How Good are my Broker's recommendations? Using Python to analyze 8 years of emailed Broker Newsletters in a few minutes

Analysis of Raymond James' Daily Energy Updates

W.G. Paseman

November 7, 2019

Used Numpy 1.15.1, Pandas 0.23.4 in Anaconda

Post: http://paseman.com/CIMI/Posts/20181126RecommendationAnalysis/index.html

Repo: https://github.com/paseman/RJRecommendationAnalysis

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Agenda

- Goals
  - Analyze the value of Raymond James' Energy newsletter's advice.
  - Describe mechanics of Recommendation Analysis in Python
- Problem Description
- Plan of Attack
- Analysis Results
- Mechanics [Python Code] (Time Permitting)

Problem Description

Problem: Every day, I get emails like these ...

ADV - RJ Energy Daily Update 9-9-2019 Inbox ×

Patty Dewey
to

6:43 AM (11 hours ago)

Patty Dewey
Senior Registered Client Service Associate
Raymond James & Associates, Inc.
500 Dallas Street, Ste. 3400
Houston, TX 77002
Phone (713)-571-3523
Fax (713)571-6690

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Problem: With attachments like this...

RAYMOND JAMES

U.S. Research
Published by Raymond James & Associates

Energy

November 2, 2018 (9:17 a.m. EDT)

Industry Brief

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Energy: Energy Daily

Raymond James Energy Daily Update

SUMMARY

We are heading into the first weekend of November, which means one thing… A sleepless Friday night for all of the dedicated deer hunters of Texas as we head into the opening weekend of whitetail rifle season (and for the family members/spouses of these hunters - a free weekend to themselves away from these buck-fevered weirdos!). Even if you're on the fence on whether or not you will gear up for the field this year, we urge you to proactively go out and purchase a super-combo hunting/fishing license (all proceeds go towards statewide conservation efforts and habitat restoration). Furthermore, don't let the recently cold weather fool you, and always be safe and on the lookout for our good friend Mr. Rattlesnake.

However, it appears that energy investors are not as happy as Texas deer hunters as we head into the weekend, as WTI and Brent finished yesterday down 2.5% and 2.9% to $63.69/Bbl and $72.89/Bbl, respectively. However, the energy equities performed surprisingly well as the E&P index finished up 1.9% alongside a 0.9% gain in the OSX while the broader market saw similar strength as the S&P 500 was up 1.1%. Ahead of the open, crude futures are flat to up, and equity futures are up.

Ticker Mentions: AM, AMGP, CVX, DWSN, EOG, GEL, MMP, MPLX, NE, NFG, PE, RDC, SEP, SM, SOI, TUSK, WAAS, WMB, XOM

Problem: Containing these recommendations

Parsley Energy (PE/$24.25/Strong Buy) 3Q18 quick take: Ea
higher than Street estimates (in line with our model). Parsley
consensus before hedges), driving its blended barrel price ~2
net wells came online versus the 40-well guide for 3Q. More

(PE/$24.25/Strong Buy)

Ticker

Price

Recommendation

Problem: How “Good” are the recommendations?

1) Are they any better than just buying SPY?

2) Is there any statistical difference between “outperform”, “strong buy”, “market perform”, “underperform” and SPY?

Plan of Attack

Plan of Attack

1) Download all pdf newsletters from email for 2010-2018

   downloadAttachments.py – 1,067 pdf files

2) Extract all recommendations from all pdfs and put in one csv file

   4 columns: email-date/ticker/price/recommendation

   extractRecommendations.py – 2,974 rows (recommendations)

3) Add ticker's and SPY's 3,6,9,12 month returns for each row

   addReturns.py → recommendationsPlusReturns.csv

4) Analyze Recommendations

   analyzeRecommendations.py

recommendationsPlusReturns.csv

1) date - From the newsletter: Date received
2) ticker - From the newsletter: ticker recommended
3) price - From the newsletter: price
4) recommendation - “outperform”, “strong buy”, “market perform”, “underperform”
5) has_history - ticker existing in Yahoo
6) tickerInitPrice - yahoo ticker price at above date
7) benchmarkInitPrice - SPY price at above date

