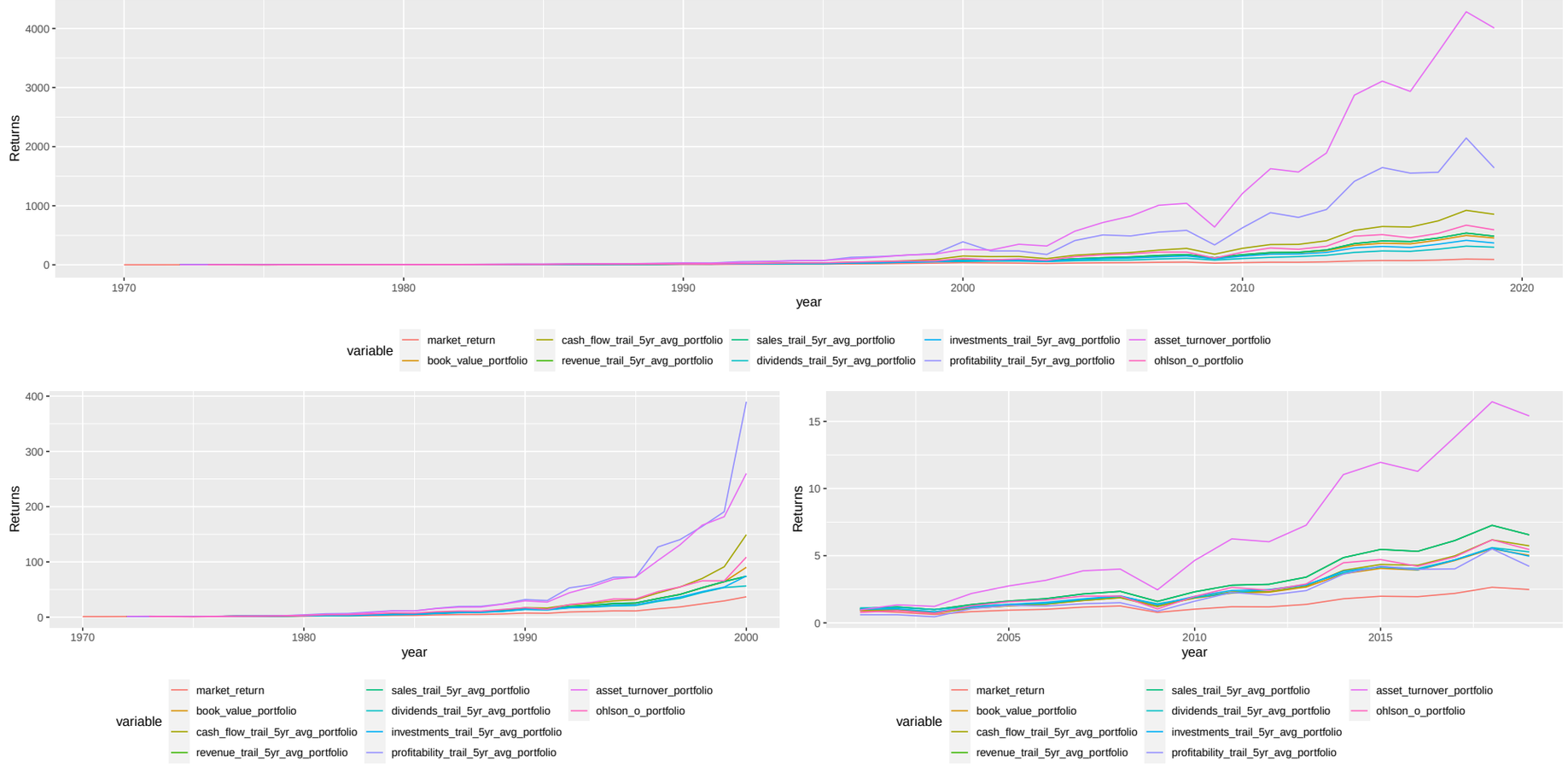
