

LRN Corporation

PURCHASE PRICE ALLOCATION

AS OF DECEMBER 17, 2018

*Report Date: April 29, 2019*



The information contained in this Report is confidential in nature and is intended for the exclusive use   
of the addressee. Any reproduction, publication or dissemination of any portion of this Report without the express written consent of RNA Capital Advisors is forbidden.

April 29, 2019

Mr. Ron Charow

Chief Financial Officer

LRN Corporation

745 5th Avenue

New York, NY 10022

Dear Mr. Charow:

In response to the engagement letter, RNA Advisors, LLC dba RNA Capital Advisors (“RNA” or “we”) has completed an analysis to determine the fair value of certain intangible assets acquired (the “Assets”) and liabilities assumed (the “Liabilities”, and together with the Assets, the “Subject Interest”) as part of Leeds Equity Partners, LLC’s (“Leeds” or the “Acquirer”) acquisition of the LRN Corporation (“LRN” or the “Target”, or the “Company”) as of December 17, 2018. (the “Valuation Date”).

For clarity, the Subject Interest includes the deferred revenue liability (“Deferred Revenue”), lease agreement (the “Favorable Lease”), customer contracts and relationships (“Customer Contracts/Relationships”), the developed or acquired technology (“Technology”), the Company developed platform and Library (the “Library”), the Company owned trademarks & tradenames (the “Trademarks” or “Trade names”), the non-compete agreements with the management (the “Non-compete agreements”) and the assembled workforce (“Assembled Workforce”), and.

Please note that this letter along with the following report (the “Report”), exhibits (individually an “Exhibit” and collectively the “Exhibits”) and their conclusions (jointly, the “Valuation” or the “Opinion”) are intended for the use of the management and Board of Directors of the Company (“Management”) for the allocation of purchase price for financial reporting purposes. This analysis has been performed in recognition of Financial Accounting Standards Board (“FASB”) Accounting Standards Codification (“ASC”) Topic 805 – Business Combinations (“ASC 805”) (formerly known as Statement of Financial Accounting Standards No. 141R, Business Combinations (“SFAS 141R”)) and FASB ASC 820 - Fair Value Measurements and Disclosures (“ASC 820”) (formerly Statement of Financial Accounting Standards No. 157, Fair Value Measurements (“SFAS 151”)). We make no representation as to the accuracy of this Valuation if it is used for any other purpose without the written consent of RNA. This Opinion should not be considered, in whole or in part, as investment advice by anyone. This valuation engagement was conducted in accordance with the Statement of Standards for Valuation Services No.1 of the American Institute of Certified Public Accountants (“AICPA”).

This valuation engagement was conducted in accordance with the Statement on Standards for Valuation Services No.1 (“SSVS 1”) - “Valuation of a Business, Business Ownership Interest, Security, or Intangible Asset” of the American Institute of Certified Public Accountants (“AICPA”)”.[[1]](#footnote-1)

This cover letter provides an overview of the purpose and scope of the analysis and its conclusions. Please refer to the attached Report below for a discussion and presentation of the analysis performed in connection with this engagement.

SUMMARY OF FINDINGS:

Based upon the information and financial data provided, and representations made by Management, as well as the analyses performed, it is our opinion that the fair value of the Subject Interest as of the Valuation Date is as follows:

*Table 1: Valuation Summary*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **VALUATION SUMMARY** | |  |  | | | **(USD IN THOUSANDS)** | |
| **Intangible Asset** |  | | | |  | **Value Indication** | |
| Customer Relationships | | | |  |  |  |  |
| Library | | | |  |  |  |  |
| Trade Name | | | |  |  |  |  |
| Non-Compete Agreement | | | |  |  |  |  |
| Assembled Workforce | | | |  |  |  |  |
| Goodwill | | | |  |  |  |  |
| **Total Intangible Assets** | | | |  |  |  |  |
| **Tangible Asset** | | | |  |  |  |  |
| Cash and Cash Equivalents | | | |  |  |  |  |
| Adjusted Debt-Free Cash-Free Working Capital | | | | | |  |  |
| Net Fixed Assets | | | | | | |  |
| **Total Tangible Assets** | | | | |  |  | |
| **Total Purchase Consideration** | | | |  |  |  |  |

The conclusions and opinions expressed in this letter and the accompanying Report are contingent upon the qualifying factors set forth in the Statement of Limiting Conditions and throughout the completed Report.

If you have any questions concerning this Report, please contact me at 925.940.0220.

Sincerely,

**RNA Capital Advisors**

**DRAFT**

Sam Renwick, CFA

*Primary Valuation Analyst*

Table of Contents

[Engagement Overview 6](#_Toc481756146)

[Purpose 6](#_Toc481756147)

[Scope 6](#_Toc481756148)

[Key Definitions 8](#_Toc481756149)

[Standard of Value 10](#_Toc481756150)

[ASC 805 – Business Combinations 10](#_Toc481756151)

[Definition of Fair Value 10](#_Toc481756152)

[Company Overview 11](#_Toc481756153)

[Background 11](#_Toc481756154)

[Deal Overview 11](#_Toc481756155)

[Acquired Product Pipeline / Products and Technology 13](#_Toc481756156)

[Intellectual Property 15](#_Toc481756157)

[Management Team 16](#_Toc481756158)

[Assets/Liabilities Overview 21](#_Toc481756159)

[Industry Overview 24](#_Toc481756160)

[Overview 24](#_Toc481756161)

[Competition 26](#_Toc481756162)

[Valuation Methodology Overview 27](#_Toc481756163)

[Valuation Theory 27](#_Toc481756164)

[Valuation Analysis 31](#_Toc481756165)

[MPEEM – IPR&D Assets 31](#_Toc481756166)

[rNPV Approach – Royalty and Milestone Payments 39](#_Toc481756167)

[Incremental Income Method – Lease Agreement 41](#_Toc481756168)

[Replacement Cost Method – Assembled Workforce 42](#_Toc481756169)

[NPV Method – Anti-Dilution Liability 42](#_Toc481756170)

[Market Approach – GCM 42](#_Toc481756171)

[Discount Rates 44](#_Toc481756172)

[Computation of Residual Goodwill and Reconciliation 47](#_Toc481756173)

[Conclusion 48](#_Toc481756174)

[Statement of Limiting Conditions 49](#_Toc481756175)

[Qualifications 51](#_Toc481756176)

[Samuel Renwick, CFA 51](#_Toc481756177)

[Certification 53](#_Toc481756178)

[Exhibits 54](#_Toc481756179)

Engagement Overview

Purpose

RNA has completed an analysis of the Company and the Subject Interest as of the Valuation Date to determine the fair value of the Subject Interest. This analysis has been performed in recognition of the SSVS1 issued by the AICPA. This analysis uses the methods and techniques outlined in ASC 805 and ASC 820, which are relevant to the valuation of the Subject Interest.

Scope

RNA has based this Opinion on information provided and represented by Management. Our review and analysis included, but was not necessarily limited to, the following steps:

1. Discussed the operations, financial condition, future prospects and projected operations with Management in order to understand the performance of the Company;
2. Reviewed the Company’s financial statements for the years ended December 31, 2016 through December 31, 2018;
3. Discussed with Management the history and nature of the Subject Interest, as well as the specific industry conditions affecting the Subject Interest and the underlying business, including but not limited to the Subject Interest’s prospective earnings capacity;
4. Reviewed the Asset Purchase Agreement (defined below) and related agreements for the Transaction (defined below);
5. Reviewed the Lease Agreement (defined below) and survey of comparable leases as provided by Management;
6. Discussed the costs associated with Assembled Workforce (defined below);
7. Reviewed the fixed assets listing for the Subject Interest as prepared by Management;
8. Reviewed a capitalization summary of the Company as prepared by Management;
9. Reviewed a copy of the Company's Articles of Incorporation;
10. Reviewed copies of certain documents pertaining to various securities underlying the Company's capital structure, such as preferred and common stock;
11. Reviewed certain publicly available financial data for companies that we deemed comparable to the Company and Shire MRT;
12. Conducted research concerning the economic conditions and outlook for the US economy generally as of the Valuation Date; and
13. Conducted other studies, analyses and inquiries, as we deemed appropriate.

The assets and liabilities considered as a part of the analysis have been discussed in detail in the “Assets/Liabilities Overview” Section below.

RNA did not independently verify the information provided; therefore, the validity of our Opinion depends on the completeness and accuracy of the information provided to RNA by Management. Management warranted to RNA that the information supplied was complete and accurate to the best of its knowledge. Information furnished by the Company and others, upon which all or portions of our Opinion are based, is believed to be reliable and we have assumed that all facts and circumstances that would significantly affect the results of the Valuation have been disclosed to us. However, RNA provides no warranty as to the accuracy of such information. Our fee for this service is not contingent upon the Valuation expressed herein.

