

Active Equity Investing : Strategies

15.1 : Fundamental vs. Quantitative

	Fundamental :	Quantitative
... in nature	Subjective	objective
relying on ... analyst discretion & judgement.		models, systematic rules
focus on		identifying relationships. b/w returns & factors.

Bottom-up vs. Top-down

Bottom-up strategies :

Quantitative → look for quantifiable relationship b/w company-level info & expected return

Fundamental → include value-based & growth-based
↑ looking for companies w/ strong business model, brand quality/loyalty

Value-based : identify securities trading below their estimated intrinsic value.

- Relative value

(i.e. compare price multiples to peers)

- Contrarian investing

- High-quality strategies.
(combine intrinsic value & evidence of financial strength, high quality management, demonstrated profitability)
 - Income Investing
Focus on high div. yield & positive dividend growth rate
 - Deep-value investing
Focus on low valuation relative to assets (e.g. low P/B), often due to financial distress.
 - Restructuring & distressed debt investing
 - Special situations.
identify mispricing due to corp. action
- Growth-based strategies: identify companies w/ revenues, earnings, CF that are expected to grow faster than their industry
- Consistent Long-term growth
 - Shorter-term earning momentum
 - GARP (Growth at reasonable price) : often look for PEG ratio (i.e. P/E divided by expected growth ratio in %)

EXAMPLE: Bottom-up strategy securities selection

Company	Share Price	Price to Book Value Ratio	Price to 12-Month Forward EPS	5-Year EPS Growth Forecast	Dividend Yield	Sector Average P/E
TW	3	0.75	1.5	-10%	-0.00%	8
NB	15	7.50	15.0	10%	1.0%	12
SO	30	10.00	20.0	2%	2.0%	30
TO	12	3.00	13.6	4%	9.0%	14

Based on the information in the table, determine which bottom-up investment strategy would most likely select each security. You must choose from the following list and each choice must be used only once.

- Deep value (of assets) investing
- GARP
- Income investing
- Relative value investing

TW : Deep value (lowest P/B ratio)

NB : GARP (lowest PEG ratio)

SO : Relative value (lowest P/E ratio)

TO : Incoming investing (highest div. yield)

Top-Down Strategies

focusing on overall macro environment & broad market variables rather than information relating to individual investments.

Managers will use ETFs & derivatives according to these params :

- Country
- Sector
- volatility (i.e. VIX)
- Thematic investment strategies (e.g. new tech, chg in regulation & econ. cycle)

Smart beta : a form of top-down that identifies specific risk factors that are expected to outperform



MODULE QUIZ 15.1

1. Screening stock markets to identify companies with low price-to-book ratios for subsequent in-depth analysis is a process that could be used by:
 - A. quantitative managers only.
 - B. fundamental manager only.
 - C. both fundamental and quantitative managers.
2. An active bottom-up manager aims to identify companies that have securities that are undervalued relative to the amount that would likely be received in a bankruptcy liquidation situation. This manager's strategy can be best described as:
 - A. relative value.
 - B. restructuring and distressed debt investing.
 - C. deep value.
3. Which of the following active equity fund managers is *least likely* following a top-down investment approach?
 - A. A manager that uses generalized autoregressive conditional heteroskedasticity (GARCH) models to forecast the volatility of U.S. market with the aim of buying options in times of low implied volatility and selling options in times of high implied volatility.
 - B. A manager that aims to identify growth at a reasonable price (GARP) for individual components of the S&P 500.
 - C. A manager that aims to identify subsectors of the energy and industrial goods sector that are likely to suffer due to changes to global climate change regulation.

