



FINM3407 – Behavioral Finance

Topic 10:

Chapters 19: Behavioral Investing

Reference: Ackert and Deaves, Chapters 19

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Topic 10: Behavioural Investing

- 10-1: Anomaly Attenuation, Style Peer Groups, and Style Investing
- 10-2: Refining Anomaly Capture:
 - Refining Value Investing using Accounting Data*
 - Refining Momentum-Investing using Volume*
 - Momentum and Reversal (Value)*
- 10-3: Multivariate Approaches
- 10-4: Style Rotation
- 10-5: Is It Possible To Enhance Portfolio Performance Using Behavioral Finance
 - Early Evidence*
 - What is Behavioral Investing*

Anomaly Attenuation

- It has been argued that **a number of anomalies**, once reported in the academic literature, either attenuate or disappear in the future.
- Anomaly dissipation is exactly what one would expect to see happen in a world which, **while not always perfectly efficient**, has a tendency to move in that direction once information is disseminated leading to remedial arbitrage activity.
- But those anomalies that have been argued to be risk factors, in particular value and firm size, should **not** disappear...
 - *Because, under a risk story, they are not anomalies at all*
 - *But rather fair compensation for risk borne*
- While **value advantage did decline in late 90s**, it did come back with a vengeance with bursting of tech/internet bubble beginning in 2000.

Peer Group Evaluation

Becoming commonplace for managers to be evaluated relative to their size/value peer group -- relative to their style-peer group.

Style is usually defined in terms of firm size and growth vs. value.

- Morningstar sorts funds into nine groups based on size/value 3 by 3 matrix
- Managers compared to other managers in their box
- To rise above crowd, one must do more!

Style-Investing

Consideration of style in portfolio formation can mean different things:

1. Given that **style returns are cyclical**, *gains in risk reduction can be obtained by consciously diversifying over different styles*
2. **Within this diversification approach**, given that historically value has **outperformed** growth, and small-cap has **outperformed** large-cap, it may **be advisable to tilt towards small-cap and value, while still investing in different styles**
3. If it is possible to *predict when styles will be favored by investors, there may scope for style-rotation -- depending on what your predictive model is calling for*

Style-Investing Example

Say a neutral value-growth allocation would be 50%/50%.

- If you consciously style-diversify, you would hold 50% in growth and 50% in value
- If you believe that value is more often than not better you might tilt 60% towards value (style tilting)
- If you believe you have a predictive model that allows you to time style returns, you might be willing to toggle back and forth, 80% or 40% in value (style rotation)

Refining Value Investing by Using Accounting Data

- Research shows that value investing can be enhanced by conditioning on volatility and investor sophistication.
- Taking a different tack, Joseph Piotroski has shown **that financial statement information can also be useful**. It turns out that the **effectiveness of value investing relies on a small number of firms — using a simple market-to-book approach**.

Less than 44% of low market-to-book firms earned positive excess returns in the 2 years following portfolio formation.

Developed a scoring system (F-Scores) on the level of financial soundness based on:

