Executive Briefing
Strategic M&A Support
for Pharmaceutical and Biotech Companies
– minimising the risk of “Winner’s Curse”
Catenion
Caught between Benjamin Graham’s “Margin of Safety” and the “Winner’s Curse”

A long time ago, the famed value investor Benjamin Graham established a few simple maxims that should guide the prudent investor. His logic was straightforward and can be summarised as follows:

- Value investing is not speculation
- Valuation focuses on fundamentals (intrinsic value) not the predicted behaviour of other investors
- Valuation is an imprecise art
- The future is unpredictable
- Having a „margin of safety“ provides protection against bad luck, bad timing or error of judgement
- 25% is a good number for the prudent investor

By analogy, the prudent acquiror should not pay more than 75% of warranted value, which includes the strategic value not available to the stock market investor. Strategic value can be derived from cost synergies, increased market power, access to new geographies, technologies that it would have been more costly to build internally, and so forth.

So the prudent acquiror following the advice of Benjamin Graham would do his valuation of both the intrinsic value of the assets of the target and the strategic value potentially available to him and then apply a margin of safety. He would desist from the transaction if the market value were to be higher than his target valuation. In reality, he would not do most deals, as market value tends to shoot up when the intent of a transaction becomes public and competitors for the target step into the fray. Countless analyses tell us that in fact, acquirors pay too much and destroy value in many if not most M&A transactions. The “Winner’s Curse” replaces Graham’s “Margin of Safety” (cf. Figure 1).

Figure 1: The market drives up Transaction Value to a point where the “Margin of Safety” is turned into “Winner’s Curse”
In a risky business driven by innovation, M&A is a vital strategic lever to counterbalance the in-built volatility of the R&D pipeline. In fact, there are many more reasons for frequent M&A in this industry: Patent expiries forcing Big Pharma and Biotechs to consolidate, the acquisition of Biotechs by pharmaceutical companies or other Biotechs to gain access to new drug formats, research programmes or development candidates, acquisitions to enter or expand the presence in therapeutic areas, geographies, customer groups, and so on.

Yet most observers agree that the pharmaceutical and biotech industry is no different from other industries in that most M&A transactions fail to create value for the acquiring company, although they generally do so for the target’s shareholders. A prominent example is the development of Pfizer’s stock price over the last decade (cf. Figure 2).

A recent publication by CMR International supports this view by showing that success rates for in-licensed compounds show consistently inferior success rates than self-orginated compounds for major companies; they conclude that “… large companies must continue to focus on improving due diligence … if they are to address the continuing gap in phase III success rates and maximise their return on investment from externally sourced innovation” (cf. “Externally Sourced Compounds Are More Likely to Fail” by CMR International, a Thomsen Reuters business). It should be noted however that this analysis focused exclusively on success rates and did not include transaction values.

Fault is usually laid at the feet of the acquiror’s management: CEOs with “super-sized egos” are just paying too much, or so we read in countless analyses of the phenomenon by business school professors and management consultants.
**A More Differentiated View**

But this may be stretching the argument a bit too far. Valuation is a tricky business and the price you pay depends on your risk preferences (cf. Figure 3). In fact, it may be perfectly rational to pay a price ex-ante which ex-post turns out not to be justified by the value actually captured, and whether one calls this approach “a sound investment” or “speculation” is mere semantics.

The analyses of past M&A transactions also suffers from the well-known problem of evidence in the field of management: The lack of control groups; to put it in another way, you never know what would have happened to your stock price if the transaction had not taken place. A reverse argument can be made that many more transactions have not been done than were actually signed. In these cases, the CEO likely decided the premium required to get the deal done would have been too high.

At Catenion we posit that the real issues of frequent value destruction in pharmaceutical and Biotech M&A lie deeper than the populists would make us believe (cf. Figure 4); in fact we see three of them:

1. Valuation methodologies do not adequately deal with uncommonly high risk and the associated broad range of possible outcomes for realised value
2. Investment bankers advising the acquiror have an agency conflict
3. Post-merger integration practices often fail to extract the value ascribed to the pipeline of R&D and lifecycle projects

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**Figure 3:** One hypothesis for frequent M&A failure is the risk preferences of acquirors for high risk/high value outcomes

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### Value-at-Risk Plot of Expected Value Creation through Transaction

- **Transaction Value 1 (TV1):** What the prudent acquiror might be willing to pay – he only stands a 25% chance of destroying value, but then he may never do a deal.
- **Transaction Value 2 (TV2):** The less risk-averse investor pays eNPV (TV2) or more rather than not doing the deal; even so, there still is a significant chance of creating value out of the transaction.