Key Definitions

The term “CAGR”, as used herein, refers to compound annual growth rate.

The term “Common Stock”, as used herein, refers to the Company’s common stock.

The term “Common Stock Valuation Opinion”, as used herein, refers to the valuation of the Company’s Common Stock performed by RNA as of the Valuation Date.

The term “DCF”, as used herein, refers to discounted cash flow method.

The term “IND”, as used herein, refers to an investigational new drug (usually in the context of a filing).

The term “IP”, as used herein, refers to intellectual property.

The term “IPR&D”, as used herein, refers to in-process R&D (defined below),

The term “NPV”, as used herein, refers to net present value.

The term “R&D”, as used herein, refers to research and development.

The term “RNA”, as used herein, refers to ribonucleic acid or RNA Capital Advisors, as per the context.

The term “rNPV”, as used herein, refers to risk-adjusted net present value.

The term “US”, as used herein, refers to the United States of America and its major territories.

The term “USD”, as used herein, refers to US Dollars. Unless otherwise noted, all currency figures in this Opinion are expressed in USD.

The term “USPTO”, as used herein, refers to the United States Patent and Trademark Office.

The term “WW”, as used herein, refers to worldwide.

Standard of Value

The intangible assets and liabilities included in our analysis were valued incorporating the concept of highest and best use in accordance with ASC 805, which uses the Fair Value definition in ASC 820, *Fair Value Measurement*, from the viewpoint of a market participant.

ASC 805 – Business Combinations

ASC 805 defines Business Combinations as follows:

*“A transaction or other event in which an acquirer obtains control of one or more businesses. Transactions sometimes referred to as true mergers or merger of equals also are business combinations.”*

ASC 805-20-30-1 provides that the *“acquirer shall measure the identifiable assets acquired, the liabilities assumed, and any non-controlling interest in the acquiree at their acquisition-date fair values.”*

ASC 805-30-30-1 indicates that *“goodwill should be recorded as the sum of the (a) consideration transferred, (b) fair value of any non-controlling interest, and (c) fair value of the acquirer’s previously held interest in the acquiree, if any, less the acquisition-date fair value of the net assets acquired.”*

Definition of Fair Value

For financial reporting purposes, the appropriate standard of value is fair value, which is defined in ASC 820 (formerly Statement of Financial Accounting Standards No. 157 Fair Value Measurements) as:

*“The price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market transactions at the measurement date” (“Fair Value”).”*

ASC 820 states that a fair value measurement assumes the highest and best use of the asset by market participants, considering the use of the asset that is physically possible, legally permissible, and financially feasible at the measurement date. In broad terms, highest and best use refers to the use of an asset by market participants that would maximize the value of the asset or the group of assets within which the asset would be used. Moreover, the highest and best use is based on the use of the asset by market participants, even if the intended use of the asset by the reporting entity is different.

The highest and best use of the asset by market participants establishes the valuation premise used to measure the fair value of the asset: (a) in-use, if the asset would provide maximum value to market participants principally through its use in combination with other assets as a group, installed or otherwise configured for use; or (b) in exchange, if the asset would provide maximum value to market participants principally on a standalone basis.

Company Overview

Background

**Target Overview:**

Founded in 1992, LRN Corporation provides ethics and compliance (“E&C”) solutions to companies WW. It offers E&C education solutions, including online courses on universally relevant topics ranging from anti-bribery to trade controls; custom courses; online E&C and compliance materials through mobile devices; and vignettes that capture and present the essence of an ethical principle or compliance challenge. The Company also provides E&C advisory services, such as services in the areas of code of conduct; model code system that allows constructing model code of conduct courses; and code of conduct mobile application. Additionally, the Company offers gamification, mobility and adaptive learning, program effectiveness index, and metrics and data solutions; and catalyst AR, an augmented reality application for businesses to enhance compliance programs.

**Acquirer Overview:**

The Acquirer is a private equity firm specializing in the leveraged buyouts, buy & build, founder transitions, corporate carve-outs, public to private and add-on-acquisition of growth oriented middle market and lower middle market companies. The Acquirer primarily invests in the knowledge sector with a focus on education, training, business services, commercial or professional services, information services, and software sectors. Within the education sector, it invests in the preschool/Pre-K, K-12, postsecondary, at-risk and special education, vocational training, instructional materials, education technology, and testing and assessment sectors. Within the training sector, it invests in testing/assessment, business skills, professional certifications, regulatory and compliance training, and corporate training. Within the business services space, it invests in the business-to-consumer information and services, business-to-business and professional publishing, professional information databases and research, human resources and business process outsourcing, consulting and staffing, and logistics and distribution. Within information services and software sector, it invests in local software, enterprise software, sales, marketing and CRM, and technology services. It mainly invests in companies based in the United States, Canada, North America and the United Kingdom. It typically invests minimum of $40 million in companies. The Acquirer prefers to take minority or majority stakes.

The Acquirer was formerly known as Leeds Weld & Co. Leeds Equity Partners, LLC was incorporated in 1993. It is based in New York.[[2]](#footnote-5)

Deal Overview[[3]](#footnote-7)

On November 21,2018, the Company entered into a merger agreement with Lion Midco, Inc. (c/o Leeds Equity Partners, LLC), and Lion Merger Sub, Inc., a subsidiary of Lion Midco, Inc. The Company, raised an aggregate $30.0 million as a part of the transaction. Under the terms of the agreement, upon closing of the deal and signing and acceptance of the certificate of merger, Lion Merger Sub shall cease and continue to operate further as the Company.

Products and Sevices

The Company’s services are divided into two main business segments:

1. **Ethics & compliance (E&C):** This segment caters to partners, seeking help navigate in the increasingly complex ethical and regulatory environment. The Company offers diagnostics, advisory services and education as a comprehensive, innovative solutions to elevate behavior and the bottom line for its partners. Under this the Company offers:
   1. E&C education services: This service offering includes online and blended learning courses, with a customization option, covering general and industry-specific E&C risks. The Company has a library of over 400 courses covering more than 20 E&C topics, with majority of the content available online material and accessible via mobile devices through different applications. LRN’s courses can be translated into 66 languages, with audio translations available on demand. Learning courses are also available in the form of vignettes, games and live education; with a set of management and reporting tools for tracking compliance certifications and employee gifts and disclosures;[[4]](#footnote-8)
   2. E&C advisory services: This service offering provides a shield against misconduct and propels long-term and sustainable performance. The Company has developed this expertise by building a team of former chief ethics and compliance officers, attorneys, adult-learning specialists and others with deep program creation and management experience. The E&C advisory services team applies a proven three-part process to every assignment emphasizing deep discovery, broad input and a strategic perspective on execution. The team is experienced in dealing with elements of program management, including risk analysis, curriculum design, crisis management, M&A activities and board reporting and more; [[5]](#footnote-9)
   3. E&C innovation solution: Over the last twenty years, the Company had contributed innovative ideas like E&C as a discrete focus area and launched the very first online E&C learning management systems. Currently, this segment is involved in gaming, mobility and adaptive learning, program effective index and metrics and data. E&C innovation invests in technology, content, and advanced learning strategies that distinguish the Company’s solutions in the market; and
   4. E&C code of conduct drafting: This service offering helps companies across the globe develop values-based codes that inspire, guide, and enable principled performance while fostering vibrant, cohesive, and ethical culture. Through an in-depth assessment and discovery process, the code of conduct team collaborates with the client’s team to create suitable content and design, and helps the client plan for a launch, with a strategy to drive adoption and sustain engagement. [[6]](#footnote-10)
2. **Government, culture and leadership:** Thisbusiness helps organizations expand focus from best practice to best behavior through collaboration around five core types of activities with specific design customized to each organization’s individual needs:[[7]](#footnote-11)
   1. Catalytic services: High impact experiences to break through traditional mindsets, introduce and enlist colleagues in a new set of ideas and spur change.
   2. How metrics: Quantitative and qualitative assessments to heighten focus on how things are done at an organization, baseline behaviors, surface risks, and measure progress.
   3. Core architecture: Refresh or re-imagine the core of an organization, its purpose and values, and the design of new frameworks, models, and mechanisms that animate behavior.
   4. Applied how: Focused efforts to tackle business issues through the lens of governance, culture and leadership, evolving organizations and helping colleagues learn by doing.
   5. Education: Experiential, online, mobile and gaming solutions to help scale values, new modes of behavior and inspirational leadership across an organization.

