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The Big Market Delusion: Valuation and Investment Implications

Bradford Cornell and Aswath Damodaran

Bradford Cornell is a professor emeritus of finance at the UCLA Anderson School of Management, Westwood, California. Aswath Damodaran holds the Kerschner Family Chair in Finance Education and is a professor of finance at New York University Stern School of Business, New York City.

In entrepreneurs' minds, big markets offer the promise of easily scalable revenues that, coupled with profitability, can translate into large profits. This article examines how the "big market promise" affects business formation and financing, with a focus on the role of overconfidence on the part of both entrepreneurs and their financiers (venture capitalists and public equity) in creating a collective overpricing of companies in alleged big markets—and an inevitable correction. Three case studies illustrate this thesis—one in which the process has fully played out (1990s dot-com retail), one in which it has been unfolding for a while (online advertising), and one in which it is just beginning (the cannabis market). We suggest several lessons for investors, regulators, and businesses based on these case studies.

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Soon after its introduction as a private company, Uber experienced an explosion in its market value. One big reason was the potential size of the market. Uber was billed not only as a potential global ride-sharing company but also as a logistics company. If Uber could capture a meaningful fraction of this gigantic market, it could easily be worth tens of billions of dollars.

The story of Uber is not unique. It applies to many companies, particularly in the technology space, that enter what are seen as "big markets." The peril of a big market, though, especially in its early stages, is that the entrepreneurs it attracts and the investors who provide funding are often so enthused about their prospects for dramatic growth that they ignore fundamentals and price their companies with unrealistic expectations about the future. In this article, we explain why we believe the big market delusion drives prices of early-stage startups, why it cannot be easily exploited by potential arbitrageurs, and why it is often immune to regulations and reasoning.

The Big Market Delusion

The big market delusion arises when three ingredients come into play. The first is the existence of a *big market*, perceived or real, that draws in businesses intent on exploiting this market for growth and profit. The second component is *overconfidence*, a key behavioral characteristic possessed in disproportionate quantities by the entrepreneurs and venture capitalists (VCs) who are drawn to big markets, leading them to overestimate their chances of—and the payoff from—success. The final piece of the puzzle is *pricing*, whereby investors attach values to companies based on what others are paying for similar companies, allowing for a disconnect between a company's stock price and its underlying fundamentals.

The Big Market. Increasing the potential market for products and services, holding all else constant, is good for the value of the business producing them. A larger market allows for more growth,

allowing companies to scale up quickly and perhaps benefit from economies of scale. If the growth is accompanied by profitability, the pieces for a valuable company are in place. In fact, the most valuable companies in history arguably have all followed this path to success.

That said, many companies that pursue big markets never reach the peaks of success, either failing early for a variety of reasons or staying small over time. That is because for value to be realized, a whole host of other pieces have to fall into place. First, the company must be able to capture a reasonable share of that big market, a difficult task if the market is splintered, localized, or intensely competitive. Second, the company has to be able to generate profits in that big market and create value from that growth, also a function of the firm's competitive advantages and market pricing constraints. Third, once profitable, the company has to be able to keep new entrants out, which is easier in some sectors than in others. It is, therefore, dangerous to base an argument for investing in a company and assigning it high value on the enthusiasm for the size of the market that it serves, although that danger does not seem to stop analysts and investors from doing so.

Finally, the big market being pursued does not always have to be a newly discovered or expanding market (such as artificial intelligence or the cloud business). It could be an existing business that is served badly by the status quo. This dynamic is at the heart of disruptive innovation, in which a new entrant disrupts an existing business model by targeting its weakest links. As to why companies already in the business do not make these changes on their own, it is worth recalling Clayton Christensen's (1997) argument in *The Innovator's Dilemma* that disruption in businesses almost always comes from an upstart outsider, not from an incumbent with too much to lose. In recent years, we have seen this phenomenon play out in retailing when Amazon, rather than the existing big-name merchants in retail, benefited the most from the shift to online commerce.

Individual Overconfidence and Collective Irrationality. To see how big market potential can fool (almost) rational and (mostly) smart individuals into being collectively irrational, consider a hypothetical entrepreneur who has developed a product that he sees as having a large potential market and, on the basis of that assessment, was able to convince VCs to fund the business. Note that everyone in this example is behaving sensibly. The entrepreneur has

created a product that he sees as fulfilling a large market need, and the VCs backing the entrepreneur see the product's potential for profit in pricing the company. Now assume that other entrepreneurs see the same big market potential at about the same time, create their own products to fulfill that market need, and find VCs to back their respective products and visions. If this were a rational market, each entrepreneur and his or her VC backers should be valuing his or her business using assessments of market potential and success as well as the existence of current and future competitors.