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**Cumulative Distribution of possible outcomes**
The Role of Investment Bankers

An M&A transaction involves five major steps: Target identification, target approach, due diligence, doing the deal, and post merger integration. For the first four steps, acquirors are normally supported by investment banks.

Investment banks bring a number of strengths and capabilities to their clients, among them relationships with potential target CEOs and insider knowledge regarding target availability; valuation models and techniques to determine transaction value, expertise for financial deal structuring and negotiating the deal, as well as determining the optimal method of funding the transaction (cf. Figure 5). Their business model rests on “getting the deal done”.

The value of the target to the acquiror (the warranted value) has two major components:

1. The intrinsic value, i.e. the value creation potential inherent in the target’s marketed products, late-stage pipeline, financial assets and intangibles
2. The strategic value, i.e. the value creation potential imputed to cost synergies and strategic advantage, e.g.: technology platforms, research programmes, market access and marketing strength

The concept of strategic value has undergone a lot of criticism as it lends itself to easy manipulation. Whatever the strength of the underlying rationales, most observers will agree that concrete transaction values should be built up from the intrinsic value of the targeted assets so as to anticipate as closely as possible the real value that can be expected to be generated from the transaction in the future.

In an industry characterised by long timelines, high attrition and significant exposure to regulatory whim, this intrinsic value is by nature difficult to capture, driven as it is by complex scientific, clinical, technical and regulatory risks, as well as uncertainty regarding competitive developments and the future market environment.

Figure 4: In Catenion’s view, value destruction in pharmaceutical M&A happens at three levels

<table>
<thead>
<tr>
<th>Pre-Transaction</th>
<th>During-Transaction</th>
<th>Post-Transaction</th>
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<tbody>
<tr>
<td>Target valuation</td>
<td>Deal negotiation</td>
<td>Leveraging asset value</td>
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- Risk in pharma is uncommonly high
- Valuation methodologies in common use tend to under-appreciate risk (using industry benchmarks) and the range of possible outcomes (focusing on eNPV)
- Typical fee structures for investment bankers create an agency problem
- Success fees tend to drive up premiums over and above Warranted Value
- This effect might be nicknamed “Banker’s Curse”
- In pharma, full value capture after the transaction goes well beyond a year or two of post-merger integration
- It can take ten to twenty years and to a significant degree depends on the quality of portfolio management
While investment banks obviously do model *intrinsic value*, this is not their particular strength; importantly, they are in the business of looking at marketed and pipeline assets at a given point in time, and are not used to accompanying assets along the tortuous path from a postulated (virtual) *intrinsic value* at the R&D stage to the point of value extraction in the market. We have found that they tend to grossly under-appreciate risk both for R&D and for lifecycle projects.

In addition, there is a blatant agency conflict: While the success-fee based incentive for investment banks is to “get the deal done” (at whatever price), their clients should “do the deal” only if the *transaction value* is right, i.e. if there is a reasonable chance of *real value* creation after the transaction; in this context it should be noted once more that what is “reasonable” depends on the risk preferences of the acquiror.

In practice, however, once a target is approached by a suitor, the dynamics are often such that all parties including management of the potential acquiror want to get the deal done; *intrinsic value* is then in danger of being given short shrift and attention is focused on *strategic value* arguments to justify the bidding price that is expected to be required for proposal acceptance by the target. Ex-post fairness opinions, as all practitioners know, are of little help in the face of these dynamics.

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**Figure 5:** M&A support by Investment banks suffers from an agency problem and the use of inadequate methodologies to deal with R&D risk and value
Over the last few years at Catenion we have increasingly been led to leverage our strategic, analytical and organisational expertise beyond classic consulting assignments into supporting the M&A transactions of pharmaceutical and biotech clients.

We have helped our clients identify acquisition targets; we have also participated in the due diligence of target assets and pipelines, and we have supported post merger portfolio optimisation (cf. Figure 6).

Clients have been attracted by our track record and our expertise in asset valuation, as well as by our methodological sophistication; importantly, they recognise that we complement the service offering of investment banks by an *a priori* neutral position towards any transaction.

We focus on identifying targets that fit company strategy, culture and “value at risk” profile and on determining the *intrinsic value* of the target’s assets; we also act as a neutral third party when adequate pricing of the transaction is discussed and help clients extract *real value* once the deal has been done.

In the following paragraphs, we briefly discuss our offering of Strategic M&A support in more detail.

**Figure 6:** Catenion’s offering of strategic M&A support complements that of other advisors and helps to minimise the risk of “Winner’s Curse”
Our approach to the identification of potential acquisition targets is based on our strategy consulting practice. We help clients draw up search criteria based on their strategy and a transparent view of the “value at risk” distribution of their own portfolio of marketed products and pipeline projects. Our in-depth knowledge of the pharmaceutical and biotech space, as well as our understanding of the underlying science and technologies enables us to support clients to quickly identify a shortlist of targets that match these search criteria.

