F|R Financial & Strategic Advisory

Expert Insight Series

Foster|Rosenblatt

Xin Hang, M.Biotech.
Practice Principal, F|R Financial & Strategic Advisory

Decoding clinical-stage drug licensing deals

MAXIMIZING VALUE DURING PHARMACEUTICAL LICENSING TRANSACTIONS

Background

In the last decade, there has been a rapid evolution of new biotechnology tools. These new technologies, such as gene editing, increase the number of potentially game changing viable therapeutics. The dramatic increase in the volume of new inventions and technologies make it impossible for any one pharmaceutical company to have all these new technologies available for in-house R&D. Combined with the lackluster performance of internal most company's R&D, a market for biotechnology innovation was created. Licensing has become a critical element of a pharmaceutical company's business model and a necessary activity to extract the full potential value from the universe of all clinical-stage assets.

Given its criticality for both small and large biopharma industry actors, extensive research into success factors, such as strategic fit, relationships, legal and negotiation tactics has been conducted. However, very little research has been done to understand when a biotechnology company should enter into a licensing agreement with a pharmaceutical partner to maximize the value of an asset. It has often been assumed that a pharmaceutical company would pay more for a later stage asset because of the lower risk and reduced time to market. However, sellers do not always consider whether the extra payout justifies the additional investment required to advance their assets or if they can get a higher return on equity by entering into a partnership earlier.

The Solution

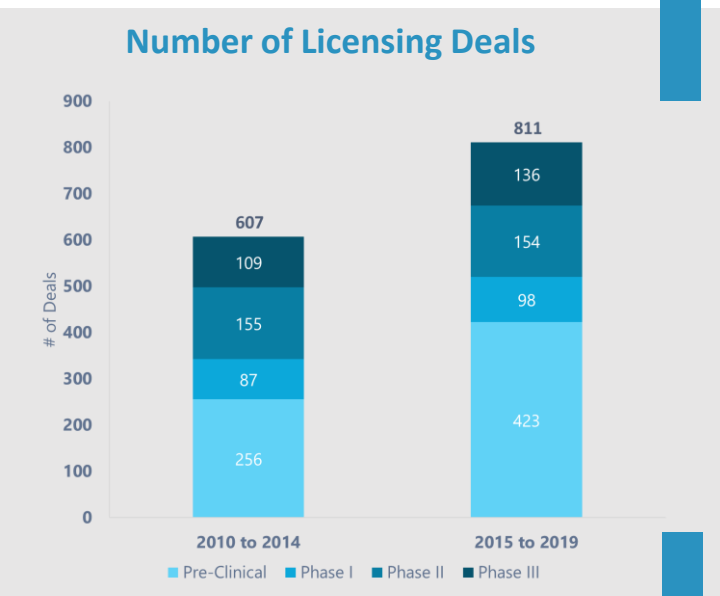
This paper provides a framework to understand when is the most appropriate time for biotechnology companies to enter into licensing agreements. It provides a quantitative assessment of the expected value of licensing transactions and breaks down the value by upfront payment and contingencies. This paper further examines the differences in the value of licensing transactions by different therapeutic areas. Equally important, it also investigates the preference of the top twelve pharmaceutical companies on when to enter into a licensing agreement.

Trends in the Number of Licensing Deals

In the last five years, there has been a significant increase in the number of licensing deals in the pharmaceutical industry. There were 607 licensing deals between 2010 to 2014, and 811 licensing deals between 2015 to 2019. The number of transactions increased by approximately 200, or an increase from 120 deals per year to 160 deals per year. Pre-clinical assets saw the most significant increase in the number of licensing deals, an additional 167 deals. Whereas, the number of deals in all other phases of clinical development were not significantly different between the two five-year periods.

Trends in the Value of Licensing Deals

The more striking trend between the two five-year periods was a significant increase in deal values. Although the number of Phase I and II licensing deals between the two five-year periods was not significantly different, the licensing deal average values were significantly different. The average deal value of Phase I assets increased from $133M in the 2010-2014 period to $361M in the 2015-2019 period, a dramatic increase of 170%.



Source: EvaluatePharma® Accessed July 1st, 2020

The average deal value of Phase II assets increased from $318M in the 2010-2014 period to $456M in the 2015-2019 period, increasing by 43%.

