Market-Based Valuation (Price Multiple)

→ MBV is a relative comparison approach unlike discount Cash Flow methods that are used to determin an intrinsic value.

→ Key Measures of MBV include P/E, PEG, P/B, P/S, P/CF, EV/EBITDA, E/p, Dividend Yield, EBITDA/EV, NOI/EV.

→ Using MBV Multipler, the compared firms must be in the <u>same industry</u> in all regards as to their Risk (the level of Operating Risk & Financial Risk) business in nature and future prospects.

→ The MBV multiplier (e.g. P/E) is the base (or benchmark) for valuation. Thus, the MBV multiplier needs to be <u>justified</u>:

① Industry Mean: the average level where a peer group trades.

② Estimate the fair price of stock using forcasted fundementals such as CFs, risk, growth rate, expected earning or ROE.

Market-Based Valuation: "Justified Multiplier"

$$V_0 = \begin{pmatrix}\text{Justified}\\ \text{Multiplier}\end{pmatrix} * \begin{pmatrix}\text{Projected}\\ \text{Parameter}\end{pmatrix}$$

For example: If the justified industrial average P/E_1 is 10, and the expected earning per share (E_1) of a firm is \$3, the $V_0 = 10 * 3 = \$30$.

Key:
① you need a robust measure of the justified multiplier
② you need an accurate projection of parameters (e.g. earning)

** Benchmark: Could be the industry, peer group, or a leading firm.

For example: if the benchmark ROE is expected to be 18%, the retention rate is 30%, the cost of equity is 10%, what is the justified P/E

Gordon Model

$$P_0 = \frac{D_1}{r-g} \Rightarrow \frac{P_0}{E_1} = \frac{(1-RE)}{r-g} = \frac{.7}{.1-.054} = 15.22$$

$$= \frac{(1-RE)\cdot E_1}{r-g}$$

*: $g = RE * ROE = 0.3 * 18\% = 5.4\%$

($RE = b$)

Normalizing Earning for Cyclical firms:

Benchmark stock price = P_0 = #20

Year	T-2	T-1	T	T+1
EPS	5	-1.5	3.64	2.27
ROE	25%	-8.6%	18.1%	10.6%
BV	20	17.5	20.14	21.41

① Normalized P/E based on Average earning:

$\overline{EPS_1} = (5 - 1.5 + 3.64 + 2.27)/4 = 2.35;$

$\overline{P/E_1} = \frac{20}{2.35} = 8.5$

② Normalized P/E on Average ROE

$\overline{ROE_1} = (25\% - 8.6\% + 18.1\% + 10.6\%)/4 = 11.28\%;$ $\overline{P/E_1} = \frac{20}{2.42}$

$\overline{EPS_1} = \overline{ROE_1} * BV_1 = .1128 * 21.41 = \#2.42;$ $= 8.3$

Market-Based Valuation: Price Earning Ratio P/E - Analysis

Pros: P/E is widely used to determine equity value and analize growth and excess returns.

Cons:
① manipulation of accounting choices can distort earnings.
② which earnings to use? reported, adjusted or expected?
③ only "on-going", "sustainable", and "expected earning" drive value.
④ Negative earning is a problem.

Leading PE (P/E_1) vs. Trailing PE (P/E_0)

$$P_0 = \frac{D_1}{r-g} = \frac{(1-b)E_1}{r-g}$$

b = Retention ratio (~~payout~~ ratio);
$g = b \cdot ROE$; $E_1 = E_0(1+g)$

if $b=0$ and $g=0$, $P_0 = \frac{E_0}{r}$ and $\frac{P_0}{E_0} = \frac{1}{r}$ ← Base PE

So, "$\frac{E_0}{r}$ = Base Value (No Growth)" $\qquad \frac{P}{E_1} = \frac{P}{E_0}$ (No Growth)

Market-Based Valuation: P/E - Analysis

$$P_0 = \frac{E_1}{r} + PVGO$$

PVGO = present value of Growth opportunity

$$P_0 = \frac{(1-b)E_1}{r-g} \Rightarrow \frac{P_0}{E_1} = \frac{1-b}{r-g} = \frac{1}{r} + \frac{PVGO}{E_1}$$

PE decomposition $\Rightarrow$ $\frac{P_0}{E_1}$ = Base PE + Growth potential

- Base PE ↑ "on-going" Business
- Growth potential ↑ "Franchise" & Growth

$$\frac{P_0}{E_1} = \frac{1-b}{r-g} = \frac{1-b}{r-b\cdot ROE_1} = \frac{1}{r}\left(\frac{r(1-b)}{r-b\cdot ROE_1}\right) = \frac{1}{r}\left(\frac{r-rb+b\,ROE_1-b\,ROE_1}{r-b\cdot ROE_1}\right)$$

($g = rb$)

$$= \frac{1}{r}\left[\frac{(r-g)+b(ROE_1-r)}{r-g}\right] = \frac{1}{r}\left[1+\frac{b\cdot\alpha}{r-g}\right]$$

$\alpha = ROE_1 - r$ = Expected Equity Return − Cost of Equity

$$\frac{P}{E_1} = f(r, \alpha, b, g)$$

$$\frac{P_0}{E_1} = \frac{1}{r}\left[1 + \frac{b\,(ROE_1 - r)}{(r - b\,ROE_1)}\right]$$

NOTE:
if $\alpha > 0$ and it is large, then $b \sim 1$ (high reinvstment rate).
Then, $r - b\,ROE_1 < 0$; Gordon Model is inappropriate to high growth (R) stocks.

$$= \frac{1}{r} + \frac{(b\,ROE_1 - br) * g}{r(r-g) * g}$$

$$= \frac{1}{r} + \left[\frac{g}{r-g} * \frac{b(ROE_1 - r)}{r\,(b.ROE_1)}\right]$$

$$= \frac{1}{r} + \left[\frac{g}{r-g} * \frac{ROE_1 - r}{r.\,ROE_1}\right]$$

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$$= \frac{1}{r} + \left[\frac{\text{Growth}}{\text{Dividend Yield}} * \frac{\alpha}{r.\,ROE_1}\right] = \frac{1}{r} + \frac{PVGO}{E_1}$$

$$= \text{Base PE} + \left[\text{Growth Factor} \times \text{Franchise Factor}\right]$$