February 24, 2023

2022 Annual Letter

Barrage Fund

Management report

For the period of January 1st to December 31st 2022, the S&P/TSX posted a return of -5.80% (including dividends) while the S&P 500 had a return of -12.16% (in Canadian dollars and including dividends). The return of the Barrage Fund for the same period was -43.02% before fees and -43.68% after fees.

Market Commentary

Interest rates continue to be a hot topic. In the financial community, there is a perpetual debate between those who believe that rates should stop rising or even fall, and those who wish to see them higher. Currently, the various indicators do not reassure the U.S. Federal Reserve, and therefore, it intends to tighten rates further.

Our securities have been particularly affected by a revaluation of their quoted market prices. However, we are surprised that a good number of stocks have held up so far, particularly companies with low growth rates. At the moment, they are considered safe havens, but we think the trend could quickly reverse.

It is not our intention to make economic predictions; however, we expect the Fed to continue to take the inflationary threat seriously. It should therefore achieve its objective this year. It may very well be that rising rates will eventually tip the economy over, bringing about the long talked about recession. In such an environment, we are still reassured by the financial strength of our portfolio companies.

In the world of so-called "technology" companies, including our own stocks, 2022 was the year of realization that belts must be tightened to match demand which has greatly diminished with the end of the pandemic:

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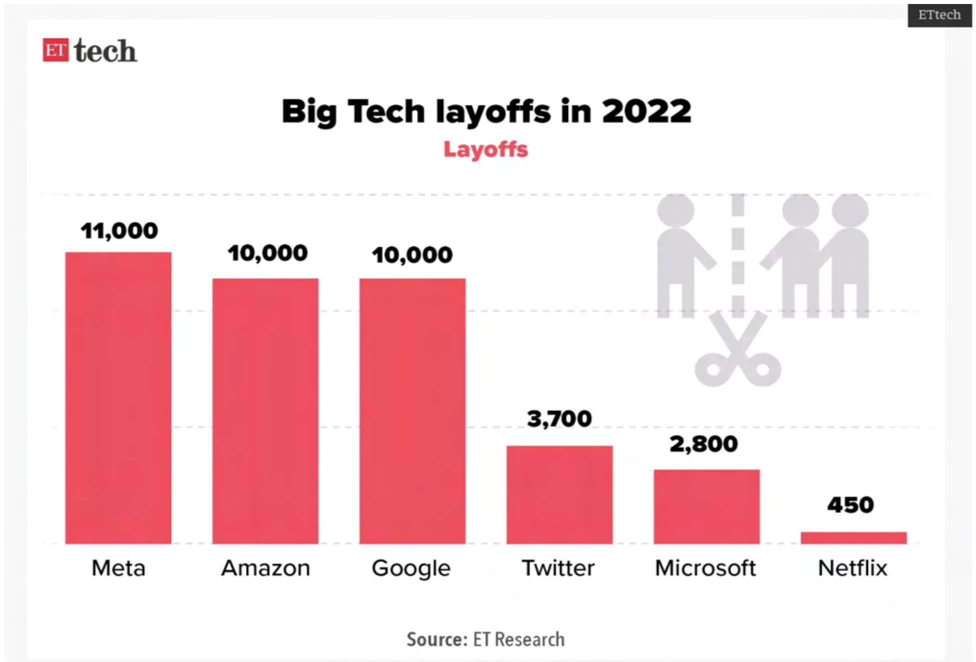
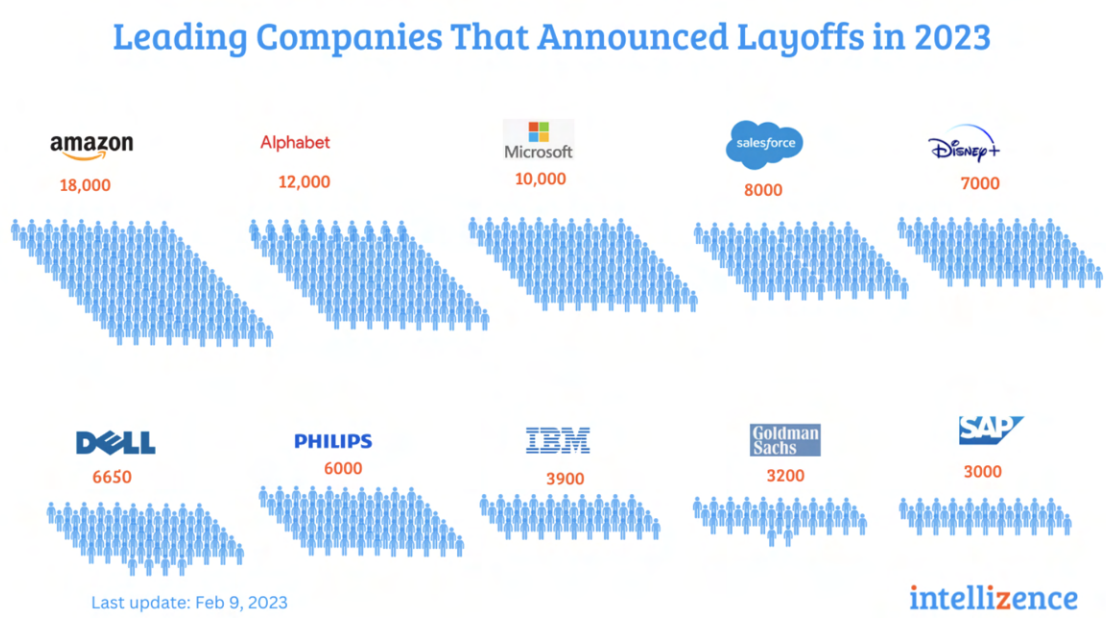


Source: [The Economic Times]

As can be seen below, the cuts have intensified, and the trend is increasingly affecting companies in different sectors:



Source: [Intellizence]

These cuts will result in savings that will better align expenses with the slowdown in revenues. In the short term, the impact will continue to be felt as the workforce reductions involve severance payments. Once the storm passes, we will see the benefits.

We are still very confident about our stocks. In the stock market, it can take a while for value to be reflected in the price. Our companies have strong balance sheets, and are busy working to minimize their expenses. They do it not because they are in trouble, but rather to optimize profitability. We are therefore in no way worried about the stock market declines of 2022 as well as the possibility of a recession.

Results of our companies

Netflix

Netflix had started the year badly, with a loss of 200,000 subscribers, followed by another loss of almost 1 million accounts in the 2nd quarter. When these results were released, the stock was severely punished, going from $348 to $166 in one month.

Before the stock's decline, Bill Ackman, the famous multi-billionaire investor and manager of New York-based Pershing Square, said he was taking the opportunity to invest in it. He has been very successful in his career, and many of his deals are highly publicized. In January of 2022, he acquired 3.1M shares, at around $375. While the stock had lost almost half of its value since its peak, he justified his purchase as follows:

"The opportunity to acquire Netflix at an attractive valuation emerged when investors reacted negatively to the recent quarter's subscriber growth and management's short-term guidance….We are pleased to add Netflix to our portfolio. Many of our best investments have emerged when other investors whose time horizons are short term, discard great companies at prices that look extraordinarily attractive when one has a long-term horizon."

