

# **A Founder's Guide to Unicorn Creation: How Liquidation Preferences in M&A Transactions Affect Start-up Valuation**

Robert P. Bartlett, III  
UC Berkeley School of Law

## **Abstract:**

This chapter, written for a Research Handbook on Mergers and Acquisitions (Davidoff-Solomon & Hill, eds.), investigates the widespread claim that the billion dollar valuations of “unicorn” start-ups are unreliable because of the manner in which founders bargain for these valuations with their venture capital (VC) investors. In particular, unicorn skeptics posit that VC investors agree to use these valuations in exchange for receiving enhanced preferred stock preferences, particularly enhanced liquidation preferences that are payable on a sale of the company.

By examining how liquidation preferences affect expected returns of founders and VC investors, this chapter argues that unicorn valuations are indeed unreliable measures of firm value but not for the reasons suggested by unicorn skeptics. While offering enhanced liquidation preferences to an investor can overcome the reduction in expected returns caused by financing a firm at a higher valuation, doing so will generally be more detrimental to a founder's expected returns than financing the company at a lower valuation using a conventional liquidation preference. Rather, this chapter argues that unicorn valuations are unreliable measures for firm value for the same reason that all start-up valuations are unreliable measures of firm value—namely, the common practice among VC investors to price VC financings as if they are purchasing common stock when they are acquiring preferred stock with downside economic protections. As a result of this practice, the reported valuations of unicorns and non-unicorns alike can be significantly higher than the enterprise value an investor is implicitly placing on a firm when financing it. For founders and prior stockholders, this insight has important implications for understanding the effective enterprise value being used in a financing and avoiding unintended dilution.

First Draft: September 22, 2015

JEL Classification: G32, G34, K22

Keywords: venture capital, start-ups, valuation, preferred stock

*“Here's the secret to how Silicon Valley calculates the value of its hottest companies: The numbers are sort of made-up. For the most mature startups, investors agree to grant higher valuations, which help the companies with recruitment and building credibility, in exchange for guarantees that they'll get their money back first if the company goes public or sells.”*

-The Fuzzy, Insane Math That's Creating So Many Billion-Dollar Tech Companies, *Fortune*, March 17, 2015

## I. Introduction

In recent years the growing number of privately-held start-up companies valued at over a billion dollars has provoked no shortage of commentary among those who work within the venture capital (VC) industry.<sup>1</sup> For entrepreneurs and their early investors, closing a round of financing that values a company at more than a billion dollars comes with immediate admission to an elite group of start-ups—so-called “unicorns” on account of their supposed rarity. Often accompanied by a press blitz covering the latest addition to the “unicorn club,”<sup>2</sup> achieving unicorn status provides a firm with added visibility to prospective employees and customers, giving it a potential competitive advantage over rival firms. It also provides a dramatic reputational boost to the company’s founders and early investors, whose very public paper gains can vault them promptly onto a *Fortune* wealth list or garner them a large following on Angel’s List.

For others, however, the growing ranks of this supposedly rare group of firms has caused considerable skepticism about the legitimacy of these reported private firm valuations. Prominent unicorns, such as the enterprise storage firm Box, Inc., that subsequently conducted an initial public offering at much less than a billion dollar valuation, have only heightened concerns that founders and late stage investors might be inflating reported valuations simply to achieve unicorn status. The basic theory is that while a higher valuation ordinarily harms returns to a new investment by diminishing the percentage of the investor’s equity ownership, a company can offset this effect on investor returns through offering late-stage investors preferential terms.<sup>3</sup> In particular, giving late stage investors superior

---

<sup>1</sup> For a summary, see Ben Zimmer, How ‘Unicorns’ Became Silicon Valley Companies, *WSJ*, March 20, 2015.

<sup>2</sup> The notion of referring to billion dollar start-ups as “unicorns” originated in a 2013 article in news website TechCrunch written by venture capitalist Aileen Lee. See Aileen Lee, *Welcome To The Unicorn Club: Learning From Billion-Dollar Startups*, TechCrunch, Nov. 2, 2013, available at <http://techcrunch.com/2013/11/02/welcome-to-the-unicorn-club/>. At the time of publication, the article identified approximately 40 unicorns. *Id.* Two years later this number had doubled by the time *Fortune* magazine wrote a February 2015 cover story entitled “The Age of Unicorns.” See Erin Griffith and Dan Primack, The Age of Unicorns, *Fortune*, Jan. 22, 2015.

<sup>3</sup> See, e.g., Sarah Frier and Eric Newcomer, The Fuzzy, Insane Math That’s Creating So Many Billion-Dollar Tech Companies, *Fortune*, March 17, 2015 (“For the most mature startups, investors agree to grant higher valuations, which help the companies with recruitment and building credibility, in exchange for guarantees that they’ll get their money back first if the company goes public or sells”); Crystal Huang, VCs Are Feeling Unicorn Fatigue - Here’s Why, *Forbes*, Jul. 15, 2015, available at <http://www.forbes.com/sites/quora/2015/07/15/vcs-are-feeling-unicorn-fatigue-heres-why/> (noting many unicorn valuations are just above \$1 billion “implying that the deals were negotiated specifically to attain this valuation” and that “the addition of liquidation preferences and other investor-friendly terms provides significant downside protection, enabling the companies to attain high sticker prices”).

liquidation preferences that are payable in the event of an acquisition of the company can be sufficient to induce these investors to conduct a financing at a higher valuation. Or at least, so the theory goes.

Notwithstanding the growing prominence of this valuation-for-preference theory, remarkably little attention has been given to its viability as a practical matter for the enterprising founder. That is, even if a founder can induce a late stage investor to fund at a higher valuation by offering up special liquidation preferences, is this likely to be attractive to either a founder or a company's prior investors? As I show below, the viability of the valuation-for-preference theory is greatly—if not entirely—undone by the adverse impact any such bargain will have on the expected returns on these stockholders relative to what are generally considered to be conventional VC terms. While offering equity with enhanced liquidation preferences can indeed induce new investors to agree to finance a company at a higher reported valuation, the amount of preferences needed to accomplish this feat will inevitably reduce the expected return to founders (and often other prior VC investors) compared to what they would receive using the new investor's original "true" valuation with industry-standard preferred stock terms. Moreover, efforts to address these adverse effects through creative deal-structuring are also likely to come under enhanced judicial scrutiny. In short, offering up enhanced liquidation preferences is likely to be a self-defeating strategy for a founder seeking to push a VC to a unicorn valuation.

Nonetheless, while companies are not likely to be achieving unicorn valuations solely by offering enhanced liquidation preferences to new investors, the common use of liquidation preferences in conventional VC financing does call into question the reliability of reported valuations for both unicorns and non-unicorns alike. As is well known, U.S. venture capitalists have long utilized a standard form of convertible preferred stock that contains a liquidation preference entitling an investor to its original investment amount in the event of an acquisition before any payments can be made on the company's common stock.<sup>4</sup> Even if not specifically offered in exchange for a higher valuation, a company that offers securities with even this industry-standard "1X" liquidation preference will enhance investors' expected returns relative to what would be expected if the same company had used only common equity as a financing instrument.

As shown below, this feature of VC finance has significant ramifications for how investor's implicitly value companies when conducting a private financing. In particular, in determining a purchase price for their preferred stock, VCs ordinarily price a financing as if they were acquiring common stock rather than preferred stock with downside protection. However, the downside protection actually provided by preferred stock liquidation preferences means that obtaining a similar expected return in the absence of this protection would require a VC investor to finance the firm at a lower valuation than the value nominally placed on the company in the financing. The end result is a reported valuation that is in excess of the enterprise value of the firm implicitly used by the VC investor. This wedge between a company's reported value and its implied enterprise value becomes even

---

<sup>4</sup> See *infra* Part II.

greater if a company's VC investors display even mild forms of risk aversion, as is likely the case given the very use of equity securities having downside protection. As such, even in the absence of enhanced liquidation preferences, unicorn valuations may indeed be an inflated measure of how a VC views a company's enterprise value. The reason, however, goes to the very structure of how VC financings occur, making it an issue for both unicorn and non-unicorn financings alike.

The fact that VC investors routinely price transactions as if they were acquiring shares of common stock rather than preferred stock has critical, under-appreciated implications for how founders and prior stockholders interpret the terms being offered in a VC financing. In particular, this pricing practice—when combined with preferred stock liquidation preferences—ensures an investor will have expected returns from a financing as if it used an enterprise value that may be materially lower than the nominal valuation agreed to by a founder. To avoid inadvertent dilution, a well-advised founder must accordingly evaluate how the nominal valuation for a proposed financing translates into an implied enterprise valuation given the preferred stock terms requested by a VC investor.

