Chapter 3: How financial statements are used in validation

**Value technologies**
= how does good valuation technology look like

\* trade-off

* Fundamental analysis
= detailed & costly & requires lot of info x time
	+ Broad outline of technologies for fundamental analysis
* Simple approach
	+ Easy to implement, avoid forecasting, not lot of info, cheap
	+ Too cheap? Missing important elements & Lose prediction power
	+ E.g. Multiple analysis
		- Method of comparables
		- Screening of multiples
	+ E.g. Asset-based valuation
* Gain by elaborate model vs. loose in simple model

MULTIPLE ANALYSIS

**Multiple**

= ratio of stock price relative to number in FS

= uses minimal info (1 number in FS), advantage & disadvantage

e.g. P/B, P/E, P/S, P/CFO,…

2 techniques use multiples

1. Method of comparables

= multiple comparison analysis

🡪 Similar firms should have similar multiples

1. **Identify comparable firms** (peers)
= operations similar to target firm under valuation & publicly listed
2. **Identify measures** for comparable firms in their FS & calculate multiples of those measures at which comparable firms trade
= book value, earnings, sales, CF
3. **Apply average** (or median)
of these multiples to corresponding measures for target to obtain that firm’s value

+ Cheap, simple method, often used

Problems

1. **Conceptual problems**
	1. Circular reasoning
	= value ascertained from price (of the comps)
	2. One assumes market are efficient for comps.
	! If efficient for comparable companies, why NOT for target firm (to be valued)?
	3. Analysis not anchored in something fundamental that is able to explain value, independent of market prices
2. **Implementation problems**
	1. Finding comparables that match precisely the target under valuation
		1. Industry, product, size, growth, risk,…
		2. # peers improves precision (averages out ‘errors’), peer group becomes less comparable
		3. Companies with multiple bs segments
	2. Different valuations from different multiples
	e.g. P/B vs P/E vs P/S
	3. Negative numbers in denominator?
	e.g. negative earnings in P/E\

Adjusted multiples

1. **Leverage adjustments**
	1. Unlevered Price/Sales (zie formularium)
	2. Unlevered Price/EBIT
	3. Enterprise P/B
2. **Accounting adjustments**
	1. Unlevered Price/EBITDA
	2. Price/Earnings before unusual items
	= market value equity/earning before unusual items (NIET IN FORM)
3. **Variations of P/E ratio**
	1. Trailing P/E
	2. Rolling P/E
	= P/E(ttm)
	3. Forward or leading P/E
	4. Divided-adjusted P/E
	=only makes sense for trailing P/E ratio, NOT for forward P/E

2. Multiple screening

= similar firms should have similar multiples

🡪 If firms trade at different multiples, may be mispriced

Process

1. Identify multiple on which to screen stocks
2. Rank stock on multiple (high to low)
3. Buy stock with lowest multiple & sell (short) stocks with highest multiples
! Can also use 2 multiples (buy stocks with lowest P/B and lowest P/E)

**Denominator**

= indicator for intrinsic value (fundamental value of firm)

* Spread btw price (in numerator) & dominator is indicator of mispricing
	+ Over-priced stock
	= P high relative to fundamental
	+ Under-priced stock
	= P low relative to fundamental
* **Glamour stock**
= growth stocks
= stocks with high value on multiples
* **Value stocks**
= contrarian stocks
= low value on multiples
* **Contrarian investors**
= buy value stocks & sell glamour stocks

Stock screening methods

**Fundamental screens**
= screening on multiples, linked to number in financial statement (economists)

* Market/Book Value (P/B) ratios
🡪 Seems that value stocks (low P/B) have higher average annual return than glamour stocks (high P/B)
🡪 BUT maybe higher return comes with higher average risk
* P/E ratios
! Firm can have high P/E & low P/B
* P/CFO ratios
* P/d ratios (!d = dividend ≠ D = debt)
* Two-way screening
= returns from 2 multiples

**Technical screens**

= No link to fundamental value (mathematicians)

* Price screens
= buy losers, sell winners (relative to market)
* Small stock screens
= buy small stocks (small market cap)
* Neglected stock screens
= buy stocks followed by few analysts
* Seasonal screens
= buy stocks at certain times of year (January effect: sell in May & go away)
* Momentum screens
= buy stocks whose P has increased
* Insider trading screens
= mimic trades of insiders
* Returns to beta or size

Advantages

= simple + little info needed

Problems

* Could be loading upon a risk factor
	+ Need risk model
* Danger of trading with someone who knows more than you
	+ Only use 1 piece of info
	+ May need model that anticipates future payoffs
	+ Full-blown fundamental analysis provides this

Contrarian investment, extrapolation & risk

Simple Glamour & value strategies

**Value strategy**

= buying stocks that have low P to earnings, div, book value or other measures of fundamental value

= outperform market & glamour strategies

* Glamour stocks were overvalued, because investors overestimated future growth rates based on past growth rates
* No evidence that value stocks are riskier than glamour stocks
* Value stock
= High B/M