"Now with both UMG (Universal Music Group) and Netflix, we are all-in on streaming as we love the business models, the industry contexts, and the management teams leading these remarkable organizations."

The firm had just made a huge profit on derivatives linked to rising interest rates. Mr. Ackman justified the sale of this position in these words: *"Had we not sold the hedge, we could have likely realized more gains based on the increase in rates, largely today, since our sale. That said, we believed the opportunity to invest in Netflix at current prices offered a more compelling risk/reward and likely greater, long-term profits for the funds."*

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Barely a few months later, we witnessed a 180-degree turn! Ackman sold the shares at around $225, and explained his move by saying:

"While we believe these business model changes are sensible, it is extremely difficult to predict their impact on the company's long-term subscriber growth, future revenues, operating margins, and capital intensity."

"Based on management's track record, we would not be surprised to see Netflix continue to be a highly successful company and an excellent investment from its current market value."

This turns out to be particularly interesting! It was mentioned that one would not be surprised if the stock is an excellent investment at the current price. However, at $225, the decision was to sell this "excellent" investment, whereas at $375 only three months earlier, it was a purchase. Mr. Ackman said he admired the management in January, and he seemed to be "teaching" investors a lesson by saying that those who sell suffer from short-termism, to the benefit of those with a long-term view.

The idea here is not to criticize a reputable investor or firm, but rather to understand that we can all make mistakes based on emotions. Certainly, we concede that the management of Netflix had announced a significant change in its business model. It planned to incorporate lower priced ad-supported plans, as well as clamping down on password sharing.

However, one can sense from statements in January that Mr. Ackman trusted management, found the stock price particularly attractive, and was investing for the long term. We suspect here that the stock's decline had probably sown the seeds of doubt. A 40% drop from $375 to $225. If the security returns to its initial price of $375, a gain of 67% will be generated ($150 profit on $225). Logically, an investor should be much more excited with an additional potential gain of 67%, even if management changes their business plan. Unfortunately, when these opportunities arise, the dips can create so many emotions that it suddenly becomes much harder to see the long term and feel any sense of optimism.

Following the sale of Netflix shares, Mr. Ackman had the opportunity to buy them again some time later, with a further potential gain of more than 100% (the stock bottomed out at $162). If the price of $375 was "extraordinary", imagine $162. Fortunately, we seized the opportunity at the time, acquiring shares between $189 and $201. We preferred to be patient with management who said that subscription growth would be positive for the year, despite a forecast of 2.2M expected subscriber losses over 6 months.

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(in millions except per share data)	Q4'21	Q1'22	Q2'22	Q3'22	Q4'22	*Q1'23 Forecast*
Revenue	$ 7,709	$ 7,868	$ 7,970	$ 7,926	$ 7,852	$ 8,172
Y/Y % Growth	16.0%	9.8%	8.6%	5.9%	1.9%	3.9%
Operating Income	$ 632	$ 1,972	$ 1,578	$ 1,533	$ 550	$ 1,625
Operating Margin	8.2%	25.1%	19.8%	19.3%	7.0%	19.9%
Net Income	$ 607	$ 1,597	$ 1,441	$ 1,398	$ 55	$ 1,275
Diluted EPS	$ 1.33	$ 3.53	$ 3.20	$ 3.10	$ 0.12	$ 2.82
Global Streaming Paid Memberships	221.84	221.64	220.67	223.09	230.75	
Y/Y % Growth	8.9%	6.7%	5.5%	4.5%	4.0%	
Global Streaming Paid Net Additions	8.28	-0.20	-0.97	2.41	7.66	
Net cash provided by (used in) operating activities	$ (403)	$ 923	$ 103	$ 557	$ 444	
Free Cash Flow*	$ (569)	$ 802	$ 13	$ 472	$ 332	
Shares (FD)	455.8	453.0	450.2	450.3	451.6	

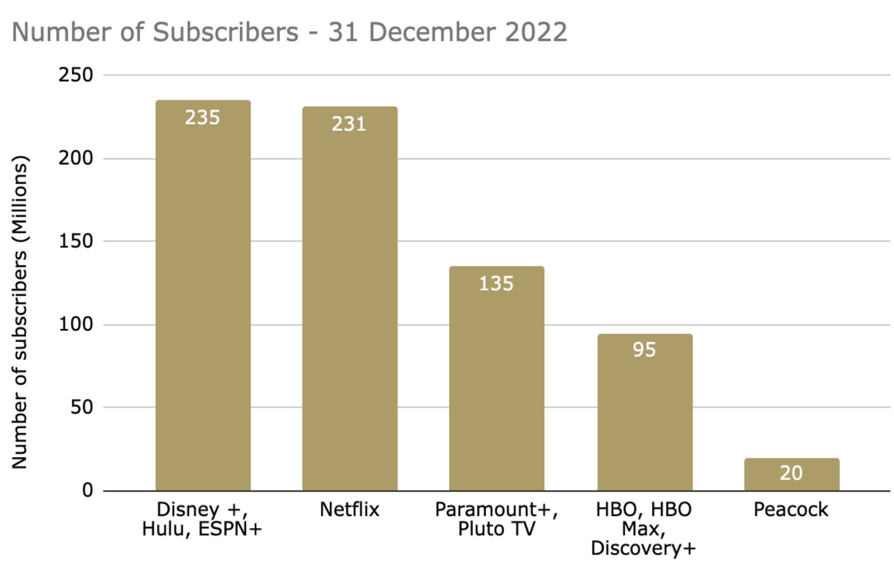
Note: Figures are consolidated, including DVD.

* Free cash flow represents Net Cash provided by (used in) operating activities less purchases of property and equipment and change in other assets.

Source: earnings release from Netflix

As can be seen above, subscriber growth came through as expected. The last quarter was particularly positive, with 7.66M new accounts against the original estimate of 4.5M.

However, the return to positive subscriber growth is not the only good news at Netflix. A quick look at the competitors allows us to better appreciate the situation:



Disney is by far Netflix's biggest competitor. When we survey its 3 services, Hulu, ESPN+ and the new Disney+ service launched in November 2019, subscriptions total 235 million, a figure slightly higher than that of Netflix. On the other hand, while Netflix generates profits, the situation is different at Disney:

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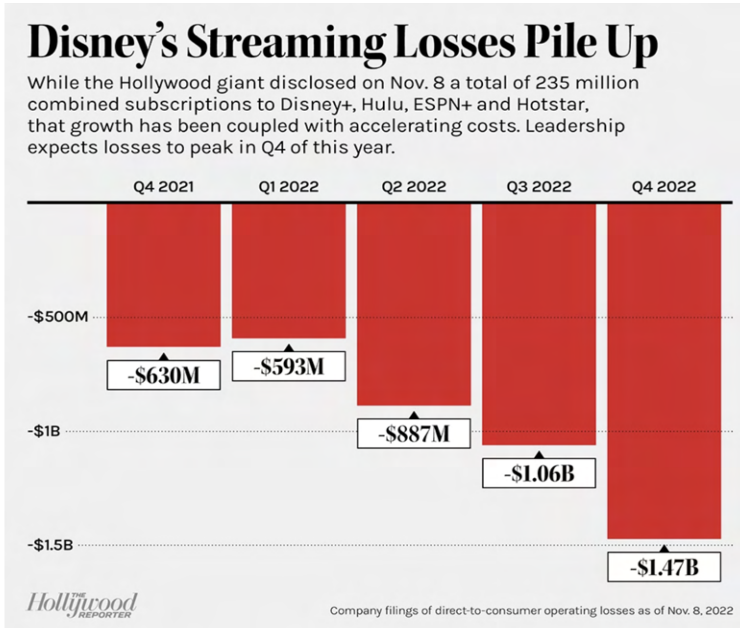
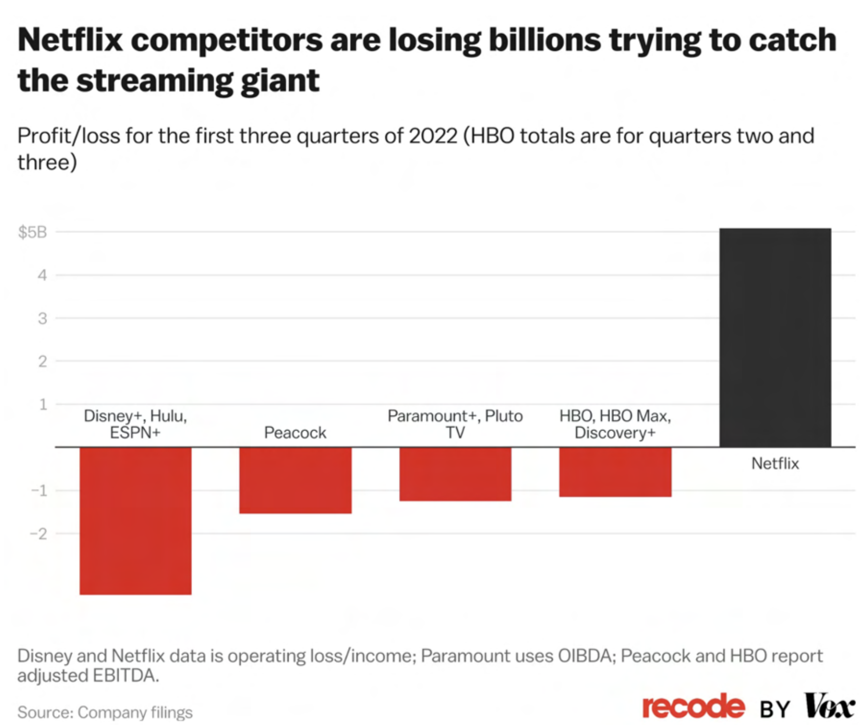


Source: [The Hollywood Reporter]

Over one year, losses totalled more than $4 billion. Netflix, with 4M fewer accounts, generated a net profit of $4.5B for 2022. Same story with competitors, as can see below for the first 9 months of 2022:



Source: [Vox]

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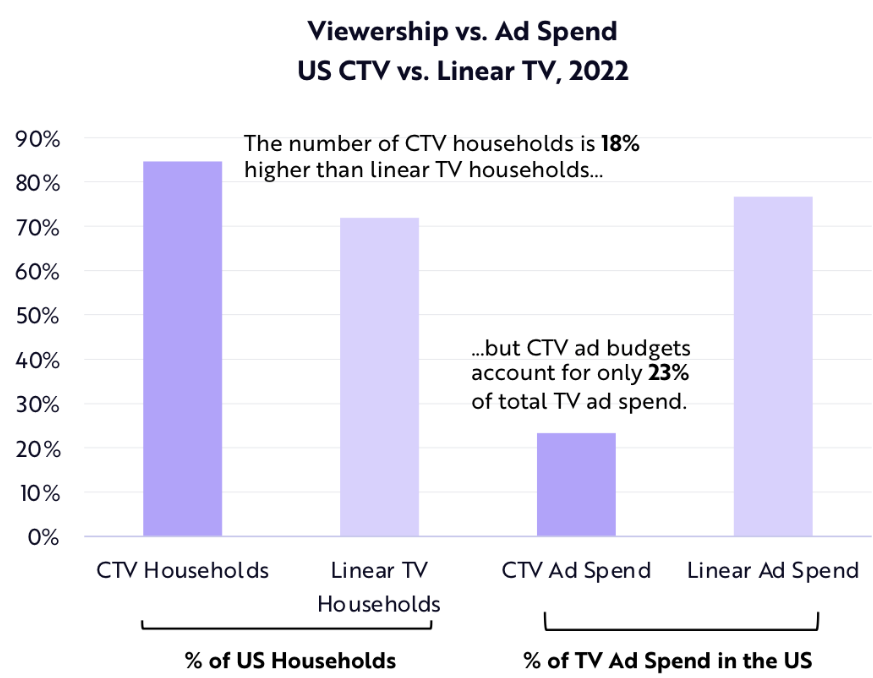
Losses are higher than expected for some competitors. For example, NBCUniversal once announced that cumulative losses would not exceed $2B over 2 years. At the end of 2021, we were approaching $2.4B, followed by another $2.4B for 2022 alone. For 2023, a loss of $3 billion is forecast. In short, while Netflix is generating profits, competitors are accumulating higher and higher losses.

On the advertising side, a market in which Netflix has decided to dive into in 2022, the outlook for the industry is favourable. For example, while the number of households with connected televisions exceeds linear televisions (traditional, usually with cable), advertising budgets are still mainly allocated to the latter, as can be seen in the graph below:



Source: Big Ideas 2023 Ark Invest

Reed Hasting had long spoken out against advertising at Netflix. The change in the business model announced at the beginning of 2022 therefore came as a surprise. We believe, however, that there were differences of opinion on the matter at the company, and that in the face of slowing subscription growth, Mr. Hasting finally relented. He admitted last November that he pays too much attention to big competitors such as Alphabet and Meta, but that hasn't stopped subscription service Hulu from offering ad-supported plans on a massive scale. The good news is that this avenue can grow for a long time, and will somewhat compensate for the possibility of more modest growth on the subscription side.