On the basis of publicly available data we then perform a quick “pre-due diligence” to identify strengths, weaknesses and risks of the target’s asset portfolio before other advisors join in to look at financial, legal and patent issues.

Once a due diligence process starts, we determine the intrinsic value of the target’s marketed and R&D assets as an important input into the valuation models of the lead investment bank. We usually join the client team in the data room and assist them in looking through the documents to identify and validate critical issues; we support them with our proven approach to assessing the different types of scientific, technical, clinical, regulatory and commercial risk and help structure and conduct the interviews with the target’s management.

Target characteristics differ and so do CEO risk preferences – for due diligence, Catenion’s in-depth valuation expertise is particularly helpful in supporting CEOs with value investor personalities (who tend to focus on the risk) in deals with a low predictability of warranted value (where the value potential is driven by R&D assets and intangible strategic value) – cf. Figure 7.

Once we have left the data room, we populate our R&D risk assessment models with the relevant information for R&D pipeline and life cycle management projects and build sales forecasts and NPV models for all key development and marketed assets; if and as required, we complement our contribution to the due diligence phase with a detailed assessment of the quality and strength of the Discovery and early-stage clinical programmes and pipeline.

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**Figure 7:** Target characteristics differ and so do CEO risk preferences – for due diligence, Catenion focuses on supporting CEOs with value investor personalities in deals with a low predictability of warranted value.
During the due diligence phase, we make sure that

1. We adequately capture the scientific, technical and clinical complexity stemming from new drug formats and targets, novel combinations and the segmentation of target populations with molecular or phenotypic markers, as well as the growing regulatory and commercial uncertainty of crowded, increasingly cost-conscious markets (cf. Figure 8)

2. All assumptions on which intrinsic value estimates are based are made transparent and explicit

3. Projections of sales and value for marketed products made by the target are not accepted at face value and pipeline value is not simply risk-adjusted based on industry benchmarks

4. To determine intrinsic value, clients receive a range of potential outcomes rather than point estimates or an upside and a downside scenario; our detailed approach includes the use of probability density functions for “value at risk” and allows the answering of questions such as: “What is the likelihood that the future value of these assets is lower or higher than $x mn?”

5. Client management does not lose sight of the intrinsic value when determining the bid price – this can help avoid impairments later on

There are two key elements to our valuation methodology that help clients develop an adequate view of the target’s assets:

1. At the project level, we use our proprietary R&D risk assessment tool to capture the technical risk of the asset (cf. Figure 9).

2. At the portfolio level, we complement the simplistic and often dangerous metric of expected net present value by an in-depth analysis of the likely distribution of value outcomes, which we model based on all available information on hand at present with the help of Monte Carlo simulations (cf. Figur 10).

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<tr>
<th>R&amp;D Risk Assessment Tool</th>
<th>TPP outcomes</th>
<th>Market Environments</th>
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<tbody>
<tr>
<td>• Phase and drug-format specific expert system</td>
<td>• Minimum, base and optimum TPP claims</td>
<td>• Positive and negative market environment with probabilities</td>
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<tr>
<td>• Based on six different risk classes – each containing up to 100 criteria, each with pre-defined weights and scoring definitions</td>
<td>• Efficacy, safety, convenience, combinability, label</td>
<td>• Epidemiology, treatment algorithms</td>
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<tr>
<td>• Allows comparison of projects</td>
<td>• Probabilities based on outcome of R&amp;D Risk Assessment</td>
<td>• Sub-populations</td>
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<tr>
<td>• Translation into PoS and likelihood of achieving TPP claims</td>
<td></td>
<td>• Pricing</td>
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<td></td>
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<td>• Degree of reimbursement</td>
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<td>• Competitor profiles</td>
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Six different Business cases per project

- Three TPP outcomes x two Market Environments
- Failure scenarios in decision tree
- Competitiveness modeling
- Lifecycles sales curves
- DCF-based Commercial and Expected Value
- Correlation of projects within internal pipeline

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Figure 8: Catenion valuation expertise: Our process builds on an in-depth bottom-up project / product evaluation – risk is captured on three levels
Figure 9: Catenion valuation expertise: Risk Assessment tool contains more than 500 individual criteria, each with a predefined high to low risk outcome and weight.

Figure 10: Catenion valuation expertise: Use of value at risk modelling based on Monte Carlo simulations to determine Intrinsic Value.
Finally, after the transaction is closed, we support clients in the all-important exercise to actually extract value from the purchased assets (cf. Figure 11). Clearly, the higher the premium paid the more important this becomes.

