Recent Project with Python

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Recurrence of Abnormal Valuation facor

Traditional Bolinger Bands Strategy

Assume return obeys Geometric Brownian Motion

$$\frac{\mathrm{d}P}{P} = \mu dt + \sigma dB$$

PE ratio is actually a simple version of DCF model:

$$V = \sum_{t=1}^{n} \frac{CF_t}{(1+r)^t}$$

We use the net profit to represent the cashflow and it has a permanent growth:

$$V = \sum_{t=1}^{\infty} \frac{E_t}{(1+r)^t} = \frac{E_1}{1+r} + \frac{E_1(1+g)}{(1+r)(r-g)}$$

Reasonable valuation level:

$$V/E = \frac{1}{1+r} + \frac{1+g}{(1+r)(r-g)}$$

Key Point: PE ratio has average reversibility. When the valuation logic of the stock itself

doesn't change, in the long run, PE ratio of the stock will move towards its historical average.

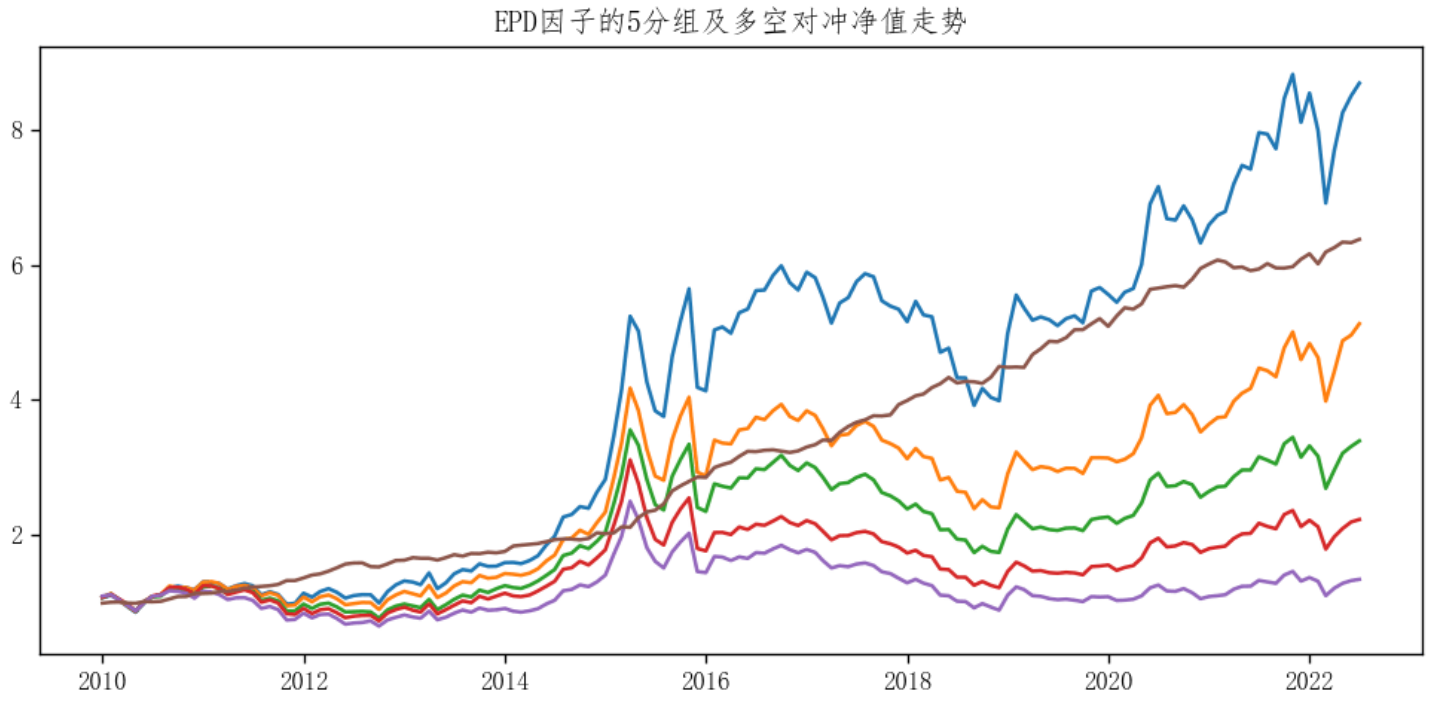
Based on the key point we caculate the factor EPD (We use EP ratio as a proxy variable of stockvaluation)

$$EP\_d = \frac{EP_{latest} - \mu_{EP,252}}{\sigma_{EP,252}}$$

Neutralization of industry and market value, use the residue term to represent the factor EPD.

