Quantitative Investments

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1 June 2018

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Recall

Last lecture we discussed active portfolio management.
- Treynor-Black Approach;
- Bayesian Statistics and Black-Litterman Approach;
- Almgren-Chriss Model;
- Risk Parity Portfolios;
- Practical Issues;
- Valuing Active Management; and,
- Performance Attribution.

Today we will talk about investment management companies.
Investment Management Companies

Chapter 25, A Quantitative Primer on Investments with R
This part discusses investment management companies. Specifically:

- Types of Investment Companies;
- Types of Investment Funds;
- Costs and Taxes; and,
- Issues and Controversies.
**Terminology**

- **Investment company**: accepts client funds and invests them.
- **Pooled** funds are commingled, invested together.
- **Segregated accounts**: funds invested simultaneously.\(^2\)
- **Trust**: A legal entity created to hold assets, pooled monies.
- **Trustees**: Entities with fiduciary duty to operate trust.
- Value of clients’ invested money: *assets under management* (AUM).
- Funds often compute **net asset value** (NAV):

\[
\text{NAV} = \frac{\text{market value of assets} - \text{liabilities}}{\text{shares outstanding}} = \frac{\text{AUM}}{\text{shares out.}}. \quad (1)
\]

- **Pass-through tax status**: No double taxation; investor pays taxes.
- **Turnover**: fraction of portfolio “traded” per year.

\(^2\)Like bus vs cars.
Types of Investment Companies
Probably all of you will invest in an investment company.

**Investment companies remove the hassle of investing:**
- Record cash in/out flows, splits, dividends/interest;
- Track cost basis, tax status (short-/long-term); and,
- Report results to investors.

**Investment companies may also offer better management:**
- May negotiate better prices, trade more cheaply;
- Hopefully offer economies of scale benefits; and,
- They manage the portfolio professionally, all-day.
The most common investment funds are of a few types:

- Open-End Funds;
- Closed-End Funds;
- Unit Investment Trusts;
- Real Estate Investment Trusts;
- Royalty Trusts and Master Limited Partnerships;
- Managed Futures/Commodity Trading Advisors; and,
- Hedge Funds.

Alternative investments invest in ways most funds cannot (by law).

Investment Company Act (1940) first defined mutual funds.

Also separated unmanaged from managed funds.
Mutual Funds

- **Mutual fund**: “open ended” # of shares of portfolio.
  - Thus fund size changes with investment in/out flows.
  - Buy/sell at end-of-day NAV (less fees); not exchange-listed.
  - Money market funds set NAV = $1, shares increase.
- Mutual funds AUM $\approx 16\text{ tn (↗)}, \approx 15\text{ tn outside US.}^3$

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^3Unless otherwise noted, these figures are from the 2016 ICI Factbook.
**Exchange-Traded Funds (ETFs)**

- *Exchange-traded fund (ETF):* very similar to mutual fund.
  - Open-ended; listed+traded on-exchange (thus shortable).
  - Reduced portfolio trading, marketing lowers expenses.
  - Purchasers from brokers incur a fee.
- Best-known: SPY (spiders); QQQQ (Q’s); IWM; XLE; XLF.
- Increasingly odd *ETNs:* gold, oil, real estate, uranium.
  - Some performed *terribly:* may have near-zero liquidity.
- Exchange-traded funds AUM \(\approx\) $2.1 \text{ tn (↑↑)}.\
Closed-End Funds (CEFs)

- **Closed-end fund**: issues fixed (closed) ≠ shares of portfolio.
  - Funds are listed and traded on-exchange (shortable).
  - Investors buy/sell at market price (may diverge from NAV).

- Reduced trading ⇒ well-suited to illiquid investments.
- May have break-up clause if discount below, say, 25%.
- Funds typically trade at a premium/discount to NAV.
- Closed-end funds AUM ≈ $261 bn (→).
A unit investment trust (UIT) invests in a fixed portfolio.
- Sponsor buys portfolio, deposits into trust;
- Sponsor sells public shares ("units") of trust\(^4\); and,
- Income, gains, principal payments are paid to shareholders.

Trust is unmanaged; portfolio composition is not directed.
- This can make expenses very low; but, no selling losers.

Sponsor earns money by selling units at a premium to NAV.
- Investors exit UIT by selling units back to trustees @ NAV.
- Only one buyer; selling can be very expensive.

