Aswath Damodaran

AI'S WINNERS, LOSERS AND WANNABES: BEYOND BUZZ WORDS!

ChatGPT did this!

AI: Buzz Word, World Changer or Something in the Middle?

- It is undeniable that AI is the buzzword of the moment, showing up in almost every aspect of our lives and in markets.
  - Nvidia has become the hottest company to invest in, seeing its market cap surge in the last two years, to hit $ 2 trillion in January 2024.
  - Every company seems to be latching on to the AI revolution, sprinkling into earnings reports and mentioning products that are built around AI.
  - A surge of venture capital is invested in AI-related businesses.
- The question, as with other big buzzwords that capture our imagination, is whether the buzz is merited or just a passing fad.

Revolutionary Change: Promise and Peril!

Aswath Damodaran

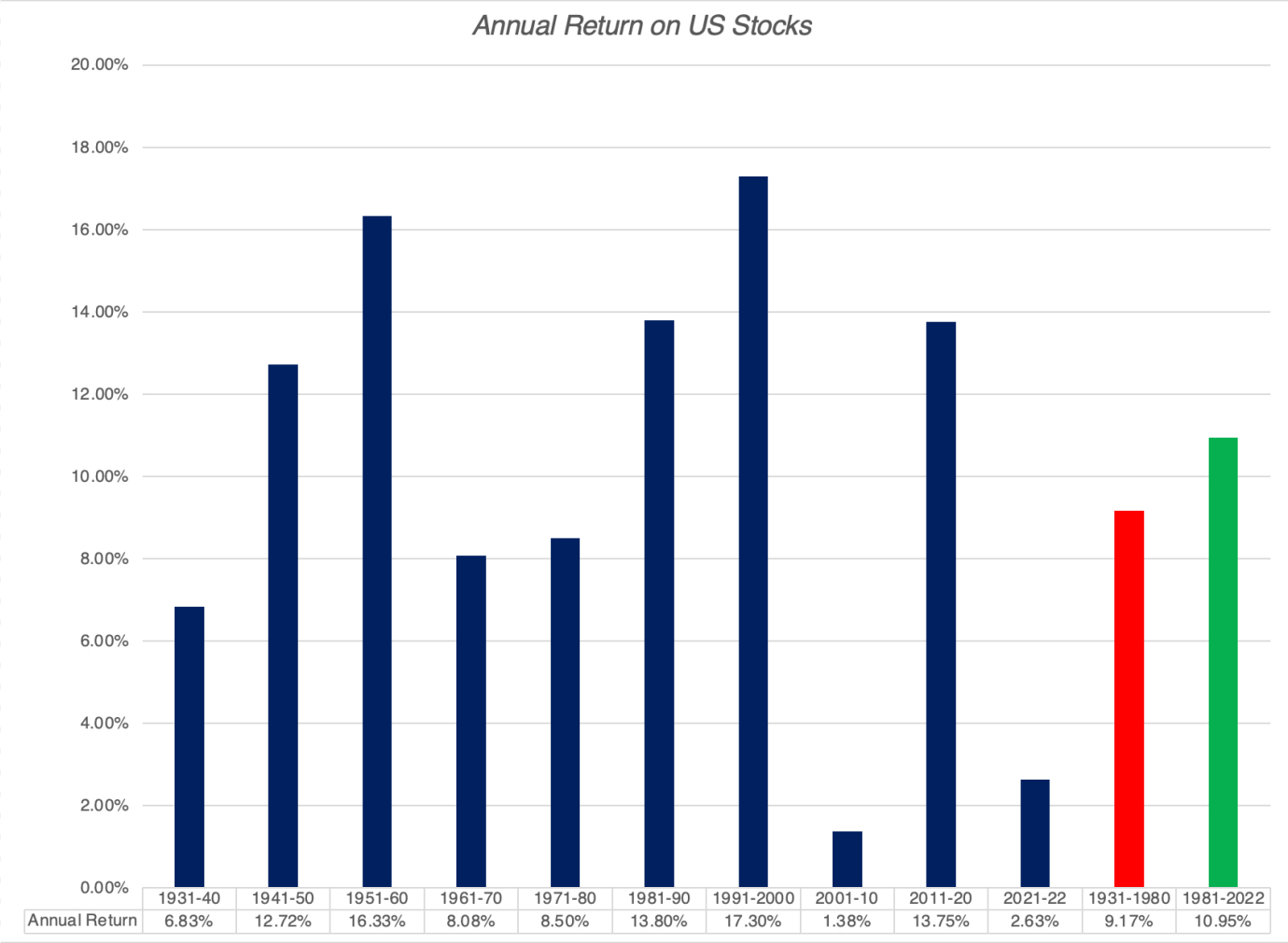
Change coming? Revolutionary or Incremental?

- Revolutionary Changes not only affected wide swathes of businesses, some positively and some adversely, but they also changed the ways that we live, work and interact.
- In parallel, we have also seen changes that are more incremental, and while significant in their capacity to create new businesses and disruption, don't quite qualify as revolutionary.
- The question of whether a change is revolutionary or incremental depends in large part on:
  - It's staying power
  - It's reach across businesses
  - It's capacity to change how we live and work

Revolutionary Changes (in my lifetime)

Revolutionary Change	Business Effects	Personal Effects
Personal Computers (1980s) Internet (1990s) Smartphones (2000s) Social Media (2010s)	- New companies built around these new businesses - Disrupt companies in businesses that are displaced by change - Show up as a cost component for companies that buy its products or services	- New workforce that is skilled in the new businesses - Job losses in businesses that are disrupted by these new businesses - Changes how we live and work

Revolutionary Change: Net Plus or Minus for Markets?



	1931-40	1941-50	1951-60	1961-70	1971-80	1981-90	1991-2000	2001-10	2011-20	2021-22	1931-1980	1981-2022
Annual Return	6.83%	12.72%	16.33%	8.08%	8.50%	13.80%	17.30%	1.38%	13.75%	2.63%	9.17%	10.95%

Revolutionary Change: Disruption's Dark Side

- The market is littered with the carcasses of what used to be successful businesses that have been disrupted by technological change.
- Investors in these disrupted companies not only lose money, as they get disrupted, but worse, invest even more in them, drawn by their "cheapness".
  - This happened, just to provide two examples, with investors in the brick-and-mortar retail companies that were devastated by online retail, and with investors in the newspaper/traditional ad companies that were upended by online advertising.
- If AI succeeds in its promise, will there be businesses that are upended and disrupted? Of course, but we are in the hype phase, where much more will be promised than can be delivered, but the biggest targets will come into focus sooner rather than later.

The Big Market Delusion!

Aswath Damodaran

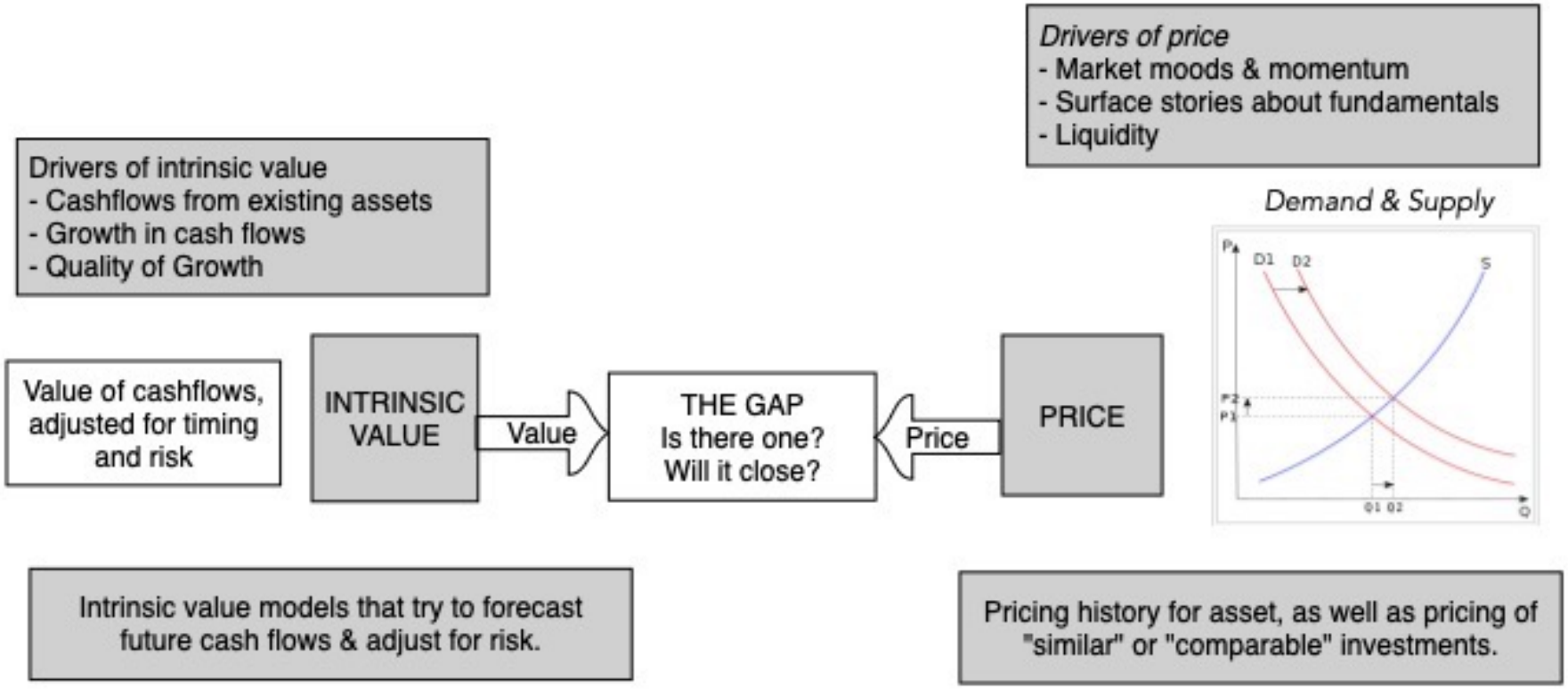
1. Big Markets

- There is nothing more exciting for a nascent business than the perceived presence of a big market for its products and services, and the attraction is easy to understand.
- In the minds of entrepreneurs in these markets, big markets offer the promise of easily scalable revenues, which if coupled with profitability, can translate into large profits and high valuations.
- The logic of impending change iss impeccable, but the extrapolation that the change would lead create huge and profitable markets was made casually.