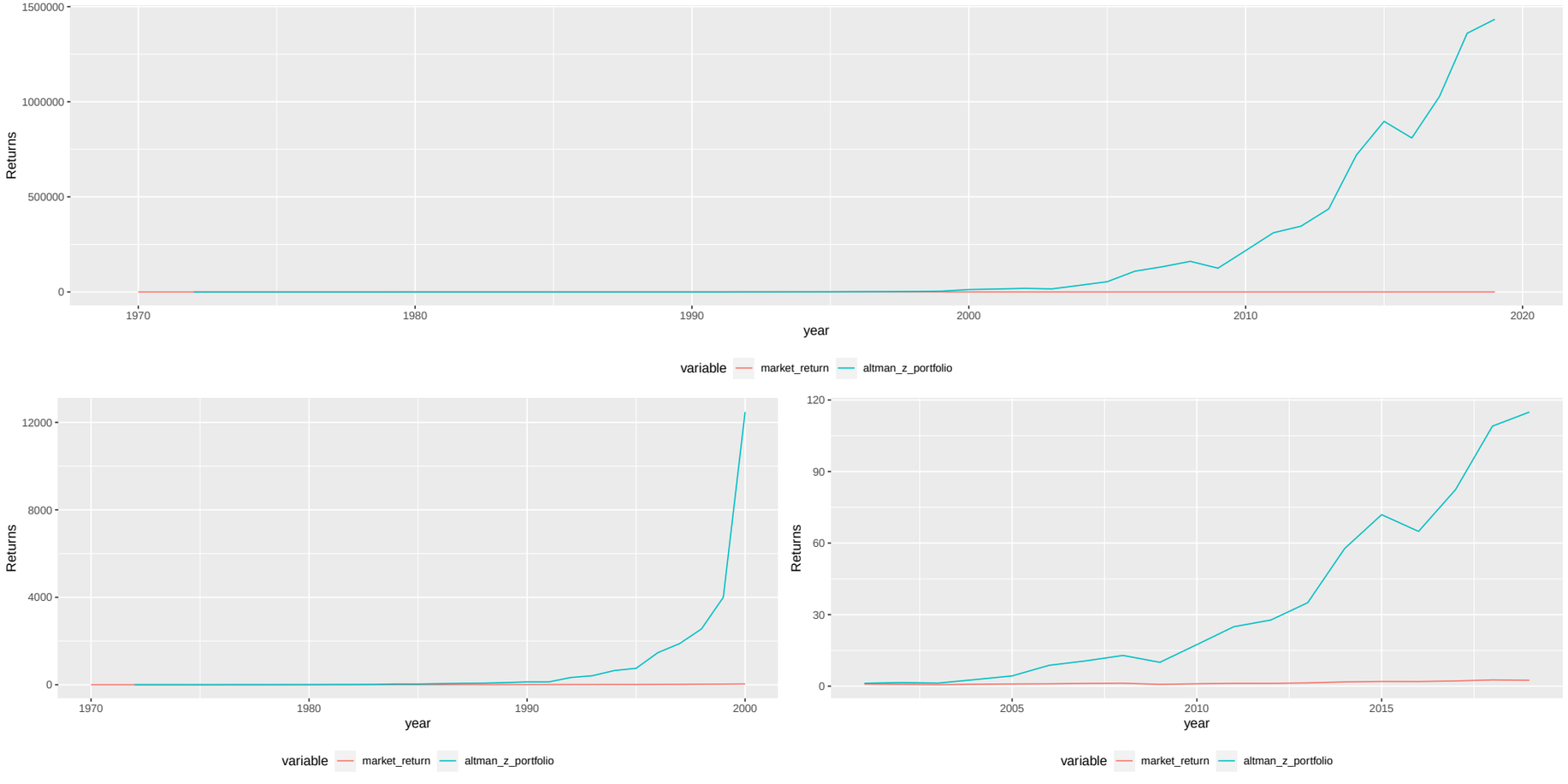
Assignment7