This chapter proceeds as follows. Part II provides a brief primer on the mechanics of preferred stock liquidation preferences used in VC finance. Part III examines the viability of the valuation-for-preference theory. Using a case study to illustrate the effect of trading off valuation for enhanced liquidation preferences, Part III casts doubt on the viability of the valuation-for-preference theory. Part IV demonstrates how the use of even industry-standard liquidation preferences causes the valuation of a company reported in a VC financing to diverge from the enterprise value implicitly used by a VC investor. Part V concludes.

## **II. A Primer on Preferred Stock Liquidation Preferences**

### **A. Basic Structure**

A well-known feature of U.S. VC finance is venture capitalists' almost uniform reliance on convertible preferred stock as their investment instrument of choice when funding new ventures.<sup>5</sup> Compared with the common stock held by founders and employees, preferred stock acquired by a VC investor will entitle the investor to a number of governance and economic rights to help minimize its financial risk. Preferential governance rights, for instance, commonly include the right to veto select corporate transactions that might materially affect the VC's economic returns (e.g., selling the company or selling additional preferred stock)<sup>6</sup> and/or the right to

---

<sup>5</sup> See Steven Kaplan and Per Strömberg, *Financial Contracting Theory Meets the Real World: An Empirical Analysis of Venture Capital Contracts*, 70 REV ECON. STUD. 281, 286 (2003) (reporting that convertible preferred stock was used in 95% of their sample financing transactions). The common use of preferred stock among US venture capitalists has been studied extensively by scholars. For a summary of this literature, see Robert P. Bartlett, III, *Venture Capital, Agency Costs, and the False Dichotomy of the Corporation*, 54 UCLA L. Rev. 37, 48-61 (2006).

<sup>6</sup> See, e.g., NAT'L VENTURE CAPITAL ASS'N, *SAMPLE TERM SHEET FOR SERIES A PREFERRED STOCK FINANCING 3-4* (2009) [hereinafter NVCA TERM SHEET], available at [http://www.nvca.org/index.php?option=com\\_docman&task=doc\\_download&gid=75&Itemid=93](http://www.nvca.org/index.php?option=com_docman&task=doc_download&gid=75&Itemid=93) (requiring creation of Series A Preferred Stock in which VC investors will have the right to approve twelve specific

designate one or more directors to the company's board of directors.<sup>7</sup> These governance rights help address the classic agency problems and information asymmetries that typify investments in new ventures.

Likewise with respect to preferential economic rights, the VC investor's convertible preferred stock will include a number of provisions designed to protect the economic value of its investment while incentivizing the holders of common equity to maximize the value of the enterprise. Among other things, these economic preferences typically include: the right to receive specified dividends prior to any dividends paid on common equity, the right to force the company to redeem the preferred stock in a specified number of years, the right to protection against dilution if the company sells cheaper securities in the future, and perhaps most importantly, the right to a liquidation preference in the event of a sale of the company.<sup>8</sup>

In its most basic form, a VC investor's preferred stock liquidation preference functions much like a principal repayment obligation in a simple loan agreement. Generally written so that it is triggered only on a liquidation or sale of the company,<sup>9</sup> the provision requires that any proceeds available for distribution to the company's equity holders first be distributed to the holders of preferred stock until the preferred stockholders receive a specified amount of money—typically an investor's original purchase price.<sup>10</sup> Once this liquidation preference is satisfied, all remaining proceeds are then paid to the holders of the company's common stock on a pro rata basis.

One might naturally ask why an investment industry that prides itself on swing-for-the-fences returns would so consistently negotiate for a simple right to receive its original investment amount in the event of a portfolio company's acquisition. The answer lies in the fact that a VC investor's preferred stock is convertible into shares of common stock at the option of the investor, initially on 1:1 basis. A VC investor holding preferred stock acquired at \$1.00 per share which provides for a 1X liquidation preference will therefore be faced with a choice upon any acquisition or liquidation of a portfolio company: Hold the preferred security and collect \$1.00 per share, or convert the security into a share of common stock and receive its pro rata share of all proceeds paid to the common stockholders. In this fashion, the

---

corporate actions including the sale of the company, amending the company's charter, or changing the size of the board of directors).

<sup>7</sup> See *id.* at 3 (providing for specific number of "Series A Directors").

<sup>8</sup> See *id.* at 2-6 (granting Series A Preferred Stock with dividends, a liquidation preference, antidilution protection, and redemption rights); see also Bartlett, *supra* note 5, at 54-55 (discussing economic terms attached to preferred stock in VC finance).

<sup>9</sup> See NVCA Term Sheet, *supra* note 6, at 3 (noting that a "merger or consolidation (other than one in which stockholders of the Company own a majority by voting power of the outstanding shares of the surviving or acquiring corporation) and a sale, lease, transfer, exclusive license or other disposition of all or substantially all of the assets of the Company will be treated as a liquidation event.")

<sup>10</sup> The NVCA Term Sheet, for instance, uses as its default a liquidation preference equal to the investor's original purchase price. See *id.* at 2; see also Fenwick & West, *Explanation of Certain Terms Used In Venture Financing Terms Survey*, available at <https://www.fenwick.com/publications/pages/explanation-of-certain-terms-used-in-venture-financing-terms-survey.aspx> ("The amount of liquidation preference that a given series of preferred stock has is usually equal to the amount paid for the stock."). In addition, shares of preferred stock are typically entitled to receive any accrued or declared but unpaid dividends then owing on the preferred stock. See Model Term Sheet, *supra* note 6, at 2.

liquidation preference can protect the economic value of an investment in unsuccessful ventures while allowing a VC investor to participate in any appreciation above the value at which the investor originally invested. Moreover, because all economic preferences disappear upon conversion into common stock, the company's founders are highly-motivated to achieve an exit that incentivizes its VC investors to convert their preferred securities.

While this basic structure describes the vast majority of VC financings, it is important to note that a variety of other types of liquidation preferences are occasionally used. Indeed, because preferred stock preferences must be drafted in a company's charter, the enabling feature of corporate law can give rise to any number of permutations of the basic liquidation preference described previously. Three permutations used from time to time in VC finance involve: (a) requiring payment of a liquidation preference to be senior to the preference owing on any previously issued shares of preferred stock, (b) adjusting the amount of the fixed payout on each preferred share, and/or (c) allowing the investor to participate in any common stock distributions even after taking the fixed liquidation preference. For instance, when investing in a distressed company, a VC investor might insist on receiving a multiple of its original investment (e.g., 1.5X, 2X, etc.) which must be paid before any distributions are made to other preferred stock investors in the event of a liquidation or acquisition, thereby ensuring that the VC investor receives both its capital and a fixed return on investment before any proceeds can be paid to the company's other stockholders.<sup>11</sup> Alternatively, a VC investor might insist that after receiving its fixed liquidation payment (e.g., 1X or 2X, as the case may be), it also participates in any distributions to common stockholders as if the investor had converted into common stock just prior to the acquisition. An investor receiving such "participating" preferred stock thus avoids the need to choose between receiving a fixed liquidation preference and converting into common stock. A variation of this last approach might also be to limit or "cap" the amount of money a stockholder can receive as a holder of preferred stock (e.g., a preferred stockholder may participate in distributions to common stockholders until the preferred stockholder receives proceeds of 3X its original investment cost).<sup>12</sup>

## B. Interaction with Staged Financing and Investment Syndication: An Example

Understanding the mechanics of liquidation preferences requires close attention to how they interact with the common use of staged financing and investment

---

<sup>11</sup> See, Fenwick & West, *supra* note 10 (noting that "in certain financings new investors may require that their liquidation preference amount be equal to more than the amount they originally invested (often referred to as a "multiple" liquidation preference)").

<sup>12</sup> Data collected by the law firm Fenwick & West reveals that between 20 and 30 percent of all financings occurring in 2013 and 2014 involved the issuance of participating preferred stock, of which 50-60% allowed for full or uncapped participation. See Michael Patrick and Barry Kramer, *Silicon Valley Venture Capital Survey, Second Quarter 2015* 10, available at <https://www.fenwick.com/FenwickDocuments/2Q15-Silicon-Valley-Venture-Capital-Survey.pdf>. Naturally, in settings where a VC holds participating preferred stock with a cap on participation, an acquisition of the company will again force the VC investor to choose between holding onto its participating preferred stock or converting it into common stock.

syndication within VC finance.<sup>13</sup> In addition to obtaining preferred stock securities, VC investors typically stage their start-up investments over time. By funding a company with just enough cash to reach a designated milestone, a VC investor retains a valuable option to abandon a failing venture, preserving follow-on funds for those portfolio companies that are successfully executing their business models. At the same time, a VC investor will generally bring in new investors to lead the subsequent round of financing as a means to establish a neutral, arms-length valuation with the founder as well as to minimize the original investor's concentration risk. When combined with the use of fixed liquidation preferences, this reliance on staged financing and investment syndication greatly enhances the likelihood that the multiple VC investors will have conflicting interests concerning what constitutes an acceptable sale price for a portfolio company.<sup>14</sup>

To illustrate, consider a hypothetical company, NewCo, that raises two standard rounds of VC finance. The first round of financing was completed several years ago when the company sold \$50,000,000 of convertible preferred stock at \$1.00 per share to AlphaFund. At the time of the financing, the only outstanding securities of NewCo were 200 million shares of Common Stock held by Founder. Given NewCo's stage of development, AlphaFund agreed to value NewCo at \$200 million, such that AlphaFund purchased 50,000,000 shares of newly issued preferred stock for \$1.00 per share.