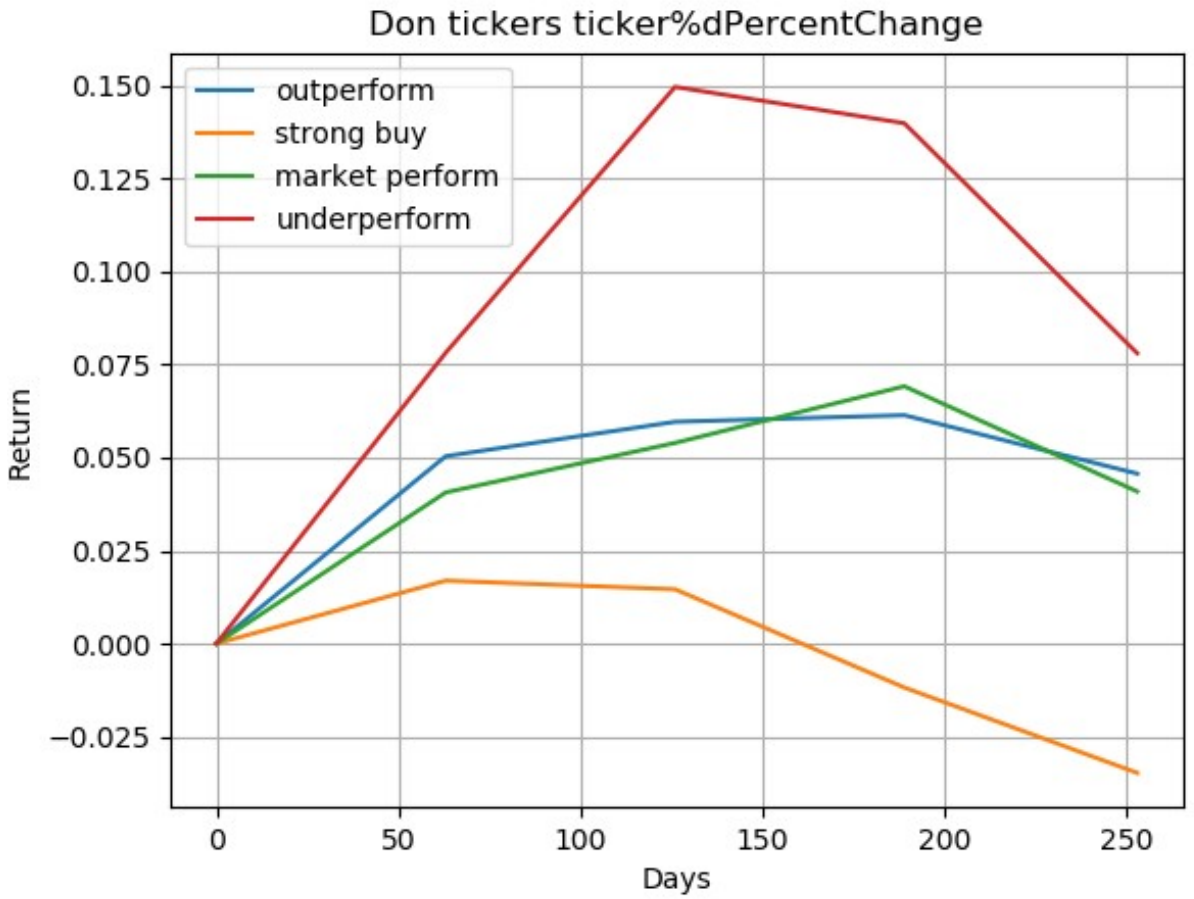
recommendationsPlusReturns.csv

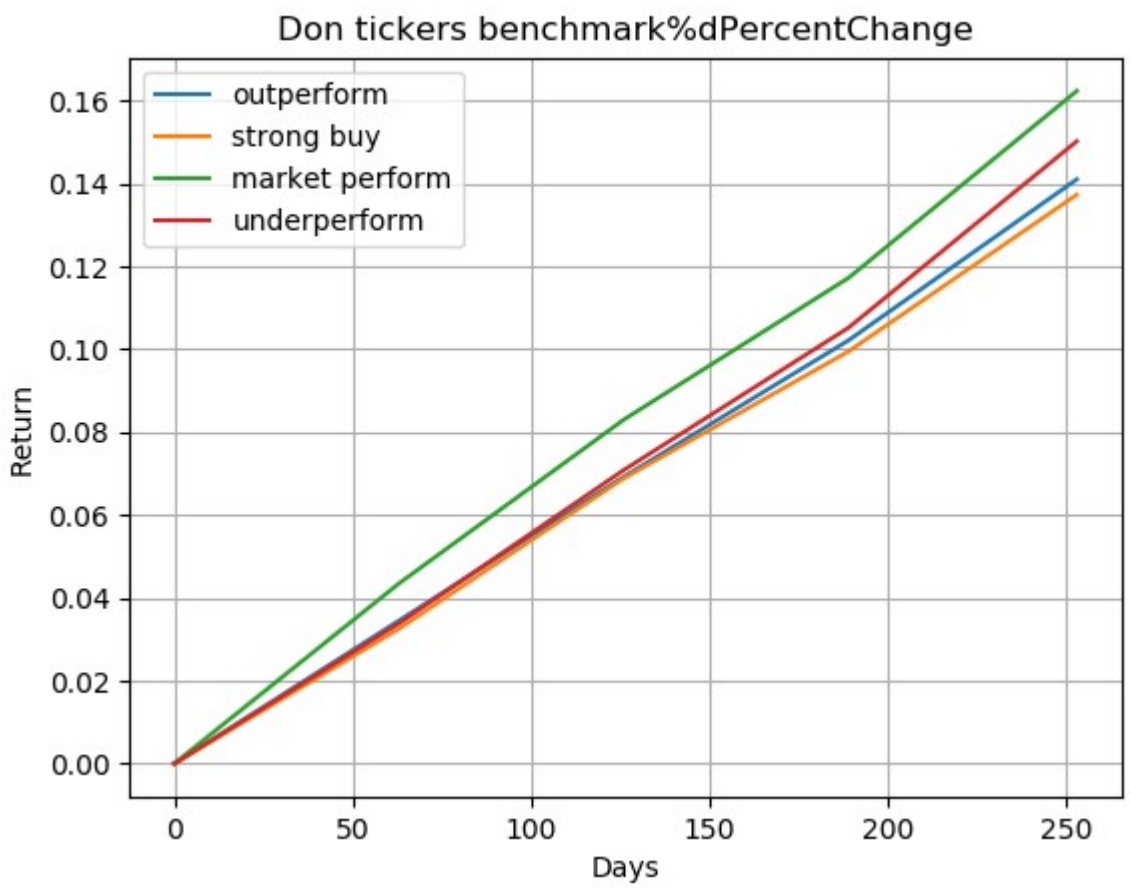
1) ticker63FinalPrice - yahoo ticker price 63 days later
2) ticker63PercentChange
   - (ticker63FinalPrice – tickerInitPrice)/tickerInitPrice
3) benchmark63FinalPrice - SPY price 63 days later
4) benchmark63PercentChange
   - (benchmark63FinalPrice – benchmarkInitPrice)/benchmarkInitPrice
5) benchmark63AdjustedPercentChange
   - ticker63PercentChange - benchmark63PercentChange

