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Blizzard in the Big Data World - What is the future of the
Biggest Software IPO?

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Abstract

Cloud Data Warehousing has emerged in the recent past, and its enormous potential of profitability woke up the entire market. Within this excitement, Snowflake's IPO soars in September of 2020, and so attracted us to do a deep analysis of the company and explore its future.

The consolidated report of this Equity Research comprises the following topics: Snowflake until Today; Cloud Data Warehousing Competitive Landscape; Opportunities and Challenges; Valuation Model; and Recommendation. In this report, the focus will be on the valuation of the company, and it covers the Opportunities and Challenges, the Valuation Model, and the Final Recommendation.

Keywords: Valuations, Data Cloud, Technology, Data Warehouse

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This report is part of the Snowflake report (annexed) and should be read as an integral part of it.

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Opportunities and Challenges

Macroeconomic Landscape

The 2000s have been, so far, a rocky period. Economically speaking, the world has dealt with the **dot com boom**, the **financial crisis**, **sovereign debt crisis**, and the **COVID-19 pandemic** all in a period of 20 years. Thus, investors are more woke than ever to the dangers that macroeconomic shifts can pose to our firm's valuations. In this section, we identified some macroeconomic risks that might affect our valuation model²³ both on the Free Cash Flow projections and on the Discount Rates we used to return a present Enterprise Value.

GDP comeback after the pandemic. Although the pandemic counted as an **opportunity** for Snowflake to benefit from the **strong digital shift** in which firms were forced to undertake during these last 2 years, its effects on the economy also **threaten its operations**. Existing customers might face financial restrictions forcing them to **reduce the platform's usage**. On one hand, if the GDP recovery isn't fast enough, it will harm the revenue growth coming from existing customers, that is, **lower net revenue retention rates**. On the other hand, it will also **reduce the rate of new clients** since data migrations are

Figure 19 Market Cap Performance with U.S. GDP

From 1993-2020	Market Cap Correlation With US GDP
SAP	91,75%
Microsoft	67,48%
Adobe	74,79%
Oracle	83,54%
IBM	16,71%
US GDP	100,00%
Average Correlation	66,86%

Source: Bloomberg

²² DeAngelo, Harry, and Linda DeAngelo. "Capital structure, payout policy, and financial flexibility." Marshall school of business working paper no. FBE (2007): 02-06.

²³ Macro scenarios are incorporated in the scenario analysis chapter.

The rate of the US GDP Comeback after the pandemic as well as the resilience of the inflationary period drive some of the uncertainty about the firm's future

expensive²⁴. Therefore, it will accumulate the firm's losses far into the future which would affect the business' liquidity, and thus, endangering its viability. After performing an analysis with long-term public U.S. software firms, we found that in most cases, with no surprise, a **firm's Equity Value correlates strongly with the US GDP evolution**.

Rising inflation. After the COVID-19 pandemic, most economies diploid **stimulus packages or similar benefits** to help population getting through the economic downturn. More, many businesses had **impactful demand breaks** which lead to **big price reductions**. With the reopening of economies, businesses, especially the ones that had major losses in their operations, **pushed their prices up**, which led to a long-time unseen **CPI rate of 6.8%**. Although we believe that this phenomenon is a short-term correction to the effects of the pandemic, we are also aware of the fact that **strong economic stimulus** injected available money to families and, if they can withstand the rise in prices, it is reasonable to believe that they can **push this inflation** further into the future. If rising inflation holds, it will certainly drive to **increases in WACC** through **rising in the risk-free rate** and it will possibly drive **Snowflake's prices to rise**. Thus, it might affect the demand for the product which directs towards a reduction in Snowflake's value. Again, we performed a **correlation analysis of market capitalization evolution with CPI's evolution** on this sample of software firms and it showed a trend that **growth in CPI negatively affects the value prospectus of these firms**.

Figure 20 Market Cap Performance with CPI

From 1993-2020	Market Cap Correlation With CPI
SAP	-27,03%
Microsoft	-20,68%
Adobe	-18,30%
Oracle	-37,48%
IBM	-4,98%
Consumer Price Index	100,00%
Average Correlation	-21,70%

Source: Bloomberg

Analyzing software firm's performance vs inflation, we see that inflation tends to damage equity value.

Snowflake competes with its supplier's solutions, but its existence also allows big cash inflows for the supplier's products.