This price reflects the near universal practice among VC investors to establish a price per share using a company's pre-financing (or "pre-money") fully-diluted capitalization (here, \$200,000,000 valuation / 200,000,000 shares). This practice ensures that the VC's ownership stake in a successful exit (when all investors choose to convert into common stock) reflects the value the VC contributed in the financing (i.e., \$50 million investment / \$250 million post-financing valuation), or 20%.<sup>15</sup> To be sure, the fact that the preferred stock will come with downside protection (such as a liquidation preference) should call into question whether the VC truly values NewCo at \$200 million prior to the financing—an issue to which we shall return in Part IV. But for present purposes, we will adhere to the industry convention of using this pre-money valuation of the company as the VC's actual assessment of the firm's value just prior to the financing.<sup>16</sup>

---

<sup>13</sup> See Bartlett, *supra* note 5 at 52-56 (describing use of staged financing and investment syndication among VC investors).

<sup>14</sup> See *id.* At 71-80.

<sup>15</sup> Naturally, this percentage will be reduced to the extent the company issues any additional securities. To account for this possibility, VC investors ordinarily include in a company's pre-money capitalization a company stock option plan (and often, an increase in the stock option plan). See Robert P. Bartlett, III, *Understanding Price-Based Antidilution Protection: Five Principles to Apply When Negotiating a Down-Round Financing*, 59 *Bus. Law.* 23, 26-28 (2004). In addition, a VC investor will also seek to address this issue by obtaining contractual preemptive rights to maintain its pro rata ownership stake. See, e.g., *NVCA Term Sheet*, *supra* note 6, at 9 (providing VC investor with right of first refusal on future equity issuances).

<sup>16</sup> Given the preferences of the preferred stock, this pricing practice also ensures that the common stock will have a value less than \$1.00 per share. As such, the company will have the ability to attract employees by offering common stock or stock options at a considerable discount to the per share price paid by the VC investor. See Ronald J. Gilson & David M. Schizer, *Understanding Venture Capital Structure: A Tax Explanation for Convertible Preferred Stock*, 116 *HARV. L. REV.* 874, 875-76 (2003).

With respect to the terms of the preferred stock, assume for simplicity that AlphaFund negotiated the basic set of terms reflected in the model term sheet published by the National Venture Capital Association.<sup>17</sup> Specifically, these included a straight, 1X liquidation preference such that AlphaFund would receive \$1.00 per share on an acquisition of NewCo and a conversion option that would allow AlphaFund to convert any share of preferred stock into common stock at a one-for-one ratio. Given that the company anticipated the need for future financing, it issued this preferred stock in the form of Series A Preferred Stock so that all price-related economic terms (e.g., the liquidation preference, the redemption price, etc.) were tied to AlphaFund's original purchase price of \$1.00 per share.

The second financing was completed after NewCo achieved several milestones. In light of this success, BetaFund (another VC investor) agreed to value NewCo at \$500 million and to purchase \$75,000,000 of newly issued Series B Preferred Stock. (We will assume for simplicity that AlphaFund did not participate in the Series B financing). Since no new securities had been issued since the Series A financing, NewCo had outstanding only the 200,000,000 shares of Common Stock and 50 million shares of Series A Preferred Stock, giving it a fully-diluted capitalization of 250 million shares of Common Stock. BetaFund accordingly paid \$2.00 per share for 37,500,000 shares of Series B Preferred Stock. As with the Series A Preferred Stock, these new securities included a 1X liquidation preference and were convertible 1:1 with Common Stock. AlphaFund and BetaFund further agreed that in the event of an acquisition that was insufficient to pay the full Series A and Series B liquidation preferences, all shares of preferred stock would receive their liquidation proceeds on a *pari passu* basis (i.e., each share would receive a pro-rata portion of the available proceeds according to the amount otherwise due on such share.) Accordingly, NewCo's capitalization had the following characteristics following the financing:

<b>Security</b>	<b>Outstanding</b>	<b>As-Converted to Common Stock</b>	<b>Liquidation Preference</b>	<b>Participation Feature?</b>	<b>Priority</b>
Common Stock	200,000,000	200,000,000	None	None	N/A
Series A Preferred	50,000,000	50,000,000	\$1.00 per share	None	Pari Passu with Series B
Series B Preferred	37,500,000	37,500,000	\$2.00 per share	None	Pari Passu with Series A

Even in this simple example, analyzing the economic impact of liquidation preferences becomes considerably more complicated with each round of financing. After the Series A financing, it was relatively straightforward to determine that the Series A Preferred Stock would convert into Common Stock in an acquisition with at least \$250 million of distributable proceeds. Because this amount represented the post-financing valuation of NewCo, any appreciation of the company in excess of \$250 million would mean AlphaFund's original 20% stake in NewCo had appreciated to more than \$50 million. In contrast, layering into the capital structure the Series B Preferred Stock would require AlphaFund to reassess its rational

<sup>17</sup> See NVCA Term Sheet, *supra* note 6, at 2-5.

conversion point given that it will now be sharing any acquisition proceeds *pari passu* with the Series B Preferred Stock. Specifically, based on NewCo’s capitalization after the Series B financing, AlphaFund would convert into Common Stock only in an acquisition having distributable proceeds of at least \$325 million. Not surprisingly, this figure is even higher for the Series B Preferred Stock given the higher valuation at which it was sold. For BetaFund, only an acquisition having proceeds of more than \$575 million would induce it to convert its Series B Preferred Stock into Common Stock.<sup>18</sup>

As this discussion suggests, the common use of liquidation preferences and staged financing ultimately creates the possibility for a significant conflict among a company’s VC investors regarding an acceptable exit price for the company. To provide a graphic representation of this concept, Table 2 provides a liquidation analysis showing the return on investment for each series of preferred stock at a range of acquisition values for NewCo. As the table indicates, AlphaFund would be willing to sell NewCo at acquisition prices much lower than those that would be acceptable to BetaFund. At the same time, the table also highlights how the Series B financing has itself raised the threshold of an acceptable sale for AlphaFund. Whereas following the Series A financing, a sale valuing NewCo at \$300 million would have yielded a return to AlphaFund of 20%, a similar sale following the Series B financing would merely return AlphaFund’s original investment amount. In other words, the issuance of even an ordinary series of preferred stock to BetaFund can diminish the expected returns to AlphaFund for certain exit events. This feature of staged financing bears special emphasis as it sets the stage for understanding why the valuation-for-preference theory is unlikely to be borne out in practice.

<b>Acquisition Value</b>	<b>Series A</b>	<b>Series B</b>
\$150,000,000	1.0000	1.0000
\$300,000,000	1.0000	1.0000
\$450,000,000	1.5000	1.0000
\$600,000,000	2.0870	1.0435
\$750,000,000	2.6087	1.3043

### **III. The Economics of the Valuation-for-Preference Theory**

Having established the basic mechanics of preferred stock liquidation preferences, we are now in a position to evaluate the viability of the valuation-for-preference theory. As noted previously, the theory supposes that when presented with a conventional VC financing proposal at a specified pre-money valuation, a founder can induce the investor to fund at a higher valuation in exchange for an enhanced liquidation preference. The reason for having to offer up this incentive stems from the fact that funding at a higher valuation would otherwise diminish the new investor’s expected returns.

---

<sup>18</sup> The methodology for calculating these conversion points is described in the Appendix.

