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Stock-Based Compensation at Twitter

Olivia Nash, an analyst at leading hedge fund BlueShark Capital Management, sat back and popped open a fresh can of Kiwi LaCroix as she looked out the pristine glass window in her office. Olivia was part of BlueShark's technology sector coverage team, having been with the firm since completing her MBA five years ago. She had just finished listening to the hour-long earnings call for Twitter's Q4 2017 results.

Was Twitter doing well? That depended on which numbers she chose to believe. According to Generally Accepted Accounting Principles (GAAP), Twitter had recorded a $108M net loss for 2017. But on the earnings call, CEO Jack Dorsey and CFO Ned Segal had emphasized a slightly different and much better-looking metric: non-GAAP net income of $329M. This adjusted version of net income was a measure Twitter had defined itself when it first went public in 2013. The biggest difference between the two was that Twitter's non-GAAP net income stripped out stock-based compensation expense.

The use of non-GAAP earnings was not unusual among Twitter's peers, and most Wall Street analysts had for years judged performance based almost exclusively on the companies' self-defined metrics. Still, Olivia couldn't help but wonder: Was stock-based compensation a true expense? Why did analysts and even regulators condone non-GAAP metrics? And, most importantly, how did the reporting of these metrics impact Twitter's profitability and the way the company was managed?

Company Background

just setting up my twttr

— Jack Dorsey, March 21, 2006 (first tweet)

Spun out of the failed podcasting startup Odeo in 2006, Twitter was founded by Jack Dorsey, Evan Williams, Noah Glass, and Biz Stone to help people stay connected through short, 140-character status updates called "tweets." After setting up an account, a user could create a tweet by sending a short message service (SMS) text message to Twitter's phone number, 40404. Anyone who had opted to "follow" that user would then receive a text message with the tweet (the initial 140-character limit

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corresponded to the maximum allowable length of an SMS message). Users could also go to Twitter's website to view a chronological feed of their own tweets and the tweets of the users they followed.

As the product gained traction, new use cases emerged. People came to Twitter not only to see what their friends were up to but also to follow celebrities, read breaking news, and engage in real-time debates about world events. By democratizing access to information and giving a platform to anyone with a phone or computer, Twitter became an important tool for news and public discourse. As cofounder Williams explained, "The insight we eventually came to was Twitter was really more of an information network than it is a social network."[1] Venture capital investors thought this utility was valuable: in 2009, despite having no revenue earned to date, the company raised money at a $1.2B valuation.[2]

Dick Costolo took over as CEO in 2010 and focused on building a sustainable business in preparation for taking the company public. Twitter created an advertising-based revenue model in which businesses could pay to place "promoted tweets" in the timelines of targeted users. Under Costolo's leadership, the company grew from 30 to 2,000 employees, from ~20 million to ~200 million monthly active users, and from $0 to $665 million in annual revenue by the time of its initial public offering (IPO) on November 7, 2013.[3] Twitter shares ended their first day up 73% to $44.90, valuing the company at more than $24 billion.[4]

Over the next several years, the company struggled to match lofty expectations for growth in its revenue, earnings, and user base, while other social networks like Facebook, Instagram, and Snap ("Snapchat") continued growing and taking share. In July 2015, Costolo stepped down as CEO and Dorsey reassumed his previous role. The stock hit an all-time low of $13.90 in May 2016, down almost 70% from its first day of trading.[5] Anthony Noto, who first joined as the company's CFO in July 2014 and later transitioned to the COO role, left the company in February 2018. Twitter's next CFO, Ned Segal, joined the company in August 2017. (See **Exhibits 1, 2, 3,** and **4** for Twitter financial data, and **Exhibit 5** for Twitter's historical stock price chart.)

Stock-Based Compensation

What Is SBC?

Stock-based compensation (SBC) was a non-cash form of payment that granted employees an ownership stake in the company. The most common forms of SBC were employee stock options and restricted stock units (RSUs).

Stock options gave employees the right to purchase shares of the company's stock at a predetermined price, known as the exercise price. For example, 400 options might be granted to an employee to purchase 400 shares of common stock at an exercise price of $10 at a later date. If the share price exceeded $10 on the date when the employee was permitted to exercise the option, the employee would profit. If the stock price was $15, the employee could pay the company $4,000 to exercise the options, for 400 shares worth $6,000 total. Once the options were exercised, the employee could choose to hold the stock, or sell it to cash in on the profit.

RSUs (restricted stock units) were "phantom stock" that were exchanged into common stock at the time of vesting. For simplicity, many employees found it useful to think of an RSU as an option with an exercise price of $0; the RSUs simply converted into common shares at no cost. This could lead to significant differences in the value of the SBC: while a grant of traditional stock options might be worth $0 if the company's stock price did not exceed the exercise price at the time of vesting, an employee

with RSUs would always receive some value from her grant so long as the company's stock price did not fall to $0. Historically, RSUs tended to be used only by public companies, but in the 2010s, as pre-IPO companies began to stay private longer, later-stage private companies such as Twitter, Airbnb, and Dropbox adopted the use of RSUs while still private.[6]

Regardless of the form, SBC was subject to vesting requirements, a period over which ownership of the granted package would be transferred to the employee according to a schedule. The most common structure was a linear four-year vesting period with a one-year "cliff" and quarterly vesting thereafter. For instance, an employee who was granted 400 options upon joining a company would vest 100 options (1/4 of the total grant) after working at the company for a year, and then 25 options (1/16 of the total grant) each quarter thereafter (see **Exhibits 6** and **7** for illustrative examples highlighting the journal entries for stock options and RSUs illustrative examples).

If an employee left the company, she forfeited the unvested portion of the grant. Historically, companies had to estimate the percentage of options that would eventually be forfeited. However, a change came into effect in the accounting for stock options in fiscal year 2017. The Accounting Standards Update (ASU) 2016-09, "Compensation — Stock Compensation (Topic 718): Improvements to Employee Share-Based Payment Accounting," allowed companies to account for forfeitures as they occurred, rather than estimate expected forfeitures. Many companies, including Twitter, chose to account for forfeitures as they occurred.[7]

Why Use Stock-Based Compensation?

Stock-based compensation was widely believed to be an effective mechanism to recruit, motivate, reward, and retain employees.[8] An Anderson Consulting study from the 1990s found that 90% of surveyed CEOs cited "attraction and retention of talent" as their primary reason for granting stock options to their employees.[9]

SBC was a useful recruiting tool because it allowed employees to participate in a lucrative outcome in the case of an upside scenario. This was especially true for early-stage companies, where the upside potential and granted ownership stake could be much larger than what would be possible at a more mature company. Pre-IPO private companies could also use large stock grants to attract and recruit senior executives from more established companies, who were crucial in helping companies scale beyond the startup stage and ultimately prepare to go public.

