

## VENTURENOMICS: ADJUSTING FOR THREE STANDARD PRACTICES MAY REDUCE VENTURE-BACKED COMPANY PRE-MONEY VALUATIONS BY 90%

*Jeff Thomas\**

### I. Introduction

Vic is trying to buy some of your pizza. He says, “I’ll give you \$3 for three of the ten slices.” His \$1 a slice offer infers your entire pizza is worth \$10 in its current state. But, what if your pizza really has just eight slices instead of ten? Further, what if the five slices Vic is not buying are inedible until you complete a substantial amount of additional work? Specifically, what if those five remaining slices are currently only 25% complete because they lack toppings and still need to be cooked (even though Vic’s three slices are full of toppings and ready to eat)? Finally, what if each of Vic’s three slices comes with a free beer while the other five slices do not? It would seem absurd if people knew these conditions existed and yet still valued your pizza, today, at \$10 simply because of Vic’s \$1 per slice offer. If Vic is paying \$3 for three edible slices with beer, the five remaining (and currently inedible) slices with no beer must be worth less than \$1 per slice and the whole eight-slice pizza, in its current state, is certainly worth much less than \$10.

Recent valuations attributed to venture-backed companies are shocking. For example, in 2013, the median “pre-money valuation”<sup>1</sup> of a company raising its first round of venture capital (or, its “Series A” round)<sup>2</sup> was reported at \$9.4 million.<sup>3</sup> Some

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\* Jeff Thomas is the Chair of the School of Business at Johnson & Wales University in Charlotte, NC. He also serves on the Board of Directors of Queen City Forward, an accelerator for social ventures. He has extensive experience in counseling entrepreneurial ventures through law firms and law school clinics in Chicago and Silicon Valley.

<sup>1</sup> A “pre-money valuation” is the value of a company prior to the round of the investment. *See infra* Section II.

<sup>2</sup> *See, e.g., Explanation of Certain Terms Used in Venture Financing Terms Survey*, FENWICK & WEST LLP (Oct. 4, 2013), <http://www.fenwick.com/publications/pages/explanation-of-certain-terms-used-in-venture-financing-terms-survey.aspx> (defining “‘Series’ of Preferred Stock” as “[w]hen a company raises venture capital . . . [t]he shares sold in the first financing are usually designated ‘Series A,’ the second ‘Series B,’ the third ‘Series C’ and so forth”).

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commentators are concerned that there is a venture capital bubble.<sup>4</sup> Make no mistake; this Article does not question the wisdom of venture capitalists or suggest that they are paying too much for stock. While it may be possible that investors are overpaying, this Article illustrates how the valuations causing concern are mathematically unsound and misleading. This is because the “VC Math” used to value venture-backed companies ignores the economic impact of three standard practices.<sup>5</sup> First, VC Math treats a company’s unissued, and even non-existing, stock options as outstanding shares of stock.<sup>6</sup> Second, VC Math ignores the fact that much of a company’s common stock, and options to purchase common stock, have not yet been earned.<sup>7</sup> Third, VC Math values a share of common stock and a share of convertible preferred stock equally, despite the fact a share of convertible preferred stock is worth more.<sup>8</sup> This Article is not the first article to point out that VC Math is broken.<sup>9</sup> However, this Article considers the cumulative effect that these three standard practices have on valuations calculated using VC Math. Moreover, a formula is presented that can be used to adjust VC Math amounts for these practices.<sup>10</sup> Using the formula, and considering quantitative norms for each of the three practices, this Article estimates the pre-money valuation of a typical company raising its Series A round in 2013 to be \$981,200 (or, 10.4% of \$9.4 million).<sup>11</sup>

## II. VC Math 101

When venture capitalists (VCs) value a company, they consider the amount they will invest in the company as well as the percentage ownership they will receive.<sup>12</sup> “Pre-money valuation” and “post-money valuation” refer to “the valuations put on the company *before* and *after* the investment,” respectively.<sup>13</sup> To determine these amounts,

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<sup>3</sup> *U.S. VC Valuations & Trends: 2014 Annual Report*, PITCHBOOK DATA, INC. 7 (last visited Oct. 28, 2014), [http://pitchbook.com/2014\\_Annual\\_US\\_VC\\_Valuations\\_and\\_Trends\\_Report.html](http://pitchbook.com/2014_Annual_US_VC_Valuations_and_Trends_Report.html) [hereinafter PITCHBOOK ANNUAL REPORT].

<sup>4</sup> *See, e.g.*, Kimberly Weisul, *VC Investment Reaches Highs Not Seen Since Dot-Com Bubble*, INC. (Apr. 10, 2014), <http://www.inc.com/kimberly-weisul/venture-investment-reaches-highs-not-seen-since-dot-com-bubble.html> (“[V]enture capital data is also making it harder to argue that we’re not in some sort of bubble.”).

<sup>5</sup> *See infra* Section IV.

<sup>6</sup> *See infra* Section IV.A.

<sup>7</sup> *See infra* Section IV.B.

<sup>8</sup> *See infra* Section IV.C.

<sup>9</sup> *See, e.g.*, Michael A. Woronoff & Jonathan A. Rosen, Practitioner Note, *Effective vs Nominal Valuations in Venture Capital Investing*, 2 N.Y.U. J.L. & BUS. 199, 200 (2005) (“The focus on the nominal pre-money and post-money value and ownership percentage, though common, is misguided.” (footnote omitted)).

<sup>10</sup> *See infra* Section V.

<sup>11</sup> *See id.*

<sup>12</sup> *See, e.g.*, CONSTANCE E. BAGLEY & CRAIG E. DAUCHY, *THE ENTREPRENEUR’S GUIDE TO BUSINESS LAW* 445 (3d ed. 2008).

<sup>13</sup> *Id.* (emphasis added).

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VCs use the following formulas<sup>14</sup>:

Formula 1: Post-Money Valuation = VC Investment Amount / Ownership % Acquired

Formula 2: Pre-Money Valuation = Post-Money Valuation – VC Investment Amount

For example, if a VC is going to invest \$4,000,000 into New Co, Inc. (New Co) and VC will own 40% of New Co immediately after the financing, Formula 1 indicates that New Co's post-money valuation is \$10,000,000 (or, \$4,000,000/40%). Moreover, Formula 2 indicates that New Co's pre-money valuation is \$6,000,000 (or, \$10,000,000 - \$4,000,000). These items can also be expressed in terms of shares<sup>15</sup>:

Formula 3: Post-Money Valuation = New Share Price x Total Shares

Formula 4: Pre-Money Valuation = New Share Price x Old Shares

For example, if VC will pay \$1.00 for each New Co share and there will be 10,000,000 Total Shares immediately after the financing, Formula 3 indicates that New Co's post-money valuation will be \$10,000,000 (or, \$1.00 New Share Price \* 10,000,000 Total Shares).<sup>16</sup> Moreover, if VC will acquire 40% of New Co, VC will acquire 4,000,000 New Shares (or, 40% \* 10,000,000 Total Shares) resulting in 6,000,000 Old Shares (or, 10,000,000 Total Shares - 4,000,000 New Shares). Per Formula 4, New Co's pre-money valuation is \$6,000,000 (or, \$1.00 New Share Price \* 6,000,000 Old Shares).<sup>17</sup>

VC Math typically uses “fully-diluted” capitalization tables when calculating pre-money and post-money valuations.<sup>18</sup> For a company raising its Series A round, this means

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<sup>14</sup> See, e.g., William A. Sahlman, *The Basic Venture Capital Formula*, Harvard Business School Background Note 9-804-042, at 3 (May 13, 2009).