Unit investment trusts AUM \(\approx\) $94 bn (→).

\(^4\)These units are properly called redeemable trust certificates.
Real estate investment trust (REIT): invests in real estate.
- REITs listed and traded on-exchange; closed-ended.
- Divergence from NAV is difficult to determine.

Many REITs are leveraged; typical debt ratio of 70%.

Hold property (equity), mortgages/construction loans (mortgage).
- Hybrid REITs hold both.

REITs typically focus on a type of property.
- Offices; hotels; condos/apartments; even timberland.

Pay out 90+% of earnings to maintain pass-through status.

Real estate investment trusts AUM $1 tn (↑).\(^5\)

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\(^5\)Source: NAREIT.
**Master Limited Partnerships and Royalty Trusts**

- **Master limited partnerships (MLPs):** US-traded LPs.
  - Most firms explore/produce/process/transport resources.
  - Quarterly-minimum distributions for MLP pass-through.
  - Stable payouts: Distributions impose strict requirements.
  - Thus MLPs used by less volatile firms (e.g. pipelines).

- **Royalty trusts (RTs):** rights to commodity-related income.
  - Typically: Oil/gas wells, or mines; some power generation.
  - Volatile payouts; perpetuity of real options to produce.
  - Pass-through almost all earnings.
  - US: closed-end, fixed holdings, suffer depletion; Canada: open-ended.

- MLPs AUM $\approx$ $400$ bn (↘).\(^6\) RTs AUM $\approx$ $12$ bn (↑↑).\(^7\)

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\(^6\) Alerian (2016).

\(^7\) Zweig (2012); Canadian RTs AUM $\approx$ USD 100 bn.
A managed futures account is like a mutual fund of futures. Managed by a commodity trading advisor (CTA). CTA invests long or short in futures, futures options. Customer funds often segregated (not pooled). Advantage: you often see each trade; very transparent.

Valued for low correlation with bond and equity returns.
Performance much better than similar ETFs.
CTAs typically more mindful of liquidity wrt futures.
Managed futures and CTAs regulated by CFTC.
Managed futures AUM ≈ $348 bn (↑).  

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8Barclay Hedge (2016).
A hedge fund invests for a restricted class of investors.

- May invest long/short, with/without leverage in anything.
- Examples: viaticals, rhodium, art, timberland, cat bonds.

Must be an accredited investor to invest.

Often restrict redemptions until after lock-up period.

- Idea: Allows investing in less liquid assets.

Typically charge fees on AUM and excess profits.

Hedge funds AUM ≈ $3.2 tn (↑↑).\(^9\)

\(^9\)Prequin (2017).
An important point that is rarely clarified:
- Fund manager/advisor may not be the portfolio company.

This distinction exists among many investment companies.
- Hedge fund: LTCM, LTCM (UK), LTCMJ all advised LTCP (Cayman).
- Some Vanguard mutual funds are managed by Wellington.
- CEE fund manager: Deutsche Asset Management\(^\text{10}\).

Thus regulating investment companies is very difficult.
- Portfolio company may be located offshore; but,
- Onshore entities only provide advice/management.

This issue becomes muddled when we talk about “funds.”

However: all investors obey rules of markets they trade in.

\(^\text{10}\)The CEE Fund even considered replacing Deutsche.
Common publicly-accessible fund types:

- **Money market**: money market bills, CP, CDs, repos; NAV=$1.
- **Bond**: corporates; munis; USTs. May target duration.
- **Equity**: index; sector; growth; value; income.
- **International**: global/regional/emerging markets bonds/shares.
- **Balanced/Asset allocation/Target date**: stocks, bonds, cash. Holdings may be adjusted by schedule or based on forecasts.
- **Specialty**: real estate, commodities, mergers, CBs, vice, . . . .
Brown and Goetzmann: cluster funds based on performance.
Reveals eight clusters of fund types:
1. *Growth and income*: large-cap stocks and indices
2. *Growth*: mostly large-cap stocks, some small-caps;
3. *Income*: high dividend-yield and utility stocks; debt;
4. *Value*: small-cap stocks with low P/B and P/E;
5. *Global timing*: non-US stocks, more US exposure as US market ↑;
6. *Glamour*: small-cap stocks with high P/B and P/E; trend-chasers;
7. *International*: non-US stocks, may vary Asia/Europe exposure; and,
8. *Metal*: metal (commodity) funds, e.g. gold.
Alternative Investment Fund Types

- Common hedge fund types:
  - Directional: short bias; equity long/short; macro; volatility.
  - Convergence: event-driven; tax arb; capital structure arb.
  - Relative Value: CBs; equity mkt neutral; fixed income arb; stat arb.
  - Other: multistrategy; fund of funds.