Also for 126, 189, 253 days

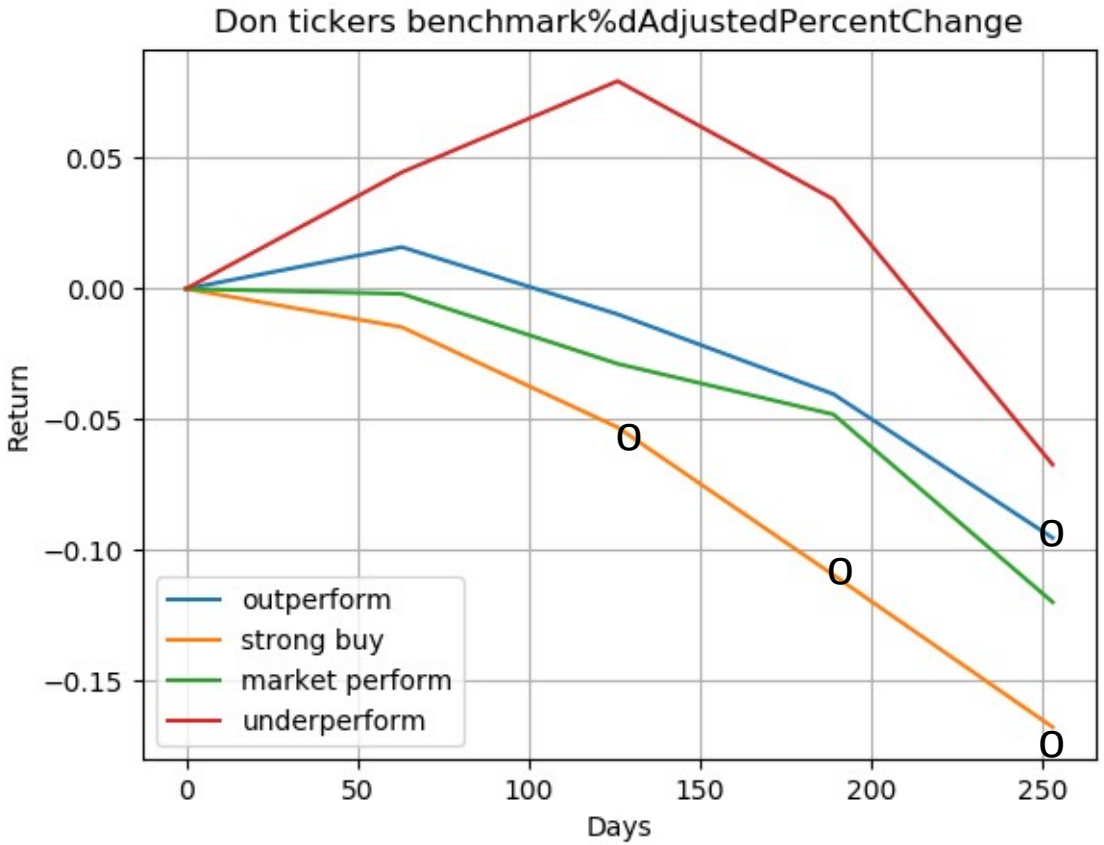
Analysis Results

Don Maurer Data - % Change and Benchmark





Don Maurer Data – Benchmark Adj % Change



- Strong Buy 253 day return:
- Underperform 126 day return: 14.96%
- Benchmark 126 day return: 7.08%

BUT T test > 3.24

Rec	Days	tickRet	bnchRet
outperform	253	+4.568	+14.100
strong buy	126	+1.460	+6.884
strong buy	189	-1.181	+9.946
strong buy	253	-3.476	+13.729

So yeah. Strong Buy really sucks.
What about UnderPerform?

