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UNDERSTANDING ANTI-DILUTION PROVISIONS IN CONVERTIBLE SECURITIES

Michael A. Woronoff and Jonathan A. Rosen*

INTRODUCTION

Anti-dilution provisions are designed to protect holders of convertible securities against dilution from a large variety of corporate events, including, among others, stock dividends and splits, cheap issuances of additional common stock, and distributions of cash or property. These provisions are complex and can have significant economic consequences; yet they have been subject to little systematic thought. Even the most

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1. For example, imagine a security that is initially convertible into a single share of common stock. If the issuer effects a two-for-one stock split (doubling the number of shares outstanding), and no adjustment is made to the number of shares delivered upon conversion, all else being equal, the value of the convertible security is cut in half. See infra Part III.A. Of course, all else is hardly ever equal, which causes much of the difficulty discussed in this Article.

2. Stanley A. Kaplan, Piercing the Corporate Boilerplate: Anti-Dilution Clauses in Convertible Securities, 33 U. Chi. L. Rev. 1, 3 (1965) (“Customary anti-dilution clauses are long and complex, presenting intricate problems of draftsmanship which may often deter penetrating examination.”).

3. See, e.g., infra Appendix A; see also Stephen I. Glover, Solving Dilution Problems, 51 Bus. Law. 1241, 1242 (1996) (“[T]he scope of the dilution protection included in equity rights documents can have a significant impact on value . . . .”)

experienced practitioners often poorly understand how common anti-dilution provisions work. This lack of understanding is partially due to the complexity of these provisions,\textsuperscript{5} exacerbated by their mathematical nature, which is off-putting to many lawyers.\textsuperscript{6}

As a result, many practitioners mechanically rely on precedent without examining the consequences of using provisions that make sense in one context but not in another.\textsuperscript{7} Indeed, anti-dilution provisions are often rigorously examined only after they have been triggered, generally when an issuer is not succeeding and, as a consequence, tensions (and emotions) are heightened.\textsuperscript{8}

The dearth of analysis is somewhat surprising, given that convertible securities have been widely used for over half a century,\textsuperscript{9} and commentators have long recognized the need for a clearly articulated theory to understand these clauses.\textsuperscript{10} As Professor David Ratner has noted, "Any presentation

\textsuperscript{5} Kahan, supra note 4, at 147 ("Technical and complex, these anti-dilution provisions are often misunderstood...").

\textsuperscript{6} While this is an anecdotal observation, it is a commonly held view. See, e.g., Stay of Execution, http://civpro.blogs.com/civil_procedure/2004/01/index.html (Jan. 23, 2004) ("I'm not ready to generalize about the size or composition of this group, but I've observed that there is some subset of lawyers who, I think, chose the law perhaps partly because of a fear of math."); see also Howard Darmstadter, The Arithmetical Lawyer, Bus. L. Today, Nov.-Dec. 2000, at 16, 16. When one of the authors of this Article submitted a much less complex explanation of anti-dilution provisions to Business Law Today (the American Bar Association's bi-monthly periodical for business lawyers), one of the editorial comments that came back was that the article had too many formulae, and that the editor suspected that if the magazine's readers were interested in math, they would not have become lawyers.

\textsuperscript{7} See, e.g., Glover, supra note 3, at 1242 ("The lawyers...often simply insert a copy of the antidilution provisions included in their most recent transaction without determining whether modifications are necessary. As a result, it is not uncommon to find antidilution provisions that simply do not make sense in the context of the particular transaction at issue."); see also Kaplan, supra note 2, at 3 ("I have seen attorneys prepare convertible securities by cutting anti-dilution clauses from instruments of other companies and pasting them into the instruments being prepared...").

\textsuperscript{8} See, e.g., Walter Kuemmerle, Note on Antidilution Provisions: Typology and a Numerical Example (Harvard Bus. Sch., Case No. 9-805-024, 2004) ("Some entrepreneurs begin to understand the full scope of such provisions only after accepting the financing, when their venture turns south. Often such a late awakening causes additional stress in a situation that is not easy for the entrepreneur and venture capitalist in the first place."); see also Broadwin, supra note 4, at 27-28.

\textsuperscript{9} Kaplan, supra note 2, at 2 n.3.

\textsuperscript{10} Id. at 5.
which helps to clarify the basic problems and the relevant choices in this arcane subject is welcome."  

Despite the desirability of doing so, commentators have had difficulty in formulating a theory that can reconcile the variance among the many types of anti-dilution clauses. This Article contends that the scope and extent of different types of anti-dilution provisions can generally be understood as a rational response to the nature and level of the information barriers and agency costs typically confronted in particular circumstances, and the existence or absence of other mechanisms to address these issues.

Viewing anti-dilution provisions in this light can provide significant insight into the design, benefits, and flaws of various anti-dilution provisions. For example:

- Information barriers exist at the time the investment in the convertible security is initially made, and increase the risk that the investor will overvalue the enterprise. These barriers are typically severe for private companies and low for large public companies, because the existence of well-established and highly liquid markets generally ensures that all relevant information is reflected in the market price of the stock of large public companies. Thus, one would expect to see anti-dilution provisions that protect against the risks from information barriers primarily in convertible securities.

11. Ratner, supra note 4, at 494.
12. Kaplan, supra note 2, at 5.
13. Information barriers may take one of several forms. Information asymmetries exist when one party (here, the issuer of the convertible security) cannot credibly convey information to another (the investor). George G. Triantis, Financial Contract Design in the World of Venture Capital, 68 U. Chi. L. Rev. 305, 307 (2001). This condition creates a difference of opinion regarding valuation of the underlying security, as each party forms a valuation expectation from the information it has available. In this case, anti-dilution provisions allow the parties to bridge the resulting valuation gap. Alternatively, neither party may have sufficient information to have a fully informed opinion regarding valuation of the enterprise. See Ronald J. Gilson, Engineering a Venture Capital Market: Lessons from the American Experience, 55 Stan. L. Rev. 1067, 1076-77 (2003). In this case, uncertainty is said to exist and anti-dilution provisions shift the risk that both parties may have overvalued the enterprise at the time of investment.
14. Agency costs "arise when one party (the 'agent') can make decisions regarding the use of another party's (the 'principal's') money, and where the interests of the two parties conflict." Michael Klausner & Kate Litvak, What Economists Have Taught Us About Venture Capital Contracting 4 (Stanford Law Sch. John M. Olin Program in Law and Econ., Working Paper No. 221, 2001), available at http://papers.ssrn.com/abstract=280024. These costs are even more severe in the context of convertible securities, where the agent has more than one class of principal with conflicting interests.
15. Dilution arising from information barriers essentially occurs at the time the investment in the convertible security is made and dilution arising from agency costs occurs at the time of the subsequent action. Thus, different mechanisms are needed to protect against these different sources of dilution.
16. See, e.g., Broadwin, supra note 4, at 28.
issued by private companies (and smaller public companies with thin trading markets).

- Agency costs are imposed at the time of the dilutive event, and the risk of incurring these costs exists whether the convertible securities are issued by public or private companies. Thus, one would expect to see protections against agency costs in convertible securities issued by both public and private companies.

- Anti-dilution protection is often the only logical way to protect against the risks presented by information barriers, but is one of many ways to minimize the risks of agency costs. Consequently, one would expect to see anti-dilution provisions used more uniformly to protect against risks from information barriers.

The remainder of this Article is divided into three parts. Part I describes the different circumstances in which convertible securities are used. Part II examines the nature of different types of dilution to determine exactly what it is investors seek (or should seek) to protect against. Part III explores some common anti-dilution adjustments, how they work in practice, the rationale behind them, and how they fit within our theory. A brief conclusion follows.

I. WHEN CONVERTIBLE SECURITIES ARE USED

A convertible security is a security—usually a debt instrument or share of preferred stock—that can be converted into a different security, generally shares of the issuer's common stock. Typically, convertible securities convert into a number of shares of common stock, calculated by dividing the initial purchase price (sometimes plus accrued but unpaid interest or dividends) by a fixed conversion price. As a consequence, absent a

19. See, for example, the several alternatives identified in Part III.C to protect against the dilution to holders of convertible securities that can be caused by a distribution to common stockholders.

20. The debt instrument will typically be denominated a bond, note, or debenture.

21. Katzin, supra note 4, at 361; Joseph L. Lemon, Jr., Don't Let Me Down (Round): Avoiding Illusory Terms in Venture Capital Financing in the Post-Internet Bubble Era, 39 Tex. J. Bus. L. 1, 6 (2003). In most cases, the holder of the convertible security determines whether and when to convert. Hills, supra note 4, at 2. In other cases, conversion is mandatory upon the occurrence of certain events, or the company retains the right to determine when conversion occurs. Kaplan, supra note 2, at 1 n.2. Closely related to convertible securities are options and warrants, which are generally exercisable for common stock in exchange for a cash payment, but have no other economic attributes.

