Patent evaluation for high-tech start-ups

Symposium: Intellectual Property Valuation in Practice
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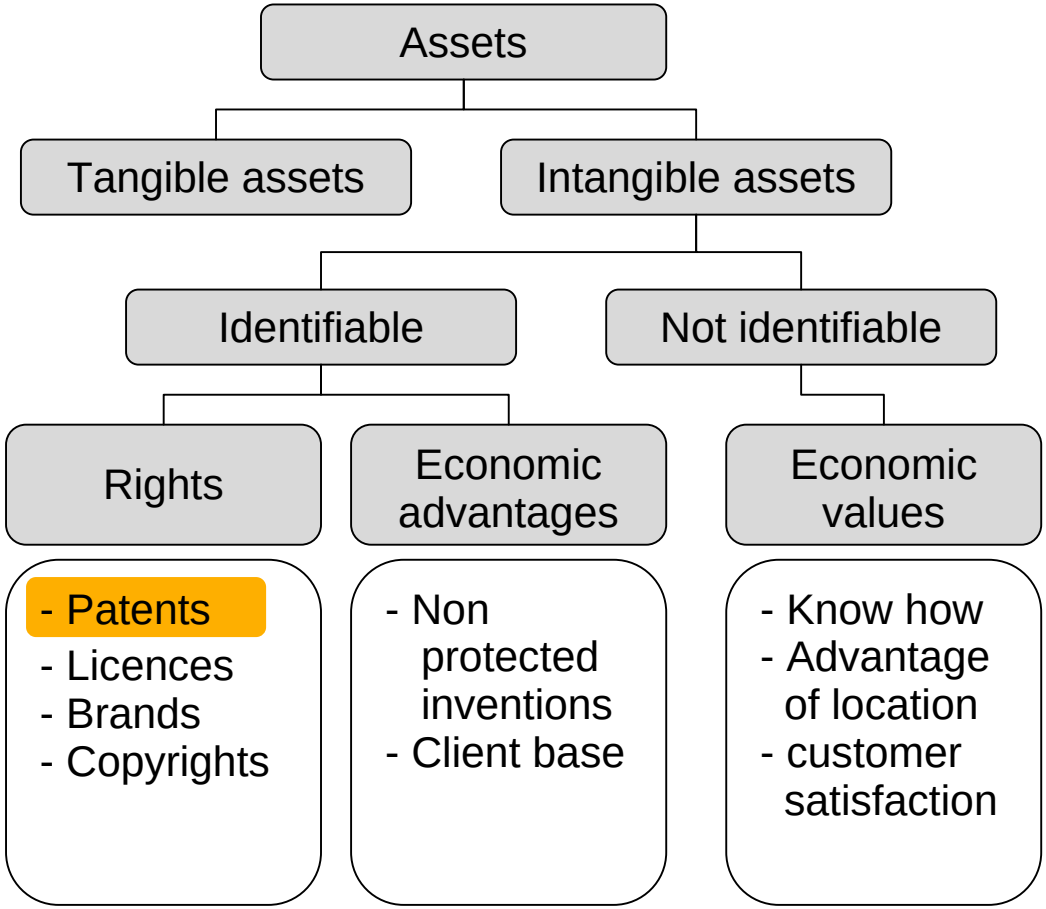
Trigger for patent evaluation

- **Transaction**
  - Buy/sell patent
  - Licencing agreement
- **Internal control**
  - Coordination of patent portfolio
- **Financing**
  - Patents are identifiable, legally protected intangible assets
  - Patents are part of the company value (eg. relevant for Venture Capital)
  - Patents can be used as guarantees for financing activities