Core Logic: Identify the stocks whose current valuation deviates significantly from the historical center and is in an abnormal range.

Five-group long-short return back test:

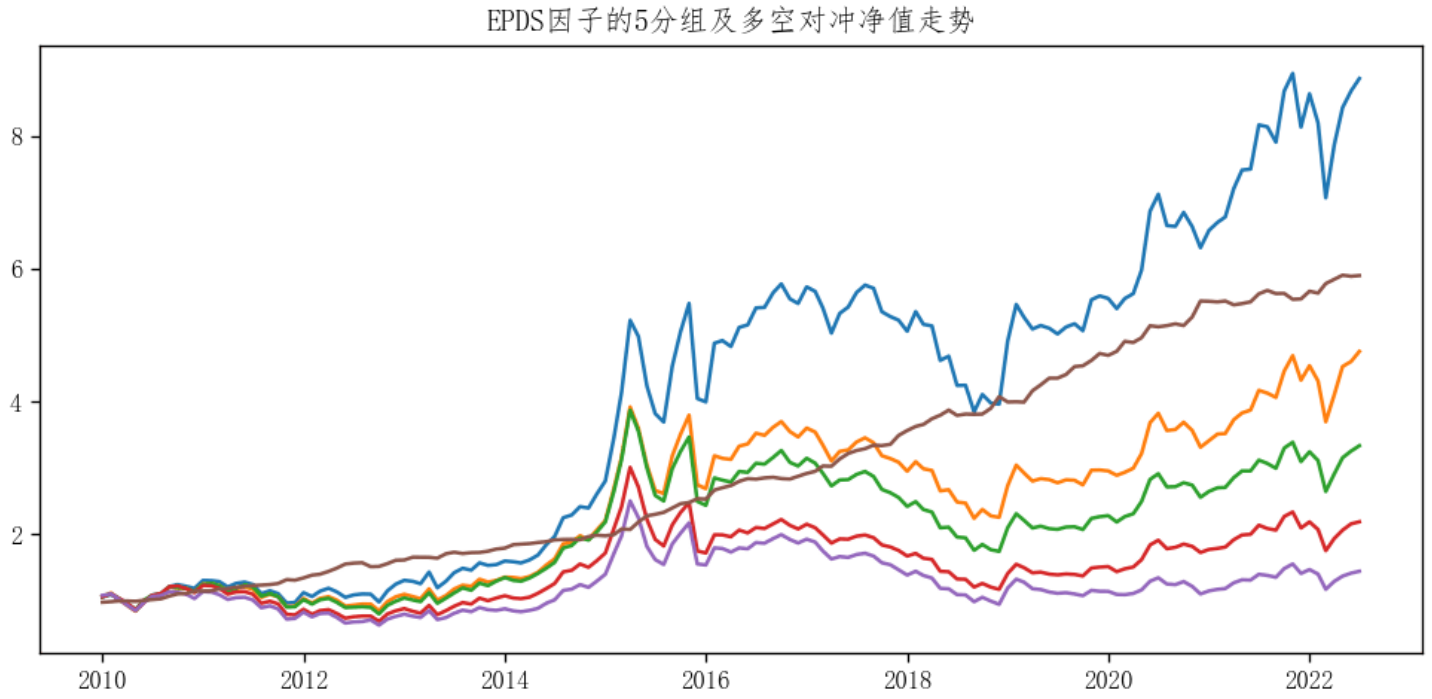


Take the stock valuation logic into consideration,

We use IR ratio as a proxy variable of the probability that the basic logic change:

$$IR = \frac{\mu_{r,126}}{\sigma_{r,126}}$$

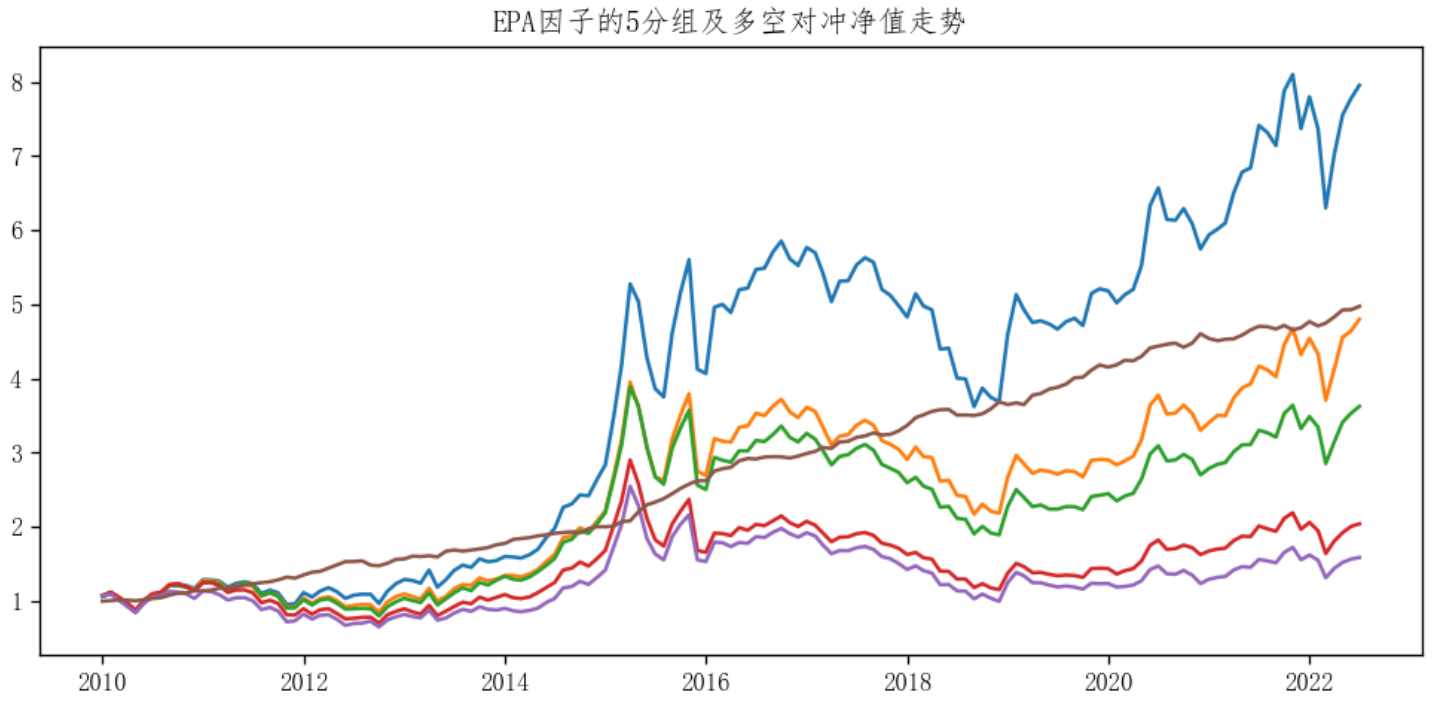
This is quite intuitive. The numerator is the average of the past 126 trading days of the stock return rate, and the denominator is the standard deviation of the stock return rate in the past 126 trading days. IR is used to measure the strength of stock price changes in the past 126 trading days.



Eliminate the influence of Barra10 style factor.

Some Barra10 factor make basic logic worse. After test one by one, we eliminate **Beta, Value and Growth** three Barra style factors.

1. **Beta:** High beta stocks are more sensitive to the ups and downs of the market, and their valuation will deviate more from the central position in the environment of great market changes.
2. **Value:** The market has different expectations for companies with different valuation levels, and companies with high valuations have greater valuation flexibility.
3. **Growth:** Companies with different growth are often in different life cycles, while companies with high growth are in an earlier life cycle, with greater valuation flexibility.



	EPD	EPDS	EPA
IC	0.04	0.04	0.03
Rank_IC	5.22%	4.86%	4.28%

Rank_ICIR	3.18	3.32	2.99
t_value	14.95	14.9	15.45
Annual rate of return	13.07%	12.5%	11.2%
Information ratio	2.64	2.69	2.76
Max Drawdown	-2.6%	-2.36%	-2.04%