- Profitability
- Financial leverage/liquidity
- Operating efficiency

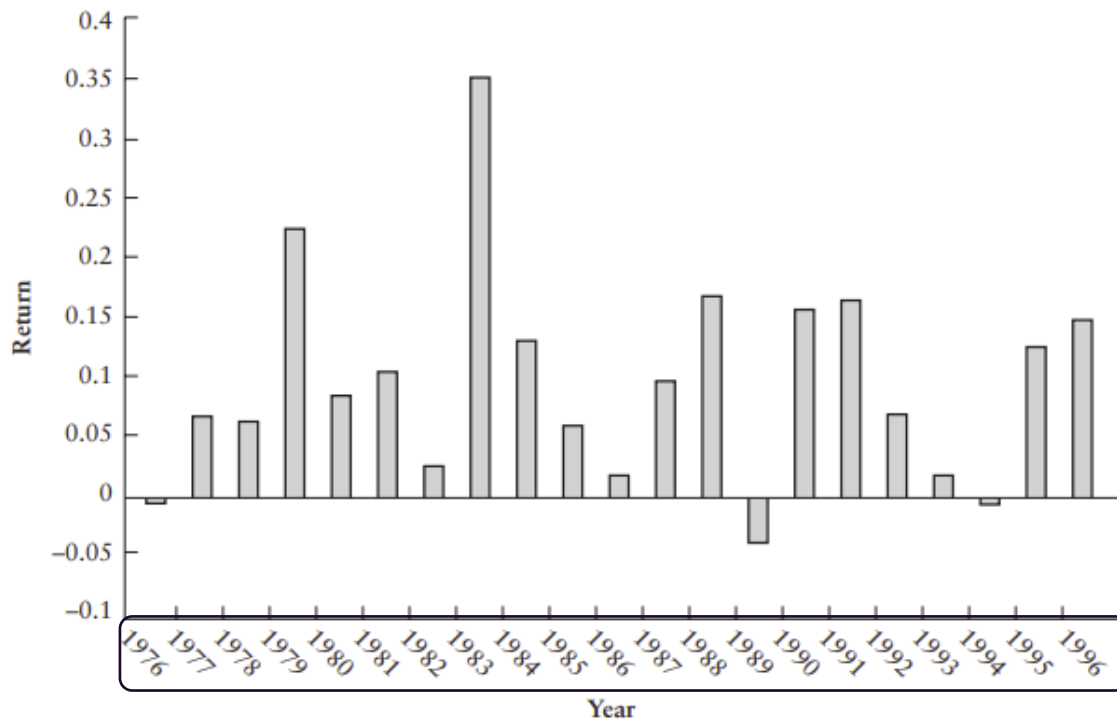
Rank the value stocks from 0 (least sound) to 9 (most sound).

Zero-investment strategy of long (F>5) and short (F<5) earned 9.7%.

Refining Value Investing by Using Accounting Data

1-year returns to long-short value strategy

19.1 One-year Returns to a Long-short Value Strategy where Additional Financial Statement Information is Used to Differentiate Predicted Winners and Losers



- Moreover, as shown in Figure 19.1, such a strategy proved quite dependable on a year-to-year basis.
- In only **3 of the 21 years** of the sample does a long-short strategy earn **negative risk-adjusted returns** — and in two of these years the return is close to zero.

Source: Piotroski, J. D.. From "Value investing: The use of historical financial statement information to separate winners from losers," *Journal of Accounting Research* 38, (Supplement), 2000, pp. 1–41. Reproduced by permission of Blackwell Publishers

Refining Momentum-Investing Using Volume

Market State Impact:

Momentum **strength** varies with market state. & *Negative market states cause momentum dissipation.*

- Volume as a Key Indicator:

Technical analysts regard volume **as significant**.

Volume predicts the magnitude and persistence of momentum.

- Relationship Between Volume and Momentum: Documented by Charles Lee and Bhaskaran Swaminathan.

Momentum returns ***tend to eventually reverse***.

Suggests momentum can be **an overreaction**.

Momentum and reversal are interconnected.

Refining Momentum-Investing Using Volume

TABLE 19.1 | TWO-WAY SORT OF MOMENTUM AND VOLUME

	Volume	V1	V2	V3	V3-V1
R1		1.12 (2.74)	0.67 (1.61)	0.09 (0.20)	-1.04 (2.74)
R5	Return/ momentum	1.36 (5.37)	1.34 (4.63)	1.15 (3.28)	-0.21 (1.33)
R10		1.67 (5.30)	1.78 (5.41)	1.55 (4.16)	-0.12 (0.67)
R10-R1		0.54 (2.07)	1.11 (4.46)	1.46 (5.93)	0.91 (4.61)

Source: Lee, C. M. C. and B. Swaminathan. From "Price momentum and trading volume," in *Journal of Finance* 55, pp. 2017-69. © 2000 Wiley Publishing, Inc. This material is used by permission of John Wiley & Sons, Inc.
Note: Table shows returns/month and t-statistics in parentheses.

