € 3.44 1 10 -29 -18 37 IBOX BB, € 40.3 -1 4 -49 -44 27 MLUS High Yield 7.99 -6 0 -71 -81							
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10 year JGB 0.72 -1 9 -2 22 10 10 year Swiss Government 0.87 -5 -2 -10 -57 17 10 year Swiss Government 582,70 -0,1% -1,5% 1,7% 0.3% -3,0% Bund 10Y Performance 549,48 -0,2% -1,0% 1,6% 3,5% -2,8% REX Performance Index 40,78 -0,3% -0,3% 1,3% 2,7% -1,0% IBOXX AA, € 3,44 1 10 -29 -18 37 IBOXX BBB, € 4,03 -1 4 49 -44 27 ML US High Yield -9 -6 0 -71 -81 19 Commodities Commodities Commodities MG Base Metal Index 382,66 1,4% 2,5% 0,4% -11,0% -2,1% Cold Brent 82,86 -0,4% 3,6% 1,0% 2,8% 6,7% Cold Gibrent 82,86 -0,4% 3,0% 1,0% -2,1% <tr< td=""><td>10 year Bunds</td><td>2,47</td><td>9</td><td>21</td><td>-6</td><td>-1</td><td>47</td></tr<>	10 year Bunds	2,47	9	21	-6	-1	47
	10 year JGB	0,72	-1	9	-2	22	10
US Treas 10Y Performance 582,70 -0.1% -1.5% 1.7% 0.3% -3.0% Bund 10Y Performance 549,48 -0.2% -1.0% 1.6% 3.5% -2.8% REX Performance Index 440,78 -0.3% -0.3% 1.3% 2.7% -1.6% IBOXX AA, € 3.44 1 10 -29 -1.8 37 IBOXX BBB, € 4.03 -1 4 -49 -44 27 ML US High Yield 7.99 -6 0 -71 -81 19 Commodities	10 year Swiss Government	0,87	-5	-2	-10	-57	17
Bund 10Y Performance 549,48 -0.2% -1.0% 1.6% 3.5% -2.8% REX Performance Index 440,78 -0.3% -0.3% 1.3% 2.7% -1.6% IBOXX AA, ϵ $3,44$ 1 10 -29 -18 37 IBOXX BBB, ϵ 4.03 -1 4 -49 -44 27 ML US High Yield 7.99 -6 0 -71 -81 19 Commodities Commodities MG Base Metal Index $382,66$ 1.4% 2.5% 0.4% -11.0% -2.1% Gold 2017.70 0.4% 3.0% 1.0% 2.2% 6.7% Sliver 22.76 -2.4% 1.1% 3.0% 3.0% 6.6% 0.4% Corper 8499.50 1.1% 3.0% 3.0% 6.6% 0.4% Corper 1752 8.8% 1.4% -0.2% 1.5%	US Treas 10Y Performance	582,70	-0.1%	-1.5%	1.7%	0.3%	-3.0%
REX Performance Index 10.11 10.	Bund 10Y Performance	549.48	-0.2%	-1.0%	1.6%	3.5%	-2.8%
RACK Tenomine matrix 440,75 0.5% 0.5% 0.5% 1.5% 2.7% 1.0% IBOXX AA, € 3,44 1 10 -29 -18 37 IBOXX BBB, € 4,03 -1 4 -49 -444 27 ML US High Yield 7.99 -6 0 -71 -81 19 Commodities	PEV Parformance Index	440.78	0,2%	0.3%	1,3%	2.7%	1.6%
BOXX AA, ε $3,44$ 1 10 -29 -18 37 BOXX BBB, ε $4,03$ -1 4 49 -44 27 ML US High Yield $7,99$ -6 0 -71 -81 19 Commodities $ -$ <th< td=""><td>KEA I enomance index</td><td>440,78</td><td>-0,570</td><td>-0,570</td><td>1,370</td><td>2,770</td><td>-1,070</td></th<>	KEA I enomance index	440,78	-0,570	-0,570	1,370	2,770	-1,070