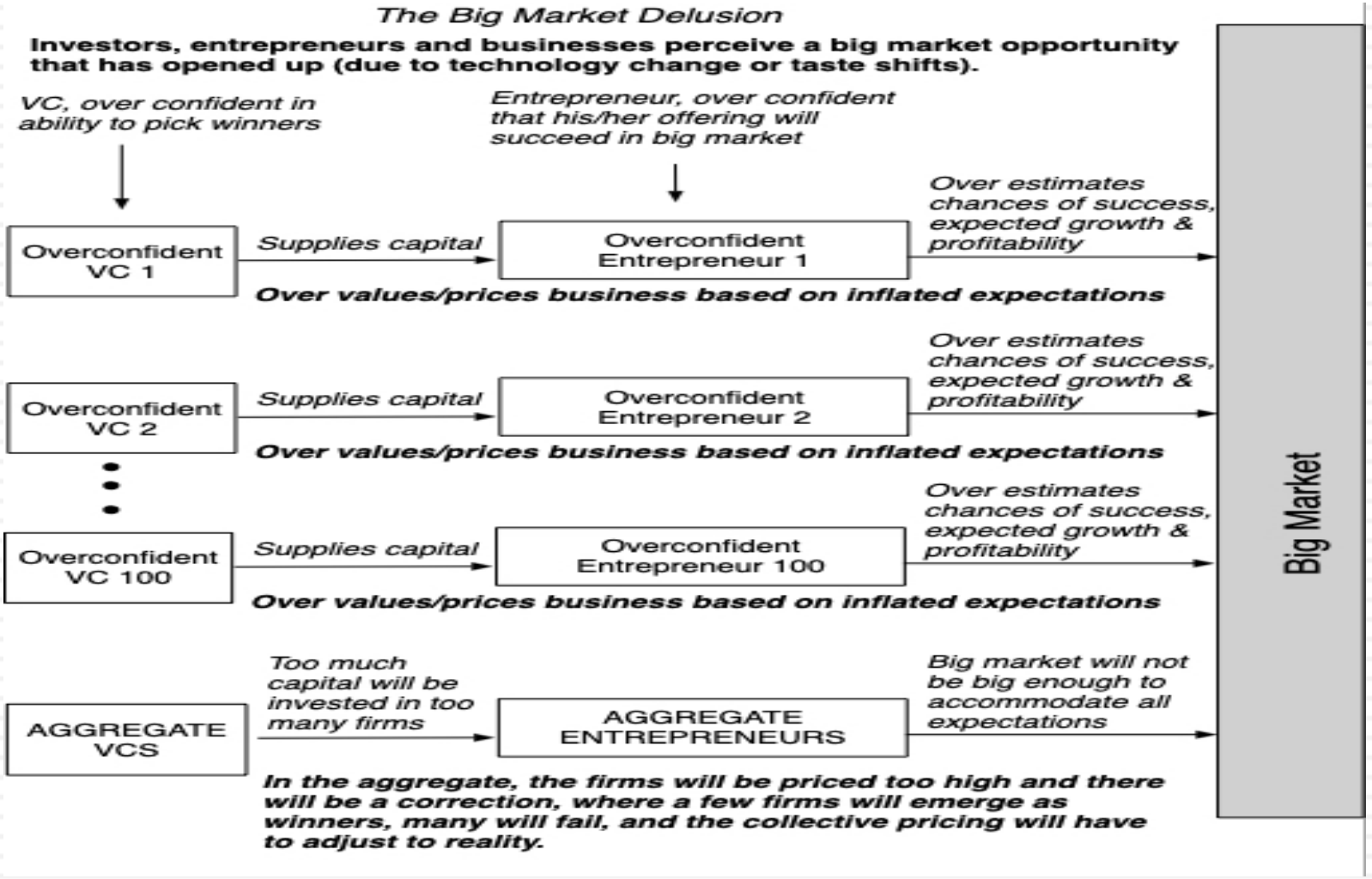
2. Overconfidence

- Daniel Kahneman, whose pioneering work with Amos Tversky, gave rise to behavioral finance as a disciple described overconfidence as the mother of all behavioral biases, for three reasons.
  - First, it is ubiquitous, since it seems to be present in an overwhelming proportion of human beings.
  - Second, overconfidence gives teeth to, and augments, all other biases, such as anchoring and framing.
  - Finally, there is reason believe that overconfidence is rooted in evolutionary biology and thus cannot be easily countered.
- The problem gets worse with big markets, because of a selection bias, since these markets attract entrepreneurs and venture capitalists, who tend to be among the most overconfident amongst us.

3. The Pricing Game



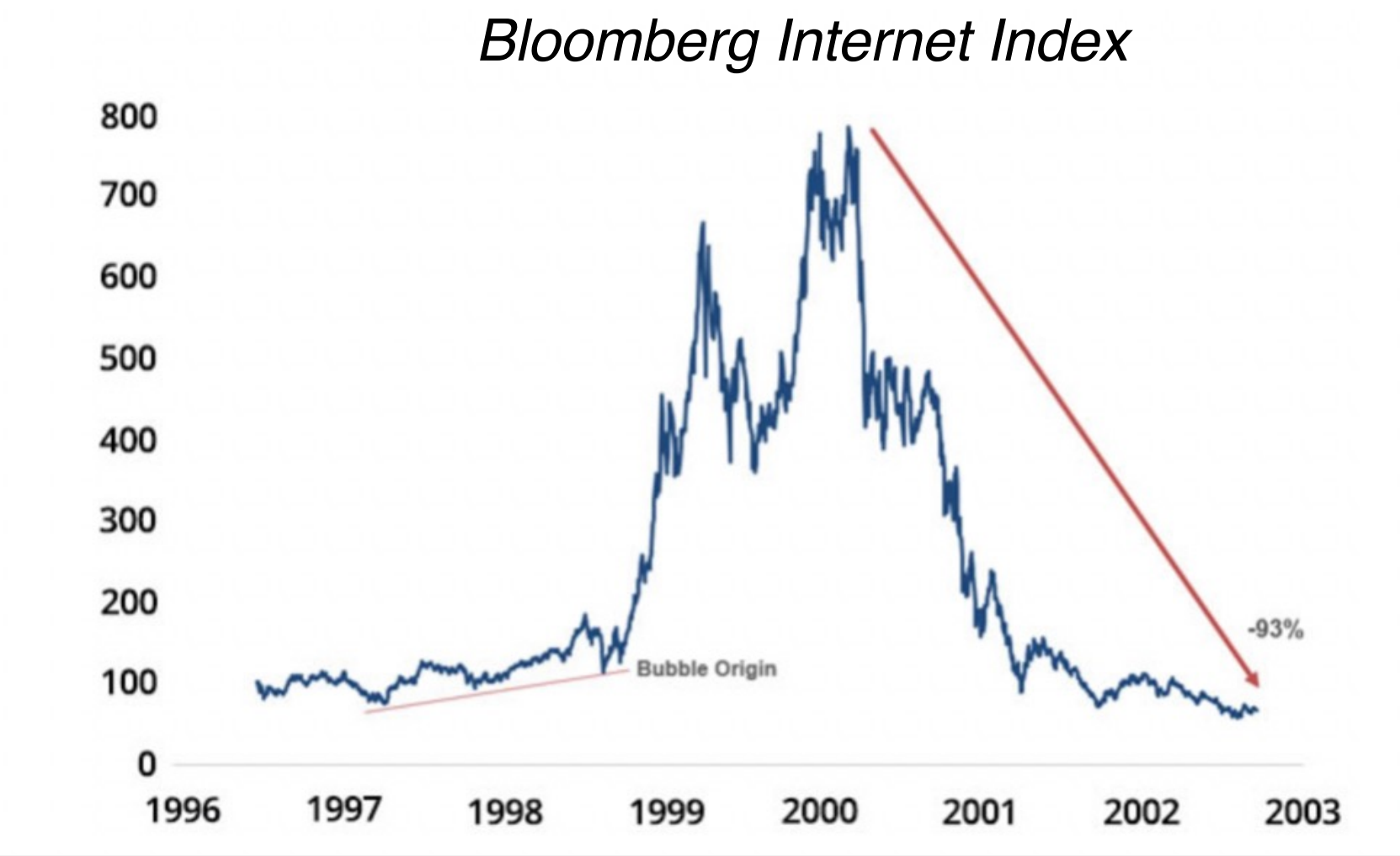
The Big Market Delusion



Case Study 1: Internet Retail in 1999

- In 1999, internet retail accounted for 0.5% of all retail sales came from the internet, but internet retail had captured the imagination of investors on the internet.
- In 1999 alone, there were 289 internet IPOs, accounting for 60% of all IPOs, with the average closing up 90% on its offering day.
- In the largest M&A transaction in history (at that point), AOL acquired Time Warner for $150 billion.