Their relationship is supported by the belief that both sides can win from this dynamic.

Frenemy relationship with cloud providers

Snowflake only operates in the public cloud. Public cloud providers such as **Amazon Web Services, Microsoft Intelligent Cloud**, and **Google Cloud** are the suppliers of the most important "Raw Material" for Snowflake's platform. At the same time, these third parties also host in their platforms their cloud data warehouse solutions, constituting then Snowflake's major competitors, **Amazon Redshift, Google BigQuery, and Azure Synapse**.

In fact, Snowflake has the inherent risk of **pricing pressure** in the future caused by its suppliers. The providers might see the potential in **gaining market share** in the cloud data warehousing market and adopt the strategy of squeezing Snowflake by **increasing cloud infrastructure prices** and/or **reducing its own querying and storage prices**. Frank Sloatman, Snowflake's CEO, stated that this relationship with cloud providers has moments of tension and it must be

²⁴ See again Lemongrass' study on the upfront costs of migrating data

managed carefully due to the fact that there are clear motivations for providers to desire greater market share, but they also win hefty amounts from **Snowflake's cloud contracts** and transference of large amounts of **on-premises workloads** to their own ecosystem. In our valuation, we incorporated the **risk-return relationship of these affiliations in each scenario** by affecting the **rate of decrease in the growth of total customers** given the competitive positioning of cloud providers and affecting the **margins** of Snowflake given the success or not of attaining good cloud supply prices.

Valuation Model

Discounted Cash Flow Valuation

- From the Past to the Future

In this research paper, we adopted the **Discounted Cash Flow**, the so-called DCF method, to value **Snowflake's Enterprise Value**.

Firstly, we appeal to this method since it looks into the **intrinsic value** of the company and allows to make **detailed assumptions** based on our firm-specific and industry-specific knowledge. Furthermore, the fact that we can perform **different scenario analyses** by using the DCF model is extremely valuable since as our company is still in its early stage, its prospects are thus far easy to foretell.

As Snowflake just became public in September of 2020, and its cash flows aren't close to being stable, we expect a larger number of years of forecasting for our company to reach its steady-state. As so, we defined the first 18 years as the **expansion phase** (from 2022-2040), following a more **mature phase with a slowing growth** (from 2041-2051), where we stopped detailing the financial statement's structure and used a growing annuity that was driven by assumptions about long-term growth rate and return on new invested capital, and then reaching the **steady state** (from 2041-2050) in which we applied the growing perpetuity formula. All projected cash flows were discounted back to the present at a **weighted average cost of capital**²⁵ according to their respective scenarios. The **long-term growth rate (g)** was estimated to be **2,46%**, and this value was based on the average of the **last 5 years of nominal GDP growth** of the United States. We excluded the year 2020 since it was an exceptional year due to the

²⁵ For more detailed information, please refer to the section of WACC Calculation.

pandemic, and we adopted the **nominal growth** instead of the real in order to align with our cash flows projections which were also in nominal terms.

As mentioned before, our company's value is extremely dependent on the future conditions of the economy and on the management of Snowflake. To tackle this problem, we conducted three scenario analyses (pessimistic, base case, and optimistic²⁶). We then weighted averaged the values according to their likelihood of occurring, resulting in our **final target price of \$323.51**, yielding a total return of **-12.63%**. According to our standards, we recommend to **SELL** the SNOW stock.

▪ WACC Calculation

To compute the Weighted Average Cost of Capital (WACC) for Snowflake, we **fixed the Market Debt-to-Equity ratio** for valuation purposes since the company presents no evidence of making significant changes in its capital structure during the forecasted period. The **market capitalization** of the company equaled **\$113.71Bn**, and the **Net Debt** equaled to **-\$4.55Bn**, originating a **Net Debt-to-Equity** ratio of **-4%**.

• Cost of Equity:

To compute the cost of equity, we used the Capital Asset Pricing Model (CAPM), and it is built upon three main factors: **the risk-free rate**, **the market risk premium**, and a **firm-specific risk adjustment**.

For the **risk-free asset**, we selected the **U.S. Government 10Y Treasury Bond (USGG10YR)** since it is a highly liquid and long-term asset. On 10th Dec 2021, it amounted to **1.485%**, despite being rising in this last year, it still depicts the low-interest-rate environment of the U.S. economy.