1. A C *Screening is the process used by both quantitative &*
2. B /
3. B /

Module 15.2. Types of Active Management Strategies

Factor-based strategies

Identify Factor Performance : hedged Portfolio Approach

Steps:

1. Rank the investable stock universe by the factor
2. Divide the universe by quantiles
3. Form a long/short portfolio by going long the best quantile & shorting the worst quantile.
4. track performance

Drawbacks:

- lost the intel on the middle quantiles which can be useful
- any nonlinear relationship b/w factor & return will be captured

- diversification might be harder to achieve if using > 1 factors to select.
- assume the manager can short
- not a "pure" risk portfolio b/c the port will most likely be exposed to other risk factors.

Factor mimicking portfolio : a theoretical long/short portfolio that's dollar neutral. (i.e. one-for-one) exposure to a chosen factor & zero exposure to other factors.

Types of Style Factors.

- Size.
- Value.
- Price Momentum
- Growth
- Quality
- Unstructured data

Factor Timing

equity style rotation : allocate to portfolios that represent factor exposure when that particular style is expected to outperform.

EXAMPLE: Establishing drivers of style factor performance

A quantitative manager is investigating whether central bank interest rate decision surprises are a key variable in driving equity style factor performance. They are particularly interested in the three factors of the Fama and French model: market risk, size, and value.

The manager collects monthly performance data for the three style factors and regresses these factor returns against a custom defined variable, $ISurprise_t$ that measures the extent of the surprise of an interest rate decision in a given month t . The variable is calculated by comparing the actual interest rate decision of the central bank with the expectations priced into Eurodollar futures contracts the day before the decision.

- A high value for $ISurprise_t$ indicates that the central bank decision was to target rates that were higher than that expected by market participants.
- A low value of $ISurprise_t$ indicates the central bank announced a target policy rate that was below market expectations.

The analyst explores possible contemporaneous and lagged relationships by performing two regressions using the current month's and the next month's factor returns respectively against the variable $ISurprise_t$:

$$f_{i,t} = \beta_{i,0} + \beta_{i,1} ISurprise_t + \varepsilon_{i,t}$$

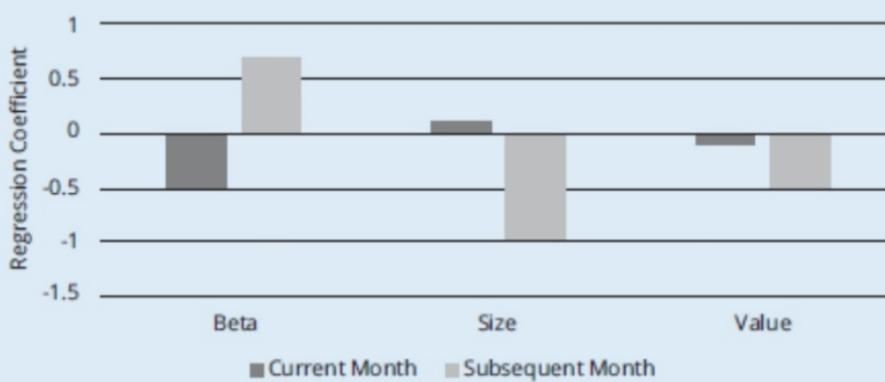
and:

$$f_{i,t+1} = \beta_{i,0} + \beta_{i,1} ISurprise_t + \varepsilon_{i,t}$$

where $f_{i,t}$ is the return of style factor i at time t and $f_{i,t+1}$ is the subsequent (next) month's return for style factor i .

The regression coefficients are presented in Figure 15.1.

Figure 15.1: Interest Rate Surprises and Style Factor Returns



Based on the data in Figure 15.1, answer the following questions:

1. **Discuss** the main factor rotation timing implications from the regression.
2. **Discuss** practical issues in using the model to time factor rotation.

1. For the current month :

- The negative regression coefficient of 0.5 indicates that higher beta stocks underperform in the month of an upward surprise in interest rates, or outperform for a downward surprise.

- size of value provide no meaningful signal.

For the subsequent month:

- Strongest effect is the negative 1.0 regression coefficient indicating small companies underperform the month after higher than expected interest rates. Value companies also underperform for an upward surprise in rates while high beta stocks outperform w/ a roughly 0.7 positive regression coefficient.