And the correction..



Case Study 2: Advertising in 2015

Online as % of Total Market	Annual CAGR in Total Ad Spending					
		1.00%	2.00%	3.00%	4.00%	5.00%
	30%	$182.49	$203.38	$226.42	$251.81	$279.76
	35%	$212.90	$237.27	$264.15	$293.77	$326.38
	40%	$243.32	$271.17	$301.89	$335.74	$373.01
	45%	$273.73	$305.07	$339.63	$377.71	$419.64
	50%	$304.15	$338.96	$377.36	$419.68	$466.26

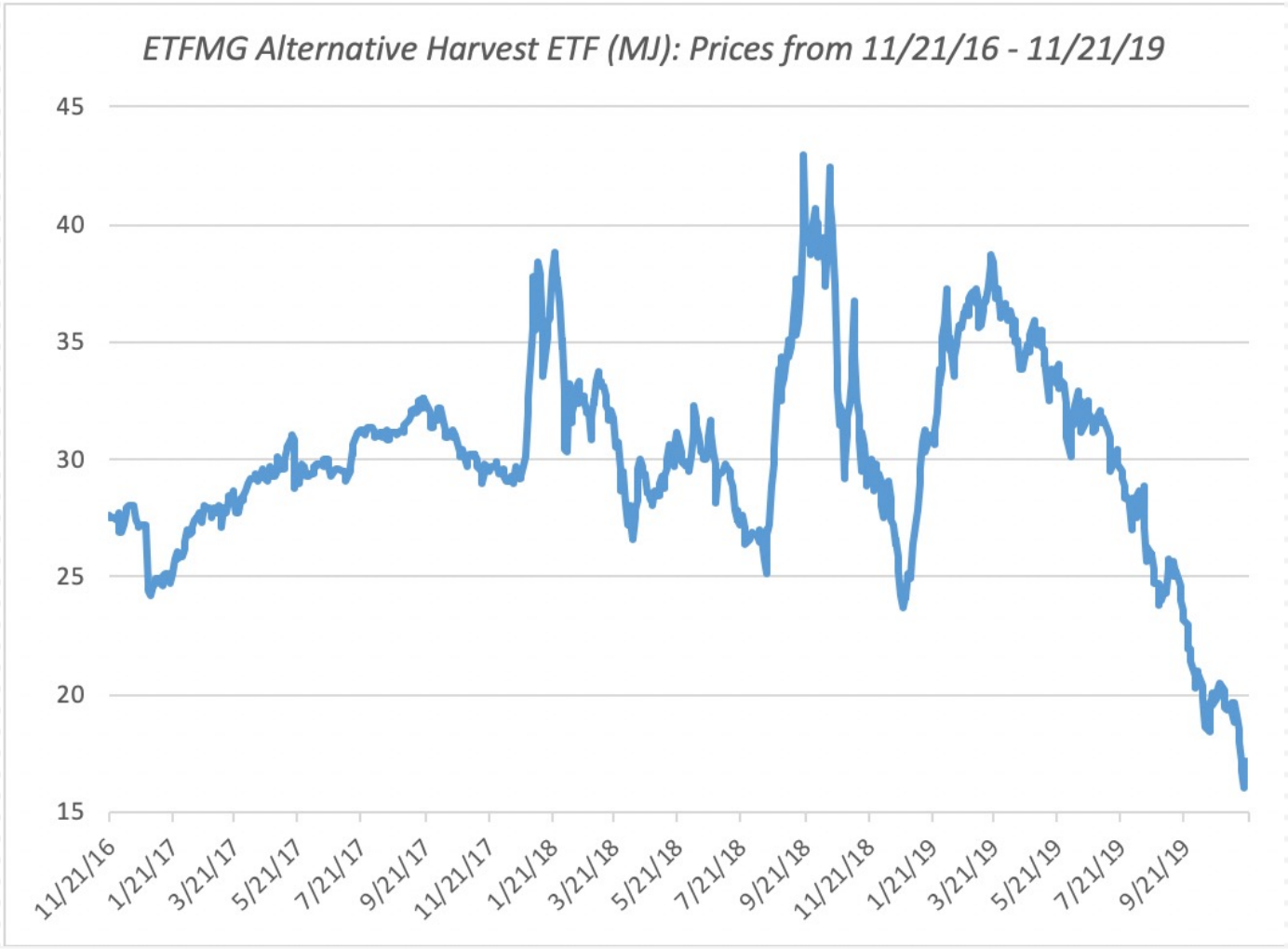
And Online Advertising

Company	*Market Cap*	*Enterprise Value*	*Current Revenues*	*Breakeven Revenues (2025)*	*% 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	$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**

Case Study 3: Cannabis in 2018

Company	*Country*	*Market Cap*	*Price/ Book*	*EV/Sales*	*EV*	*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	4.1	127.4	$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	Canada	$1,445	4.74	NA	$1,183	$0	($24)	($25)	$305
HEXO Corp	Canada	$1,351	6	342.9	$1,159	$3	($5)	($5)	$225
CannTrust Holdings	Canada	$1,195	8.4	48.64	$1,126	$23	$19	$18	$142
Auxly Cannbis	Canada	$654	2.4	281.46	$501	$2	($24)	($24)	$273
Aggregate		$48,086	11.43	204.79	$47,464	$232	($203)	($244)	$4,208

And the correction…



Common Elements in Big Market Delusions

1. Big Market stories: 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, i.e., that the retail or advertising or cannabis markets were huge.
2. 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 growth will have to be shared with both existing and potential new entrants.
3. 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.
4. 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, you get pricing that is disconnected from the fundamentals.

The Bottom Line

- 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 and argued that such episodes are bad for markets, and suggested fixes, some disclosure-related and some putting restrictions on investors and companies.
- Not only are bubbles part and parcel of markets, they are not necessarily a negative. They change the way we live and work. We would choose the chaos of bubbles, and the change that they create, over a world run by actuaries, where we would still be living in caves, weighing the probabilities of whether fire is a good invention or not.
- Our policy advice to politicians, regulators and investors then 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 AI Effect: Revolutionary or Incremental?

Aswath Damodaran

AI: Revolutionary or Incremental Change

- In many ways, AI is the culmination of two forces that have been building up over time:
  - Big data: Over the last two decades, not only have we seen data consolidated and accessible as never before, but we have also traded away personal data for convenience.
  - Computing power: We have a multiple of the power that only a few with access to super computers had a few decades ago.
- It is ironic that what brought AI into the public consciousness was not a AI breakthrough, but Chat GPT, a lower-level AI innovation, which brought AI into public consciousness.
- In the short time since, AI has not only driven markets, but also altered company strategies and has started affecting how we do our jobs/ live our lives.

AI: Business Potential

Hardware and Infrastructure	**Data**
The AI effect on NVIDIA comes from the increased demand for AI-optimized computer chips, and as that market is expected to grow exponentially, the companies that can grab a large share of this market will benefit.	Big data, used more as a buzzword than a business proposition, over the last decade may finally find its place in the value chain, when twinned with AI, but that pathway will not be linear or predictable
Software	**AI Products/Services**
This software can take multiple forms, from AI platforms, chatbots, deep learning algorithms (including image and voice recognition, as well as natural language processing) and machine learning.	AI may allow companies to target customers better (increasing revenues) or reduce costs (replacing manual labor with AI-driven applications) and make them more efficient, and by extension, more profitable.

AI: Social Effects

- I know that there are some advocates of AI who paint **a picture of goodness**, where AI takes over the menial tasks that presumably cause us boredom and brings an unbiased eye to data analysis that lead to better decisions.
- I know that there are others who see AI as an instrument that big companies will use to control minds and acquire power. With the experience of the big changes that have engulfed us in the last few decades still fresh, I would argue that they are both right.
- There are some who believe that AI can be held in check and made to serve its more noble impulses, by restricting or regulating its development, but I am not as optimistic for many reasons.
  - I believe that both regulators and legislators are woefully incapable of understanding the mechanics of AI, let alone pass sensible restrictions on its usage.
  - Second, any regulation or law that is aimed at preventing AI's excesses will almost certainly set in motion unintended consequences, that at least in some cases will be worse than the problems that the regulation/law was supposed to hold in check.