Vesting schedules were an effective mechanism to retain employees. The one-year "cliff" was a significant deterrent to any employee leaving before spending at least a year with the company, as doing so would result in having no vested stock. Beyond that, if an employee had confidence that their equity would be worth a meaningful amount in the long term, she would be motivated to stay at the company until her entire grant had vested.

Stock grants did not need to be limited to new employees. Companies could also use SBC to motivate, reward, and retain current employees through "refresh" grants.[10] Incremental to the initial stock package, a company could grant additional stock to employees as part of a performance evaluation to reward strong performers.

Another key reason for using SBC was its non-cash nature. Early-stage companies that generated little or no cash flow, who could not afford to compensate their employees commensurately at market salaries on a cash-only basis, found stock-based compensation a useful tool for keeping cash burn lower.

SBC started gaining popularity in the late 1980s among both emerging technology companies and established Fortune 500 companies, as competition for highly educated talent intensified.[11] By 2017, 34% of public companies implemented some form of employee stock purchase plan according to FW Cook, with prevalence highest among tech companies, 70% of which implemented such a plan (see **Exhibit 8** for SBC by industry and company size).

However, not all were in favor of the growing use of SBC. Critics expressed concern that high levels of SBC could distort managerial decision-making. Because it tied compensation closely to a company's stock price, some argued that SBC incentivized executives to make the company look better during the periods when they received equity grants, even though doing so might not be in the company's best long-term interests. Academic studies showed that CEOs with larger equity packages tended to take bigger risks, and that their companies were more likely to engage in illegal earnings manipulation.[12] Other studies claimed that higher levels of SBC were not in fact correlated with better company performance.[13]

Regulation of SBC

Because stock-based compensation did not involve a cash outflow, there had been questions about the expense treatment of employee stock option grants since the late 1980s. Historically, the Federal Accounting Standards Board (FASB) did not require companies to record the fair value of SBC as an expense, instead permitting the use of the intrinsic value method. In 1993, the FASB proposed new accounting rules for stock options, recommending that companies value stock options using the fair value method and expensing these accounts in their income statements. Corporate America reacted with overwhelming disapproval, resulting in a less ambitious change and the release of Statement of Financial Accounting Standards (SFAS) No. 123, "Accounting for Stock-Based Compensation," in October 1995. Under SFAS 123, companies were "encouraged" to take an earnings charge based on an estimated fair value for the stock grants they issued, although they were given the option to disclose this value in a footnote instead and continue using the intrinsic value method.[14] By 2000, all but a handful of the companies most actively issuing SBC opted to use the footnote approach rather than report the fair value of these options in their earnings.[15] (See **Appendix A** for a further explanation of accounting rules for intrinsic value and fair value methods.)

In the early 2000s, major accounting scandals at large companies like Enron and Worldcom led to a renewed focus on financial reporting regulations. SBC was one area that came under particular scrutiny, as the bursting of the dot-com tech bubble had exposed the high cost of equity grants. In the 2002 Sarbanes-Oxley Act, SBC was specifically highlighted as a concern in Section 404, which required issuers to disclose the scope and adequacy of their procedures and internal control structure for financial reporting.[16] In December 2004, the FASB issued SFAS 123R, "Share-Based Payment," to replace the previous SFAS 123 standard, which finally required that stock options be valued using the fair value method and thus recorded as an expense as of the grant date.

SBC as an Expense?

In the years leading up to the FASB's modification to SFAS 123, there was intense debate among standard-setters, politicians, investors, corporations, and academics about whether to require the expensing of stock options.[17] The eventual 2004 announcement of SFAS 123R was met with corporate uproar and heavy congressional lobbying to reverse the FASB's decision.[18]

Those in favor of SFAS 123R argued that expensing SBC presented a more accurate representation of a company's profitability. They claimed that SBC reflected a cost of acquiring employee labor, and that expensing SBC conveyed this information to outsiders consistently with other labor costs, such as

salaries and cash bonuses.[19] Many investors argued that because the granting of employee stock options allowed companies to pay their employees lower cash salaries, not including this expense artificially inflated profits.[20] A study in 2001 found that for a sample of large growth firms, mandatory expensing of SBC would have made the median firm's earnings per share 14% lower.[21]

From a corporate governance perspective, proponents of expensing argued that the absence of SBC from income statements exacerbated ineffective corporate governance and allowed C-level executives to extract excessive compensation.[22] Requiring the expensing of SBC would bring more transparency in C-level executive compensation.

Arguments against expensing focused on the uncertainty of the value of SBC. Because it was not paid in cash and because employees might not be able to realize the value of the grants for several years, they argued, the true value could not be known. Even though there were common fair value valuation methods, such as Black-Scholes, SBC contracts were constructed in a way that led employee behaviors to deviate from the assumptions underlying such pricing models, with features such as vesting provisions, long expiration periods, non-transferability, and accelerated maturity when the holder terminates employment. [23] Accounting standard-setters were often reluctant to endorse figures in the financial statements that could not be measured reliably.[24] In the most extreme argument, because options were often underwater at the time of being granted, accounting purists argued that options held no tangible value at the time of issue.[25]

Even if fair values were clearly assigned to equity grants, the compensation expense recorded over the duration of the vesting schedule was calculated according to the fair value at the time of the grant, and not using an updated fair value at the time of the vesting. This meant that as the stock price rose or fell, the compensation expense recorded in a period would not necessarily match the value of those shares at market prices at that time, but rather the value at the time they were initially granted. If the stock price fell dramatically, the company would be recording an expense that was arguably overstated, and if the stock price appreciated significantly, the compensation expense would arguably be understated. Segal emphasized that "from my experience, this is an important nuance of SBC, which is not well understood."[26]

Furthermore, prominent business leaders argued that the economic costs of SBC were already reflected in their dilutive effects on "earnings per share" (EPS), as the exercise of options by employees increased the number of shares outstanding, thereby diluting existing shareholders' equity by reducing their previous ownership.[27] This dilution materialized in EPS by increasing the denominator figure in the EPS calculation, lowering EPS. If a fully diluted EPS metric already captured the dilution cost, they argued, expensing SBC would double-count their cost by also penalizing the numerator figure (see **Exhibit 9** for an illustrative calculation). More tactically, they worried that expensing SBC would convey weaker financial results to investors, which could raise the firms' cost of financing and stifle corporate investment and innovation.[28]