2. Further analysis is needed in relation to the timing of the beta effect. b/c the coefficient is negative for the current month but positive for the following month.

Activist Strategies

- take stakes in listed companies & pushing for companies to make changes

Typical Process:

- screening & analysis of activist opportunities
- buying initial stake (typically less than 10% of voting rights).
- Submitting public proposal for changes
- if no agreement, threaten c proxy contest.
- if no agreement, launch c proxy contest.

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Target Companies : tend to feature slower earnings & revenue growth

Impact : leads to improvement in growth & profitability but raises debt level.



MODULE QUIZ 15.2

1. An analyst is attempting to construct a hedged portfolio to represent the value factor in their domestic stock market. They use the following process:
 1. Rank securities in the domestic market in order of book value of equity in relation to market value of equity (book-to-market ratio).
 2. Purchase the quartile of securities with lowest book-to-market, short sell the quartile of securities with highest book-to-market ratio to create a dollar-neutral portfolio.
 3. Track the performance of the long/short portfolio over time.

Which of the following statements *most accurately* describes an error in this process?

 - A. Stage 1 is incorrect because price-to-book ratio should be used instead of book-to-market ratio.
 - B. Stage 2 is incorrect because the top and bottom deciles of securities should be used to construct the dollar-neutral portfolio instead of the top and bottom quartile.
 - C. Stage 2 is incorrect because the long/short portfolio should be constructed by purchasing the securities with the highest book-to-market and short selling the securities with the lowest book-to-market.
2. Which of the following strategies would *least likely* be used as part of the investment process of an activist investor?
 - A. Buying a majority stake in the company to enforce value-enhancing changes on company management.
 - B. Submit public proposal for changes to investee company, usually in the form of an open letter to the company.
 - C. Launch a proxy contest against the current management team.

1. C
2. A

Other Strategies :

Statistical Arbitrage :

- use technical stock price & volume data to exploit pricing inefficiencies & aim to profit from mean reversion
- e.g. Pairs trading (identify 2 highly historically correlated securities in the same industry & take advantage of a temporary breakdown of the relationship)

Event-driven strategies : exploit market inefficiencies around corporate actions.

EXAMPLE: Identifying opportunities

Jessica Nguyen, a portfolio analyst for Bridgeriver Associates, is reviewing several investment opportunities, as detailed in the following:

- Formby Corp is a large cap multinational technology company headquartered in the United States that designs consumer electronics and sells online computer services. After a decade of stellar growth, the company has accumulated significant cash balances, but growth in core markets has slowed and recent product launches have missed expectations. The company currently doesn't pay a dividend.
- Parmeon SA is a large French retailer with a well-known brand. Competition from the internet has been strong in recent years and the company has experienced slow growth and declining margins. Parmeon has recently announced its intent to acquire another well-known retailer. Parmeon will issue one share of its stock for one share of the acquired company. The deal is likely to attract the attention of regulators because it will create the largest retailer in the sector.
- Baron PLC is a commodity trading and services company based in the United Kingdom. Recent moves in commodity prices and tightening up of credit conditions has led to the company issuing several profit warnings, with management being replaced and the new team announcing a focus on selling assets to raise liquidity. Analysts are questioning whether the company can continue to service its debt. The correlation coefficient of Baron and the largest company in the sector has historically been very strong but has recently broken down.

For *each* investment opportunity (Formby, Parmeon and Baron), **identify** the active equity strategy you would *most likely* take an interest in. Your identification must be made from the following list:

- Activist investing.
- Distressed debt investing.
- Event-driven investing.
- Pairs trading.

For *each* opportunity **discuss** how the active equity strategy might be applied in that opportunity.