<sup>15</sup> See *id.*

<sup>16</sup> Alternatively, if the post-money valuation has already been established, one can back into the New Share Price or Total Shares amount once a value is set for one of those items. For example, if New Co's post-money valuation and Total Shares amount are \$10,000,000 and 10,000,000, respectively, Formula 3 can be used to deduce that the New Share Price is \$1.00 (or, \$10,000,000/10,000,000 Total Shares).

<sup>17</sup> Alternatively, if the pre-money valuation has already been established, one can back into the New Share Price or Old Shares amount once a value is set for one of those items. For example, if New Co's pre-money valuation and New Share Price are \$6,000,000 and \$1.00, respectively, Formula 4 can be used to deduce that New Co has 6,000,000 Old Shares (or, \$6,000,000/\$1.00 New Share Price).

<sup>18</sup> See, e.g., *Term Sheet*, NATIONAL VENTURE CAPITAL ASSOCIATION 2 (June 2013), [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)

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that the Total Shares amount is broadly defined to include all: (i) New Shares that VC is acquiring in the current financing;<sup>19</sup> (ii) outstanding shares of common stock; (iii) shares of common stock that can be acquired with options already issued under the company's option pool (or, "issued options");<sup>20</sup> (iv) shares of common stock that can be acquired with options still available for *future* grants under the company's option pool (or, "unissued options");<sup>21</sup> and (v) shares of common stock that can be acquired by outstanding warrants (if any).<sup>22</sup> Because the New Shares that VC is acquiring represents the only difference between the Total Shares and Old Shares amounts, the Old Shares include items (ii) through (v).

### III. VC Math Amounts for a Representative 2013 Series A Co

As previously stated, the median pre-money valuation of a company raising its Series A round in 2013 has been reported at \$9.4 million.<sup>23</sup> Further, the median investment amount for a Series A financing in 2013 has been reported at \$4.2 million.<sup>24</sup> Given these two amounts, VC Math can be used to calculate other amounts for a "Representative 2013 Series A Co." For example, Formula 2 infers a post-money valuation of \$13.6 million (or, \$9.4 million + \$4.2 million) and Formula 1 can be used to deduce the investing VC acquired 30.88235% (or, \$4.2 million/\$13.6 million) of the Representative 2013 Series A Co when purchasing New Shares. Therefore, the remaining 69.11765% (or, 100% - 30.88235%) of ownership is attributed to the Old Shares. Using the post-money valuation of \$13.6 million, and assuming 10,000,000 Total Shares,<sup>25</sup>

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[hereinafter *NVCA Term Sheet*] (demonstrating that the New Share Price, pre-money valuation, and post-money valuation are based on a fully-diluted capitalization table and that an option pool will represent a certain percentage of the company's fully diluted *post*-money capitalization table).

<sup>19</sup> On a converted to common stock basis (holders of convertible preferred stock have the option of converting their shares to common stock (typically) at an initial ratio of 1:1; however, the ratio is subject to adjustments (i) for stock dividends, splits, combinations and similar events and (ii) pursuant to the anti-dilution provisions granted to the convertible preferred stock. *See, e.g., NVCA Term Sheet, supra* note 18, at 4).

<sup>20</sup> Note that other phrases such as "granted options" or "options no longer available for grant" or "allocated options" or "allocated shares" may also be used to describe an option pool's issued options.

<sup>21</sup> Note that other phrases such as "ungranted options" or "options available for grant" or "unallocated options" or "unallocated" may also be used to describe an option pool's unissued options.

<sup>22</sup> *See, e.g., NVCA Term Sheet, supra* note 18, at Exhibit A. Moreover, see *infra* Section VI for consideration of the Old Shares including Series Seed stock, which will typically acquire the same rights as the Series A stock (once the Series A stock is issued).

<sup>23</sup> *See* PITCHBOOK ANNUAL REPORT, *supra* note 3, at 7.

<sup>24</sup> *See id.* at 5.

<sup>25</sup> For illustrative purposes, this article assumes 10,000,000 Total Shares which results in a New Share Price of \$1.36. However, once the pre-money valuation and VC investment amount are known (and thus ownership percentages can be calculated), an infinite combination of Total Shares and New Share Price amounts could be assumed. That is, if we would like to assume a different Total Shares amount, we would simply need to make a corresponding adjustment to the New Share Price (or vice versa). For example, if

Formula 3 can be used to deduce a New Share Price of \$1.36 (or, \$13.6 million/10,000,000 Total Shares). Because VC acquires 30.88235% of the Total Shares, VC acquires 3,088,235 New Shares (or, 10,000,000 Total Shares \* 30.88235%) resulting in 6,911,765 Old Shares (or, 10,000,000 Total Shares - 3,088,235 New Shares). Formula 4 can also be used to deduce a New Share Price of \$1.36 (or, \$9.4 million/6,911,765 Old Shares). These amounts are summarized in Table 1.<sup>26</sup>

**Table 1:** Representative 2013 Series A Co – VC Math Amounts

ITEM	VC Math Amount
Pre-Money Valuation	\$9,400,000
VC Investment Amount	\$4,200,000
Post-Money Valuation	\$13,600,000
Ownership NOT Acquired by VC	69.11765%
Ownership Acquired by VC	30.88235%
Old Shares	6,911,765
New Shares	3,088,235
Total Shares	10,000,000
New Share Price	\$1.36

we assumed 5,000,000 Total Shares (and given the post-money valuation of \$13.6 million), Formula 3 deduces a New Share Price of \$2.72 (or, \$13.6 million/5,000,000 Total Shares). Because VC's ownership interest is still 30.88235% (or, \$4.2 million/\$13.6 million), VC would own 1,544,117.5 New Shares (or, 5,000,000 Total Shares \* 30.88235%) resulting in 3,455,882.5 Old Shares (or, 5,000,000 Total Shares - 1,544,117.5 New Shares). Using Formula 3, the post-money valuation still equals \$13.6 million (or, \$2.72 New Share Price \* 5,000,000 Total Shares). Further, using Formula 4, the pre-money valuation still equals \$9.4 million (or, \$2.72 New Share Price \* 3,455,882.5 Old Shares).

<sup>26</sup> Formulas 1 through 4 can also be used to illustrate VC Math amounts for the Representative 2013 Series A Co:

Formula 1: Post-Money Valuation = VC Investment Amount / Ownership % Acquired

$$\$13.6 \text{ million} = \$4.2 \text{ million} / 30.88235\%$$

Formula 2: Pre-Money Valuation = Post-Money Valuation – VC Investment Amount

$$\$9.4 \text{ million} = \$13.6 \text{ million} - \$4.2 \text{ million}$$

Formula 3: Post-Money Valuation = New Share Price x Total Shares

$$\$13.6 \text{ million} = \$1.36 * 10,000,000 \text{ shares}$$

Formula 4: Pre-Money Valuation = New Share Price x Old Shares

$$\$9.4 \text{ million} = \$1.36 * 6,911,765 \text{ shares}$$

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#### IV. VC Math Does Not Add Up Because It Disregards Three Standard Practices

While venture backed companies may differ from each other in certain ways,<sup>27</sup> they are all likely to follow three well-established practices. First, venture backed companies use option pools to attract, motivate, retain and compensate employees.<sup>28</sup> Second, venture backed companies require founders and other employees to earn their equity ownership through a concept referred to as vesting.<sup>29</sup> Third, venture backed companies leverage a two-class equity system whereby founders and other employees are issued common stock, or options to purchase common stock, while VCs are issued convertible preferred stock.<sup>30</sup> This section provides background information for each of these practices. Relevant quantitative norms for venture backed companies raising their Series A round are also provided for each practice. Further, the Representative 2013 Series Co A is revisited to illustrate how the VC Math amounts provided in Table 1 should be adjusted to account for the economic impact of these practices.

