Dividend payout ratio and market value

How market value of a company is related to its dividend policy? We will provide a very simple discussion. As a approximation, market value of a company can be represented as

$$S=\frac{D}{r-g} (1)$$

Where D is amount of dividend, r is the market discount rate and g is the growth rate of dividend payout.

$$D=Earning\*P$$

Where P is the payout ratio.

$$Earning=ROEB\*EquityB$$

Where ROEB is the return on book value of equity and EquityB is the book value of equity.

$$g=\left(1-P\right)ROEB$$

Hence

$$S=\frac{ROEB\*EquityB\*P}{r-\left(1-P\right)\*ROEB}$$

The goal of a company is to maximize its market value of equity relative to its book value. That is to maximize

$$\frac{S}{EquityB}=\frac{ROEB\*P}{r-\left(1-P\right)\*ROEB}=\frac{ROEB\*P}{r-ROEB+P\*ROEB}$$

Or minimize its inverse

$$\frac{EquityB}{S}=\frac{r-ROEB+P\*ROEB}{ROEB\*P}=1+\frac{r-ROEB}{ROEB\*P} (2)$$

If

$$r<ROEB$$

The market value of the company is higher than its book value. At an early stage of a company, usually

$$r<ROEB$$

That is why people bother to build a company. At this stage, from (2) P is usually small to keep market valuation high. This suggests that when return on book value of equity is high, the company shall retain more earning. This is consistent with our intuition. If we follow the formula strictly, market valuation of the company can reach infinity if we fine tune P. However, formula (1) is only an approximate valuation of the company.

If

$$r>ROEB$$

The market value of the company is lower than its book value. At this stage, from (2) market value is an increasing function of P. A company should payout most of its earning. Again, this is consistent with our intuition. Warren Buffet once said a company should payout all its earning if its return is less than market return.

In essence, a company shall retain most of its earning if its return on equity is higher than market average and distribute most of its earning if its return on equity is lower than market average.