Table 19.1

shows a two-way sort on momentum and volume.

- Researchers *divided firms into 10 past-return deciles* and **three volume terciles, forming 30 momentum-volume portfolios.**
- They found that **low volume-high momentum firms yielded higher returns at 1.67% per month,**
- while **high volume-low momentum firms earned just 0.09% per month, creating a spread of 1.58% per month.**

Refining Momentum-Investing Using Volume

- **Momentum Life Cycle:**

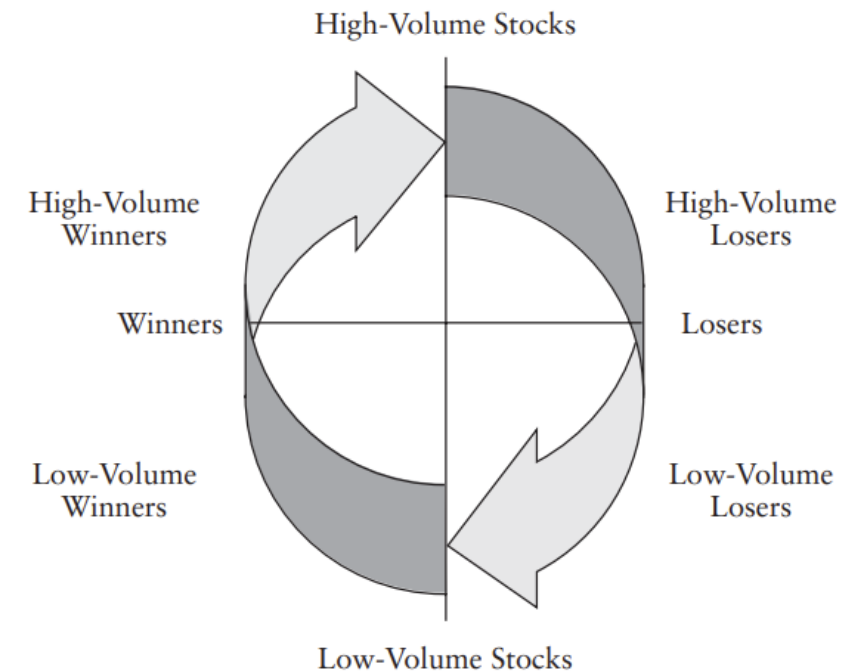
Stocks with *good past returns* and *high-volume exhibit patterns*.

Stocks peak, *face bad news*, and *get sold at high volume*.

As stocks decline, volume decreases.

On stock recovery, volume starts low but eventually increases as the stock gains attention.

Momentum Life Cycle



- **Further Studies:.**

Examining the term structure of *past returns (momentum and reversal)*.

Investigating the relationship between momentum and value.

Momentum and Reversal: Utilising Term Structure of Past Returns

- Mark Grinblatt and Tobias Moskowitz documented the gains available if one conditions on the entire term structure of past returns.
- As we have seen earlier, there is a negative serial correlation using both **short-term (one-month) returns** and **long-term (3–5 year) returns**, while positive serial correlation is present for **medium-term (6–12 month) returns**.

Researchers performed a regression of returns on:

- Past returns
- Differentiating between winners & losers
- And conditioning on consistency

Then they formed deciles based on predicted returns from this regression.

Grinblatt-Han Model Summary:

- Focuses on **capital gains overhang** as the driver of future returns.
- Consistent winners likely to **have larger unrealized capital gains**.
- Stocks with similar **past returns** may differ in capital gains if achieved by occasional price jumps.