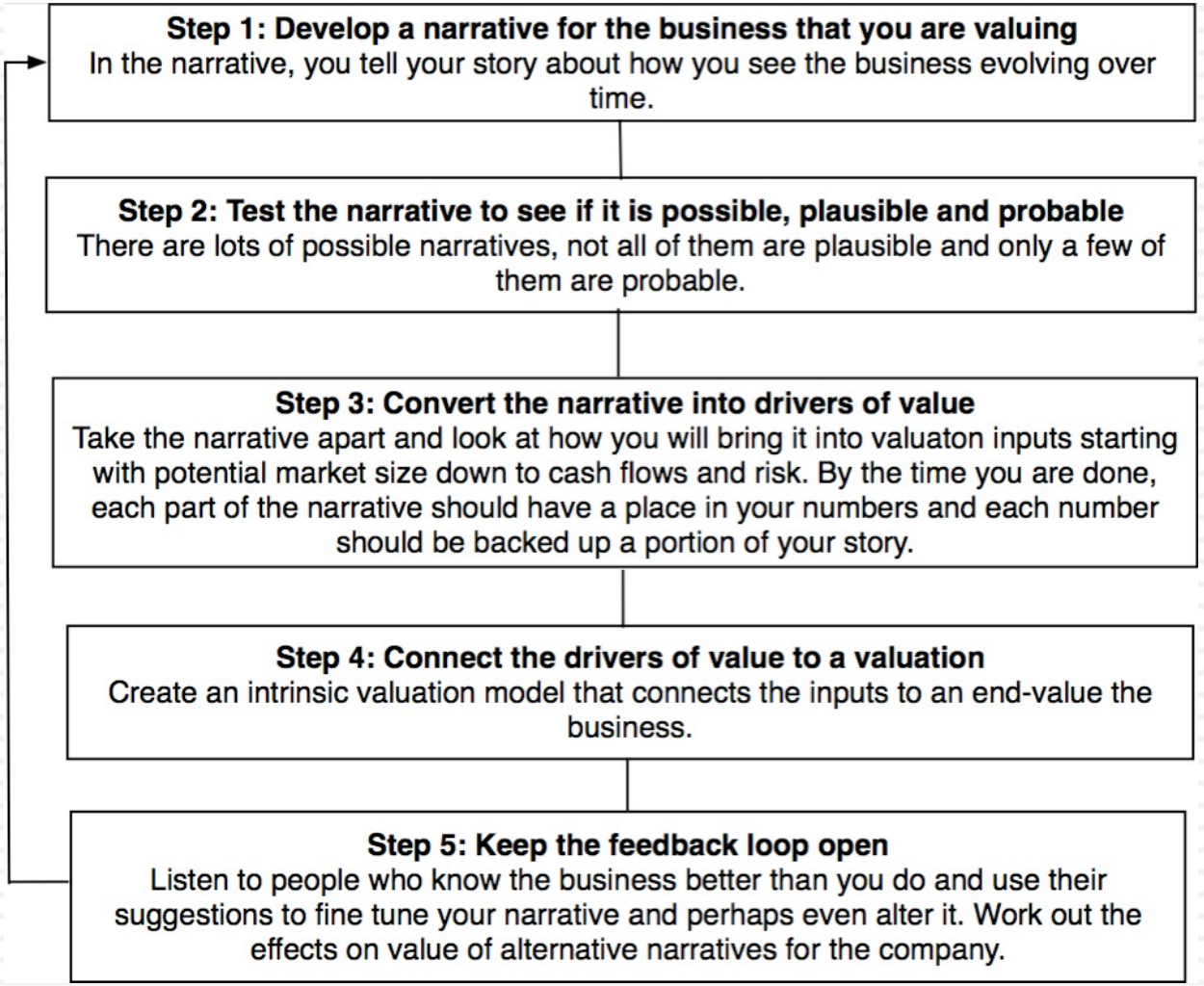
Nvidia: An AI winner

Aswath Damodaran

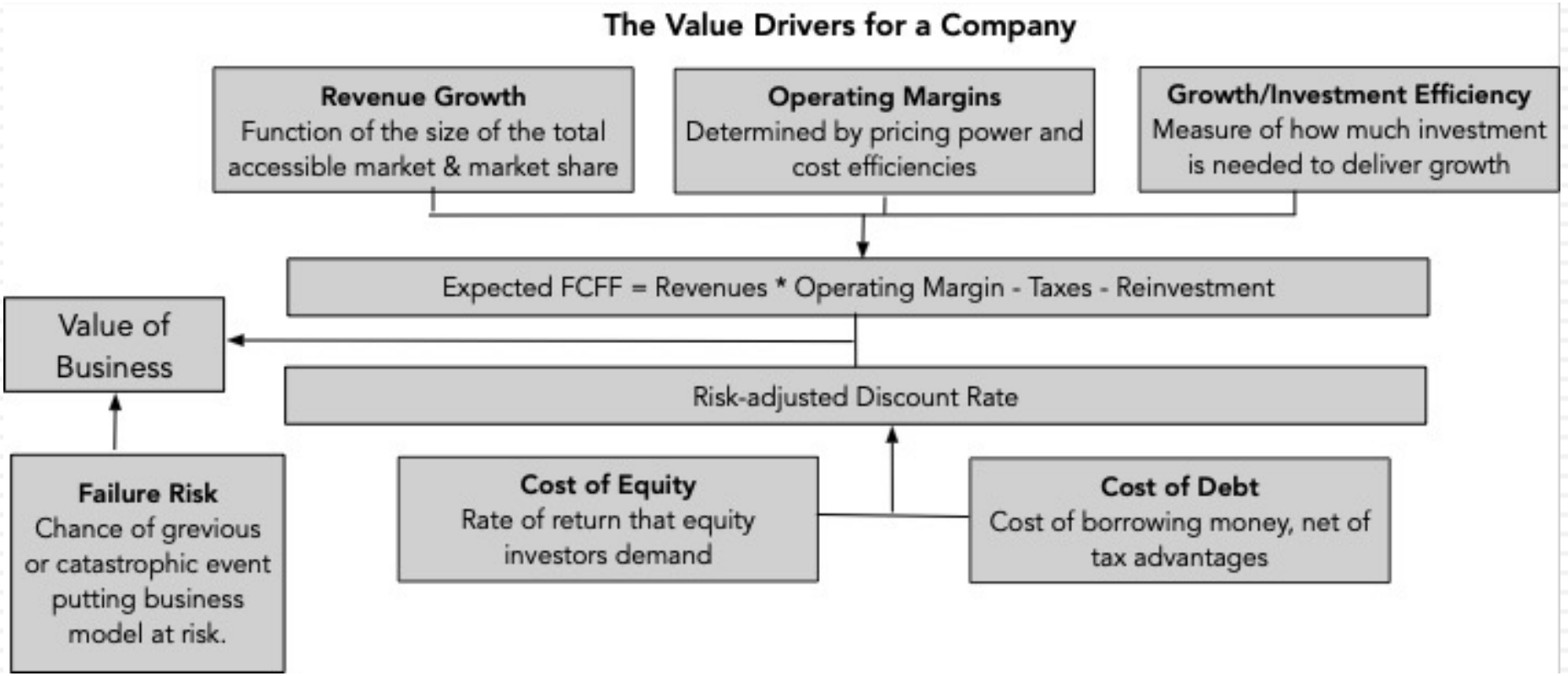
My Nvidia Interests..

- Market buzz: Nvidia has clearly caught a market wave, and generated media buzz, as its market cap has exploded. Just as Amazon and Cisco became the poster children for the dot.com boom, Nvidia is at the center of the AI buzz.
- Jensen Huang, genius CEO: As Nvidia has risen, Huang has gone from a CEO whose name most people (including institutional investors) would have had a hard time recalling to the "greatest CEO" of all time.
- Personal: I was lucky enough to buy Nvidia after it was beaten up by markets in 2018, at $29/share, and if I truly believe in value investing, I had to take a look when the stock price hit $450/share.