Now add the twist that causes the deviation from rationality and makes both the entrepreneurs and VCs overconfident—the former in the superiority of their products over the competition and the latter in their capacity to pick winners. Both groups, entrepreneurs and VCs, self-select to attract overconfident individuals. Evidence in support of this view includes the following as well as the general work of Kahneman (2011):

- Cooper, Woo, and Dunkelberg (1988) examined a sample of 2,994 entrepreneurs and documented what they perceived to be their odds of success. Of the group, 81% believed that their chance of success was at least 70%, and a third of the sample believed that success was guaranteed, even though the reality is that 75% of new businesses fail within five years of inception. In a comparative study, Busenitz and Barney (1997) compared overconfidence in managers with the same characteristic in entrepreneurs and concluded that although both groups were overconfident, entrepreneurs were more so.
- The same combination of selection bias and personal characteristics that leads to entrepreneurial overconfidence also plays out among the VCs who invest in these startups. Zacharakis and Shepherd (2001) studied 53 VCs from Denver and Silicon Valley and concluded not only that they were overconfident but also that the overconfidence increased with more information and unfamiliar framing of that information. Graves and Ringuest (2018) took the assessment of overconfidence in VCs one step further: Using a metric called Bell's disappointment, a measure of the difference between anticipated and actual payoffs, they concluded that VCs not only are likely to be more overconfident than other investors but also will face more disappointment as a consequence.

Once overconfidence is introduced into the game, it changes because each business cluster (the entrepreneur and the VCs that back her business) will overestimate its capacity and its probability of success, resulting in the following scenario. First, the businesses that are targeting the big market will be collectively overpriced, because each cluster is convinced that it will be the winner. Second, the market will become more crowded and competitive over time, with new entrants being drawn in because of the perceived growth potential associated with the big market. Thus, although revenue growth in the aggregate may confirm that the market is big, the revenue growth at firms collectively will fall below expectations and operating margins will be lower than expected because each individual firm overestimated its own prospects. Third, a period of reckoning will arrive, during which some or many of the participants will recognize the gap between reality and expectations. When they do, aggregate pricing of the sector will eventually decline, with some of the entrants folding. Despite the shortfall in the aggregate, a few big winners will emerge, which will fuel the cycle of enthusiasm for the next big market.

A Pricing Game. Although the words *price* and *value* are often used as if they are interchangeable, they represent different processes, are determined by different variables, and can yield different numbers. The determinants of value are simple, though not always easy to estimate. Whether one is valuing startup businesses, emerging market firms, or commodity companies, the values are driven by expected cash flows that incorporate growth and the risk that these cash flows will not materialize. The determinants of price are demand and supply, and although fundamentals affect both, mood and momentum can also affect pricing. These “animal spirits,” as behavioral economists may tag them, may not only cause price to diverge from value but also require different tools to assess the proper pricing for an asset. With many assets and businesses, the pricing process typically involves (1) using a standardized metric (a multiple) derived from comparable assets that are already priced in the marketplace and (2) controlling for differences. Although in an efficient market value and price will stay close or converge, the potential gap between price and value is at the core of almost all investment philosophies. Value investors, for instance, believe that over time, markets will see the gap and the price will converge toward value. Traders, in contrast, have little faith in convergence, arguing

that value is too nebulous and subjective, and they believe that the key to market success is playing the pricing game well.

Early in the business life cycle, it is the traders who dominate, and the game is primarily a pricing game, with value investors often left frustrated. As companies age and their financial realities start to take form, value begins to become more tangible and more visible, making it more likely that the gap, if it exists, will be noticed. For a young company making the transition from startup to early growth, the focus is all pricing all the time (priced stocks), with stories about market size driving the pricing. That dynamic leads to two conclusions.

The first is that VCs, the primary players in the startup space, play a pricing game, focusing on whatever metric they believe will lead to higher pricing down the road, often at the expense of building business models around fundamentals. In fact, the widely used VC valuation approach is really VC pricing, with a metric (revenues or earnings) forecast into a future year and an assumed exit multiple based on what others are paying for similar companies. Second, even if that startup is able to list itself on public markets, investors, at least in the early years, continue to play the pricing game, with mood and momentum driving price movements on a day-to-day basis. In fact, public markets often take their cues from private market investors, not only by basing their initial assessments of price on the most recent venture capital rounds but also by using the same metrics that VCs use to justify pricing, be it revenues or users. Following up on these implications, even if these companies do go public and investors are able to sell the stock short, those investors may find that pathway hazardous given the momentum in the pricing process as well as the low float and light liquidity that characterize many of these listings.

The collective overpricing of companies in a big market will bear resemblance to a bubble, and the correction will lead to the usual handwringing about bubbles and market excesses. But the culprit is overconfidence, a characteristic that is essentially a prerequisite for successful entrepreneurship and venture capital investing. That said, the extent of the overpricing will vary across different markets, depending on the following:

- *Degree of overconfidence.* The greater the overconfidence that entrepreneurs and investors exhibit in their own products and investment

abilities, the greater the overpricing. Both groups are predisposed to overconfidence, and that overconfidence tends to increase with success in the market. Therefore, the longer a market boom lasts in a business space, the larger the overpricing will become. This tendency suggests, somewhat surprisingly, that the extent of overpricing will be greater in markets with more serial entrepreneurs that have records of past success and experienced VCs.