##### A. Option Pools

###### 1. Background Information

At a typical venture backed company, founders are issued common stock upon the company's formation and subsequent employees are issued options to purchase common stock, instead of common stock itself.<sup>31</sup> Options entitle employees to purchase shares from an "option pool."<sup>32</sup> Option pools are approved by the venture backed company's board of directors and stockholders.<sup>33</sup> Options act like a coupon, giving employees the

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<sup>27</sup> For example, venture-backed companies may offer different products and services.

<sup>28</sup> See *infra* Section IV.A.

<sup>29</sup> See *infra* Section IV.B.

<sup>30</sup> See *infra* Section IV.C.

<sup>31</sup> See, e.g., BAGLEY & DAUCHY, *supra* note 12, at 89–90 (“At the formation stage of the business and for some time thereafter, it is usually best to issue stock outright [to founders] rather than to use stock options. . . . As the company matures and the value of the stock increases, stock options are used extensively to allow employees and others the opportunity to participate in the growth of the business without putting up cash . . . .”); GUIDE TO STARTING A CORPORATION, FENWICK & WEST LLP 6 (Apr. 22, 2009), [http://www.fenwick.com/FenwickDocuments/2009\\_Guide\\_Starting\\_Corp.pdf](http://www.fenwick.com/FenwickDocuments/2009_Guide_Starting_Corp.pdf) [hereinafter FENWICK CORPORATION GUIDE] (“A common initial [capital] structure is to authorize 10 million shares of common stock . . . [with] about 3-5 million shares issued [to founders] and about 1-2 million shares reserved in the [option pool].”).

<sup>32</sup> Note that other phrases such as “equity incentive plan” or “employee stock pool” or “employee plan” or “stock option plan” or “employee stock plan” or “stock plan” may be used to describe an option pool.

<sup>33</sup> Orrick, Herrington & Sutcliffe LLP provides examples of related forms including a: (i) Stock Plan; (ii) Board Approval of Stock Plan; and (iii) Stockholder Approval of Stock Plan. See *Start-Up Forms: Equity Compensation*, ORRICK, HERRINGTON & SUTCLIFFE LLP, <http://www.orrick.com/Practices/Emerging-Companies/Startup-Forms/Pages/Forms-Compensation.aspx>

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right to purchase shares of the company's common stock at a set price for a set period of time.<sup>34</sup> That is, options allow employees to share in a company's increase in value, without requiring them to actually purchase stock from the outset.<sup>35</sup> Thus, options are often used to attract, motivate, retain and compensate employees.<sup>36</sup> VC Math's Total Shares amount includes shares covered by an option pool's *issued* and *unissued* options.<sup>37</sup> However, it is widely accepted that, by including *unissued* options in the Total Shares, VCs acquire a larger *true* ownership percentage of a company resulting in VC Math valuations being overstated.<sup>38</sup> Moreover, VCs routinely condition their investments on companies increasing their amount of unissued options prior to the investment<sup>39</sup> thereby

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(last visited Jun. 22, 2014) [hereinafter ORRICK EQUITY COMPENSATION].

<sup>34</sup> A company's employees can be granted more favorably taxed incentive stock options which must, among other things, have exercise price of at least 100% of the fair market value of the underlying stock at the date of issuance and a maximum duration of 10 years; however, individuals typically have only one to three months after termination of service to exercise their options. *See, e.g.*, BAGLEY & DAUCHY, *supra* note 12, at 92, 314.

<sup>35</sup> For example, assume New Co would like to hire a Diane as an employee. To entice Diane to join its team, New Co offers to issue Diane an option to purchase 400,000 shares of New Co's common stock for \$0.11 a share. The \$0.11 "exercise price" equals the fair market value of the New Co common stock on the date the option is issued. Thus, once hired, Diane has an economic incentive to work hard and help increase New Co's stock price. If we assume New Co's stock price increases to \$15.11 per share, and that Diane exercises her option to purchase all 400,000 shares for \$44,000 (or, \$0.11 per share \* 400,000 shares), she would receive economic value of \$6,044,000 (or, \$15.11 per share \* 400,000 shares) and an economic gain of \$6,000,000 (or, \$6,044,000 of economic value less the \$44,000 of exercise price she must pay).

<sup>36</sup> *See e.g.*, ORRICK EQUITY COMPENSATION, *supra* note 33 (under "Stock Plan," it reads: "[m]any companies use employee stock options to compensate, retain, and attract employees."); Meghan Casserly, *Understanding Employee Equity: Every Startup's Secret Weapon*, FORBES.COM (Mar. 8, 2013, 5:30 PM), <http://www.forbes.com/sites/meghancasserly/2013/03/08/understanding-employee-equity-bill-harris-sxsw/>

<sup>37</sup> Assume that when New Co initially adopted its option pool, 1,000,000 shares of common stock were "reserved" for option issuances to future employees. After issuing Diane an option for 400,000 shares, New Co would have *unissued* options for 600,000 shares (or, 1,000,000 total shares reserved – 400,000 shares covered by the option issued to Diane). Even though unissued options for 600,000 shares can be issued to attract and motivate future New Co employees, all 1,000,000 shares reserved under the option pool would be included in the Total Shares.

<sup>38</sup> *See, e.g.*, Fred Wilson, *Valuation and Option Pool*, AVC (Nov. 6, 2009), <https://avc.com/2009/11/valuation-and-option-pool/>; Brad Feld, *Term Sheet: Price*, FELDTHOUGHTS (Jan. 3, 2005), <http://www.feld.com/wp/archives/2005/01/term-sheet-price.html>.

<sup>39</sup> This is done by requiring the companies to increase the size of their option pools. For example, assume that VC would like to invest in New Co but believes New Co needs additional shares in its option pool in order to attract and motivate employees it will need to grow in the coming years. Specifically, assume VC insists New Co's option pool represent 20% of 10,000,000 Total Shares. Thus, VC will condition its investment in New Co on New Co increasing the size of its option pool to 2,000,000 shares. Assuming VC is acquiring 4,000,000 shares and that New Co's option pool *previously* covered 1,000,000 shares, increasing the size of the option pool to 2,000,000 shares gives VC the ability to say VC is only acquiring 40% (or, 4,000,000 New Shares/10,000,000 Total Shares) of New Co instead of 44.44% (or,

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further increasing the *true* ownership percentage that VCs acquire and further overstating VC Math valuations.<sup>40</sup> In order to determine a company's *true current value*, one should back out unissued options as of the date of the financing.

