Figure 1: DTU Logo

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Describtive analysis

A) The data described in the output of "Simple summary of data" consists of 5 couloums, meaning 4 ETF, and a time Cloumn that tracks weeks. There are 453 rows of recorded movement for the ETF's. The Data is collected from 2006-2015. Note the data has more than the 4 ETF's described in this report but aren't analyzed. Important to notice is that AGG is a bond based ETF while others are stock based. Bonds are loans to typically to credit-worthy loaners, like govourments, this typically results in lower volatility.

B)

	No_Obs	Mean	Variance	Std_Dev	Q25	Q50	Q75
AGG	454.000000	0.000265	3.571067×10^{-05}	0.005975	-0.002999	0.000237	0.003894
VAW	454.000000	0.001793	0.001301	0.036082	-0.016248	0.004797	0.019736
IWN	454.000000	0.001187	0.001024	0.032015	-0.014348	0.003119	0.019060
SPY	454.000000	0.001360	0.000614	0.024786	-0.011356	0.004215	0.014522

This table shows the summary statistics for the four ETFs (AGG, VAW, IWN, SPY):

- No_Obs: Number of observations
- Mean: Sample mean of weekly returns
- Variance: Sample variance
- Std_Dev: Standard deviation
- Q25, Q50, Q75: 25th, 50th (median), and 75th percentiles

C)

Statistical analysis I

D) Covariance matrix:

	AGG	VAW	IWN	SPY
AGG	3.571067×10^{-05}	$-4.260067 \times 10^{-05}$	$-2.587825 \times 10^{-05}$	$-3.239567 \times 10^{-05}$
VAW	$-4.260067 \times 10^{-05}$	0.001301	0.000983	0.000792
IWN	$-2.587825 \times 10^{-05}$	0.000983	0.001024	0.000722

SPY	$-3.239\,567 \times 10^{-05}$	$0.000\,792$	$0.000\,722$	$0.000\,614$

Here it is seen that AGG the bond ETF is very slightly negatively covaried with the stock ETF's, this mainly shows that AGG isn't effected as dependant on the stock market as stock ETF's. The stock based ETF's are positively covary, in this case the intrepetration could be that the stock market thrives together, when look deep into the data we will see that it also covaries negatively.
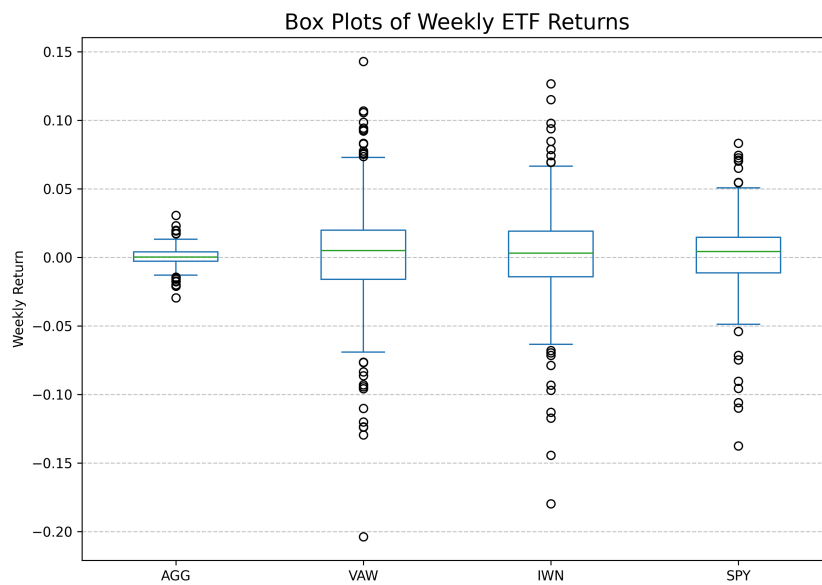

Figure 2: Box plots of weekly ETF returns

The greenline being in the positive is quite important for investment, it shows that the typical return for a week is positive.
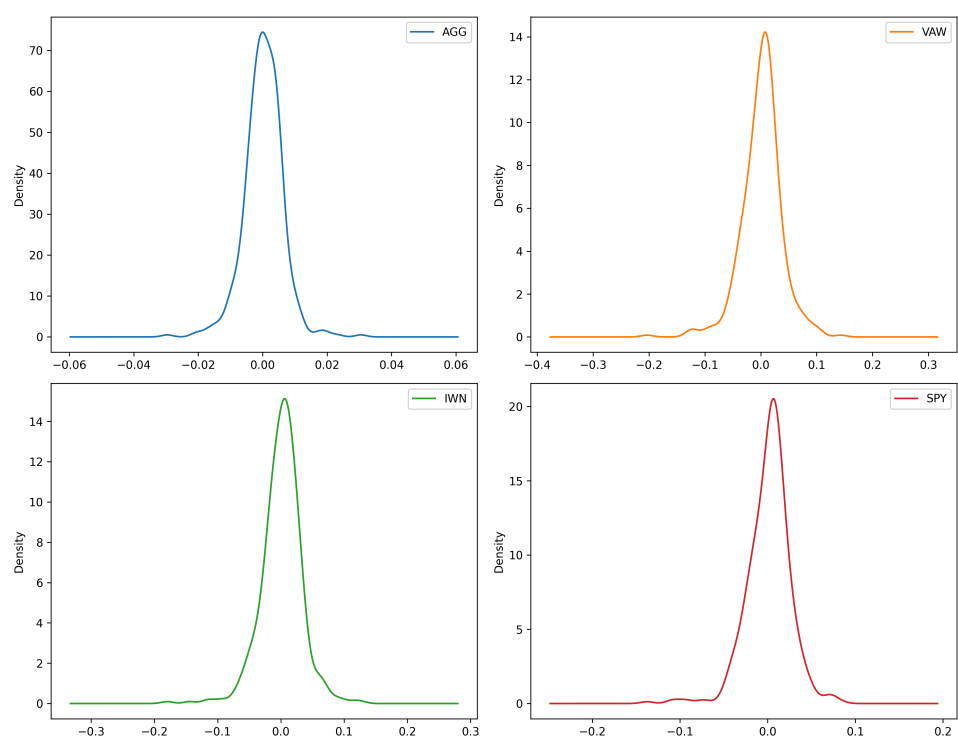
Figure 3: Empirical density plots of weekly ETF returns