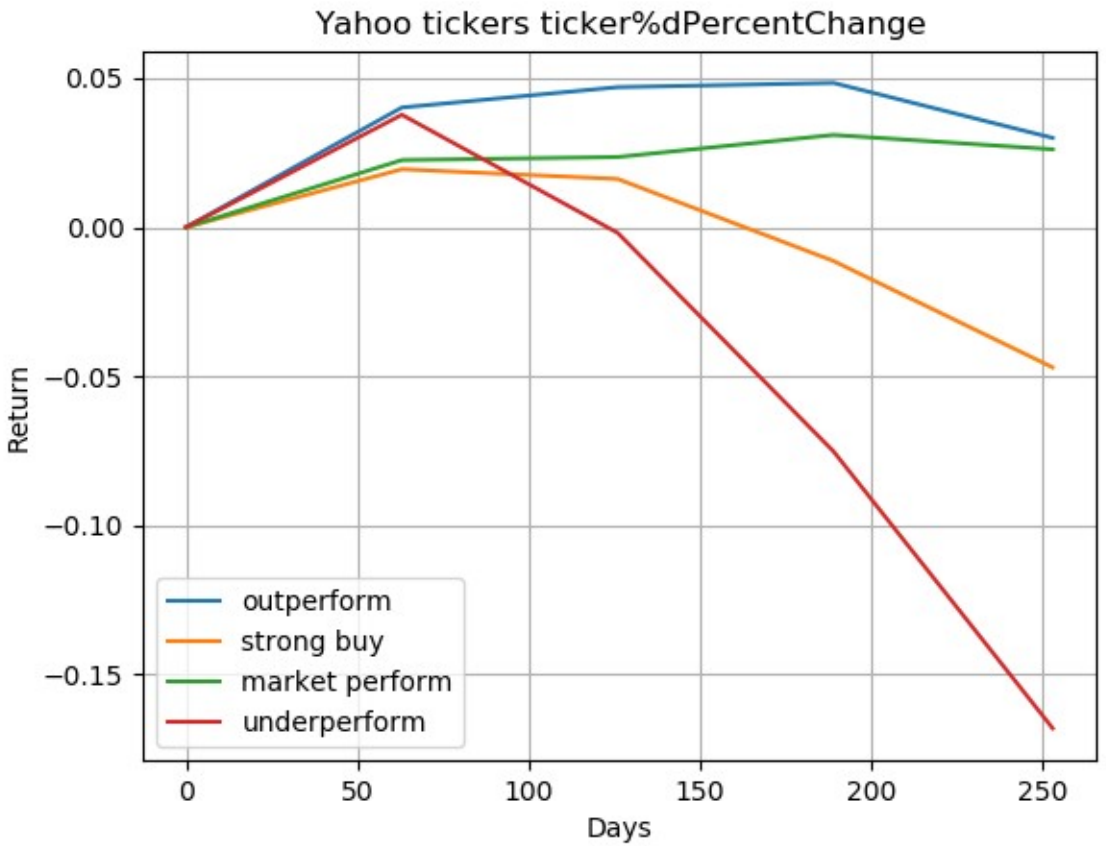
UnderPerform - From Don Maurer 20181207

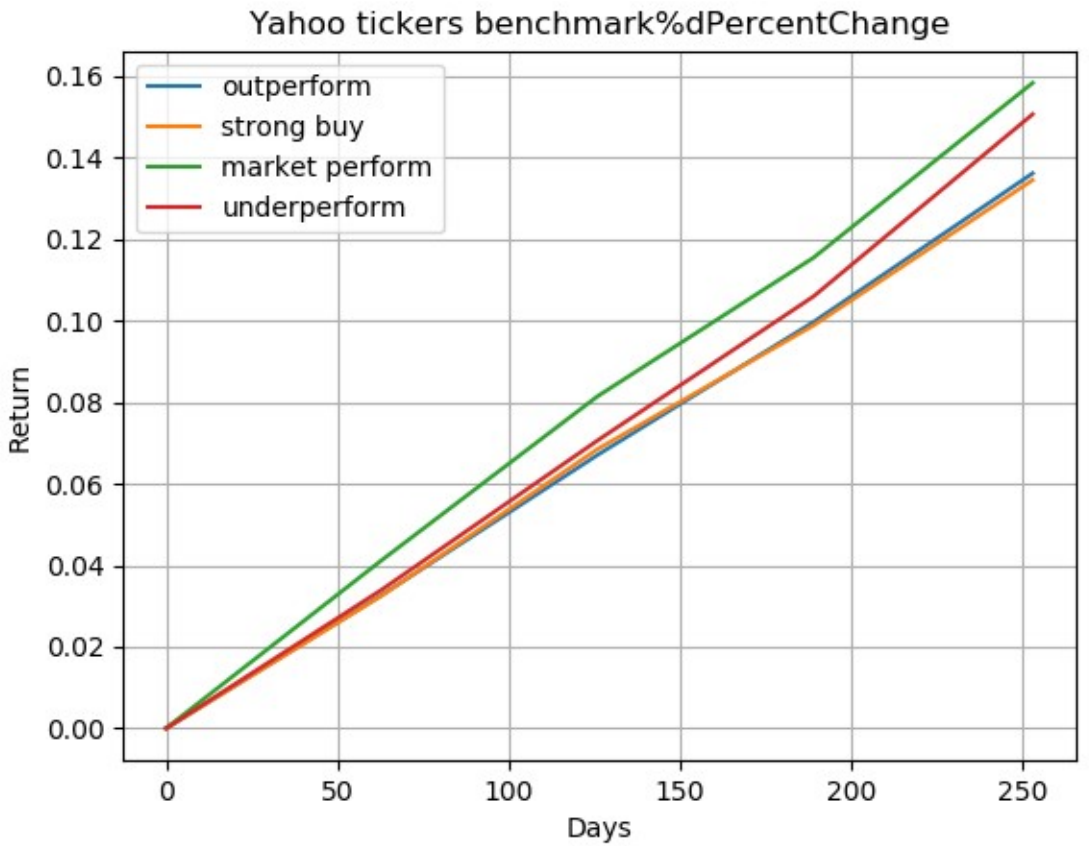
- It turns out the “underperform” category does well because of a few outliers – stocks with very low prices which get some “luck” and show a huge gain. Normally our strategies don’t buy stocks priced below $5, REN was one of the outliers with a low price.
- If you look at the median returns of the groups, there is hardly any difference. It is only at the +2SD point where you see the big difference between the “underperform” and the other groups.
- The SD for the “underperform” was also quite high – an indicator of outliers.
- Not sure that this would be a workable strategy but you can keep working on it. You’d probably need to apply a $Vol test to insure liquidity and add a minimum price test. I didn’t try to do that for this run but it might be worth a try to see its affect. However, it might eliminate the outliers and therefore the big gains.

BP Note: Venture Capital Portfolios are like this. A few outliers are responsible for all the gains.