### 2. *Quantitative Norms for Companies Raising Their Series A Round*

For a typical company that just completed its Series A round, the option pool will represent approximately 15% of its fully-diluted capital and approximately 76% of the options in the option pool will be unissued.<sup>41</sup> Thus, immediately *after* a Series A financing, unissued options will represent approximately 11.4% (or, 15% \* 76%) of the Total Shares.<sup>42</sup>

### 3. *Adjustments to VC Math Amounts for the Representative 2013 Series A Co*

Assuming options that have not yet been (and may never be) issued to anyone make up 11.4% of the Representative 2013 Series A Co's fully diluted capital immediately after the Series A financing, only 88.6% of the VC Math Total Shares (or, 8,860,000 Total Shares) are legitimate when considering the company's *current* value. That is, the VC Math Total Shares are overstated by 1,140,000 shares (or, 11.4% \* 10,000,000 Total Shares) that *might* be acquired by options that *might* be issued in the future to employees but are, nevertheless, *currently* unissued options. Moreover, none of this overstatement will be reflected in the New Shares amount, since that amount represents shares VC purchases in the financing. Instead, the entire 11.4% reduction to the Total Shares amount must come out of the Old Shares amount. Making this adjustment results in VC really acquiring 34.85593% (or, 3,088,235 New Shares/8,860,000 Total Shares) of the Representative 2013 Series A Co for the \$4.2 million investment thereby reducing the company's post-money and pre-money

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4,000,000 New Shares/9,000,000 Total Shares).

<sup>40</sup> See, e.g., Jim Brenner, *Option Pools: What's Market in the "New Normal,"* in THE ENTREPRENEURS REPORT, PRIVATE COMPANY FINANCING TRENDS (WILSON SONSINI GOODRICH & ROSATI ), Q4 2012, <http://www.wsg.com/publications/PDFSearch/EntrepreneursReport-Q4-2012.pdf> [hereinafter WSGR REPORT] ("In almost all cases, new investors require a company to increase the size of its option pool as part of the pre-money valuation prior to the financing . . . [the] increase in the option pool effectively reduces the pre-money valuation of the company . . .").

<sup>41</sup> See *id.* at 9. ("The average size of the post-Series A total option pool that we examined was 15.9% of fully diluted capital and the median size was 14.5% . . . . It is also useful to note that immediately following the Series A financing, an average of approximately 24% of the stock options in the plan already had been granted."). I (conservatively) round down from 15.9% to 15%.

<sup>42</sup> This 11.4% amount is also consistent with the WSGR REPORT'S average (12.06%) and median (10.56%) percentages of options available for grant following the Series A round. See *id.* at 11. Moreover, 11.4% is consistent with Fred Wilson's reported experiences. See Wilson, *supra* note 38 ("In most of the early stage financings I've done in the past few years this work on the option pool has shown a need for around 10% in unissued options. I've seen it as big as 15% but that is rare. I've also seen it as low as 5%, but that is even more rare.").

valuations to \$12,049,600 (or, \$4.2 million/34.85593%) and \$7,849,600 (or, \$12,049,600 - \$4.2 million), respectively. Further, the percent of ownership not acquired by VC becomes 65.14407% (or, 100% - 34.85593%). These amounts are summarized in the right column of Table 2.

**Table 2:** Representative 2013 Series A Co – VC Math Amounts Including Adjustments for Unissued Options (Unissued Os)

ITEM	VC Math Amount	<i>Adjusted for:</i> Unissued Os
Pre-Money Valuation	\$9,400,000	\$7,849,600
VC Investment Amount	\$4,200,000	\$4,200,000
Post-Money Valuation	\$13,600,000	\$12,049,600
Ownership NOT Acquired by VC	69.11765%	65.14407%
Ownership Acquired by VC	30.88235%	34.85593%
Old Shares	6,911,765	5,771,765
New Shares	3,088,235	3,088,235
Total Shares	10,000,000	8,860,000
New Share Price	\$1.36	\$1.36

## B. Vesting

### 1. Background Information

Through a process referred to as vesting, founders must earn their shares of common stock and other employees must earn their options to purchase shares of common stock.<sup>43</sup> Vesting typically occurs when the individual holding the option or stock continues to be employed by the company over a specific period of time.<sup>44</sup> A typical vesting schedule for an employee option occurs monthly over four years, with the right to purchase the initial 25% of the shares covered by the option vesting when the employee has been employed by the company for 12 months.<sup>45</sup> Most founders will commence

<sup>43</sup> See, e.g., Bo Yaghmaie, *Vesting: A Founder's Need to Earn Equity*, ENTREPRENEUR (Jan. 27, 2014), <http://www.entrepreneur.com/article/231044> (“Vesting is absolutely standard in venture deals. It is predicated on the notion that the founding and management teams must earn their equity by contributing to value creation through so-called ‘sweat equity,’ or hard work.”).

<sup>44</sup> BAGLEY & DAUCHY, *supra* note 12, at 94.

<sup>45</sup> See, e.g., John Bautista, *What Entrepreneurs Need to Know about Founders' Stock*, THINK BIG. MOVE FAST. (Sep. 15, 2008), <http://lsvp.com/2008/09/15/what-entrepreneurs-need-to-know-about->

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vesting the date they start providing services to the company, even if that date is prior to the company's date of incorporation.<sup>46</sup> Moreover, because a founder acquires common stock, as opposed to an option, vesting is accomplished by the issued stock being subject to a contractual "repurchase option" at cost (which is often a nominal value) in favor of the company.<sup>47</sup> The repurchase option will then lapse, usually monthly over a four-year period, as the founder provides services to the company.<sup>48</sup> VC Math's Total Shares amount includes all outstanding common stock and issued and unissued options, whether vested or not.<sup>49</sup> However, employees have not yet earned (and thus do not yet *truly* own) the right to purchase shares covered by their unvested options.<sup>50</sup> Similarly, founders have not yet earned (and thus do not yet *truly* own) their unvested stock.<sup>51</sup> By including the

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founders-stock/ (noting that the first year of vesting is referred to as "cliff vesting").

<sup>46</sup> *See id.*

<sup>47</sup> *See, e.g.,* Yaghmaie, *supra* note 43; *Common Stock Purchase Agreement (with Vesting)*, ORRICK, HERRINGTON & SUTCLIFFE LLP 1, <http://www.orrick.com/Events-and-Publications/Documents/1951.pdf> (last visited Jun. 23, 2014).

<sup>48</sup> *See, e.g.,* FENWICK CORPORATION GUIDE, *supra* note 31, at 8 ("The corporation typically retains the option to repurchase unvested shares at the initial purchase price at the time of termination of a shareholder's employment. Vesting usually occurs over 4 years, i.e., if the employee remains employed by the corporation for the entire period, all shares become 'vested' and the repurchase option ends.").

<sup>49</sup> *See supra* note 22 and accompanying text.

<sup>50</sup> For example, assume Diane is issued an option to purchase 400,000 shares of New Co common stock for \$0.11 a share and she will be able to purchase 100,000 shares (or, 25% \* 400,000 shares) after her one-year anniversary at New Co and an additional 8,333 and 1/3 shares (or, 100,000 shares/12 months) at the end of each of the next 36 months thereafter. Thus, if Diane leaves New Co immediately after her three-year anniversary, she will be able to purchase 300,000 shares (or, 100,000 shares after the initial 12 months + (8,333 and 1/3 shares per month \* 24 additional months)). If the stock is valued at \$10.11 a share at the time of her three-year anniversary, Diane would have an economic gain of \$3,000,000 (or, \$3,033,000 worth of stock - \$33,000 of exercise price she must pay). However, by departing New Co immediately after her three-year anniversary, Diane would "lose out" on \$1,000,000 of additional appreciation to date (or, \$1,011,000 worth of unvested options - the \$11,000 exercise price she would have to pay) because her right to purchase the remaining 100,000 shares had not vested prior to her departure.