- **Market size.** As the target market grows bigger, it is more likely to attract new entrants and the collective overpricing will increase. This tendency will worsen if the size of the target market itself is unclear, leading more optimistic entrepreneurs and VCs to inflate their assessments of market size.
- **Uncertainty.** The more uncertainty there is about business models and the ability to convert them into revenues, the more overconfidence will skew the numbers, leading to greater overpricing in the market. For example, more overpricing should arise in artificial intelligence—a big market where there is great uncertainty about not only which technologies will end up as winners but also the uses for those technologies—than in online food delivery, a more established market with fewer technological twists. It also follows that overpricing should be greater earlier in a market's evolution and should decrease over time, as evidence accumulates to indicate actual market size as well as business successes and failures.
- **Winner-take-all markets.** The overpricing will be greater in markets with global networking benefits (i.e., growth feeds on itself), and winners can walk away with dominant market shares. Because the payoffs for success are greater in such markets, misestimating the probability of success will have a larger impact on value.

In short, not only will collective overpricing be a feature of big markets, that overpricing will vary across markets and over time. One high-profile example of this dynamic was observed at WeWork, a young company in the real estate leasing business that saw its equity value rise from close to nothing in 2010 to \$47 billion in 2019, mostly based on the size of the commercial real estate market.¹

Case Studies

Turning to the data, we use three case studies to illustrate the issues. The first one is the internet retail

sector in the 1990s, which is particularly instructive because the entire cycle has played out, with winners and losers chosen along the way. The second is the online advertising space in 2015, a few years into the phenomenal surge of Facebook and Google's expansion and a couple of years after the entry of new players seeking a share of the business. The third is the cannabis market in 2019, a few months after a surge in stock prices of cannabis companies following legalization of cannabis in Canada and many US states.

E-Commerce in the 1990s. The dot-com boom and bust are now part of investing lore, with books, articles, and movies documenting the history of this episode. That rich history gives us a chance to use data from the sector to observe both how the big market delusion played out in inflated market valuations at the peak of the boom in late 1999 and how the correction ensued in the subsequent years.

The big market promise. The history of e-commerce is closely tied to the history of the internet, because online shopping became feasible only when the internet was opened to the public in 1991. One of the first online consumer shopping experiences was created by Book Stacks Unlimited, an online bookstore started by Charles Stack. Amazon launched in 1994 as an online bookstore, and after adding such innovations as customer reviews to its site, it expanded its online offerings. As more people gained internet access, online retailing continued to grow, and the growth potential attracted new companies into the fold. The revenues from online retailing climbed from close to nothing in the early 1990s to about 5% of all retailing revenues in 1999. Along the way, new businesses were started to take advantage of this growing market, with entrepreneurs using the promise of big market potential to raise money from VCs, who then attached sky-high prices to these companies. By the end of 1999, not only was venture capital flowing in record amounts to young ventures but 39% of all venture capital was going into internet companies.

The pricing delusion. The enthusiasm that entrepreneurs and VCs were bringing to online retail companies seeped into public markets, and as public market interest climbed, many young companies found that they could bypass the traditional venture capital route to success and jump directly to public listings. Many of the online retail companies that were listed on public markets in the late 1990s had the characteristics of nascent businesses,

with small revenues, unformed business models, and large losses, but all these shortcomings were overwhelmed by perceptions about the size of the e-commerce market. In 1999 alone, there were 295 IPOs of internet stocks, representing more than 60% of all IPOs that year. One measure of these dot-com stocks' success is that data services created indexes to track them. The Bloomberg US Internet Index was initiated on 31 December 1998 with 100 young internet companies, and it rose 250% in the following year, reaching a peak market capitalization of \$2.9 trillion in early 2000. Because the collective revenues of these companies were a fraction of that value and most of them were losing money, the only way to justify these market capitalizations was with extraordinary anticipated revenue growth accompanied by healthy profit margins in steady state, both of which were premised on the successful entry into a big market.

The follow-up. The rise of internet stocks was dizzying in its speed of ascent, but the descent was even more precipitous. Although the date the bubble burst is debatable, the NASDAQ, then dominated by young internet companies, peaked on 10 March 2000. In the months after, stock pricing unraveled. The Bloomberg US Internet Index dropped to \$1.2 trillion by November 2000, a loss of about 70% of its value, and continued to decline, albeit at a slower pace. By 2003, the index had lost 93% of its value, and in a sign of the times, Bloomberg stopped computing the index. Of the dozens of publicly traded retail companies in existence in March 2000, more than two-thirds failed as they ran out of cash (and capital access) and their business models imploded. Even those that survived, such as Amazon, faced carnage, losing 90% of their value and flirting with the possibility of shutting down. The venture capital spigots that had been open and running at full force just a few months prior were turned off as VCs collectively went into hibernation, taking nascent and private online retail companies down with them. Not surprisingly, the IPO market, which was white-hot in 1998 and 1999, cooled down in 2000 and essentially froze in 2001.