- CTAs often focus on macro and asset allocation strategies.

- Other types: venture capital, private equity funds.
Hedge Fund Strategy Types

- LTCM classified hedge fund strategies in five types:
  - *Arbitrage*: self-funding, riskless profit or “scratch;”
  - *Convergence*: long+short economically identical now or later;
  - *Conditional Convergence*: convergence not guaranteed to occur;
  - *Relative Value*: long+short related in theory/history;
  - *Directional*: long or short exposure to a risk factor.

- True *arbitrage* (SS+B at diff prices) is *very* rare.
Investment Fund Costs

- Investment funds charge various explicit and implicit fees.
- Operating/management fees: 0.2%–2% of AUM/year.
- Publicly-available funds charge other fees:
  - Load: explicit sales fee at buy/sell; only affects you.
  - Marketing (12b-1): recurring; deducted from AUM.
- Hedge funds, PE, VC incentive fees, aka carried interest.
  - 10%–20+% of “excess” gains; quoted as mgmt+incentive, e.g. 2+20.
- Soft dollars: rarely reported; broker pays costs.
  - Looks great; isn’t: often means broker was overpaid.
- You should pay less fees, esp. for comparable mutual funds.
- Turnover also key: all funds pay transactions costs.
Taxation

- Taxes may alter what we sell and when.
- Must separate interest, dividends, capital gains (ST vs. LT).
- In general, higher turnover means higher taxes for investors.
  - Index funds (2% turnover) more tax-efficient (vs. 60%).
- Foreign investments may incur foreign taxes.
- Funds with physical metal pay collectibles (28%!) gains tax.
- Futures gains taxed as 60% long-term, 40% short-term. (!)
- Hedge funds often create shells to lower client taxes.
Issues
Mutual funds have engaged in some unethical practices.

The *late trading scandal* was exposed in 2003:
- Some funds let key clients trade at NAV after close+news.
- Funds paid $3.7 bn in restitution, fines, fee reductions.

*Market timing*, by contrast, is legal:
- Invest in regional/country fund after those markets close.
- But invest before US markets close; get in at stale NAV.
Some issues are not illegal, just... shady.

Window dressing is a recurring problem:
  - Change holdings before reporting, then change back.

Soft dollars discourage seeking lowest costs for investors.
  - Extreme: soft dollars pay for manager/advisor entertainment.
  - Still legal but onus of “best execution” is reducing abuses.

Sharing sales fees with brokers creates wrong incentives.
Hedge funds are opaque by regulation and choice.
- Accredited investors only; opacity was once mandated.
- May be short; illiquid; in derivatives; in anything legal.
- May also have an analytical advantage.
- So: give out limited information on strategies/holdings.

Investor funds often have six-month to multi-year lock-ups.
Return data is always suspect; often reported strategically.
Fung-Hsieh and Hasanhodzic-Lo models reveal:
- Many just take directional bets on risk factors.
- Should not pay up for “beta;” can buy risk factors cheaply.
Finally, a few words on fund of funds (FoFs).

Funds of funds exist in mutual funds, hedge funds, CTAs.

Fund of funds have some powerful benefits:
- FoF managers can learn more about funds they invest in.
- Thus FoF managers are better-informed.
- Wield big influence; can advocate for better management.

Funds of funds also have some major drawbacks:
- Investors pay incentive and management fees twice.
- Investors may pay incentive fees even if FoF is down.
Key sources of investment fund information.

- Information about a particular fund:
  - Prospectus: details advisor, manager, policies, fees, risks.
  - Statement of Additional Information: Part B of prospectus.
  - Other investor communication: ranges from awful to brilliant.
  - Yahoo/Google Finance: summarize above information.
  - Morningstar: Ratings, style box, comparisons, and metrics.
  - *N.B.* Highly-rated funds can and do perform poorly.

- About a category or industry:
  - Investment Company Institute: www.ici.org
  - National Association of REITs: www.reit.com
  - Managed Funds Association: www.managedfunds.org
  - Alerian (MLPs): www.alerian.com
We covered investment management companies.
On to crises next!