Despite the FASB's clear ruling, the debate continued into 2018. Companies reacted to the accounting change in a number of ways. One common reaction was to provide pro-forma, non-GAAP statements for investors that showed profitability metrics that excluded the expensing of options.[29]

Twitter's Use of Stock-Based Compensation

Twitter, like many of its venture capital-backed contemporaries, relied heavily on SBC as a tool to recruit and retain employees.[a] The company granted SBC to employees across all functions, categorized under cost of revenue, research and development, sales and marketing, and general and administrative (**Exhibit 3** includes a breakdown of SBC expense by function).[b] Twitter furthermore used SBC to retain employees that joined the company through acquisitions. The company's growth coincided with a period of rapidly intensifying competition for engineering talent in Silicon Valley, and SBC provided a way for startups to present employees with compensation packages potentially worth far more than what they could afford to pay in cash. As Twitter noted in its S-1[c] and all subsequent quarterly reports:

> We depend on highly skilled personnel to grow and operate our business, and if we are unable to hire, retain and motivate our personnel, we may not be able to grow effectively. . . . Competition for highly skilled personnel is intense, particularly in the San Francisco Bay Area. We may need to invest significant amounts of cash and equity to attract and retain new employees.[30]

Segal echoed the sentiment, explaining: "Twitter attracts and retains employees in part by compensating competitively. We view equity as an important component of compensation. When you choose to work at Twitter, you are betting on equity in Twitter. Our philosophy is that employees behave differently when they feel like owners."[31]

Even among similar companies, one could make the case that Twitter granted an unusually large amount of equity. By the time of its IPO in 2013, it had granted equity awards estimated to be worth almost $1 billion.[32] By 2015, the company's SBC expense as a percentage of revenue was almost twice as high as that of any of its closest comparables (see **Exhibit 10** for SBC as a percentage of revenue for selected internet companies). In fiscal years 2017, 2016, and 2015, Twitter's SBC expense as a percentage of revenue was 18%, 24%, and 31%, respectively.

In addition to the SBC expense reflected on the income statement, Twitter, like many other technology companies, capitalized the cost of engineering for underlying technology to run its business, including relevant employee compensation, of which SBC was one component. In fiscal years 2017, 2016 and 2015, Twitter capitalized costs totaling $113.9 million, $139.0 million, and $92.8 million, respectively, out of which $51.8 million, $73.9 million, and $50.3 million were SBC expenses, respectively.[33] These capitalized costs were included in property and equipment, net (PP&E). The estimated useful life of such capitalized expenses, evaluated on a project-by-project basis, could be up to four years. In fiscal years 2017, 2016 and 2015, the amortization of capitalized costs included in the cost of revenue totaled approximately $96.5 million, $74.6 million, and $37.8 million, respectively.[34]

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[a] In August 2018, Twitter had over 400 open job postings on its website (https://careers.twitter.com/en.html)

[b] Per Twitter's 10-K, "cost of revenue" included infrastructure costs; other direct costs including content costs, amortization expense of technology acquired through acquisitions, and amortization of capitalized labor costs for internally developed software; allocated facilities costs; and traffic acquisition costs. "Research and development" consisted primarily of personnel-related costs for engineers and other employees engaged in the research and development of products and services. "Sales and marketing" consisted primarily of personnel-related costs for employees engaged in sales, sales support, business development and media, marketing, corporate communications, and customer service functions. "General and administrative" consisted primarily of personnel-related costs for executive, finance, legal, information technology, human resources, and other administrative employees.

[c] A form that companies going public must file to register with the U.S. Securities and Exchange Commission.

Although there was no one clear reason, a confluence of factors contributed to the magnitude of Twitter's SBC expense. From a product reliability standpoint, the real-time nature of the product meant that site outages, which happened regularly in the company's early years at times of peak usage, were especially problematic. The company therefore put extra emphasis on hiring the best engineering talent to fix and prevent such issues.[35] At the executive level, internal turmoil among the founders and company leadership led to unusually high levels of executive turnover. The company had three different CEOs in its first four years, and so many Heads of Product were fired or resigned that the role was often compared to the Defense Against the Dark Arts professorship from the *Harry Potter* book series (a position in which no professor lasted more than one year).[36] Each new executive required a new large equity grant (although some of the departing executive's SBC expense might be reversed if the grant had not fully vested). Additionally, because the company was slow to monetize and revenue growth was slower than anticipated, the grants may have been larger relative to future revenue than was expected at the time they were issued.

Finally, many employee grants ended up being worth less than expected due to the company's floundering stock price. Twitter issued additional grants in an attempt to make up the difference, leading to additional SBC expense. At one point in 2016, the company was offering refresh stock grants companywide to make up for the losses and prevent a mass talent exodus to better-performing competitors.[37] This put Twitter at risk of falling into a "downward spiral": if a company's stock price went down, so did its compensation level relative to competitors, leaving the company vulnerable to high employee turnover. In addition, the company's GAAP financials would be further depressed because the expensing of SBC relied on the fair value of the grant at the time of the issuance instead of the time of the vesting, even if a lower stock price meant the grants were worth less at the time of vesting. A company in such a scenario, if it were not managing this risk well, could then be compelled to grant even more SBC to stem turnover, costing the business more and depressing its stock price further.

Shareholders frequently reached out to Twitter expressing concern over the additional stock grants. At that time Twitter presented three arguments in favor of doling out the extra grants:

(1) The cost of these additional grants was less than it appeared on the company's income statement, because according to GAAP rules, SBC had to be expensed based on the stock price at which it was granted. Since Twitter's stock price had decreased, the earlier grants ended up being worth less than the associated GAAP-approved expense suggested.

(2) The cost of the grants was lower than the alternative cost of potentially higher employee turnover at a critical moment in the company's life.

(3) Because employees' equity grants were worth less than was expected at the time they were initially granted, these employees did not have the ownership stake or level of compensation that the company had originally intended for them to have. Twitter believed that employees should have enough equity in the company to reflect their contributions, and wanted to issue additional shares to ensure they continued to be appropriately invested in the business.[38]

Twitter's Use of "Adjusted Earnings"

Although beholden to GAAP reporting rules, Twitter's management felt that including SBC as an expense was not the only way investors would want to see the business's financials. To address this, the company included certain non-GAAP financial measures in its earnings reports. These non-GAAP metrics included "adjusted EBITDA" (earnings before interest, tax, depreciation and amortization) and

"non-GAAP net income," both of which removed stock-based compensation expense from profit calculations, among other adjustments.