Momentum and Reversal

Regression of hedged monthly stock returns on set of term structure variables

TABLE 19.2 | REGRESSION OF HEDGED MONTHLY STOCK RETURNS ON A SET OF TERM STRUCTURE VARIABLES

Independent variables	Coefficient	Abs. t-stats
Previous month's return	-0.0472	11.39
Previous month's return (L)	-0.0764	9.63
Previous month's return consistency indicator (W)	0.0051	8.79
Return from -12 to -2	0.0028	2.50
Return from -12 to -2 (L) Min(0, Return from -12 to -2)	0.0113	2.97
Return from -12 to -2 consistency indicator (W)	0.0046	5.80
Return from -12 to -2 consistency indicator (L)	-0.0007	0.76
Return from -36 to -13	-0.0015	3.47
Return from -36 to -13 (L)	-0.0052	2.04
Return from -36 to -13 consistency indicator (W)	0.0014	2.73
Return from -36 to -13 consistency indicator (L)	-0.0007	0.80

Source: Reprinted from the *Journal of Financial Economics*, Vol 71, Issue 3, Grinblatt, M., and T. J. Moskowitz., "Predicting stock price movements from past returns: The role of consistency and tax-loss selling," pp. 541-79, © 2004. With permission from Elsevier.

Table 19.2 shows a regression of hedged monthly security returns on a set of term structure variables.

- **Strong positive serial correlation** observed in returns from 12 months back to one month.
- Greater persistence noticed for firms with *negative returns in this span, indicating loser firms tend to remain losers.*
- **Consistency matters:**
 - **Firms with positive returns** in at least 8 of the 11(from -12 to -2) months showcase **enhanced momentum.**
 - Firms consistently *performing negatively* over 8 of the 11(from -12 to -2) months don't affect momentum.



- Overall findings:
Losers show amplified serial correlations, consistent winners boost returns, while consistent losers don't influence momentum or reversal

Momentum and Reversal

Performance across deciles using term structure

FIGURE 19.3 Average Hedged Returns by Deciles

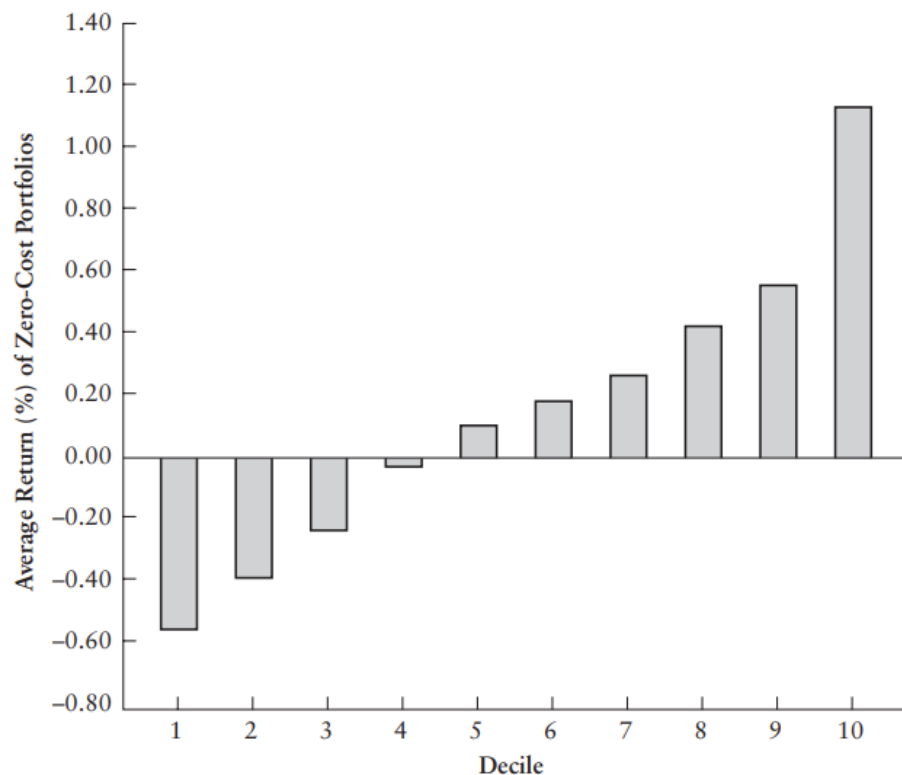


Figure 19.3

shows average returns by decile for these zero-cost portfolios.