Intellectual Property

In June 2013, the Company was issued a patent titled “Knowledge Management System”. It includes a mapping engine configured to receive responses for a survey campaign completed by a participant and a set of rules configured to map the survey responses to a set of knowledge resources.[[8]](#footnote-14)

Management Team[[9]](#footnote-16)

The key members of the Management team of the Company are:

**Dov Seidman – *Founder and Chief Executive Officer***

Mr. Seidman’s professional career has focused on how companies and their people can operate in both a principled and profitable way. Mr. Seidman is also the author of best-selling book *“HOW: Why HOW We Do Anything Means Everything”*. He was named one of the “Top 60 Global Thinkers of the Last Decade” by Economic Times, and “the hottest advisor on the corporate virtue circuit” by Fortune. He became the exclusive corporate sponsor of the Elie Wiesel Foundation for Humanity Prize in Ethics in 2008. Mr. Seidman is a Harvard Law School graduate who also earned Bachelors and Master’s degrees in moral philosophy from UCLA and a Bachelor of Arts with honors in philosophy, politics, and economics from Oxford University.

**Tom Bubeck – *Chief Operating Officer***

Mr. Bubeck, the Chief Operating Officer, of the Company, is also the Chairman of the Company’s People & Principled Performance Council, which manages day-to-day operations, determines market strategy and execution, and creates opportunities for the Company’s people.

Before joining the Company in February 2016, he was the Chief Operating Officer and General Counsel of Relationship Science where he helped guide the company’s global operations, corporate strategy and development, sales and marketing, and human resources. Prior to joining Relationship Science, Tom was Chief of Staff at S&P Capital IQ, a division of McGraw-Hill Financial, overseeing the company’s major non-U.S. operations centers. He previously held various positions at Capital IQ (prior to the merger with S&P), including General Counsel, Managing Director of Client Development (including sales, client support, and marketing) and Head of Business and Legal Affairs. Mr. Bubeck is a graduate of Columbia Law School and received a Bachelor of Arts from Stony Brook University.[[10]](#footnote-17)

**Ron Charow – *Chief Financial Officer***

Mr. Charow ensures operational performance and financial discipline against the Company’s operational and financial targets and objectives. He has deep experience across a broad range of strategic functions, guides focus on designs, and builds strategic solutions and operational efficiencies while bringing essential business rigor and insight.

Mr. Charow has significant experience in mergers and acquisitions, having completed more than 20 such transactions over his career both in industry and while in public practice on behalf of clients. Mr. Charow began his career in public accounting with KPMG. He served as the Chief Financial Officer and Executive Vice President of Fujitsu Consulting, Inc. and was responsible for finance, administration, IT and legal affairs. Mr. Charow served as the Chief Financial Officer of Fujitsu Consulting (Canada), Inc. starting in 1999. He served as Chief Financial Officer for DMR Consulting’s Canadian division. He served as an Officer and Corporate Controller of Westburne Inc. He specialized in banking and treasury for the accounting firm Deloitte & Touche, where he managed the worldwide audit of Royal Bank, Canada's largest financial institution. He is a Chartered Accountant and has lectured extensively in the graduate program of McGill University on topics ranging from financial reporting to financial engineering. Mr. Charow has a Master’s degree in Public Accounting from McGill University in Montreal and a Commerce degree from Concordia University in Montreal.[[11]](#footnote-18)

**Sunil Bheda – *Chief Product Officer***

Mr. Bheda serves as the Chief Product Officer at the Company since August 2016. Mr. Bheda’s responsibilities include advancing the development of enhanced delivery platforms, data, and analytics solutions for the Company’s global partner base. He joined the Company in March 2013, as the Senior Vice President (“VP”) of Product development. Mr. Bheda has a 15-years of experience, successfully designing and deploying scalable enterprise business and product solutions. Prior to joining the Company, he served as the Managing Director for PowerMyLearning from January 2012 to February 2013. He also served as the Senior VP of Product Development at StayWell since March 2013. He served as the VP of MHHE Digital Technology at McGraw-Hill Higher Education (“MHHE") from January 2008 to January 2014 and served as the VP of HPI Media Technology at MHHE from 2005 to 2008. He was a Senior Broadcast Consultant at BBC from March 2001 to January 2005 and a Senior Ecommerce Consultant of Razorfish from September 1997 to March 2001.[[12]](#footnote-19)

Mr. Bheda has a Certificate in Management of technology from the Georgia Institute of Technology, and a Bachelors degree in Chemical Engineering from the Georgia Institute of Technology.

**Danielle Schlar – People Leader[[13]](#footnote-20)**

Ms. Schlar serves as the Global Head of People at the Company since March 2016. Prior to this she served as the VP Human Resources (“HR”) at Relationship Science, a technology solutions company, for more than three years. She also served as the HR manager at ICAP, and as an HR/Recruting at S&P Global Market Intelligence for three years. She served as a recruiter for baker Hostetler between 2006 to 2008.

She has a Bachelor’s in Arts from the New York University and is a Certified Senior Professional in HR (SPHR) from the HR Certification Institute.

Assets/Liabilities Overview

The following assets were identified in the Transaction, and will be transferred to the Buyer.

Tangible Assets

1. Current Assets (including inventory): We have not valued inventory separately since Management indicated that the book value of inventory has been estimated to be zero; and
2. Long Term Tangible Assets: Includes fixed assets and tenant improvements related to the Lease Agreement. We considered the book value of fixed assets as of the Valuation Date. We did not estimate the value of lease agreements.

Intangible Assets

The intangible assets can be further classified as follows:

the fair value of non-compete agreements, using a “Incremental Income Method”. Under this, RNA built two separate cases: one with the non-compete covenant in place and the other without one, estimated the present value of the two, cash flows. We subtracted one without covenant from the one with covenant in place, adjusted for the probability of competition and tax amortization benefit to get the estimated fair value of the agreement. As per the restrictive covenant agreement, the non-compete period is of five years starting from the date of transaction. Further, RNA considered a 10.0% loss of revenue for each year, beginning from 2019, when the agreement isn’t in place, based on discussion with the Management. RNA assumed a 10.0% probability of competition.

**IPR&D ASSETS**

The IPR&D Assets includes a learning platform and a library consisting of more than 400 courses. For the purpose of this analysis RNA relied on the “Relief from Royalty Method” to estimate the fair value. RNA considered an 8.0% Pre-Tax Royalty rate based on the royalty rates of comparable transactions, a 26.5% tax rate based on the guidance provided by Management, and a discount Rate of 15.0%, based on WACC.

**TRADE NAME & TRADEMARKS**

The Company’s registered trademarks include: Company logo, Company name design, name design for its products. For the purpose of this analysis RNA relied on the “Relief from Royalty Method” to estimate the fair value. RNA considered an 3.0% Pre-Tax Royalty rate based on the royalty rates of comparable transactions, a 26.5% tax rate based on the guidance provided by Management, and a discount Rate of 15.0%, based on WACC.

**CUSTOMER RELATIONSHIPS**

Management provided a list of customer contracts with the underlying contract terms and Management’s expectations on renewal of these contracts . RNA relied on the Multi-period Excess Earnings Method for valuing the customer relationship contracts. Also RNA, considered the growth of existing customers to be 50.0% of the total revenue growth, and assumed a 15.0% customer attrition rate based on the historical customer renewal rates. We also considered an 80.0% addback for the overall selling and marketing expenses, considering most of the expenses for the existing customers have been incurred already.

**GOODWILL**

RNA considered the compensation, recruiting, training, and interview costs related to the assembled workforce (the “Assembled Workforce”) based exclusively on information provided by Management.

Liabilities

The liabilities include the following Contingent Payments:

1. Deferred Revenue Liability: Since, the company offers its services on a subscription basis as well it has deferred revenues, and the same has been valued. RNA relied on a Cost approach to estimate the value for the same.

Assets Excluded in the Analysis

We identified the following assets but did not value them separately. RNA estimated that the following assets would not have material value.

**LEASE AGREEMENTS**

RNA also considered, but did not value separately, any lease agreements with third-parties. Given the nature and the scope of the engagement, lease agreements weren’t considered as a part of the valuation exercise.

Industry Overview

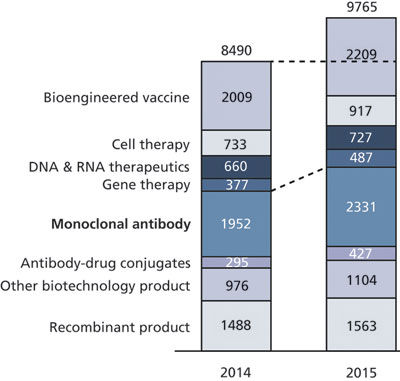
Overview

In valuing a business or its assets, it is important to consider the condition of, and the outlook for, the industry in which the enterprise operates. Depending upon the nature of the marketplace, industry conditions can significantly affect financial performance and, consequently, value. The following section provides a brief overview of the RNA-based therapeutics market, with a focus on treatments for CF and OTC, as well as a discussion of the competitive environment in that space.