Moreover, we calculated the **raw beta** (Figure 21) of Snowflake through a regression analysis against the **S&P500** from 22nd Dec 2017, or whenever is the most recent data. We opt for **weekly returns** so that we can avoid the noisiness of daily data and have considerable sample data since Snowflake has just gone public in the recent past. If we look solely at Snowflake's **raw beta**, it resulted in **1.21** with a confidence interval of **[0.35; 2.07]**. With such a large confidence interval, we decided that the best strategy was to compute the **median adjusted beta of the selected comparable companies**, including Snowflake, resulting in

Figure 31 Raw Beta and its Confidence Interval

Company	Raw Beta	Confidence Interval 95%	
		Lower	Upper
SNOW	1,21	0,35	2,07
NOW	0,95	0,76	1,14
TDC	0,99	0,68	1,30
CLDR	0,85	0,47	1,24
DDOG	0,64	0,20	1,08
MDB	1,00	0,62	1,38
Median	0,94		

Source: Bloomberg; Analysts Estimates

²⁶ For more detailed information, please refer to the section of scenario analysis

Figure 22 Adjusted Betas and Unlevered Adjusted Betas

Company	Adjusted Beta	Unlevered Adjusted Beta
SNOW	1,14	1,19
NOW	0,97	0,97
TDC	0,99	0,88
CLDR	0,90	0,87
DDOG	0,76	0,77
MDB	1,00	1,01
Median	0,98	0,93

Source: Bloomberg; Analysts Estimates

a figure of **0.89**. The Adjusted Beta ($Adjusted\ \beta = \frac{2}{3} * Raw\ \beta + \frac{1}{3} * 1$) approach is based on evidence that, in the long run, firms tend to have betas of 1. After getting the adjusted beta for each company, we unlevered the adjusted betas to eliminate capital structure's effects and levered back the median of it using our company's D/E structure. Furthermore, since the risk of default of this type of company is nearly inexistent, we also assume that the beta of debt is equal to 0.

Considering the fact that there is not a single and widely accepted model to calculate the **Market Risk Premium**, we chose two proxies for accuracy purposes:

○ Implied Market Risk Premium

We chose **SPX Index** as the well-diversified market portfolio since Snowflake is based in the **U.S.** and its main activities are also delivered to this country. For the market return, we used the next formula:

$$Nominal\ Market\ Return = \left(\frac{P}{E}\right)^{-1} \times \left(1 - \frac{real\ g + inflation}{ROE}\right) + (real\ g + inflation)$$

Figure 24 Calculation of Implied Market Risk Premium

S&P 500 median P/E	25,97
US Real GDP 2019	19,092
US Real GDP 1932	0,828
Real Growth Rate	2205,80%
US GDP Real Growth Rate (CAGR)	3,67%
Inflation Rate	2,80%
Historical S&P 500 ROE	13,04%
Nominal Return on Equity	8,41%
Real Market Return	5,89%
10y TIPS Rate	-1,01%
10Y US T-Bond	1,49%
Expected Inflation	2,52%
Nominal Expected Market Risk Premium	6,93%
Real Expected Market Risk Premium	4,41%

Source: Bloomberg; OECD; The Balance; Analysts Estimates

From our calculations, the **Market Return** equaled **8.41%**. The **real growth rate** was assumed to be the same for the future as the CAGR of Real US GDP from 1932-2019 and the inflation adjustment, followed McKinsey's suggestion of averaging the previous 5 year's inflation rate as a proxy of each year's expected inflation²⁷.

Finally, to arrive at the **nominal Implied Market Risk Premium**, we used:

$$Implied\ MRP = Market\ Return - Risk\ Free\ Rate$$

We end up with an **expected market risk premium** of **6.93%**. We used **nominal risk premium** to maintain consistency with our nominal cash flow projection.

○ Historical Market Risk Premium

If we assume that, over the last century, the **level of risk aversion of investors had remained unchanged**, we consider the **historical excess returns** as a good metric to project future premiums. In this scenario, we assumed the 5%²⁸

²⁷ <https://www.mckinsey.com/~/media/mckinsey/business%20functions/strategy%20and%20corporate%20finance/our%20insights/the%20real%20cost%20of%20equity/the%20real%20cost%20of%20equity.pdf?shouldIndex=false>

²⁸ E. Dimson, P. Marsh, M. Staunton, and J. Wilmot, Credit Suisse Global Investment Returns Yearbook 2009 (London: Credit Suisse Research Institute, February 2009).

which is derived from the premium vs. the treasury bills of 1-year from the period studied (from 1900 – 2008), following the studies of Dimson, Marsh, and Staunton & Blume.