IBOXA AA, ¢ 5,44 1 10 -29 -18 37 IBOXA BBB, € 4,03 -1 4 -49 -44 27 IBOXA BBB, € 7,39 -6 0 -71 -81 19 Commodities - - - 0 -71 -81 19 MG Base Metal Index 382,66 1,4% 2,5% 0,4% -11.0% -2,1% Crude oil Brent 82,86 -0.4% 3,6% 1.0% 2,8% 6,7% Gold 2017,70 0,4% -0.2% 1,2% 9.9% -2,3% Silver 22,76 -2,4% 1,1% -3,7% 5,2% -6,1% Aluminium 2154,74 -2,0% 1,8% -1,1% -9,3% -8,1% Copper 8499,50 1,1% 3,0% 3,0% -6,6% 0,4% Iron ore 127,82 -1,1% -5,6% -1,6% 1,6% -6,3% Freight rates Baltic Dry Index	IDONAL A A C	2.44		10	20	10	27
IBOXX BBB, € 4,03 -1 4 -49 -44 27 ML US High Yield 7,99 -6 0 -71 -81 19 Commodities	IBOXX AA, t	3,44	1	10	-29	-18	37
ML US High Yield 7,99 -6 0 -71 -81 19 Commodities MG Base Metal Index 382,66 1,4% 2,5% 0,4% -11,0% -2,1% Cude oil Brent 82,86 -0,4% 3,6% 1,0% 2,8% 6,7% Gold 2017,70 0,4% -0,2% 1,2% 9,9% -2,3% Silver 22,76 -2,4% 1,1% -3,7% 5,2% -6,1% Aluminium 2154,74 -2,0% 1,8% -1,1% -9,3% -8,1% Copper 8499,50 1,1% 3,0% 3,0% -6,6% 0,4% Ion one 127,82 -1,1% -5,6% -1,6% 1,6% -6,3% Freight rates Baltic Dry Index 1752 8,8% 15,4% -0,2% 159,9% -16,3% EUR / USD 1,0819 0,5% -0,7% -0,8% 1,6% -2,1% USD / CHF 0,9534 0,5% 0,8% -1,1% -3,4% 3,0% USD / CNY 1,195 -0,1% 0,0% 0,5% 4,4% <td>IBOXX BBB,€</td> <td>4,03</td> <td>-1</td> <td>4</td> <td>-49</td> <td>-44</td> <td>27</td>	IBOXX BBB,€	4,03	-1	4	-49	-44	27
Commodities NGBase Metal Index 382,66 1,4% 2,5% 0,4% -11,0% -2,1% Crude oil Brent 82,86 -0,4% 3,6% 1,0% 2,8% 6,7% Gold 2017,70 0,4% -0.2% 1,2% 9.9% -2,3% Silver 22,76 -2,4% 1,1% -3,7% 5,2% -6,1% Aluminium 2154,74 -2,0% 1,8% -1,1% -9,3% -8,1% Copper 8499,50 1,1% 3,0% 3,0% -6,6% 0,4% Iron ore 127,82 -1,1% -5,6% -1,6% 1,6% -6,3% Freight rates Baltic Dry Index 1752 8,8% 15,4% -0,2% 159,9% -16,3% EUR / USD 1,0819 0,5% -0,7% -0,8% 1,6% -2,1% EUR / GBP 0,8541 -0,2% -0,2% -2,1% -3,0% -1,4% USD / CNY 1,085 0,7% 1,3% 0,5% 1,3% 4	ML US High Yield	7,99	-6	0	-71	-81	19