RNA-based Therapeutics Market

RNA-based therapeutics target the treatment of diseases such as diabetes, cancer, tuberculosis, and some cardiovascular conditions. There is currently a great deal of money being put into this relatively new class of therapeutics and vaccines, which is projected to grow 12.0% in 2016 and reach $1.2 billion by 2020. The 2015 R&D biotech pipeline is shown in the adjacent figure. There are more than 700 nucleic acid-based therapeutics (DNA and RNA) in the pipeline and more than 60.0% of the nucleic acid-based therapeutic pipeline is in preclinical development. Approximately 35.0% of such pipeline is focused on oncology. Approximately 160 companies and 65 academic institutes are developing RNA-based therapeutics.[[14]](#footnote-21)

*Figure 3: R&D Biotech Pipeline Expansion*



RNAi is a natural post-transcriptional process of gene silencing involving short strands of nucleic acids. It is a regulatory process that cells utilize to silence and/or inhibit gene expression through the destruction of specific mRNA molecules. One of the major advantages of RNAi is that it enables sequence specific knockdown of a target gene.[[15]](#footnote-22) According to a report by Grand View Research, Inc., the global antisense and RNAi therapeutics market is anticipated to reach $4.6 billion by 2022. Technological development in the drug delivery technology based on liposome and nano biotechnology is expected to provide the market with a high potential to grow due to enhancement in the adoption of gene silencing therapeutic product models.[[16]](#footnote-23)

Cystic Fibrosis Market

According to MarketResearchReports.biz, the respiratory disorders market is forecast to rise from a value of $28.1 billion in 2015 to $46.6 billion in 2022, at a CAGR of 7.5%. The treatment landscape for respiratory disorders has traditionally been dominated by small molecule therapies that aim to treat the disease symptoms, rather than the cause. This means that treatment options can be diverse in terms of their targets and mechanisms of action. This is most notable in CF, where patients may be prescribed a combination of drugs from several treatment categories, including mucolytic agents, bronchodilators and antibiotics. Although the more traditional non-specific symptomatic therapies continue to have a strong presence in the respiratory disorder pipeline, the pipeline also contains promising targeted biologic therapies, which reflects their growing prominence in this therapy area. Overall, 908 products are currently in active in development for respiratory disorders.[[17]](#footnote-24) Per a report by Visiongain, the global CF market is expected to grow at a CAGR of 16.7% from 2016 to 2021, to reach $7.7 billion.[[18]](#footnote-25)

OTC/UCD Market

UCD result from defects in the metabolism of waste nitrogen from the breakdown of protein and other nitrogen-containing molecules.[[19]](#footnote-26) OTC deficiency is a rare X-linked genetic disorder characterized by complete or partial lack of the OTC enzyme. OTC is one of the six enzymes that play a role in the break down and removal of nitrogen the body, a process known as the urea cycle.[[20]](#footnote-27) OTC deficiency can occur as a severe neonatal-onset disease in males (but rarely in females) and as a post-neonatal-onset (partial deficiency) disease in males and females.[[21]](#footnote-28) The incidence for UCD in the US is one patient for every 35,000 births, presenting about 113 new patients per year across all age groups. The incidence for OTC in the US is one patient for every 56,500 births, estimated based on the overall incidence of UCD.[[22]](#footnote-29)

Competition

The Company and Shire MRT face competition from other companies in the mRNA therapeutics market like Moderna Therapeutics, CureVac, BioNTech, PhaseRx, Inc., Arcturus Therapeutics, and Ethris.[[23]](#footnote-30)

Valuation Methodology Overview

The following section provides an overview of various valuation methodologies considered as part of this analysis.

Valuation Theory

In summary, there are three generally accepted valuation approaches available when valuing the operating assets and liabilities of a closely held business:

1. Cost Approach (“Cost Approach”);
2. Income Approach (“Income Approach”); and
3. Market Approach (“Market Approach”).

Within each category, a variety of methodologies exist to assist in the estimate of value. They are discussed in further detail herein. In addition, there is the Hybrid Approach (“Hybrid Approach”), a methodology that combines two or more of these approaches.

Cost Approach

The Cost Approach relies upon separately valuing each sub-component of the company being valued. The discrete valuation of an asset using this approach is based upon the concept of replication or replacement as an indicator of value. In essence, this method answers the build approach when looking at a “buy versus build” approach to investment.

In the case of most IP-centric technologies with explicit patent protection and substantive and broad blocking rights to competitive entrants, the Cost Approach is not a reasonable proxy for value. By the time most products are commercial, the cost to recreate the existing asset is prohibitive in these circumstances given the demanding regulatory requirements. Furthermore, these costs should be considered sunk costs and, as such, other approaches to value should be considered.

Typical methods of the Cost Approach used to value an intangible asset include the following:

**REPRODUCTION COST METHOD**

This method contemplates the construction (or purchase) of exact replica of the subject asset. This method assumes the fact that the materials, quality of work, and technology used in the original subject asset are still available in the current scenario. As such, reproduction cost does not consider either the current market demand for or the current market acceptance of the subject intangible asset.

**REPLACEMENT COST METHOD**

This method contemplates the cost to recreate the utility of the subject intangible asset that serves the same purpose as the original subject asset but in a form that is not an exact replica of the subject asset. In this method, the replacement cost new is determined and reduced for depreciation of the asset. In this context, depreciation has three components: (i) physical deterioration, (ii) functional obsolescence, and (iii) economic obsolescence. Physical deterioration is impairment to the condition of the asset brought about by ― wear and tear, disintegration, use in service, and/or the action of the elements. Functional obsolescence is the impairment in the efficiency of the asset brought about by such factors as overcapacity, inadequacy, or change in technology that affect the asset. Economic obsolescence is the impairment in the desirability of the asset arising from external economic forces, legislative enactment, or changes in supply and demand relationships.

**RESIDUAL METHOD**

The residual value method provides an estimate of the salvage value of an asset. That is, it represents the amount of value that the owner of an asset can expect to obtain when the asset is dispositioned. It is the measurement of the net income that an investment earns above the threshold established by the minimum rate of return assigned to the investment. It can be used to estimate the value of a business or a particular asset.

Income Approach

The Income Approach is based on the earnings power, or the cash generating abilities of the company being valued. This approach focuses on determining a forecast benefit stream that is reflective of the subject company’s most likely future performance. The forecast benefit stream is then discounted to present value based on the appropriate risk‐adjusted discount rate or capitalization rate. The DCF is a commonly used Income Approach. In addition, in the life sciences, if clinical or regulatory risks remain, an rNPV is also common. For IP-centric rights interests, with reasonable patent protection and expectations for a significant decrease in market share upon patent expiration, the Income Approach is generally the favored approach by industry professionals. Other commonly used methods used for intangible assets valuation within the Income Approach are described below in detail:

**MULTI-PERIOD EXCESS EARNINGS METHOD (“MPEEM”)**

This method is used in cases where there is an identifiable stream of cash flows associated with more than one asset. An MPEEM may provide reasonable indication of the value of a specific intangible asset. Under this method, the value of an intangible asset equals the present value of the incremental after-tax cash flows attributable only to the subject intangible asset, after making adjustments for the required return on and of (when appropriate) the other assets – working capital, fixed assets, and other intangible assets – required to produce the subject intangible asset cash flows. The remaining cash flow stream, or excess earnings, is attributable to the subject intangible asset being valued. An appropriate discount rate is then selected and the present value of the excess earnings stream is derived to yield the value of the subject asset.

The adjustments for the other assets are made by calculating and applying the contributory asset charges. Using guidance from the Appraisal Foundation’s Best Practices for Valuations in Financial Reporting – The Identification of Contributory Assets and the Calculation of Economic Rents, contributory asset charges were utilized in the valuation of the Company’s most valuable intangible asset.

Contributory assets are defined as assets that are used in conjunction with the subject intangible asset in the realization of prospective cash flows associated with the subject intangible asset. Assets that do not contribute to the prospective cash flows associated with the subject intangible asset are not contributory assets. For example, a certain amount of real property (land and buildings) may be necessary to support the cash flow attributable to a subject intangible asset. Alternatively, land held by an entity for investment (a non-operating asset) would not be appropriate to include as a contributory asset if the land is not necessary for, or expected to contribute to, the generation of the prospective cash flows of the subject intangible asset.

**RELIEF FROM ROYALTY METHOD (“RFR”)**

The premise of this method is that the ownership of the subject intangible asset relieves the owner of the need to license the asset from a third party. Thus, by owning the intangible asset, the owner avoids the royalty payments required to license the asset. A critical element of this method is the development of a royalty rate that is comparable to ownership of the specific intangible asset. Under this method, value is estimated by discounting the royalty savings as well as any tax benefits related to ownership to a present value using an appropriate discount rate.