Formby Corp : Activist (invest in shares & advocate for cash payouts)

Parmeon SA : Event - driven (acquiring another company)

Baron PLC : Distress debt

Steps to create fundamental active investment strategy :

1. Define the investment universe.
2. Prescreen the investment universe
3. Analyze the industry
4. Forecast performance
5. Convert forecasts into valuations
6. Construct portfolio
7. Rebalance

Pitfalls in Fundamental Investing

1. Behavioral Bias
2. Value trap

appears to be attractive b/c of a significant price fall
might be overvalued & decline further.

3. Growth trap.

When the prospects are already reflected / over-reflected in
the price.

Steps to create quantitative active investment

Strategy :

1. Define market opportunities
2. Acquire & process data
3. Back-test strategy

Use the correlation b/w factor exposures & subsequent port.
returns (i.e. information coefficient / IC)

Steps of a back-test (e.g. Earnings Yield (E/P)):

- a). Obtain a sample of historical data on a cross sections of stocks.
- b) Calculate E/P & subsequent stock return
- c) Rank the stocks by earning yield (i.e. factor score, i.e. a standardized dist. away from avg.)
- d) Assuming a linear relationship b/w factor exposures & subsequent port, IC is the correlation b/w factor exposures & subsequent port. (aka. Pearson IC)

e) Pearson IC is sensitive to outliers, Spearman Rank IC.

addresses the issue by calculating the correlation b/w RANK OF the factor scores & RANK OF the subsequent return.

4. Evaluate the strategy

use out-of-sample testing to confirm model robustness.

5. Construct portfolio

- need to consider trading costs of risk models

EXAMPLE: Pearson correlation coefficient IC and Spearman Rank IC

An analyst collects a cross section sample of nine stocks and calculates the E/P factor score for each stock. The factor scores and subsequent month's return are shown in the table.

Stock	Factor Score	Subsequent Month's Return (%)	Rank of Factor Score	Rank of Return
A	-1.57	10.06%	9	1
B	-1.01	-0.60%	8	9
C	-0.73	-0.50%	7	8
D	-0.40	-0.48%	6	7
E	-0.01	1.20%	5	6
F	0.65	3.00%	4	5
G	0.75	3.02%	3	4
H	0.90	3.05%	2	3
I	1.43	5.20%	1	2
Mean	0.00	2.66%		
Standard Deviation	1.00	3.43%		
Pearson IC		-0.99%		
Spearman Rank IC				40%

Based on the table:

1. Discuss whether the earnings yield factor exhibits predictive power for this dataset. In your discussion, comment on both the Pearson and Spearman Rank IC.
2. Calculate the performance of a long/short factor portfolio with an equal weighting of the three most extreme factor scores.
3. Based on these results, discuss what should be done next.

1. Pearson IC of -0.99% is very small. It suggests an insignificant negative relationship b/w E/P & return. However, Pearson IC was distorted by non-linear relationship b/w factor & subsequent return. Stock A had a negative score of by far the highest positive return. 40% Spearman IC supports that high E/P is associated w/ strong subsequent perf.

$$\begin{aligned}
 2. \text{ Long position} : & (G + H + I) \div 3 \\
 & = (3.02\% + 3.05\% + 5.20\%) \div 3 \\
 & = 3.76\%
 \end{aligned}$$

$$\begin{aligned}
 \text{Short position} : & (A + B + C) \div 3 \\
 & = (10.06\% - 0.6\% - 0.5\%) \div 3 \\
 & = 2.99\%
 \end{aligned}$$

$$\begin{aligned}
 \text{Total port return} & = 3.76\% - 2.99\% \\
 & = 0.77\%
 \end{aligned}$$

3. Another larger sample, a different time period & additional testing is appropriate.

Evaluating the strategy : look at both returns & risk measures (e.g. VaR & max. drawdown)

Pitfalls of quantitative investment :

- Survivorship bias
- look-ahead bias
- Data-mining / overfitting
- Turnover constraint might constrain the manager's ability to follow a strategy.
- Lack of availability of stock to borrow
- Transaction costs.