Commodities June 1000 MG Base Metal Index 382,66 1,4% 2,5% 0,4% -11,0% -2,1% Crude oil Brent 82,86 -0,4% 3,0% 1,0% 2,2% 6,7% Gold 2017,70 0,4% -0,2% 1,2% 9,9% -2,3% Silver 2,276 -2,4% 1,1% -3,7% 5,2% -6,1% Aluminium 2154,74 -2,0% 1,8% -1,1% -9,3% -8,1% Copper 8499,50 1,1% 3,0% 3,0% -6,6% 0,4% Iron or 127,82 -1,1% -5,6% -1,6% 1,6% -6,3% Freight rates Baltic Dry Index 1752 8,8% 15,4% -0,2% 159,9% -16,3% EUR USD 1,0819 0,5% -0,7% -0,8% 1,6% -2,1% EUR / GBP 0,8541 -0,2% -2,1% -3,0% -1,4% EUR / GP 0,9534 0,5% 0,5% 1,3% 3,							
Commodities	a						
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NG Dase weight nuck 382,00 1,4% 2,5% 0,4% -11,0% -2,1% Crude oil Brent 82,86 -0,4% 3,6% 1,0% 2,8% 6,7% Gold 2017,70 0,4% -0,2% 1,2% 9,9% -2,3% Silver 22,76 -2,4% 1,1% -3,7% 5,2% -6,1% Aluminium 2154,74 -2,0% 1,8% -1,1% -9,3% -8,1% Copper 8499,50 1,1% 3,0% 3,0% -6,6% 0,4% Iron ore 127,82 -1,1% -5,6% -1,6% 1,6% -6,3% Freight rates Baltic Dry Index 1752 8,8% 15,4% -0,2% 159,9% -16,3% EUR/ USD 1,0819 0,5% -0,7% -0,8% 1,6% -2,1% EUR/ GBP 0,8541 -0,2% -0,2% -2,1% -3,0% -1,4% USD / CNY 1,085 0,7% 1,3% 0,5% 1,3,8% 4,3%	MC Pasa Matal Inday	202.00	1.40/	2.50	0.494	11.0%	2.16/
Chude oil Brent 82,260 -0,4% 3,0% 1,1% 2,2% 6,7% Gold 2017,70 0,4% -0,2% 1,2% 9,9% -2,3% Gold 2017,70 0,4% -0,2% 1,2% 9,9% -2,3% Silver 22,76 -2,4% 1,1% -3,7% 5,2% -6,1% Aluminium 2154,74 -2,0% 1,8% -1,1% -9,3% -8,1% Copper 8499,50 1,1% 3,0% 3,0% -6,6% 0,4% Iron ore 127,82 -1,1% -5,6% -1,6% 1,6% -6,3% Freight rates Baltic Dry Index 1752 8,8% 15,4% -0,2% 159,9% -16,3% EUR/ USD 1,0819 0,5% -0,7% -0.8% 1,6% -2,1% EUR/ GBP 0,8541 -0,2% -0,2% -2,1% -3,0% -1,4% USD / CMY 163,05 0,7% 1,3% 0,5% 1,38% 4,3% US	MG Base Metal Index	382,66	1,4%	2,5%	0,4%	-11,0%	-2,1%
Gold 2017,70 0.4% -0.2% 1.2% 9.9% -2.3% Silver 22,76 -2.4% 1,1% -3.7% 5.2% -6.1% Aluminium 2154,74 -2.0% 1,8% -1,1% -9.3% -8.1% Copper 8499,50 1,1% 3.0% 3.0% -6.6% 0.4% Iron ore 127,82 -1,1% -5.6% -1.6% 1.6% -6.3% Freight rates Baltic Dry Index 1752 8.8% 15.4% -0.2% 159.9% -16.3% Currencies EUR/ USD 1,0819 0.5% -0.7% -0.8% 1.6% -2,1% EUR/ GBP 0.8541 -0.2% -2,1% -3.0% -1.4% EUR/ IPY 163.05 0.7% 1,3% 0.5% 1.3% 4.3% USD / CNY 7,1985 -0.1% 0.0% 0.5% 4.4% 1.3% USD / CNY 7,1985 -0.1% 0.0% 0.5% 4.4%	Crude oil Brent	82,86	-0,4%	3,6%	1,0%	2,8%	6,7%