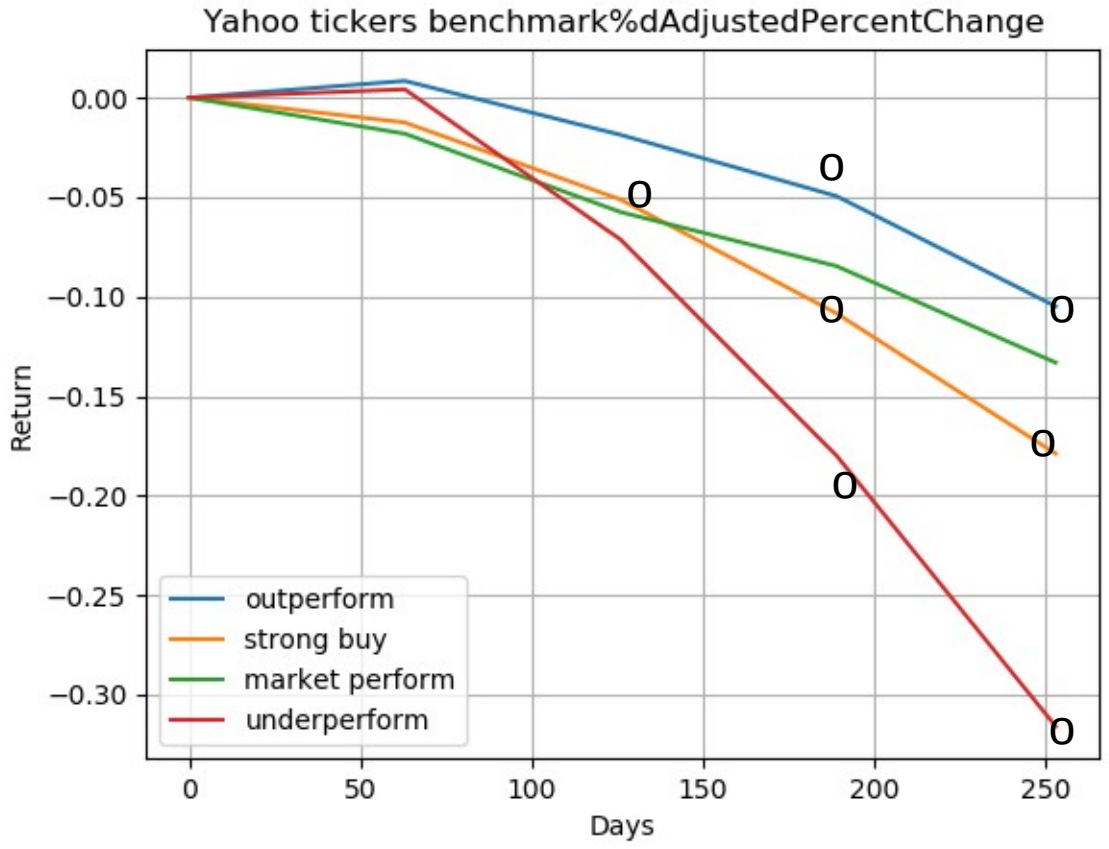
Analysis Results
Let’s switch data source

Yahoo Data - % Change and Benchmark





Yahoo Data – Benchmark Adj % Change



- Underperform 63 ~~126~~ day return: 3.77%
- Benchmark 63 ~~126~~ day return: 3.4%

Don Mauer Data

Days	tickRet	bnchRet
253	+4.568	+14.100
126	+1.460	+6.884
189	-1.181	+9.946
253	-3.476	+13.729

T test > 3.24

Rec	days	tickRet	bnchRet
outperform	189	+4.838	+9.968
outperform	253	+2.994	+13.618
strong buy	126	+1.618	+6.850
strong buy	189	-1.131	+9.884
strong buy	253	-4.699	+13.453
underperform	189	-7.513	+10.596
underperform	253	-16.799	+15.067