**INCREMENTAL INCOME METHOD**

Various incremental income methods are used to estimate the value of an intangible asset based on a comparison of the prospective revenues or expenses for the business or the intangible asset with and without the subject intangible asset in place. Under these methods, value is estimated by discounting the cash flow differential as well as any tax benefits related to ownership to a present value using an appropriate discount rate.

**rNPV METHOD**

In a typical license contract valuation, the asset is valued by estimating present value of future cash flows adjusted for probability of technical success (“POTS”). Such cash flows include upfront payments, milestone payments, royalties and adjusted for company’s share of R&D and other expenses. License contract is valued from both perspectives, the licensee’s and the licensor’s. When we estimate the cash flows for this method, we need to understand the perspective of valuation and accordingly consider upfront payment, milestone payments and royalties as income or expense. Accordingly, we also need to factor the additional risk of achieving the set research targets; since the commonly used Capital Asset Pricing Model (“CAPM”) is not capable of capturing this risk. Hence, we adjust the estimated cash flows for POTS and arrive at the NPV of the cash flows.

Market Approach

In summary, the Market Approach references actual transactions involving (i) the subject being valued, or (ii) similar assets and/or enterprises. The Market Approach generally consists of two primary methodologies: the Guideline Comparables Method (“GCM”) and the Guideline Transaction Method (“GTM”). The GCM involves identifying and selecting publicly traded companies or guideline public companies (“Guideline Public Companies”) with financial and operating characteristics similar to the subject being valued, and subsequently deriving multiples and other metrics from such Guideline Public Companies to apply to the subject being valued. The GTM involves identifying and selecting actual transactions, such as mergers, acquisitions, investments, and licensing agreements, involving companies and/or assets with financial and operating characteristics similar to the subject being valued, and subsequently deriving multiples and other metrics from such guideline transactions (“Guideline Transactions”) to apply to the subject being valued.

The third method under the Market Approach that can provide an indication of value is the Option Pricing Model Backsolve Method (the “OPM Backsolve Method”). By considering the sale price of shares in a recent financing, the equity value can be “back-solved” using an option pricing model that gives consideration to the Company’s capitalization structure and the rights of the preferred and common shareholders. This methodology is most applicable when a valuation is conducted close to the date of a financing transaction, and when other methodologies are deemed less reliable.

Hybrid Approach

A Hybrid Approach combines two or more of the approaches above. Typically, this involves some combination of an Income Approach with a Market Approach. For example, a licensing transaction, which has definitive upfront payments, milestones and royalties, can be viewed as an Income Approach; however, the determination of reasonable consideration across the three major approaches can be based on comparable license arrangements for similar assets, which can be viewed as a Market Approach.

Valuation Analysis

RNA applied the following valuation methodologies to estimate the fair value of the Subject Interest as of the Valuation Date:

1. IPR&D Assets – MPEEM (also utilizing the rNPV Method) under the Income Approach;
2. Relief from Royalty Method under the Income Approach;
3. Royalty and Milestone Payments – rNPV Method under the Income Approach;
4. Anti-Dilution Liability – NPV Method under the Income Approach;
5. Lease Agreement – Incremental Income Method under the Income Approach; and
6. Assembled Workforce – Replacement Cost Method under the Cost Approach.

MPEEM – IPR&D Assets

The MPEEM aggregates the present value of the incremental risk-adjusted after-tax cash flows attributable only to the subject intangible asset as of the Valuation Date. The IPR&D Assets were determined to be the key assets acquired, and as such, RNA relied on the MPEEM in determining fair value indication for the IPR&D Assets. Furthermore, considering the nature and the stage of development of the IPR&D Assets, we applied the rNPV Method to calculate the cash flows within the MPEEM.

IPR&D Assets – Overall Methodology

The RFR methodology applied here involves the following key components:

*Table 2: Cash Flow Structure for MPEEM*

|  |  |  |
| --- | --- | --- |
| **Cash Flow Structure** | | |
| **Particulars** |  |  |
| Revenues |  |  |
| Multiply: Pre-Tax Royalty rate |  |  |
| **Net Revenues** |  |  |
| Less: Taxes |  |  |
| **After Tax Cash Flows** |  |  |
| Multiply: Discount Factor |  |  |
| **Present Value of Cash Flows** |  |  |
| Add: Tax Amortization Benefit |  |  |
| **Concluded Value** |  |  |

The key components of the cash flow structure and the related assumptions are described below:

**NET REVENUES**

To estimate the net revenues for the IPR&D Assets, RNA considered the library and custom subscription revenues, provided by Management.

**ROYALTY RATE**

Based on discussions with Management and royalty rates of comparable transactions RNA applied an 8.0% royalty rate.

**CALCULATION OF ESTIMATED TAXES**

The tax rate applied herein was based on discussions with Management, RNA’s observations of tax rates for companies similar to the Company and a blended rate for the primary markets in which the Company is expected to operate. RNA generally considers a 26.5% tax rate for US corporations as the marginal corporate tax rate noting the revision in the US tax laws, effective from December 31, 2017 onwards.

DISCOUNT RATE

RNA estimated discount rate to be applied to the Platform equal to the weighted average cost of capital (“WACC’). We estimated a 0. 5% premium to the WACC as an appropriate discount rate to be applied on MRT Platform Programs, given the risks associated with the Company’s ability to meet its revenues forecasts.

**TAX AMORTIZATION BENEFIT (“TAB”)**

IRC Section 197 requires that intangible assets be amortized over a 15-year period. However, RNA added the present value of TAB to the present value of cash flows based on a 10-year period considering the life of the asset being valued.

**REMAINING USEFUL LIFE**

Based on discussion, Management indicated that technologies are reviewed annually for upgrades and the sales cycle is typically three years with content full refreshes. Considering this, we assumed that the developed technology will have a useful life of 10 years before it becomes absolute and is replaced by a new technology.

**VALUE CONCLUSION**

RNA estimated the value of each of the IPR&D Assets based on the structure described in Table 2 above and considering the above assumptions. RNA applied the mid-period discounting convention, and developed projections starting in 2018 through 2028.

Refer to Exhibits C.3 and C.5 for further details.

IPR&D Assets – Details

**CF PROGRAM**

To determine the value associated with the CF Program, RNA considered the following key assumptions to develop the rNPV analysis:

1. Net Revenues: Net revenues were forecast based on the WW sales estimates consisting of peak sales and penetration curve assumptions. Refer to Exhibit H.3 for further details; and
2. Phase of Development: The CF Program is currently in the preclinical stage, is expected to initiate clinical trials in 2018, and is expected to reach the market in 2027 given estimated development timelines.

RNA performed a sensitivity analysis of peak sales for the CF Program to calculate and conclude to the probability weighted average value of the CF Program at $42.3 million. Refer to Exhibit C.2 for details on the rNPV analysis, and Exhibit B.1 for rNPV assumptions.

**OTC PROGRAM**

To determine the value associated with the OTC Program, RNA considered the following key assumptions to develop the rNPV analysis:

1. Net Revenues: Net revenues were forecast based on the WW sales estimates consisting of peak sales and penetration curve assumptions. Refer to Exhibit H.4 for further details;
2. Phase of Development: The OTC Program is currently in the preclinical stage, is expected to initiate clinical trials in 2018, and is expected to reach the market in 2025 given estimated development timelines; and
3. Payments related to MIT Agreement: In addition, as described in the “Assets/Liabilities Overview” section above, we have subtracted the payments related to the MIT Agreement.

RNA performed a sensitivity analysis of peak sales for the OTC Program to calculate and conclude to the probability weighted average value of the OTC Program at $18.6 million. Refer to Exhibit C.3 for details on the rNPV analysis, and Exhibit B.2 for rNPV assumptions.

**MRT PLATFORM PROGRAMS**

To determine the value associated with the asset, RNA considered the following for purposes of developing the rNPV analysis:

1. Net Revenues: As discussed above, net revenues were forecast based on the peak sales for typical gene therapy/mRNA type orphan blockbuster drugs, as well as general penetration curve assumptions; and
2. Phase of Development: Based on discussion with Management, the Company is expected to initiate lead optimization and preclinical studies for the Pipeline Program #1, the Pipeline Program #2, and the Pipeline Program #3 in 2017, 2018, and 2019, respectively, and they are expected to commercialize in 2026, 2027 and 2028 respectively. The timelines essentially mirror those for the OTC Program with development starting one year apart for each pipeline program. Furthermore, we considered a duration of 2 years to complete the lead optimization and preclinical studies considering that the MRT Platform Programs are at an earlier stage as compared to the CF Program and the OTC Program.

RNA performed a sensitivity analysis of peak sales for the MRT Platform Programs to calculate and conclude to the probability weighted average value of the Pipeline Program #1, the Pipeline Program #2, and the Pipeline Program #3 at $18.0 million, $15.2 million and $12.8 million, respectively. Refer to Exhibits C.4 through C.6 for details on the rNPV analysis, and Exhibits B.3 through B.5 for rNPV assumptions.