Online Advertising. The second and most detailed case study involves the online advertising business—first in October 2015, a time when online advertising was disrupting the conventional advertising market and young companies were targeting the market with varying degrees of success, and again in November 2019 at a later stage of disruption.

The big market promise. Businesses have always advertised, but the growth of media in the second half of the 20th century gave advertising a jolt, allowing for the creation of companies that generated value from the business. These companies ranged from those providing support services for advertising to those that benefited from being vehicles for delivering advertising, from billboard operators to newspapers to television networks. As the internet gave birth to the dot-com boom in the 1990s, it also opened the door to digital advertising, and although it was slow to find its footing, the arrival of search engines, such as Yahoo! and Google, fueled its growth. The advent of social media altered the game even more, as businesses realized not only that they were more likely to reach customers on social media sites but also that social media companies brought in data about their users that would allow for more focused and effective advertising. The net result of all these innovations was that digital advertising not only increased its market share but also contributed to an increase in overall advertising revenues, as companies that had hitherto never spent money on advertising were drawn into social media advertising.

The pricing delusion. To examine how the perception of a big online advertising market affected business formation and pricing, we examined online advertising companies in 2015. Rather than just point to the obvious, which is how much the market capitalization of these companies had risen over time, we ran an experiment with each one. We started with each company's market capitalization in the online advertising space as of August 2015 and calculated the expected revenues 10 years in the future (2025) that would be required to justify the market price. In doing so, we had to make assumptions about the rest of the variables required to conduct a discounted cash flow valuation (the cost of capital, target operating margin, and sales-to-capital ratio). We held them fixed and varied the revenue growth rate until we arrived at the current market capitalization.

We repeated the calculation for all the publicly traded companies with significant online advertising revenues, assuming a target pretax operating margin of either the current margin or 20%, whichever was higher, and a fixed cost of capital of 9% for every firm. Note that both assumptions are aggressive (the cost of capital may have been set too low and the operating margin probably too high, given increasing competition), and both will push down

imputed revenues in Year 10. **Exhibit 1** presents estimates of the imputed revenues in 2025 for each publicly traded online advertising company as of August 2015. We interpret these to be the expected revenues imputed in market prices.

The total future revenue for all the companies on the list totals \$522 billion. Note that this list is not comprehensive, because it excludes some smaller companies that also generate revenues from online advertising and the not-inconsiderable secondary revenues from online advertising generated by companies in other businesses (such as Apple). It also does not include the online advertising revenues being imputed into the valuations of

private businesses that were waiting in the wings in 2015, such as Snapchat. Consequently, the total understates the imputed online advertising revenue that was being priced into the market at that time. To gauge whether these imputed revenues are viable, we examined both the total advertising market globally and the online advertising portion.

In 2014, the total global advertising market was about \$545 billion, with \$138 billion from digital (online) advertising. Total advertising will presumably grow at a rate comparable to that of the overall economy, but online advertising as a proportion of that total is expected to rise. Even with optimistic assumptions about the growth in total advertising

