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2026 Level 3 - Portfolio Management Pathway

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Index-Based Equity Strategies

a. compare factor-based strategies to market-capitalization-weighted indexing

b. compare different approaches to index-based equity strategies

c. compare different approaches to index-based equity investing

d. compare the full replication, stratified sampling, and optimization approaches for the construction of index-based equity portfolios

e. discuss potential causes of tracking error and methods to control tracking error for index-based equity portfolios

f. explain sources of return and risk to an index-based equity portfolio

Index-Based Equity Investing

Page 1

Passive Investing
- any rules-based, transparent, & investable strategy that does not involve identifying mispriced securities
⇓
changes made as rules dictate

Indexing ⇒ replicate the performance of a benchmark index
- low cost
- broad diversification
- tax efficiency

⇓
changes made only when the index changes

⇒ Selecting a Benchmark/
- an existing index – must meet 3 requirements

① must be rules-based – criteria for inclusion, rebalancing
↓
must be objective, consistent, predictable
② transparent – disclosure of rules and constituents
③ investable – performance can be replicated in the market
(basically, can buy and sell the constituents easily)
(liquidity)

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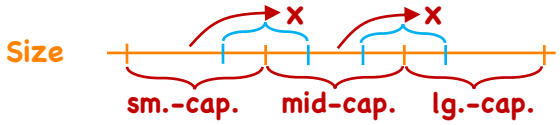
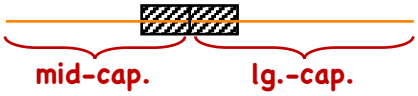
Terminology/ • Buffering – ranges around break-points that defines whether a stock belongs in one index or another



– makes index transitions more gradual & orderly

• Packeting – splitting stock positions into multiple parts



⇒ What to consider (when choosing a benchmark index)
- the desired market exposure
  - market segment (broad vs. sectors, domestic vs. international)
  - equity capitalization (large, mid, small)
  - style (value, growth, core/blend)
  - other exposures (momentum, volatility, quality)

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⇒ Index Construction/ • exhaustive vs. selective
(US Total Market Index) (S&P500)

• weighting → will influence its performance

a) market-cap – recall: cap-weighted market portfolio is mean-variance optimal
(free-float)
– if index is a good proxy for the market portfolio → any tracking portfolio will be

• cap weighting ~ liquidity weighting ~ greatest capacity to handle investor flows

– low cost, rules-based construction, transparency, investable
– based on EMH
– subject to concentration risk

$$HHI = \sum_{i=1}^{n} w_i^2$$ (Herfindahl-Hirschman Index)
– range from $1/N$ to 1.0

– effective # of stocks = $1/HHI$

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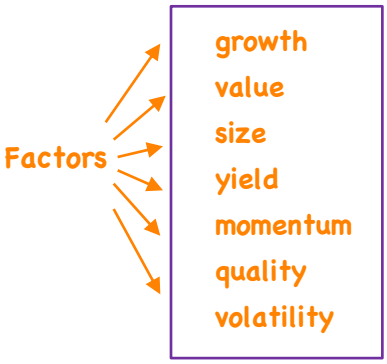
LOS a
– compare

Factor-based strategies – goal is to improve upon the risk or return performance of the market-cap weighted strategy



Benchmark Index
(diversified risk factors)

Portfolio #1	Portfolio #2
growth	underweight
size	overweight over lg.
quality	overweight
	underweight
	equal
	underweight
⇓	⇓
selective exposure	factor tilts

concentrated risk factors

– will leave investors exposed during periods when a chosen risk factor is out of favour

• passive rules for inclusion
(transparency on factor selection, weighting, rebalancing)

• active decisions regarding degree and timing of factor exposures
(take place up front)

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Factor-based strategies

① Return-oriented strategies
- dividend yield
  - growth
  - absolute value
- momentum
- fundamentally weighted

② Risk-oriented strategies
- based on past return data
- volatility weighting (inverse)
- minimum variance investing

③ Diversification-oriented strategies
- equally weighted indexes $(1/n)$ (low amount of single stock risk)
- maximum diversification strategies

- changing exposures to specific risk factors as market conditions change is known as factor rotation

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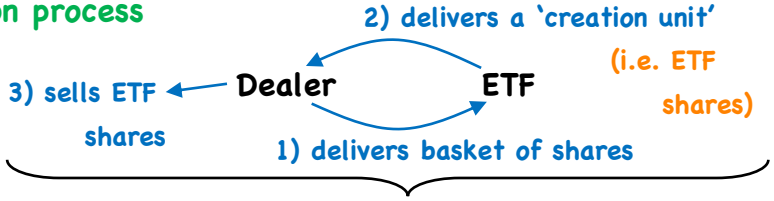
1/ Pooled Investments - easy to purchase, hold & sell (open-end mutual funds, ETFs)

MF/ • low cost, administrative convenience

ETF/ • low fees, ease of trading, tax efficiency (vs. MF)

→ creation process



• process is reversed to retire ETF shares

2/ Derivatives-Based approaches - options, swaps, futures
- low cost, easy to implement, provide leverage, but they expire
- typically used to adjust a pre-existing portfolio (overlay)

e.g./ target beta, target asset class weight
(completion overlay) (rebalancing overlay)

- increase/decrease exposure in a single transaction, sometimes with more liquidity than the underlying cash assets

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- compare

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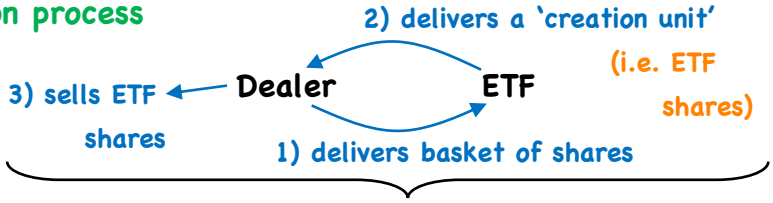