- Notice that they line up in order, with decile 10 earning the highest average returns and decile 1 earning the lowest.
- The decile 10 versus decile 1 gap is an impressive (and highly significant) 1.68%/month.
- Indeed, conditioning on the term structure of past returns seems a wise strategy.

This is of course what technical analysts have always done, though likely not with the same statistical rigor.

Source: Reprinted from the *Journal of Financial Economics*, Vol 71, Issue 3, Grinblatt, M. and T. J. Moskowitz, "Predicting stock price movements from past returns: The role of consistency and tax-loss selling," pp. 541–79, © March 2004. With permission from Elsevier.

Momentum and Value

Clifford Asness studied the effects of simultaneous value and momentum screening on U.S. stocks.

- Stocks sorted into value and momentum quintiles

resulted in 25 intersection portfolios.

- High momentum-high value portfolio averaged

returns of 1.62%/month.

- Simultaneous use of value and momentum is not

maximally effective because:

- Value best suits low-momentum stocks.
- Momentum most effective for low-value stocks.
- Low-value stocks showed a momentum differential of 1.47%.

TABLE 19.3 | AVERAGE ONE-MONTH RETURNS (IN PERCENT) BASED ON A TWO-WAY SORT OF VALUE AND MOMENTUM

		Value					
		Low	2	3	4	High	Average
Momentum	Low	0.03	0.49	0.80	0.83	1.00	0.63
	2	0.61	0.59	0.90	1.25	1.35	0.94
	3	0.52	0.93	0.80	1.19	1.44	0.98
	4	0.99	0.97	1.17	1.45	1.68	1.25
	High	1.50	1.44	1.49	1.60	1.62	1.53
	Average	0.73	0.88	1.03	1.26	1.42	

Source: Data adapted from Asness, C. S., 1997, "The interaction of value and momentum strategies," in *Financial Analysts Journal* vol. 53, No. 2, (March/Apr 1997), p. 29. With permission from CFA Institute. Copyright 1997. All rights reserved.

Note: Marginal values are averages of internal two-way sort returns.

Multivariate Approaches

- **Objective:** Expand research beyond two factors using a multivariate approach.
- **Study by Marc Reinganum:**
 - Analysed 222 firms with stock prices that doubled between 1970 and 1983.
 - **Goal:** Identify shared characteristics of these "winners."
 - **Primary Question:**
Can these characteristics be used to develop a successful trading strategy?

Multivariate Approaches

Conditioning on a large number of variables

- Now a large number of conditioning variables used.
- Variables grouped into five categories: 1/risk; 2/liquidity; 3/price level; 4/growth potential; and 5/technical.
 1. **Risk factors** include such standard risk factors as beta and sensitivities to macroeconomic variables
 2. **Illiquid stocks** need to have higher returns to compensate traders who must face higher transaction costs, so such logical factors as price per share and volume were included
 3. **Price level factors** essentially capture value strategies, as this category includes share price relative to various accounting magnitudes
 4. **Growth potential factors** point to the likelihood of higher growth in earnings and dividends, with various profitability measures being used as proxies in this regard
 - Idea here is that, for a given price relative to accounting measures, indicators suggesting higher future growth might point to diamonds in the rough
 5. **Technical factors include standard momentum and reversal measures**

Multivariate Approaches

Regression

- Reinganum's study (1970-1983) on AMEX and NYSE firms used specific commonalities to screen stocks. *When all characteristics aligned, a buy signal was triggered, and stocks were held for two years, outperforming the S&P 500 by 37.14% at a comparable risk.*
- Later, Haugen and Baker categorised numerous predictive factors into five groups: **risk, liquidity, price level, growth potential, and technical**. These factors encompassed elements like beta, stock liquidity, value strategies, earnings growth potential, and momentum indicators, aiming to enhance stock selection and investment strategy.