Exhibit 1. Imputed Revenues in 2025 from Online Advertising

Company	Market Cap	Enterprise Value	Current Revenues	Breakeven Revenues (2025)	Percentage from Online Advertising	Imputed Online Ad Revenue (2025)
Google	\$441,572.00	\$386,954.00	\$69,611.00	\$224,923.20	89.50%	\$201,306.26
Facebook	\$245,662.00	\$234,696.00	\$14,640.00	\$129,375.54	92.20%	\$119,284.25
Yahoo!	\$30,614.00	\$23,836.10	\$4,871.00	\$25,413.13	100.00%	\$25,413.13
LinkedIn	\$23,265.00	\$20,904.00	\$2,561.00	\$22,371.44	80.30%	\$17,964.26
Twitter	\$16,927.90	\$14,912.90	\$1,779.00	\$23,128.68	89.50%	\$20,700.17
Pandora	\$3,643.00	\$3,271.00	\$1,024.00	\$2,915.67	79.50%	\$2,317.96
Yelp	\$1,765.00	\$0.00	\$465.00	\$1,144.26	93.60%	\$1,071.02
Zillow	\$4,496.00	\$4,101.00	\$480.00	\$4,156.21	18.00%	\$748.12
Zynga	\$2,241.00	\$1,142.00	\$752.00	\$757.86	22.10%	\$167.49
Total US	\$770,185.90	\$689,817.00	\$96,183.00	\$434,185.98		\$388,972.66
Alibaba	\$184,362.00	\$173,871.00	\$12,598.00	\$111,414.06	60.00%	\$66,848.43
Tencent	\$154,366.00	\$151,554.00	\$13,969.00	\$63,730.36	10.50%	\$6,691.69
Baidu	\$49,991.00	\$44,864.00	\$9,172.00	\$30,999.49	98.90%	\$30,658.50
Sohu.com	\$18,240.00	\$17,411.00	\$1,857.00	\$16,973.01	53.70%	\$9,114.51
Naver	\$13,699.00	\$12,686.00	\$2,755.00	\$12,139.34	76.60%	\$9,298.74
Yandex	\$3,454.00	\$3,449.00	\$972.00	\$2,082.52	98.80%	\$2,057.52
Yahoo! Japan	\$23,188.00	\$18,988.00	\$3,591.00	\$5,707.61	69.40%	\$3,961.08
Sina	\$2,113.00	\$746.00	\$808.00	\$505.09	48.90%	\$246.99
NetEase	\$14,566.00	\$11,257.00	\$2,388.00	\$840.00	11.90%	\$3,013.71
Mail.Ru	\$3,492.00	\$3,768.00	\$636.00	\$1,676.47	35.00%	\$586.76
Mixi	\$3,095.00	\$2,661.00	\$1,229.00	\$777.02	96.00%	\$745.94
Kakaku.com	\$3,565.00	\$3,358.00	\$404.00	\$1,650.49	11.60%	\$191.46
Total non-US	\$474,131.00	\$444,613.00	\$50,379.00	\$248,495.46		\$133,415.32
Global total	\$1,244,316.90	\$1,134,430.00	\$146,562.00	\$682,681.44		\$522,387.98

Note: For all companies, numbers and valuations are in millions of US dollars.

and the online advertising portion of it climbing to 50% of revenues, the total online advertising market in 2025 is estimated to be \$466 billion. The imputed revenues from the publicly traded companies in Exhibit 1 alone exceed that number, implying that these companies were being overpriced relative to the market (online advertising) from which their revenues were derived.

As more companies line up to enter this space, the gap between the aggregate market value of companies in the space and the size of the advertising market from which they are expected to derive revenues must continue to grow. Nonetheless, investors were still anxious to finance new companies that planned to enter this space, such as Snapchat. After all, the nature of overconfidence is that founders and investors are convinced that the overpricing is a problem not for their company but for the rest of the market.

To be fair, it is possible that the approach we are using to estimate imputed revenues is overreaching on several fronts. First, our assumptions about operating margins and costs of capital may be wrong. Specifically, if the target margins turn out to be greater than our estimate of 20% for the sector, the imputed revenues are being overestimated. Similarly, if the cost of capital is lower than our estimate of 9%, the imputed revenues are being overestimated. It is also possible that the market cap incorporates expectations of new businesses that online advertising companies may enter in the future, which is especially true for the two biggest players in the game, Google and Facebook. If investors are pricing in expectations that one or both of these companies will be able to use their huge user base platforms to enter into new businesses (such as entertainment or retailing), we are overestimating the imputed revenues from advertising by holding its percentage of revenues unchanged over time.

The follow-up. Earlier, we argued that as big markets evolve and businesses and investors learn more about them, the delusion will start to fade and the divergence between price and value should lessen. By 2019, not only had investors learned more about the publicly traded companies in the online advertising business; online advertising had also matured. Using the same process that we used for 2015, we imputed revenues for 2029 using data through November 2019. There are signs that the market has moderated since 2015. First, the number of companies shrank—some were acquired, some failed, and a few consolidated. Second, the

market capitalizations had been recalibrated, and starting revenues in 2019 were much greater than in 2015. As a result, the breakeven revenue in 2029 is \$573 billion, only slightly higher than the imputed revenues from the 2015 calculation, despite being four years further into the future. This finding suggests that the market is starting to take account of the limits imposed by the size of the underlying market. Third, more of these companies have had moments of reckoning with the market, whereby they have been asked to show pathways to profitability and not just growth numbers. Two examples are Snapchat and Twitter. For both companies, the market capitalizations have languished because of the perception that their pathways to profitability are rocky.

The Cannabis Market in 2018. Until recently, cannabis in any form was illegal in every state in the United States and in most of the world, but the situation is changing rapidly. By October 2018, both recreational and medical marijuana were legal in nine US states, and medical marijuana alone was legal in another 20 states. Outside the United States, much of Europe has always taken a more sanguine view of cannabis, and on 17 October 2018, Canada became the second country (after Uruguay) to legalize the product's recreational use. In conjunction with this development, new companies were entering the market, hoping to take advantage of what they saw as a big market, and excited investors rewarded them with large market capitalizations.