22. Sometimes, particularly in venture capital transactions, parties speak in terms of a conversion rate, rather than a conversion price. For example, one share of preferred stock will be initially convertible into one share of common stock. While provisions in older convertible securities sometimes mechanically worked this way, modern provisions generally do not. As early as 1965, one commentator noted that "the 'conversion price' method has practically supplanted the older 'conversion rate' method." Kaplan, supra note 2, at 7.
provision to the contrary, actions taken by an issuer that increase the number (or decrease the value) of shares of its common stock outstanding will also decrease or "dilute" the value of the conversion right.

It is conventional to include anti-dilution provisions in convertible securities to protect the value of the conversion right from certain of these actions. The circumstances in which anti-dilution provisions are applicable and the nature of the adjustment used vary (sometimes greatly) based on the nature of the convertible security and the transaction in which it is issued. Because the conversion right is contractual and therefore may take a wide variety of forms, convertible securities are issued in a variety of contexts. For example:

- Development-stage companies typically raise capital by issuing convertible preferred stock.
- Intermediate-stage private companies (and small public companies with thin trading markets) often raise capital by issuing convertible securities in private placements to private equity funds and other institutional investors.
- Widely traded public companies may raise capital by issuing convertible bonds or convertible preferred stock in public offerings or private placements in the belief that this will decrease their cost of capital.

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23. Irvine, supra note 4, at 729 ("The purpose of anti-dilution provisions is, of course, to provide for adjustment in the amount of securities to be issued upon conversion of the convertible security . . . to compensate for certain changes affecting the security . . . into which it is convertible.").
24. Kaplan, supra note 2, at 29; see also Glover, supra note 3, at 1243.
25. See Glover, supra note 3, at 1243 ("Depending on custom and the parties' needs, different categories of equity rights use different forms of antidilution provisions.").
26. Hills, supra note 4, at 1; Broadwin, supra note 4, at 28.
27. See, e.g., Kaplan, supra note 2, at 1 n.2; see also Katzin, supra note 4, at 360.
29. See Glover, supra note 3, at 1245.
30. Id. at 1244.
31. Id.
32. Id. at 1243 (citing Richard A. Brealey & Stewart C. Myers, Principles of Corporate Finance 547-49 (4th ed. 1991)); see also Charles J. Johnson, Jr. & Joseph Mclaughlin, Corporate Finance and the Securities Laws 865 (3d ed. 2004). Convertible securities tend to have lower interest rates than non-convertible securities because of the potential appreciation in the value of the underlying security. See Katzin, supra note 4, at 362. In addition, the
In mergers and recapitalizations, parties will sometimes receive convertible securities for a variety of economic, tax, accounting, and governance reasons.\textsuperscript{33}

The nature and severity of the information barriers and agency costs, as well as the relative bargaining power of the parties, vary greatly in each of these situations. For example, the information barriers that exist for investors in small private companies are much greater than those for investors in large public companies.\textsuperscript{34} Thus, an anti-dilution provision that makes sense to protect investors in small private companies may be meaningless (or worse, counterproductive) for investors in large public companies.

\section*{II. Types of Dilution}

To understand different types of anti-dilution provisions, it is important to examine the nature of the dilution against which each provision is designed to protect. As Stephen Glover notes, "[d]raftspersons rarely articulate the theories of dilution and value on which they are relying when they craft antidilution provisions. Not surprisingly, however, different theories can lead to very different results."\textsuperscript{35}

Dilution connotes a decrease in something. As applied to equity securities, there are two potentially relevant dilution concepts:

\begin{itemize}
\item percentage dilution, a decrease in the percentage of the entity an investor owns, and
\item economic dilution, a decrease in the economic value of the investor's investment in the entity.
\end{itemize}

\textsuperscript{33} See Katzin, supra note 4, at 360.

\textsuperscript{34} See supra notes 17-18 and accompanying text; cf. Broadwin, supra note 17, at 24 (comparing investors' assumptions regarding the fair value of large public companies and privately-held companies).

\textsuperscript{35} Glover, supra note 3, at 1242 (citation omitted); see also Kaplan, supra note 2, at 29 ("To speak of protecting the right of conversion begs the question; in the absence of a precise theory one cannot know precisely what the 'right of conversion' entails.").
A. Percentage Dilution

In the absence of anti-dilution protection, percentage dilution will occur merely through the issuance of additional shares of common stock or securities convertible for common stock.\(^{36}\)

Example:

- A owns 1000 common shares of X Corp.—100% of the outstanding stock, worth $1000
- X Corp. issues an additional 1000 common shares to B for $1000

A experiences percentage dilution of ownership from 100% (1000/1000) to 50% (1000/2000).

Percentage dilution has no direct relationship to the value of an investor’s holdings. All else being equal, if B pays X Corp. fair value for the stock issued, the current value of A’s holdings will not decrease.\(^{37}\)

Example:

- A owns 1000 common shares of X Corp.—100% of the outstanding stock, worth $1000
- X Corp. issues an additional 1000 common shares to B for $1000

Pre-investment by B, the value of A’s investment is $1000 (100% of a business worth $1000).

Post-investment by B, the value of A’s investment is $1000 (50% of a business worth $2000).

As a result, investors typically do not use anti-dilution provisions to protect against percentage dilution, unless it is accompanied by economic dilution.\(^{38}\)

\(^{36}\) Ratner, supra note 4, at 496 (“In a sense, every issue of additional common stock ‘dilutes’ the interests of present and potential stockholders by increasing the number of shares over which the total voting power and the total equity interest are spread.”).

\(^{37}\) Of course, percentage dilution by itself can affect the value of the investment by altering noneconomic features—for example, if a reduction in the investor’s percentage ownership eliminates the ability to exercise a veto in connection with certain voting rights. Glover, supra note 3, at 1257-59; see also Ratner, supra note 4, at 496 (“[I]f a convertible security holder can convert his security into ... a majority of the outstanding shares and if acquisition of a majority of the shares is important to him, any issuance of additional shares at any price will ‘dilute’ his interest in a meaningful way . . . .”).
B. Economic Dilution

Anti-dilution provisions are typically designed to protect against events that cause economic dilution, dilution that occurs as a result of a decrease in the value of the investment.

Example:

- A paid $1 per common share for 1000 common shares of X Corp.
- B buys 1000 common shares of X Corp. for $0.75 per share

A experiences both percentage dilution (from 100% to 50%) and economic dilution (A's investment, initially worth $1000, decreases to $750 in value (1000 common shares now worth $0.75 per share)).

Conversely, if B pays $2 per share, A experiences percentage dilution (from 100% to 50%), but economic accretion. (A's investment, initially worth $1000, increases to $2000 in value (1000 common shares now worth $2 per share)).

To measure a decrease in value, one has to have a starting place. Thus, when considering economic dilution in any investment, distinguish between (i) dilution from initial investment (the value of the investment when originally made) and (ii) dilution from current value (the value of the investment immediately prior to the occurrence of the dilutive event).

Additionally, one must know exactly what is being valued. Thus, when analyzing economic dilution in connection with convertible securities, one can measure (i) dilution to the value of the convertible security itself (dilution to the full economic value) or (ii) dilution to the value of the securities receivable upon conversion (dilution to the immediate exercise value).

Each of these concepts is discussed in detail below.

1. Initial Investment Versus Current Value

"Initial investment" is the value of an investment when originally made. "Current value" is the value of an investment immediately prior to the occurrence of the dilutive event. An event may be dilutive to the initial investment, the current value, or both.

38. See Broadwin, supra note 4, at 30. In general, "[a] simple decline in percentage interest is dealt with in other contractual provisions such as rights of first refusal rather than antidilution provisions." Id.
Example:

- A paid $1 per common share for 1000 common shares of X Corp.
- B buys 1000 common shares for $0.75 per share at a time when the fair market value is $0.75 per common share

A experiences economic dilution from A's initial investment of $1000 (A's investment is now worth $750), but no economic dilution from the current value of the investment of $750.

Conversely, if B pays $1 per share when the fair market value was $3 per share, A experiences economic dilution from the current value, but no economic dilution from A's initial investment.

Notice that if X Corp. receives fair value in the issuance to B, any economic dilution from initial investment is not caused by the subsequent issuance. A's stock has decreased in value, regardless of whether a new investment is made. B's purchase merely evidences this decrease. This is an important observation that provides the rationale for one of the most controversial anti-dilution provisions, full-ratchet price protection, which is discussed in detail in Part III.B.1.a below.

2. Immediate Exercise Value Versus Full Economic Value

When analyzing economic dilution in connection with convertible securities, it is important to distinguish between

- a decrease in the value of the convertible security itself (the "full economic value") and
- a decrease in the net value of the securities receivable upon conversion (the "immediate exercise value").

While the net value of the securities receivable upon conversion is one factor affecting the full economic value of the convertible security, it is not the only factor. Other factors include, among others, the variability of the price of the underlying security, the term of the option to convert, and the risk-free interest rate. Consequently, "the difference between full economic value and immediate exercise value".