The following regression was then run using all these independent variables:

$$R_{j,t} = \sum_i \beta_{t,i} F_{j,i,t-1} + u_{j,t}$$

- $R_{j,t}$ is the return on stock j at month t
- $\beta_{t,i}$ is the regression coefficient or payoff to factor i at month t
- $F_{j,i,t-1}$ is the exposure to factor i of stock j at month t

These researchers first estimated this regression cross-sectionally (at a single point in time) for all 180 months during 1979–1993

Which variables were significant?

$$R_{j,t} = \sum_i \beta_{t,i} F_{j,i,t-1} + u_{j,t}$$

TABLE 19.4 | FACTOR COEFFICIENTS AND T-STATISTICS

	1979/2001 to 1986/2006		1986/2007 to 1993/2012	
	Mean	Abs. t-stat.	Mean	Abs. t-stat.
One-month excess return	-0.97%	17.04	-0.72%	11.04
12-month excess return	0.52%	7.09	0.52%	7.09
Volume/market cap	-0.35%	5.28	-0.20%	2.33
2-month excess return	-0.20%	4.97	-0.11%	2.37
E/P	0.27%	4.56	0.26%	4.42
ROE	0.24%	4.34	0.13%	2.06
Book-to-price	0.35%	3.90	0.39%	6.72
Volume trend	-0.10%	3.17	-0.09%	2.58
6-month excess return	0.24%	3.01	0.19%	2.55
CF/P	0.13%	2.64	0.26%	4.42
Variability in CF/P	-0.11%	2.55	-0.15%	3.38

Source: Reprinted from the *Journal of Financial Economics*, Vol 41, Issue 3, Haugen, R. A., and N. L. Baker, "Commonality in the determinants of expected stock returns," pp. 401-39, © July 1996. With permission from Elsevier.

- *The table displays coefficients representing the change in a stock's monthly expected return due to a one standard deviation change in exposure to a factor.*
- **Robustness checked by repeating the analysis for the latter half of the sample.**
- Key observations:
 - Factors' impact is consistent.
 - No risk measures are present.
 - Dominant factors are technical, price level, and liquidity.

Which variables were significant?

$$R_{j,t} = \sum_i \beta_{t,i} F_{j,i,t-1} + u_{j,t}$$

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Volume/market cap	-0.35%	5.28	-0.20%	2.33
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ROE	0.24%	4.34	0.13%	2.06
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Volume trend	-0.10%	3.17	-0.09%	2.58
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CF/P	0.13%	2.64	0.26%	4.42
Variability in CF/P	-0.11%	2.55	-0.15%	3.38

Source: Reprinted from the *Journal of Financial Economics*, Vol 41, Issue 3, Haugen, R. A., and N. L. Baker, "Commonality in the determinants of expected stock returns," pp. 401-39, © July 1996. With permission from Elsevier.

An out-of-sample test was conducted.