Silver 22.76 -2.4% 1,1% -3.7% 5.2% -6.1% Aluminium 2154,74 -2.0% 1,8% -1,1% -9.3% -8.1% Copper 8499,50 1,1% 3.0% 3.0% -6.6% 0.4% Ion ore 127.82 -1.1% -5.6% -1.6% 1.6% -6.3% Freight rates Baltic Dry Index 1752 8.8% 15.4% -0.2% 159.9% -16.3% EUR/ USD 1.0819 0.5% -0.7% -0.8% 1.6% -2.1% EUR/ GBP 0.8541 -0.2% -0.2% 1.3% -2.1% USD (CHF 0.9534 0.5% 0.8% -1.1% -3.4% 3.0% USD / IPY 150,53 0.2% 1.6% 0.7% 1.6% 6.7% USD/ GBP 0.79 -0.6% 0.4% -1.6% 4.4% 1.3% USD / GBP 0.79 -0.6% 0.4% -1.6% 4.7% 0.7%	Gold	2017,70	0,4%	-0,2%	1,2%	9,9%	-2,3%
Aluminium 2154,74 -2,0% 1,8% -1,1% -9,3% -8,1% Copper 8499,50 1,1% 3,0% 3,0% -6,6% 0,4% Iron ore 127,82 -1,1% -5,6% -1,6% 1,6% -6,6% 0,4% Freight rates Baltic Dry Index 1752 8,8% 15,4% -0,2% 159,9% -16,3% Currencies EUR/ USD 1,0819 0,5% -0,7% -0.8% 1,6% -2,1% EUR/ GBP 0,8541 -0,2% -0,2% -2,1% -3,0% -1,4% EUR/ CHF 0,9534 0,5% 0,8% -1,1% -3,4% 3,0% USD / CNY 7,1985 -0,1% 0,0% 0,5% 4,4% 1,3% USD/ GBP 0,79 -0,6% 0,4% -1,6% -4,7% 0,7%	Silver	22,76	-2,4%	1,1%	-3,7%	5,2%	-6,1%
Copper 8499,50 1,1% 3,0% 3,0% -6,6% 0,4% Iron ore 127,82 -1,1% -5,6% -1,6% 1,6% -6,3% Freight rates Balic Dry Index 1752 8,8% 15,4% -0,2% 15,9% -16,3% Correncies	Aluminium	2154,74	-2,0%	1,8%	-1,1%	-9,3%	-8,1%
Iron ore 127,82 -1,1% -5,6% -1,6% 1,6% -6,3% Freight rates Baltic Dry Index 1752 8,8% 15,4% -0,2% 159,9% -16,3% Currencies EUR/ USD 1,0819 0,5% -0,7% -0,8% 1,6% -2,1% EUR/ USD 1,0819 0,5% -0,2% -2,1% -3,0% -1,4% EUR/ GBP 0,8541 -0.2% -0.2% -2,1% -3,0% -1,4% EUR/ IPY 163,05 0,7% 1,3% 0,5% 13,8% 4,3% USD (CNY 7,1985 -0,1% 0,0% 0,5% 4,4% 1,3% USD / DY 150,53 0,2% 1,6% 0,7% 11,6% 6,7% USD / GBP 0,79 -0.6% 0,4% -1,6% -4,7% 0,7%	Copper	8499,50	1,1%	3,0%	3,0%	-6,6%	0,4%
Freight rates Baltic Dry Index 1752 8,8% 15,4% -0,2% 159,9% -16,3% Currencies EUR/ USD 1,0819 0,5% -0,7% -0,8% 1,6% -2,1% EUR/ USD 1,0819 0,5% -0,2% -2,1% -3,0% -1,4% EUR/ USD 0,8541 -0,2% -0,2% -2,1% -3,0% -1,4% EUR/ CHF 0,9534 0,5% 0,38% -1,1% -3,4% 3,0% USD/ CNY 7,1985 -0,1% 0,0% 0,5% 4,4% 1,3% USD/ GBP 0,79 -0,6% 0,4% -1,6% -4,7% 0,7%	Iron ore	127.82	-1.1%	-5.6%	-1.6%	1.6%	-6.3%
Correncies Correnc	Freight rates Baltic Dry Index	1752	8.8%	15.4%	-0.2%	159.9%	-16.3%
Currencies EUR/ USD 1,0819 0,5% -0,7% -0.8% 1,6% -2,1% EUR/ USD 0,8541 -0,2% -2,1% -3,0% -1,4% EUR/ JPY 163,05 0,7% 1,3% 0,5% 13,8% 4,3% EUR/ VFF 0,9534 0,5% 0,8% -1,1% -3,4% 3,0% USD / CNY 7,1985 -0,1% 0,0% 0,5% 4,4% 1,3% USD / JPY 150,53 0,2% 1,6% 0,7% 11,6% 6,7% USD / GBP 0,79 -0,6% 0,4% -1,6% -4,7% 0,7%	reight fates balle biy much	1752	0,070	10,170	0,270	100,070	10,570