39. The net value is "the difference between the current market value of the common stock that a holder would acquire upon exercise and the price [if any] payable upon exercise." Glover, supra note 3, at 1250. For most convertible securities, the net value will equal the current market value of the common stock issuable upon exercise, because the holder typically does not pay any additional exercise price. The net value concept is more relevant for options and warrants, which are generally exercisable for common stock in exchange for a cash payment. See supra note 21.

40. Glover, supra note 3, at 1251-55.

41. Id.
economic value before and after a dilutive event will not bear any necessary relationship to the difference between immediate exercise value before and after the dilutive event.\textsuperscript{42}

Stephen Glover believes that traditional anti-dilution provisions are designed to ensure that immediate exercise value before and after the dilutive event remain constant.\textsuperscript{43} He argues that, as a result, traditional formulae are too simplistic because they ignore many of the variables that affect the full economic value of the conversion rights.\textsuperscript{44}

Glover believes the traditional immediate exercise approach therefore does not effectively ensure that the value of the conversion right is preserved following the adjustment.\textsuperscript{45} Because the full economic value models attempt to reflect all of the variables that may affect the value of the conversion right, Glover contends that even the most basic of these models "produce better measurements of the value of the conversion right than the simplistic immediate exercise approach."\textsuperscript{46} He recommends sophisticated Black-Scholes or binomial option-pricing models to determine the full economic value of the convertible security.\textsuperscript{47}

Despite Glover's argument, the full economic value approach is rarely (if ever) used. There are at least three reasons for this.

First, the full economic value approach is complex and difficult to document.\textsuperscript{48} Once documented, application of the provisions would invariably require the assistance of experts.\textsuperscript{49} Given the difficulty

\textsuperscript{42} Id. at 1255.
\textsuperscript{43} Id. at 1301 ("The traditional formulas for extraordinary distributions, spinoffs, below-market issuances of common stock and equity rights, asset sales, recapitalizations, and stock buybacks are . . . designed to ensure that the immediate exercise value of the equity rights remains constant."). As explained in Part II.C infra, we disagree with this view.
\textsuperscript{44} Glover, supra note 3, at 1251.
\textsuperscript{45} Id.
\textsuperscript{46} Id. at 1255. Glover provides numerous examples of shortcomings in the immediate exercise value approach that he believes are overcome by application of the full economic value approach. For example, in the case of an equity issuance below the current market price, he argues that the immediate exercise value approach does not take into account variables such as movements of the market price, changes in the stock price variance, or changes in default risk in response to the dilutive issuance. If the market views the issuance favorably and the stock price increases, or the stock price variance or the default risk decreases, Glover believes the immediate exercise value approach will overcompensate the convertible security holder. Alternatively, if the issuance is viewed negatively and decreases the market price, or increases the stock price variance or the default risk, he believes the immediate exercise value approach will undercompensate for the dilutive issuance. Id. at 1288.
\textsuperscript{47} Id. at 1252-53.
\textsuperscript{48} Id. at 1277 ("[T]he Black-Scholes and other pricing models are not easily described in an option agreement or convertible debt indenture.").
\textsuperscript{49} Id. at 1279 ("As a practical matter, the lawyers and business people charged with the responsibility for making adjustments are not likely to have the expertise needed to make decisions about how best to determine full economic value."); Id. at 1256 ("Determining values for all of the relevant variables and applying the appropriate formulas is likely to require expert help.").
practitioners have with "the simpler" (though not simple\textsuperscript{50}) traditional anti-
dilution provisions, "[t]he widespread reliance on [traditional approaches] 
may reflect the tradeoff between certainty, simplicity, and ease of 
application on the one hand, and accuracy on the other."\textsuperscript{51}

Second, determining the value of the convertible security under the full 
economic value approach requires numerous subjective judgments about 
the effect of a dilutive event on various unquantifiable variables, such as 
stock price variances and default risks.\textsuperscript{52} The subjective nature of these 
judgments leaves this approach open to even more manipulation than the 
traditional approach.

Third, the purchaser of a convertible security is bargaining to participate 
in the change in value in the underlying investment.\textsuperscript{53} A change in full 
economic value occurring concurrently with a dilutive event will likely be 
due to multiple factors, some of which are worthy of adjustment, some of 
which are not.\textsuperscript{54} It is impractical to determine what part of a change in 
value is attributable to the dilutive event and what part is due to some 
extraneous factor, such as a change in the underlying business or the 
macroeconomic environment. As a result, the parties will be unable to 
calculate the appropriate adjustment. For example, if a company issues 
equity below the current market price and uses the proceeds to make an 
acquisition that the market views as favorable, the full economic value 
approach, in effect, penalizes the holder of convertible securities by not 
allowing the holder to share in the increase in value of the underlying 
common stock that occurs because of the acquisition.

C. Our Dilution Framework

Although the market has rejected the full economic value approach, it has 
not embraced the immediate exercise value approach either. Glover 
believes that traditional anti-dilution provisions use an immediate exercise 
value approach and are designed to ensure that the exercise value of the 
equity right remains constant immediately before and immediately after the 
dilutive event.\textsuperscript{55} This view differs from the framework identified in this 
Article in at least two ways.

First, the immediate exercise value approach uses current value as its 
starting point. However, in cases where information barriers are the

\textsuperscript{50} See id. at 1279 n.63 ("This is not to say that using the standard formulas is easy. Disputes are common even when the traditional approaches are applied."); see also supra note 5 and accompanying text.
\textsuperscript{51} Id. at 1256.
\textsuperscript{52} Id. at 1277-79.
\textsuperscript{53} See Kahan, supra note 4, at 147 ("The conversion feature provides the investor with an opportunity to participate in the company's upside potential.").
\textsuperscript{54} Cf. Kaplan, supra note 2, at 5 ("[T]here are doubtless many events and occurrences of a business or economic nature which may materially and adversely affect the value of the underlying security which do not cause an adjustment of the conversion price.").
\textsuperscript{55} See supra note 43 and accompanying text.
primary concern, the exercise value immediately before the dilutive event is irrelevant. In these circumstances, anti-dilution provisions are designed to reduce (or eliminate) the economic dilution from initial investment that arises because the investor had imperfect information at the time the convertible security was issued. To do this, the conversion price is reduced to something closer (or equal) to the conversion price that would have been set at the time of initial issuance if the investor had had the benefit of the subsequently discovered information.\(^5\)

Second, in cases where agency costs are the primary concern, it is true that anti-dilution provisions are designed to reduce (or eliminate) the economic dilution from current value resulting from the transfer of value to common stockholders. To do this, however, the provisions make an adjustment that attempts to ensure that holders of convertible securities will be indifferent to converting immediately before or immediately after the dilutive transaction.\(^5\) Depending upon whether there is a concurrent change in the value of the enterprise, this adjustment may or may not ensure that the immediate exercise value of the equity right remains constant before and after the dilutive event.\(^5\)

Part III explores some common anti-dilution adjustments to see how well they fit within this framework.

### III. TYPES OF ANTI-DILUTION PROTECTION

Many actions can have a dilutive effect on outstanding convertible securities.\(^5\) Absent contractual protection, "the conversion privilege attached to a convertible obligation is subject to dilution and change at the will of the corporation."\(^6\) This part examines three common dilutive

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56. See, e.g., Broadwin, supra note 17, at 24 ("[I]n the case of a privately held company . . . the antidilution adjustment is used to ensure against improperly low valuations.").

57. See Kahan, supra note 4, at 149.

58. Revisit the hypothetical from note 1 supra, and imagine a security that is initially convertible into a single share of common stock. Under the commonly used approach, if the issuer effects a two-for-one stock split (doubling the number of shares outstanding), the security would become convertible into two shares of common stock. See infra Part III.A. But under a true immediate exercise value approach, if the per share stock price did not go down at all following the stock split (for instance, if there were a general increase in the stock market), no adjustment would be made to the conversion ratio because the exercise value immediately before and after the split would be the same without adjustment.

59. See Glover, supra note 3, at 1260. According to Glover, [t]hese events include, among others: (i) stock dividends, stock splits and reverse stock splits; (ii) mergers and consolidations; (iii) extraordinary distributions of cash and property; (iv) sales of all or substantially all of the company's assets, followed by a distribution of the sale proceeds in the form of cash or property; (v) the issuance of additional common stock; (vi) the issuance of common stock purchase rights, warrants, or securities convertible into common stock; (vii) recapitalizations; and (viii) common stock buybacks.

60. Hills, supra note 4, at 21; see also Glover, supra note 3, at 1248-50; Kahan, supra note 4, at 148.
situations: (i) structural changes in common stock (that is, stock dividends, splits and the like), (ii) cheap issuances of common stock, and (iii) distributions of cash or property. After exploring the nature and level of the information barriers and agency costs confronted in each situation, each section examines the anti-dilution adjustments customarily used to protect against the dilution presented.

A. Structural Changes in Common Stock

Absent protection, an issuer can transfer value from the holders of its convertible securities to the holders of its common stock merely by effecting a structural change in its common stock, such as a stock split, stock dividend, or similar action. These actions would result in both percentage dilution and economic dilution from current value.