Here we can leverage our core consulting experience in portfolio management, which comprises processes, tools, methods and good governance principles for decision-making on project strategy, portfolio optimisation and resource allocation; a key driver for successful value extraction is the successful integration of the two portfolios and the creation of a new portfolio management process and portfolio management group for the post-merger organisation that is accepted by both senior management and the R&D project teams.

A post merger portfolio integration typically involves several stages:

1. At the first stage, transparency needs to be created about which projects are actually active and where urgent issues need to be addressed; this is then presented to the Executive Team who will have to make decisions as to the priorities for immediate analysis and investments.

2. In a second step, all active projects are reviewed in-depth together with the project teams and in cooperation with the new portfolio management group; in this process, preferred development strategies are reviewed and changed as required by the data and resourcing needs are identified; the results are presented to the Executive Team who now will have to take a number of decisions: The portfolio must be aligned with the post-transaction strategy in terms of TAs, indications, drug formats, etc. and programmes and projects must be prioritised for resource allocation.

3. In a third stage that usually covers the second and third year after the transaction, Catenion supports the introduction of the new portfolio management process into routine practice; at this stage, we train portfolio managers and project teams in the use of decision analysis concepts, methods and tools and provide a neutral third party opinion for selected assets if and as required.

4. Finally, and in parallel with step three, we support management with the formal integration of the insights garnered in the annual portfolio management exercise into the company’s Risk Management System.

The precise role we play at this stage has varied in the past and depends on the specifics of the situation as well as on client preferences. We have been retained to accompany – and effectively guide – clients throughout a multi-year process as described above, establishing a new portfolio management system (comprised of tools, methods, processes and governance structure and rules) different to those of both legacy organisations. In other instances, the acquiror’s management determined their best option was to extend their pre-transaction portfolio management system to the target and used Catenion for intense challenging of project teams and the facilitation of management discussions based on value at risk simulations.

In any event, we are keenly aware of the potential danger of yet another agency conflict inherent in our positioning and discuss this openly with our clients before the start of an engagement.
The reader will have noticed that the description of our post-transaction service offering has a distinctly process-oriented flavour to it, as if the strategic dimension had been fully taken care of during the earlier stages of the transaction.

While we firmly believe that effective portfolio consolidation requires transparent processes and governance structures, we also recognize the fundamental role of the dimension of strategic fit in post-merger portfolio optimization. Often it is only after an in-depth review of the technologies, capabilities and project assets in a first round of portfolio consolidation that new strategic opportunities emerge and others turn out to be wishful thinking.

More than in most other industries, strategy in the pharmaceutical space is dictated by the particular strengths of the R&D project and technology portfolio, as well as by management vision. Our strategy consulting background enables us to effectively link the reality of the asset portfolio to the strategy process at the level of therapeutic area, R&D and company.
Catenion is a strategy consulting firm in the fields of pharmaceutical, biotech and medical products with a focus on two key challenges of clients: Developing the Corporate Portfolio and increasing returns on R&D spending.

At Catenion, we always base our recommendations on a thorough understanding of the risks and value of individual product and project assets.

In our consulting work, we have helped clients develop R&D project and product lifecycle strategies, identify and manage asset risks and optimise project and product portfolios.

Over the last ten years, we have worked on well over 700 assets in all stages of research, development and marketing across a wide range of therapeutic areas and drug formats. We have developed solid processes to deal with uncertainty and risk in the areas of science, clinical and technical development, regulatory affairs and the market place and we have built a unique modular expert system to assess asset risks using over 500 different criteria (cf. Figure 12).

We have used our tools, processes and know-how to deliver independent third party opinions as well as to guide organisations in dealing with portfolio optimisation and investment prioritisation.

**Deep Experience Across Therapy Areas**
- Review of > 700 projects
- Across all phases from target ID to phase III
- Across all major TAs
- SMOLs and Biologics

**Integrated Processes and Tools**
- Seamless project review process from target ID to phase III
- Unique and proprietary tools, e.g. R&D Risk Assessment
- Value-at-Risk modelling for corporate or TA levels

**The Right People**
- Mixture of PhDs and MBAs
- Many with double backgrounds in pharma and strategy consulting
- Team continuity – knowledge is built and retained
- Respected as “peers” by pharma professionals

**A Broad Network**
- Advisory board with unique access to Biotech / Pharma thought leaders
- Broad network of academic thought leaders across major therapeutic areas

*Figure 12: We have built a unique track record in the evaluation of portfolio assets*
Catenion: Your Partners for Pharmaceutical Strategy and Innovation

Catenion is a management consulting firm devoted to helping pharmaceutical and medical products companies significantly increase the returns on their R&D and Marketing investments by creating more innovative and effective strategies and organisations.
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