EUR/USD 1,0819 0.5% -0.7% -0.8% 1,6% -2.1% EUR/GBP 0.8541 -0.2% -0.2% -2.1% -3.0% -1.4% EUR/JPY 163.05 0.7% 1.3% 0.5% 13.8% 4.3% EUR/VFF 0.9534 0.5% 0.8% -1.1% -3.4% 3.0% USD/CNY 7.1985 -0.1% 0.0% 0.5% 4.4% 1.3% USD/JPY 150.53 0.2% 1.6% 0.7% 11.6% 6.7% USD/GBP 0.79 -0.6% 0.4% -1.6% -4.7% 0.7%	Currencies						
EUR/USD 1,0819 0,5% -0,7% -0,8% 1,6% -2,1% EUR/GBP 0,8541 -0,2% -0,2% -2,1% -3,0% -1,4% EUR/DPY 163,05 0,7% 1,3% 0,5% 13,8% 4,3% EUR/CHF 0,9534 0,5% 0,8% -1,1% -3,4% 3,0% USD/CNY 7,1985 -0,1% 0,0% 0,5% 4,4% 1,3% USD/CMP 150,53 0,2% 1,6% 0,7% 11,6% 6,7% USD/GBP 0,79 -0,6% 0,4% -1,6% -4,7% 0,7%							
EUR/GBP 0,8541 -0.2% -2,1% -3,0% -1,4% EUR/JPY 163,05 0,7% 1,3% 0,5% 13,8% 4,3% EUR/JPY 0,9534 0,5% 0,8% -1,1% -3,4% 3,0% USD/CNY 7,1985 -0.1% 0,0% 0,5% 4,4% 1,3% USD/JPY 150,53 0,2% 1,0% 0,7% 11,6% 6,7% USD/GBP 0,79 -0,6% 0,4% -1,6% -4,7% 0,7%	EUR/ USD	1,0819	0,5%	-0,7%	-0,8%	1,6%	-2,1%
EUR/JPY 163,05 0,7% 1,3% 0,5% 13,8% 4,3% EUR/CHF 0,9534 0,5% 0,8% -1,1% -3,4% 3,0% USD/CNY 7,1985 -0,1% 0,0% 0,5% 4,4% 1,3% USD/JPY 150,53 0,2% 1,6% 0,7% 11,6% 6,7% USD/GBP 0,79 -0,6% 0,4% -1,6% -4,7% 0,7%	EUR/ GBP	0,8541	-0,2%	-0,2%	-2,1%	-3,0%	-1,4%
LUR CHF 0.9534 0.5% 0.8% -1.1% -3.4% 3.0% USD/CNY 7.1985 -0.1% 0.0% 0.5% 4.4% 1.3% USD/JPY 150,53 0.2% 1.6% 0.7% 11.6% 6.7% USD/GBP 0.79 -0.6% 0.4% -1.6% -4.7% 0.7%	EUR/ JPY	163.05	0.7%	1.3%	0.5%	13.8%	4.3%
Last Chi 0.250 ft 0.270 ft 0.070 ft -1.170 ft -5.470 ft 5.076 ft USD/ CNY 7,1985 ft -0.1% ft 0.0% ft 0.5% ft 4.4% ft 1.3% ft USD/ JPY 150.53 ft 0.2% ft 1.6% ft 0.7% ft 11.6% ft 6.7% ft USD/ GBP 0.79 ft -0.6% ft 0.4% ft -1.6% ft -4.7% ft 0.7% ft	EUR/CHE	0.9524	0.5%	0.9%	_1 104	-3 /10/	3.0%
0.517 7.1955 -0.1% 0.0% 0.5% 4.4% 1.5% USD/ JPY 150.53 0.2% 1.6% 0.7% 11.6% 6.7% USD/ GBP 0.79 -0.6% 0.4% -1.6% -4.7% 0.7%	LED CNV	7 1095	0,570	0,070	-1,170	-3,470	1.20/
USD/JPT 150,55 0,2% 1,6% 0,7% 11,6% 6,7% USD/GBP 0,79 -0.6% 0,4% -1,6% -4,7% 0,7%	USD/ CN1	/,1985	-0,1%	0,0%	0,5%	4,4%	1,5%
USD/ GBP 0,79 -0,6% 0,4% -1,6% -4,7% 0,7%	USD/ JPY	150,53	0,2%	1,6%	0,7%	11,6%	0,/%
	USD/ GBP	0,79	-0,6%	0,4%	-1,6%	-4,7%	0,7%

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