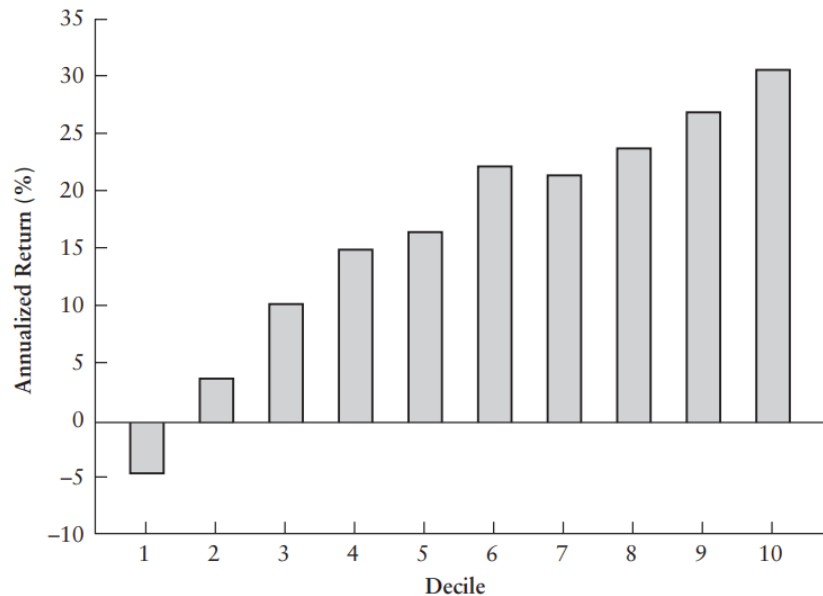
- *Factor sensitivities were determined using data from the 12 months before 1993.*
- *Expected returns for each stock were calculated for January 1993 based on these sensitivities and factor exposures.*
- Stocks were then ranked **by expected return, from highest to lowest.**
- **They were divided into 10 deciles.**

Decile 10 contained the top 10% of stocks with the highest expected return.

Decile 1 had stocks with the lowest expected return.

Performance Deciles

FIGURE 19.4 Average Decile Returns to Expected Return Portfolios



Source: Reprinted from the *Journal of Financial Economics*, Vol 41, Issue 3, Haugen, R. A., and N. L. Baker, "Commonality in the determinants of expected stock returns," pp. 401–39, © July 1996. With permission from Elsevier.

Figure 19.4 shows the average returns to the 10 deciles during this sample period.

- The Haugen and Baker expected return approach *appears to be quite successful in predicting which stocks will outperform going forward.*
- While momentum and value seem to be the heart of it, other factors apparently matter as well.
- *Nevertheless, recent work casts doubt on the contribution of factors over and above momentum and value.*
- When **transaction costs are factored into the analysis**—and it should be noted that the Haugen and Baker strategy entails monthly rebalancing—there appears to be no value added beyond momentum and value.

Style Rotation

- The act of moving from style to style in the attempt to time aggregate style preference shifts.

Predictive Models & Investment Strategies

- **Necessity:** Reliable predictive models are foundational for investment approaches.
- **Key Macroeconomic Factors:**
 1. Default premium
 2. Term structure slope
 3. Aggregate dividend yield

Style Rotation

Country-Level Style Rotation Research

Researchers: Desrosiers, L'Her, and Plante

Data Source: MSCI country indexes from 1975-2003 (including countries like US, Canada, Australia)

Investment Strategies & Their Returns

•**Relative-Value Strategy:**

Approach:

Focus on book-to-market values

Return: 0.32%/month

•**Relative-Strength (Momentum)**

Strategy:

Approach: Focus on past annual returns

Return: 0.81%/month

Strategy Correlations & Combined Approach

•**Correlation:**

The two strategies had a negative correlation of -0.56 over five years.

•**Combined Portfolio:** Mix of both strategies

Return: 0.86%/month

Risk: Lower than individual strategies

Market Trends & Strategy Efficacy

•**Downturns:**

Favored Strategy: Relative-value

Reason: Increased risk aversion

•**Upturns:**

Favored Strategy: Momentum

Reason: Increased overconfidence

Style Rotation

TABLE 19.5 | AVERAGE ONE-MONTH RETURNS FOR RELATIVE-VALUE TILT, RELATIVE-STRENGTH TILT, AND STYLE ROTATION USING COUNTRY INDEXES

	Relative-value Tilt	Relative-strength Tilt	Style Rotation
Correct prediction months	3.32%	5.18%	4.20%
Incorrect prediction months	-1.38%	-4.12%	-2.29%
Weighted average of all prediction months	0.93%	1.81%	1.30%
Single-style approach	0.32%	0.81%	

Source: Data adapted from DesRosiers, S., J. F. L’Her, and J. F. Plante, “Style management in equity country allocation,” in *Financial Analysts Journal* vol. 60, No. 2, (2004), pp. 40–54. With permission from CFA Institute. Copyright 2004. All rights reserved.