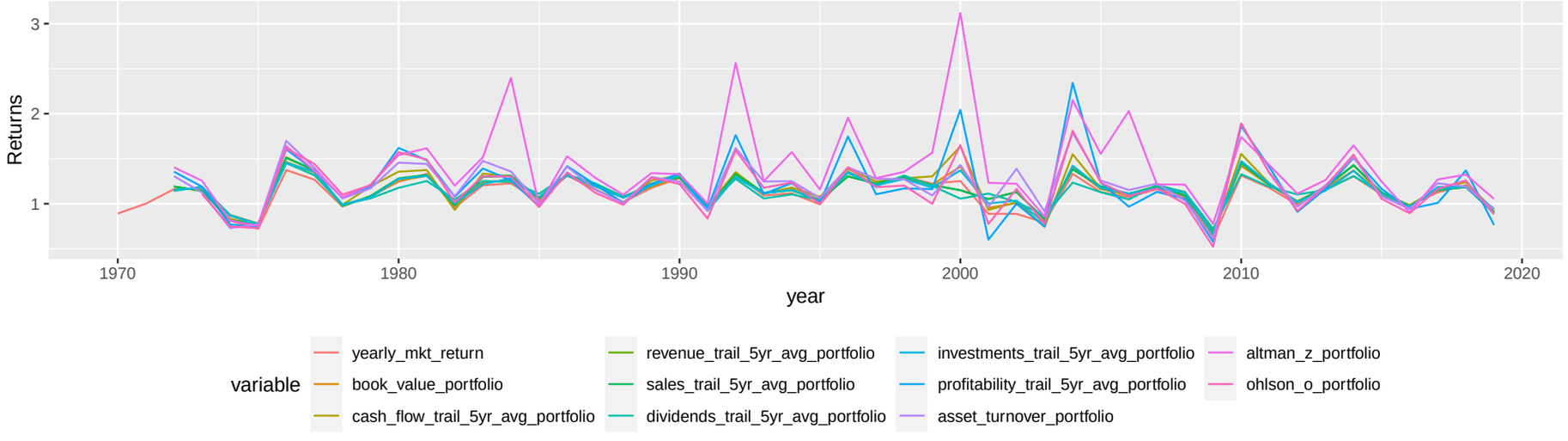
Fundamental variable-weighted potfolio and VWRETD compounded returns