Whereas, the number of licensing deals of Pre-clinical and Phase III assets increased, the average values of these transactions between the two periods were similar. The average deal value of Pre-clinical assets was $157M in the 2010-2014 period and $184M in the 2015-2019 period, an 17% increase. The average deal value of Phase III assets was $235 in the 2010-2014 period and $248M in the 2015-2019 period, an 5% increase.

This demonstrates that licensees today have a definite preference for Phase I and Phase II assets. It also suggests that the level of competitiveness for Phase I and Phase II assets has increased. Therefore, sellers could extract more value by engaging in earlier licensing deals, specifically in Phase I and Phase II.

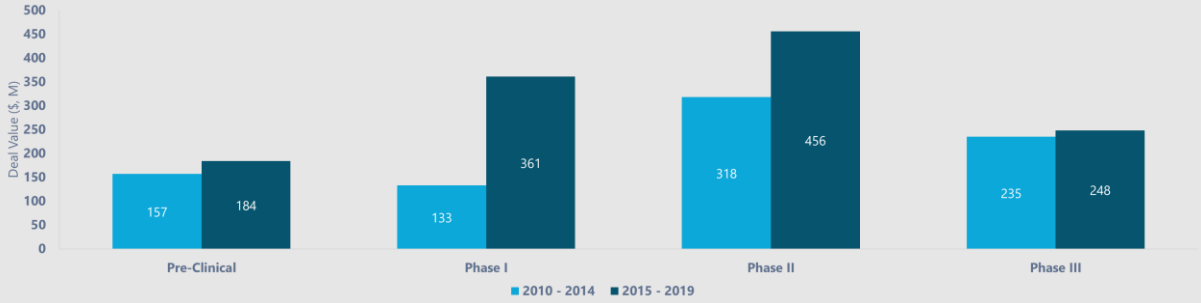
Trends in the Structure of Licensing Deals

Between the 2010-2014 period and the 2015-2019 period, there was an increase in the number of licensing deals and the average value of licensing deals. At the same time, the structure of the licensing deals also changed. Generally, licensing deals made between 2015 and 2019 saw a decline in the proportion of the deal value allocated to the upfront portion.

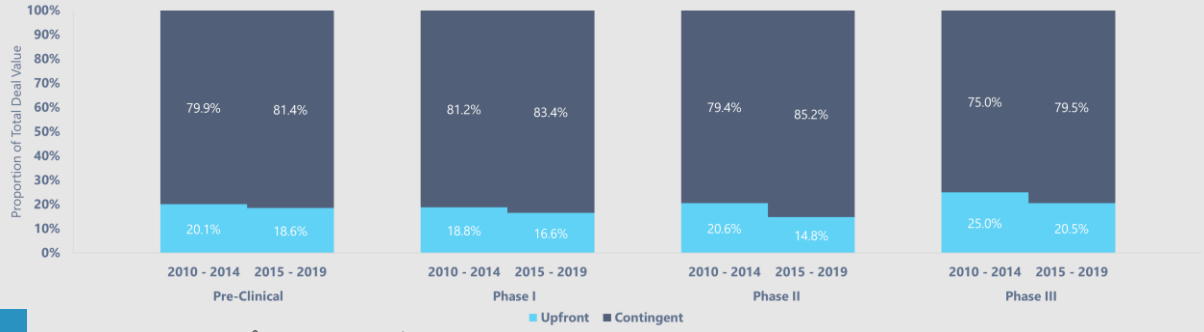
For Pre-clinical licensing deals, the upfront portion fell from 20.1% in the 2010-2014 period to 18.6% in the 2015-2019 period, a 7% decrease. For Phase I deals, the upfront portion fell from 18.8% in the 2010-2014 period to 16.6% in the 2015-2019 period, an 11% decrease. Later stage transactions saw a greater proportion drop in the upfront portion. The upfront portion for Phase II deals fell from 20.6% to 14.8% in the 2014-2014 period to the 2015-2019 period, a 29% drop. The upfront portion for Phase III deals fell from 25.0% to 20.5% in the 2014-2014 period to the 2015-2019 period, an 18% drop.