The big market promise. The widespread view as of October 2018 was that the cannabis market would be a big one in terms of users and revenues. According to the Canadian national census, 42.5% of Canadians had tried marijuana and about 16% had used it in the recent past (last three months). Furthermore, the percentages were higher among younger Canadians, with one in three being recent users. The total revenue from recreational marijuana sales in Canada alone is expected to be \$7 billion–\$8 billion in 2020 and grow at a healthy rate after that. Some of this figure will represent a shift from the illegal market (estimated at close to \$5 billion in 2017), and some of it will represent new users drawn in because of its legal status.

Some information can also be gleaned about the future of this business from the US states that have legalized marijuana. In Colorado, where recreational marijuana use has been legal since 2014, the revenues from selling marijuana increased

from \$996 million in 2015 to \$1.25 billion in 2016 to \$1.47 billion in 2017, representing solid but not spectacular growth. Marijuana-related businesses in Colorado have benefited from the revenue growth but have, for the most part, been unable to convert that growth into meaningful profits, partly because of the regulatory and tax overlay that they have to navigate. Despite concerns about US federal laws against cannabis impeding future growth and profitability, optimism about growth in this market remained, with the more conservative forecasters predicting that global revenues from marijuana sales would increase to \$70 billion in 2024—triple the estimated sales in 2018—and the more daring ones predicting close to \$150 billion in sales.

The pricing delusion. In October 2018, the cannabis market was young and evolving, with Canadian legalization drawing more companies into the business. Although many of them were small, with little revenue and big operating losses, and most were privately owned, a few of these companies had public listings, primarily on the Canadian market. **Exhibit 2** lists the top 10 cannabis companies as of 14 October 2018, along with their market capitalizations and operating numbers (revenues and operating income/losses).

The most valuable company on the list is Tilray, with a market cap of more than \$13 billion. Tilray had gone public a few months prior, with revenues that barely register (\$28 million) and nearly equal operating losses. But the company had made the news right after its IPO, with its stock price increasing *tenfold* in the following weeks, before losing almost half of its value thereafter. Canopy Growth, the largest and most established company on the list, had the highest revenues, at \$68 million. More generally, all the companies trade at astronomical multiples of book value, with a collective market cap in excess of \$48 billion. As new companies flock to the market, the list of publicly traded companies in this industry will only grow, and at least for the foreseeable future, most of them will continue to lose money. Adding to the chaos, existing companies that have logical reasons to enter this business but have held back will enter as the stigma of being in the business fades, and with it, the federal handicaps imposed for being in the business.

For each company, the high market capitalization relative to any measure of fundamental value was justified using the same rationale—namely, that the cannabis market was big, allowing for huge potential growth. Although that argument has some basis,

Exhibit 2. Largest Publicly Traded Cannabis Companies, October 2018

Company	Country	Market Cap	Price/Book	Enterprise Value/Sales	Enterprise Value	Revenues	EBITDA	EBIT	Book Equity
Tilray	Canada	\$13,813	392.08	494.36	\$13,842	\$28	-\$18	-\$20	\$35
Canopy Growth	Canada	\$11,516	13.13	170.19	\$11,556	\$68	-\$64	-\$80	\$877
Aurora Cannabis	Canada	\$10,161	8.45	239.77	\$10,207	\$43	-\$52	-\$62	\$1,202
Aphria	Canada	\$3,677	4.10	127.40	\$3,627	\$28	-\$1	-\$6	\$898
Cronos Group	Canada	\$1,754	10.01	236.22	\$1,689	\$7	\$0	-\$1	\$175
MedMen Enterprises	United States	\$2,520	33.53	87.64	\$2,574	\$29	-\$35	-\$39	\$75
The Green Organic Dutchman	Canada	\$1,445	4.74	na	\$1,183	\$0	-\$24	-\$25	\$305
HEXO Corp.	Canada	\$1,351	6.00	342.90	\$1,159	\$3	-\$5	-\$5	\$225
CannTrust Holdings	Canada	\$1,195	8.40	48.64	\$1,126	\$23	\$19	\$18	\$142
Auxly Cannabis	Canada	\$654	2.40	281.46	\$501	\$2	-\$24	-\$24	\$273
Aggregate		\$48,086	11.43	204.79	\$47,464	\$232	-\$203	-\$244	\$4,208

Notes: Amounts are in millions of US dollars. na = not applicable.

the fundamental valuation question is whether the collective market, at least as it existed in October 2018, was large enough to sustain the collective market capitalization of all the existing companies and expected entrants.