The Altman Z-score weighted portfolio was significantly different, so it is plotted separately



Fundamental variable weighted portfolio returns and VWRETD yearly returns, non-compounded

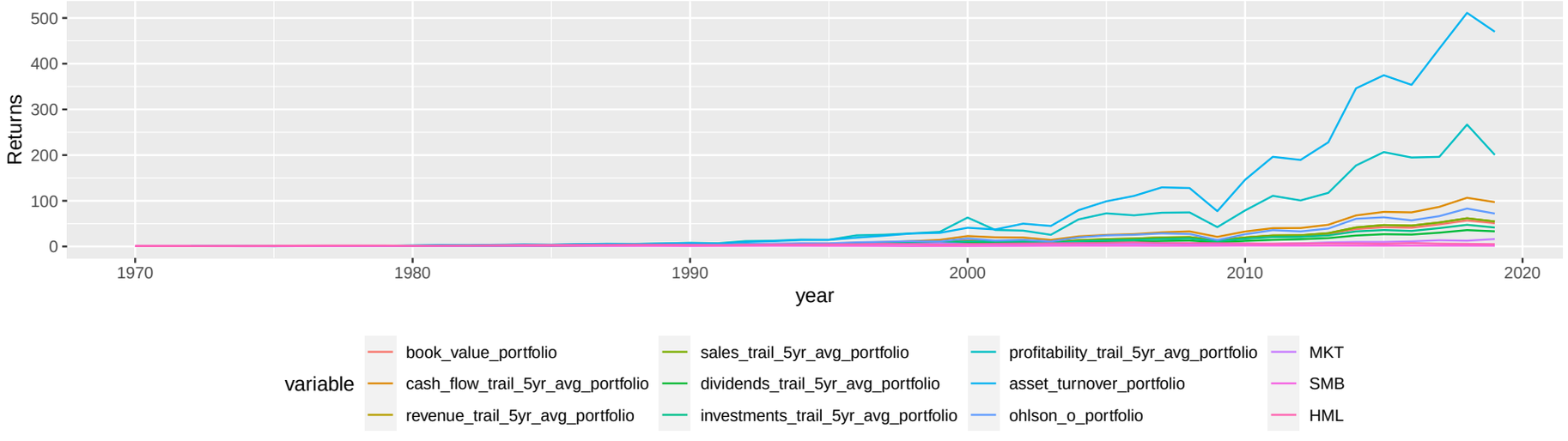


- On the non-compounded fundamental variable portfolio returns, we can see the drop in returns because of the 1973-1975 recession. During this period of time there are also NBER based Recession indicators. We can also see dips in the yearly returns in the early 1980s and around 1982, both of which are times where the NBER recession indicator is active. Then, in early 1990, we again see the yearly returns crash coinciding with the NBER recession indicator. These are not visible on the compounded returns graph because of the scale.
- The dotcom bubble around the year 2000 is the first major movement that can be seen in both the compounded portfolio returns and the non-compounded returns. The great recession from 2008-2009 also can be seen in both graphs, and additionally matches the NBER recession indicator.

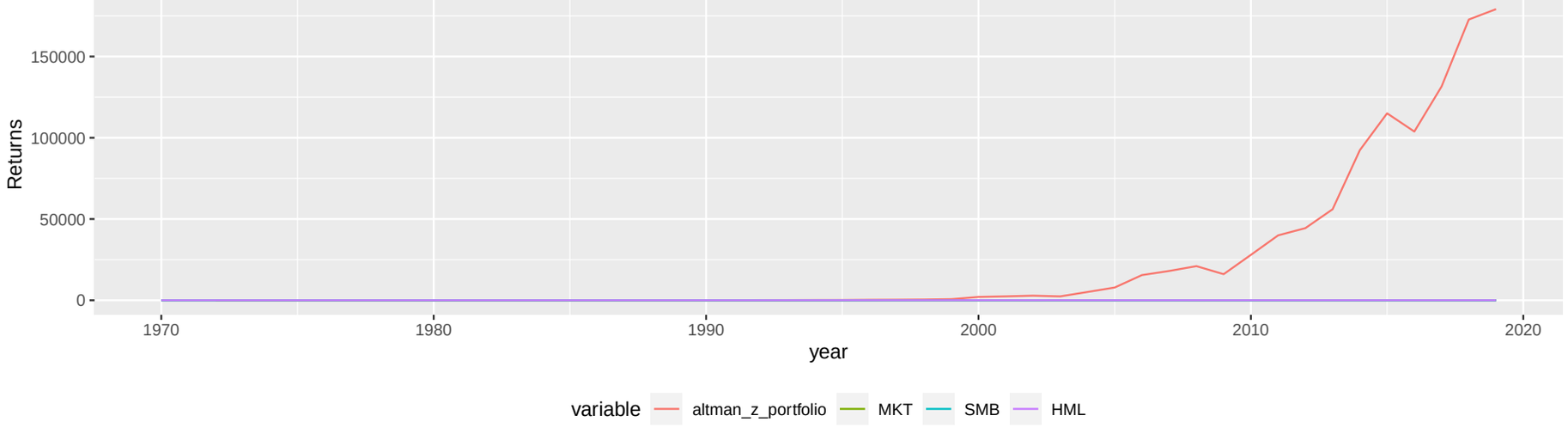
Descriptive stats and ratios for portfolio returns

portfolio_returns	information_ratio	sharpe_ratio	volatility	skewness	kurtosis
book_value_portfolio	0.836	6.468	0.174	-0.489	-0.146
cash_flow_trail_5yr_avg_portfolio	0.729	5.357	0.215	-0.178	-0.209
revenue_trail_5yr_avg_portfolio	0.615	6.349	0.178	-0.467	-0.003
sales_trail_5yr_avg_portfolio	0.615	6.349	0.178	-0.467	-0.003
dividends_trail_5yr_avg_portfolio	0.310	7.449	0.151	-0.552	0.219
investments_trail_5yr_avg_portfolio	0.620	6.247	0.179	-0.483	-0.067
profitability_trail_5yr_avg_portfolio	0.426	3.360	0.354	0.824	0.996
asset_turnover_portfolio	0.692	4.566	0.260	0.219	0.123
altman_z_portfolio	0.790	3.041	0.457	1.552	3.069
ohlson_o_portfolio	0.406	3.991	0.290	0.260	-0.138