**Glamour strategy**

* Glamour stock
= low B/M

**Gordon growth model**

= \* idea glamour vs value
$$P=\frac{D\_{t+1}}{r-g} \& P=\frac{ρC\_{t+1}}{r-g}$$

🡪 Holding constant discount rates (r) and payout ratios (ρ), High C/P = low expected growth rate of future cash flows (g)
🡪 Similar formula for earnings

🡪 Value stocks outperform when sorting on C/P, E/P, …

**Past growth**

= measured by growth in sales

* Compute GS in years -5,…, -1 prior to portfolio formation
* Compute each firm’s weighted average rank
* Rank by weighted average GS
* Deciles based on weighted average sales growth rank

🡪 Low past GS firms (value) outperform high past GS firm (Glamour)

**Simple investment strategies, based on single fundamental variable, produce very large returns**

Methodology

* 5y accounting data
* **\* portfolios**
	+ Portfolio with stocks in each decile of D/M (10 portfolio)
		- Decile 1 = all stocks in first decile (10% lowest B/M stocks)
	+ Within each portfolio: stocks equally weighted
	+ Returns computed: annual buy-and-hold strategy for years +1,…,+5 (0=transformation)
	+ End of each year: portfolio rebalanced
* **B/M instead of M/B**
	+ Low B/M
		- Lot of intangible assets (e.g. R&D, not in book value)
		- Attractive growth opportunities
		- Low risk (future FCF discounted at lower rate)
		- Overvalued (glamour stock)
	+ NOT clean measure (of mis-pricing)
	+ Therefore also focus on expectations of future growth x past firm growth
* Raw returns x size-adjusted returns
* Look-ahead bias (survivorship bias):
if small firms perform well, added to database, otherwise not
= when going to lower & lower market valuation firms, one finds population increasingly selected from firms with good 5y past performance records
= \* association low initial value & future returns
🡪 Bias, so cut out 1st 5 years of database

Anatomy of contrarian strategy

= Evidence of psychological flaws in future prediction

= \* predictions without fully accounting for mean reversion

**Contrarian investment strategy**

= exploits that

* Sells stock with high past growth rates & high expected future growth (glamour stock)
* Buys stock with low past growth rates & low expected future growth (value stock)
🡪 Stocks reflect failure of investors to account for mean reversion in growth forecasts

🡪 Low expected future growth = proxied by high C/P or E/P ratio

Sort stock on 2 variables: future growth (C/P or E/P) & past growth (GS)

🡪 Deciles not practical, \* 3 groups according to each var & intersection from 2 classifications

Performance of contrarian strategy

**Results apply to large stocks**

1. Larger firms of greater interest for implementing trading strategies
	1. Large firm
		1. 50% largest market capitalization
		2. 20% largest market capitalization (S&P500)
2. More closely followed (e.g. analysts)
3. Look-ahead bias (survivorship bias) should be less important for larger firms

**Significant variables defining glamour/value portfolios?**

= use multiple regression

* Separately for each postformation (so y1 = 22 separate regressions)
* Coefficients are averaged & \* t-statistics
	+ All except size have significant predictive power for future returns
		- GS, B/M, E/P, DE/P, C/P, DC/P
		- GS & C/P stand out

Test of the extrapolation model

🡪 Contrarian strategies earn higher returns r.t. market & r.t. extrapolation strategies

**Excessive extrapolation & expectational errors**= overreaction theory of De Bondt & Thaler

= characterizes glamour stocks & value stocks

Extrapolation

= investors excessively optimistic about glamour stocks & pessimistic about value stocks
🡪 Exp of future growth tied to past growth

**Test**

= compare actual FGR to past GR & expected FGR implied by multiple at time of portfolio formation

Results

* Historically: glamour stocks grow fast
* Market expects superior future growth of glamour stocks as well
* ST (1-2y): Superior growth
* LT: growth rates essentially =
* Forecasts tied to past GR too optimistic for glamour vs value stocks

Are contrarian strategies riskier?

NO

🡪 But tested first:

Value stocks would be fundamentally riskier than glamour stocks if

1. Underperform glamour stocks in some states of world
2. Those states on average are “bad states”, where marginal utility of wealth (consumption) is high

3 approaches

**1. Consistency?**

= Look at performance consistency of V vs G strategies

1. # times that V < G
2. NO, V consistently > G

2. **Bad states?**

= when V < G, is this in recessions, severe market declines of bad states?