The company noted in its first quarterly earnings press release as a public company:

> Twitter believes that adjusted EBITDA, non-GAAP net income (loss) and non-GAAP EPS help identify underlying trends in its business that could otherwise be masked by the effect of the expenses that we exclude . . . Twitter also believes that adjusted EBITDA, non-GAAP net income (loss) and non-GAAP EPS provide useful information about its operating results, enhance the overall understanding of the Company's past performance and future prospects and allow for greater transparency with respect to key metrics used by the Company's management in its financial and operational decision-making. Twitter uses these measures to establish budgets and operational goals for managing its business and evaluating its performance. The Company is presenting these non-GAAP financial measures to assist investors in seeing the Company's operating results through the eyes of management, and because it believes that these measures provide an additional tool for investors to use in comparing Twitter's core business operating results over multiple periods with other companies in its industry.[39]

Segal added, "We want investors to have the tools to make good decisions about our equity and we give them all the data they need. We were aware that investors would look at non-GAAP metrics, and would often adjust for SBC. Because investors have historically looked at non-GAAP metrics, we provide and give guidance on non-GAAP metrics. That said, we were mindful that in the long run investors, just like us, would care about the all-in costs to run the business, including equity grants."[40]

Because of the magnitude of the company's SBC, the difference between its GAAP and non-GAAP earnings was significant: in 2014, for example, the company was unprofitable on a GAAP basis, with a net loss of $578M, but profitable by its non-GAAP calculations, with a net income of $68M (see **Exhibit 11** for a comparison of Twitter's GAAP and non-GAAP net income). As of Q2 2018, Twitter continued to report non-GAAP earnings and discuss these metrics in its earnings calls and press releases.

Market Reactions

At the time of Twitter's IPO, Wall Street analysts seemed amenable to the company's non-GAAP approach to its financial metrics. Most analysts referred to Twitter's "adjusted EBITDA" as simply "EBITDA" and used it to calculate their own valuations and benchmark performance against competitors, largely ignoring the company's GAAP-approved profitability metrics. In initiating coverage reports, none cited the magnitude of SBC at Twitter as a risk factor or cause for concern, though most included the dilution impact of the shares that would vest upon IPO in calculating their estimated per-share stock price and thus determining their buy/sell recommendation.[41] This may have partly been driven by an assumption that post-IPO SBC expense would drop significantly. As Brian Wieser noted in a Pivotal Research Group report, the company's initial "Buy" rating "presumes that issuances we have seen in 2013 so far are abnormally high, as the company aims to secure the services of key employees in the critical periods post-IPO, or otherwise provide this compensation during a time when the company may be less subject to public investor scrutiny."[42]

Since the IPO, sell-side research analysts had seemingly not changed their views. Research reports in 2018 published by analysts at global investment banks generally used "adjusted EBITDA" when applying enterprise value/EBITDA (EV/EBITDA) multiples as part of valuation exercises.[43] On quarterly earnings calls, analysts continued to accept and corroborate "adjusted EBITDA" as well as the other non-GAAP financial measures. As of Q2 2018, no analysts had asked Twitter management

about the interpretation of these non-GAAP financial measures during any of the company's quarterly earnings calls since its IPO.[44] During the same time period, management's outlook for SBC expense came up only three times during Q&A (question and answer) sessions during these earnings calls: once on the Q2 2017 call from an individual under the pseudonym "Lyman Zerga," who was unaffiliated with any financial institution; once on the Q1 2016 call from Eric Sheridan of UBS; and once on the Q1 2014 call from Justin Post of Bank of America Merrill Lynch.[45]

Regulatory Reactions

The Securities and Exchange Commission (SEC), the governing body in charge of regulating and enforcing securities law in the U.S., had long viewed the reporting of non-GAAP earnings skeptically. During her keynote address at the 2015 Certified Public Accountant (CPA) National Conference in 2015, SEC Chair Mary Jo White remarked, "Non-GAAP measures are used extensively and, in some instances, may be a source of confusion."[46] In May 2016, the SEC released new and updated Compliance and Disclosure Interpretations (C&DIs) on the use of non-GAAP financial measures, signaling a renewed focus and tighter policy on non-GAAP measures.[47] As part of this update, the SEC provided example disclosures that would lead a non-GAAP measure to be more prominent than the most directly comparable GAAP metric.[48] The SEC regularly issued comment letters to firms, raising questions regarding their use of non-GAAP metrics.[49,50]

Twitter received one such SEC comment letter in 2017, claiming that the company placed greater prominence on its non-GAAP measures than on its GAAP measures in its financial reports, which was inconsistent with SEC guidelines. Twitter responded, saying that going forward it would "ensure that when a non-GAAP financial measure is presented, the most directly comparable financial measure calculated in accordance with GAAP is disclosed with equal or greater prominence."[51]

Non-GAAP Reporting by Other Internet Companies

Though other internet companies at one point reported non-GAAP earnings that excluded SBC as an expense, by 2017 that had begun to change. Both Facebook and Alphabet (Google's parent company) stopped reporting non-GAAP earnings in 2017, citing an acknowledgment that SBC was an operating expense that should be accounted for.

Alphabet CFO Ruth Porat said at the time, "Although it's not a cash expense, we consider it to be a real cost of running our business because [stock-based compensation] is critical to our ability to attract and retain the best talent in the world."[52] Facebook CFO David Wehner made a similar remark, stating that investors "should focus primarily on our GAAP metrics given that stock-based [compensation] is an important part of our compensation mix."[53]

Despite these proclamations, many in the media speculated that the change was also driven by two additional factors: (1) the SEC's heightened scrutiny of non-GAAP reporting, and (2) the fact that these companies now operated at healthy GAAP profit levels, while other internet companies (including Twitter and Snap, which went public in March 2017) did not, and using GAAP profitability metrics would make them look better by comparison.[54]

On the latter point, Segal noted that "a firm's use of SBC could change over the course of its lifecycle, and as business grows, the ratio of SBC to revenue should improve." Thus, one needed to be mindful when defining peers to compare on a metric like "SBC as Percentage of Revenue." Segal went on, "When we look at companies to compare these metrics against, we don't just look at companies with similar business models, but companies that are also similar in size, operate in similar geographies, and have similar margin profiles."[55] Indeed, companies that had yet to steadily generate GAAP profits

and free cash flows had a higher usage of SBC relative to revenue. Comparing two of the biggest technology IPOs of the previous few years, Snap and Dropbox, helped to illustrate this idea: Snap recorded SBC expense of $156 million against revenue of $262 million in Q2 2018 (60% of revenue).[56] On the other hand, Dropbox, which had generated many quarters of free cash flow by the time it went public in March 2018, recorded SBC expense of $55 million against revenue of $339 million in Q2 2018 (16% of revenue).[57] In Twitter's 2017 10-K, management stated that they "remain[ed] committed to reducing stock-based compensation to high single digits to low teens as a percentage of revenue over time, bringing [them] more in line with our peers."[58]