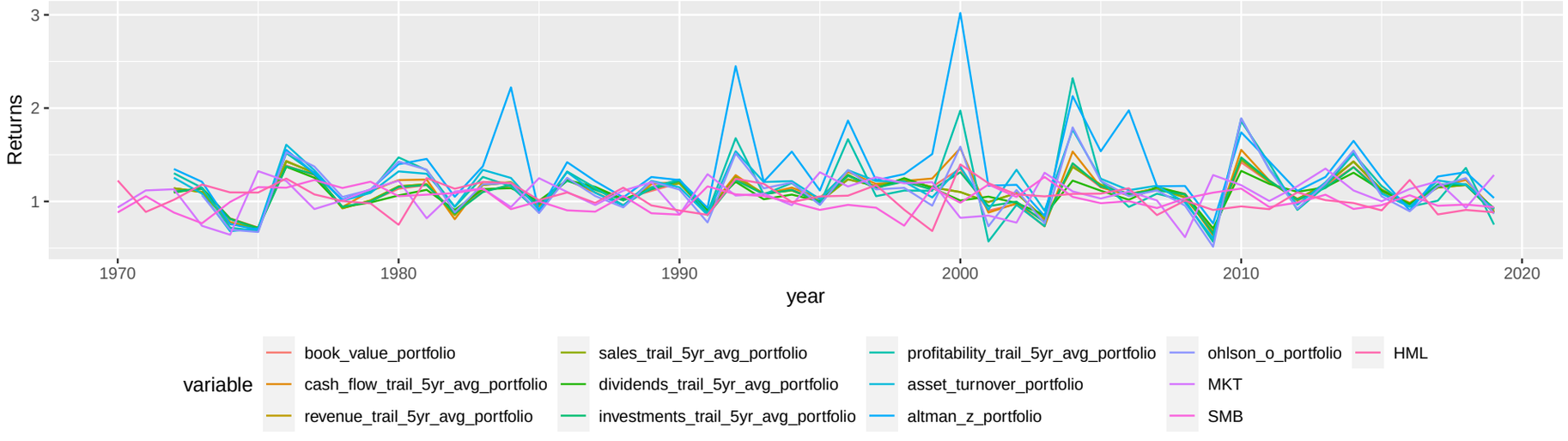
Excess returns compounded compared with MKT, SMB, HML



Altman-Z score portfolio again was a significant outlier, so it is plotted separately