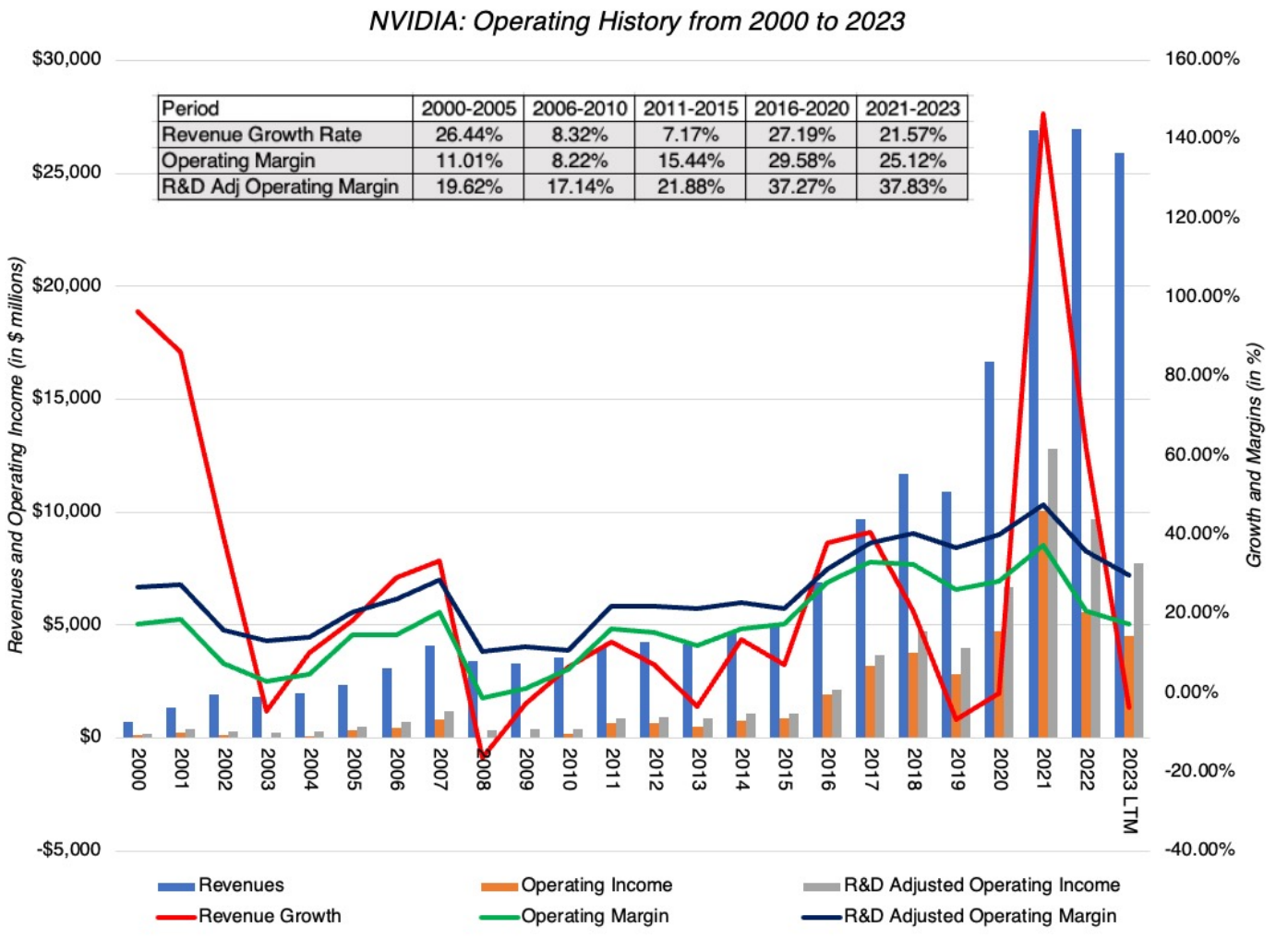
Story to Numbers



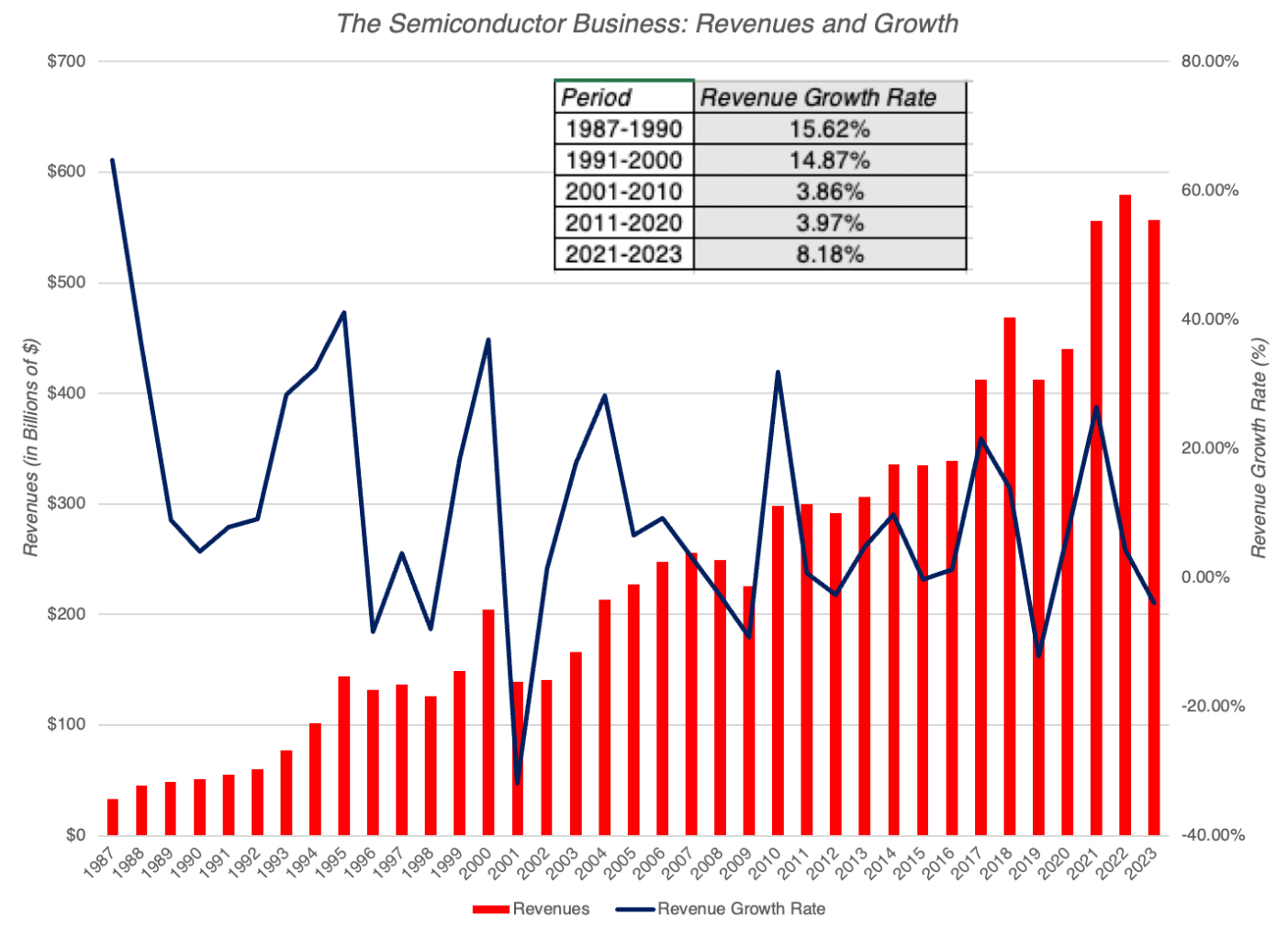
And keep your valuation parsimonious!