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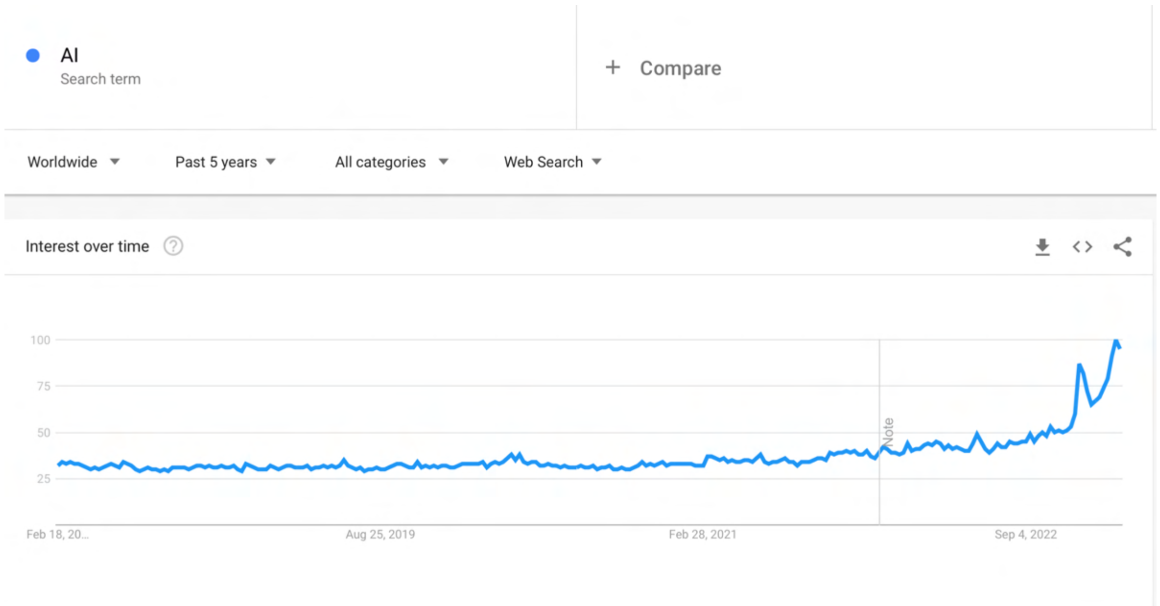
Microsoft

The talk of the town for several months has been artificial intelligence and its many possibilities for development and applications. Since ChatGPT became available to the general public, Google searches for the term "AI" have exploded:



Source: [Google Trends]

In November 2022, ChatGPT was released and quickly garnered one million users in just 5 days. Two months later, this figure reached 100 million, demonstrating its meteoric popularity in a very short time.

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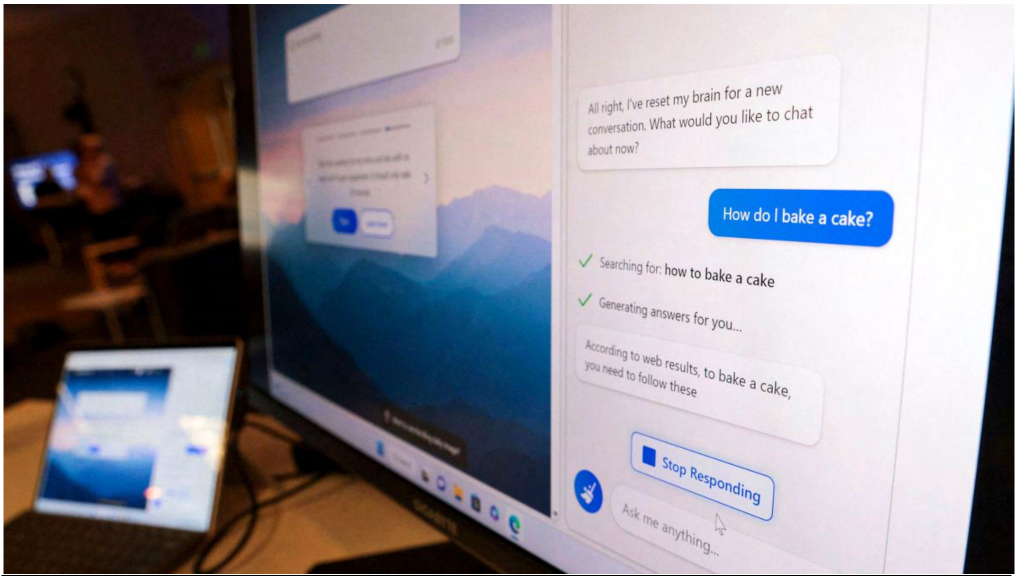
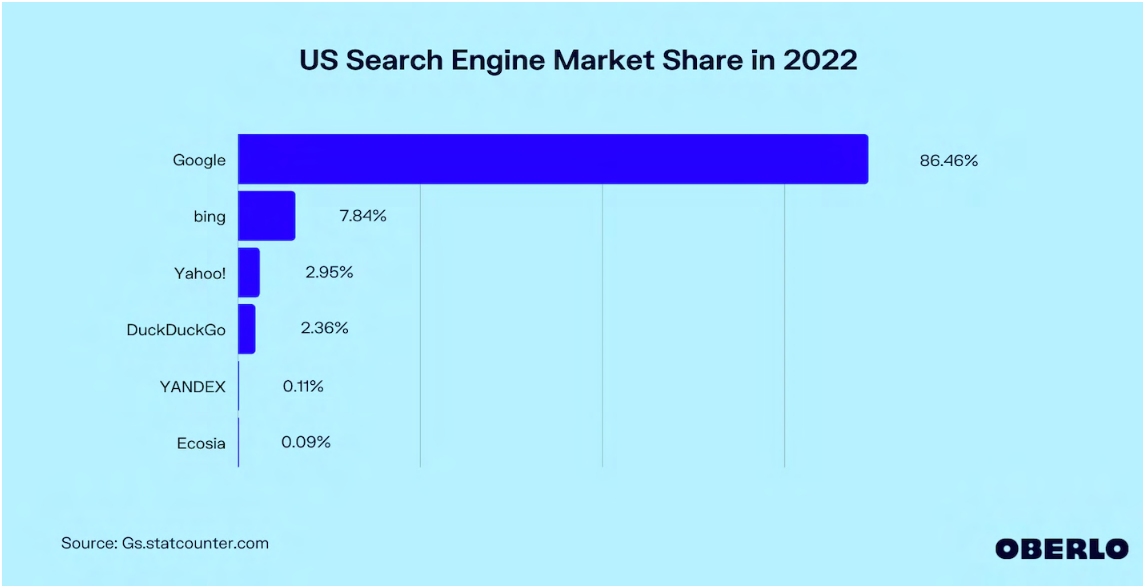


Source: CNN

ChatGPT was created by OpenAI, a company originally founded in 2015 by several well-known personalities, including Elon Musk. Starting out as a non-profit, the company has since changed. Mr. Musk left the board in 2018 and the company now grants its investors access to profits, contrary to its initial structure.

Microsoft made its first investment in OpenAI in 2019, amounting to US$1 billion. In exchange, the artificial intelligence company agrees to license exclusively to Microsoft. This provided a gateway for the tech giant to compete with Deepmind, the company created in 2010 and purchased by Alphabet in 2014.

This year, Microsoft announced that it was going to cut 10,000 jobs, while planning to invest $10 billion in OpenAI, demonstrating the importance that management places on artificial intelligence in its future plans. CEO Satya Nadella thinks their search engine, Bing, will benefit from this technology, and thus move from its present modest position in the market.



Source: Oberlo

Globally (excluding China), Google's dominance stands out even more, with its 92% market share, against Bing's 3%. There is therefore great potential, where the company has everything to gain compared to Alphabet, which must protect its large lead. Also, the integration with Azure can only help it get closer to the number one in cloud computing, Amazon, which has a 34% market share. Microsoft sits at 21%, while Alphabet has just 11%.