This indicates that the licensees became more cautious regarding the clinical risk associated

Licensing Deal Value by Phase and Year



Deal Value Split by Phase and Year



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with development. However, given the significant increase in average value, the absolute upfront paid had gone up as well. Therefore, the shift in structure could also be a result of the increase in deal value.

Timing Consideration of Licensing Deal

Focusing on the most recent period, 2015-2019, the licensing transaction data suggests a significant increase in deal value when assets move from Pre-clinical to Phase II. However, contrary to expectation, the average value of Phase III licensing deals was significantly lower than the average value of Phase II licensing deals. This phenomenon was also observed in the 2010-2014 period and the 2000 to 2009 period (data not shown).

Therefore, when it comes to timing, licensors should not wait until their assets are in Phase III before entering into a licensing agreement. No calculation is required to understand that the extra time and cost will not likely create greater value. This is likely due to the preference of large pharmaceutical companies wanting to influence the design and execution of Phase III clinical trials and regulatory strategies.

Whether or not a licensor should advance their asset from Pre-clinical to Phase I or from Phase I to Phase II depends on if the additional value generated is worth the investment. The following assumptions were used to calculate the return on additional investment.

- Milestones were paid out upon successful approval of the asset
- Average # of enrollment per trial and average all-inclusive cost per enrollment based on publication by PhRMA
- Average duration of trial of 1 year, 2 years, and 3 years for Ph I, II, and III, respectively
- Average success rates by different phase of clinical development based on collaborative publication by BIO and Biomedtracker
- Industry average cost of capital of 15%

The additional deal value achieved from advancing Phase I to Phase II was approximately $95M. Given the average enrollment for Phase I trial was 85 and the average all-inclusive cost per enrollment is $38,500, the average cost to advance the asset to Phase II is approximately $3M. The probability of success for Phase I trial is 63%, and the overall success rate from Phase I to approval is 9.6%. Therefore, the rNPV for making such an investment is approximate $1.5M, representing a return higher than 50%.

The additional deal value achieved from Pre-clinical to Phase I was approximately $177M. Given the average cost of Pre-clinical trials was roughly $500,000. Pre-clinical trials' success rate was also very high, and the overall success rate was 8.6%. Therefore, the NPV for making such an investment was approximately $3.1M, representing a return higher than 350%.

The analyses showed that it was not ideal to wait until Phase III to enter into a licensing collaboration with a licensee. The analyses shows that there was significant value appreciation by advancing the assets' clinical stage up until Phase III after considering the cost, time and risk.

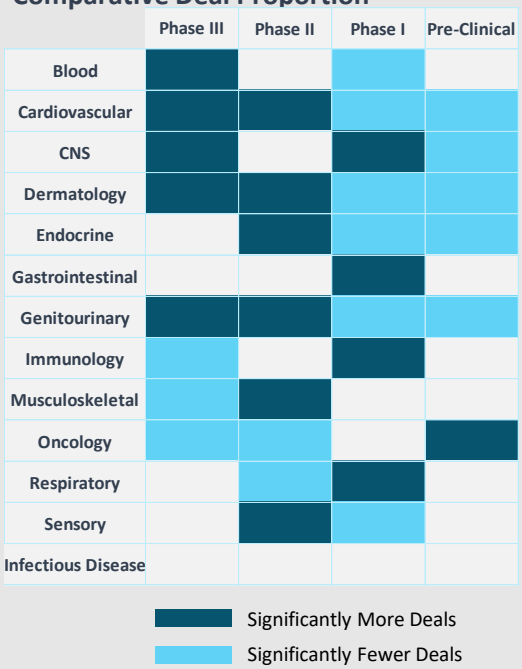
Therapeutic Area Consideration

Sub-analyses were performed to understand the deal value by therapeutic areas. The results suggest there were significant differences in preference in licensing timing between the therapeutic areas. The results also demonstrate there were differences in the deal value between the therapeutic areas. Therefore, individual considerations are needed for each therapeutic area.