Twitter's New Bonus Program

> Before 2017, Twitter did not offer performance-based cash bonuses. In a 2017 proxy statement on executive compensation, the company explained: We believe that until we reach sustainable profitability on a GAAP basis, performance-based compensation opportunities for our Named Executive Officers should continue to be in the form of long-term equity incentives. This approach allows us to conserve cash resources and tie most of the annual compensation opportunities for our Named Executive Officers to our performance in the form of equity awards whose value is linked to stockholder value and, beginning in 2016, a portion of which is tied directly to company performance.[59]

In 2017, with an eye on reducing SBC expense, Twitter initiated an annual performance-based cash bonus program for its non-executive employees. The company explained that the program was instituted "in recognition of our focus on sustained profitability as well as to better align pay mix to market and commitment to continue to reduce stock-based compensation to high single digits from low teens as a percentage of revenue over time."[60] Executives, however, continued to be compensated primarily in the form of equity. "Our Named Executive Officers do not participate in this plan because the compensation committee believes that it is important that equity compensation remains the core incentive to create alignment between our Named Executive Officers, the performance of the company and stockholder value creation. [. . .] By 2019, 50% of each Named Executive Officer's target equity compensation will be in the form of performance-based equity."[61]

It was common for more mature technology companies with more cash on hand to offer a cash bonus in addition to base salary and equity as part of a compensation package. Benefits of a cash bonus program included the ability to reduce equity awards, compete more aggressively for top talent, and tie compensation to both individual and company performance.

More traditional companies offered cash bonuses on top of an employee's base salary, but did not grant equity awards to junior employees. This contrast raised questions about the extent to which SBC and cash bonuses were substitutable, as technology companies often reduced their equity grants after introducing cash bonuses. Because the size of the bonus could still be influenced by company performance if the program was designed in that manner, cash bonuses still had the potential to align employee incentives in a similar way that SBC did.

The Next Earnings Announcement

By early 2018 things were looking up for Twitter. An increasing user base and a focus on reining in costs had helped the company to finally achieve GAAP profitability in the fourth quarter of 2017. However, stock-based compensation expense for the year remained high relative to peers at 18% of revenue, and the company continued to highlight its non-GAAP adjusted earnings metrics in its financial reports.

Olivia could feel a migraine coming on as she wrestled with how to determine a valuation for the company. Should she continue to focus on non-GAAP earnings, as she and her peers had always done? Or should she heed the advice of Facebook and Google's CFOs and start viewing stock-based compensation as an expense? Should shareholders be pushing more aggressively for Twitter to cut back on its equity grants to employees, or would that create the risk of missing out on the top-tier talent that the company needed to stay competitive with its larger rivals? What tools did management at Twitter have at their disposal to reduce the use of SBC going forward? Exhausted, she decided to distract herself for a few minutes by pulling out her phone and refreshing her Twitter feed.

Exhibit 1 Annual Income Statements (years ended December 31, in $ thousands)

	2017	2016	2015	2014	2013
Revenue	$2,443,299	$2,529,619	$2,218,032	$1,403,002	$664,890
Cost of revenue	861,242	932,240	729,256	446,309	266,718
Research and development	542,010	713,482	806,648	691,543	593,992
Sales and marketing	717,419	957,829	871,491	614,110	316,216
General and administrative	283,888	293,276	260,673	189,906	123,795
Total costs and expenses	2,404,559	2,896,827	2,668,068	1,941,868	1,300,721
Income (loss) from operations	38,740	(367,208)	(450,036)	(538,866)	(635,831)
Interest expense	(105,237)	(99,968)	(98,178)	(35,918)	(7,576)
Other income (expense), net	(28,921)	26,342	14,909	(3,567)	(3,739)
Loss before income taxes	(95,418)	(440,834)	(533,305)	(578,351)	(647,146)
Provision (benefit) for income taxes	12,645	16,039	(12,274)	(531)	(1,823)
Net loss	**($108,063)**	**($456,873)**	**($521,031)**	**($577,820)**	**($645,323)**
Net loss per share attributable to common stockholders:					
Basic and diluted	($0.15)	($0.65)	($0.79)	($0.96)	($3.41)
Weighted-average shares used to compute net loss per share attributable to common stockholders:					
Basic and diluted	732,702	702,135	662,424	604,990	189,510
Other Financial Information:					
Adjusted EBITDA	$862,986	$751,493	$557,807	$300,896	$75,430
Non-GAAP net income (loss)	$328,859	$264,406	$180,486	$68,438	($19,057)

Source: Twitter 10-Ks.

Exhibit 2 Annual Balance Sheet (in $ thousands)

	2017	2016	2015	2014	2013
Cash and cash equivalents	$1,638,413	$988,598	$911,471	$1,510,724	$841,010
Short-term investments	2,764,689	2,785,981	2,583,877	2,111,154	1,393,044
Property and equipment, net	773,715	783,901	735,299	557,019	332,662
Total assets	7,412,477	6,870,365	6,442,439	5,583,082	3,366,240
Convertible notes	1,627,460	1,538,967	1,455,095	1,376,020	-
Total liabilities	2,365,259	2,265,430	2,074,392	1,956,679	416,234
Total stockholders' equity	5,047,218	4,604,935	4,368,047	3,626,403	2,950,006

Source: Twitter 10-Ks.

Exhibit 3 Selected Additional Financial Data

	2017	2016	2015	2014	2013
Monthly Active Users (MAUs) (in millions)					
MAUs: Worldwide	330	318	305	288	241
MAUs: United States	68	67	65	63	54
MAUs: International	262	251	241	225	187
Revenue Mix (in $ thousands)					
GAAP Revenue (Worldwide)	2,443,299	2,529,619	2,218,032	1,403,002	664,890
Advertising Revenue	2,109,987	2,248,052	1,994,036	1,255,688	594,546
Data Licensing & Other	333,312	281,567	223,996	147,314	70,344
GAAP Revenue (United States)	1,413,614	1,564,776	1,443,240	945,720	492,320
GAAP Revenue (International)	1,029,685	964,843	774,792	457,282	172,570
Cash Flows (in $ thousands)					
Cash Flows from Operating Activities	831,209	763,055	383,066	81,796	1,398
Adjusted Free Cash Flow	550,015	444,117	4,571	(260,519)	N/A
Cash Flows from Investing Activities	(112,932)	(598,008)	(902,421)	(1,097,272)	(1,306,066)
Cash Flows from Financing Activities	(78,373)	(83,975)	(62,998)	1,691,722	1,942,176
Stock-Based Compensation Expense by Function (in $ thousands)					
Total Stock-Based Compensation Expense	433,806	615,233	682,118	631,597	600,367
Cost of Revenue	23,849	29,502	40,705	50,536	50,942
Research and Development	240,833	335,498	401,537	360,726	379,913
Sales and Marketing	94,135	160,935	156,904	157,263	114,440
General and Administrative	74,989	89,298	82,972	63,072	55,072

Source: Twitter quarterly results, selected company metrics, and financials.

