**Todo: Change Value Weighted Quintile 5 AAR to 7,6 and Volatility to 0,27**

**Slide 1**

What we see here is that energy companies’ emission varies across the three different scopes.

**Slide 2**

Extraction, refinement, production and transportation of energy are highly dependent on burning fossil fuels to support the large energy demand of these processers – which is clearly demonstrated by the large mean of Scope 1 intensity. It’s twice as large as Scope 3 and almost ten times larger than Scope 2. Furthermore, we see that Scope 3 emissions are 4 times larger than the Scope 2 emissions, which can be explained by energy companies large supply chain, capturing by upstream and downstream Scope 3 emissions.

From discoveries we know that around 80% of

**Slide 3**

We can also see that the huge difference in mean and median, supports an asymmetric distribution, especially for Scope 1 emissions.

**Slide 4**

The standard deviation supports a highly spread distribution.

**Slide 5**

These findings are evident when we plot the histogram of all 27800 monthly observations for the 185 firms under observation. We have around 60 observations where the each million of return yielded over 30 thousand tons of CO2! For the upcoming question we assume that are huge risks associated with an outlying carbon intensity, which should be captured by the volatility of these firms.

**Slide 11**

We started by selecting the same firms as we worked with in Question 2 in Homework 1, but we chose a time period from 2007-2019 so we had no missing datapoints.This approachwould not capture heavy emitters that started reporting after 2007. In addition, it’s of high importance to acknowledge that when only selecting firms with consistent Scope reporting we eliminate all default, M&As, and new listings, which does not reflect the nature of the market! In practice we end up with only investigating successful companies due to this backwards looking perspective.

The key statistics of the different Value Weighted and Equally Weighted portfolios, we see that the value weighted portfolio outperforms the equally weighted for each quintile for the period under observation! Which is consistant with what we found in Homework 1, that the value-weighted portfolio outperformed the equally weighted.

**Slide 12**

If we look at the two best and two worst performing quintiles for both portfolio types we see that the low carbon intense quintiles perform much better than the brown quintiles, though for some quintiles with a higher volatility, but overall the Sharpe ration is drastically better!

**Slide 13**

When we look at the Long minus Short portfolios, we did not find any “greenium”, the premium of investing based on «green» environmental values, whereas brown companies in contrast have to offer better return to attract investors. The value-weighted long short portfolio shows a 2,8% AAR which could suggest that large companies have a bigger risk of breaking environmental laws, norms and policies as all eyes are on them!

**Slide 14**

The volatility and return difference is clearly visible when we plot the return over the timespan of 2007 and 2019.

**Slide 15**

We can get an even more nuanced picture if we plot each portfolio quintile, making the key characterstics shown in the previous “big” table more visual!

**Slide 16**

If we plot the two long-short portfolios could evidently show the difference of investing in a large corporation that does not take carbon emissions into consideration throughout their value chain.