

Portfolio Performance Evaluation

Types of Abnormal Performance:

- Stock Selectivity
- Market Timing

Related:

- Style Analysis

Performance Evaluation

The market model regression in excess returns form (subtracting the risk-free interest rate from the asset return being studied) essentially uses the CAPM as the benchmark, so the intercept $a(i)$ measures the average excess return (compared with the prediction of the CAPM):

$$[R(it) - R(ft)] = a(i) + b(i) [R(mt) - R(ft)] + e(it)$$

The CAPM says

$$E[R(it) - R(ft)] = b(i) E[R(mt) - R(ft)]$$

and $E[e(it)] = 0$, so $a(i)$ should equal 0

– this is sometimes called “Jensen’s alpha”

Performance Evaluation

- $R(it)$ is the mutual fund return, including dividends, subtracting fees and expenses
- $R(ft)$ is the default-free interest rate of the time interval (e.g., 1 month Tbill yield)
- $R(mt)$ is the CRSP value-weighted portfolio return (or the S&P 500 index with dividends, or some other “market” index)
- If you want to use the F-F 3-factor model, just use SMB and HML as additional variables in the regression model, and the loadings on SMB and HML tell you whether the portfolio behaves like a large or small cap, or a growth or value fund

DFA US Small Cap I (DFSTX)

- This is a small-cap “index” fund (not specifically either value or growth)
- It is a \$17B fund, follows Fama-French research
- Monthly data from January 2005 through March 2018 in BRN481MF.XLSX (also BRN481MF.ZIP)

Stock Selectivity and Style for DFSTX, 2005-2018

	2005-2018		2005-2011		2012-2018	
a(i)	-0.0009	-0.0001	0.0011	0.0002	-0.0016	-0.0002
t(a(i))	-0.53	-0.19	0.51	0.37	-0.65	-0.32
b(i)	1.2334	1.0306	1.2872	1.0447	1.0986	0.9900
t(b(i)-1)	5.82	2.30	6.16	2.76	1.25	-0.45
s(i)		0.8546		0.9198		0.7677
t(s(i))		36.82		28.82		25.67
h(i)		0.2356		0.1931		0.3007
t(h(i))		11.62		7.74		9.90
Rsq	0.8569	0.9869	0.9016	0.9917	0.7238	0.9783
s(e(i))	0.0206	0.0062	0.0206	0.0060	0.0200	0.0056

Stock Selectivity and Style for DFSTX, 2005-2018

- It looks like DFSTX has no abnormal returns/stock selectivity
- Market risk is slightly above average of 1.0
- Strong tilt toward low-cap stocks (which is what we would expect)
 - $s(i) = .76$ to $.92$
- Tilt toward value (high book-to-market)
 - $h(i) = .19$ to $.30$

DFA International Small Cap Value I (DISVX)

- This is a small-cap and value “index” fund of non-US stocks
 - Although they own ADRs of foreign stocks traded in the US
- It is a \$16B fund, follows Fama-French research
- Monthly data from January 2005 through March 2018 in BRN481MF.XLSX (also BRN481MF.ZIP)

Stock Selectivity and Style for DISVX, 2005-2018

	2005-2018		2005-2011		2012-2018	
a(i)	-0.0006	-0.0005	0.0011	0.0012	-0.0017	-0.0016
t(a(i))	-0.25	-0.21	0.32	0.35	-0.53	-0.50
b(i)	1.1013	1.0907	1.1307	1.1275	1.0349	1.0288
t(b(i)-1)	1.81	1.47	1.83	1.48	0.35	0.28
s(i)		0.0077		-0.0490		0.0451
t(s(i))		0.07		-0.29		0.33
h(i)		0.0525		0.0617		0.0058
t(h(i))		0.56		0.47		0.04
Rsq	0.7103	0.7072	0.7506	0.7453	0.5910	0.5802
s(e(i))	0.0287	0.0288	0.0315	0.0318	0.0253	0.0256

Stock Selectivity and Style for DISVX, 2005-2018

- It looks like DISVX has no abnormal returns/stock selectivity
- Market risk is slightly above average of 1.0
- Surprisingly little tilt toward low-cap or value stocks (as defined by US factors)
 - $s(i) = -.05$ to $.05$
 - $h(i) = .01$ to $.06$

Swiss Helvetia Fund, Inc. (SWZ)

- “Closed end” fund of Swiss stocks
 - Assets of the fund are Swiss stocks and ADRs
 - The stock of this firm is traded on the NYSE
 - Unlike an “open end” fund, which trades at the net asset value (NAV) of the fund, closed end fund prices are set independently
 - In many cases, such as this one, it trades at a “discount”
 - Many of SWZ’s largest shareholders are other institutional investors who put pressure on SWZ to distribute assets to let shareholders realize the value of the firm’s assets