Exhibit 4 Reconciliation of Twitter's GAAP and non-GAAP Financial Measures (years ended December 31, in $ thousands)

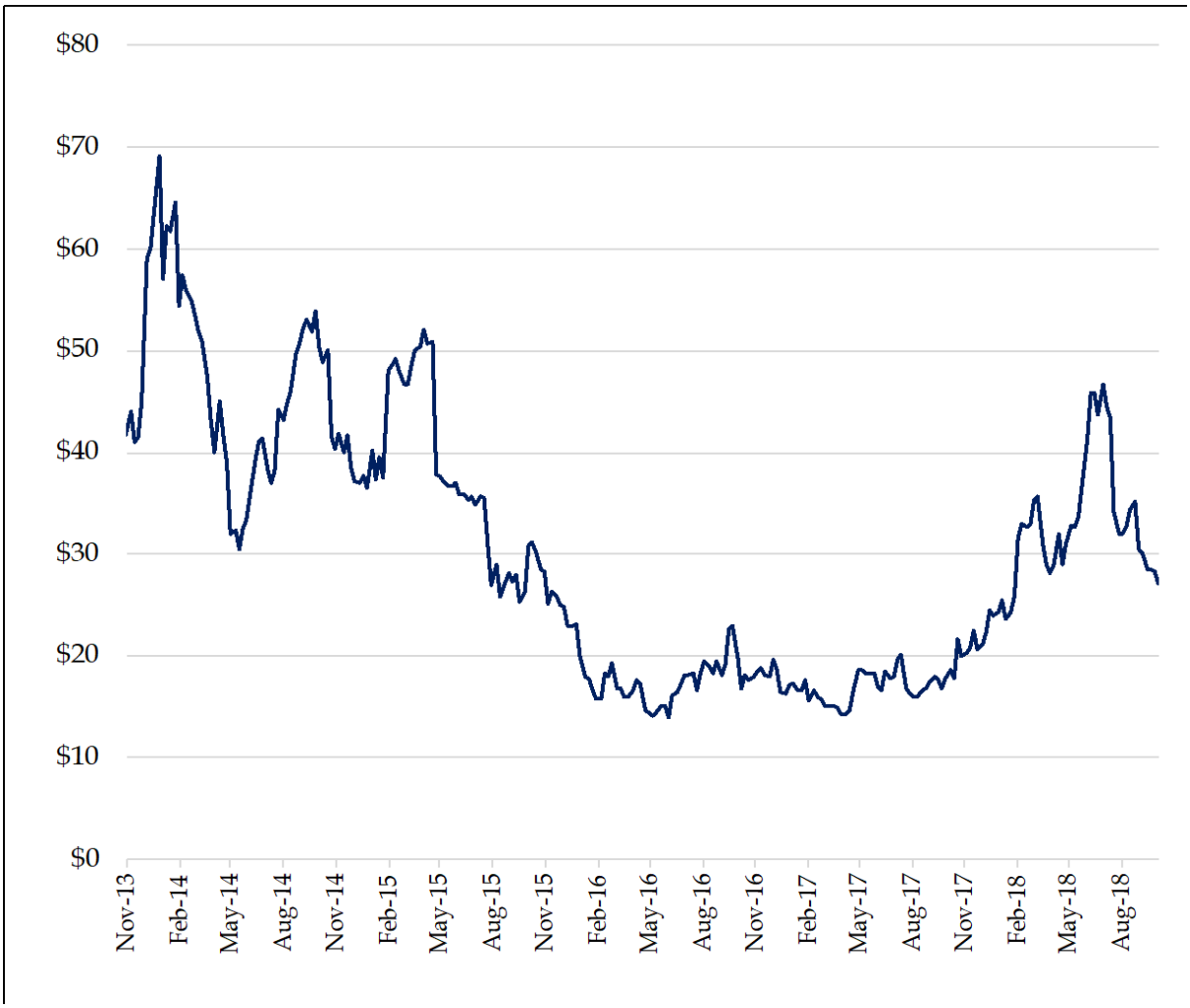
(in $ thousands, except per share data)	2017	2016	2015	2014	2013
Reconciliation of Net Income (Loss) to Non-GAAP Net Income (Loss)					
Net income (loss)	(108,063)	(456,873)	(521,031)	(577,820)	(645,323)
Exclude: Provision (benefit) for income taxes	12,645	16,039	(12,274)	(531)	(1,823)
Loss before income taxes	(95,418)	(440,834)	(533,305)	(578,351)	(647,146)
Stock-based compensation expense	433,806	615,233	682,118	631,597	600,367
Amortization of acquired intangible assets	46,537	69,338	54,659	36,563	16,530
Non-cash interest expense related to convertible notes	80,061	74,660	69,185	18,823	-
Non-cash expense related to acquisition	-	-	926	-	-
Impairment of investments in privately-held companies	62,439	-	-	-	-
Restructuring charges and one-time nonrecurring gain	(5,427)	101,296	12,902	-	-
Non-GAAP income (loss) before income taxes	521,998	419,693	286,485	108,632	(30,249)
Non-GAAP provision (benefit) for income taxes	193,139	155,287	105,999	40,194	(11,192)
Non-GAAP net income (loss)	328,859	264,406	180,486	68,438	(19,057)
Reconciliation to Net Income Per Share (available for 2017 and 2016 only)					
GAAP basic shares	732,702	702,135			
Dilutive equity awards (1)	9,521	13,009			
Non-GAAP diluted shares (2)	742,223	715,144			
Non-GAAP diluted income per share	$ 0.44	$ 0.37			
Reconciliation of Net Income (Loss) to Adjusted EBITDA					
Net income (loss)	(108,063)	(456,873)	(521,031)	(577,820)	(645,323)
Stock-based compensation expense	433,806	615,233	682,118	631,597	600,367
Depreciation and amortization expense	395,867	402,172	312,823	208,165	110,894
Interest and other expense, net	134,158	73,626	83,269	39,485	11,315
Provision (benefit) for income taxes	12,645	16,039	(12,274)	(531)	(1,823)
Restructuring charges and one-time nonrecurring gain	(5,427)	101,296	12,902	-	-
Adjusted EBITDA	862,986	751,493	557,807	300,896	75,430

(1) Gives effect to potential common stock instruments such as stock options, RSUs, shares to be issued under an employee stock purchase plan (ESPP), unvested restricted stock, and warrants. There is no dilutive effect on the notes nor the related hedge and warrant transactions.