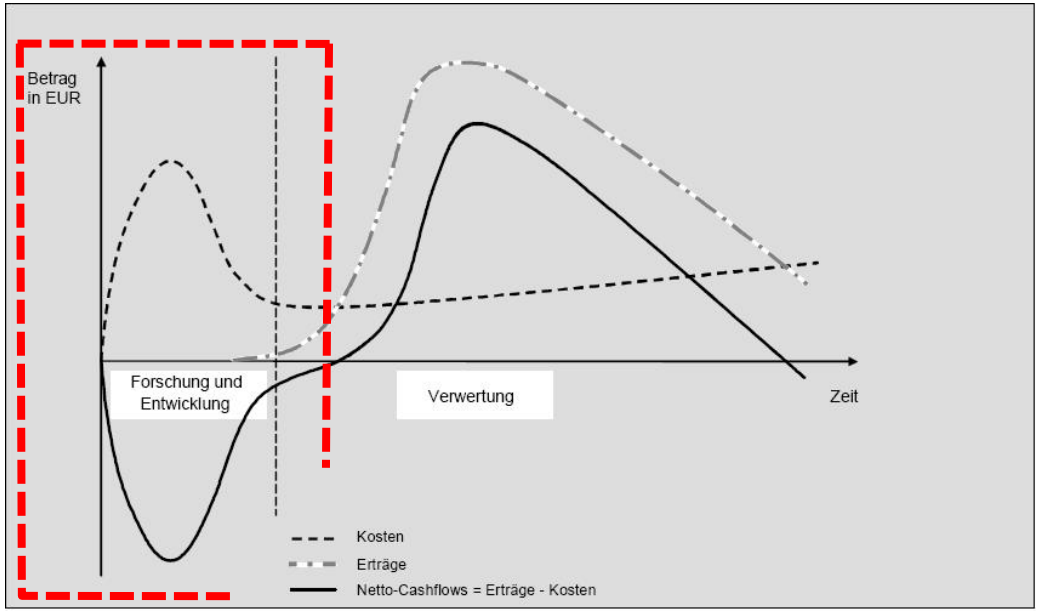


Quantitative evaluation methods

- **Cost oriented**
  - What were the costs for the reproduction / replacement of the patent ?
- **Market oriented**
  - What is the value of similar patents ?
- **Net present value oriented**
  - What are the future cashflows generated by the patent ?
- **Hybrid / special methods**
  - Conjoint-Analysis, Competitive Advantage Valuation, etc.

Special situation of high-tech start-ups

In this early stage of the start-up there are no or only marginal revenues => the predominant company value is intangible !



=> For investors (VC) the company value is based on the value of its patents

The main criteria for a practical evaluation method

Which evaluation method is the best for valuating patents of high-tech start-ups?

Criteria for the method:

- **Evaluation model should include only few parameters which can be determined reliably**
- **Evaluation procedure should only cause limited efforts and costs**
  - Adequate research expenses
  - No empirical method (surveys)

Known evaluation methods (literature)

Cost method based on reproduction	Cost method based on replacement	Market method based on comparable patent transactions
Real option Method	Conjoint Analysis	Residual value method by *Parr*
Competitive Advantage Valuation	**Relief-from-Royalty Method**	Method of direct acertainable cashflows
25%-Method	Incremental cashflow method	Residual value method

Relief-from-Royalty Method (SIMPLIFIED OVERVIEW)

The basic idea of the method:

How much licensing fees would I have to pay for using the technology, if I were not the owner?

The calculation of the patent value with the Relief-from-Royalty-Method includes 3 main steps:

Step 1: Calculation/estimation of the revenues generated by the product(s) based on the patent