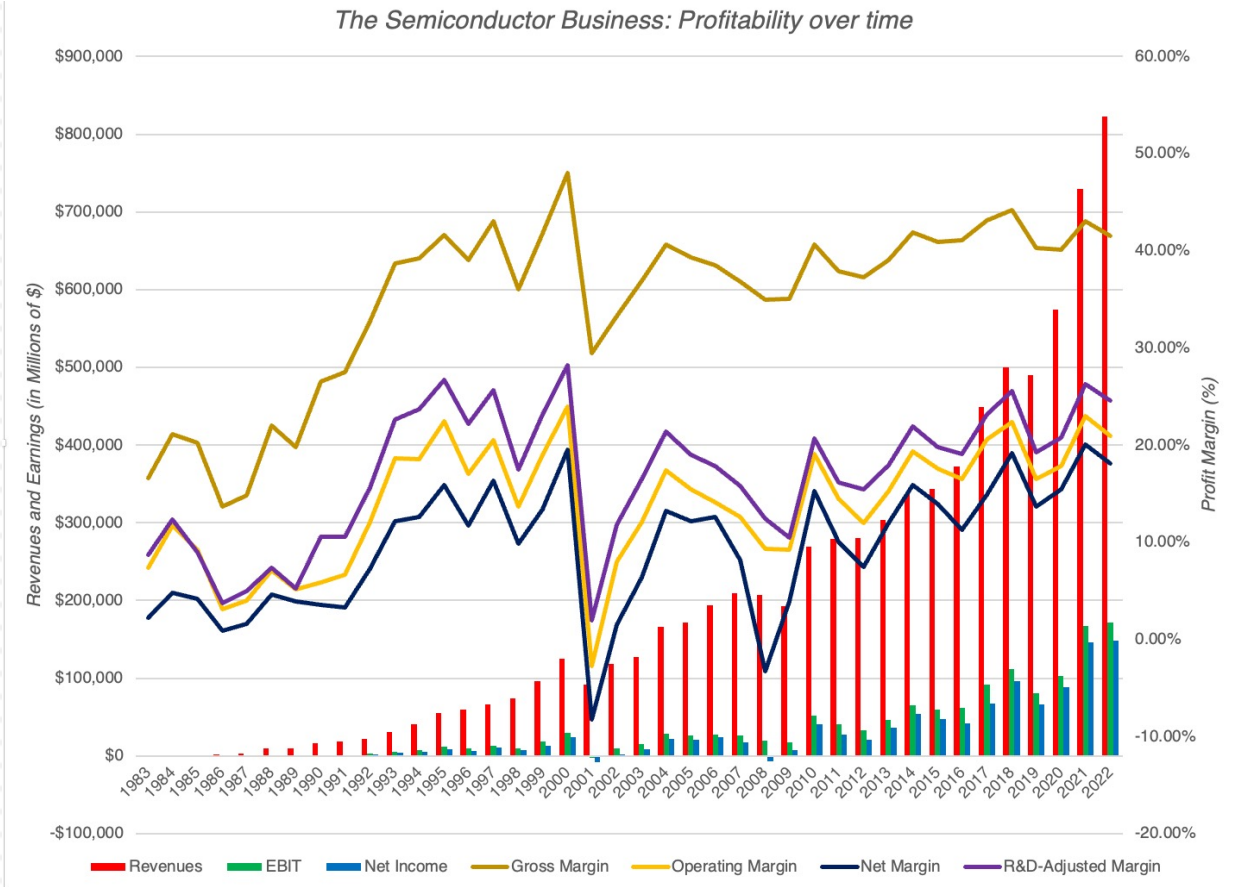
1. Opportunistic Growth



In a business that is approaching maturity…

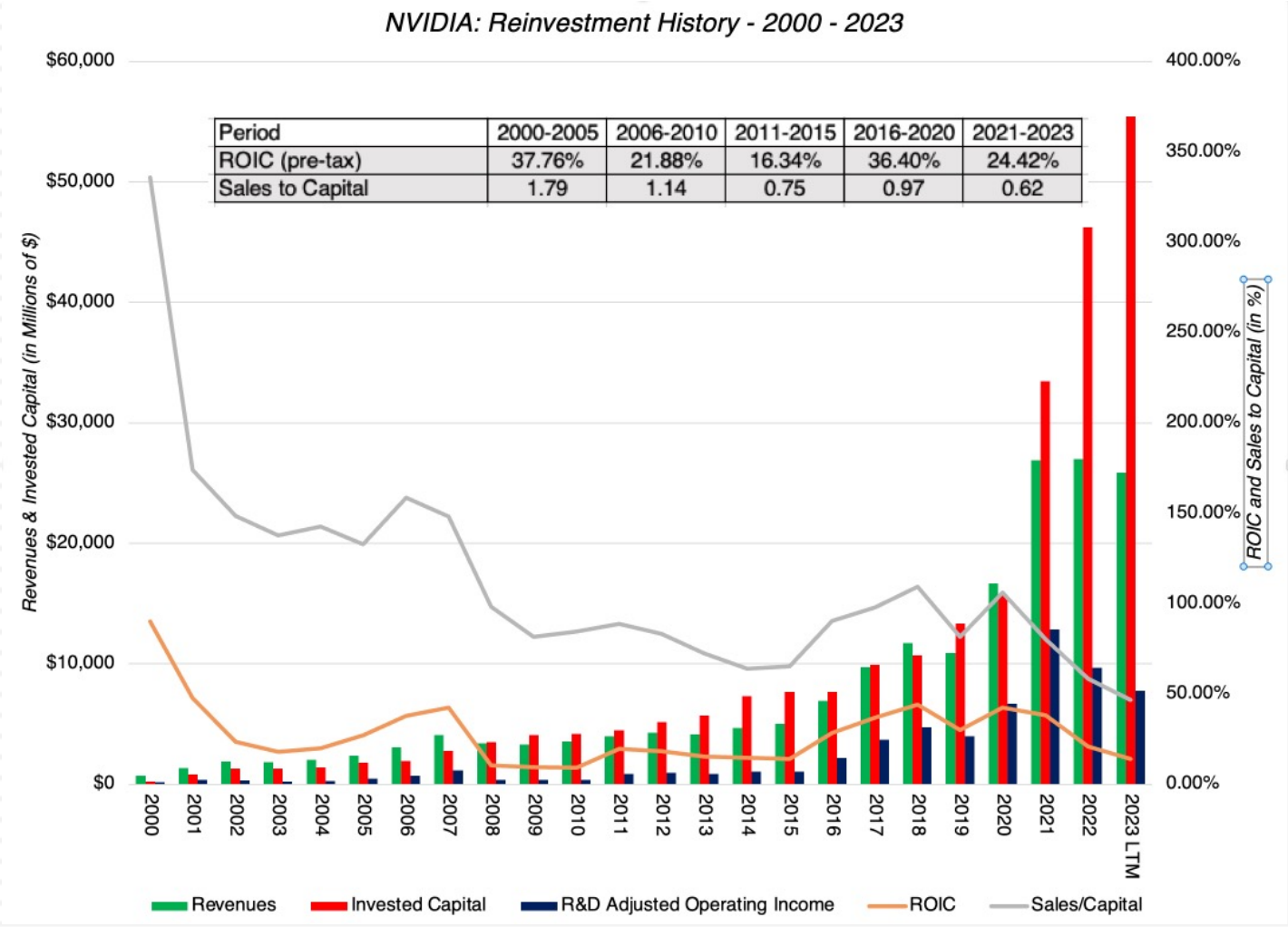


But with high margins…



Time Period	1983-1990	1991-2000	2001-2010	2011-2020	2021-2022
Gross Margin	19.36%	38.77%	36.57%	40.58%	42.28%
Operating Margin	6.70%	17.25%	11.45%	17.23%	21.94%
Net Margin	3.23%	12.22%	6.17%	13.38%	19.08%
R&D Adjusted Margin	7.73%	21.60%	14.79%	19.90%	25.46%

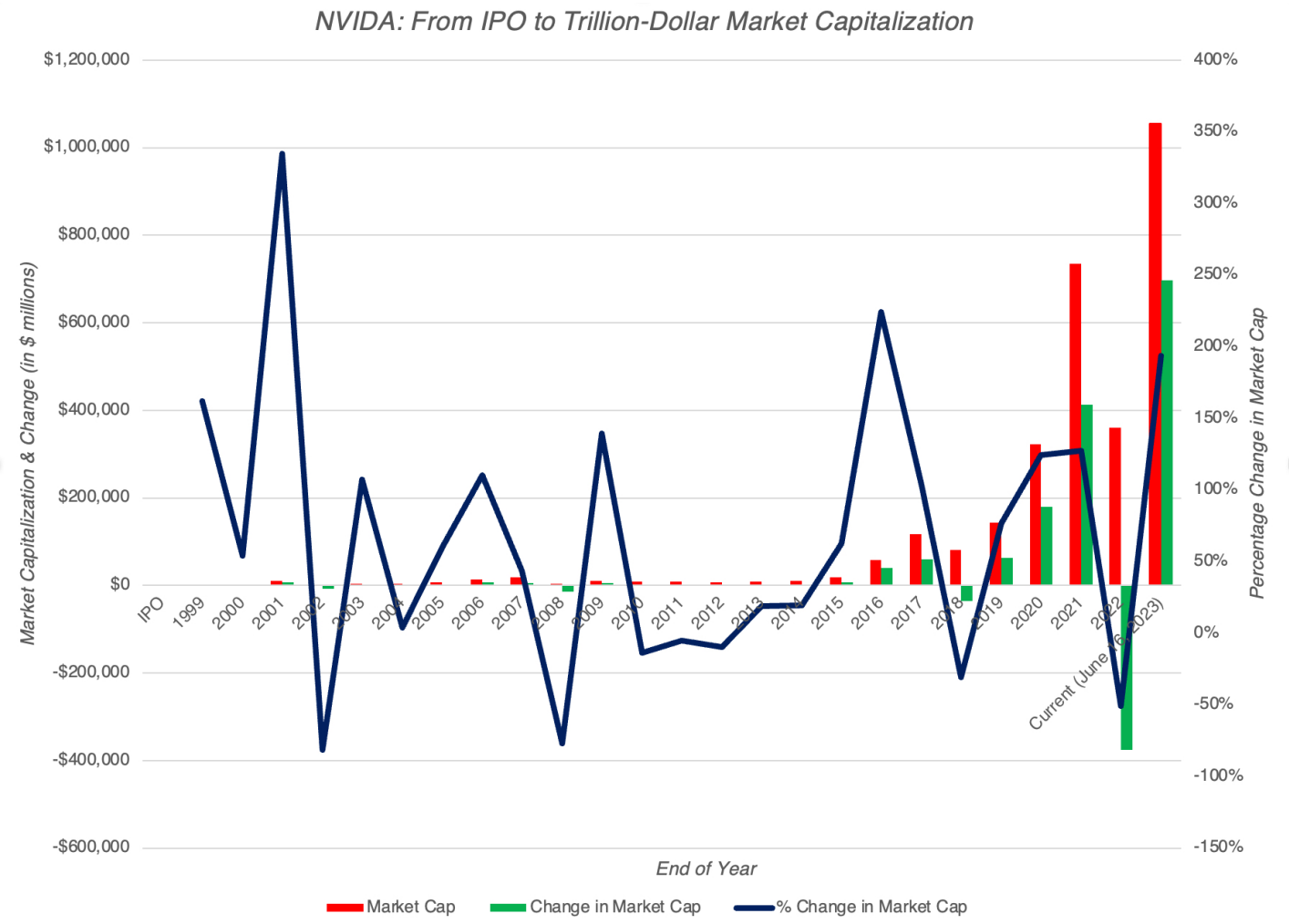
2. With Large (but Productive) Reinvestment!



