

### Why royalties are up-tiered

In license contracts one often encounters tiered royalties. For example the royalty rate amounts to 10% for sales up to a limit of US\$ 200 Mio and 12% above. This means that if in one year the drug sales amount to US\$ 300 Mio the licensor receives 10% on the first US\$ 200 Mio (=US\$ 20 Mio) and 12% on the remaining US\$ 100 Mio (=US\$ 12 Mio)<sup>1</sup>. This up-tiering of royalties is on first sight counterintuitive. Why should the commercialising company be punished with a higher rate if it does a good job? And isn't it even counterproductive, because the margin might suffer from the increased royalty payments, leading to no incentives to sell more. In this article we provide the more educated second sight.

Upfront and milestone payments are fixed amounts and depend only on the scientific success of the project. Royalty payments allow the licensor to participate in the economic success of the product. For the licensee royalties are attractive because he shares the development and economic risk to some extent with the licensor.

When negotiating the license terms both parties acknowledge that the value of the project should be split between the two parties, considering the effort and time that already went into the project by the licensor, and that still has to be invested by the licensee.

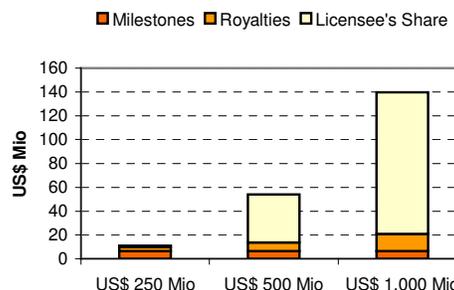
<sup>1</sup> It does not mean that the licensor receives 12% of all sales as soon as they are greater than US\$ 200 Mio. Imagine that the sales are exactly around US\$ 200 Mio. If the sales were greater than US\$ 200 Mio, e.g. US\$ 200,000,001, then the licensee would have to pay US\$ 24 Mio (=12%), but if the sales are only US\$ 2 less, then the payment would only be US\$ 20 Mio, giving the licensee an incentive to misstate its revenues.

For our analysis it is not of importance whether this value split should be 25%-75% or rather 50%-50% as long as there is a mutual understanding that both parties should receive their fair share. The biggest problem is usually to determine the value of the project, which then has to be split. Unfortunately, the value always refers to cash flows in the future that are not yet observable. Therefore almost naturally different views of how well a drug will perform arise. Even the most proficient companies cannot accurately predict the sales of a drug that is still in clinical development.

**Table 1: Financial terms for a phase I deal**

In US\$ Mio	Terms
Upfront	2
Phase II Milestone	2
Phase III Milestone	5
Filing Milestone	8
Approval Milestone	15
Royalty	7%

What happens to the value split<sup>2</sup> of a license contract as displayed in table 1 if we assume once peak sales of US\$ 250 Mio, once US\$ 500 Mio, and once US\$ 1,000 Mio?



**Figure 1: 3 different scenarios**

<sup>2</sup> Calculated at a joint discount rate of 12%.

In figure 1 we see that the licensor would keep 25% of the project under the assumption that the project reaches peak sales of US\$ 500 Mio. If we assume that the drug only reaches sales of US\$ 250 Mio then the licensor company would capture 92% of the value, and in the scenario of US\$ 1,000 Mio the licensor would end up with 15%. We clearly see that the value of the milestones remains the same independent of the economic success. Only the royalties move with the market success.

Let's assume that US\$ 500 Mio is the most realistic guess today. Both companies would be happy with the license terms if these US\$ 500 Mio really become true. If the sales are lower, then the licensee asks for lower royalties, and if the sales are higher, the licensor asks for higher royalties. Therefore the royalties should naturally increase. Assuming a tiered structure of 6% up to sales of US\$ 200 Mio, 8% for sales up to US\$ 400, and 10% for sales exceeding US\$ 400 Mio we could reduce the span of value splits from 15%-25%-92% to 17%-25%-88% (for the scenarios US\$ 250 Mio – US\$ 500 Mio – US\$ 1,000 Mio). We acknowledge that this improvement is not enormous, but it goes into the right direction. A deal structure that is neutral to the peak sales assumption would be most desirable, but unfortunately this is not possible. We have seen that the licensor receives anyway a value of US\$ 6.6 Mio regardless of the peak sales assumption. This is the risk-adjusted net present value of upfront and milestone payments. So, if the licensor insists in fixed payments, which do not depend on the commercial success of the

project, the value of the project must be at least US\$ 26 Mio. This is of course non-sense, because with peak sales below US\$ 340 Mio, the project value falls below US\$ 26 Mio in this particular case. Consequently, a peak-sales neutral deal structure must not include any upfront or milestone payments – or should include a repayment schedule which is hardly acceptable for any licensor. And because the value of the licensor will never fall below zero, it is not possible to reach a peak sales neutral deal structure with a royalties-only deal (at some peak sales assumption the project value turns negative).

Once again the virtual company model<sup>3</sup> provides the best explanation why royalties must be up-tiered. The current terms sheet offers the licensee an IRR of 20%. After phase II the licensor still holds 22% of the project if valued until then with the assumption of US\$ 500 Mio. Now imagine that the trial results suggest that the peak sales assumption must be modified. If the potential is higher than originally anticipated, then the value of the virtual company, i.e. the value of the project, increases and the dilutive power of the licensee is weaker. Therefore the licensor ends up with a higher stake at launch and can claim more dividends in the form of royalties. If the peak sales estimate increases to US\$ 1,000 Mio in phase II, the fair royalty rate would be 11%. This again exhibits that the royalty rate should increase with increasing sales.

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<sup>3</sup> To familiarise yourself with the virtual company model you can read News in Avance No 3 ([www.avance.ch/newsletter/docs/avance\\_on\\_co-development.pdf](http://www.avance.ch/newsletter/docs/avance_on_co-development.pdf)).

Usually the royalty tiers will not be as steep as they should be. This can be explained in the securitising aspect of a license contract. Securitising the complete value of the project right away would correspond to a sale of the asset, where the seller runs the full risk of underselling it, i.e. if the product performs better than anticipated he does not participate in this upside, because this information was not yet available at the moment when the price was determined. If on the other hand the seller wants to completely participate in the economic risk – here we understand risk in a positive sense of “better than anticipated” – then he must also participate in the development risk. The licensor usually hands over the development risk to the licensee and securitises already part of the value via upfront and milestone payments. Therefore he can only expect to get a less steep than quantitatively justified royalty tiering. This is again a matter of balancing potential upside in the future against certain early milestone payments.

In co-promotion deals the same reasoning of tiered profit share mechanisms apply. Interestingly, some contracts include a down-tiered profit share model, i.e. the better the project performs, the less (in %) the licensor receives. These contracts contradict the above outlined theory. A possible explanation for this phenomenon is the following: The licensor could never reach the upper tiers without the development and marketing power of the licensee. It is therefore fair, that the licensee profits more from what is essentially his contribution. Of course, it also possible,

that the licensee just made use of his bargaining power.