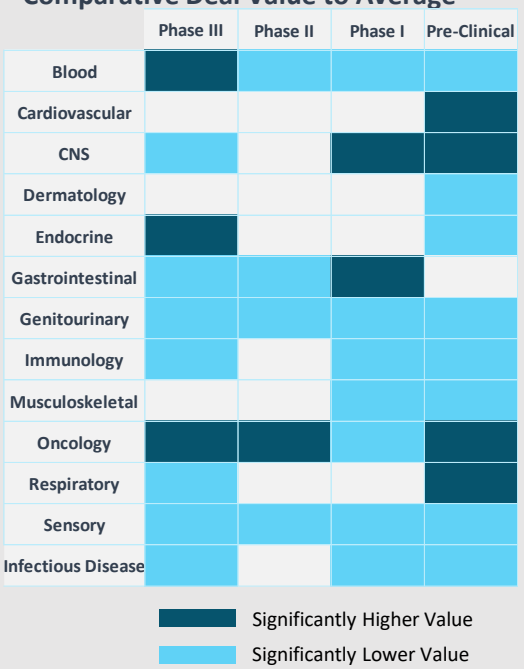
Between 2015 and 2019, there was a higher concentration of licensing deals in the Oncology and Central Nervous System areas. In terms of Pre-clinical licensing deals, Oncology represented more than 40% of total licensing deals within the 2015-2019 period.

Licensing Deal by Therapeutic Area

Comparative Deal Proportion



Comparative Deal Value to Average



Source: EvaluatePharma® Accessed July 1st, 2020

These data highlight the immense level of interest in Oncology as a significant driver for pharmaceutical industry growth. It also indicated the diversity of early-stage technologies and science in Oncology, and to some extent, Central Nervous System. At the same time, there were fewer deals (the average was ~100) that occurred in Cardiology, Dermatology, Genitourinary, and Respiratory areas. This demonstrates the lack of early-stage innovation in those therapeutic areas.

The analyses demonstrates that in some therapeutic areas, there is a preference to do deals in later stages, and in other therapeutic areas, a preference for earlier stage deals. For example, Blood, Cardiovascular, Central Nervous System, Dermatology and Genitourinary have a significantly higher number of deals during Phase II and Phase III compared to the average. Whereas Gastrointestinal, Immunology, and Respiratory have a substantially higher number of transactions during Phase I. Oncology stood out as having a significantly higher number of deals in the Pre-clinical stage.

The analyses also shows that some therapeutic areas have higher and lower deal values. For example, in Oncology, the value of Pre-clinical, Phase II and Phase III licensing deals was significantly higher than the average. Immunology, Genitourinary, Sensory and Infectious Disease assets typically have lower than average deal values regardless of the clinical phase of development.

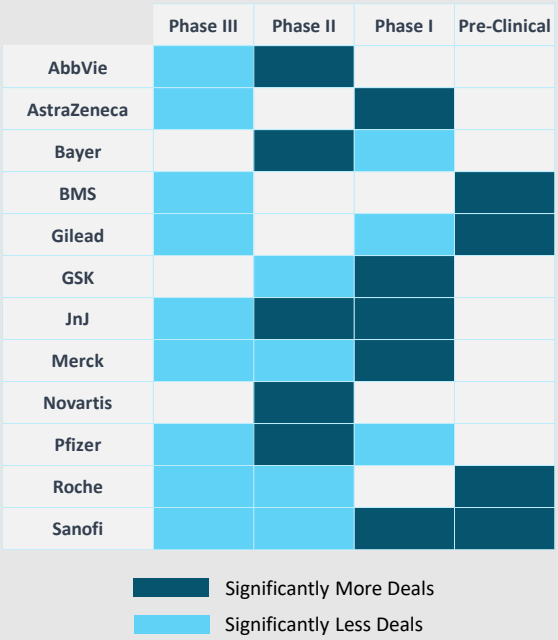
When it comes to the most appropriate timing for a licensing deal, individual analyses need to be conducted based on the therapeutic area. However, except for Blood and Endocrine, all other therapeutic areas followed the same trend as the general market. In contrast, Phase III licensing deal value is lower than the Phase II licensing deal value. Therefore, unless the licensor operates in the Blood and Endocrine space, biopharma companies likely should out-license their assets before Phase III.