RNA also gauged details on various comparable preclinical platform deals to ascertain the reasonability of the value concluded above. Other transactions in the market for early stage technology platforms with the potential to generate clinical development candidates tend to consist of meaningful upfront payments with significant contingent payments (milestones and royalties) if products are ultimately successful. For the platform itself, RNA considered the upfront component of these comparable transactions as a reasonable benchmark for the value of the MRT Platform (essentially representing the price others have paid to access interesting technology to develop clinical candidates). Refer to Exhibit H.5 for further details.

rNPV Approach – Royalty and Milestone Payments

For purposes of this analysis, RNA relied on the rNPV method to determine the valuation indication for the Royalty Payments and Milestone Payments.

Royalty Payments

Based on the Asset Purchase Agreement and as explained in the “Deal Overview” section above, the Company is required to pay a 4.0% royalty on net revenues for each of the IPR&D Assets to Shire until the loss of exclusivity. RNA applied the Royalty Payment Rate to the net revenues for each of the IPR&D Assets, and also considered a tax benefit since the Royalty Payments would reduce the tax liability of the Company to calculate net royalty payments (“Net Royalty Payments”). We then adjusted the Net Royalty Payments for POTS (consistent with the respective POTS applied for each of the IPR&D Assets) to calculate the probability adjusted net royalty payments (“Probability Adjusted Royalty Payments”).

**DISCOUNT RATE**

RNA considered 15.0% as an appropriate discount rate to be applied on the Royalty Payments, based on the cost of debt (venture debt or another similar structured debt) issued to similar companies in the life sciences industry. RNA noted that the range of cost of debt was 7.3% to 11.5% for similar companies with an average cost of debt of approximately 10.0%. Refer to Exhibits H.14 through H.16 for further details. However, such cost of debt noted above does not include considerations apart from interest rates, such as warrant coverage, administrative charges, final payment fees and origination fees. Such data is not usually summarized publicly, though in our experience these items would add the equivalent of a few percentage points to the interest rate. RNA also considered credit risk associated with these payments, based on the credit risk premium for large pharmaceutical companies, which was 1.5%, on average. Refer to Exhibits H.17 for further details.

**VALUE CONCLUSION**

RNA applied the discount rate mentioned above to the Probability Adjusted Royalty Payments to determine the present value of Royalty Payments. Similar to the IPR&D Assets, RNA applied the mid-period discounting convention and also performed a sensitivity analysis by estimating different peak sales and assigning the corresponding probabilities to each of the peak sales scenarios. Thereafter, RNA calculated and concluded to the probability weighted average value of the Royalty Payments. Refer to Exhibits D.1 through D.6 for further details.

Incremental Income Method – Non-Compete Agreements

According to the terms of the Lease Agreement, Shire currently pays $29.75 per square foot as the rental expense for occupying the property. Based on discussions with Management and the market rates for similar properties in the area, the market rental expense was considered at $35.00 per square foot for a comparable property. Refer to Exhibit E.2 for the details on the comparable market data. RNA applied the incremental income method to calculate the incremental value generated due to the lower rental expense compared to the market rates. The cash flows were then discounted at a discount rate of 8.1%. The lower discount rate is warranted considering that the cash flows related to the Lease Agreement are more certain compared to the cash flows associated with the other intangible assets. The present value of the TAB was added to the present value of the cash flows to estimate the value of the Lease Agreement at $65,500. Refer to Exhibit E.1 for further details.

Replacement Cost Method – Assembled Workforce

RNA considered the recruiting, training, and interview costs related to the Assembled Workforce (based exclusively on information provided by Management) to estimate the value of workforce at $0.7 million. Refer to Exhibit E.4 for further details.

NPV Method – Anti-Dilution Liability

Based on the Asset Purchase Agreement and as mentioned above in the “Deal Overview” section, if the Company raises Series C – Tranche II, the Company is required to issue Common Stock to Shire to maintain the its 18.0% holding on an as converted basis or 19.9% voting power in the Company. Management indicated that there is a high probability of the Company raising the Series C –Tranche II at the end of the first quarter of 2017, and as such, we calculated the number of shares to be issued to Shire in the second tranche, as calculated in the Common Stock Valuation Opinion. Furthermore, based on discussions with Management, we assigned 100.0% probability to the Series C – Tranche II raise and calculated the value of Shire – Tranche II based on the per share value of Common Stock concluded in the Common Stock Valuation Opinion. We then discounted the value of Shire – Tranche II with a 3-month risk-free rate and calculated the present value as of December 31, 2016 (noting no meaningful difference than calculating it as of the Valuation Date although we would have to interpolate risk-free rates given the few extra days beyond 3 months).

To calculate the value of Anti-Dilution Liability, we considered the difference between the value of Shire – Tranche II as of the expected raise date, and the present value of Shire – Tranche II as of December 31, 2016. Refer to Exhibit D.7 for further details.

Market Approach – GCM

The GCM involves the determination of a valuation indication by multiplying a representative level of earnings, cash flows or other measure against an appropriate risk‐adjusted multiple. This approach provides an indication of value for a company or asset that corresponds with the particular earnings figure being capitalized on a controlling or non‐controlling basis dependent on the underlying levels of multiples applied.

For purposes of this analysis, RNA did not rely upon the GCM in determining the enterprise value. Notwithstanding, RNA did consider Guideline Public Companies deemed comparable to Shire MRT, a key element of the Market Approach. Refer to Exhibit G.2 and Exhibits H.6 through H.8 for details on capital structure, beta, market capitalization, enterprise value, operating metrics, net working capital and capital expenditures requirement, and business descriptions, and for the selected Guideline Public Companies.

For the purpose of calculation of WACC (and capital structure and beta) and estimate the capital expenditure and net working capital ratios, RNA considered the following Guideline Public Companies:

1. Gartner, Inc.;
2. The Ultimate Software Group, Inc.;
3. Ceridian HCM Holding Inc.;
4. Conduent Incorporated;
5. Cornerstone OnDemand, Inc.;
6. FTI Consulting, Inc.;
7. SVMK Inc.;
8. ICF International, Inc.;
9. Navigant Consulting, Inc.;
10. Heidrick & Struggles International, Inc;
11. CRA International, Inc.; and
12. Franklin Covey Co.

RNA selected these Guideline Public Companies based on consideration of the Common Stock Valuation Opinion, discussions with Management and our own research. The Guideline Public Companies include companies that develop gene therapy products (such as CRISPR Therapeutics AG and Editas Medicine, Inc.), RNA-based products (such as PhaseRx, Inc.), and companies that develop products targeting rare diseases (such as Horizon Pharma plc).

RNA acknowledged the characteristics of Shire MRT that differ from the characteristics of the Guideline Public Companies, detailed as follows:

1. Shire MRT's operations focus primarily on mRNA therapeutics, which is generally different from and/or less diversified than the businesses of the selected Guideline Public Companies;
2. Shire MRT must raise financing in order to develop certain assets (noting that the Guideline Public Companies generally have easier access to capital to develop their programs);
3. The Shire MRT is generally smaller and at an earlier development stage than the Guideline Public Companies;
4. The range of WACC observed for the Guideline Public Companies represent the growth and risk profile associated with each of the selected Guideline Public Companies. In general, the strategies and prospects of Shire MRT represent a higher risk profile than the Guideline Public Companies; and
5. Shire MRT is not a publicly traded company and relies on private sources of equity. Public companies typically have lower costs of equity since the public equity markets typically demand lower levels of return compared to private sources of equity. Investments in public companies provide a liquid investment that may compensate for the minority level interest typically involved.

Furthermore, RNA considered the following Guideline Public Companies to estimate the expense trends primarily related to commercial costs, since majority of the companies comparable to Shire MRT are at an early stage of development and do not provide meaningful expense trends:

1. Regeneron Pharmaceuticals, Inc.;
2. Grifols, S.A.;
3. Alexion Pharmaceuticals, Inc.;
4. Vertex Pharmaceuticals Incorporated;
5. United Therapeutics Corporation;
6. Opko Health, Inc.;
7. BioMarin Pharmaceutical Inc.;
8. Incyte Corporation;
9. Myriad Genetics, Inc.;
10. Alkermes plc;
11. Emergent BioSolutions Inc.; and
12. BioMarin Pharmaceutical Inc.

Discount Rates

WACC

We considered WACC for estimating an appropriate discount rate for the Subject Interest. It is comprised of the following elements:

1. Cost of Debt (“Kd”): Reflects the cost of a hypothetical senior secured loan facility;
2. Tax Rate (“T”): Reflects an all-in marginal corporate tax rate;
3. Cost of Equity (“Ke”): Reflects the required rate of return for an equity investment;
4. % Debt (“D/C%”): Reflects the percentage of debt in the capital structure; and
5. % Equity (“E/C%”): Reflects the percentage of equity in the capital structure.