To illustrate, consider again the case of NewCo. Assume that NewCo continued to execute its business plan following its Series B financing, hitting several important milestones. NewCo's success eventually catches the attention of GammaFund, a late-stage investor. GammaFund is confident that NewCo will be a prime acquisition target in the near future and is willing to invest \$100 million in the company at a pre-financing valuation of \$746 million. GammaFund arrives at this valuation based on its assessment of NewCo's acquisition at various valuations. For simplicity, assume that analysts at GammaFund believe the following table represents the universe of possible acquisition scenarios in one year's time if GammaFund invests \$100 million, with each possibility having a 10% likelihood of occurring:<sup>19</sup>

<b>Exit:</b>	<b>Probability</b>
\$200,000,000	.1
\$400,000,000	.1
\$600,000,000	.1
\$800,000,000	.1
\$1,000,000,000	.1
\$1,200,000,000	.1
\$1,400,000,000	.1
\$1,600,000,000	.1
\$1,800,000,000	.1
\$2,000,000,000	.1

Based on these estimates, GammaFund follows the common practice within the venture capital industry of discounting these future values to present value using an internally-derived hurdle rate to justify investments in private portfolio companies given their greater risk profile and lack of liquidity.<sup>20</sup> In the present case, GammaFund uses a discount rate of 30%. Based on this rate, the expected post-financing value of NewCo would accordingly be \$846 million, implying a pre-financing value of \$746 million.<sup>21</sup> At this valuation, GammaFund indicates it would be willing to accept the same preferred stock terms as were provided to the Series A and Series B investors. Given NewCo's pre-financing, fully-diluted capitalization of

<sup>19</sup> Analyses of expected returns in this Chapter assume a uniform, discrete distribution for expositional purposes only. The basic economics behind the valuation-for-preference theory remain the same were one to use a different probability density function for the acquisition values of NewCo and then calculate expected values through numeral integration.

<sup>20</sup> See Josh Lerner, A Note on Valuations in Private Equity Settings, in *Venture Capital and Private Equity: A Casebook* 204-223 (3<sup>rd</sup> ed. 2005).

<sup>21</sup> That is, the expected present value of NewCo ( $E[Z]$ ) would be calculated as follows using a discount rate of 30%:

$$E[Z] = \sum_{i=1}^{10} \frac{.1 \times Z_i}{1.3}$$

where  $Z_i$  represents one of the ten possible acquisition value of NewCo listed in Table 3.

287,500,000 shares, this valuation translates to a per share price for the Series C financing of \$2.595 (i.e., \$746 million / 287,500,000).

While this proposed valuation represents a healthy increase from the Series B post-financing valuation of \$500 million, Founder is determined to secure a post-financing valuation of one billion dollars. Accordingly, Founder proposes a \$900 million pre-money valuation to GammaFund at a price of \$3.13 per share, meaning that with GammaFund's \$100 million contribution, NewCo would be worth exactly \$1 billion after the financing. GammaFund's analysts produce the following two liquidation analyses comparing the returns to GammaFund using a \$746 million and a \$900 million pre-money valuation:<sup>22</sup>

Exit:	Probability:	\$746 Million Valuation		\$900 Million Valuation	
		Proceeds to Series C	GammaFund Return on Capital	Proceeds to Series C	GammaFund Return on Capital
\$200,000,000	.1	\$88,888,889	-11.11%	\$88,888,889	-11.11%
\$400,000,000	.1	\$100,000,000	0.00%	\$100,000,000	0.00%
\$600,000,000	.1	\$100,000,000	0.00%	\$100,000,000	0.00%
\$800,000,000	.1	\$100,000,000	0.00%	\$100,000,000	0.00%
\$1,000,000,000	.1	\$118,203,310	18.20%	\$100,000,000	0.00%
\$1,200,000,000	.1	\$141,843,972	41.84%	\$120,000,000	20.00%
\$1,400,000,000	.1	\$165,484,634	65.48%	\$140,000,000	40.00%
\$1,600,000,000	.1	\$189,125,296	89.13%	\$160,000,000	60.00%
\$1,800,000,000	.1	\$212,765,957	112.77%	\$180,000,000	80.00%
\$2,000,000,000	.1	\$236,406,619	136.41%	\$200,000,000	100.00%
<b>Expected Return:</b>		<b>45.27%</b>		<b>28.89%</b>	

As the table reveals, GammaFund's expected return would decline from approximately 45% to approximately 29% by agreeing to a \$900 million dollar valuation of NewCo. The reason stems from the fact that at this higher valuation, GammaFund's \$100 million investment would entitle it to only 10% of NewCo's fully-diluted capitalization, whereas at a \$746 million valuation, GammaFund would receive approximately 12% of NewCo equity on a fully-diluted basis. At a \$900 million dollar valuation, GammaFund would accordingly be entitled to a smaller share of the proceeds paid on NewCo Common Stock were it to convert its Series C Preferred Stock. This both raises the acquisition threshold at which GammaFund would convert its preferred stock (from \$846 million to \$1 billion) and reduces GammaFund's share of the acquisition proceeds following any such conversion.

<sup>22</sup> Returns to GammaFund in Table 4 reflect gross returns, taking into account any scenarios where it would be rational for AlphaFund, BetaFund, and GammaFund to convert into Common Stock. Specifically, completing the proposed Series C financing at a \$746 million pre-money valuation would mean that: (a) AlphaFund would convert its Series A Preferred Stock in any acquisition with distributable proceeds of at least \$425 million, (b) BetaFund would convert its Series B Preferred Stock in any acquisition with distributable proceeds of at least \$675 million, and (c) GammaFund would convert its Series C Preferred Stock in any acquisition with distributable proceeds of at least \$846 million. In contrast, if the Series C financing is completed at a \$900 million pre-money valuation, these amounts would be \$425 million, \$675 million, and \$1 billion, respectively. The Appendix describes the methodology used to obtain these conversion points.

The valuation-for-preference theory thus rests on the possibility that Founder might be able to offer sufficiently attractive terms on the Series C Preferred Stock so as to enhance GammaFund's expected return if it invests at a higher valuation. In particular, this can be done by providing for a liquidation preference that enhances the fixed return on the Series C Preferred Stock (i.e., more downside protection) or which allows GammaFund to participate with Common Stock in the sharing of acquisition proceeds (i.e., more upside participation). Critically, because preferred stock preferences will disappear in an IPO following conversion of the Series C Preferred Stock, this bargain will be possible only if GammaFund places a high likelihood on exiting by means of NewCo's acquisition.<sup>23</sup>

Assuming GammaFund does indeed place a high likelihood on an exit by means of an acquisition rather than an IPO, what kind of enhanced liquidation preference should Founder offer? One approach that is simple to implement—and one often speculated to occur in the financial media<sup>24</sup>—would be to improve on the standard VC liquidation preference in step-like fashion. For instance, rather than offering the same liquidation preference given to the Series A and Series B Preferred Stock, Founder might consider offering one of the following:

- A 1X senior liquidation preference (i.e., Series C investors receive their money back before any proceeds are paid on the other preferred stock)
- A 2X liquidation preference
- A 1X liquidation preference + full participation with Common Stock

Using the same acquisition scenarios as above, the proceeds on the Series C Preferred Stock for each of these options would be as follows:

---

<sup>23</sup> In the event GammaFund assumed NewCo would exit by IPO, enhancing the Series C liquidation preference would have little effect on GammaFund's expected returns given that its preferred stock will convert into common stock at the time of an IPO, leaving GammaFund with a simple 10% equity stake in the company.

<sup>24</sup> See, e.g., Frier and Eric Newcomer, *supra* note 3 ("Buried in their corporate filings, startups tuck away all sorts of provisions that reward investors for accepting these mega-valuations... One stipulation, called [a] senior liquidation preference, ensures that a certain group gets its money back before anyone else...."); Cankut's Blog—Thoughts of a VC, *Liquidation Preferences*, available at <http://cdurgun.com/2015/04/liquidation-preferences.html> ("However, rather than simply walk away, I'm increasingly seeing investors offer startups the headline valuation that they want coupled with a high liquidation preference multiple in order to bridge the gap.")

Acquisition Price	Probability	\$900M - 1X Senior Preference		\$900M - 2X Preference		\$900M - 1X + Full Participation	
		Proceeds to Series C	Return	Proceeds to Series C	Return	Proceeds to Series C	Return
\$200,000,000	0.1	\$100,000,000	0.0%	\$123,076,923	23.1%	\$88,888,889	-11.1%
\$400,000,000	0.1	\$100,000,000	0.0%	\$200,000,000	100%	\$124,101,796	24.1%
\$600,000,000	0.1	\$100,000,000	0.0%	\$200,000,000	100%	\$148,152,709	48.2%
\$800,000,000	0.1	\$100,000,000	0.0%	\$200,000,000	100%	\$170,000,000	70.0%
\$1,000,000,000	0.1	\$100,000,000	0.0%	\$200,000,000	100%	\$190,000,000	90.0%
\$1,200,000,000	0.1	\$120,000,000	20.0%	\$200,000,000	100%	\$210,000,000	110.0%
\$1,400,000,000	0.1	\$140,000,000	40.0%	\$200,000,000	100%	\$230,000,000	130.0%
\$1,600,000,000	0.1	\$160,000,000	60.0%	\$200,000,000	100%	\$250,000,000	150.0%
\$1,800,000,000	0.1	\$180,000,000	80.0%	\$200,000,000	100%	\$270,000,000	170.0%
\$2,000,000,000	0.1	\$200,000,000	100.0%	\$200,000,000	100%	\$290,000,000	190.0%
<b>Expected Returns:</b>		<b>30.0%</b>		<b>92.3%</b>		<b>97.1%</b>	

The table reveals several features about using enhanced liquidation preferences to offset the dilution GammaFund would experience from funding NewCo at a higher valuation. First, notwithstanding widespread speculation that unicorn valuations are due to companies' use of senior liquidation preferences, granting GammaFund a senior 1X liquidation preference would have a negligible effect on GammaFund's expected returns at a \$900 million pre-money valuation. In general, assuring GammaFund a return of its investment capital before the Series A and Series B investors only matters in acquisition scenarios where total acquisition proceeds are less than the total proceeds raised in all preferred stock financings. While these scenarios may be a real possibility for a company doing a distressed VC financing, they are far less likely to be a factor for a VC investor considering an investment in a potential unicorn unless the company has raised several hundred million dollars of preferred stock financing.