Example:

- A owns 1000 common shares of X Corp.—100% of the outstanding common stock
- B owns 1000 preferred shares of X Corp., convertible into 1000 shares of common stock (50% of X Corp.)
- X Corp. effects a 9-for-1 stock split

A now owns 9000 common shares, and on an as-converted basis, the 1000 common shares to which B is entitled represent 10% of X Corp. B has experienced both percentage dilution and economic dilution from current value.

These actions present a classic agency cost problem. Absent protection, the holders of the convertible securities and the holders of the common stock have directly opposing interests with respect to a stock split, stock dividend, or similar action. The board of directors, which makes the decisions with respect to these types of transactions, has a fiduciary duty to common stockholders, but not necessarily to holders of convertible securities. Consequently, one can expect to see protection against

61. Hills, supra note 4, at 21-22.
62. See Kaplan, supra note 2, at 3 n.7.

The interests of the holders of a convertible security will in many respects necessarily be in direct opposition to those of the holders of the underlying securities. Every advantage granted to the convertible security holders through the anti-dilution clause diminishes the interests of the holders of underlying securities; conversely, any failure of the anti-dilution clause to protect against diminution of the value of the conversion privilege will dilute the value of the senior securities.

Id.

63. Glover, supra note 3, at 1248-49.
structural changes in the underlying common stock in all types of convertible securities issued by both public and private issuers.

In accordance with this expectation, all convertible securities include a clause that adjusts the conversion price in the event of a stock dividend or distribution on the common stock, or a subdivision, combination, or reclassification of the outstanding shares of common stock.\(^6\) Since it is clear in these instances that the corporation is merely rearranging its capital structure, the conversion price is typically adjusted so that the holder of convertible securities maintains the same percentage ownership both before and after the change.\(^6\) For example, if the stock is split two-for-one, the conversion price is halved, so the number of shares issuable upon conversion doubles.\(^6\) As a result of this adjustment, the holder of the convertible security will ultimately own the same percentage of the issuer regardless of when the conversion occurs, and thus will be indifferent to converting immediately before or immediately after the dilutive event.\(^6\)

**B. Price Protection**

In the absence of anti-dilution protection, percentage dilution will occur merely through the issuance of additional shares of common stock or securities convertible for common stock.\(^6\) If the new issuance is priced high enough, however, no economic dilution will occur. A "price protection" clause protects against the economic dilution that occurs when the new issuance is not priced high enough. The question arises: high enough as measured against what?

As noted earlier, economic dilution may take one of two forms:

- Economic dilution to the initial investment occurs when the additional shares are issued at a price below the initial conversion price.\(^6\)

\(^{64}\) See Hills, supra note 4, at 21-23; Irvine, supra note 4, at 732; Kaplan, supra note 2, at 4-5.

\(^{65}\) See Glover, supra note 3, at 1261.

\(^{66}\) See id.

\(^{67}\) Revisit the example discussed in notes 1 and 58, supra. If the holder of a security initially convertible into a single share of common stock converts immediately prior to a two-for-one stock split, the holder will receive one share upon conversion. This share then becomes two shares upon the effectiveness of the stock split. If the holder does not exercise until after the stock split, the security becomes convertible into two shares of common stock by reason of the adjustment mechanism. Notice that, unless the value of two shares of common stock post-split equals the value of one share of common stock pre-split, the immediate exercise value will be different before and after the dilutive event. See supra note 58.

\(^{68}\) See supra note 36 and accompanying text.

\(^{69}\) More accurately, economic dilution from initial investment is evidenced when the additional shares are issued at a price below the conversion price. See supra Part II.B.1.
Economic dilution to the current value occurs when the additional shares are issued at a price below the then-current market price (or the fair market value of private securities).  

Depending on the nature of the economic dilution the investor is protecting against, a "price protection" clause provides for an adjustment in the conversion price upon the issuance of additional shares of common stock at a price below either the then-current conversion price (a "conversion-price formula") or the then-current market price (a "market-price formula"). In other words, a conversion-price formula will protect against economic dilution to the investor's initial investment and a market-price formula will protect against economic dilution to the current value of the investment. These provisions are explored below.

1. Conversion-Price Formula

A conversion-price formula protects against economic dilution from initial investment, adjusting the conversion price whenever additional shares of common stock are issued at a price below the then-current conversion price.  

Some commentators believe that the case for anti-dilution protection is weak when the new issuance is at or above market price but below the conversion price. This belief is based on the assertion that the holder of the convertible security is not actually harmed by the subsequent issuance. Although the value of the investor's initial investment has declined, the subsequent issuance is merely evidence of this decline, which has already occurred, perhaps at the time of the initial investment.

In general, the decline in value from the initial investment will be a result of one or more of the following factors:

- Information barriers existing at the time of the initial investment (If the investor had imperfect information at the time of the initial investment and overvalued the investment as a result, the decline in value may be due to the fact that more complete information has become available.)

- Unsuccessful management of the business

- A general decline in the market for similar investments

70. See supra Part II.B.1.
71. See Broadwin, supra note 4, at 29.
72. See, e.g., Glover, supra note 3, at 1281. Glover writes the following:

A transaction in which the company offers stock to new investors at a price equal to or greater than the current market price (or, if the stock is not publicly traded, at a price equal to or greater than its current fair market value) does not represent a strong candidate for antidilution protection.

Id. (citations omitted).
73. Id. ("But the economic value of their interest in the company (whether measured on an immediate exercise or full value basis) should remain constant or increase.").
Information barriers that can lead to inaccurate valuations are more severe in private companies than in larger public companies.\textsuperscript{74} Furthermore, "there is a working assumption that the market price of [the common stock of larger public companies] reflects the fair value of the business,"\textsuperscript{75} so the risk of unsuccessful management should be priced into the common stock of those companies at the time of the initial investment.\textsuperscript{76} Consequently, one would expect to find conversion-price protection primarily in convertible securities issued by private companies.\textsuperscript{77}

In accordance with this expectation, with one exception discussed later,\textsuperscript{78} conversion-price formulae are found almost exclusively in convertible securities issued by private companies.\textsuperscript{79} Indeed, the ability to correct for the effects of information barriers through conversion price anti-dilution adjustments may explain the ubiquity of convertible securities in venture capital transactions.\textsuperscript{80} Interestingly, while there has been a significant amount of debate over the factor that leads to the almost universal use of convertible securities in these transactions,\textsuperscript{81} sparse attention has been paid to this key feature.

\textsuperscript{74} Broadwin, supra note 17, at 27 ("[I]n the private company case the risk being guarded against is the risk of an inaccurate valuation... [I]n the case of a large, liquid public stock for which there is an efficient market, the risk of inaccurate valuation is low... ").

\textsuperscript{75} Id. at 24; see also supra notes 17-18 and accompanying text.

\textsuperscript{76} Because the purchase price of convertible securities of large public companies should reflect the risk of unsuccessful management, it is appropriate for investors in these securities to bear this risk. See Broadwin, supra note 17, at 24. On the other hand, information barriers make it unlikely that the purchase price of convertible securities of private companies would accurately reflect the risk of unsuccessful management. Viewed in this light, the risk of unsuccessful management is merely a subset of the information barrier issues addressed by the conversion-price formula.

\textsuperscript{77} Another reason public companies may not use a conversion-price formula could be that the conversion price in securities of large public companies is generally set at a premium to market. See Katzin, supra note 4, at 361. It is therefore quite likely (and not unexpected by the investor) that a subsequent issuance could be below the conversion price.

\textsuperscript{78} Because smaller public companies with thin trading markets for their common stock present information barriers similar to those presented by private companies, convertible securities issued by these smaller public companies often contain a conversion-price formula. See infra notes 118-20 and accompanying text.

\textsuperscript{79} Glover, supra note 3, at 1248.

\textsuperscript{80} A conversion-price formula is a convenient way to implement what Professor Klein has termed the "Put-Up-Or-Shut-Up Strategy." William A. Klein, The Put-Up-Or-Shut-Up Strategy in Business Negotiations, 17 U.C. Davis L. Rev. 341 (1983). That is, the formula serves as a mechanism to eliminate problems of honesty and differences in perception as to an investment's expected outcome at the time the investment is made. Id. at 349. One could hardly think of a more appropriate circumstance for employing this strategy than in the venture capital context.

\textsuperscript{81} See Lemon, supra note 21, at 7 ("There is some disagreement regarding the motivation for the widespread use of convertible preferred stock in VC financings."). The author discusses a number of reasons such as: (i) the superior value that priority gives to convertible stock, (ii) the effect of liquidation preferences, (iii) separation of control and cash flow rights, and (iv) tax considerations. Id. at 7-8. See generally Gilson & Schizer, supra note 28.
A conversion-price formula commonly takes one of two forms: "full-ratchet" or "weighted-average." The method used can have significant economic consequences, as illustrated in Appendix A. These methods are discussed below.