The WACC formula is as follows: Kd \*(1-T)\*D/C% + Ke \*E/C%

With respect to determining the above WACC inputs, RNA noted the following:

1. Kd:
2. Considered the average yield on the Moody’s Baa Rated Corporate Index as of the Valuation Date;
3. Considered the cost of debt for certain companies deemed comparable to Shire MRT;
4. Considered Shire MRT’s weighted-average cost of debt as of the Valuation Date; and
5. Considered discussions with Management regarding market interest rates.

1. T: Based on discussions with Management and RNA’s observations of tax rates for companies similar to Shire MRT;
2. D/C% and E/C%:
3. Considered the capital structure for certain companies deemed comparable to Shire MRT;
4. Considered Shire MRT’s capital structure as of the Valuation Date; and
5. Considered discussions with Management regarding the degree of financial leverage Shire MRT could reasonably bear.
6. Ke:
7. Considered the historical rates of return for venture capital firms, as further discussed below; and
8. Considered the CAPM, as further discussed below.

The CAPM is comprised of the following elements:

1. Risk-Free Rate (“Rf”): Reflects a risk-free rate of return;
2. Beta (“β”): Reflects the sensitivity of the expected excess asset returns to the expected excess market returns;
3. Market Risk Premium (“Rm”): Reflects the expected return of the market;
4. Size Premium (“Rs”): Reflects a risk premium for small size; and
5. Unsystematic Risk Premium (“Ru”): Reflects a risk premium for any unsystematic or company-specific risks.

The CAPM formula is as follows: Ke = Rf + β\*(Rm) + Rs + Ru

With respect to determining the above CAPM inputs, RNA noted the following:

1. Risk-Free Rate (Rf): Considered the yields on 20-year US treasuries as of the Valuation Date;
2. Beta (β): Based on unlevered beta of the selected Guideline Public Companies and re-levered based on the applied capital structure;
3. Market Risk Premium (Rm): Based on the Duff and Phelps 2016 Valuation Handbook;
4. Size Premium (Rs): Based on the Duff and Phelps 2016 Valuation Handbook – decile 10; and
5. Unsystematic Risk Premium (Ru): Based on RNA’s assessment of Shire MRT’s risk factors previously discussed. We ultimately applied a 0.0% premium given the high beta applied.

Based on the considerations herein, RNA estimated a WACC of 19.0%. Refer to Exhibit G.1 for further details. Furthermore, to determine the reasonability of the discount rate determined using WACC, we also studied the discount rate survey published by Avance and Biostrat. The WACC of 19.0% was within the range of the discount rates for the early- to mid-stage companies, which is reasonable considering the development stage of Shire MRT. Refer to Exhibit G.3 for further details.

Weighted Average Return on Assets (“WARA”)

The WACC is generally the starting point for determining the discount rate applicable to an individual intangible asset. Premiums and discounts are applied to the company’s WACC to reflect the relative risk associated with the particular tangible and intangible asset categories that comprise the group of assets expected to generate the projected cash flows. The process of disaggregating the discount rate is typically referred to as “rate stratification.” The range of discount rates assigned to the various tangible and intangible assets should reconcile, on a value-weighted basis, to the entity’s overall WACC.

RNA assessed the overall reasonableness of the discount rates assigned to each asset by generally reconciling the discount rates assigned to the individual assets, on a value-weighted basis, to the WACC Although goodwill is not explicitly valued by discounting residual cash flow, its implied discount rate should be reasonable, considering the facts and circumstances surrounding the transaction and the risks normally associated with realizing earnings high enough to justify investment in goodwill. Refer to Exhibit B.1 for the rates of return estimated for the different assets in the analysis. The discount rates selected for the intangible assets in conjunction with the rates selected for other assets, including goodwill, resulted in a WARA of 18.9%, in line with the Company’s WACC of 15.0%. Therefore, the selected discount rates assigned to the assets acquired appear reasonable.

The rate applied to the current assets, such as inventory, were generally at a premium to the after-tax US prime bank rate. The rate applied to the fixed assets, Lease Agreement and tenant improvements was generally at a premium to the after-tax cost of debt as explained in the “WACC” section above. For the intangible assets, RNA assumed the rate of return for the learning platform equal to the WACC, as discussed in the “IPR&D Assets” section above. The discount rate for the Assembled Workforce was estimated at WACC. The implied discount rate for goodwill, which is at 2.0% premium to the WACC, is higher than the discount rates for the identified intangible assets considering it to be the riskiest asset on the balance sheet (along with the Assembled Workforce). Refer to Exhibit B.1 for further details.

Internal Rate of Return (“IRR”)

To calculate IRR, we considered the total cash flows at enterprise level. We considered the probability adjusted net revenues and expenses from the IPR&D Assets as explained in the “IPR&D Assets” section above to calculate the probability adjusted cash flows. We made adjustments to the cash flows for net operating losses (“NOL”). We considered the beginning balance of the NOL as zero since the deal was structured as an asset deal. The NOL balances generated as a result of operating losses during the forecast period were then applied in each year of the forecast period, as available and as appropriate, to estimate the taxable cash flow. We then applied taxes to calculate cash flows after tax (“After Tax Cash Flows”). With respect to net working capital requirements and capital expenditures, RNA primarily relied on the net working capital and capital expenditure requirements of selected Guideline Public Companies. After making adjustments for net working capital and capital expenditure, we discounted the net probability adjusted after tax cash flows to determine the present value of the cash flows. As discussed above, similar to the IPR&D Assets and the Contingent Consideration, RNA applied the mid-period discounting convention to estimate the IRR.

We then subtracted the fixed assets from the present value of the cash flows to calculate the TAB for the Subject Interest. We then added TAB to calculate the total enterprise value. The discount rate was backsolved such that the total enterprise value is equal to the total purchase consideration. The implied IRR from the above calculation was 14.7%, which is in line with the WACC of 15.0% and WARA of 14.8%. Refer to Exhibit F.1 for further details.

Computation of Residual Goodwill and Reconciliation

The goodwill was calculated by subtracting the value of the current and long-term tangible assets, as well as the fair value of the identifiable intangible assets from the enterprise value. The residual goodwill (including Assembled Workforce) was estimated at $127.3 million or approximately 45.9% of the Purchase Consideration. Refer to Exhibit A.1 for further details.

Conclusion

Based on our analysis, it is our opinion that the fair value of the Subject Interest as of the Valuation Date is reasonably stated as follows:

*Table 3: Valuation Summary*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **VALUATION SUMMARY** | |  |  | | | **(USD IN THOUSANDS)** | | |
| **Asset** |  | | | |  | **Value Indication** | | |
| **Tangible Assets** | | | |  |  |  |  | |
| **Intangible Assets** | | | |  |  |  |  | |
| IPR&D Assets | | | |  |  |  |  | |
| CF Program | | | |  |  |  |  | |
| OTC Program | | | |  |  |  |  | |
| MRT Platform Programs | | | |  |  |  |  | |
| Lease Agreement | | | |  |  |  |  | |
| **Goodwill** | | | |  |  |  |  |  |
| Assembled Workforce | | | |  |  |  |  | |
| Goodwill | | | |  |  |  |  | |
| **Concluded Fair Value of the Subject Interest** | | | | | | |  | |
| **Purchase Consideration** | | | | |  | **Value Indication** | | |
| **Total Value of Shares Issued to Shire** | | | | | |  |  | |
| **Payment to MTS** | | | |  |  |  |  | |
| **Contingent Consideration** | | | |  |  |  |  | |
| Royalty and Milestone Payments | | | |  |  |  |  | |
| Anti-Dilution Rights | | | |  |  |  |  | |
| **Total Contingent Consideration** | | | |  |  |  |  | |
| **Total Purchase Consideration** | | | |  |  |  |  | |

The conclusions and opinions expressed in this letter and the accompanying Report are contingent upon the qualifying factors set forth in the Statement of Limiting Conditions attached to the completed Report.