In contrast, increasing GammaFund's liquidation preference from 1X to 2X has a dramatic effect on GammaFund's expected returns, increasing them to 92.3% from 28.9% in Founder's original proposal for a \$900 million valuation. By receiving a 2X liquidation preference, GammaFund would be assured of a 100% return on its investment for any acquisition valuing the company above \$325 million (i.e., the \$125 million of Series A and B preference + the \$200 million of Series C Preference), accounting for the significant improvement in expected returns. Similarly, keeping the Series C liquidation preference at 1X but granting the Series C Preferred Stock a participation feature would also result in a significant improvement to GammaFund's expected returns at a \$900 million pre-money valuation. In particular, allowing GammaFund to receive its \$100 million liquidation preference and then to participate with Common Stock as if it had converted its Series C Preferred Stock would increase GammaFund's expected return on capital to approximately 97%.

Although these last two forms of enhanced preference would no doubt induce GammaFund to finance NewCo at a \$900 million pre-money valuation, there are at least two reasons to doubt that either Founder or NewCo's existing investors

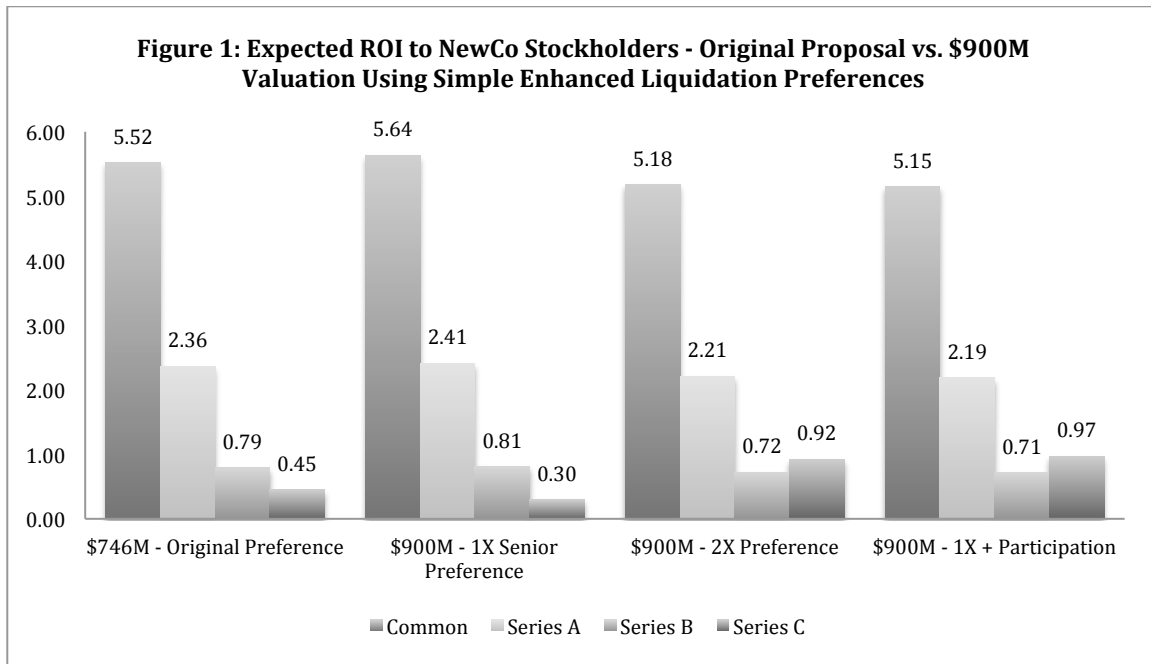
would engage in this simple strategy. First, Table 5 reveals that a simple 2X liquidation preference or a full participation feature works *too* well in terms of incentivizing GammaFund. That is, GammaFund's expected returns increase from 45% in its original proposal to over 90% at a \$900 million pre-money valuation using either form of enhanced liquidation preference.

Second, over-compensating GammaFund in this fashion is likely to be highly objectionable to the company's prior investors given the fact that GammaFund's superior returns must be paid for by reducing the expected returns to all other investors. In this valuation-for-preference story, Founder's proposal to use a \$900 million pre-money valuation does nothing to change the company's likely acquisition scenarios.<sup>25</sup> As a result, any attempt to use enhanced liquidation preferences to increase a new investor's expected returns from its baseline proposal will have the effect of diminishing the expected returns of existing investors. Figure 1, for instance, presents the expected returns to all four categories of NewCo capital stock using the acquisition scenarios of Table 5 and compares GammaFund's original proposal against the three options under consideration. As the figure highlights, any option that increases GammaFund's expected return above 45.27% has the effect of diluting the returns of NewCo's Common Stock and its Series A and B Preferred Stock.<sup>26</sup>

---

<sup>25</sup> To be sure, closing a financing at a billion valuation could in theory change GammaFund's acquisition estimates if turning NewCo into a unicorn came with real marketing benefits, such as enhancing NewCo's ability to attract employees or customers. The possibility of such benefits, however, does nothing to change the overcompensation of GammaFund caused by agreeing to provide GammaFund a simple enhancement of its liquidation preference. Assume, for instance, that Founder believes if NewCo achieves unicorn status each of the acquisition values in Table 5 would be higher by 20%. In such a situation, there would be no need to offer GammaFund an enhanced liquidation preference as GammaFund's expected returns at a \$900 million pre-money valuation would increase to 48% simply using the same terms as were given to the Series A and Series B Preferred Stock. It is only in settings where the theoretical benefits of achieving unicorn status are insufficient by themselves to induce GammaFund to fund at a \$900 pre-money valuation that enhanced liquidation preferences would be a necessary inducement. Using a simple enhancement, however, means that most (if not all) of these theoretical benefits would inure to GammaFund rather than Founder. For example, if Founder believed achieving unicorn status would only increase each value in Table 5 by 5%, issuing Series C Preferred Stock with a 2X liquidation preference and a \$900 million pre-money valuation would take GammaFund's expected returns to 94%, while leaving Founder's expected returns largely the same as under GammaFund's original proposal.

<sup>26</sup> To facilitate visual comparison among stockholders in Figure 1, common stockholders were assumed to have purchased common stock at \$0.50 per share.



In short, using this naïve approach to securing a unicorn valuation is unlikely to be practical for the simple reason that any proposal that is attractive to a new investor is almost certainly going to be objectionable to a company’s existing VC investors and Common Stockholders. Moreover, attempts to diminish these objections through creative deal-structuring are likely to be problematic from a legal perspective given the likelihood that many of the adversely affected stakeholders will have a representative on the company’s board of directors. In the hypothetical, for instance, a variety of changes to the Series C financing could be made to compensate AlphaFund, BetaFund, and Founder for the dilution of their expected returns were NewCo to issue GammaFund shares of Series C Preferred Stock with a 2X liquidation preference or a full participation feature. Among other things, NewCo could issue these stakeholders additional common equity (or options to acquire common stock) or allow them to participate in the Series C financing alongside GammaFund. However, to the extent AlphaFund and BetaFund followed the common practice of securing board representation when they originally invested in NewCo, the presence of a board majority consisting of Founder and directors beholden to AlphaFund and BetaFund could render any future transaction involving the enforcement of these terms legally problematic.<sup>27</sup>

<sup>27</sup> For instance, the Delaware court of chancery has recently held that directors of a company who are designees of VC firms that acquired preferred stock with a senior liquidation preference were deemed to have a material financial interest in any sale of the company in which the preferred stock received its liquidation preference. The same was true for management directors who would receive acquisition proceeds because of a management incentive plan that was approved in the financing for the specific purpose of providing management with an economic incentive to sell the company given the size of the preferred stock liquidation preferences. See *In re Trados Incorporated Shareholder Litigation* 73 A.3d 17 (Del. Ch. 2013). When common stockholders challenged a subsequent sale of the company in which common stock was paid nothing due to these financing terms, the court accordingly reviewed the transaction under the entire fairness standard of review.