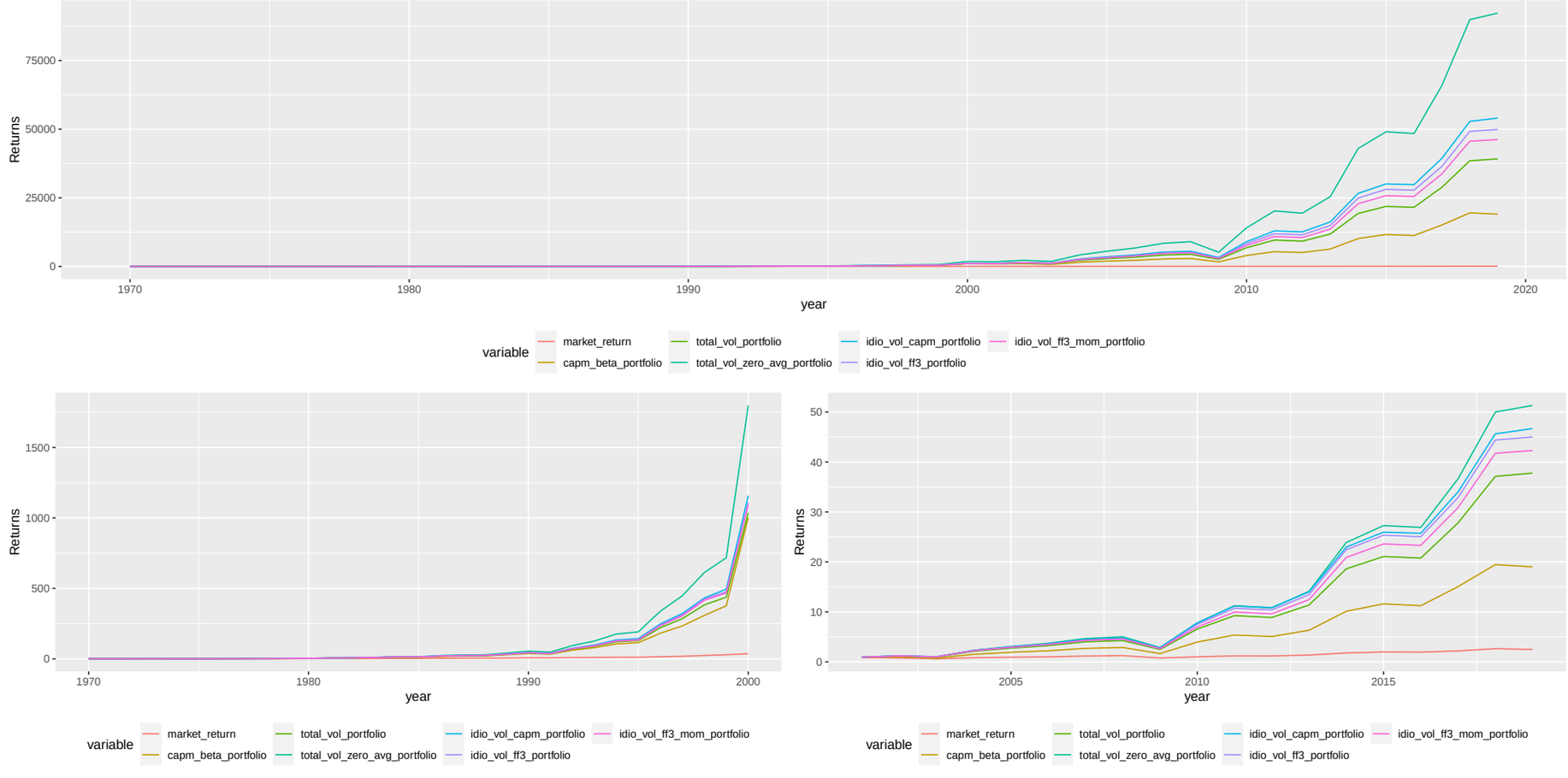


Excess returns yearly compared with MKT, SMB, HML

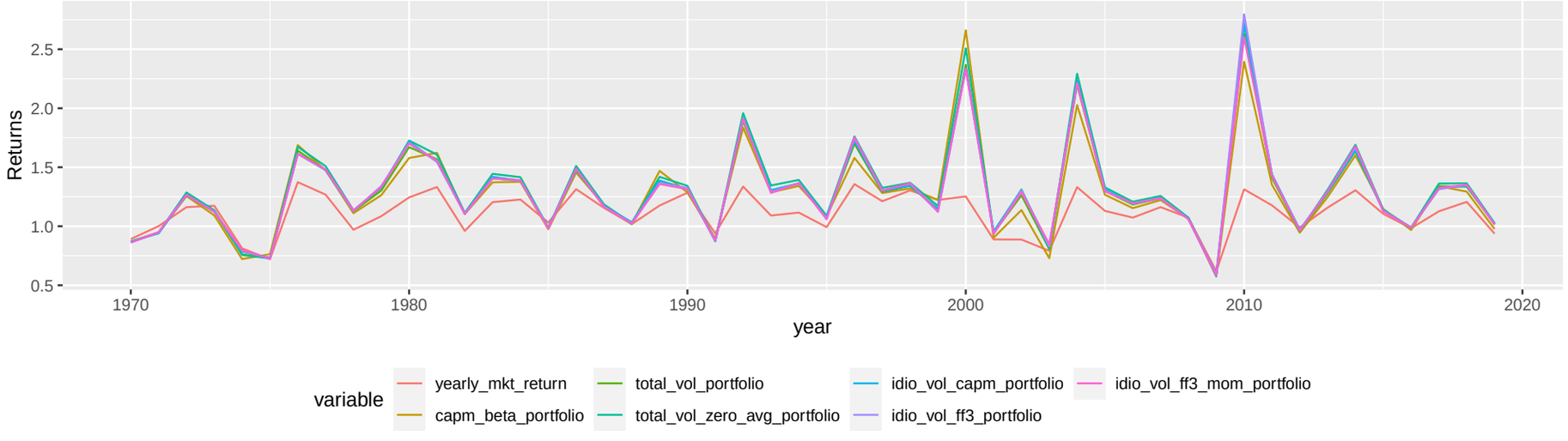


- The excess returns of the fundamental variable weighted portfolios are all larger than those of MKT, SMB, and HML. Most of them were within a similar scale, but the returns from the asset turnover portfolio, trailing 5-year profitability, and Altman-Z portfolios were all significantly larger.
- There could be significant survivorship bias in the constructed portfolios. Because each year has been filtered to only use stocks with a large market cap and minimum price, a lot of the stocks ending up in the portfolio are time-tested and historically proven to be profitable, as they have the large market cap in the first place. The portfolio restrictions can also help avoid larger losses. If a stock has multiple bad years in a row, losses will be cut when the stock market capitalization drops below our minimum and the stock is no longer in the portfolio.
- The fundamental indexing does look to be better than the market in all cases though. Some of the fundamental variable indexes look to be able to better hedge against risks as well.
- The sharpe ratios of all the portfolios are extremely high. The fundamental variable weighting must help in mitigating investments in riskier firms. A few of the information ratios are very strong (book value, trailing 5 year cash flow, and Altman-Z portfolios), but these are definitely relatively more normal than the high sharpe ratios.
