Measurement Concepts for Banking, Trading, and Investing

Introduction for the MFM Orientation

John Dodson

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Introduction

If you are going to work with bankers, traders, or investment managers, it is important for you to understand the language and concepts of accounting, finance, and investment performance measurement.

I encourage you to consider taking relevant electives at the Carlson School of Business.

Outline

Financial Accounting

Financial accounting is contrasted with managerial accounting in that it is directed at outsiders. Consequently, its terms and concepts are highly standardized and its application is usually subject to audit.

Advanced Topics

- income recognition (cash vs. accrual basis)
- capitalized expenses
- depreciation, amortization, and impairment
- qualified off-balance sheet hedges
- entity consolidation

Double-Entry Bookkeeping

entity concept autonomy with rights and obligations

going concern concept assume that the entity will persist

balance sheet financial condition at a point in time

income statement financial activity over a period in time

account elements asset, expense; liability, revenue, capital

journal entry amount, debit account, and credit account

closing the books periodic adjustment of the balance sheet

accounting identity assets $=$ liabilities $+$ capital

N.B.: An entity's assets may include shares of other entities' debt and equity.

Financial Statements

Wells Fargo & Company

Income statement 2009 ($ billions)

interest income	56	interest expense	10
commissions/fees	37	*loan provisions*	22
other income	6	other expense	50
		income taxes	5
		dividends	6
		retained earnings	6
total revenue	99	total	99

Balance sheet 12/31/2009 ($ billions)

cash	68	deposits	824
investments	261	short-term debt	142
loans	783	long-term debt	164
loan reserves	-25		
other assets	157	capital	114
total assets	1,244	total	1,244

Investment Accounting

Investment accounting generally uses single-entry bookkeeping on a mark-to-market basis with a daily close

In place of the dual aspect accounting identity, we have

$$\text{net assets} = \text{net cash} + \sum_{i \in \text{holdings}} \text{price}_i \cdot \text{quantity}_i$$

Note the liquidity assumption: Unlike in normal microeconomics, price here does not depend on quantity.

- cash enters and leaves the portfolio through subscriptions and redemptions or dividends
- cash also changes through transactions which create or modify holdings
- net cash is adjusted for unsettled trades, taxes payable, and accrued interest and fees

Performance Measurement

- daily return is measured as

$$1+\text{daily return}_t = \frac{\text{net assets}_t - \text{subscriptions}_t + \text{redemptions}_t + \text{dividends}_t}{\text{net assets}_{t-1}}$$

- this may be interpreted as a weighted average

$$\text{daily return}_t = \sum_i \text{weight}_{i,t} \cdot \text{daily return}_{i,t}$$

  where the (beginning) weights satisfy

$$\sum_i \text{weight}_{i,t} = 1 - \frac{\text{net cash}_{t-1}}{\text{net assets}_{t-1}}$$

- return over longer periods is measured "geometrically"

$$\prod_{t\in\text{period}} (1 + \text{daily return}_t) - 1$$

Active Return

It may be important to assess the "added value" of an investment manager. Two approaches to this are:

- relative to a benchmark
  - an index can be interpreted as a portfolio
  - the relative return can therefore be expressed as the sum of the contributions for the each relative overweight and underweight

$$r - r' = \sum_i (w_i - w_i') \cdot r_i$$

  - to which one can apply various statistical measures, such as the information ratio
- relative to static weights
  - this is a newer concept appropriate for hedge funds
  - the manager should increase (decrease) weights in holdings that subsequently outperform (underperform)

$$\mathrm{E}[r] = \sum_i \mathrm{E}[w_i] \cdot \mathrm{E}[r_i] + \sum_i \mathrm{cov}[w_i, r_i]$$

Securities

A security is a claim on future cashflows from its issuer

- U. S. Treasury
  - (nominal, indexed) bond
- bank
  - interbank loan/deposit, commercial paper, repo
  - swap, over-the-counter derivative, currency contract
- corporation
  - (common, preferred) equity
  - (secured, senior, subordinated, convertible) bond
  - (short-term) commercial paper
- municipality
  - (revenue, general obligation) bond
- derivatives clearinghouse
  - futures, option
- collective investments
  - (open-ended, closed-ended, exchange-traded) funds and unit trusts

Also: real estate, private equity, bank loans, etc.

Securities Conventions

- equity trades shares and lots of 100 shares, and pays dividends to registered holders as of the ex date
  - prices are quoted per share; trades settle in about three business days
  - the broker may be able to provide financing or locate shares to borrow for shorting
- bonds trade in increments of $1,000 par amount and pay periodic (annual or semi-annual) coupons
  - prices are quoted per $100 notional and exclude accrued interest for the current coupon
  - settlement is typically two business days
- futures settle daily through a margin account according to the tick size and the settlement price
- the underlying for equity options is typically 100 shares; options covert to ordinary trades upon exercise
- public open-ended funds trade at the end-of-day net asset value per share; ETF's trade like equities

Financial Markets

Institutions use the financial markets for at least three reasons:

- to raise funds
- to make investments
- to mange risks

Participants

Common participants

- commercial banker
- investment banker
- trader or dealer
- broker
- salesperson
- investor

Other participants

- clearing house
- custodian
- market regulator
- exchange authority
- industry authority
- tax authority

Trading Terminology

Broker terminology

In the role of market maker, the broker provides indicative bid and ask price quotations at which he is willing to buy or sell some small quantity of a security.

Client terminology

types of orders include

- market order
- limit order
- special instructions, such as conditional orders or non-standard settlement

On futures exchanges, special language is sometimes used

- "pay (price or market) for (quantity)"
- "sell (quantity) at (price or market)"

and the handle on the price is implicit

Cases

1. futures
2. equities
3. bonds

- Choose a case to work from – http://math.umn.edu/~dodso013/cases/

Correct answers will be eligible to enter a drawing for a prize!