While these factors render highly improbable a simple valuation-for-preference strategy, a more nuanced approach could in theory reduce many of these problems. Such a strategy would entail crafting an enhanced liquidation preference that assures GammaFund precisely the same expected return at a \$900 million pre-money valuation as at a \$746 million pre-money valuation. Formally, if (a) we define function  $f(Z_i)$  as the gross proceeds payable to GammaFund as a holder of Series C Preferred Stock in acquisition  $i$  valuing NewCo at amount  $Z_i$ , and (b) we define function  $g(Z_i)$  as the gross proceeds payable to GammaFund as a holder of Common Stock upon conversion of the Series C Preferred Stock in acquisition  $i$ , GammaFund's expected return ( $X$ ) would be calculated as follows assuming the distribution of  $Z_i$  in Table 5:

$$E[X] = \frac{\sum_{i=1}^{10} .1 \times \max\{f(Z_i), g(Z_i)\} - \$100,000,000}{\$100,000,000} \quad (1)$$

As noted previously,  $g(Z_i)$  decreases if GammaFund uses a \$900 million valuation for NewCo, while  $f(Z_i)$  will increase because of an enhanced liquidation preference. Accordingly, assuming GammaFund is risk-neutral, it should be indifferent between valuing NewCo at \$746 million and \$900 million if it receives an enhanced liquidation preference such that the conditional expectation of Gamma's return on investment is the same under either valuation—in other words, where  $E[X | \$746M \text{ valuation}] = E[X | \$900M \text{ valuation}]$ . In the case of NewCo's Series C financing, granting the Series C Preferred Stock a liquidation preference of \$4.19 or giving it participation feature with a cap of \$4.38 would each allow this identity to be satisfied.<sup>28</sup>

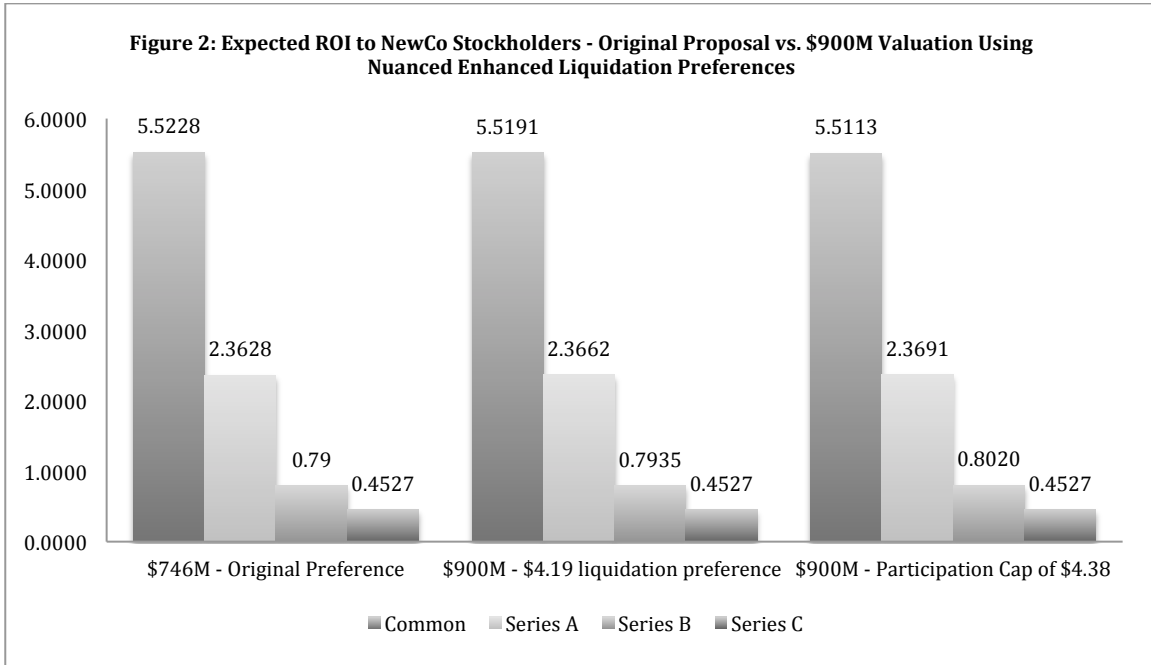
Even this more nuanced approach, however, would no doubt raise a number of practical challenges calling into question its feasibility. For one, while this strategy avoids the problem of over-compensating GammaFund, it does not entirely eliminate the problem of diluting NewCo's existing stockholders. Fundamentally, this nuanced strategy relies on the fact that, while a \$900 million valuation forces a redistribution from GammaFund to prior stockholders at high values of  $Z_i$  (i.e., because it reduces  $g(Z_i)$  relative to a \$746 million valuation), this reduction can be offset by forcing a redistribution of proceeds from NewCo's prior stockholders to GammaFund at lower values of  $Z_i$  (i.e., because of a larger  $f(Z_i)$  relative to a \$746 million valuation). However, the existence of prior stockholders with a fixed liquidation preference will likely ensure that any such redistribution at low values of  $Z_i$  is borne entirely by common stockholders. This result can occur because in acquisition scenarios where prior preferred stockholders take their liquidation preference, any redistribution to GammaFund can only be paid for by reducing the distribution on NewCo's Common Stock.

As such, because NewCo has pre-existing preferred stock with liquidation preferences, this nuanced approach will result in expected returns to common stockholders being less than under GammaFund's original proposal. Figure 2, for

---

<sup>28</sup> These figures were obtained using an Excel liquidation analysis for NewCo created by the author. The model is available upon request.

instance, compares the expected returns to NewCo’s four categories of capital stock in this modified proposal. As the figure highlights, expected returns to common stockholders decline slightly by granting GammaFund a liquidation preference that keeps its expected return constant when financing NewCo at a \$900 million valuation.



While this dilution to NewCo’s Common Stock is admittedly slight, a more important limitation of this approach is the fact that calibrating these liquidation preferences requires GammaFund, Founder, AlphaFund, and BetaFund to have considerable confidence in their estimates of NewCo’s possible acquisition scenarios. Imagine, for instance, that GammaFund’s \$746 million valuation was derived from the following thick-tailed distribution of  $Z_i$  having an expected present value of \$846 million using a 30% discount rate:

Acquisition Value	Probability
\$50,000,000	25%
\$300,000,000	1%
\$550,000,000	1%
\$800,000,000	1%
\$1,050,000,000	8%
\$1,300,000,000	35%
\$1,550,000,000	11%
\$1,800,000,000	8%
\$2,050,000,000	5%
\$2,300,000,000	5%

In such a scenario, setting  $E[X | \$746M \text{ valuation}] = E[X | \$900M \text{ valuation}]$  would entail issuing the Series C Preferred Stock with a liquidation preference of \$5.05 or a participation feature with a cap of \$5.175. However, to the extent NewCo's other stakeholders adhere to the prior distribution of  $Z_i$ , GammaFund's request for either of these preferences will raise the same problem of possible over-compensation of GammaFund discussed in the context of the naïve valuation-for-preference strategy, ensuring objections from NewCo's prior stockholders. As such, any attempt to implement a nuanced form of the valuation-for-preference bargain is certain to implicate considerable transaction costs.

In short, neither the simple nor the nuanced approach to the valuation-for-preference strategy would appear to be an effective means for extracting a higher reported valuation for a company than an investor is willing to use. This conclusion is further supported by a recent analysis by the law firm Fenwick & West of the preferred stock terms of thirty-seven US-based venture-backed companies that raised money at valuations of \$1 billion or more in the 12 month period ending March 31, 2015. Table 7 summarizes the study's findings regarding the use of enhanced liquidation preferences by investors in these firms:<sup>29</sup>

No. of Firms	Median Valuation	% with Liquidation Preference Over Common Stock	% with Senior Liquidation Preference Over Other Series of Preferred Stock	% with Multiple Liquidation Preference	% with Participating Preferred Stock
37	\$1.6 Billion	100%	15%	3%	5%

As the table reveals, the use of either a multiple liquidation preference or participating preferred stock—the two enhancements most likely to boost investors' expected returns relative to a conventional 1X liquidation preference—were rarely used in these companies' financings. Issuing preferred stock to investors with a senior liquidation preference was slightly more common, though still limited to just 15% of the sample. As noted above, this latter term is likely to have a much smaller effect on the ability to incentive an investor to fund at a higher valuation. Notably, the analysis found that 35% of the companies had valuations in the \$1 billion to \$1.1 billion range, suggesting that "attaining a unicorn valuation appears to be a goal of promising companies raising money." The absence of enhanced liquidation preferences, however, would suggest these billion dollar valuations were not obtained from a simple valuation-for-preference strategy but rather from late stage investors' willingness to fund at this value using conventional preferred stock (and possibly with a belief that using a billion valuation could create real value for the company.)<sup>30</sup>

<sup>29</sup> Barry Kramer, Michael Patrick and Nicole Harper, *The Terms Behind the Unicorn Valuations As of March 31, 2015*, available at <https://www.fenwick.com/FenwickDocuments/The-Terms-Behind-The-Unicorn-Valuations.pdf>.