Many challenges remain in the development of artificial intelligence. ChatGPT users have noticed many errors, and it seems that Alphabet's response, with its Bard tool, also experiences difficulties responding to certain questions. Also, so far, ChatGPT only accesses data up to 2021, because unlike Bard, the data is not pulled from the net. The replacement of the Google search engine is therefore not happening overnight. Satya

Nadella seems determined to make Bing a comparable search engine, but large investments will be required, without having success guaranteed.

In the fourth quarter, as can be seen in the table below, the results were strongly affected by currency impacts:

Three Months Ended December 31, 2022			
	Percentage Change Y/Y (GAAP)	Constant Currency Impact	Percentage Change Y/Y Constant Currency
Microsoft Cloud revenue	22%	7%	29%
Office Commercial products and cloud services	7%	7%	14%
Office 365 Commercial	11%	7%	18%
Office Consumer products and cloud services	(2)%	5%	3%
LinkedIn	10%	4%	14%
Dynamics products and cloud services	13%	7%	20%
Dynamics 365	21%	8%	29%
Server products and cloud services	20%	6%	26%
Azure and other cloud services	31%	7%	38%
Windows OEM	(39)%	0%	(39)%
Windows Commercial products and cloud services	(3)%	6%	3%
Xbox content and services	(12)%	4%	(8)%
Search and news advertising excluding traffic acquisition cost	10%	5%	15%
Devices	(39)%	5%	(34)%

Source: Microsoft website

Like our other companies, we are seeing some slowdown, in addition to the currency headwinds. Revenues grew by 2% (7% in constant currency), while at the same time last year, growth was 20%. This deceleration contributed to a 12% drop in profits, and was certainly a factor in the decision to cut 10,000 jobs in the first quarter of the year.

As for Azure, the number 2 in cloud, as well as the main growth vector for Microsoft in our opinion, its growth of 38% looks good against the 20% of AWS (Amazon Web Services).

<u>Amazon</u>

Source: Tikr

Amazon's stock fell 38% over the past year, despite operating profits of US$12 billion generated in 2022. 2020 had been a good year, with a 57.5% increase in profits, followed by a much more modest increase in 2021 of 8.6%. Like several other companies benefitting from the increased adoption of internet-based services, Amazon was hit in 2022 by the pendulum swinging the other way.

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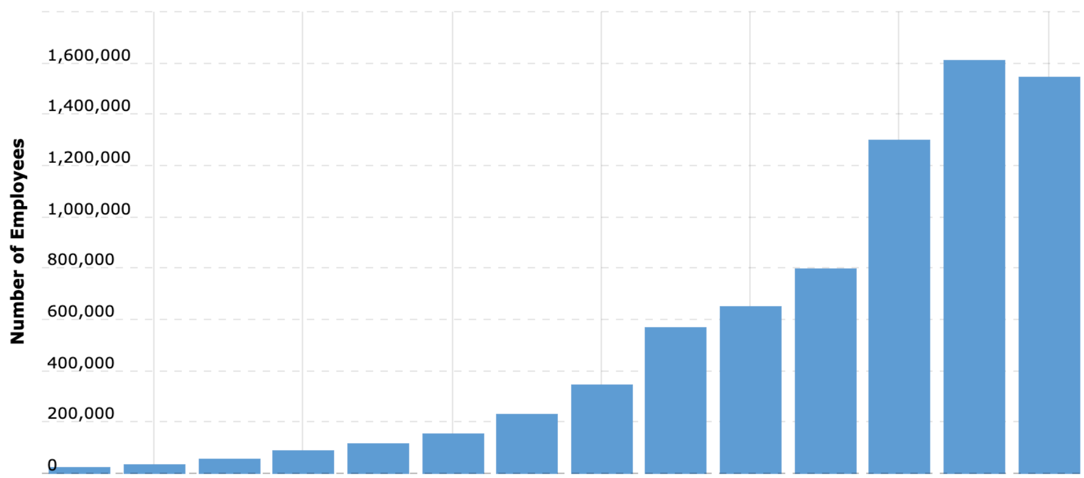
The company admitted to over-hiring in 2020 and 2021, in an attempt to meet suddenly increased demand, as well as to temporarily replace workers who fell ill. The demand surge from the pandemic collapsed as people left their homes, and businesses reopened. “As the variant subsided in the second half of the quarter and employees returned from leave, we quickly transitioned from being understaffed to being overstaffed, resulting in lower productivity,” said Brian Olsavsky, the company’s chief financial officer.

Number of employees from 2009 to 2022



Source: Macrotrends.net

In the 4th quarter, overall sales grew by 9% (12% in constant currency). To get an idea of the magnitude of the currency movement, just look at Amazon's international segment: reported revenues plunged 8%, but actually rose 5% when the currency effect is factored in! The good news with currencies is that the trend ends up reversing sooner or later, to varying degrees. Sometimes they help results, other times they hurt them.

We have often said that companies with international operations bring us geographic diversification. The other side of the coin lies in the volatility of the results, with which we are comfortable. When this volatility is combined with a slowdown in sales, we can expect a strong stock market reaction, like the one we have seen recently.

At AWS (Amazon's cloud segment), sales soared 20%. As we can see below, this division allowed the company to be profitable in 2022, and aided an otherwise difficult year:

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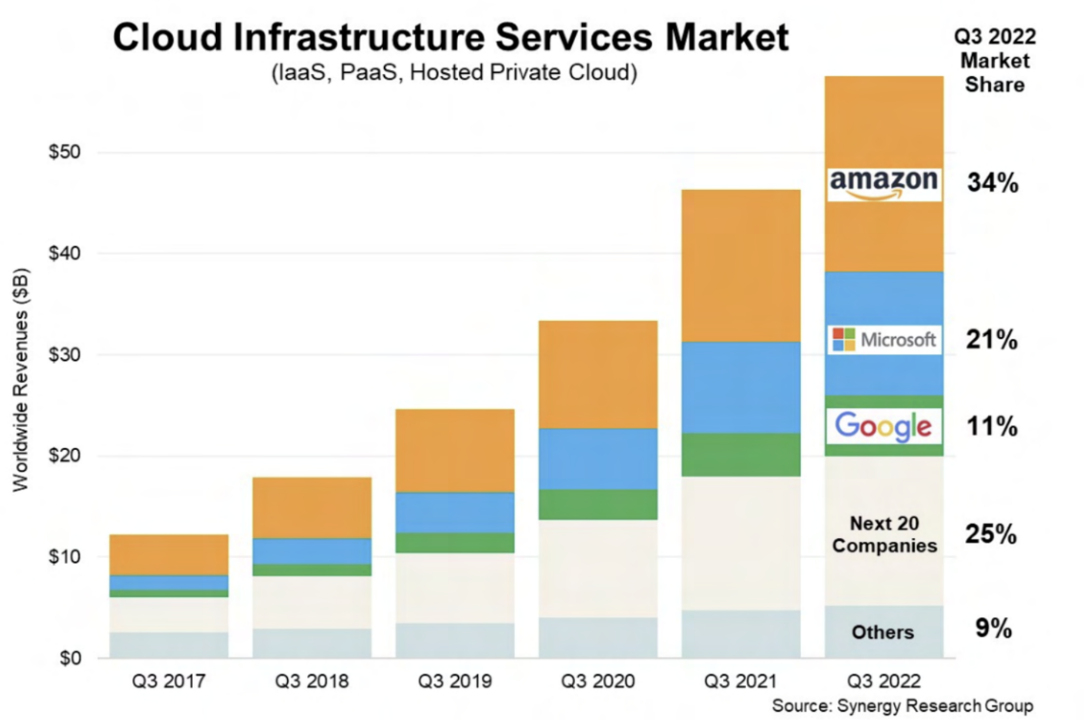
AMAZON.COM, INC.
Segment Information
(in millions)
(unaudited)