Comparing Don’s and Yahoo’s top 20

	date	ticker	tickerInitPrice	ticker63PercentChange
724	2016-07-11	REN	6.070000	3.861614
404	2016-03-31	CWEI	8.920000	2.206278
589	2016-05-10	REN	3.190000	2.059561
188	2016-01-21	DNR	1.260000	1.904762
327	2016-03-01	MCEP	1.040000	1.903846
1130	2016-11-07	BCEI	94.849800	1.447059
1019	2016-10-17	BCEI	114.935638	1.427185
878	2016-08-09	REN	9.760000	1.409836
256	2016-02-09	CHK	1.950000	1.205128
367	2016-03-16	CWEI	10.700000	1.182243
199	2016-01-25	CHK	2.950000	1.169492
352	2016-03-10	CWEI	12.440000	1.141479
208	2016-01-28	MUR	15.845088	0.959622
768	2016-07-26	CWEI	38.250000	0.936993
351	2016-03-09	CWEI	15.780000	0.804182
1832	2017-08-04	CLMT	5.250000	0.780952
359	2016-03-11	SWN	8.000000	0.643750
607	2016-05-24	CHK	4.050000	0.595062
647	2016-06-09	CHK	4.880000	0.586065
372	2016-03-17	SWN	8.100000	0.580247

	date	ticker	tickerInitPrice	ticker63PercentChange
188	2016-01-21	DNR	1.260000	1.904762
327	2016-03-01	MCEP	1.040000	1.903846
1130	2016-11-07	BCEI	94.849800	1.447059
1019	2016-10-17	BCEI	114.935638	1.427185
256	2016-02-09	CHK	1.950000	1.205128
199	2016-01-25	CHK	2.950000	1.169492
387	2016-03-23	PES	2.090000	1.133971
208	2016-01-28	MUR	15.845088	0.959622
1832	2017-08-04	CLMT	5.250000	0.780952
336	2016-03-04	PES	2.170000	0.663594
359	2016-03-11	SWN	8.000000	0.643750
607	2016-05-24	CHK	4.050000	0.595062
1099	2016-11-01	PES	3.750000	0.586667
647	2016-06-09	CHK	4.880000	0.586065
372	2016-03-17	SWN	8.100000	0.580247
243	2016-02-04	ECT	0.658168	0.571508
2456	2018-05-02	CHK	2.930000	0.518771
1044	2016-10-25	RIG	10.030000	0.513460
2316	2018-02-20	RIG	9.090000	0.512651
2325	2018-02-21	RIG	9.010000	0.503885

Are the recommendations even different?

Yahoo

Rec	vs	Rec	Days	Avg Ret		t-test
outperform		strong buy	253	+2.994	-4.699	+4.040
outperform		underperform	189	+4.838	-7.513	+4.411
outperform		underperform	253	+2.994	-16.799	+6.653
strong buy		underperform	253	-4.699	-16.799	+4.681
market perform		underperform	253	+2.612	-16.799	+3.818

Long Term, strong buy is worse that outperform in the Don data

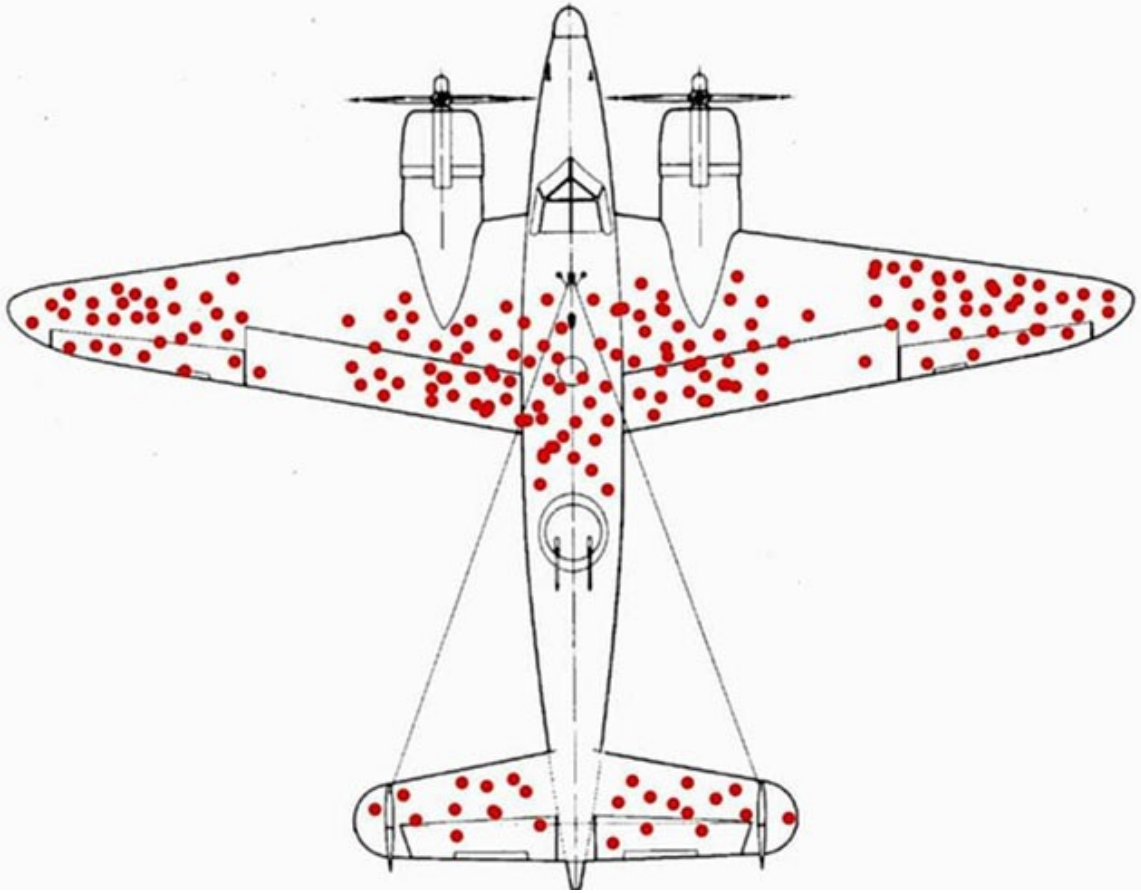
Long Term, Underperform is worse that everything else in the Yahoo data