Statement of Limiting Conditions

This Opinion has been prepared pursuant to the following general assumptions and general limiting conditions:

* We assume no responsibility for the legal description of real property or matters including legal or title considerations. For real property included in this appraisal, we were not furnished legal descriptions or other detailed site and improvement drawings. Title to the subject assets, properties, or business interests is assumed to be good and marketable unless otherwise stated.
* The subject assets, properties, or business interests are appraised free and clear of any or all liens or encumbrances unless otherwise stated.
* We assume responsible ownership and competent management with respect to the subject assets, properties, or business interests.
* The information furnished by management is believed to be reliable. However, we issue no warranty or other form of assurance regarding its accuracy.
* We assume that there is full compliance with all applicable Federal, state, and local regulations and laws unless noncompliance is stated, defined, and considered in the appraisal Report.
* We assume that all required licenses, certificates of occupancy, consents, or legislative or administrative authority from any local, state, or national government, private company or organization have been or can be obtained or renewed for any use on which the valuation opinion contained in this Report is based.
* Possession of this valuation Report, or a copy thereof, does not carry with it the right of publication. It may not be used, without our written consent, for any purpose by any person other than the party to whom it is addressed and, in any event, only with proper written qualifications and only in its entirety.
* We, by reason of this valuation, are neither required to give testimony nor to be in attendance in court with reference to the assets, properties, or business interests in question unless arrangements have been previously made.
* This valuation Report has been prepared in conformity with, and is subject to, the requirements of the code of professional ethics and standards of professional conduct of the professional appraisal organizations of which we are members.
* Disclosure of the contents of this valuation Report is governed by the bylaws and regulations of the CFA Institute.
* No part of the contents of this Report, especially any conclusions of value, the identity of the appraisers, or the firm with which the appraisers are associated, shall be disseminated to the public through advertising, public relations, news, sales, or other media without our prior written consent and approval.
* We assume no responsibility for any financial reporting judgments, which are appropriately those of Management. Management accepts the responsibility for any related financial reporting with respect to the assets, properties, or business interests encompassed by this appraisal.

Qualifications

Samuel Renwick, CFA

Sam Renwick provides valuation and advisory services to biopharmaceutical, medical device and equipment, diagnostic companies, and clinical research and manufacturing organizations, as well as other IP-centric technology companies. His experience includes buy-side and sell-side advisory engagements for licensing, financing, and mergers and acquisitions, as well as for tax and financial reporting matters for large public companies to small venture-backed enterprises. Whether developing dynamic, patient flow models for late-clinical therapeutic assets or developing an opinion of value for a security for compliance purposes, Mr. Renwick combines his breadth of industry knowledge with deep expertise in finance and financial models to create compelling communications regarding the value proposition of an asset, portfolio of assets or a company. Mr. Renwick has worked with well over 600 life sciences and technology companies in his career.

Professional Affiliations

* UCLA Anderson Business Honor Society
* CFA Institute
* Chartered Financial Analyst Society of San Francisco
* Member, Fair Value Forum
* Licensing Executive Society

Education

* BA/Economics & Business – Westmont College, Honors
* MBA/Finance – UCLA Anderson, Honors, J. Fred Weston award for Academic Excellence in Finance
* Chartered Financial Analyst (CFA)

Publications

* 409A Administration Handbook Valuation Section – Thomson Reuters, 2014
* Why Your 409A Valuation is Too High – Dis-Incentive Stock Compensation in the Life Sciences – BPM White Paper, May 2013
* Modeling and Forecasting to Communicate the Biotherapeutic Value Proposition – BayBio White Paper, May 2010
* Common Stock Valuation – Tips from the Trade, BayBio NOTES, April 2010
* Defensible Equity Incentive Valuation Opinions Under IRC 409A, Company Newsletter, December 2009
* What is the IRS Doing with IRC 409A, Silicon Valley Bank Newsletter, December 2008
* Eleven of the Top Ten Mistakes to Avoid in Your Options Program, Atlanta CEO Connexions, August 2007

Instruction and Seminars

* Panelist on Valuation Issues in Early Stage Company Valuations – Fair Value Summit November 2015
* Presentation on Funding Technology Innovation to Caltech Science and Entrepreneurship Group, Pasadena, March 2015
* Presentation to accelerator programs/technology transfer group on Financing Early Stage Technologies – Navigating Valuation Discussions, UC Berkeley, October 2014
* Panelist, Funding Early Stage Ventures, Sand Hill Angels, September 2013
* Panelist on Communicating the Biotech Value Proposition, BayBio Annual Event, South San Francisco, May 2011
* Presentation on the Use of Discount Rates in the PWERM, Fair Value Forum, Palo Alto, November 2008
* Panelist on the Valuation of Biotechnology Companies, Biocom, San Diego, May 2008

Certification

I certify that, to the best of my knowledge and belief:

* The statements of fact contained in this Report are true and correct.
* The reported analyses, opinions, and conclusions are limited only by the reported assumptions and limiting conditions, and are our personal, impartial, and unbiased professional analyses, opinions, and conclusions.
* We have no present or prospective interest in the property that is the subject of this Report, and we have no personal interest with respect to the parties involved.
* We have no bias with respect to the property that is the subject of this Report or to the parties involved with this assignment.
* Our engagement in this assignment was not contingent upon developing or reporting predetermined results.
* Our compensation for completing this assignment is not contingent upon the development or reporting of a predetermined value of direction in value that favors the cause of the client, the amount of the value opinion, the attainment of a stipulated result, or the occurrence of a subsequent event directly related to the intended use of this appraisal.
* Our analyses, opinions and conclusions were developed, and this Report has been prepared, in conformity with the American Institute of Certified Public Accountants Statement on Standards for Valuation Services.

Sincerely,

**

Samuel Renwick, CFA

Exhibits

1. This AICPA Practice Aid, which was initially developed in 2001, was revised in 2014 by the AICPA staff and IPR&D Task Force. Source: https://www.kpmg.com/CN/en/IssuesAndInsights/ArticlesPublications/Newsletters/Defining-Issues/Documents/Defining-Issues-O-1401-04.pdf. [↑](#footnote-ref-1)
2. Source: https://www.bloomberg.com/research/stocks/private/snapshot.asp?privcapId=23409. [↑](#footnote-ref-5)
3. Source: Information provided by Management. [↑](#footnote-ref-7)
4. Source: Company Website: https://lrn.com/ethics-compliance/education/. [↑](#footnote-ref-8)
5. Source: Company Website: https://lrn.com/ethics-compliance/advisory-services/. [↑](#footnote-ref-9)
6. Source: Company website, https://lrn.com/ethics-compliance/. [↑](#footnote-ref-10)
7. Source: Company website, https://lrn.com/governance-culture-leadership/. [↑](#footnote-ref-11)
8. Source: http://www.patentsencyclopedia.com/assignee/lrn-corporation/. [↑](#footnote-ref-14)
9. Source: Company website, http://ranarx.com/about-rana/. [↑](#footnote-ref-16)
10. Source: Company website, http://lrn.com/about/people/. [↑](#footnote-ref-17)
11. Source: http://www.bloomberg.com/research/stocks/private/person.asp?personId=7244590&privcapId=544780. [↑](#footnote-ref-18)
12. Source: https://www.bloomberg.com/research/stocks/private/person.asp?personId=312432874&privcapId=544780. [↑](#footnote-ref-19)
13. Source: https://www.linkedin.com/in/danielleschlar. [↑](#footnote-ref-20)
14. Source: Article published in July 2016, “Bioprocessing Technology Trends of RNA-Based Therapeutics and Vaccines”, http://www.biopharminternational.com/bioprocessing-technology-trends-rna-based-therapeutics-and-vaccines. [↑](#footnote-ref-21)
15. Source: Article published in November 2016, “RNAi Therapeutics Market, 2015 - 2030”, http://www.prnewswire.com/news-releases/rnai-therapeutics-market-2015---2030-300357424.html. [↑](#footnote-ref-22)
16. Source: Article, “Antisense and RNAi Therapeutics Market Will Grow To $4.58 Billion By 2022: Grand View Research, Inc.”, http://www.medgadget.com/2016/05/antisense-and-rnai-therapeutics-market-will-grow-to-4-58-billion-by-2022-grand-view-research-inc.html. [↑](#footnote-ref-23)
17. Source: News Release, “Global Respiratory Disorders Market Forecast to Reach $46.6 Billion By 2022 - Current Clinical and Commercial Landscape: MarketResearchReports.biz”, https://globenewswire.com/news-release/2016/09/14/871840/0/en/Global-Respiratory-Disorders-Market-Forecast-To-Reach-46-6-Billion-By-2022-Current-Clinical-and-Commercial-Landscape-MarketResearchReports-biz.html [↑](#footnote-ref-24)
18. Source: Article, “Global Cystic Fibrosis Therapeutics Market 2016-2026”, http://www.marketwatch.com/story/global-cystic-fibrosis-therapeutics-market-2016-2026-2016-11-03-11203415. [↑](#footnote-ref-25)
19. Source: https://www.ncbi.nlm.nih.gov/books/NBK1217/. [↑](#footnote-ref-26)
20. Source: https://rarediseases.org/rare-diseases/ornithine-transcarbamylase-deficiency/. [↑](#footnote-ref-27)
21. Source: https://www.ncbi.nlm.nih.gov/books/NBK154378/. [↑](#footnote-ref-28)
22. Source: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4364413/. [↑](#footnote-ref-29)
23. Source: Information provided by Management. [↑](#footnote-ref-30)