**a. Full-Ratchet Approach**

Under the full-ratchet approach, the conversion price is reduced to the exact price per share paid in the dilutive issuance, in effect allowing the holder of the convertible security to receive stock at that lower price. Theoretically, this approach fully protects the investor against economic dilution from the initial investment; after the adjustment, the securities receivable upon conversion will have the same aggregate value as the initial investment.

**Example:**

- Founder owns 4 million shares of Common Stock.

- A owns 1 million shares of Series A Preferred Stock, purchased for $1 million. These shares were initially convertible into 1 million shares of Common Stock (that is, the initial conversion price is $1 per share). The conversion right is entitled to full-ratchet anti-dilution protection.

- B purchases 1 million shares of Series B Preferred Stock for $250,000. These shares are initially convertible into 1 million shares of Common Stock at a conversion price of $0.25 per share.

After giving effect to the issuance of the Series B Preferred Stock and the full-ratchet anti-dilution protection, A can convert the Series A Preferred Shares into 4 million shares of Common Stock at a conversion price of $0.25 per share (or $1 million of value in the aggregate).

Full-ratchet anti-dilution protection is viewed by many as unfair, among other things, because of the potential for substantial dilution to

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83. In the absence of anti-dilution protection, under the same facts, A would convert its Series A Preferred Shares into 1 million shares of Common Stock (or $250,000 of value in the aggregate).

84. Bagley & Dauchy, *supra* note 28, at 461 ("Full ratchet appears simple and fair on its face, but it is rarely used for more than a brief period of time. It is widely viewed as unfair . . ."); Alex Wilmerding, "Deal Terms: The Finer Points of Venture Capital Deal Structures, Valuations, Term Sheets, Stock Options and Getting Deals Done" 71 (2003)
common shareholders, regardless of the size of the dilutive issuance. In the foregoing example, Founder is diluted from an investment worth $4 million to one worth $1 million, while A is left whole. This would be true even if only a single share of Series B Preferred Stock were issued.

This view ignores the purpose of the full-ratchet adjustment. The full-ratchet approach is designed to fully protect against inaccurate valuation arising from information barriers, ensuring that the economic dilution from initial investment, which is merely evidenced by future fundraisings, is borne by the prior investors. Because the dilution is not caused by the subsequent issuance, in the absence of manipulation, the number of shares issued in the dilutive round is irrelevant.

While it is so effective at protecting against the risks presented by information barriers, the full-ratchet approach completely shifts the costs of any decline in the value of the business to common shareholders. As a result, this approach is used almost exclusively in venture capital deals, where the common stockholders tend to be founders and management. Because the parties in these transactions agree on a price based on numerous assumptions, significant valuation gaps can exist. Venture capitalists argue that if a subsequent round of financing is raised at a lower valuation, the assumptions underlying the original valuation were by

(“With good reason, [full ratchet] makes the hair of the entrepreneur stand on end and sends a shiver up the spine.”).

85. See Lemon, supra note 21, at 14 (“As is apparent, this term [full-ratchet] has the potential to be draconian in a most arbitrary way.”); Broadwin, supra note 4, at 36 (“[A] full-ratchet provision can have a draconian effect on the common stock. This effect is exacerbated by the fact that the full ratchet provision does not take into account the number of shares issued at the low price.”).

86. In other words, full-ratchet protection implements Professor Klein’s “Put-Up-Or-Shut-Up Strategy” discussed supra note 80. David Broadwin describes it this way:

The principal justification advanced for full-ratchet provisions is that valuation is highly uncertain. Often the investor believes that management has asked for a highly speculative valuation. As a result, the investors agree to the high valuation but ask for a full ratchet provision to guard against dramatic valuation risk.

Broadwin, supra note 4, at 36.

87. See supra Part II.B.1. This realization is taken to an extreme in so-called “death spiral” securities. In conventional convertible securities, adjustments to the conversion price are typically not made until the issuer takes some action—a new issuance, for example. In less conventional convertible securities (often called “floorless,” “toxic,” “death spiral,” or “ratchet” convertibles), the conversion price is automatically reduced whenever the market price of the underlying common stock declines (even if no additional securities are issued). As the market price declines, the “reset” provision automatically reduces the conversion price and a greater number of shares thereby become issuable upon conversion. This formula can have disastrous consequences for the issuer and the holders of its common stock. Holders of the convertible security have an incentive to short-sell the underlying stock, driving the price down, allowing them to obtain even more shares upon conversion. This causes further downward pressure on price, resulting in a continuing downward spiral. See Broadwin, supra note 17, at 28-29; U.S. Sec. & Exch. Comm., Convertible Securities, http://sec.gov/answers/convertibles.htm (last visited Aug. 12, 2005).

88. Bagley & Dauchy, supra note 28, at 461.
definition incorrect and the investor should be fully protected. Not surprisingly, entrepreneurs often feel that, because a decrease in valuation may be caused by many factors (for example, a fall in the general market), the impact of a drop in valuation should be shared, and therefore a different method of adjustment is more appropriate. Consequently, even in venture transactions, use of full-ratchet anti-dilution protection is rare. This type of protection is used most often in riskier transactions or in periods of economic turmoil.

b. Weighted-Average Approach

Under the weighted-average approach, the conversion price is reduced to the weighted-average price per share of securities issued (or deemed issued) both prior to and in the dilutive issuance, generally treating all stock outstanding (or deemed outstanding) prior to the dilutive issuance as being issued at the conversion price in effect immediately prior to the dilutive issuance.

Unlike the full-ratchet approach, the weighted-average method provides a more significant adjustment “if a larger number of shares of stock is issued at a lower price, and a less significant adjustment if a smaller number of shares is issued at a lower price.”

89. See Broadwin, supra note 4, at 36. In this regard, the full-ratchet approach is the ultimate implementation of Professor Klein’s “Put-Up-Or-Shut-Up Strategy.” See supra note 80.

90. See Wilmerding, supra note 84, at 66.

91. The law firm of Fenwick & West LLP found that full-ratchet anti-dilution provisions were contained in only 5-14% of venture capital deals contained in an unscientific quarterly survey conducted by the firm from April 2003 through March 2005. See Fenwick & West LLP, Trends in Terms of Venture Financing in the San Francisco Bay Area, http://www.fenwick.com/vctrends.htm (last visited Aug. 4, 2005) [hereinafter Fenwick]. Even if an investor requires full-ratchet anti-dilution protection, it often will at least partially waive this protection in connection with subsequent dilutive financings because of the harmful effect on the company of essentially eliminating management’s ownership. See Kuemmerle, supra note 8, at 3. Kuemmerle observes the following:

I have seen several incidences where strong anti-dilution provisions took the founders’ stake to such a small level that the stake itself no longer provided an adequate incentive. This is fine if the founders are no longer needed or wanted but counterproductive if a lot of useful capabilities rest with the founders.

Id.

92. Broadwin, supra note 4, at 36 (“Full ratchet provision tends to become more popular in very risky transactions or in periods of economic uncertainty.”).

93. See Katzin, supra note 4, at 365; Broadwin, supra note 4, at 29, 35-36.

94. As several commentators have noted, this formulation gives the issuer “no credit for the sale of additional common stock at a price in excess of the conversion price.” Irvine, supra note 4, at 730; see also Katzin supra note 4, at 366.

95. Miller et al., supra note 28, § 3-13.
Typical weighted-average formula:

\[ CP_I = \frac{(CP_0 \times O_0 + S)}{(O_0 + I)} \]

Where:

- \( CP_I \) = adjusted conversion price
- \( CP_0 \) = initial conversion price
- \( O_0 \) = number of common shares outstanding (or deemed outstanding) prior to the dilutive issuance
- \( S \) = consideration received for the issuance of the dilutive securities
- \( I \) = number of common shares issued (or deemed issued) in the dilutive issuance

This formula sets the new conversion price to equal the total consideration received by the issuer (that is, the sum of (i) the dollar value of the shares outstanding (or deemed outstanding) before the dilutive issuance, based on the original conversion price, plus (ii) the consideration received for the issuance of the dilutive securities, divided by the total number of shares outstanding (or deemed outstanding) after giving effect to the dilutive issuance, excluding shares issuable by reason of the anti-dilution provision.

Although the weighted-average approach is far more common than the full-ratchet approach, it is actually more difficult to rationalize. To the extent that the rationale for using a conversion-price formula is based on the information barriers existing at the time of the initial investment, it is hard to understand why the original conversion price (which, by definition,

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96. Anti-dilution formulae may be drafted in prose or in arithmetical notation. We use the latter because "[u]nlike the lawyer's word version, arithmetical notation is almost instantly comprehensible." Darmstadter, supra note 6, at 16.

97. See Irvine, supra note 4, at 730. A mathematically equivalent (although less intuitive) formula sometimes used is: \( CP_I = CP_0 \times \frac{(O_0 + S)}{(O_0 + I)} \). See Bagley & Dauchy, supra note 28, at 462.