	Three Months Ended December 31,		Twelve Months Ended December 31,	
	2021	2022	2021	2022
North America				
Net sales	$ 82,360	$ 93,363	$ 279,833	$ 315,880
Operating expenses	82,566	93,603	272,562	318,727
Operating income (loss)	$ (206)	$ (240)	$ 7,271	$ (2,847)
International				
Net sales	$ 37,272	$ 34,463	$ 127,787	$ 118,007
Operating expenses	38,899	36,691	128,711	125,753
Operating loss	$ (1,627)	$ (2,228)	$ (924)	$ (7,746)
AWS				
Net sales	$ 17,780	$ 21,378	$ 62,202	$ 80,096
Operating expenses	12,487	16,173	43,670	57,255
Operating income	$ 5,293	$ 5,205	$ 18,532	$ 22,841

Source: earnings release from Amazon

AWS still dominates in an industry that is still growing strongly:



Source: PR News Wire

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Its other promising segment, advertising, is now posting annualized revenues of around US$40 billion, or 4 times the revenues of Snapchat and Twitter combined. In the 4th quarter, growth was 23% (in constant currency). Unlike Alphabet, which has to pay third parties for some of its advertising inventory, Amazon only uses its own inventory and can therefore generate high margins.

We believe that by combining the value of AWS and the advertising division, we get at least the current stock market value, meaning shareholders get everything else for $0.

Spotify

During the second half of the year, Spotify hit a low of $69, an approximate drop of 80% from its peak of $364 at the start of 2021. However, the number of users on the platform each month is approaching half a billion, a year-over-year increase of 20%. The Swedish company continues to benefit from the effect of currencies, seeing its revenues increase by 18% year-on-year (13% in constant currency).

USER & FINANCIAL SUMMARY	Q4 2021	Q3 2022	Q4 2022	Y/Y	Q/Q
USERS (M)					
Total Monthly Active Users ("MAUs")	406	456	489	20%	7%
Premium Subscribers	180	195	205	14%	5%
Ad-Supported MAUs	236	273	295	25%	8%
FINANCIALS (€M)					
Premium	2,295	2,651	2,717	18%	2%
Ad-Supported	394	385	449	14%	17%
Total Revenue	**2,689**	**3,036**	**3,166**	**18%**	**4%**
Gross Profit	712	750	801	13%	7%
Gross Margin	**26.5%**	**24.7%**	**25.3%**	**--**	**--**
Operating (Loss)/Income	**(7)**	**(228)**	**(231)**	**--**	**--**
Operating Margin	(0.3%)	(7.5%)	(7.3%)	--	--
Net Cash Flows From Operating Activities	119	40	(70)	--	--
Free Cash Flow[1]	**103**	**35**	**(73)**	**--**	**--**

Source: Earnings release from Spotify

Although subscribers to the premium service represent less than half of all users, they brought in 87% of the company's revenue for 2022, compared to 88% and 91% for 2021 and 2020 respectively. This source as a percentage of revenue is diminishing slightly to make way for advertising revenue. However, 2022 has been a more difficult year for the

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ad segment, with an annual growth of 14% (4%, constant currency) compared to 40% (38%, constant currency) in 2021.

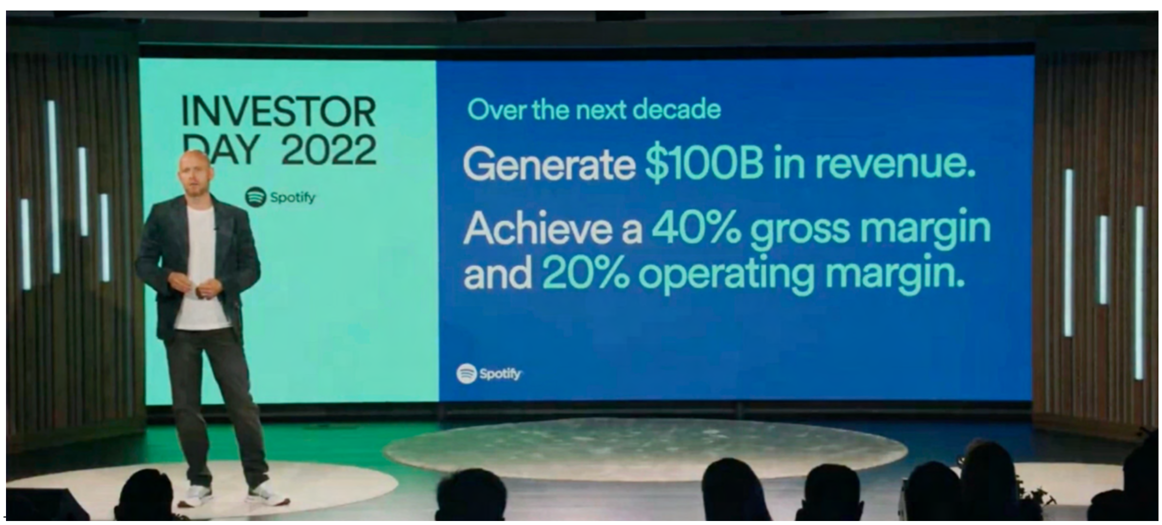
There could be a number of reasons for this slowdown, but the most notable would be efforts to acquire podcast shows to drive users to the platform rather than improve ad revenue. During the last quarterly earnings conference call, founder Daniel Ek confessed:

"And in hindsight, I probably got a little carried away and overinvested relative to the uncertainty we saw shaping up in the market. So, we are shifting to focus on tightening our spend and becoming more efficient."

We appreciate when management is able to admit mistakes and act on them quickly. Their new goals for this year should lead to improved podcast monetization and higher ad revenue.

However, we remain hesitant in the face of Daniel Ek's optimism. During the investor day, the entrepreneur shared the following:

"So from everything I see, I believe that over the next decade, we will be a company that can generate $100 billion in revenue annually, and that we can achieve a 40% gross margin and a 20% operating margin."



Source: Investor day 2022

For 2022, revenues amounted to 12 billion euros and a negative operating margin of -5.5%, results still far from the objective. However, with the announcement of improved efficiency for 2023, Spotify could increase its margins and reach the following targets for each segment, again shared at the 2022 Investor Day:

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Future Growth Drivers

Gross Margin Profiles by Vertical: Medium to Long-term

	2021	3-5 years	Long-term
Music	28%	30%	35%
Podcasting	-57%	30-35%	40-50%
Other	NM*	30-60%	40-80%

Source: Investor day 2022

We see here that music will not be the most profitable segment, due to the hold of record companies. Rather, it will be podcasts and other segments, such as audiobooks, that will earn the most. It is therefore in the company's interests to invest in these new content categories and make them profitable. Separately, in early February, activist firm ValueAct, headed by Mason Morfit, took a stake in Spotify following significant losses in 2022. This will ensure that the company improves its profitability. Spotify also announced a 6% layoff of its employees in January.