(2) Assume GAAP dilutive shares are the same as non-GAAP dilutive shares.

Source: Twitter 10-Ks and shareholder letters.

Exhibit 5 Twitter Historical Stock Price, Nov 2013 — Aug 2018



Source: Bloomberg, accessed September 2018.

Exhibit 6 Illustrative Example of the Accounting for Stock Options using Fair Value Method

Suppose a company grants the following RSU:

- On January 1, 2018: the company grants 400 stock options with a fair value of $3 per option on grant date, an exercise price of $10 per share, and a par value of $1.
- The options vest linearly over four years (or 16 quarters).
- The employee exercises all options on January 1, 2022. The stock price per share on the exercise date is $15.
- On January 1, 2023, the employee sells shares obtained through exercise of options.

Journal Entries for Stock Options Using Fair Value Method

Date	Entry	Dr.	Cr.
Jan 1, 2018	No entry	N/A	N/A
Quarterly, from Mar 31, 2018 through Dec 31, 2022 (16 quarters)	Dr. Compensation expense	75	
	Cr. Paid in capital – stock options		75
	*$75 = 25 options vest each quarter * $3 fair value of option (service period begins as of Jan 1, 2018)*		
Jan 1, 2022	Dr. Cash	4,000	
	Dr. Paid in capital – stock options	1,200	
	Cr. Common stock		400
	Cr. Paid in capital – stock options		4,800
	*$4,000 = 400 options * $10 exercise price*		
	*$1,200 = 400 options vested * 3 fair value of option (this is being debited because the options are being converted into shares of common stock)*		
	*$400 = 400 options yield 400 shares * $1 par value per share*		
Jan 1, 2023		N/A	N/A

Source: Casewriters.

Note: Twitter no longer grants stock options to its employees.

Exhibit 7 Illustrative Example of the Accounting for RSUs

Suppose a company grants the following RSU:

- On January 1, 2018: the company grants 100 RSUs with a market price of $10 and a par value of $1.
- The employee must work four years after which the award vests.

Journal Entries for RSUs (net method)

Date	Entry	Dr.	Cr.
Jan 1, 2018	No entry	N/A	N/A
Quarterly, from Mar 31, 2018 through Dec 31, 2022 (16 quarters)	Dr. Compensation expense	62.5	
	Cr. Paid in capital – stock awards		62.5
	*$62.5 = 6.25 shares vest each quarter * $10 market price of share at grant date*		
Jan 1, 2022	Dr. Paid in capital – stock awards	1,000	
	Cr. Common stock		100
	Cr. Paid in capital – stock awards		900
	*$1,000 = 100 shares * $10 market price at grant date*		
	*$100 = 100 shares * $1 par value per share (common stock)*		

Source: Casewriters.

Journal Entries for RSUs (gross method)

Date	Entry	Dr.	Cr.
Jan 1, 2018	Dr. Deferred Compensation Expense (*contra-equity account*)	1,000	
	Cr. Common Stock		100
	Cr. Paid in capital – stock awards		900
Quarterly, from Mar 31, 2018 through Dec 31, 2022 (16 quarters)	Dr. Compensation expense	62.5	
	Cr. Deferred Compensation Expense		62.5
	*62.5 = 6.25 shares vest each quarter * $10 market price of share at grant date*		
Jan 1, 2022	No entry	N/A	N/A

Source: Casewriters.

Note: Twitter uses the net method to account for RSUs.

Exhibit 8 Prevalence of Employee Stock Purchase Plans by Industry and Company Size

Industry	All Sizes	Small Cap	Mid Cap	Large Cap
Consumer Discretionary	37%	40%	30%	40%
Energy	18%	18%	25%	13%
Financials	20%	10%	15%	35%
Industrials	27%	20%	25%	35%
Information Technology	70%	75%	55%	80%
All Industries	**34%**	**33%**	**30%**	**40%**

Source: FW Cook 2017 Aggregate Share-Based Compensation Report, accessed August 23, 2018.

Exhibit 9 Illustrative Calculations of the Effects on EPS of SBC Expense and Dilution from Equity Issuance

Suppose a company has the following financial metrics:

- GAAP net income: $95 million
- Stock-based compensation expense: $25 million
- Net income if SBC was never issued: $120 million
- GAAP basic shares: 14 million (if SBC had never been issued, this would be equal to the diluted share count)
- Dilutive equity awards: 2 million shares
- GAAP and non-GAAP diluted shares: 16 million

Assume the company operates in a world with no corporate income tax.

(in $ millions, except per share figures)

GAAP EPS		
Net income	95	
Diluted shares	16	
Earnings per share	$5.94	
EPS if SBC was never issued		
Net income	120	
Basic shares	14	
Earnings per share	$8.57	EPS if SBC was never issued is $2.63 higher than GAAP EPS.
Effect of SBC expense		
SBC expense	(25)	
Basic shares	14	
SBC expense per share	($1.79)	SBC expense decreases EPS by $1.79 on the basic share count.
Effect of dilution		
GAAP net income	95	
GAAP basic shares	14	
GAAP diluted shares	16	
GAAP earnings per basic share	$6.79	
GAAP earnings per diluted share	$5.94	
Dilution impact on EPS	($0.85)	The issuance of additional equity decreases EPS by $0.85.
		As a check, the two effects combined bridge the difference between our EPS figures: $2.63 ≈ $1.79 + $0.85 (with rounding error).

Source: Casewriters.