1. Look at pay-off relevant factors associated with larger risk premium
	1. Relation btw factors & - returns on contrarian strategy does NOT explain higher average returns on value strategies: NOT RISKIER
2. Look at recessions
🡪 Implausible that value strategies do bad in recessions
3. Look at ‘bad states’ as worst months for stock market as whole
🡪 V > G in worst 25 months
4. Look at worst quarters ito real GNP growth
🡪 V > G in worst 10 quarters

🡪 Value investment strategies do NOT expose investor to greater downside risk

🡪 V: higher up-market beta & lower down-market beat (wrt market/economic conditions) than glamour stock

**3. Traditional risk measures**

= Compare V & G strategies using betas & standard dev

* Average annual standard dev of portfolio returns
	+ SD V> G
		- Not really greater downside risk, as average return much higher
		- SD size-adjusted =
		🡪 Results seem driven by smaller average size of value stocks
* Beta of value & glamour portfolios w.r.t. value-weighted CRSP index (& risk free asset)
	+ V > G 0.128 but explains only 1% difference per year ipv 10-11% that is found

Conclusion

Question: 10-11% extra return V > G persistent so long?

1. Investors unaware of this
2. Data snooping (Coincidence)
	1. BUT similar results in other samples
	2. Systematic pattern of expectational errors on part of investors
	= no correction for mean reversion in expectations
	3. Genuine economic phenomenon

**Conjecture**

= individual & institutions prefer G & avoid V because

1. Judgment errors extrapolating past growth rates of G (while unlikely to persist)
2. Investors equate well-run firms with good investments, regardless of P
= seem prudent investments for clients
3. ST horizons compared to those needed for V to consistently pay off
🡪 Cannot afford to underperform index of peers

! Fact that institutional investors favour G may explain part of inferior performance compared to market index

* Pension fund managers underperform as well
* Money managers underperform as well

2. ASSET-BASED VALUATION

Value of Equity = value of assets – value of debt

🡪 Same as BS but BS does it imperfectly

* Assets ~ amortized historical costs
↔ can be market-to-market
* Missing intangible assets bc too hard to measure under GAAP reliability criterion
e.g. brand names, knowledge, patents & managerial ability

Asset-based valuation

= try to redo balance sheet

* Record all available assets x liablities at market value
* Identify omitted items & assign market value

🡪 Difficult & Expensive

* Market value?
	+ May not be traded often
	+ Intangible asset evaluation
* Do market values represent intrinsic value?
	+ Market for an asset may be imperfect
	+ Value of asset may depend on in-firm usage
* Value of synergies btw assets?

🡪 Feasible in some cases

* Asset-based firms
e.g. oil field, gas field & mineral products; REITs
* Valuation of some investment funds
= add up value of portfolio firms
* Calculating liquidation value/ break-up value
↔ going-concern value

FUNDAMENTAL ANALYSIS

= 1st method involving forecasting

1. Analyses info
2. Forecasts payoffs from that info
= value of share based on expected future payoffs
3. Obtains valuation from those forecast

🡪 Stock screening on P/V ratio (>1: market too excited)

FS, Pro-Forma & Fundamental analysis

* Forecasting
= essential for valuation
* Current FS are used in these forecasts
* Future numbers (earnings, CF,…) will be reported in future FS

🡪 FS help to forecast but are also what is to be forecast

Fundamental analysis
= developing pro-forma FS form current FS (& other info) & converting into valuation

The valuation model

= Tool for understanding bs & strategy
= threefold role

1. Directs what is to be forecast
2. Directs how to convert forecast into valuation
3. Points to relevant info for forecasting

**Terminal investment**
= investment for fixed term

1. A bond
	1. Periodic cash coupon
	2. Cash at redemption (usually large)
	3. Purchase price
	4. Valuation
	
	met pD = (one plus) required rate of return on debt
	5. Valuation issue: discount rate PD
2. Project
	1. Periodic flow
	2. Residual value (usually small)
	3. Initial investment
	4. Valuation
	
	met pP = (one plus) required return (hurdle rate) for project
	5. Valuation issue: forecasting CF & Discount rate Pp
3. Value creation
V0 > I0

**Going-concern investment**
= investment goes on indefinitely, no terminal date/liquidation value

1. Terminal value TVT = price payoff PT when share sold
2. Valuation issues: typical as below

**Valuation issues**

* Forecast target: div, CF, earn,…
* Time horizon
* Terminal value
* Discount value



**Criteria for practical valuation**

1. Finite-horizon forecasting
	1. Infinite horizons = impractical
	2. Uncertainty as horizon
2. Validation
	1. What we forecast must be observable ex post (hard data)
3. Parsimony
	1. Information gathering and analysis should be straightforward
	2. Fewer pieces of information = better

**What generates value?**

* Operating activities
* Investing activities
* Financing activities?
= investing in operating activities
≠ financial investments
	+ Debt financing
		- In principle, does NOT create value
		- Taxes ∆ picture
	+ **Equity financing**
		- **Share issues**
			* At too high P, buyers (new sh) lose
			* At too low P, current sh lose
			* At market P, per-share value not affected
			* May impact share P through signaling
		- **Share repurchases**
			* Share issue in reverse
		- **Dividends**
			* M&M dividend irrelevance concept (home-made dividends)
			* Transaction cost (or stock illiquidity) may alter this
			* Dividend announcements might convey info (signalling)