In a sector, where companies have diverged on reinvestment..

- The semiconductor business sees reinvestment in multiple forms, with R&D providing the starting point for new and more advanced chips, and manufacturing investments creating the foundation for cost advantages.
- The older semiconductor companies have a mix, but as the business has commoditized, they have worked on reducing their cost of production and trying to get an advantage.
- Nvidia and AMD, in particular, have gone the R&D route, going after the higher-end portion of the market, often in new businesses that need these more powerful chips.

3. And a Mega Market Payoff



NVIDIA: Drivers of Success

- The driver of NVIDIA's success has been its high-performance GPU cards, but it is very likely that the businesses that bought these cards and drove NVIDIA's success in the last decade will be different from the businesses that will make it successful in the next one.
- For much of the last decade, it was gaming and crypto users that allowed the company to set itself apart from the competition, but the bad news is that both of these markets are maturing, with lower expected growth in the future.
- The good news, for NVIDIA, is that it has two other businesses that are ready to step in and contribute to growth.
  - The first is AI, where NVIDIA commands a hefty market share of what is now a relatively small market, but one that is almost certain to grow ten-fold or greater over the decade.
  - The other is in the automobiles business, where more powerful computing is seen as the ingredient needed to open up automated driving and other enhancements.

Nvidia: The AI Chip Story

- First mover: NVIDIA has spent much of the last few years investing and developing products for a nascent AI market. This lead time has given NVIDIA not just market leadership, but revenues and profits already. Much of the excited reaction to NVIDIA's most recent earnings report came from the company reporting a surge in its data center revenues, with much of the increase coming from AI chips.
- Dominant share: While the company does not explicitly break out how much of the data center revenues are from AI chips, it is estimated that the total market for those chips in 2022 was about $15 billion, with NVIDIA holding a dominant market share of about 80%. If those estimates are right, the bulk of the data center revenues for NVIDIA in 2022, which amounted to $15 billion in all, comes from AI-optimized chips.
- Growing market: The ChatGPT jolt to market expectations has played out in increases in expected growth of the AI chip market over the next decade, with estimates for the overall AI chip market in 2030 ranging from $200 billion at the low end to close to $300 billion at the high end.

Nvidia: Behind the AI Success

- First mover: Nvidia was the first large semiconductor company to see the potential for AI to be a large market, and channel its energies to designing chips for that market.
- Software bundling: Nvidia has software that it bundles with its chips, making them more efficient in delivering results (with less energy being consumed).
- Design, not manufacturing: Nvidia does not make its own chips. It designs the chips for TSMC to manufacture. That does expose them to outsourcing risk, but it does allow them to move faster.

The NVIDIA Growth Story: Opportunistic and First Mover..

- Revenue Growth: NVIDIA will remain a high growth company for two reasons.
  - The first is that in spite of its scaling up due to growth over the last decade, at least in terms of revenues, it has a modest market share of the overall semiconductor market, with revenues that are less than half of the revenues posted by Intel or TSMC.
  - The second, and more important reason, is that while its gaming revenue growth is starting to flag, it is well-positioned in AI and Auto, two markets poised for rapid growth. In my story, I will assume that these markets will deliver on their growth promise and that NVIDIA will maintain a dominant, albeit lower, market share of the AI chip business, while gaining a significant share (15%) of the Auto chip business

	AI		Auto		Gaming & Other		NVIDIA	
	Current	In 2033	Current	In 2033	Current	In 2033	Current	In 2033
Total Market ($ Mil)	$15,000	$325,000	$20,000	$200,000	Revenue growth: 30% for years 1-5, declining thereafter.		Revenues increase 10-fold over next decade	
Market Share	75%	60%	3.00%	15%				
NVIDIA revenues ($ Mil)	$26,250	$195,000	$600	$30,000	$18,020	$130,029	$68,051	$355,029

NVIDIA: The Rest of the Story

- Profitability: The semiconductor business has a cost structure that has relatively little flex to it, but I will assume in my NVIDIA story that the right margin to focus on is the R&D adjusted version, and that NVIDIA will continue to deliver high margins. While its 2023 margin hit 44.49%, those margins will trend down, as competition in the AI chip business increases, but at a target margin of 40%, it will still be substantially higher than the rest of the chip industry.
- Investment Efficiency: NVIDIA has invested heavily in the last decade, generating only 65 cents in revenues for every dollar of capital invested (including the investment in R&D), in 2022. I believe that given the company's larger scale, with the payoff from past investments augmenting revenues, the company's sales to invested capital will approach the global industry median, which is $1.15 in revenues for every dollar of capital invested.
- Risk: I estimated NVIDIA's cost of capital, given its market capitalization and extended client base, will converge on the third quartile of all US companies, at 8.84%. Over time, it will move to the median value for all US companies, of 8.58%.

Nvidia

Feb-24

Base Year and Comparison	Company	Industry
Revenue Growth	71.24%	5.77%
Revenue	$18,020	
Operating Margin	44.49%	16.32%
Operating Income	$8,018	
EBIT (1-t)	$7,208	

Growth Story (Revenue)
Even as gaming and other chip businesses mature, NVIDIA"s investments in the AI and Auto chip businesses will deliver healthy growth over the next decade.

Profitability Story (Margin)
Margins improve, first as NVIDIA rebounds from a down-year and then long term, because of competitive advantages, especially in their growth businesses and economies of scale.

Growth Efficiency Story
Sales to capital moves to industry median, as company is able to slow its investment pace, and see payoffs from past investments in AI & Auto.

Terminal Value	
Growth Rate	4.08%
Cost of capital	8.58%
Return on capital	20.00%
Reinvestment Rate	20.40%

Value of Rest	$392,481
Value of AI	$622,303
Value of Auto	$81,485
Probability of failure =	0.00%
Value of operating assets =	$1,096,269
- Debt	$11,027
- Minority interests	$0
+ Cash	$18,281
+ Non-operating assets	$1,172
Value of equity	$1,104,695
- Value of options	$0
Value of equity in common sto	$1,104,695
Number of shares	2,470.00
Estimated value /share	**$447.25**
Price per share	$681.00
% Under or Over Valued	52.27%

	1	2	3	4	5	6	7	8	9	10	Terminal year
Revenue (Gaming/Other)	$ 23,426	$ 30,454	$ 39,590	$ 51,467	$ 66,907	$ 83,511	$ 99,905	$ 114,340	$ 124,932	$ 130,029	$ 135,335
Revenue (AI)	$ 42,777	$ 58,608	$ 73,743	$ 88,182	$ 101,925	$ 122,628	$ 142,287	$ 160,902	$ 178,473	$ 195,000	$ 202,956
Revenue (Auto)	$ 1,848	$ 3,672	$ 6,072	$ 9,048	$ 12,600	$ 15,504	$ 18,696	$ 22,176	$ 25,944	$ 30,000	$ 31,224
Revenues (Total)	$ 68,051	$ 92,734	$ 119,405	$ 148,697	$ 181,432	$ 221,643	$ 260,888	$ 297,418	$ 329,349	$ 355,029	$ 369,515
R&D Adj Operating Margin	30.00%	52.00%	36.00%	38.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%
Operating Income	$ 33,248	$ 47,561	$ 51,835	$ 61,796	$ 72,573	$ 88,657	$ 104,355	$ 118,967	$ 131,740	$ 142,012	$ 147,806
EBIT (1-t)	$ 29,890	$ 42,757	$ 46,600	$ 55,554	$ 65,243	$ 77,061	$ 87,596	$ 96,316	$ 102,731	$ 106,509	$ 110,854
Reinvestment	$ 21,463	$ 23,192	$ 25,471	$ 28,465	$ 34,966	$ 34,127	$ 31,765	$ 27,766	$ 22,331	$ 12,596	$ 22,614
FCFF	$ 8,427	$ 19,565	$ 21,128	$ 27,089	$ 30,277	$ 42,934	$ 55,831	$ 68,549	$ 80,400	$ 93,913	$ 88,240
										$ 1,960,891.14	
Cost of Capital	8.84%	8.84%	8.84%	8.84%	8.84%	8.79%	8.74%	8.68%	8.63%	8.58%	
Cumulated WACC	0.9188	0.8442	0.7756	0.7126	0.6547	0.6018	0.5535	0.5093	0.4688	0.4317	
Sales to Capital	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	
ROIC	82.96%	74.37%	57.75%	52.33%	48.46%	45.44%	43.00%	40.90%	39.02%	37.30%	20.00%

Risk Story
Initial cost of capital set equal to semiconductor industry average, for first 5 years, moving towards average for entire market over time. Dependence on TSMC for chip production creates risk exposures to Taiwan and China.