<sup>51</sup> For example, assume that: (i) Sam is the founder of New Co which was incorporated on January 2, 2013; (ii) Sam started working on New Co-related business on January 2, 2013; (iii) Sam acquired 4,000,000 shares of New Co common stock for \$0.001 per share on January 2, 2013 (for a total of \$4,000); (iv) as a condition to investing in October 2013, VC required Sam's shares to become subject to a repurchase option, at cost, in favor of New Co; (v) the repurchase option will lapse, and thus Sam's shares will vest monthly over a four-year period commencing as of January 2, 2013; (vi) despite New Co's success in 2013, Sam quit New Co on January 3, 2014; and (vii) on January 3, 2014, New Co's stock was valued at \$2.00 per share. Upon Sam's departure, New Co would exercise its repurchase option and buy back Sam's unvested shares for \$3,000 (or, 3,000,000 shares x \$0.001 per share) even though those shares would then be worth \$6,000,000 (or, 3,000,000 shares x \$2.00 per share). Thus, while Sam had purchased all 4,000,000 shares on January 2, 2013, it seems as though he does not *truly* own 3,000,000 of those shares on January 3, 2014 since he must allow New Co to repurchase those shares at a \$5,997,000 discount (from their value) on that date. Instead, it seems as though Sam *truly* owns only his vested stock (that is, the 1,000,000 shares that are no longer subject to the repurchase option on January 3, 2014).

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unvested options and stock in the Total Shares, VCs (again) acquire a larger *true* ownership percentage of a company resulting in VC Math valuations being (further) overstated. In order to determine a company's *true current value*, one should back out unvested options and shares as of the date of the financing.

### 2. *Quantitative Norms for Companies Raising Their Series A Round*

For a typical company that just completed its Series A round, it is unlikely that more than 25% of the company's issued common stock has vested.<sup>52</sup> It is also unlikely that more than 25% of the issued options have vested at the time of the Series A financing.<sup>53</sup>

### 3. *Adjustments to VC Math Amounts for the Representative 2013 Series A Co*

Because it is unlikely that more than 25% of the Representative 2013 Series A Co's issued options and common stock have vested at the time of the Series A financing, the Total Shares and Old Shares amounts are likely to be significantly overstated. Specifically, if all of the Representative 2013 Series A Co's Old Shares are represented by common stock or options to purchase common stock held by founders and other employees, only 25% of the Old Shares amount, *after* being adjusted for unissued options, is legitimate when considering the company's *current* value (since the remaining shares, or the options to purchase them, by definition, have not yet been earned).<sup>54</sup> Thus, the issued and vested Old Shares amount becomes 1,442,941 shares (or, 5,771,765 issued Old Shares \* 25% vested) and the Total Shares amount becomes 4,531,176 shares (or, 1,442,941 Old Shares + 3,088,235 New Shares). This means VC really acquires 68.15526% (or, 3,088,235 New Shares /4,531,176 Total Shares) of the Representative 2013 Series A Co for its \$4.2 million investment thereby further reducing the company's post-money and pre-money valuations to \$6,162,400 (or, \$4.2 million/68.15526%) and \$1,962,400 (or, \$6,162,400 - \$4.2 million), respectively. Moreover, the percent of ownership not acquired by VC becomes 31.84474% (or, 100% - 68.15526%). These amounts are summarized in the right column of Table 3.

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<sup>52</sup> See, e.g., Yaghmaie, *supra* note 43 ("The range of credit that venture investors are willing to give a founder tends to fall somewhere between 10 to 25% . . . ."); Bautista, *supra* note 45 ("In Orrick's experience, venture capitalists require that at least 75% of founders' stock remain subject to vesting over the three or four years following the date of Series A investment.").

<sup>53</sup> This is because, by definition, founders have been at a company the longest. Thus, subsequent employees (who receive options) would have experienced less vesting.

<sup>54</sup> See *infra* Section VI for a discussion of when Old Shares are represented by Series Seed stock or other shares that will have the same rights as the New Shares being acquired by VC.

**Table 3:** Representative 2013 Series A Co – VC Math Amounts Including Adjustments for Unissued Options (Unissued Os) and Unvested Options and Common Stock (Unvested Os/CS)

ITEM	VC Math Amount	<i>Adjusted for:</i>	
		Unissued Os	Unissued Os & Unvested Os/CS
Pre-Money Valuation	\$9,400,000	\$7,849,600	\$1,962,400
VC Investment Amount	\$4,200,000	\$4,200,000	\$4,200,000
Post-Money Valuation	\$13,600,000	\$12,049,600	\$6,162,400
Ownership NOT Acquired by VC	69.11765%	65.14407%	31.84474%
Ownership Acquired by VC	30.88235%	34.85593%	68.15526%
Old Shares	6,911,765	5,771,765	1,442,941
New Shares	3,088,235	3,088,235	3,088,235
Total Shares	10,000,000	8,860,000	4,531,176
New Share Price	\$1.36	\$1.36	\$1.36

## C. The Two-Class Equity System

### 1. Background Information

While founders and other employees will hold common stock and options to purchase common stock, VCs will hold convertible preferred stock.<sup>55</sup> In fact, convertible preferred stock is “practically the exclusive means of external financing for U.S. venture capital-backed companies.”<sup>56</sup> By holding convertible preferred stock, VCs will have rights and preferences generally not given to holders of common stock.<sup>57</sup> The most popular of these rights and preferences are in respect to the earnings or assets of a company.<sup>58</sup> However, virtually any combination of rights and preferences is possible.<sup>59</sup> In

<sup>55</sup> See, e.g., BAGLEY & DAUCHY, *supra* note 12, at 87.

<sup>56</sup> Ronald J. Gilson & David M. Schizer, *Understanding Venture Capital Structure: A Tax Explanation for Convertible Preferred Stock*, 116 HARV. L. REV. 874, 879 (2003).

<sup>57</sup> See, e.g., Woronoff & Rosen, *supra* note 9, at 206.

<sup>58</sup> *Id.* Also, for an example of the value of such rights and preferences, assume that: (i) Sam and VC are New Co’s two stockholders; (ii) Sam purchased 4,000,000 shares of New Co common stock for \$0.001 per share on January 2, 2013 (for a total of \$4,000); (iii) all of Sam’s shares have since vested; (iv) VC purchased its 4,000,000 shares of Series A convertible preferred stock in October 2013 for \$1.00 per share (for a total of \$4,000,000); (v) the Series A convertible preferred stock has a “1x” liquidation preference, entitling VC to recoup “1 times” its original purchase price before any proceeds from a New

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addition to responding to control and other concerns associated with startups, granting unique rights and preferences to convertible preferred stock minimizes the tax on employee incentive compensation.<sup>60</sup> This is because companies are able to sell (i) convertible preferred stock at a relatively high price to VCs and (ii) common stock at a relatively low price to employees.<sup>61</sup> If VCs purchased stock at the same (relatively low) price employees pay, employees would quickly be diluted and would thus lose motivation when companies raise external capital since raising significant funds from VCs would require issuing too many New Shares relative to the number of Old Shares.<sup>62</sup> On the other hand, if employees were required to purchase stock at the same (relatively high) price

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Co liquidation are distributed to common stockholders; (vi) after selling all of its assets and paying off of its debts, New Co has \$5,000,000; and (vii) New Co plans to distribute all of the sale proceeds to its stockholders. Even though Sam owns 50% of New Co's nominal shares, VC's 1x liquidation preference entitles VC to \$4,000,000 (or, 80% of the sale proceeds) leaving Sam with just \$1,000,000 (or, 20% of the sale proceeds). VC's convertible preferred stock may also have full "participation rights" which entitle VC to share any amounts remaining, after payment of the liquidation preference, with the holders of common stock (as if the VC had converted its stock to common stock). If this was the case, VC would receive 50% of the \$1,000,000 remaining after VC's \$4,000,000 liquidation preference is paid. Further, this would result in VC receiving \$4,500,000 (or, 90% of the proceeds) and Sam receiving \$500,000 (or, 10% of the proceeds).