<sup>30</sup> See supra note 25. The Fenwick & West study also examined whether firms in the sample used other forms of enhanced preferred stock preferences such as stronger forms of anti-dilution protection or price protection for low-priced IPOs. Similar to its analysis of liquidation preferences, the study found 100% of the companies had

#### IV. How Liquidation Preferences Shape Investors' Implied Valuations of Start-ups

Although unicorn valuations are unlikely to be the result of a valuation-for-preference bargain, proponents of this theory nevertheless raise a valid concern in questioning the reliability of the valuations reported for unicorn financings. Specifically, these commentators worry that where a company raises money at a billion dollar valuation, it is unlikely to reflect the actual enterprise value of the company. As this Part shows, there is indeed a reason to be skeptical of the valuation reportedly used in a round of VC finance, but the reason has little to do with founders engaged in a valuation-for-preference bargain. On the contrary, the problem with using a VC's nominal valuation as a measure for enterprise value is a general problem that occurs in any financing that uses conventional VC preferred stock—even one that provides for a simple 1X liquidation preference.

To see why, consider again NewCo's Series C financing. Assuming the financing were to close on GammaFund's original terms, NewCo would issue approximately 38.5 million shares of Series C Preferred Stock to GammaFund at a price of \$2.59 per share based on GammaFund's pre-financing valuation of \$746 million. For this reason, NewCo might publicize the closing of the financing, noting that it implies a post-financing valuation for the firm of \$846 million. But such a claim would overstate the post-financing value GammaFund implicitly placed on the company, which would be closer to \$657 million.

How can this be the case given that GammaFund used a stated \$746 million pre-money valuation? The reason relates to the common practice among VC investors to price a preferred stock financing on a fully-diluted basis.<sup>31</sup> Recall from Part III that GammaFund priced NewCo's Series C financing using what is often referred to as the venture capital valuation method.<sup>32</sup> Specifically, GammaFund estimated a future value for NewCo, which it then discounted to present value using an internally-derived hurdle rate. In theory, this discount rate represents GammaFund's opportunity cost of capital. Having derived a value for NewCo in this fashion, GammaFund then used NewCo's fully-diluted capitalization to calculate the Series C price per share. In the event NewCo achieves a successful exit (when all preferred stock is presumably converted to common stock), this pricing method ensures GammaFund will have an equity claim that is proportionate to the economic value it is investing in the financing (here 12%). And in such a scenario, GammaFund would realize a 30% rate of return, in keeping with its use of a 30% discount rate.

---

only standard weighted-average antidilution protection which "provides some, but very limited, protection" and is commonly used in venture capital finance. See, e.g., Patrick and Kramer, *supra* note 12, at 11 (finding that over 95% of all financings that closed between 2013 and 2014 came with weighted-average antidilution protection). The study also found that these companies generally had little protection against low-priced IPOs. For instance, only 14% would receive any form of economic entitlement in the event an IPO was priced lower than the last round of financing.

<sup>31</sup> See, e.g., Brad Feld, *Venture Capital Deal Algebra*, Feld Thoughts, July 7, 2004 available at <http://www.feld.com/archives/2004/07/venture-capital-deal-algebra.html> (noting practice of calculating share price as pre-money valuation / pre-money fully-diluted shares).

<sup>32</sup> See Lerner, *supra* note 20.

This pricing method, however, ignores the possibility that GammaFund will receive instead its fixed liquidation preference in a less successful exit event, which significantly limits GammaFund's downside exposure. Instead, the practice treats GammaFund as if it were willing to purchase 38.5 million shares of NewCo Common Stock for \$100 million, which is obviously not what GammaFund was willing to do. Assessing the "true" value that GammaFund places on NewCo in the financing therefore requires calculating the enterprise value GammaFund implicitly used when it agreed to acquire 38.5 million shares of Series C Preferred Stock for \$100 million.

Calculation of this implied valuation of NewCo can be done using a straightforward application of the Miller-Modigliani irrelevance theorem.<sup>33</sup> According to Proposition I of the theorem, the value of a firm with a complex capital structure must always equal the value of that same firm were it to have an all-common capital structure. As such, estimating the implied value of NewCo in the Series C financing can be accomplished by asking what value GammaFund would have placed on NewCo to receive the same expected return were NewCo to have only common stock in its capital structure. As noted in Part III, GammaFund's original proposal would create an expected return of approximately 45% on its \$100 million investment (i.e., gross proceeds of approximately \$145 million). As such, the pre-money valuation of NewCo would have to be approximately \$657 million in a hypothetical all-Common financing structure for GammaFund to receive the same expected return as in the actual Series C financing.<sup>34</sup> At this valuation, GammaFund would receive an Common Stock equity claim equal to 13.2% of NewCo's outstanding capitalization, entitling GammaFund to 13.2% of any proceeds involving an acquisition of NewCo. Table 8 confirms that based on GammaFund's estimate of NewCo's likely acquisition scenarios, this hypothetical Common Stock equity claim would yield the same expected value as GammaFund's actual purchase of Series C Preferred Stock.

---

<sup>33</sup> Consisting of two propositions, the theorem posits that, under certain conditions such as the absence of taxes and bankruptcy costs, a firm's value is independent of its capital structure. Proposition I of the theorem provides that the value of an unlevered firm must equal the value of a levered firm while Proposition II provides that the return on equity of a levered firm must increase as a function of the firm's debt-to-equity ratio. See Franco Modigliani & Merton H. Miller, *The Cost of Capital, Corporation Finance and the Theory of Investment*, 48 *Am. Econ. Rev.* 261, 277 (1958).

<sup>34</sup> Following the Series C financing, GammaFund expected gross proceeds of \$145 million on its Series C investment. Because the expected (non-discounted) acquisition value was \$1.1 billion million, GammaFund's \$100 million investment would have to yield a common equity claim of 13.2% (i.e., \$145/\$1,100) were NewCo's capital structure limited to common stock. This implies a post-financing valuation of NewCo of \$757 million (i.e., \$100M/.132) and a pre-financing valuation of NewCo of \$657 million (i.e., \$100M/.132 - \$100M).

<b>Table 8: Expected Returns to GammaFund</b>			
<b>Acquisition Value</b>	<b>Probability</b>	<b>Returns from Series C Financing at a \$746M Valuation</b>	<b>Returns from All Common Stock Financing at a \$657M Valuation</b>
\$200,000,000	.1	\$88,888,889	\$26,413,067
\$400,000,000	.1	\$100,000,000	\$52,826,134
\$600,000,000	.1	\$100,000,000	\$79,239,201
\$800,000,000	.1	\$100,000,000	\$105,652,267
\$1,000,000,000	.1	\$118,203,310	\$132,065,334
\$1,200,000,000	.1	\$141,843,972	\$158,478,401
\$1,400,000,000	.1	\$165,484,634	\$184,891,468
\$1,600,000,000	.1	\$189,125,296	\$211,304,535
\$1,800,000,000	.1	\$212,765,957	\$237,717,602
\$2,000,000,000	.1	\$236,406,619	\$264,130,668
<b>Expected Proceeds:</b>		<b>\$145,271,868</b>	<b>\$145,271,868</b>

Even this attempt to infer GammaFund’s implied valuation of NewCo, however, likely overstates GammaFund’s valuation of the company. While Table 8 indicates that expected returns to GammaFund in the two scenarios are equivalent, they present considerably different risks to GammaFund in terms of return volatility; proceeds to GammaFund in the all-common financing scenario have a standard deviation of almost \$80 million—over 50% more than the standard deviation of \$53 million for the proposed Series C financing.

To the extent GammaFund displays any risk aversion, one further adjustment to this hypothetical valuation is therefore required to put the two scenarios on an equal footing. In particular, it is necessary to determine at what valuation GammaFund would invest \$100 million in a hypothetical all-Common NewCo such that its expected utility—rather than expected returns—would be equivalent to the expected utility of its investment in the Series C financing. This can be done using expected utility theory to estimate GammaFund’s expected utility for each financing and the financing’s certainty equivalent (CE).<sup>35</sup> Because a CE represents the amount of risk-free money GammaFund would accept as equivalent to the expected cash flows from a risky investment, any Common Stock financing that possesses a CE equal to the CE of the Series C financing will represent an equivalent investment to GammaFund in light of its risk aversion.