- The volatility in most of the portfolios is low, but some notable standouts are the Altman-Z portfolio and profitability portfolio. A lot of the trailing values have negative skewness which is faily interesting. The Altman-Z portfolio also has a very strong positive skew and kurtosis. There were quite a few very outlier strong yearly returns in the altman-Z portfolio, leading to its crazy returns.

Market variable-weighted potfolio and VWRETD compounded returns



Market variable-weighted portfolio returns and VWRETD yearly returns, non-compounded

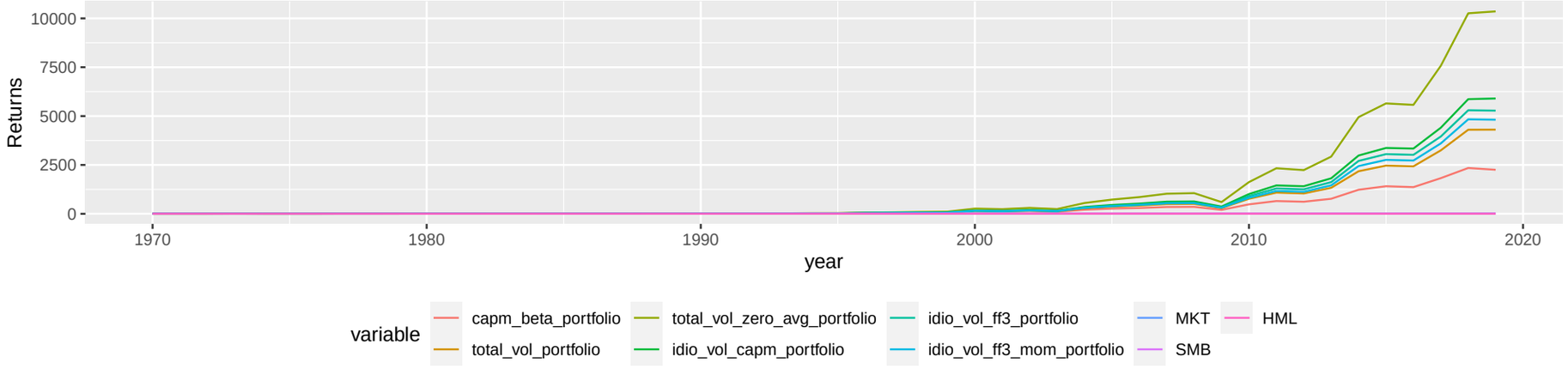


- Similar to the fundamental variable weighted portfolio returns, looking at the yearly, non-compounded returns, we can see the drop in returns because of the 1973-1975 recession as well as dips in the returns of the early 1980s and around 1982, both of which are times where the NBER recession indicator is active. Then, in early 1990s, we again see the yearly returns crash coinciding with the NBER recession indicator. These are not visible on the compounded returns graph because of the scale.
- Since the market variable weighted portfolio returns look to be much larger than those from the fundamental variable weighted porfolio, he dotcom bubble around the year 2000 can be only seen in both the yearly, non-compounded portfolio returns and the non-compounded returns. Then, the great recession from 2008-2009 can be seen in both graphs.