<sup>59</sup> See, e.g., *NVCA Term Sheet*, *supra* note 18, at 2–12 (providing that rights and preferences granted to the Series A convertible preferred stock may include: (a) a liquidation preference – which may entitle a VC to recoup its entire investment amount (or more), upon the sale or dissolution of a company, before common stockholders receive any of the proceeds from the sale or winding-up process; (b) participation rights – which may entitle a VC to a portion of any amounts remaining after the payment of the liquidation preference, upon the sale or dissolution of a company; (c) control rights – which may entitle a VC to designate board members and benefit from certain contractual protective provisions (such as certain veto rights); (d) conversion rights – which give a VC the right to convert its convertible preferred stock to common stock, when it is advantageous for VC to do so; (e) anti-dilution protections – which may favorably adjust a VC's conversion price (the price at which VC's stock converts to common stock) if shares are subsequently issued for less than the price VC paid for its shares; (f) redemption rights – which may entitle a VC to have its shares repurchased by the company at a multiple of the VC's original purchase price; (g) registration rights – which may entitle a VC to have its stock registered with the Securities and Exchange Commission, at the company's expense; (h) management and information rights – which may provide a VC with access to a company's facilities as well as ongoing financial reports and information; (i) right to participate pro rata in future rounds – which may entitle a VC to participate in subsequent issuances of the company's securities; (j) right of first refusal – which may entitle a VC to purchase shares of stock the company's founders are proposing to sell to someone else; (k) right of co-sale (or take-me-along or tag-along rights) – which may entitle a VC to join in on a proposed sale of stock by a founder to someone else; (l) drag along rights – which may allow a VC and the company's board of directors to force all stockholders to sell their shares of company; and (m) a preferred dividend – which may entitle a VC to a specific amount of dividends before any dividends are paid to common stockholders (and may increase the amount VC is entitled to upon the liquidation of the company or redemption of VCs shares)).

<sup>60</sup> See e.g., Gilson & Schizer, *supra* note 56, at 877.

<sup>61</sup> BAGLEY & DAUCHY, *supra* note 12, 64–65, 87, 89–91 and 149.

<sup>62</sup> See *id.*

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VCs pay, employees may not be able to afford enough shares to become motivated.<sup>63</sup> Further, issuing identical stock at two different prices, on or around the same date, would create tax issues.<sup>64</sup> Having two classes of stock can address these issues. As one Silicon Valley law firm puts it:

At a minimum, the [convertible] preferred stock gives investors a liquidation preference in the event the company fails or is acquired. In addition, [VCs] usually obtain certain other preferential rights over the holders of common stock. From your company's point of view, these preferences justify a fair market value differential between the [convertible] preferred stock and common stock. This enables your company to sell common stock to your employees at a lower price than is paid by [VCs].<sup>65</sup>

VC Math values Old Shares, which include common stock and options to purchase common stock, at the New Share Price. However, as discussed above, shares of common stock are intentionally worth less than the shares of convertible preferred stock VC acquires at the New Share Price. By valuing common stock at an inflated price, VC Math (further) overstates valuations. In order to determine a company's *true current value*, the company's Old Shares (that are represented by common stock and options to purchase common stock) must be appropriately priced.

## 2. *Quantitative Norms for Companies Raising Their Series A Round*

For a typical company that just completed its Series A round, a share of its common stock will be priced at approximately 10% to 50% of the price of a share of its convertible preferred stock.<sup>66</sup> For years, venture backed companies valued their common

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<sup>63</sup> *See id.*

<sup>64</sup> *See id.* Also, for an example of how the 2-class system may increase incentive compensation, assume VC purchased 4,000,000 shares of New Co's Series A convertible preferred stock in October 2013 for \$1.00 per share (for a total of \$4,000,000). Assume further that Diane was hired by New Co immediately after the Series A financing in October 2013 and granted an incentive stock option to purchase 400,000 shares of New Co's common stock. If there are no bona fide differences between New Co's common stock and its Series A convertible preferred stock, the exercise price for Diane's options must be set at least \$1.00 per share since VC's investment supports a \$1.00 per share fair market value at that time. However, if New Co's convertible preferred stock has unique rights and preferences, it will be more valuable than New Co's common stock. Thus, by utilizing two classes of stock New Co justifies common stock having a fair market value of less than \$1.00 per share at the time Diane's option is granted. Therefore, the exercise price for Diane's options could be set at less than \$1.00 per share thereby increasing her incentive compensation.

<sup>65</sup> VENTURE CAPITAL FOR HIGH TECHNOLOGY COMPANIES, FENWICK & WEST LLP 13 (2010), [http://www.fenwick.com/FenwickDocuments/venture\\_capital\\_final\\_2010.pdf](http://www.fenwick.com/FenwickDocuments/venture_capital_final_2010.pdf) [hereinafter FENWICK VC GUIDE].

<sup>66</sup> *See, e.g.,* ERIC KOESTER, WHAT EVERY ENGINEER SHOULD KNOW ABOUT STARTING A HIGH-TECH BUSINESS VENTURE 273 (2009) ("A typical price differential between preferred and common stock for an

stock at 10% of the price of their convertible preferred stock being sold at or around the same time.<sup>67</sup> However, Section 409A of the Internal Revenue Code recently increased the need for diligence when valuing common stock.<sup>68</sup> This is because Section 409A and its regulations require the value of a private company's stock to "be determined, based on the company's own facts and circumstances, by the application of a reasonable valuation method."<sup>69</sup>

### 3. *Adjustments to VC Math Amounts for the Representative 2013 Series A Co*

Even if we assume the high end of the "10% to 50%" range referenced above, the Representative 2013 Series A Co's common stock is worth \$0.68 per share (or, 50% \* \$1.36 New Share Price) at the time of the Series A financing.<sup>70</sup> Because there are 1,442,941 Old Shares, after adjusting for unissued options and unvested options and common stock, the value of the Old Shares and thus pre-money valuation is \$981,200 (or, \$0.68 per share \* 1,442,941 Old Shares).<sup>71</sup> Further, since VC is investing \$4.2 million, the Representative 2013 Series A Co's post-money valuation is \$5,181,200 (or, \$981,200 + \$4,200,000). Thus, while VC acquires 68.15526% of the Representative 2013 Series A Co's issued and vested shares (or, 3,088,235 New Shares/4,531,176 Total Shares), VC

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early stage company would be between approximately 2:1 and 10:1, respectively (this price or value differential is just a rule of thumb and is due to the additional rights provided to the preferred stock, including the liquidation preferences, voting rights, participation rights, and veto powers.); FENWICK VC GUIDE, *supra* note 65, at 2, 16 ("Employees continue to buy common stock at a fraction of the price paid by outside investors [and the convertible preferred stock to common stock] price differential starts at 10 to 1 and then declines as the company nears an IPO or acquisition. . . . It is typical for early stage companies (though not approved by the IRS) to establish a fair market value for common stock for such employee plans with a range of 10 to 20 percent of the most recent value of the preferred stock.").