98. The denominator in the weighted-average approach is sometimes expressed as \( O_I \) (rather than \( O_0 + I \)). \( O_I \) is the number of shares outstanding (or deemed outstanding) after the dilutive issuance, including the shares issuable by reason of the anti-dilution provision. See, e.g., Katzin, supra note 4, at 366. A formula using \( O_I \) therefore includes these shares in the denominator but does not include these shares in the numerator (unless the provision specifies that \( O_0 \) is also deemed to include these shares). This, in essence, treats these shares as if they had been issued at no cost, and thereby increases the magnitude of the adjustment. Whatever one thinks about the appropriateness of including these shares in calculating the adjusted conversion price, it adds a great deal of complexity in applying the formula.

99. The law firm of Fenwick & West LLP found that weighted-average anti-dilution provisions were contained in 86-93% of venture capital deals contained in an unscientific quarterly survey conducted by the firm from April 2003 through March 2005. See Fenwick, supra note 91.

100. See supra Part III.B.1; see also Broadwin, supra note 4, at 30.
did not reflect a true value) is at all relevant in calculating the weighted-average price per share. 101

Perhaps the use of this method stems from the difficulty determining the true cause of a drop in value, and therefore what portion of that drop should be borne disproportionately by common stockholders. 102 The weighted-average approach allocates the drop in a way that may not be accurate, but may be the best the parties can hope for. 103

Once the parties have determined to use the weighted-average approach, there are several ways to weight the relative price contributions to arrive at the new conversion price, depending largely on which shares to consider as outstanding when performing the calculation (that is, depending on what is included in $O_o$). 104 In general, however, there are two categories: broad-based and narrow-based.

Broad-based formulae take into account all common stock outstanding on a "fully-diluted basis," giving effect to the exercise or conversion of all outstanding warrants, options, and convertible securities. 105

While there are various forms, narrow-based formulae exclude certain shares from the calculation, taking into account only a subset of outstanding shares, such as:

- common and protected convertible preferred stock plus options, warrants, and other convertible securities with an exercise price lower than the then-applicable conversion price (for example, in-the-money options), or

- common and protected convertible preferred stock (excluding options, warrants, and other convertible securities, even if they are in-the-money).

Because the shares outstanding prior to the dilutive issuance are valued higher in the formulae, the more shares considered outstanding (that is, the broader the base) prior to the dilutive issuance, the better off the

101. In other words, it should not matter whether the original conversion price was $5 or $10 if the per share price should have been $1 at the time the convertible securities were issued. Yet under a weighted-average approach, all else being equal, the formula for the adjusted conversion price is highly dependent on the original conversion price.

102. As noted earlier, a decrease in valuation may be caused by many factors, some of which should probably not result in adjustment. See supra note 54.

103. There is some support for this idea. The shorter the period of time between the issuance of the convertible security and the dilutive issuance, the more likely the drop in value will be due to information barriers existing at the time of the investment, which presumably should be borne by the common stockholders. Interestingly, even when convertible securities contain full-ratchet provisions, these provisions will often flip into weighted-average provisions after the passage of some amount of time. Bagley & Dauchy, supra note 28, at 461.

104. Broadwin, supra note 4, at 36.

105. Wilmerding, supra note 84, at 75. Indeed, the broadest based formula will include shares reserved for issuance pursuant to employee options that have not even been granted at the time of the dilutive issuance. See Broadwin, supra note 4, at 36.
unprotected shareholders and the worse off the holders of protected convertible securities.  

2. Market-Price Formula

The market-price formula provides for adjustments when additional shares of common stock are sold at a price below their current market value.  

A typical market-price formula is:

$$CP_1 = CP_0 \times \frac{(O_0 + \$ / MP_0)}{O_1}$$

Where:

- $CP_1$ = adjusted conversion price
- $CP_0$ = initial conversion price
- $O_0$ = number of common shares of common stock outstanding (or deemed outstanding) prior to the dilutive issuance
- $\$ =$ = consideration received for the issuance of the dilutive securities
- $MP_0$ = current market price prior to the dilutive issuance
- $O_1$ = number of common shares outstanding (or deemed outstanding) after the dilutive issuance

This formula sets the new conversion price so that the ratio of the new conversion price to the old conversion price is equal to the ratio of

- the number of shares of common stock that would be outstanding if the amount invested had been used to purchase shares of common stock at the market price, to

- the number of shares of common stock actually outstanding after the dilutive issuance (including shares issuable by reason of the anti-dilution provision).

In other words, if there are twice as many shares outstanding than there theoretically should be (based on the amount of money raised and the market price prior to the dilutive issuance), the conversion price is halved.

The market-price formula is designed to protect the holder of a convertible security against economic dilution from current value, based on the implied view that the holder of a convertible security

106. See Broadwin, supra note 4, at 36. This will not necessarily be true when the denominator is expressed as $O_1$ and the broader base can also increase the number of dilutive securities deemed issued. See supra note 98.

107. Ratner, supra note 4, at 494 n.2; Broadwin, supra note 17, at 25-26.

108. See Broadwin, supra note 17, at 25-26. Note the similarity to the alternate weighted-average conversion-price formula. See supra note 97.
suffers harm if additional shares of common stock are issued below
the prevailing market price, even if this issuance is above the
conversion price, and

suffers no harm if additional shares of common stock are issued at
or above the prevailing market price, even if this issuance is below
the conversion price.109

The conclusion that there is no harm to holders of convertible securities
when additional shares of common stock are issued at or above the
prevailing market price, even if below the conversion price, is based upon a
presumption that the original conversion price was set by fully informed
parties.110 This presumption is most likely to be true in the public company
context,111 and as would therefore be expected, the market-price formula is
found almost exclusively in anti-dilution provisions of convertible
securities issued by public companies.112

Large public companies with active trading markets for their common
stock often resist the inclusion of price protection totally, arguing that

for these companies, the original conversion price accurately
reflects current market value at the time the convertible security is
issued, so holders of convertible securities should bear the risk of
subsequent declines in market price113 (that is, a conversion-price
formula is not appropriate), and

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109. See Ratner, supra note 4, at 496-97. Ratner explains:

If a corporation sells common stock to the public, or to its stockholders, at $8 a
share when the market price is $8 a share, there is no dilution of the interest of
convertible security holders, whether their conversion price is $6, or $10, or any
other figure. The corporation may be ill-advised in selling stock at a time when
the market is low, but it is not the function of anti-dilution provisions to protect
convertible security holders against the possible bad judgment of the corporation's
directors in timing its security issues, any more than to protect against bad
judgment in production, or sales, or any other aspect of the management of the
business.

Id. (footnote omitted).

110. Try this thought experiment: VC invests in Company A and, based on incomplete
information, sets the conversion price at $5 per share, which VC believes to be fair market
value, when the true fair market value is in fact $2 per share. One day later, Company A
sells stock for $2 per share. As a technical matter, VC is not harmed by the second issuance,
which merely evidences the harm VC suffered immediately upon its investment.
Nevertheless, VC will likely be unsatisfied with a market-price formula, which does not
protect it from the original information asymmetry.

111. See supra notes 17-18 and accompanying text.

112. See Broadwin, supra note 17, at 24. It is sometimes presumed that the market-price
formula is not used by private companies because, in the absence of a public market, there is
no readily ascertainable market price. See Ratner, supra note 4, at 498. However, this
shortcoming can be mitigated through other measures of current value.

113. Broadwin, supra note 17, at 24. Broadwin writes the following:

With respect to issuers of convertible instruments, there is a working assumption
that the market price of their common stock reflects the fair value of the business
(unlike the case of a privately held company in which the antidilution adjustment
is used to ensure against improperly low valuations). Since investors tend to
absent a transaction with the common holders, the interests of the holders of common shares and the holders of convertible securities are aligned\textsuperscript{114} (that is, no risk of agency costs exists so a market-price formula is inappropriate as well).

These companies bolster these arguments by pointing out that (i) large public companies typically do not issue shares below current market price,\textsuperscript{115} and (ii) because of the liquid market for the underlying security, holders of convertible securities can protect against dilutive transactions either by converting and selling, or through hedging transactions.\textsuperscript{116}

These arguments generally win the day,\textsuperscript{117} and price protection in securities of large public companies often applies only if common shareholders receive a disproportionate benefit (for example, if the low price issuance is exclusive to common shareholders).\textsuperscript{118} The anti-dilution protection in these instances is designed to protect against the risks of agency costs similar to those arising from a stock split or similar transaction.

Smaller public companies with less liquid trading markets for their common stock raise different issues. Because of the thin trading market and higher volatility in the market price of shares of these companies, information barriers are more likely to exist, increasing the probability of a disparity between the initial conversion price and the fair market value on the date the convertible security is issued.\textsuperscript{119} As a result,\textsuperscript{120} investors in convertible securities of these smaller public companies often treat these issuers like private companies and seek price protection through a conversion-price formula.\textsuperscript{121}

\textsuperscript{114} Or perhaps it is not the force of the arguments but the fact that these large issuers have "substantial bargaining power" and therefore "do not have to make these kinds of concessions." \textit{Id.}

\textsuperscript{115} Id.