Conclusion :

Style rotation averages 1.30%/month. Diversifying styles is beneficial, but prior year returns-based style rotation optimizes gains.

Style Rotation’s Value :

Table 19.5 highlights the effectiveness of style rotation. For a relative-value tilt, although it's successful in 100 of the 203 months, the weighted average is a notable 0.93%/month. This is due to a stark difference between gains in successful months (3.32%) versus losses in unsuccessful ones (-1.38%).

Relative-Strength Returns :

Signals favoring a relative-strength tilt succeeded in 90 out of 141 months. High gains during successful months (5.18%) against losses during failures (-4.12%) resulted in an impressive weighted return of 1.81%.

What is Behavioural Investing?

Anomalies are common knowledge -- having been published in many of the best journals.

Anomaly capture in portfolio construction, while behavioral, is insufficient:

- Distinction should be made between what is behavioral (perhaps having continuity) and what is not (perhaps indicating statistical artifact)

One of the main determinants of whether a pattern in data has usefulness for the future is whether or not it is behaviourally based.

- Such anomalies are in some sense “natural”
- While they can potentially be arbitrated away, given the limits to arbitrage and human nature, this is not necessarily easy to do

Is It Possible To Enhance Portfolio Performance Using Behavioural Finance

Early Evidence

Behavioral Mutual Funds Performance Analysis

- Overview:

Study evaluated 16 behavioral mutual funds (self-proclaimed or media-identified) claiming strategies based on behavioral finance principles.

- Limitations:

1. Small sample size.
2. Uncertainty if *behavioral investing genuinely followed*.
3. Funds may *change names/strategies to attract investments*.

- Findings:

- Behavioral funds attract investors mainly due to **outperforming the S&P 500**.
- Using Fama-French three-factor model with momentum, *these funds don't show excess returns; they capitalise mainly on the value advantage*.

- Conclusion:

- No strong evidence that behavioral investing has significant benefits.
- Issues with sample size and statistical test power; funds might provide value, **but it's challenging to conclusively determine**.

Is It Possible To Enhance Portfolio Performance Using Behavioural Finance

What is Behavioural Investing

Behavioural investing aims to enhance portfolio performance using behavioural finance insights.

- **What It Isn't:**

Merely naming a fund as "behavioural" or mentioning behavioural principles in a prospectus isn't enough.

- **True Behavioral Investing:**

Utilizing known anomalies from behavioural models.

Essential to discern which patterns will persist in the future.

Preference for genuinely behaviorally based factors, e.g., the value advantage.

- ***Is It Effective?***

Despite mixed evidence, the distinction between true behavioural patterns and spurious ones is crucial.

The verdict on behavioural investing's efficacy remains open due to current evidence limitations.

Conclusion

1. **Momentum and value** investing have shown themselves to be robust over different samples and markets. But the forces of arbitrage-driven anomaly attenuation are always present.
2. The fact that managers are compared to others in their style peer group makes it vital to look for an additional edge.
3. Value can be **enhanced** by utilizing financial statement information. Momentum can be enhanced by taking volume into consideration. Looking at the entire term structure of past returns, and consistency of return, also leads to a payoff.
4. Multivariate approaches seek to utilize **all relevant factors**, but it is **not clear** if there **is any value added beyond momentum or value.**
5. **Style rotation seeks to time style shifts.** Preliminary research **both within countries and using national markets suggests promise.**
6. There is **no evidence** ***that behavioral investing leads to any return boost.*** Given the paucity of funds espousing a **behavioral bent**, however, and ***the lack of clarity on what behavioral investing really is, the jury is still out on this question.***



FINM3407 – Behavioral Finance

Topic 10:

Thank you very much