Don

Rec	vs	Rec	Days	Avg Ret		t-test	
outperform		strong buy	189	+6.139	-1.181	+4.157	+0.000
outperform		strong buy	253	+4.568	-3.476	+4.159	+0.000

Long Term, strong buy is worse that outperform in the Don data

Conclusions:



- Complete/Consistent (Clean) data matters
  - ← Abraham Wald – Survivorship Bias
- RJ Recommendation Data is not Complete
  - Analyzing incomplete rcommendations is like analyzing a portfolio where you are not allowed to see all the components. This is why indices (and their components) are nice.
- #BuffetBet wins
  - Outperform, Strong Buy and Underperfrom may be directionally correct for longer term choices, but the benchmark (SPY) seems a better bet.

Mechanics [Python Code]

Used Numpy 1.15.1, Pandas 0.23.4 in Anaconda

Repo: https://github.com/paseman/RJRecommendationAnalysis

Mechanics – 1) downloadAttachments.py

- Bypass Security: https://myaccount.google.com/lesssecureapps?pli=1
- read_email_from_gmail('myFinance/PattyDewey')
  - Login (imaplib)
  - select label ('myFinance/PattyDewey')
  - fetch emails (email)
  - save attachment for each email
- Restore Security: https://myaccount.google.com/lesssecureapps?pli=1

Repo: https://github.com/paseman/RJRecommendationAnalysis

Mechanics – 2) extractRecommendations.py

- extractRecommendations("myFinance/PattyDewey/*.pdf","20190910recommendations.csv")
  - Collect all pdf filenames (glob("myFinance/PattyDewey/*.pdf"))
    - Note that filename contains the receipt date (NOT publication date)
  - Extract text from PDF (PyPDF2) – **NOTE: may not work with all pdf files**
  - Extract recommendation from text using regular expression
    - ss.replace("\n","")
    - for ss in re.findall('\(([^)]+)', s)
    - if 2==ss.count("/") and "/$" in ss and 1==ss.count("$") and len(ss) < 25
  - of.write("%s,%s,%s,%s\n"%(date,ticker,price,rating))

Repo: https://github.com/paseman/RJRecommendationAnalysis

Mechanics – 3) addReturns.py

- addReturns("logs/recommendations.csv","logs/recommendationsPlusReturns.csv")
  - Pull tickers from recommendations file
  - (Try to) pull from yahoo, noting those who are no longer listed
    - Note that we do not check for symbol reassignment.
    - Note that this approach is rife with survivor bias
  - Add 3,6,9,12 month returns for both surviving tickers and Benchmark (SPY).

Repo: https://github.com/paseman/RJRecommendationAnalysis

Mechanics – 4) analyzeRecommendations.py

- analyzeRecommendations("20190910recommendations.csv",benchmark="SPY")
  - Wanted to see if the categories (outperform,strongBuy,marketPerform,underperform) were significantly different from one another, or just noise.
  - Counts, ttests, graphs.

Repo: https://github.com/paseman/RJRecommendationAnalysis