PUGET SOUND ENERGY

EARNINGS-PRICE RATIO PROOF

If market price exceeds book value,
the market-to-book ratio is greater than 1.0,
and the earnings-price ratio understates the cost of capital.

MP = market price
BV = book value
i = cost of equity capital
r = earned return
E = earnings

1.   At MP = BV, $i = r = \dfrac{E}{MP}$.

2.   E = rBV.

3.   Then, $\dfrac{E}{MP} = \dfrac{rBV}{MP}$.

4.   When BV < MP, i.e., $\dfrac{BV}{MP} < 1$, then,

         a. $\dfrac{E}{MP} < r$, since $\dfrac{E}{MP} = \dfrac{rBV}{MP} < r$, because $\dfrac{BV}{MP} < 1$;

         b. $i < r$, since at $\dfrac{BV}{MP} = 1$, $i = \dfrac{E}{MP} = \dfrac{rBV}{MP}$, but if $\dfrac{BV}{MP} < 1$, then $i < r$; and

         c. $\dfrac{E}{MP} < i$, since at $\dfrac{BV}{MP} = 1$, $i = \dfrac{E}{MP} = \dfrac{rBV}{MP}$, but if $\dfrac{BV}{MP} < 1$, then $\dfrac{E}{MP} < i$, because,

             1) $\dfrac{BV}{MP} < 1$, through MP increasing, and, if so, $\dfrac{E}{MP}$ decreases, therefore, $\dfrac{E}{MP} < i$, or

             2) $\dfrac{BV}{MP} < 1$, through BV decreasing, and, if so, given E = rBV, $\dfrac{E}{MP}$ decreases, therefore, $\dfrac{E}{MP} < i$.

5.   Ergo, $\dfrac{E}{MP} < i < r$, the earnings-price ratio is lower than the cost of capital, which is lower than the earned return.