Note that for paid subscriptions, the company has a 31% market share, thus maintaining its dominant position against competitors. Its closest rival, Apple Music, is just 14% of the market.

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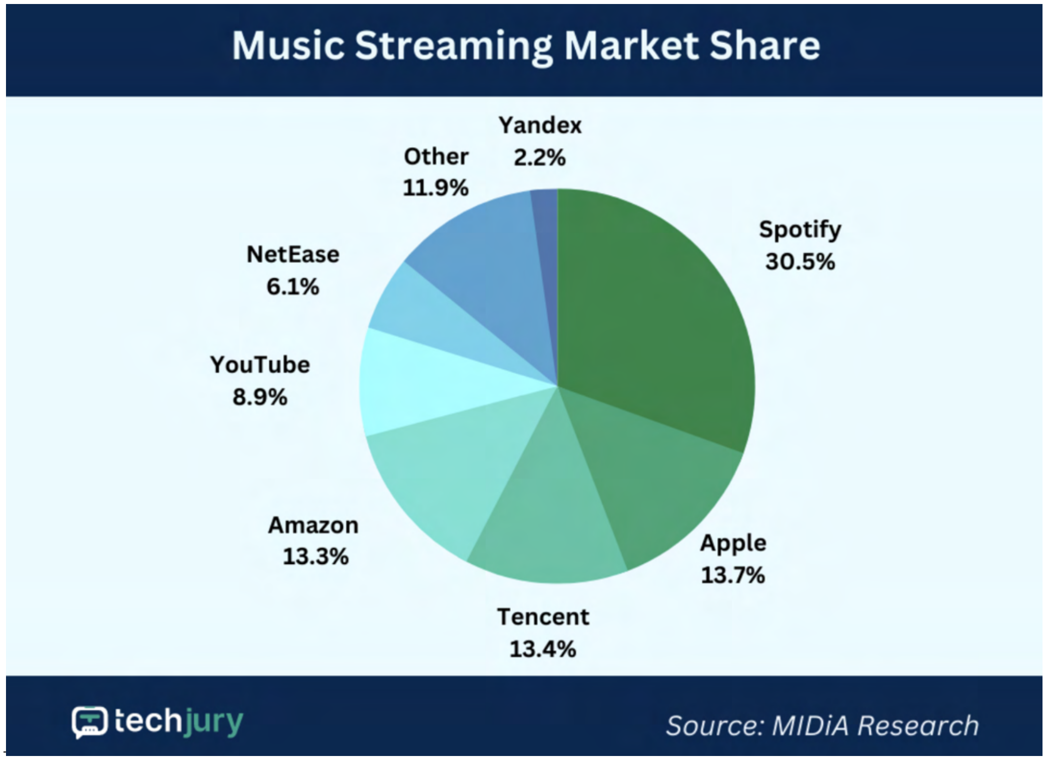
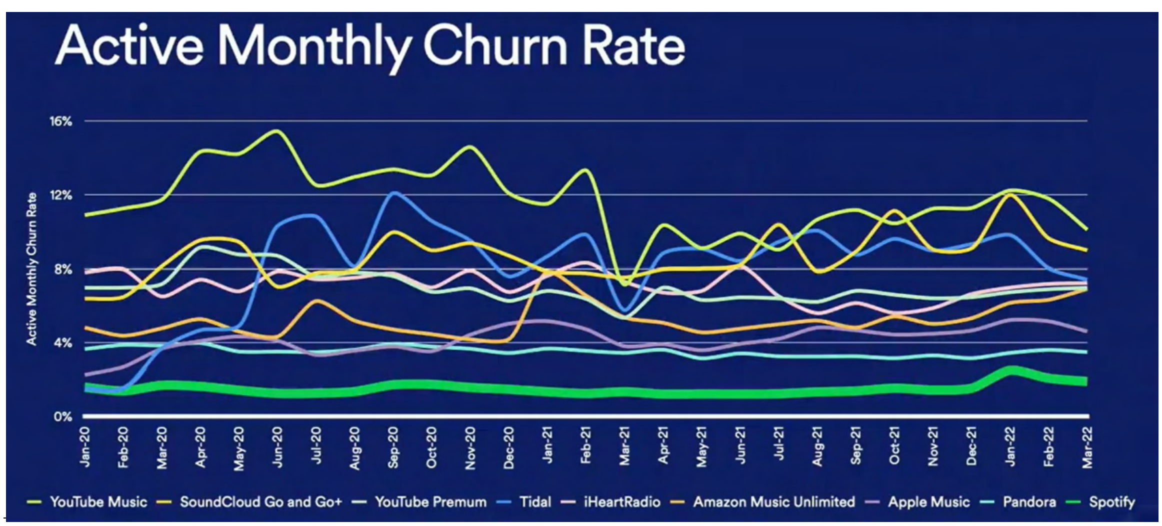


Source: [Techjury]

For companies that offer a subscription service, it is important to study the churn rate. It is simply the percentage of customers who unsubscribe from the service over a given period. Obviously, we are looking for a low churn rate. Now, as indicated by the green line at the bottom of the following graph, Spotify is the music service with the lowest monthly churn rate:



Source: Investor day 2022

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This gives us a good indication of the satisfaction of the users of the platform. On the other hand, we see a slight increase in the unsubscribe rate in January 2022, caused by controversial remarks made about Covid-19 vaccinations on the podcast *The Joe Rogan Experience*, the most listened to program on the platform. In response to the misinformation, several artists like Neil Young and Gilles Vigneault had asked to remove their songs from Spotify, creating several dissatisfied users.

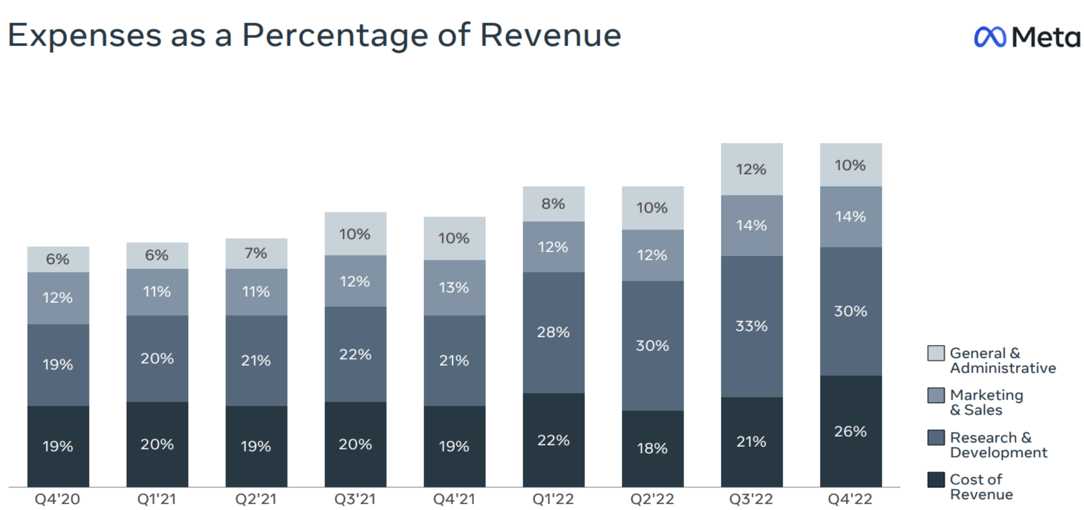
Alphabet and Meta

Words related to efficiency are also spreading at Meta, the parent company of Facebook. It is with delight that investors learned, at the release of the results for the 4th quarter of 2022, that the company was going to better control its expenses:

"...our management theme for 2023 is the 'Year of Efficiency' and we're focused on becoming a stronger and more nimble organization"

These were the latest comments by Meta founder Mark Zuckerberg during the most recent quarterly earnings conference call. The stock jumped more than 23% after the earnings announcement. Since bottoming out in November 2022 at $88 per share, the stock is up 92% at the time of this writing.

The years 2021 and 2022 were marked by massive investments in the development of the metaverse. Research and development spending increased from 19% of revenue in the 4th quarter of 2020 to 30% of revenue for the last quarter of 2022.



Source: Meta earnings release

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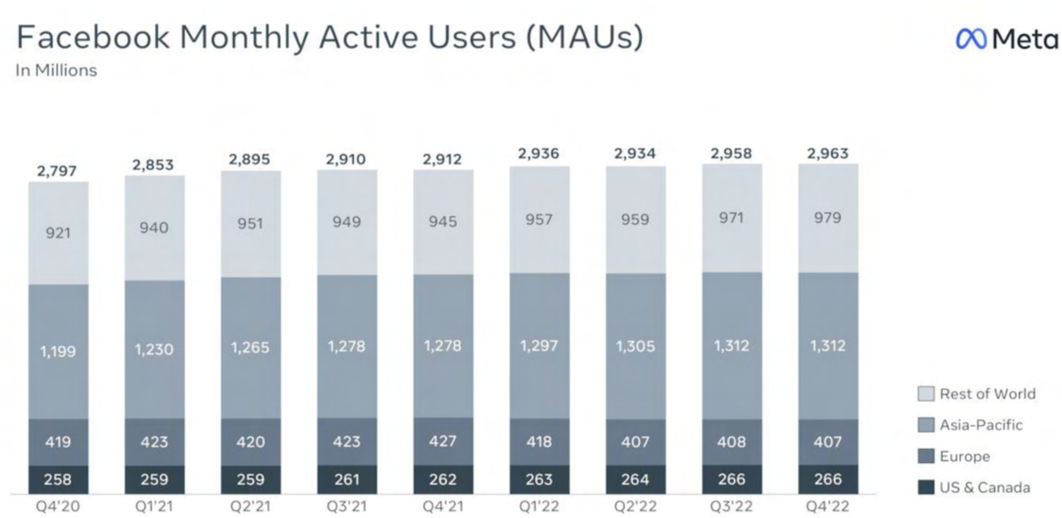
However, with the economic uncertainties, this announcement of austerity reassured several investors.



Source: Meta earnings release

Meta's cash cow, the Facebook platform, is slowly approaching 3 billion monthly users, an increase of 2% compared to a year ago. A slowdown in online advertising continues to be felt, causing a drop in annual revenues, which went from US$117.9 billion for 2021 to US$116.6 for 2022. Currencies, however, had a downward impact on revenues, since in constant currencies, the change should have been a 4% increase.

The same discourse can be found at Alphabet. Last September, CEO Sundar Pichai announced that he wanted to make the company 20% more efficient. At that time, the company had approximately 187,000 employees and as of December 31, 2022, it had 190,234. Recently, the company announced that it would reduce its workforce by 6%.

However, the situation is critical in the face of the threat of Microsoft's AI efforts. Alphabet will have to invest heavily to develop its own artificial intelligence system, Bard. During the official announcement in early February, Bard gave the wrong information following a question about the James Webb Space Telescope. The stock quickly fell by 8%, revealing the dissatisfaction of investors.

On the other hand, it is necessary to take into account the novelty of this system. Recently, Google VP of Research Prabhakar Raghavan said this in an email to employees to correct Bard's errors:

"Bard learns best by example, so taking the time to rewrite a response thoughtfully will go a long way to helping us improve the model."

Indeed, Bard is built with many algorithms that allow it to learn and improve its responses. Given its newness, Bard still has a lot to learn, just like in the early days of Google Search. Over time and with the improvement of algorithms, Google has become the most used search engine thanks to the relevance of its results. Despite the current artificial intelligence frenzy, this is a long-term project. We will continue to monitor this situation closely.

Airbnb

Airbnb ended 2022 with impressive results. Total revenue was US$8.4B, an increase of 40% over last year (46% in constant currency). For the first time since its IPO, the company generated positive net income for the year, amounting to US$1.9B compared to losses of -US$352M and -US$4.6B for 2021 and 2020 respectively.

Key Financial Measures	Q4 2022	FY 2022
Revenue Revenue of $1.9 billion increased 24% from Q4 2021 demonstrating continued strong travel demand.	**$1.9B** 24% Y/Y 31% Y/Y (ex-FX) 72% Y/3Y	**$8.4B** 40% Y/Y 46% Y/Y (ex-FX) 75% Y/3Y
Net Income Our first full GAAP profitable year (23% net margin) included our most profitable Q4 ever (17% net margin)—both periods delivering double digit year-over-year margin expansion.	**$319M** $385M (ex-FX) $55M Q4 2021 $(352)M Q4 2019	**$1.9B** $2.2B (ex-FX) $(352)M FY 2021 $(674)M FY 2019

Source: earnings release from Airbnb

During the last quarterly earnings conference call, Airbnb Chief Financial Officer Dave Stephenson said the following:

"I have to add a couple of things. One is our head count is actually still 5% below where it was in 2019, and the revenue is 75%. So we're nearly twice as big as we were previously with fewer people."

This quote gives us a positive indication of the company's efficiency and cost management, despite the considerable 31% increase in the number of nights and experiences booked in 2022. Indeed, the operating margin of Airbnb for 2022 amounted to 21.5% compared to 7.2% for 2021.

As for gross booking value (the total amount charged to customers), this increased by 35% (42% in constant currencies) for the year.

FY 2022

393.7M	$63.2B
Nights & Experiences Booked	**Gross Booking Value**
31% Y/Y	35% Y/Y
20% Y/3Y	42% Y/Y (ex-FX)
	67% Y/3Y

Source: earnings release from Airbnb

Finally, the company bought back US$1.5 billion of its outstanding shares for 2022.

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Conclusion

We hope you enjoyed this financial update. Please be assured that we are carefully monitoring the portfolio and actively seeking additional securities that will add value to the Barrage Fund.

It is with great pleasure that we celebrate the 10th anniversary of the Barrage Fund this year.

We thank you for your trust over the past decade and look forward to having you as clients for many more years to come.

Cordially,

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