Another risk : if many quant managers are following the similar strategies & exit @ the same period of poor performance, might exaggerate losses & lead to margin calls. (aka. quant overcrowding)

**MODULE QUIZ 15.3**

1. High-frequency trading techniques are *most likely* used by:
 - A. pairs-trading strategies.
 - B. market microstructure strategies.
 - C. event-driven strategies.
2. The *value trap* is best defined as:
 - A. a stock that is trading at low multiples justified by deteriorating fundamental business conditions.
 - B. a stock that is trading a low price multiples without justification.
 - C. a stock that is trading at high price multiples justified by high expected earnings growth rates.
3. When backtesting a quantitative active investment strategy, a manager concerned about outliers in data is *most likely* to conclude that a factor has predictive power when:
 - A. the information coefficient of factor scores versus contemporaneous returns is significantly different from zero.
 - B. the Spearman Rank correlation coefficient of factor scores and subsequent returns is significantly different from zero and positive.
 - C. the Pearson correlation coefficient of factor scores versus contemporaneous returns is significantly different from zero.

1. B

2. C

3. A

15.4. Equity Investment Style Classification

Approaches to Style Classification :

Holding-Based Style

- look at the attributes of each individual stock & aggregate to conclude the overall style.
- common application : morningstar fund style

Figure 15.2: Morningstar Fund Style Box

Value	Blend/Core	Growth	
			Large

Value	Blend/Core	Growth	
			Mid

Value	Blend/Core	Growth	
			Small

Note: no consensus on definition of large, mid & small cap.

Stocks are allocated a style score b/w 0 & 100 in a way designed to distribute rows evenly o/c. the columns.

Same process can be done for growth attributes (e.g. earning growth, revenue growth or CF growth)

Figure 15.3: Morningstar Value and Growth Scoring Scheme

Value Score Components and Weights		Growth Score Components and Weights	
<i>Forward-looking measures</i>	50.0%	<i>Forward-looking measures</i>	50.0%
*Price to projected earnings		*Long-term projected earnings growth	
<i>Historical measures</i>	50.0%	<i>Historical measures</i>	50.0%
*Price to book	12.5%	*Historical earnings growth	12.5%
*Price to sales	12.5%	*Sales growth	12.5%
*Price to cash flow	12.5%	*Cash flow growth	12.5%
*Dividend yield	12.5%	*Book value growth	12.5%

Once the security has value score & growth score, the net style score = growth score - value score.

net style score = NEGATIVE \Rightarrow VALUE

net style score = POSITIVE \Rightarrow GROWTH

net style score = 0 \Rightarrow CORE

Note: Fund w/o strong value/growth bias = BLEND.
Stocks w/o strong value/growth bias = CORE

Returns-based Style analysis
run regression on fund returns vs. passive index returns:

e.g.

$$R_p = \alpha + b_1 SCG + b_2 LCG + b_3 SCV + b_4 LCV + \epsilon$$

SCG = returns on small cap growth index

LCG = returns on large cap growth index

SCV = returns on small cap value index

LCV = returns on large cap value index

$$\sum b_i = 1$$

Manager's self-identification

- fund investment strategy is usually self-identified
- the style analysis will either confirm the identification or indicate a need for further explanation.

Strengths & Limitations of Style Analysis

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	Advantage	Disadvantages
Holding-based	Generally more accurate. Access holding's contribution may be harder to analyze to style	Requires holding info. Derivatives
Returns-based	no info on holding needed easily applied	Constraints on outputs can limit detection



MODULE QUIZ 15.4

1. The use of derivatives overlay strategies with limited information is *likely* to hinder style analysis performed by which of the following approaches?
 - A. Holdings-based analysis only.
 - B. Returns-based analysis only.
 - C. Both holdings-based and returns-based analyses.

1.A.

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