Exhibit 10 Stock-Based Compensation and Revenue for Selected Internet Companies, 2015–2017 (excluding Twitter, ordered by 2017 revenue from greatest to least)

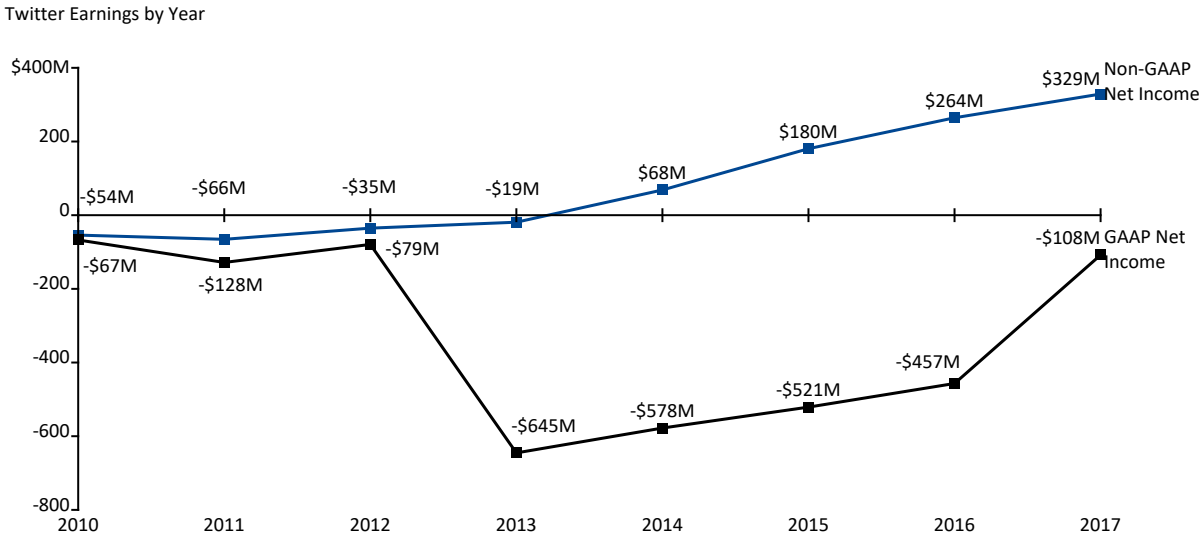
GAAP metrics	Total SBC Expense			Revenue			SBC % of Revenue		
(in $ millions)	**2015**	**2016**	**2017**	**2015**	**2016**	**2017**	**2015**	**2016**	**2017**
Twitter	**682**	**615**	**434**	**2,218**	**2,530**	**2,443**	**31%**	**24%**	**18%**
Amazon	2,119	2,975	4,215	107,006	135,987	177,866	2%	2%	2%
Alphabet (Google)	5,203	6,703	7,679	74,989	90,272	110,855	7%	7%	7%
Facebook	2,970	3,220	3,720	17,928	27,638	40,653	17%	12%	9%
Salesforce.com	565	594	820	5,374	6,667	8,292	11%	9%	10%
Square	82	139	159	1,267	1,709	2,214	6%	8%	7%
Autodesk[a]	197	222	261	2,504	2,031	2,057	8%	11%	13%
LinkedIn[b]	510	-	-	2,991	-	-	17%	-	-

Source: Twitter, LinkedIn, Facebook, Alphabet, and Amazon 10-Ks.

[a] The Autodesk fiscal year ends January 31. For example, 2017 revenue in the table is revenue for the 12 months ended January 31, 2018.

[b] LinkedIn was acquired by Microsoft in 2016, after which point the company no longer reported separate SBC expense.

Exhibit 11 Twitter's GAAP and non-GAAP net income, 2010–2017



Source: Twitter 10-Ks.

Note: 2013–2016 GAAP Net Income was impacted by pre-IPO SBC, much of which vested at the time of the IPO and was expensed across the next four years according to GAAP rules.

Appendix A: Note on Accounting Rules for Intrinsic Value and Fair Value Methods

The Financial Account Standards Board (FASB) started to revisit the accounting rules for stock options in the 1980s.[62] At this time, the relevant accounting rule was Accounting Principles Board Opinion No. 25 (APB 25), which required companies to record stock options as an expense using the intrinsic value method for valuing stock options. However, because intrinsic value was calculated as the market price less exercise price, and the market price and exercise price were often the same amount, many companies attributed an intrinsic value of zero to the employee stock options being granted, and thus recorded no actual expense.[63]

The FASB believed that, in contrast to the intrinsic value method specified in APB 25, granted options had a positive, measurable value even when the exercise price was equal to the market price.[64] In SFAS 123, the FASB gave companies a choice to either 1) disclose their stock option expenses as a footnote, or 2) take an earnings charge using a fair-value approach based on grant date, though it was "encouraged" that they use fair value method.[65] If a company chose the footnote approach, it was permitted to continue following the intrinsic value method to account for stock options under APB 25. The footnote would disclose the "pro forma" net income that would have been reported had the company used the fair value method. Following SFAS 123, the use of stock options continued to increase. In the year 2000, 21 companies granted over 50 million stock options and 11 granted more than 100 million options, with all but a handful continuing to report using the intrinsic value method.[66]

Intrinsic Value Method

In the intrinsic value method of calculating stock option compensation, each option's intrinsic value was the difference between the quoted market price of the underlying stock at the time of the grant and the exercise price placed on the options. Stock options with exercise prices equal to or less than the market price on the date of the grant had an intrinsic value of zero, resulting in zero compensation expense being recorded on financial statements. Suppose 400 options with an exercise price of $10 were granted on a stock that was trading at $10 on the date of the grant. The compensation expense would be:

number of options granted × intrinsic value of each option

= number of options granted × (quoted market price − exercise price)

= 400 × ($10 − $10) = $0

Fair Value Method

The FASB believed that granted options had a positive, measurable value even when the intrinsic value was zero. The FASB advocated for the Black-Scholes model, or other related models, to be used to estimate the value of option grants.[67] The Black-Scholes model calculated the fair value of an option to be influenced by, in addition to the market price and exercise price of the options, volatility of the underlying stock, the length of the exercise period, and the risk-free interest rate. The direction of impact of the variables that affected an option's price could be readily summarized:

Variable	Impact of increases in the variable on option value
Current price per share	Increase
Exercise price per share	Decrease
Volatility of price per share	Increase
Length of exercise period	Increase
Risk-free interest rate	Increase

Thus, while the current market price and exercise price could imply an intrinsic value of zero, an option still derived some amount of fair value from volatility in the underlying asset and the time it had to expiration. The intuition here was that the market price had the potential to rise above the exercise price before the options expired, in which case the option would have a positive intrinsic value at the time of exercise.

Returning to our previous example, assume the Black-Scholes valuation for each option was a fair value of $3. The total compensation cost over the duration of the grant would be:

number of options granted × fair value of each option

= 400 × $3 = $1,200

The company would record compensation expense to match the vesting schedule of the grant. For instance, if 100 options vested after the first year, the company would record compensation expense of 100 × $3 = $300. If 25 options vested each quarter, the company would record compensation expense of 25 × $3 = $75. It is important to note that over the course of the vesting period, the compensation expense is calculated according to the fair value at the time of the grant, and not using an updated fair value at the time of the vesting.

Source: Casewriters, adapted from Mark T. Bradshaw, "Accounting for Employee Stock Options," HBS No. 102-039 (Boston: Harvard Business School Publishing, 2007).

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