Step 2: Determination of an appropriate royalty rate

Step 3: Discouted cashflows (saved expenses) related to the date of evaluation

Determination of an appropriate royalty rate

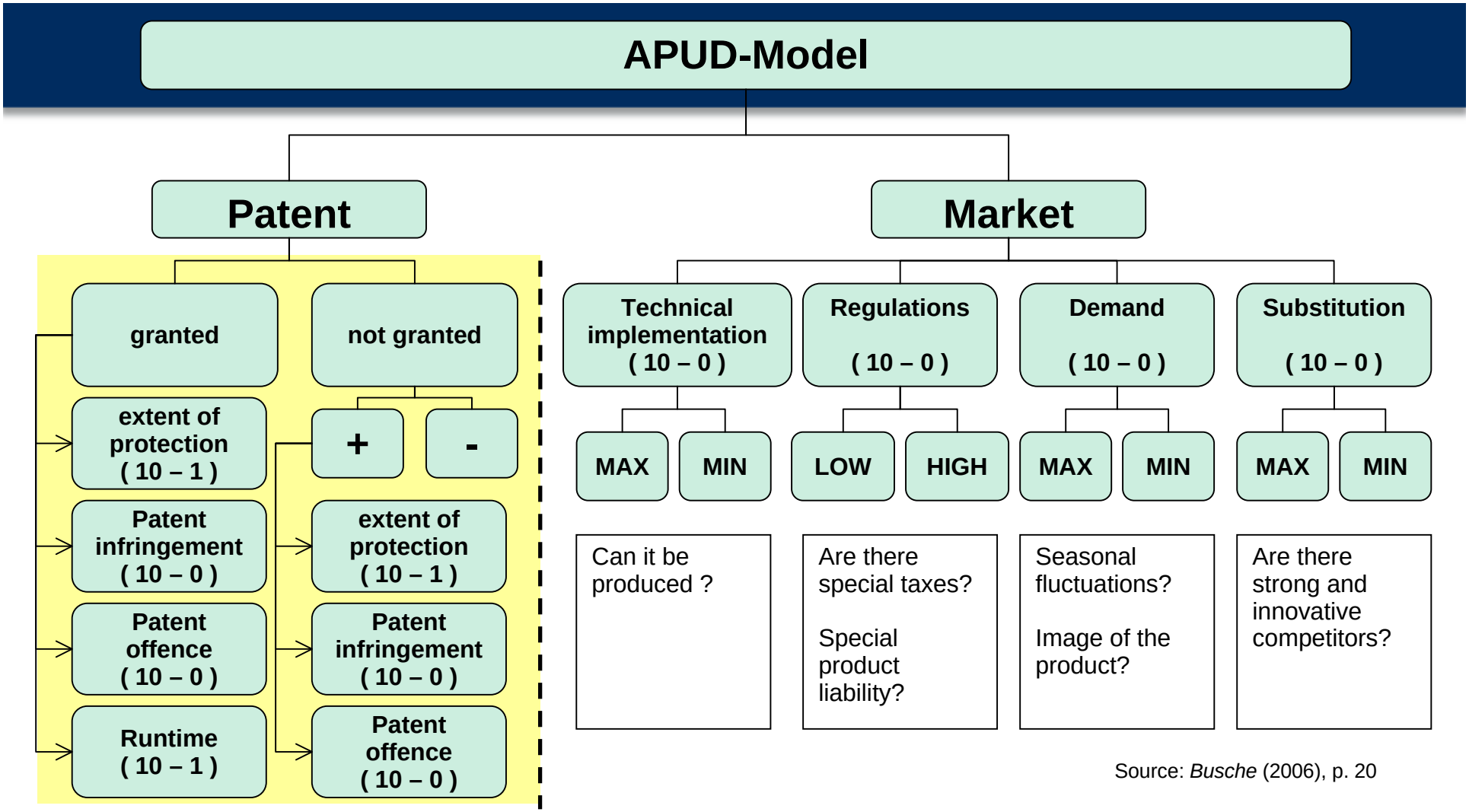
- **What is the royalty rate of a comparable patent?**
  →Comparison of patents which have already been traded
- **The problem**
  - Every patent is unique, which means that patents are not fully comparable
    → no exact comparable royalty-rate can be determined
- **The solution**
  - Band width of variation can be determined / classified in different industries / branches
    (International Patent Classification)
    eg. IPC A61 – Human Necessities - Health; Amusement: Range might be 3,5%-6,5%

Now we need an additional method to define an appropriate royalty rate within this range!!

