

a next step the analyst calculates the net present value of these probability-adjusted sales, assuming that they only occur in 5 years. In order to get to risk adjusted earnings (=Net in table 2) he must reduce the NPV of sales by cost of goods, sales, general and administrative expenses, and taxes.

Table 2: Calculation

Parameter	rNPV
Sales	68.7
COGS	10.3
SG&A	17.7
EBIT	46.6 ²
Tax	16.3
Net	30.3

The final \$ 30.3 Mio represent the risk adjusted net present value of Clinuvel's earnings in 5 years. On a per share basis this corresponds to (risk adjusted and discounted) earnings per share (EPS) of \$ 0.1. At a share price of A\$ 1.07 this corresponds to a P/E ratio of 9.1 (including the exchange rate A\$/US\$). The analyst then compares this to the Industry P/E (BBG World Biotech Index) of 45.05 and concludes that the share is a bargain.

Dynamic P/E ratio

1. Determine representative year regarding revenues (5 to 10 years in the future): T.
2. Assess revenues for that year: R_T
3. Discount and probability-adjust earnings: $R_t = p * R_T * (1 + r)^{-(T-t)}$
4. Calculate EBIT:
 $EBIT = R_t * (1 - COGS - M\&S)$
5. Calculate earnings: $E_t = EBIT * (1 - tax)$
6. Multiply with selected P/E ratio:
 $P = E_t * P/E$

² It is unclear why this is not 40.7.

This method, the so-called dynamic P/E ratio, is much wider spread than one would believe³. Some analysts do not even use risk-adjusted sales but simply use a much higher discount rate (35%) and factor in the attrition risk this way. But then they all use an industry P/E ratio. These industry P/E ratios differ quite dramatically.

Another analyst from RRS, also valuing Clinuvel, uses a 25 P/E ratio. He mentions, that profitable biotech companies trade at 25 to 40 times their earnings. Other analysts use a multiple of 30.

P/E ratio in more detail

Established drug development companies typically exhibit a P/E ratio of about 10-15.

Table 3: P/E ratios and corresponding discount rates

Company	P/E ratio	Discount rates
Amgen	9.73	10.3%
BMS	14.28	7.0%
Lilly	13.29	7.5%
Merck	11.96	8.4%
Pfizer	9.29	10.8%

We can assume that these companies have reached a stable stage of their business cycle. Therefore we can apply the P/E idea and deduct their discount rates, with some caution. A 30x multiple (read price = 30 x earnings) would therefore correspond to a discount rate of 3.3%. Of course, this does not correspond at all to biotech companies that usually exhibit much higher discount rates than pharma companies.

³ cf reference Bähr/Manns

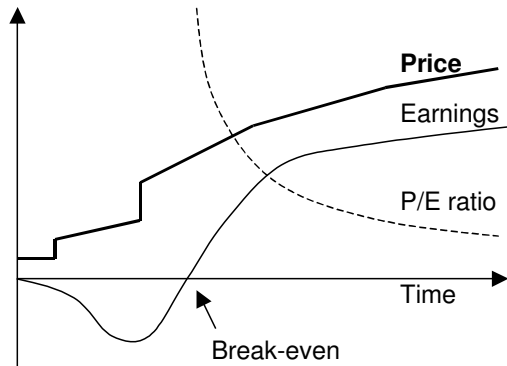


Figure 1: P/E ratio along the business cycle of a company

Figure 1 exhibits first, that unprofitable companies do not have any P/E ratio at all (due to lack of earnings). Second, companies that are only at the beginning of profitability have naturally a high P/E ratio, because the price is calculated using the future and higher earnings, but are divided by the current and lower earnings. A high P/E ratio is therefore not only a sign of an established and diversified business as is the case for pharma companies, but also for a business that is still in growth.

Critique

The described risk-adjusted discounted P/E method has some serious flaws. First, it does not account for all the R&D expenses it takes to get to a profitable stage. Second, it is completely unclear that the selected year represents already a stable state of business. Calculating with the expected P/E ratio in 5 years corresponds to taking the terminal value already after 5 years. This is quite a short period of time in an industry where it takes 15 years to commercialise a product that should then stay on the

market for another 10 years. Third, this method is unsuited to correctly account for the tax value of the company (cf. Avance Newsletter May 2008). Fourth and most important of all, it makes no sense to compare with an industry P/E ratio. The P/E ratio depends on the stage of the company and on the discount rate. Both are particular to the company and the selected year.

We can only speculate why analysts use this method. One advantage is that the method is relatively insensitive to the discount rate, one of the most critical parameters. On the other hand the method supposes that the company is comparable to the industry average and uses an at best questionable P/E ratio. It is careless to hope that all the flaws of the method will compensate each other.

With risk-adjusted net present value (rNPV) analysts have a method at hand that accounts for all particularities of the company. Fortunately, most analysts make use of rNPV, although the described dynamic P/E method is widely spread.

References

Dr. Christa Bähr, Dr. Markus Manns: „Life Science am Kapitalmarkt, Biotechnologie im Fokus“, publication of DVFA, 2005.

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