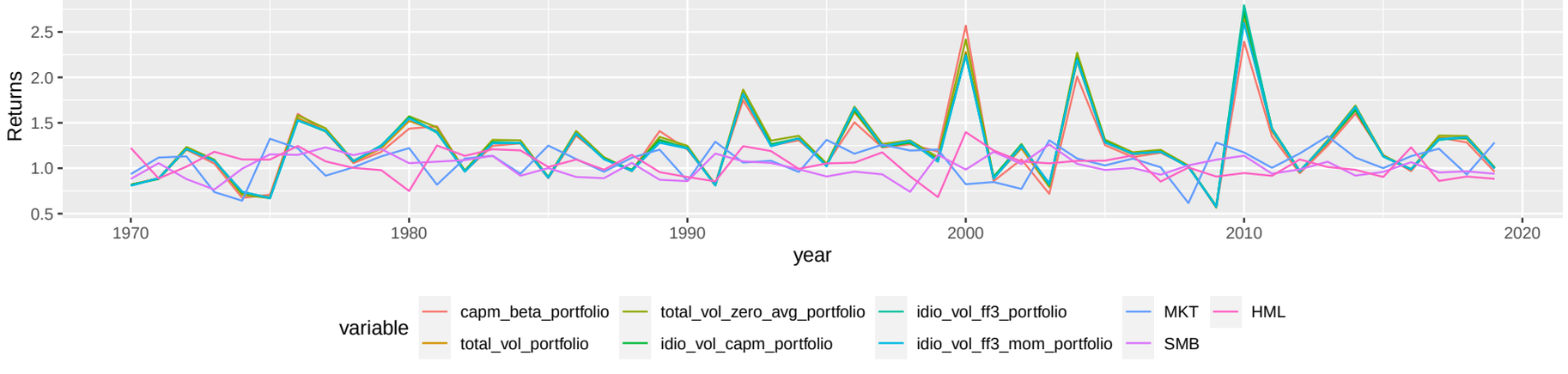
Descriptive stats and ratios for market variable weighted portfolio returns

portfolio_returns	information_ratio	sharpe_ratio	volatility	skewness	kurtosis
capm_beta_portfolio	0.586	3.197	0.388	1.310	2.702
total_vol_portfolio	0.644	3.191	0.392	1.243	2.198
total_vol_zero_avg_portfolio	0.681	3.062	0.417	1.246	2.133
idio_vol_capm_portfolio	0.652	3.150	0.399	1.344	2.607
idio_vol_ff3_portfolio	0.638	3.106	0.404	1.387	2.853
idio_vol_ff3_mom_portfolio	0.661	3.207	0.391	1.191	1.926

Excess returns compounded compared with MKT, SMB, HML



Excess returns yearly compared with MKT, SMB, HML



- Like the portfolio returns, the excess returns of the fundamental variable weighted portfolios are all very large, performing significantly better than the MKT, SMB, and HML returns. The total volatility assuming zero average portfolio was very strong.
- There is probably also significant survivorship bias in this fundamental variable weighted portfolio as well.
- The sharpe ratios of all the portfolios are very strong, but also very consistent, with all of them a little greater than 3. This is different from the fundamental variable portfolio, as that has some very strong outliers. The information ratios are also more consistent and steady.

- Most of other descriptive stats for the market variable portfolio are similar. This could possible be due to all of them being regression based and using overlapping values. I think the returns would be highly correlated as well.
- These are much higher volatility than the fundamental variable portfolios which could explain the lower sharpe and information ratios. All are positively skewed with strong kurtosis as well.