Competitive Advantages
Strong competitive edges allow NVIDIA to earn well above its cost of capital for the next decade and beyond.

AI and Auto Business: Market Size and Market Share

	AI		*Auto*	
	Current	*In 2033*	*Current*	*In 2033*
Total Market ($ M)	$15,000	$325,000	$20,000	$200,000
Market Share	75%	60%	3.00%	15%
NVIDIA revenues	$11,250	$195,000	$600	$30,000

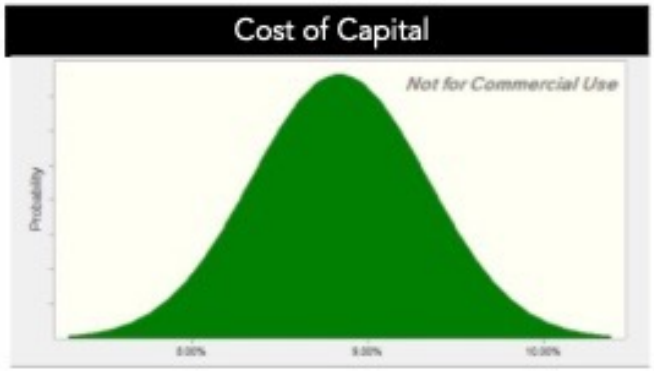
NVIDA: Value Simulation

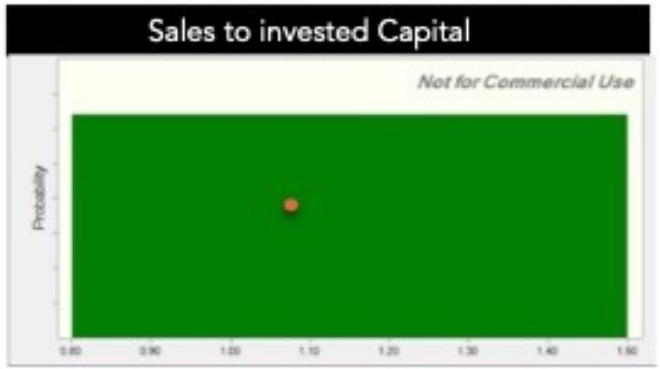
- Revenue Growth
  - Base Case: Revenues of $370 billion in 2033
  - Distribution:

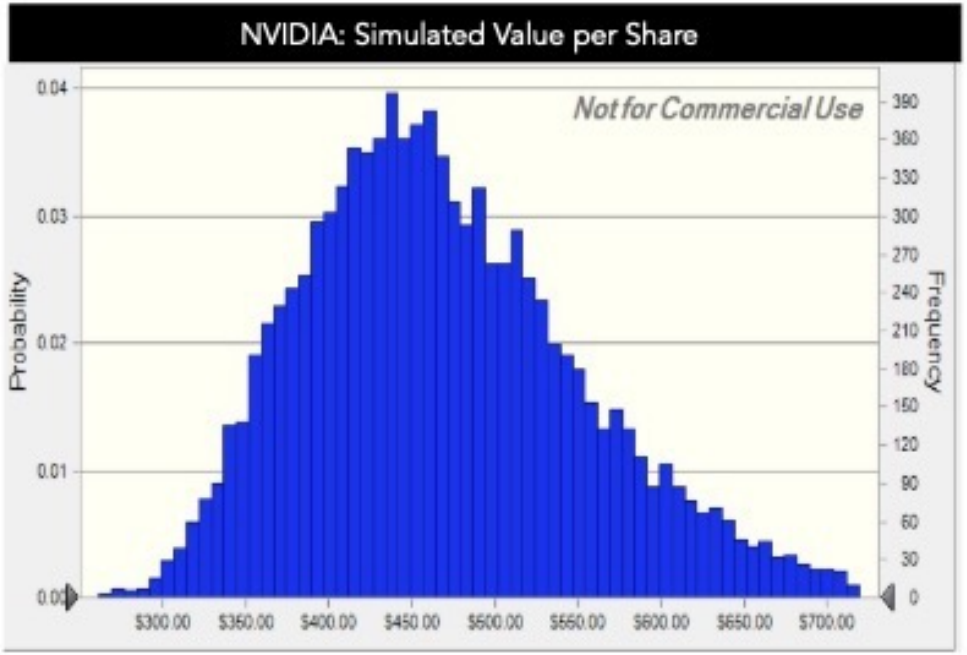
Market	*Total Market*	*Market Share*
AI	$200 billion to $450 billion, uniform	60%, lognormal with std dev = 10%
Auto	$100 billion to $300 billion, uniform	15%, lognormal with std dev
Rest	CAGR next 5 years: 15% to 45%, uniform	

- Operating Margin
  - Base Case: Pre-tax operating margin of 40% (target)
  - Distribution: Lognormal distribution, with scale of 4.00%
- Cost of Capital
  - Base Case: Median company cost of capital of 8.84%%
  - Distribution: Normal Distribution (with standard dev of 0.5%)

NVIDIA: VALUE SIMULATION (February 2024)







Percentile	Value per share
0%	$261.86
10.0%	$366.15
20.0%	$395.88
30.0%	$419.05
40.0%	$439.48
50.0%	$459.95
60.0%	$481.92
70.0%	$508.22
80.0%	$538.97
90.0%	$588.25
100.0%	$1,023.47

Aswath Damodaran

And an AI breakeven analysis!

- If it is the AI story that is carrying Nvidia to new highs, it is worth asking how big the AI chip market will have to be to sustain a value per share of $850 or $900.
- The answer is, holding margins at their stratospheric levels and the market share at the dominant 60%, is about a trillion dollars.
- Even if you buy into the highest end estimates of what the overall AI market will be, which is $2-$3 trillion, this would require that AI chips alone would be more than a third to a half of the market.

The Take-Aways from What ifs?

- The breakeven table reinforces the findings in the simulation, insofar as it shows that there are plausible paths that lead to the current price being a fair value or under value, but these paths require a daunting combination of extraordinary revenue growth and super-normal margins.
- Put simply, you need another market or two, with potential similar to the AI market, where NVIDIA can wield a dominant market share to justify its pricing.
- That would be an optionality argument, and it would require immensely valuable option to be justified.

Judgment Day: Investing

- I love NVIDIA as a company and have nothing but praise for Jensen Huang's leadership of the company. My valuation story for NVIDIA reflects all of the positive features in the company will continue into the next decade, but that upbeat narrative still yields a value well below the current price.
- I would be lying if I said that selling one of my biggest winners is easy, especially since there is a plausible pathway, albeit a low-probability one, that the company will be able to deliver solid returns, at current prices.
  - I chose a path that splits the difference, selling half of my holdings and cashing in on my profits, and holding on to the other half, more for the optionality (that the company will find other new markets to enter in the next decade).
  - The value purists can argue, with justification, that I am acting inconsistently, given my value philosophy, but I am pragmatist, not a purist, and this works for me.
- It does open up an interesting question of whether you should continue to hold a stock in your portfolio that you would not buy at today's stock prices, and it is one that I will return to in a future post.

But it is an awesome company!

Your perception of Company Quality	Investor/Market Perception of Company Quality						
	Abysmal	Very Bad	Bad	Average	Good	Very Good	Awesome
Awesome							
Very Good							
Good							
Average							
Bad							
Very Bad							
Abysmal							

AI in the rest of the market

On the AI hardware front..

- While Nvidia has had the lion's share of the AI chip glory, there are signs that the other chip makers are throwing resources into catching up.
  - To the extent that you believe that one or more of these companies will be the one to take share away from Nvidia in a growing market, you have a winner.
  - Of course, you could always bet on a maker of chips like TSMC as a winner, no matter who dominates the market.
- There is more to AI architecture that AI chips. As the business evolves, you are likely to see the rest of the AI hardware business developing, and winners in that market.
- The question, from a value perspective, is whether the AI business will be commoditized.

On the AI product/service front…

- To the extent that AI is the real payoff from "big data", and that its requirements in big data are specific, there may be big data providers who have an advantage.
- Among companies that already collect data, the payoff to using AI will be directly proportional to how exclusive their data is, and how well they can use what they learn to modify products and services.
  - This will give tech companies a head start, since they have the data (exclusive and vast) and the computing power.
  - This will be a test of the Christensen hypothesis that disruption comes from upstarts and not the status quo.

For AI customers…

- For some companies that are built around providing services that are mechanical (or easily replicated), AI will be an existential threat.
- For most companies, AI will become an expense that they will have to incur, since not spending money on it may put them at a disadvantage, reducing margins and profitability.
- And, of course, academics, consultants and experts all of whom will claim (falsely) that they can lead you to the promised land, and charge you through the nose for the privilege.

And for all of us…

- While much of the discussion about AI has been about its effects on the economy and markets, it is undeniable that is has planted the seeds of worry in peoples' heads that they might be replaced by AI.
- Put simply, it is prudent to act as if there is a bot out there that is trying to replicate what you do on your jobs, and is trying to displace you.
  - If what you do is mechanical (coding), purely cosmetic or mental grunt work, your bot will do it better and cheaper.
  - To beat your bot, you have to do things that are not easily replicable – intuition, imagination and leaps of logic.