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2/ Derivatives-Based approaches
- may introduce basis risk (futures), counterparty credit risk (OTC)

3/ Separately Managed Equity Index-Based Portfolios - actually buying the shares (requires an entire trading/admin. infrastructure)

LOS d
- compare

1/ Full replication - hold all securities of the index
- lowest tracking error, higher transaction costs
- seek to replicate an index that is priced at the close of business each day (∴ use market-on-close orders)

2/ Stratified sampling - hold a limited sample of index constituents
- sample from strata that are mutually exclusive & exhaustive
- higher tracking error, lower transaction costs
⇒ used when index is large / AUM is low

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3/ Optimization

- involves either { max. a desirable characteristic / min. an undesirable characteristic } s.t. one or more constraints

+/ - lower amount of tracking error vs. stratified sampling
- explicitly accounts for the covariance among constituents

4/ Blended approach - full replication for more liquid issues
- optimization or sampling for less liquid issues

LOS e
- discuss

⇒ Tracking Error/ • measured: → $\mathbf{TE} = \sqrt{\mathbf{Var}(\mathbf{R_p} - \mathbf{R_b})}$

→ $\mathbf{Excess\ Return} = \mathbf{R_p} - \mathbf{R_b}$

- Causes → fees (higher fees = lower excess return & higher TE)
→ # of constituents held vs. benchmark (sampling = higher TE)
→ intraday trading of the constituents (any price bought or sold different from closing price = higher TE)
→ trading commissions
→ cash balances (cash drag → negative in rising markets)

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LOS e
- discuss

⇒ Tracking Error/

- Controlling → trade-off: benefits of full replication vs. costs
→ minimizing cash held (maintain $\beta = 1.0$ relative to the benchmark)

LOS f
- explain

⇒ Sources of Return & Risk/

- attribution analysis (exhibit 13)
  - company specific
  - sector
  - country
  - currency
- securities lending • requires a lending agent (typically the custodian)
- investor activism & engagement (?)

Active Equity Investing: Strategies

a. compare fundamental and quantitative approaches to active management

b. analyze bottom-up active strategies, including their rationale and associated processes

c. analyze top-down active strategies, including their rationale and associated processes

d. analyze factor-based active strategies, including their rationale and associated processes

e. analyze activist strategies, including their rationale and associated processes

f. describe active strategies based on statistical arbitrage and market microstructure

g. describe how fundamental active investment strategies are created

h. describe how quantitative active investment strategies are created

i. discuss equity investment style classifications

Active Equity Investing: Strategies

Page 1
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- compare

- **Fundamental** → based on research
  → involve analyst judgment/discretion in making decisions
- **Quantitative** → based on quantitative models of security returns
  → look for market characteristics and patterns that have predictive power
  → decisions are non-discretionary, systematic

	Fundamental	Quantitative
Style	Subjective	Objective
Decision-making process	Discretionary	Systematic, non-discretionary
Primary resources	Human skill, experience, judgment	Expertise in statistical modeling
Information used	Research (company/industry/economy)	Data and statistics
Analysis focus	Conviction (high depth) in stock-, sector-, or region-based selection	A selection of variables, subsequently applied broadly over a large number of securities
Orientation to data	Forecast future corporate parameters and establish views on companies	Attempt to draw conclusions from a variety of historical data
Portfolio construction	Use judgment and conviction within permissible risk parameters	Use optimizers

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LOS a
- compare

Quantitative e.g./

$$y = b_0 + b_1X_1 + b_2X_2 + b_3X_3$$

high R^2 = evidence of relationship based on past data
(use a very large group of stocks)
- then model is used to predict future expected returns

∴ investment success depends on model quality

X_1 – earnings yield
X_2 – size
X_3 – market sentiment

factors

- rewarded factors
  (those shown to be positively related to long-term return premium)
- unrewarded factors
  (not been empirically proven to offer a persistent return premium)

⇒ Risk/
- Fundamental → risk is at the company level
  (valuation, forecasts, convergence time frame)
- Quantitative → risk is at the portfolio level
  (factor returns will not perform as expected)

⇒ Rebalancing/
- Fundamental → discretionary
- Quantitative → systematic, typically monthly/quarterly

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- analyze

⇒ Bottom-up strategies/
- begin analysis at company level
- business model & branding
- competitive advantages
- company mgmt. & corp. governance
(value added performance)

• valuation: DCF, DDM, P/E, P/B, $EV/EBITDA$

1/ Value-based approaches

a) relative value – vs. sector peers

b) contrarian investing – typically depressed cyclical stocks
– tend to rely more on market sentiment

c) high-quality value – above average ROE, financial strength, consistent earnings power

d) income investing – high dividend yields, positive dividend growth rates
(tends to give price support)

e) deep-value investing – very low P/B, financial distress
(limited market interest → inefficient pricing)

f) restructuring/distressed investing

g) special situations – corporate events → divestitures, restructuring

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- analyze

⇒ Bottom-up strategies/

2/ growth-based approaches
- focus on companies expected to grow faster than their industry or the overall market
- above average valuation multiples

GARP – growth at a reasonable price ⇒ PEG ratio = 1

LOS c
- analyze

⇒ Top-Down Strategies/ • ETFs, futures, swaps, custom basket of stocks

1/ Country & Geographic allocation – futures or ETFs

2/ Sector & Industry rotation – sector & industry ETFs

3/ Volatility-based strategies – VIX futures, options

4/ Thematic Investing – broad macro, demographic or political drivers
– futures, ETFs, currencies