The follow-up. In the case of the cannabis market, the overreach on the part of both businesses and their investors has caught up with them. By October 2019, the assumptions regarding growth and profitability were being universally scaled back, business models were being questioned, and investors were reassessing the pricing of these companies. Within a period of approximately one year, cannabis stocks lost more than 50% of their aggregate value. The damage cut across the board. Tilray and Canopy Growth, the two largest market-cap companies, saw their market capitalizations decline by 80.7% and 38.6%, respectively. Given that there was no significant shift in fundamentals, the apparent explanation is that investors came to realize that the “big market” was not going to deliver the previously expected growth rates or profitability for the expanding group of individual companies. As with the dot-com bubble, it is difficult to determine exactly what caused this reassessment. There were disappointments, such as the continued unwillingness of banks in the United States to fund any part of the business, notwithstanding the passage of the Secure and Fair Enforcement (SAFE) Banking Act. All these factors were in existence in 2018 when cannabis stocks zoomed, however, which makes it hard to understand why opinions suddenly changed and values collapsed. In all three of our case studies, the reason for the timing of the correction remains mysterious.

Implications

We examined the internet sector in the 1990s, online advertising in 2015, and the cannabis market in 2019 as case studies of the big market delusion, yet we argue that the big market phenomenon is common and continuing. Although each big market delusion is different in some respects, all share important commonalities, especially with regard to the run-up in pricing. The commonalities are as follows:

- *Big market stories.* In every big market delusion, there is one shared feature. When asked to justify the pricing of a company in the market—especially young companies with little to show in terms of fundamentals—entrepreneurs, managers, and investors almost always point to macro potential—that is, that the online retail, advertising, or cannabis market was huge. Interestingly, they rarely express any need to go beyond that justification by explaining why the specific company they were recommending was positioned to take advantage of that growth. In recent years, the big markets have gone from just words to numbers, as young companies point to big total accessible markets (TAMs) when seeking higher pricing, often adopting nonsensical notions of what “accessible” means to get to large numbers. As one illustration, in its prospectus, Uber described itself as a personal mobility business, defining that business to include all things transportation related. This definition led to an assessment of the TAM of more than \$6 trillion.
- *Blindness to competition.* When the big market delusion is in force, entrepreneurs, managers, and investors generally downplay existing competition, thus failing to factor in the reality that market growth will have to be shared with both existing and potential new entrants. With cannabis stocks in late 2018, much of the pricing optimism was driven by the size of the potential US market assuming legalization, but very few entrepreneurs, managers, and investors seemed to consider the likelihood that legalization would attract new players into the market or that currently illegal sources of supply would maintain their hold on the market.
- *All about growth.* When enthusiasm about growth is at its peak, companies focus on growth, often putting business models to the side or even ignoring them completely. That scenario held true in all three of our case studies. With internet stocks, companies typically based their entire pricing pitch on how quickly they were growing. With social media companies, it took an even rawer form, with growth in users and subscribers being the calling cards for higher pricing. Investors, both private and public, not only went along with the pitch but also often actively encouraged companies to emphasize growth at the expense of profits.
- *Disconnect from fundamentals.* If you combine a focus on growth as the basis for pricing with an absence of concern at these companies about business models, the result is that pricing of the company’s stock becomes disconnected from the fundamentals. In all three case studies, most of the companies in each group at the peak

of the pricing run-up had negative earnings (making earnings multiples not meaningful), had little to show in assets (making book value multiples difficult to work with), and traded at huge multiples of revenues. Put simply, the stock pricing lost its moorings in value, but investors who looked only at multiples missed the disconnect.

Despite the similarities among the case studies, there are differences in the speed with which the big market phenomena were scaled. It appears that the greater and less concentrated the access to capital, the more quickly prices rise. Therefore, it comes as little surprise that the United States, with more ready access to capital, especially for young firms, has been the epicenter of big market price run-ups.

There are also differences in how these markets have corrected. For instance, the dot-com bubble hit a wall in March 2000 and burst in a few months, as public markets corrected first, followed by private markets. The online advertising run-up has moderated much more gradually over a few years, and if that trend continues, the correction in this market may be smooth enough that investors will not even call it a correction. With cannabis stocks, the rise and fall were both precipitous, with the stocks tripling over a few months and losing that rise in the next few months. In all three cases, the most difficult variable to pinpoint is what caused the correction to occur at the time that it did. As Ross (2005) observed, it is extraordinarily difficult to explain why a market moved when it did, even well after the fact.

Coping with the Big Market Delusion.

In the aftermath of every correction, there are many who look back at the bubble as an example of irrational exuberance. A few have gone further, arguing that such episodes are bad for markets and suggesting fixes. We believe these critics are missing the point. Not only are bubbles part and parcel of markets, but they are also not necessarily a negative. The dot-com bubble did change the way we live, altering not only how we shop but also how we travel, plan, and communicate with each other. Furthermore, some of the best-performing companies of the last two decades emerged from the debris. Amazon, a poster child for dot-com excess, survived the collapse and now has a trillion dollar market capitalization.