<sup>35</sup> Expected utility theory is the standard economic account of decision making under uncertainty. In general, the theory models an agent’s behavior as maximizing utility rather than simply wealth. To the extent an agent demonstrates risk aversion, expected utility theory assumes the agent’s utility is a concave function of wealth such that large additions to wealth provide less utility than smaller additions to wealth. For this reason, when choosing among a stream of probabilistic cash flows with the same expected value but different distributions of outcomes, a risk averse agent will assess the utility of each possible outcome and choose the option that is greatest in expectation. Given an agent’s utility function, these options can also be evaluated by converting each stream of cash flows into a certainty equivalent, which represents the sum of money an agent with a given utility function would accept in exchange for a stream of risky payments. By preferring the cash flows with the greatest expected utility, a risk averse agent will therefore also be preferring the one with the highest certainty equivalent.

As an illustration, imagine the simple case where GammaFund possesses a negative exponential utility function.<sup>36</sup> In such a setting, the CE for the stream of cash flows expected from the Series C financing would be calculated as follows:

$$CE_{Series\ C} = -R \left[ \ln \left( 1 - \sum_{i=1}^{10} .1 \times \left( 1 - e^{-\frac{\gamma_i}{R}} \right) \right) \right] \quad (2)$$

where  $R$  represents GammaFund's risk tolerance and  $\gamma_i$  represents the gross proceeds payable to GammaFund at each of the ten possible acquisitions  $i$ . Assuming a mild risk tolerance where  $R$  equals \$200 million,<sup>37</sup> equation (2) indicates that GammaFund would be indifferent between receiving \$139.3 million with certainty and receiving the expected cash flows projected from the Series C financing. As such, any Common Stock financing that yields a stream of cash flows  $\gamma_i$  such that its CE is equivalent to \$139.3 million would represent a risk-equivalent opportunity to GammaFund. Using an  $R$  of \$200 million, this would be the case if GammaFund were to invest \$100 million in an all-common NewCo at a pre-money valuation of approximately \$607 million—nearly 20% less than the Series C valuation of \$746 million.<sup>38</sup> This difference between NewCo's implied enterprise value and the stated valuation of the company in the Series C financing only grows as we weaken GammaFund's risk tolerance.<sup>39</sup>

The implications of this analysis naturally have significant consequences for how one should view the valuations reportedly used in a company's preferred stock financing. For outside observers such as 409A valuation firms, investment banks, or potential acquirers attempting to infer enterprise value from a company's last round of financing, it highlights the real possibility that the reported valuation in a financing may in fact be significantly higher than the implied enterprise value

---

<sup>36</sup> A negative exponential utility function is commonly used in modeling investment behavior. See, e.g., Alan Kraus and Gordon Sick, Distinguishing Beliefs and Preferences in Equilibrium Prices, 35 J. Fin. 335 (1989) (modeling security market equilibrium assuming agents possess negative exponential utility). With a negative expected utility function, GammaFund's utility for receiving sum  $X$  would be given by:

$$U(X) = 1 - e^{-\frac{X}{R}}$$

where  $R$  represents GammaFund's risk tolerance and determines how risk-averse an agent is (smaller values of  $R$  represent stronger risk-aversion). Determination of  $R$  is discussed in note 37.

<sup>37</sup> An appropriate  $R$  for an agent is generally obtained by finding the sum of money ( $M$ ) for which the agent is indifferent between playing a binary lottery where the outcome is either receiving \$ $M$  or losing \$ $M/2$ . Given the size of GammaFund's investment, an  $R$  of \$200 million would indicate that GammaFund has mild risk aversion.

<sup>38</sup> Given the distribution of likely acquisition values estimated by GammaFund, calculating the required pre-money valuation of NewCo in this hypothetical all-common financing was accomplished by solving for  $Y$  in the following equation:

$$\$139,300,000 = -R \left[ \ln \left( 1 - \sum_{i=1}^{10} .1 \times \left( 1 - e^{-\frac{100,000,000}{Y+100,000,000} \times \frac{\gamma_i}{R}} \right) \right) \right]$$

where  $Z_i$  represents the total value of each of the ten acquisitions  $i$  anticipated by GammaFund and  $R$  represents GammaFund's risk tolerance.

<sup>39</sup> For instance, decreasing GammaFund's risk tolerance to \$150 million would decrease this valuation to \$587.5 million.

actually used by a VC investor. Moreover, as this example demonstrates, this inflation can occur even with a conventional 1X liquidation preference.

Understanding the implications of this analysis is even more pressing for a company's founders and prior stockholders. In particular, the practice of pricing a financing without regard to the downside protection of a liquidation preference ensures that the enterprise valuation nominally agreed to by a founder and a VC will not in fact be the valuation implicitly used by the VC. Even with a simple 1X liquidation preference, this practice allows a VC investor to have expected returns as if it valued the firm at a discount from this nominal value—a discount that only increases with any enhancement to an investor's downside protections.

The end result is that founders and other common stockholders will experience more dilution from a preferred stock financing than if the transaction were priced at the reported valuation but also accounted for a VC investor's downside protection. In NewCo's Series C financing, for instance, GammaFund could have valued NewCo based on its expected acquisition values, but priced the Series C Preferred Stock such that it accounted for the downside protection of the Series C liquidation preference. In particular, this could have been accomplished if GammaFund purchased \$100 million of Series C Preferred Stock at \$3.09 per share. Given GammaFund's estimate of NewCo's acquisition values, this purchase price would have provided GammaFund with an expected return equal to exactly its .30 hurdle rate rather than an expected return of .45, while expected returns to Common Stock would have been 5.63 rather than 5.52.<sup>40</sup>

In this fashion, founders and common stockholders will be affected by a VC's liquidation preference even if the preference is never triggered in an acquisition. A founder accepting VC financing would accordingly be well-advised to construct her own probability distribution of likely acquisition outcomes to understand better how a VC's requested liquidation preference affects its implicit valuation of the company.

## V. Conclusion

Offering up enhanced liquidation preferences in exchange for a higher valuation in a VC financing is unlikely to be a successful strategy for a founder intent on securing unicorn status for a company. Simple attempts to tack on additional enhancements such as multiple liquidation preferences or a participation feature will likely result in considerable dilution in expected returns to common stockholders. Likewise, more nuanced attempts to calibrate liquidate preferences to minimize this dilution implicate seemingly intractable transaction costs, while not entirely eliminating the problem of dilution to common stockholders.

The recent controversy over unicorn valuations does, however, highlight a more general problem with relying on the firm values reportedly used in VC financings in light of the common use of preferred stock having downside protections. Anticipating success, VCs routinely ignore these protections when pricing a financing, even as they shape a VC's expected investment returns. Yet by

---

<sup>40</sup>The financial model used to calculate this price per share is available from the author upon request.

pricing deals without explicit regard to these protections, VC investors place implied enterprise values on their portfolio companies that are likely to be significantly less than the nominal valuations reported in the transaction. For founders and prior stockholders, understanding how even conventional downside protections affect investors' expected returns is therefore critical for understanding how a VC investor is implicitly valuing a start-up and the dilution founders and prior stockholders will experience in a proposed financing.

**Appendix:**  
**Methodology for Obtaining Preferred Stock Conversion Points**

Calculating the first conversion point among  $i$  series of non-participating, convertible preferred stock can be accomplished using the following equation for each series of preferred:

$$\frac{Preference_i}{CS_i} = \frac{X - (Total\ Preference - Preference_i)}{Common\ Stock + CS_i}$$

where  $Preference_i$  represents the aggregate liquidation preference payable on all shares of series  $i$ ,  $CS_i$  represents the total number of shares of Common Stock issuable upon conversion of Series  $i$ ,  $Total\ Preference$  represents the dollar value of all liquidation preferences owed on all shares of Preferred Stock, and  $Common\ Stock$  represents the number of shares of Common Stock actually outstanding.

Solving for  $X$  in the equation yields the acquisition value at which series  $i$  would convert into Common Stock if no other series converted. Accordingly, finding the lowest  $X$  among  $i$  series of preferred stock represents the lowest acquisition price at which any series of preferred stock will convert. Accounting for this conversion point, iterating this process can yield the full set of conversion points for the remaining series of preferred stock. For instance, the next highest conversion point can be determined by repeating this general procedure for the series of preferred stock that has the next lowest conversion point and accounting for the fact that (in any acquisition at that conversion point) the prior series will have already elected to convert into Common Stock thereby eliminating its liquidation preference and increasing  $Common\ Stock$ .

All acquisition analyses in this chapter rely on this methodology (with slight adjustments to account for participation features, as appropriate) implemented in a liquidation analysis model created by the author. The model is available upon request.