<sup>67</sup> See e.g., Gilson & Schizer, *supra* note 56, at 900 n.86 (referring to the "ten-to-one rule" whereby employees common stock is valued at 10% of the price paid by VCs for convertible preferred stock as a "market practice").

<sup>68</sup> See, e.g., FENWICK CORPORATION GUIDE, *supra* note 31, at 7.

<sup>69</sup> See, e.g., Yoichiro Taku, *How do you set the exercise price of stock options to avoid Section 409A issues?* STARTUP COMPANY LAWYER (Jan. 1, 2009), <http://www.startupcompanylawyer.com/2009/01/01/how-do-you-set-the-exercise-price-of-stock-options-to-avoid-section-409a-issues/> (citing the CEO of a boutique valuation company stating that "the fair market value of the common stock of a typical early stage technology company is at least around 25% to 30% of the last round preferred stock price" and stating that "[t]he old rule of thumb that the option exercise price could be 10% of the preferred stock price is not valid").

<sup>70</sup> Alternatively, if we assume the low end of the "10% to 50%" range, the Representative 2013 Series A Co's common stock would be worth \$0.136 per share (or, 10% \* \$1.36 New Share Price) at the time of the Series A financing. Because there are 1,442,941 Old Shares, after adjusting for unissued options and unvested options and shares, the value of the Old Shares, and thus the pre-money valuation, would be \$196,240 (or, \$0.136 per share \* 1,442,941 Old Shares).

<sup>71</sup> This assumes all Old Shares are common stock or options to purchase common stock. See *infra* Section VI for when Old Shares are represented by Series Seed stock or other shares that will have the same rights as the New Shares being acquired by VC.

actually acquires 81.06230% (or, \$4,200,000/\$5,181,200) of the company's *true current value* and thus economic ownership. Again, this is because a share of convertible preferred stock is more valuable than a share of common stock. This also results in 18.93770% (or, 100% - 81.06230%) of the Representative 2013 Series A Co's true current value (and thus true economic ownership) not being acquired by VC. These amounts are summarized in the right column of Table 4.

**Table 4:** Representative 2013 Series A Co – VC Math Amounts Including Adjustments for Unissued Options (Unissued Os), Unvested Options and Common Stock (Unvested Os/CS) and Mispriced Common Stock (Mispriced CS)

ITEM	VC Math Amount	<i>Adjusted for:</i>		
		Unissued Os	Unissued Os & Unvested Os/CS	Unissued Os, Unvested Os/CS & Mispriced CS
Pre-Money Valuation	\$9,400,000	\$7,849,600	\$1,962,400	\$981,200
VC Investment Amount	\$4,200,000	\$4,200,000	\$4,200,000	\$4,200,000
Post-Money Valuation	\$13,600,000	\$12,049,600	\$6,162,400	\$5,181,200
Ownership NOT Acquired by VC	69.11765%	65.14407%	31.84474%	18.93770%
Ownership Acquired by VC	30.88235%	34.85593%	68.15526%	81.06230%
Old Shares	6,911,765	5,771,765	1,442,941	1,442,941
New Shares	3,088,235	3,088,235	3,088,235	3,088,235
Total Shares	10,000,000	8,860,000	4,531,176	4,531,176
New Share Price	\$1.36	\$1.36	\$1.36	\$1.36
Old Share Price	N/A	N/A	N/A	\$0.68

## V. Formula to Apply the IVY Adjustments to VC Math Pre-Money Valuations

Companies raising their first round of venture capital can use the following formula to adjust VC Math pre-money valuations for the three standard practices examined above:

$$\text{PreM}_{\text{ADJ}} = \text{PreM}_{\text{VCM}} * I * V * Y$$

Where:

- PreM<sub>ADJ</sub> is the pre-money valuation adjusted for the three standard practices
- PreM<sub>VCM</sub> is the pre-money valuation using VC Math
- I is the percent of Old Shares already *issued*
- V is the percent of issued Old Shares already *vested*
- Y is the *yield* (or ratio) of the fair market value of a share of common stock to the New Share Price

Per Section IV, the Representative 2013 Series A Co's amounts for I, V and Y are as follows<sup>72</sup>:

$$\begin{aligned} I &= 83.5063836 \\ V &= 25\% \\ Y &= 50\% \end{aligned}$$

Thus, given the Representative 2013 Series A Co's PreM<sub>VCM</sub> equals \$9.4 million,<sup>73</sup> its PreM<sub>ADJ</sub> equals \$981,200. This is calculated as follows<sup>74</sup>:

<sup>72</sup> Per Section IV.A.2, unissued options will represent 11.4% of the 10,000,000 Total Shares. This results in 1,140,000 *unissued* Old Shares (or, 11.4% \* 10,000,000 Total Shares) and 5,771,765 *issued* Old Shares (or, 6,911,765 *total* Old Shares - 1,140,000 *unissued* Old Shares). Moreover, 5,771,765 *issued* Old Shares equals 83.5063836% of the *total* Old Shares (or, 5,771,765 *issued* Old Shares/6,911,765 *total* Old Shares). See *supra* Sections IV.B.3 and IV.C.3 for calculation of V and Y.

<sup>73</sup> PITCHBOOK ANNUAL REPORT, *supra* note 3.

<sup>74</sup> While currently unissued and unvested Old Shares may become issued and vested shares in the future, the economic rights that may eventually be represented by those shares have not yet materialized. Moreover, the economic value that may eventually be attributed to those shares still needs to be created. In the case of unissued shares, future employee-option holders may still need to be identified, recruited and hired. In the case of unvested shares, future work still needs to be performed. See *supra* note 43. While improving a team and completing work may increase a company's economic value, simply designating shares for a future team or future work does not. If it did, merely increasing the size of a company's option pool would increase the company's valuation. While VC Math supports such an increase in valuation, this is problematic. See *supra* note 38. Thus, unissued and unvested Old Shares should not be factored into current valuations.

$$\text{PreM}_{\text{ADJ}} = \text{PreM}_{\text{VCM}} * I * V * Y$$

$$\text{PreM}_{\text{ADJ}} = \$9.4 \text{ million} * 83.5063836\% * 25\% * 50\%$$

$$\text{PreM}_{\text{ADJ}} = \$981,200$$

To the extent these values for I, V and Y are correct for different companies raising their Series A round, a particular company's  $\text{PreM}_{\text{ADJ}}$  would equal approximately 10% of its  $\text{PreM}_{\text{VCM}}$ .<sup>75</sup> However, as the right column of Table 5 illustrates, the  $\text{PreM}_{\text{ADJ}} / \text{PreM}_{\text{VCM}}$  ratio will change as values for I, V and Y change.