Our policy advice to politicians, regulators, and investors is to stop trying to make bubbles go away. In our view, requiring more disclosure, regulating

trading, and legislating moderation are never going to stop human beings from overreaching. The enthusiasm for big markets may lead to added price volatility, but it is also a spur for innovation. The benefits of that innovation, in our view, outweigh the costs of the volatility.

Investment Implications. If we are correct about the big market delusion, it raises obvious questions about the investment implications. We see at least three, depending on the type of investor looking at the stocks in the midst of the delusion:

1. From the standpoint of momentum investors, the big market delusion is one explanation for the momentum of growth stocks. When fascination with a big market, such as “transportation,” takes hold, it can produce momentum in the stock prices of innovative companies in that space, such as Uber and Lyft. Of course, the big market delusion fades and the market corrects, as happened with both Uber and Lyft. As we have emphasized, however, there appears to be no way to time such corrections.
2. For value investors, the apparently obvious advice is to avoid growth stocks whose value is based on big market stories. But that avoidance carries its own risk. In the 12-year stretch beginning in 2007, growth stocks dramatically outperformed value stocks. As one example, during this period, the Russell 1000 Growth Index outperformed the Russell 1000 Value Index by an astonishing 4.3% per year. That outperformance was driven in part by stories about how technology companies were going to disrupt or invent big markets, from housing to entertainment to automobiles. From our perspective, these stories represent overreach, and a correction is to be expected. But we would have said the same last year, which is further evidence of how hard it is to predict the timing of corrections.
3. For valuation professionals, including appraisers and equity research analysts, the key lesson is that pricing based on multiples and the peer group can lead to significant overpricing. Put simply, companies can appear fairly priced relative to other companies in a big market, but they might all be overvalued. Although many of these professionals avoid in-depth valuation, claiming that uncertainty makes it difficult to forecast revenues, margins, and reinvestment, the very act of making such projections, flawed

though they might be, can prove to be the first step in recognizing the big market delusion and perhaps correcting it.

Conclusion

The big market delusion has its roots in the type of people who become entrepreneurs and VCs. Overconfident in their own abilities, such individuals are naturally drawn to big markets that offer companies the possibility of huge valuations if they can effectively exploit them. We presented three case studies to illustrate how this process plays out—the dot-com bubble in the late 1990s, the online advertising boom in the last decade, and the cannabis stock flare in 2018—but that list is not meant to be complete. The implications of the big market delusion are many and varied. At a minimum, they include the following:

- The big market space tends to quickly become overcrowded as too many companies are founded, with each “overconfident” founder thinking the odds of success are better than they actually are.
- The VCs who invest in these companies tend to overprice them, at least collectively, because they often overestimate the revenues and profits

that their “chosen” company will make in the big market.

- The overpricing in the private market feeds into the public market during IPOs because public market investors rely on projections prepared by the founders and VCs.
- The delusion need not end after companies have gone public, because analysts and investors often adopt the metrics (such as user numbers or revenue growth) that the founders and VCs used to price the company.
- Eventually, a correction is likely to occur as facts accumulate regarding the market’s actual size and the extent of competition.

To those who are troubled by these consequences, the bad news is that the big market delusion is not a problem to be solved or regulated away but rather a feature of healthy, dynamic financial markets. For investors and VCs who risk losing money by getting caught up in the big market delusion, we suggest reality checks of investment pitches for young companies via the development of skeptical discounted cash flow models based on critical evaluations of the market size and projections of the number of competitors.

Notes

1. The WeWork story had a bad ending: The reckoning for the company’s absence of a business model and unwillingness to talk about its risks led to a meltdown in pricing right after the company announced its IPO. The public

offering was pulled from the market, and SoftBank, the leading VC invested in the company, had to add more than \$9 billion in funding to keep WeWork alive.

References

Busenitz, L.W., and J.B. Barney. 1997. “Differences between Entrepreneurs and Managers in Large Organizations: Biases and Heuristics in Strategic Decision-Making.” *Journal of Business Venturing* 12 (1): 9–30.

Christensen, Clayton M. 1997. *The Innovator’s Dilemma: When New Technologies Cause Great Firms to Fail*. Boston: Harvard Business Review Press.

Cooper, A.C., C.A. Woo, and W. Dunkelberg. 1988. “Entrepreneurs’ Perceived Chances for Success.” *Journal of Business Venturing* 3 (2): 97–108.

Graves, S.B., and J. Ringuest. 2018. “Overconfidence and Disappointment in Venture Capital Decision Making: An Empirical Examination.” *Managerial and Decision Economics* 39 (5): 592–600.

Kahneman, D. 2011. *Thinking Fast and Slow*. New York: Farrar, Straus and Giroux.

Ross, Stephen A. 2005. *Neoclassical Finance*. Princeton, NJ: Princeton University Press.

Zacharakis, A., and D. Shepherd. 2001. “The Nature of Information and Overconfidence on Venture Capitalists’ Decision Making.” *Journal of Business Venturing* 16 (4): 311–32.