The APUD-Model (University Dűsseldorf)

- **This qualitative evaluation method accounts for all factors that affect the practical patent value**
- **The APUD-Model consists of 2 main groups of factors:**
  - **Legal side:** extent of protection, patent infringement, patent offence and runtime
  - **Product market:** Technical feasible/implementation, regulation, demand and substitution
- **The qualitative parameters are evaluated in points between 0** (very bad) **- 10** (very good)

Step 2

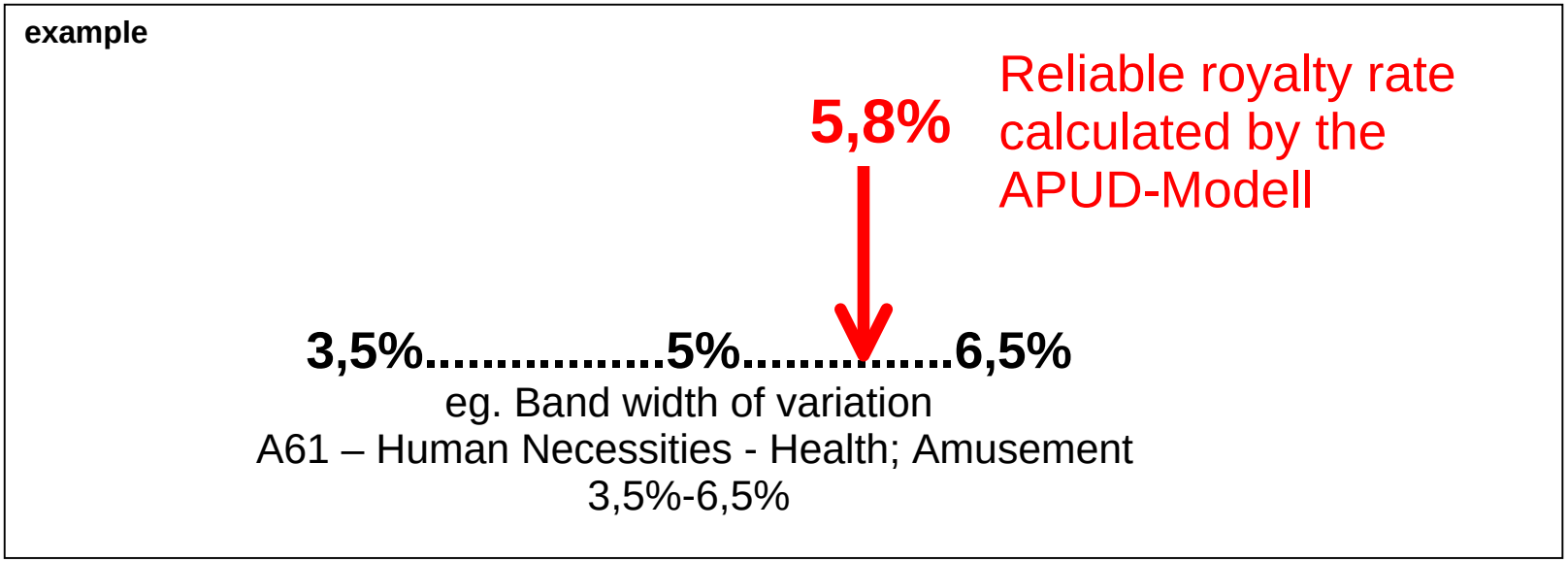


Source: *Busche* (2006), p. 20

Calculation of the appropriate royalty rate

- **After conducting the qualitative evaluation, a reliable royalty rate for the patent within the band width of variation can be determined**

example



eg. Band width of variation
A61 – Human Necessities - Health; Amusement
3,5%-6,5%

Calculation of the patent value

Step 3: Calculation using the Net Present Value formula

$$\text{Patent value} = \sum_{t=1}^{T} \frac{\text{Revenues}_t \times \text{RoyaltyRate}}{1 + (\text{Interest}_{\text{Riskfree}} + \text{Risk surcharge})^t}$$

T = max. years of economic use of patent

→simplified presentation:

additional factors like taxes have to be included in concrete evaluation projects

Summary

- **The new evaluation model is a combination of a quantitative and qualitative method, using 3 different parts:**
  - Net present value approach (Revenues)
  - Market approach (Royalty rates of similar patents)
  - Qualitative approach (APUD-Model)
- **This model is a practical solution for evaluating patents of high-tech start-ups → in this early phase only few parameters can be determined reliably**
- **The evaluation method can also be used for evaluating patents in all later phases**

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