Licensor Consideration

Additional sub-analyses were conducted to understand whether licensees have different preferences in what clinical phase to engage in licensing collaboration. The analyses focused on the preference of the top twelve pharmaceutical companies. The results demonstrate that there were significant differences between top pharmaceutical companies and an average licensee. The results also indicate that there are different preferences within top pharmaceutical companies in what clinical stage each licensee was more likely to engage in a licensing transaction.

Overall, the results demonstrate that ten of the twelve top pharmaceutical companies have a significantly lower likelihood of engaging in Phase III licensing deals than an average licensee. As previously discussed, this is likely due to a preference to be involved earlier as well as the ability to avoid “last minute” fixes to a whole in the portfolio.

Differences in Timing Preference of Licensing Deal



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These data show that BMS, Gilead, Roche and Sanofi have a higher preference for licensing Pre-clinical assets than other companies. AstraZeneca, GSK, Johnson & Johnson, Merck and Sanofi have a higher preference for licensing Phase 1 assets than other companies. Lastly, AbbVie, Bayer, Johnson & Johnson, Novartis and Pfizer have a higher preference for licensing Phase 2 assets.

Each of these top twelve pharmaceutical companies has their areas of concentration. Supplementary analyses shows that each company is willing to pay more to license assets aligned with their therapeutic areas of focus compared to an average licensee in the same therapeutic area.

In Conclusion

Licensing transactions are complicated. In addition to looking at traditional financial metrics such as total deal value, deal structure, and deal terms, our analyses strongly suggest that timing of the deal also significantly impacts how much value a licensee can extract from the transaction. It is crucial to use a framework that considers cost, time, risk and value. The framework also needs to consider the asset's therapeutic area and preference of potential licensee. Therefore, only with a thorough understanding of the market for licensing innovation and a robust framework can licensors achieve the maximum value for their clinical assets.

Case Study

Business Situation

An early-stage biotechnology company wanted to understand the value of their lead clinical asset, which is in Phase I clinical development for an endocrinology indication. The company also wanted to know the best licensing strategy for their asset and what they can expect in terms of deal value and structure from potential licensees.

Approach & Methodology

F|R provided a valuation of their lead clinical asset using DCF and comparable methodologies. Using the framework described in this paper, F|R benchmarked what value the company could receive if it advanced its asset to Ph2. F|R calculated what the rNPV would be if they advanced their asset based on the cost of the Phase I trial and the difference in total licensing deal value.

Business Outcomes

- F|R determined that the company could receive an additional $84M if they licensed their asset in Phase II instead of Phase I
- However, the clinical trial would have cost the company $8.5M (~200 enrollment at $36K per enrollment)
- Assuming, the overall PoS of an endocrine asset is 13.2%, the rNPV would be -$2.9M
- Given the negative rNPV and the targeted potential licensees also have a preference for Phase I asset, F|R recommended that the company engage in licensing deal in Phase 1

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Xin Hang, M. Biotech.
Practice Principal, F|R Financial & Strategic Advisory
xhang@fosterrosenblatt.com
+1 647 299 9428

Executive Biography

Xin is both a commercial analyst and molecular biologist. His work utilizes his combined expertise in the basic sciences and the marketing sciences to characterize commercial opportunities for life science products. Much of Xin's work focuses on advanced "discrete discount aggregation" techniques that provide the framework and calculus to determine valuations with much greater precision than traditional methodologies. Additionally, he develops epidemiological patient-flow models as well as demand-based market models that serve as the basis for many financial use cases.

Xin works with financial organizations, life science companies and law firms to support their strategic, capital market and transaction needs. His work is balanced on the buy-side and sell-side.

Prior to joining F|R, Xin worked at the Brand Institute as a pharmaceutical brand strategist and at Sanofi Pasteur as an analyst.

Xin has a Master of Biotechnology and a Bachelor of Science from the University of Toronto.

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The F|R Financial Advisory practice supports client companies and investors engaged in major capital decisions with independent and objective services. We are deep content experts and industry veterans in the areas we serve. We support assets at every phase of development, from multibillion-dollar business units to early-stage intellectual property.

Our team has supported transactions and/or business decisions valued at over $350B, and we have completed over 1,000 projects.

The F|R Financial Advisory is a unit of Foster|Rosenblatt, an international consulting firm focused on life sciences, healthcare and medtech.