Neighbouring Assets

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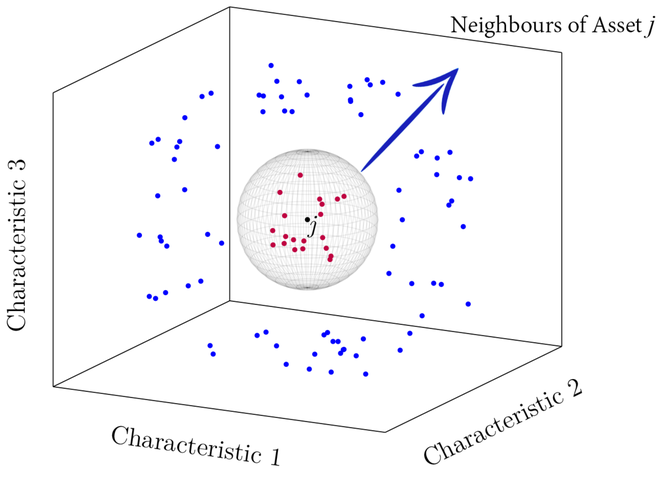
The key point

I Define *neighbouring assets* as those stocks with the most similar set of characteristics. I show that past performance of an asset's neighbours predicts its future expected returns.

Neighbouring Assets Definition

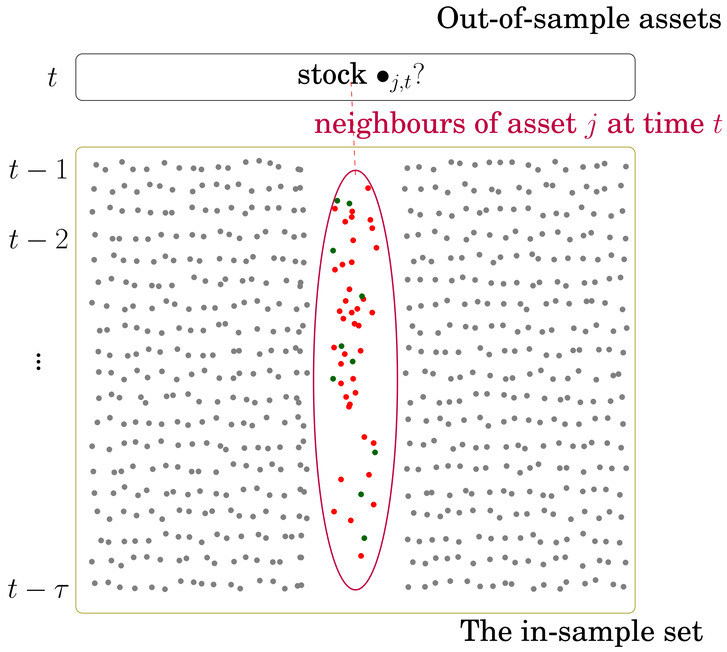


I define the k closest assets to the asset j (shown as red dots) as the neighbours of asset j. Neighbouring assets have similar expected returns because they have similar characteristics. In my empirical analysis, I find the neighbouring assets according to 94 characteristics.

Abstract

If a majority of an asset's neighbours have performed poorly (well) in the past, it is likely that this asset also performs poorly (well) in the future. A long-short portfolio generates an out-of-sample annualized Sharpe ratio of 1.15 with a monthly alpha of 2.72% (t = 8.86) when classifying each asset into a decile portfolio based on the past performance of its neighbours, with 94 characteristics.

Neighbouring Assets algorithm

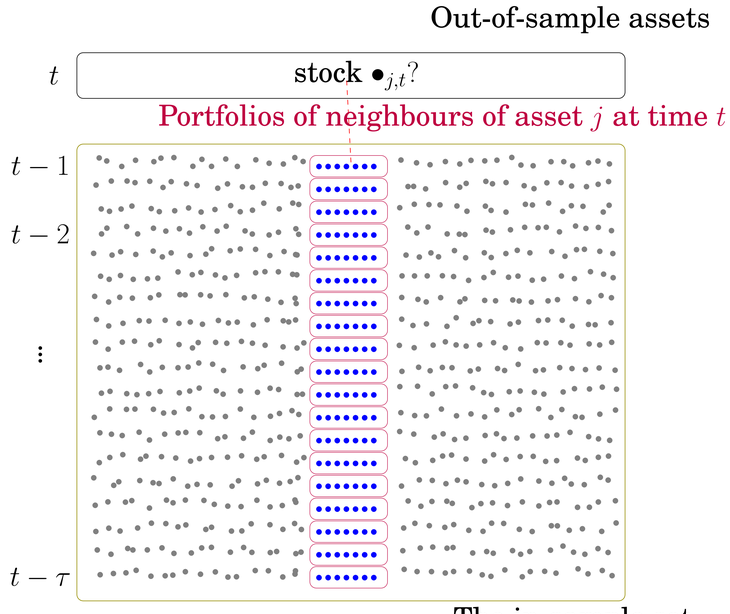


To predict the expected returns of an asset j at time t, I find its k neighbours in the past, which have had the closest distance of characteristics to asset j at time t. Then, I put asset j at time t into the decile portfolio to which the majority of its neighbours belonged in the past. Below is the out-of-sample performance of decile portfolios based on the neighbouring assets algorithm.

	mean	std	t-stat	SR
1	-0.46	9.07	-1.14	-0.18
2	0.21	7.63	0.61	0.09
3	0.45	6.15	1.65	0.26
4	0.68	4.77	3.20	0.49
5	0.72	3.99	4.03	0.62
6	0.69	3.94	3.90	0.60
7	0.83	4.34	4.28	0.66
8	0.80	5.15	3.48	0.54
9	0.94	7.12	2.98	0.46
10	1.25	8.90	3.14	0.48
10-minus-1	1.71	4.43	8.66	1.34

Table: The performance of portfolios based on 94 characteristics in 1980-2021

Portfolios of neighbouring assets



Here, to predict the expected return of each asset j at time t, I create a portfolio of neighbouring assets at each month in the in-sample data. Blue dots show the assets which have had the most similar characteristics to asset j at time t. Then I predict the return of asset j at time t based on the average of in-sample neighbouring portfolios. Below shows the alpha of a long-short portfolio based on the portfolios of neighbouring assets.

	alpha	$t-$stat	adj R^2
CAPM	2.83	13.72	0.00
FF3	2.87	13.98	0.02
Carhart	2.38	14.03	0.35
FF5	2.61	12.44	0.05
q	2.36	11.64	0.13
q^5	2.19	10.12	0.14

Table: The monthly alphas of the long-short portfolios of neighbouring assets based on 94 characteristics in 1980-2021