\textsuperscript{116} Id.

\textsuperscript{117} Id.

\textsuperscript{118} See Bratton, \textit{supra} note 4, at 687 n.76. In a survey of forty-six convertible bonds, forty-one (about 90%) contained market price anti-dilution protection only if the below market issuance was to existing common shareholders. \textit{Id.} at 687 n.75.

\textsuperscript{119} Broadwin, \textit{supra} note 17, at 27.

\textsuperscript{120} Or, perhaps as a result of the fact that "these issuers tend to have less bargaining power." \textit{Id.}

\textsuperscript{121} Id. ("Experience indicates that most of the convertible securities issued by these companies have private company type antidilution provisions.").
C. Other Distributions

When a corporation makes a distribution of cash or other assets\(^{122}\) to common shareholders, the value of the common stock will typically fall.\(^ {123}\) Unlike most other dilutive transactions, these distributions do not result in percentage dilution because there is no change in relative ownership.\(^ {124}\) Economic dilution does occur, however, as value is transferred from the holders of convertible securities to the holders of common stock.\(^ {125}\) This potential transfer of value presents a classic agency cost problem. As a result, one would expect to see protection against these distributions in all types of securities issued by all types of issuers.

In accordance with this expectation, investors purchasing convertible securities generally require inclusion of a clause that protects against the economic dilution that may occur from certain distributions. However, the clause is not always an anti-dilution provision. Rather, the protection may take one of several forms:

- an anti-dilution provision, that is, a formula reduction in the conversion price\(^ {126}\)
- a flat prohibition on the payment of any distributions\(^ {127}\)
- a clause that requires prior notice to the holders of convertible securities to allow them sufficient time to convert prior to the applicable record date and therefore receive the benefit of the distribution\(^ {128}\)
- a “partaking clause” or participation feature, giving holders either immediately or upon conversion, in addition to the common shares, an amount equal to the distribution they would have received had they converted prior to the distribution\(^ {129}\)

\(^{122}\) Other assets would include property and securities (other than common stock or securities convertible into common stock, which are typically dealt with by the adjustment mechanism described supra Part III.A).

\(^{123}\) Glover, supra note 3, at 1268; Kahan, supra note 4, at 150-51 n.5.

\(^{124}\) Glover, supra note 3, at 1268.

\(^{125}\) Id.; Kahan, supra note 4, at 148 ("The most direct method of transferring wealth from holders of convertible securities to shareholders is to reduce the price of the underlying common stock through a payout to the shareholders.").

\(^{126}\) See Kahan, supra note 4, at 150-51.

\(^{127}\) See Miller et al., supra note 28, § 3-15. The flat prohibition is most commonly found in securities of venture capital companies, id. § 3-12, which typically would not be expected to pay any form of dividend.

\(^{128}\) See Hills, supra note 4, at 20; Kaplan, supra note 2, at 12-14. A prior notice clause in essence acts as a forced conversion, requiring the holder of the convertible security to give up the remaining benefit of the conversion period to partake in the benefit of the distribution. Thus, such a provision still allows for a transfer of wealth from the holders of convertible securities to the common stockholders in the form of recapture of the conversion premium. Bratton, supra note 4, at 680-81; see also Kaplan, supra note 2, at 12-14.

\(^{129}\) See Kahan, supra note 4, at 150.
Typical dividend conversion-price adjustment:

\[ CP_1 = CP_0 \times \frac{(MP_0 - D)}{MP_0} \]

Where:

- \( CP_1 \) = adjusted conversion price
- \( CP_0 \) = initial conversion price
- \( MP_0 \) = current market price prior to the dilutive distribution
- \( D \) = per share value of the distribution

The anti-dilution formula provides that, upon conversion, the holder of the convertible security will receive with respect to each share of common stock issuable upon conversion prior to the distribution, (i) that share plus (ii) a number of additional shares with a value equal to the value of the per share distribution (with these additional shares valued at the pre-distribution market price less the amount of the distribution).

The commonly held view is that the above formula fully protects against economic dilution to current value, but only if the distribution reduces the common share price on a dollar-for-dollar basis. Because this is an unlikely event, commentators view this formula as flawed. As one commentator notes, if the actual post-distribution market price of the common stock is higher than the pre-distribution price less the distribution, the holder of the convertible security receives an economic benefit. If the actual post-distribution market price is lower, the holder of the convertible security suffers economic dilution.

This problem can be readily solved using a more accurate formula that includes a consideration of the post-distribution market price; however, even this more accurate formula has flaws. Among other things, applying the formula will increase the percentage of the issuer that is owned by holders of convertible securities, and decrease the percentage of the issuer.

130. \( \text{Id. at 151.} \)
131. Various methods are used to determine the value of \( D \) for non-cash dividends. See Glover, \textit{supra} note 3, at 1272.
132. \( \text{See Kahan, \textit{supra} note 4, at 150. Appendix B demonstrates the mathematical accuracy of this proposition.} \)
133. \( \text{See, e.g., Edwin J. Elton et al., Marginal Stockholder Tax Effects and Ex-Dividend Day Behavior—Thirty-Two Years Later 3 (Am. Fin. Ass'n, 2003), http://ssrn.com/abstract=363620, at 3 ("The literature . . . overwhelmingly supports the fact that the drop in price on the ex-dividend day is less than amount of the dividend when ordinary income tax rates exceed capital gains tax rates."); see also Glover, \textit{supra} note 3, at 1272.} \)
135. \( \text{See \textit{id. at 1273.}} \)
136. \( \text{See \textit{id.}} \)
137. \( \text{Id.; see infra Appendix B (Equation 4).} \)
that is owned by holders of common stock. As a result, following a distribution and application of the formula, holders of convertible securities will recognize disproportionate accretion or dilution from subsequent changes in value of the issuer.

Given the foregoing difficulties and the availability of several alternative protective mechanisms, one would predict that anti-dilution adjustments for distributions would often not be included in instruments governing convertible securities. Experience supports this conclusion. Indeed, even when anti-dilution provisions are used to protect against distributions, the clause is applied only in narrow circumstances, typically providing for adjustments solely for extraordinary distributions, and not for regular cash dividends.

CONCLUSION

The debate over the proper use and formulation of anti-dilution provisions in convertible securities has been addressed in only a handful of articles. However, as Professor Stanley Kaplan noted early in the debate, it has been “difficult to formulate a theory and to reconcile the provisions of many clauses with any single theory.” This difficulty is apparent; even experienced practitioners often misunderstand these provisions, which can have significant economic consequences.

This Article provides a comprehensive framework to understand various anti-dilution adjustments and to reconcile the apparent inconsistencies among various anti-dilution clauses. This framework is based on the observation that the scope and extent of different types of anti-dilution provisions can generally be understood as a rational response to the nature and level of the information barriers and agency costs typically involved, and the existence or absence of other mechanisms to address these issues.

For example, convertible securities issued in venture capital transactions, where information barriers are severe, almost universally contain some

138. Instead of getting a cash (or other non-stock) distribution, the holders of convertible securities get the right to acquire more common stock, thus their percentage interest in the issuer vis-à-vis common stockholders increases following a distribution.

139. See Kahan, supra note 4, at 154 (“About 42% of... the sample offered no [anti-dilution] protection to [convertible] bondholders for [cash] dividends.”); see also Bratton, supra note 4, at 695 n.114 (noting that of a sample of forty-six convertible bonds, thirty-five permitted cash dividends out of surplus without adjustment and eleven permitted all cash dividends without adjustment, while forty-four provided for adjustments for distributions in kind).

140. Cf. Glover, supra note 3, at 1268 (“Antidilution provisions ordinarily provide for adjustments in the event of a special distribution.”).

141. Id. at 1269 n.58; Kahan, supra note 4, at 154; Klein, supra note 4, at 565 n.51. In the case of large public companies, this dichotomy likely results from the assumption that the existence of normal cash dividends were reflected in the initial purchase price of the convertible security. Evidence of this rationale is that convertible securities of these companies often contain provisions that require adjustments if the company changes its normal dividend policy. See Kaplan, supra note 2, at 12.

142. Kaplan, supra note 2, at 5.
form of conversion-price formula price protection. In contrast, convertible securities of large public companies, where these barriers are small (but the risk of agency costs exists), generally contain a market-price formula, which is typically applied only when common shareholders receive a disproportionate benefit.

Issuers and investors—or more likely their respective counsel—can use this framework to better understand these complex provisions and the consequences of choosing one form over another. This increased understanding should enable draftsmen of anti-dilution provisions to better accomplish the goals of their clients.
APPENDIX A: FULL-RATCHET VERSUS WEIGHTED-AVERAGE PRICE PROTECTION

The following discussion illustrates the different economic effects of full-ratchet and weighed-average price protection.

Assumptions:

X Corp. has four million shares of Common Stock outstanding, all owned by Founder.

Investor A acquires one million shares of Preferred Stock for $1 million. Each preferred share is initially convertible into one common share (that is, the initial conversion price is $1 per share).