**Table 5:** Ratios of Adjusted Pre-Money Valuations to VC Math Pre-Money Valuations (Where  $\text{PreM}_{\text{VCM}}$  equals \$9.4 million and Different Values are Assumed for I, V and Y)

<i>Assuming:</i>					
$\text{PreM}_{\text{VCM}} =$	I =	V =	Y =	$\text{PreM}_{\text{ADJ}} =$	$\text{PreM}_{\text{ADJ}} / \text{PreM}_{\text{VCM}} =$
\$9,400,000	80%	10%	10%	\$75,200	0.80%
\$9,400,000	85%	15%	25%	\$299,625	3.19%
\$9,400,000	90%	25%	33%	\$697,950	7.43%
\$9,400,000	100%	33%	50%	\$1,551,000	16.50%

## VI. Considering Series Seed and Other Convertible Preferred Stock

Until now, this Article has assumed that all of the Old Shares are represented by common stock and options for common stock. While this may be the case for some companies raising their first round of venture capital, other companies may have issued "Series Seed" stock to friends, family members, angel investors or "seed round VCs" prior to raising their Series A round.<sup>76</sup> Because Series Seed stock is fully-vested and will typically acquire the same rights and preferences as Series A convertible preferred stock

<sup>75</sup> Specifically, 10.4382979% (or, 83.5063836% x 25% x 50%). However, as a company grows and time passes, one would expect V to increase since founders and employees will have remained longer at the company. Moreover, Y should also increase since companies will be closer to an acquisition or IPO. See *supra* note 66 and accompanying text.

<sup>76</sup> See, e.g., FENWICK VC GUIDE, *supra* note 65, at 10 ("Some founding teams with strong track records can raise venture capital without a business plan or a product prototype. Most people, however, find it necessary to seek a small amount of "seed" money from friends, relatives, angels or 'seed round' venture capitalists."). However, while Series Seed (preferred) stock may be used to raise seed capital, many companies will instead issue convertible notes to raise such funds. See, e.g., Paul Graham, Tweet, TWITTER (Aug. 27, 2010, 7:29 PM), <https://twitter.com/paulg/status/22319113993> ("Convertible notes have won. Every investment so far in this YC batch (and there have been a lot) has been done on a convertible note.").

(once the Series A financing occurs),<sup>77</sup> the percentage of Old Shares represented by Series Seed stock should not be adjusted for I, V or Y. Thus, the  $PreM_{ADJ}$  formula becomes:

$$PreM_{ADJ} = (PCS * (PreM_{VCM} * I * V * Y)) + (PPS * PreM_{VCM})$$

Where:

PCS is the percent of Old Shares represented by common stock and options to purchase common stock

PPS is the percent of Old Shares represented by Series Seed stock (and other stock that will have the same rights as the New Shares)<sup>78</sup>

Assuming that a company's Series Seed stock represents 20% of its Old Shares,<sup>79</sup> and using Section IV's amounts for I, V and Y (83.5063836%, 25% and 50%, respectively), the company's  $PreM_{ADJ}$  equals \$2,664,960 (or, 28.35% of the \$9.4 million amount). This is calculated as follows:

<sup>77</sup> See, e.g., *Series Seed - Term Sheet*, SERIESSEED.COM 1 (Feb. 25, 2014), <http://www.seriesseed.com/files/series-seed---term-sheet-v-3-2.doc> (stating under "Future Rights" that "[t]he Series Seed will be given the same rights as the next series of Preferred Stock (with appropriate adjustments for economic terms)" upon conversion).

<sup>78</sup> If a company raises later rounds of venture capital and all of its convertible preferred stock will end up having the same rights and preferences, the company's convertible preferred stock outstanding immediately prior to the later round would be included in the PSS figure. For example, if a company raises is raising its Series B round and the Series B stock will have the same rights and preferences as its (previously issued) Series A stock, the company's Series A stock would be included in the PSS figure. Because the Series A stock would be fully-vested and have the same rights and preferences as the Series B stock (given our assumption), the percentage of Old Shares represented by the Series A stock should not be adjusted for I, V or Y.

<sup>79</sup> This assumption of 20% is consistent with Fenwick & West LLP's illustrative financing scenarios. See, e.g., FENWICK VC GUIDE, *supra* note 65 (providing two scenarios whereby Seed investors hold: (i) 14.2857143% (or, 1,000,000 Series Seed shares) of what would constitute the pre-Series A Old Shares (or, 4,250,000 founder shares + 1,750,000 employee shares + 1,000,000 Series Seed shares) of a company with a highly successful team (*see id.* at 20); or (ii) 21.0526316% (or, 1,000,000 Series Seed shares) of what would constitute the pre-Series A Old Shares (or, 2,000,000 Founder Shares + 1,750,000 Employee Shares + 1,000,000 Seed Shares) of a company with a less experienced team (*see id.* at 21)). This assumption of 20% is also consistent with PitchBook data. See PITCHBOOK ANNUAL REPORT, *supra* note 3 (stating that, for 2013: (i) \$5.1 million was the median pre-money valuation for companies raising their Series Seed round (*see id.* at 7); and (ii) \$1.5 million was the median amount raised in the Series Seed round (*see id.* at 5)). Using VC Math, Series Seed investors would own 22.727% (or, \$1.5 million / (\$5.1 million + \$1.5 million)) of the median company's shares immediately after the Series Seed round. However, the 22.727% amount would likely decrease due to VCs conditioning their Series A investment on the company increasing its number of unissued options (and thus its number of Old Shares) prior to the Series A round. See *supra* note 40 and accompanying text.

$$\text{PreM}_{\text{ADJ}} = (\text{PCS} * (\text{PreM}_{\text{VCM}} * \text{I} * \text{V} * \text{Y})) + (\text{PPS} * \text{PreM}_{\text{VCM}})$$

$$\text{PreM}_{\text{ADJ}} = (80\% * (\$9,400,000 * 83.5063836\% * 25\% * 50\%)) + (20\% * \$9,400,000)$$

$$\text{PreM}_{\text{ADJ}} = (80\% * \$981,200) + (20\% * \$9.4 \text{ million})$$

$$\text{PreM}_{\text{ADJ}} = \$2,664,960$$

## VII. Conclusion

While recent valuations attributed to venture backed companies may be shocking, the VC Math used to calculate the valuations is flawed. This is because VC Math: (i) treats unissued, and even non-existing, stock options as outstanding shares of stock; (ii) ignores the fact that much of the common stock and options to purchase common stock have not yet been earned; and (iii) values common stock and convertible preferred stock equally despite the fact that convertible preferred stock was intentionally created to be worth more. The cumulative effect of disregarding these three standard practices is substantial. As this Article illustrates, pre-money valuations calculated using VC Math may be overstated by 10X for companies raising their first round of venture capital. While this should be surprising, what seems more bizarre is the fact that so many intelligent people use VC Math formulas that ignore the existence and impact of three practices they helped make standard. Perhaps more sophisticated investors are taking advantage of less sophisticated entrepreneurs.<sup>80</sup> Alternatively, perhaps overstated valuations just make everyone feel better. Regardless, this Article encourages and empowers people to adjust VC Math amounts to better reflect the economic impact of these practices.

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<sup>80</sup> See, e.g., Woronoff & Rosen, *supra* note 9, at 225 (noting that “[e]xperienced venture capitalists are acutely aware of the economic value of the rights and preferences of the stock they agree to buy” (alteration in original) (quoting CONSTANCE E. BAGLEY & CRAIG E. DAUCHY, *THE ENTREPRENEUR’S GUIDE TO BUSINESS LAW* 472 (2d ed. 2003)) and concluding that “many Founders apparently are not so aware of the economic effects of these non-price terms at the time of the initial investment.”).