Stock Selectivity and Style for SWZ, 2005-2018

	2005-2018		2005-2011		2012-2018	
a(i)	-0.0010	-0.0012	0.0003	0.0010	-0.0022	-0.0025
t(a(i))	-0.38	-0.44	0.07	0.22	-0.69	-0.81
b(i)	0.8096	0.8596	0.8264	0.8535	0.7771	0.8086
t(b(i)-1)	-2.89	-1.96	-1.92	-1.37	-2.21	-1.98
s(i)		-0.2582		-0.3248		-0.1611
t(s(i))		-2.06		-1.54		-1.25
h(i)		-0.0064		0.1928		-0.3738
t(h(i))		-0.06		1.17		-2.85
Rsq	0.4874	0.4948	0.4984	0.5090	0.4401	0.5020
s(e(i))	0.0338	0.0335	0.0399	0.0395	0.0256	0.0242

Stock Selectivity and Style for SWZ, 2005-2018

- It looks like SWZ has no abnormal returns/stock selectivity
- Market risk is below average of 1.0
 - .78 to .86
- Tilt toward large cap stocks
 - $s(i) = -.16$ to $-.32$
- Tilt toward growth stocks since 2012
 - $h(i) = -.37$

Testing for Market Timing

- If you thought you had the ability to “time” the market (i.e., you could tell when stock returns were likely to be higher than Treasury bill returns), you should be more heavily invested in stocks in those periods
 - This would imply that the beta of your portfolio would be higher when market risk premiums were positive (and lower when they were negative)

$$[R(it) - R(ft)] = a(i) + b(i) [R(mt) - R(ft)] + b_{up}(i) D(t) [R(mt) - R(ft)] + e(it)$$

where $D(t) = 1$ if $[R(mt) - R(ft)] > 0$, and 0 otherwise

$b_{up}(i)$ represents the increase in risk (if any) due to market timing

Market Timing for DFSTX, 2005-2018

	2005-2018	2005-2011	2012-2018
a(i)	-0.0015	0.0001	-0.0029
t(a(i))	-0.60	0.02	-0.71
b(i)	1.2131	1.2613	1.0339
t(b(i)-1)	3.00	3.27	0.19
bup(i)	0.0425	0.0585	0.1064
t(bup(i))	0.35	0.40	0.40
Rsqr	0.8579	0.9030	0.7281
s(e(i))	0.0206	0.0207	0.0201

Market Timing for DFSTX, 2005-2018

- It looks like DISVX has no significant market timing
 - Beta is higher by about 0.04 to .11 in “up markets,” but none of the t-stats are bigger than 0.4, so this is not reliable evidence of anything
- This is not surprising, since an index fund should not be trying to do market timing

Market Timing for DISVX, 2005-2018

	2005-2018	2005-2011	2012-2018
a(i)	0.0031	0.0056	0.0017
t(a(i))	0.88	1.04	0.35
b(i)	1.2123	1.2382	1.2146
t(b(i)-1)	2.16	1.96	0.94
bup(i)	-0.2333	-0.2426	-0.2957
t(bup(i))	-1.37	-1.09	-0.88
Rsqr	0.7155	0.7572	0.6008
s(e(i))	0.0286	0.0315	0.0253

Market Timing for DISVX, 2005-2018

- It looks like DISVX has weak negative market timing
 - Beta is lower by about $-.23$ to $-.30$ in “up markets,” with t-stats between $-.9$ and -1.4
- Not clear what this means, except that perhaps DFA was holding cash (perhaps waiting to invest) in months when the market went up?

Market Timing for SWZ, 2005-2018

	2005-2018	2005-2011	2012-2018
a(i)	0.0058	0.0085	0.0047
t(a(i))	1.40	1.27	0.94
b(i)	1.0153	1.0246	1.1391
t(b(i)-1)	0.13	0.16	0.61
bup(i)	-0.4320	-0.4476	-0.5956
t(bup(i))	-2.17	-1.61	-1.77
Rsqr	0.5056	0.5197	0.4706
s(e(i))	0.0334	0.0395	0.0253

Market Timing for SWZ, 2005-2018

- It looks like SWZ has weak positive stock selectivity, off-set by weak negative market timing
 - Alpha is between 0.5 and 0.9% per month
 - t-stats between .9 and 1.4
 - Beta is lower by about -.43 to -.60 in “up markets”
 - t-stats between -1.6 and -2.2

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Data used for these slides can be accessed at:

<http://schwert.ssb.rochester.edu/brn481/brn481mf.xlsx>

<http://schwert.ssb.rochester.edu/brn481/brn481mf.zip>

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