Five million common shares are now outstanding on a fully-diluted basis.\footnote{For simplicity’s sake, effects of employee options should be ignored throughout these examples.}

Initial Capitalization:

<table>
<thead>
<tr>
<th></th>
<th>Conversion Price</th>
<th>Fully Diluted Shares</th>
<th>Implied Economic Value (at $1/share)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Founder</td>
<td>N/A</td>
<td>4 million</td>
<td>$4 million</td>
<td>80%</td>
</tr>
<tr>
<td>Investor A</td>
<td>$1.00</td>
<td>1 million</td>
<td>$1 million</td>
<td>20%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>5 million</td>
<td>$5 million</td>
<td>100%</td>
</tr>
</tbody>
</table>

Investor B:

How will new Investor B generally frame an offer? Merely stating the dollar amount to be invested and the number of shares (or the price per share) would subject Investor B to the effects of any outstanding anti-dilution provisions.\footnote{See Bagley & Dauchey, supra note 28, at 460-61.}

For example, if Investor B offered to buy 2.5 million shares for $1 million (or $0.40/share), Investor B’s ownership would range from 33.33% to 27.7%, depending on the type of anti-dilution protection in Investor A’s securities. As a result, Investor B will first value the company and then offer to acquire a fixed percentage of the company for a fixed dollar amount.\footnote{See Kuehmerle, supra note 8, at 3 (“In reality, Series B investors will often ask the following two questions: (1) How much capital does the ailing company need in this round? and (2) What percentage of the company would I like to own in exchange for this amount of capital?”).}
Assume Investor B offers to acquire 33.33% of X Corp. for $1 million. In the nomenclature of a venture capital deal, this implies a post-money valuation of $3 million ($1 million divided by 33.33%).

The following examples show the post-closing ownership based on various anti-dilution provisions.

**No Anti-dilution Protection:**

Absent anti-dilution protection, the post-closing ownership will be allocated as follows:

<table>
<thead>
<tr>
<th>Conversion Price</th>
<th>Fully Diluted Shares</th>
<th>Implied Economic Value (at $0.40/share)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Founder</td>
<td>N/A</td>
<td>4 million</td>
<td>$1,600,000</td>
</tr>
<tr>
<td>Investor A</td>
<td>$1.00</td>
<td>1 million</td>
<td>$400,000</td>
</tr>
<tr>
<td>Investor B</td>
<td>$0.40</td>
<td>2.5 million</td>
<td>$1,000,000</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>7.5 million</td>
<td>$3,000,000</td>
</tr>
</tbody>
</table>

**Full-Ratchet Approach:**

Under the full-ratchet approach, Investor A’s conversion price is adjusted down to the price of the stock issued to Investor B, effectively allowing Investor A to purchase Common Stock at the lower price. After adjustment, the current value of Investor A’s investment will be equal to the value of Investor A’s initial investment.

Investor A initially paid $1 million. Investor B’s $1 million investment now buys Preferred Stock convertible into 33.33% of the Common Stock of X Corp. It follows that Investor A’s Preferred Stock must now also be convertible into 33.33% of the Common Stock of X Corp. This leaves the remaining 33.33% for Founder. Because Founder owns four million shares of Common Stock, both Investors A and B must also be entitled to receive four million shares. A price per share of $0.25 can be calculated by dividing (i) the $1 million aggregate price paid by Investor B by (ii) the four million shares Investor B will receive.

<table>
<thead>
<tr>
<th>Conversion Price</th>
<th>Fully Diluted Shares</th>
<th>Implied Economic Value (at $0.25/share)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Founder</td>
<td>N/A</td>
<td>4 million</td>
<td>$1,000,000</td>
</tr>
<tr>
<td>Investor A</td>
<td>$0.25</td>
<td>4 million</td>
<td>$1,000,000</td>
</tr>
<tr>
<td>Investor B</td>
<td>$0.25</td>
<td>4 million</td>
<td>$1,000,000</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>12 million</td>
<td>$3,000,000</td>
</tr>
</tbody>
</table>

146. A price of $0.40 per share is used to imply the economic value because this is the price that Investor B pays.
Weighted-Average Approach:

The adjusted conversion price is much more difficult to calculate under the weighted-average approach. The formula is relatively straightforward:

\[ CP_1 = \frac{(CPO \times O_0 + \$)}{(O_0 + I)} \]

However, there are two unknown variables in the equation:

- \( CP_1 \), the adjusted conversion price and
- \( I \), the number of shares of common stock issued (or deemed issued) in the dilutive transaction.

Consequently, other equations are needed to solve for these unknowns. These equations can then be solved through an iterative process (best done with a spreadsheet program).

Here is the application of the formula:

\[ CP_1 = \frac{($1 \times 5 \text{ million} + 1 \text{ million})}{(5 \text{ million} + 2.64 \text{ million})} = \$0.79 \]

<table>
<thead>
<tr>
<th>Conversion Price</th>
<th>Fully Diluted Shares</th>
<th>Implied Economic Value (at $0.38/share)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Founder</td>
<td>N/A</td>
<td>4.00 million</td>
<td>$1,520,000</td>
</tr>
<tr>
<td>Investor A</td>
<td>$0.79</td>
<td>1.27 million</td>
<td>$480,000</td>
</tr>
<tr>
<td>Investor B</td>
<td>$0.38</td>
<td>2.64 million</td>
<td>$1,000,000</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>7.91 million</td>
<td>$3,000,000</td>
</tr>
</tbody>
</table>

147. See supra text accompanying notes 130-31 for definitions of the variables.
148. In the example, the shares will equal 33.33% of the aggregate number of shares outstanding following completion of the transaction.
149. Trial and error works too, but tends to take longer.
Conclusion:

The following tables illustrate the effect of the different provisions on Founder and Investor A:

<table>
<thead>
<tr>
<th></th>
<th>Founder</th>
<th>Investor A</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percent Ownership</td>
<td>Implied Economic Value</td>
</tr>
<tr>
<td>Pre-Closing</td>
<td>80%</td>
<td>$4,000,000</td>
</tr>
</tbody>
</table>

**Anti-dilution Protection:**

<table>
<thead>
<tr>
<th></th>
<th>Founder</th>
<th>Investor A</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percent Ownership</td>
<td>Implied Economic Value</td>
</tr>
<tr>
<td>None</td>
<td>53.3%</td>
<td>$1,600,000</td>
</tr>
<tr>
<td>Weighted-Average</td>
<td>50.57%</td>
<td>$1,520,000</td>
</tr>
<tr>
<td>Full-Ratchet</td>
<td>33.3%</td>
<td>$1,000,000</td>
</tr>
</tbody>
</table>
APPENDIX B: EXTRAORDINARY DISTRIBUTION ADJUSTMENTS

The ideal anti-dilution provision ensures that holders of a convertible security "receive property of the same value whether they convert immediately before or immediately after a dilutive action."\textsuperscript{150} Consequently, to formulate an appropriate anti-dilution provision for extraordinary distributions, compare the value of the property held immediately after an extraordinary distribution by two investors: one holder of a convertible security who converted immediately before the distribution and one who converted immediately after the distribution.

Definitions

\begin{align*}
M_P & = \text{per share market price pre-distribution} \\
M_P' & = \text{per share market price post-distribution} \\
D & = \text{per share value of the distribution} \\
C_P & = \text{the initial conversion price} \\
C_P' & = \text{the adjusted conversion price}
\end{align*}

A holder of a convertible security exercisable for a single share of common stock who converts prior to an extraordinary distribution will have, immediately after the distribution, property worth:

Equation 1: \( M_P + D \)\textsuperscript{151}

If the holder chooses to exercise his conversion rights immediately following the extraordinary distribution, the value of the property will be:

Equation 2: \( \frac{C_P}{C_P'} \times M_P \)

To fully protect against economic dilution, Equation 1 and Equation 2 must be equal, so:

Equation 3: \( M_P + D = \frac{C_P}{C_P'} \times M_P \)

To find the appropriate adjustment formula, solve Equation 3 for \( C_P' \):

Equation 4: \( C_P' = \frac{C_P \times M_P}{(M_P + D)} \)\textsuperscript{153}

\textsuperscript{150} Kahan, supra note 4, at 149.
\textsuperscript{151} That is, one share of stock with a value of \( M_P \), plus the distribution on that share with a value of \( D \).
\textsuperscript{152} Prior to the distribution, the holder receives \( \frac{C_P}{C_P} \) (or one) share of common stock upon conversion. Following the distribution and the adjustment of the conversion price, the holder will receive \( \frac{C_P}{C_P} \) shares.
\textsuperscript{153} Equation 4 is the most accurate adjustment for extraordinary distributions.
If the distribution reduces the exercise price on a dollar-for-dollar basis, then:

Equation 5: \( MP_1 = MP_0 - D \)

Substituting the value of \( MP_1 \) in Equation 4 yields the traditional adjustment formula for extraordinary distributions:

Equation 6: \( CP_1 = CP_0 \times (MP_0 - D) / MP_0 \)