Stock-Picking Model

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Overview

This product sheet introduces an **AI-powered data tool** for smart decision-making process in the stock market. Our research team have developed a model for market inefficiency exploitation (researchers call it no-arbitrage condition violation). Stock portfolio can be designed with the tool to 'beat the market'. The Stock-Picking Model for stock ranking is based on expected risk-adjusted returns. The model focuses on a representative universe of US stocks DJIA, SP100, SP500 and Russel 2000 with investment horizons ranging 1-week, 1-month, 3-moths and 6-months.

Predictor Types

Firm-Specific:
The model uses firm-specific and macro predictors. The statistical firm-specific variables include momentum, statistical moments, trading volumes, technical analysis indicators, dividend payout yield, standardised unexplained volume (SUV) and autoregressive factors. Fundamental firm-specific variables include financial ratios, market capitalisation, dividend yield and others.
Macro predictors:
Yahoo indices, stock indices returns, realised volatility, bond indices data, financial activity measures, commercial banking indicators, monetary data, employment data, national income, international trade and others.

Method

The goal is to develop a model to estimate the following value:

$$y_{i,t} = r_{t,i} - \mu_{r,t},$$

where:

$$\mu_{r,t} = \frac{1}{N}\sum_{i=1}^{N} r_{t,i}$$

There are nine submodels, all of them are estimated on the cross-sectional dataset of NxT size and tested with: ridge linear regression, elastic-net linear regression, feed-forward neural network with continuous targets, elastic-net logistic regression, feed-forward neural network with binary targets.

Use Case

The user can collect long & short portfolio, equal-weighted from 20 undervalued and 20 overvalued stocks and the investment horizon is 1-month. It means the user will both buy and sell stocks picked by the model.

Use Case - Inputs

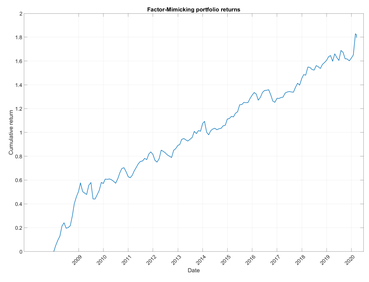
The model provides following chart with mispriced stocks.

ID	Ticker	Company	YF	ID	Ticker	Company	YF
75	OXY	Occidental Petroleum Corp	0.198	45	GOOG	Alphabet Cl C	-0.060
42	GE	General Electric Company	0.141	100	WMT	Wal-Mart Stores	-0.060
55	KMI	Kinder Morgan	0.132	99	WFC	Wells Fargo & Company	-0.061
95	RTX	United Technologies Corp	0.129	81	QCOM	Qualcomm Inc	-0.062
60	MA	Mastercard Inc	0.116	17	BLK	Blackrock	-0.066
26	COP	Conocophillips	0.103	15	BK	Bank of New York Mellon Corp	-0.068
6	AGN	Allergan Plc	0.103	54	KHC	Kraft Heinz Company	-0.070
71	NFLX	Netflix Inc	0.095	65	MMM	3M Company	-0.071
92	UNP	Union Pacific Corp	0.095	57	LLY	Eli Lilly and Company	-0.074
85	SO	Southern Company	0.081	77	PFE	Pfizer Inc	-0.088
63	MDT	Medtronic Inc	0.080	1	AAPL	Apple Inc	-0.091
56	KO	Coca-Cola Company	0.075	9	AMGN	Amgen Inc	-0.098
70	NEE	Nextera Energy	0.067	93	UPS	United Parcel Service	-0.100
5	ADBE	Adobe Systems Inc	0.064	3	ABT	Abbott Laboratories	-0.101
7	AIG	American International Group	0.060	67	MRK	Merck & Company	-0.101
30	CVX	Chevron Corp	0.060	16	BKNG	Booking Holdings Inc	-0.108
61	MCD	McDonalds Corp	0.059	52	JNJ	Johnson & Johnson	-0.111
96	V	Visa Inc	0.058	10	AMZN	Amazon.com Inc	-0.119
84	SLB	Schlumberger N.V.	0.056	31	DD	Du Pont De.Nemours Inc	-0.126
33	DIS	Walt Disney Company	0.053	69	MSFT	Microsoft Corp	-0.130

The user will place properly set-up orders in his/her trading platform in order to assemble the portfolio. The next steps are managed by user's broker.

Results

The following charts show the above-compiled portfolio performance.



ID	Factor	FM Return	FM MaxDI	FM DDRat	FM Tstat	FM Pval	Long Retu	Long Max	Long DDR	Long Tstat	Long Pval	PearsonCc	AbsCorr	CorrTStat	CorrPVal	nObs
1	Model 1 pVal: 0.05 maxCorr: 0.8	14.76%	-0.1426	12.2514	4.8450	100.00%	16.49%	-0.5939	3.2859	3.2091	99.92%	0.0836	0.0836	5.3379	100.00%	142
2	Model 2 pVal: 0.05 maxCorr: 0.6	14.59%	-0.1211	14.2530	4.9525	100.00%	16.22%	-0.5648	3.3973	3.1153	99.89%	0.0777	0.0777	5.3063	100.00%	142
3	Model 3 pVal: 0.05 maxCorr: 0.4	13.02%	-0.0632	24.3879	4.6603	100.00%	15.63%	-0.5303	3.4870	3.2412	99.93%	0.0546	0.0546	4.7843	100.00%	142
4	Model 4 pVal: 0.01 maxCorr: 0.8	16.57%	-0.1037	18.9149	5.7928	100.00%	18.04%	-0.5100	4.1852	3.6232	99.98%	0.0838	0.0838	6.2933	100.00%	142
5	Model 5 pVal: 0.01 maxCorr: 0.6	16.91%	-0.0852	23.4767	5.6227	100.00%	18.51%	-0.4428	4.9475	3.8297	99.99%	0.0764	0.0764	6.2361	100.00%	142
6	Model 6 pVal: 0.01 maxCorr: 0.4	13.78%	-0.1043	15.6284	4.4000	100.00%	16.60%	-0.4040	4.8607	3.4373	99.96%	0.0818	0.0818	4.9624	100.00%	142
7	Model 7 pVal: 0.001 maxCorr: 0.8	17.87%	-0.1400	15.1041	5.4538	100.00%	18.76%	-0.4278	5.1881	3.9687	99.99%	0.1000	0.1000	6.6812	100.00%	142
8	Model 8 pVal: 0.001 maxCorr: 0.6	17.69%	-0.1372	15.2520	5.3161	100.00%	19.47%	-0.3914	5.8869	4.1686	100.00%	0.0832	0.0832	6.3013	100.00%	142
9	Model 9 pVal: 0.001 maxCorr: 0.4	15.02%	-0.1036	17.1602	4.8398	100.00%	16.80%	-0.4586	4.3361	3.5977	99.98%	0.0796	0.0796	5.4511	100.00%	142

The compound annual growth rate is 17.69 % while the maximum drawdown is -13.72 % during the 2008 - 2020 period. The selection and testing is full-sample so there is no overfitting in the model.

Conclusions

The results show excessive rate of return in comparison to the benchmarks (stock indices DJIA, SP500). The model is reinforcing with Bayesian procedure (Dynamic Bayesian Selection of Factors) to identify valid factors (with positive expected returns).

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