- Cost of Debt:

Figure 25 Scenarios of Cost of Debt

Minimum Possible Cost of Debt		
Rd = 10Y US T-Bond		1,49%
3% Cost of Debt		
Rd		3%
Maximum Possible Cost of Debt		
	Implied MRP	Historical MRP
Rd = Re	7,06%	5,68%

Source: Bloomberg; Analysts Estimates

Due to the fact that Snowflake **neither issued a bond instrument nor have a credit rating attributed** and since its low Net Debt to Equity capital structure implies that the cost of debt won't affect much our final WACC estimation, we considered **3 scenarios** for computing the cost of debt (Figure 24).

Firstly, we computed the **minimum possible cost of debt**, which happens when it is **equal to the risk-free asset**, meaning that the credit spread of the company is equal to 0%. For a **medium** scenario, we set the **cost of debt equal to 3%**. And finally, **the maximum possible cost of debt** happens when **the cost of debt coincides with the cost of equity**. When using **the implied MRP**, the cost of debt equals **7.06%**. If taking **Historical MRP** into consideration, the cost of debt will then amount to **5.68%**.

After having all the necessary inputs, we end up with a WACC ranging from [5.91%; 7.91%]. We assumed the **median figures** of **6.93%**, **6.92%**, and **6.93%** for the base case, optimistic and pessimistic scenarios, respectively. These minor changes in WACC between scenarios are due to **different marginal tax rates** assumed per scenario (the current 21% on the optimistic scenario, 28% proposed by Joe Biden for the pessimistic scenario, and 26.5% proposed by the house of democrats for the base case²⁹).

Figure 26 Range of WACC in different scenarios

Statistical Range	WACC		
	Optimistic WACC	Base Case WACC	Pessimistic WACC
High	7,91%	7,91%	7,91%
3rd Quartile	7,82%	7,83%	7,83%
Median	6,92%	6,93%	6,93%
Average	6,94%	6,95%	6,95%
1st Quartile	6,09%	6,09%	6,10%
Low	5,98%	5,99%	6,00%

Source: Analysts Estimates

Revenue Breakdown and Cost Structure

As mentioned previously, Snowflake sells only one product which is its biggest source of revenues, **93% of Total Revenues**, and from those Product Sales, it rises additional **professional service revenues** that come from support to the

²⁹ <https://fortune.com/2021/09/13/democrats-slash-biden-corporate-tax-rate-appeal-pro-business-moderates/>

migration of data from legacy data warehouses to Snowflake's platform, accounting for **7% of total revenue**.

Therefore, it is pivotal to **breakdown** its product revenue drivers to make forecasting more explicit in the next stage. Its Product Revenue model is characterized by the following equations:

- At a higher level by sizing the market

$$\text{Product Revenue} = \text{Cloud Data Warehousing Market} * \text{Market Share}$$

Following the studies of **IndustryARC**³⁰, the Cloud Data Warehousing market is expected to reach **\$39,1bn in 2026**, after growing at a **CAGR of 31,4%** during 2021-2026. However, we expect this exponential growth to remain until 2029, and from this time onwards, a slowdown of the growth can be foreseen.

- At a firm level

$$\begin{aligned} \text{Product Revenue} &= \% \text{ of Small} * \text{Average Spending Small} \\ &+ \% \text{ of Medium} * \text{Average Spending (M)} \\ &+ \% \text{ of Large} * \text{Average Spending (L)} \end{aligned}$$

We divided the customers into 3 different types: Small, Medium, and Large. The characteristics of S, M, and L-type of customers are based on **phData** estimates³¹, as shown in *Figure 26*.

Figure 27 Characteristics of Snowflake's customers

Customers	Revenue Size	Analytics Users	ELT Pipelines	TB of Data	Typical Spending (in \$)
Small	<\$10M	10 to 20	10 to 20	<5	<75k
Medium	\$10M to \$1000M	30 to 50	30 to 50	<50	<300k
Large	>\$1000M	100+	100 to 1000	>100	>300k

Source: *phData*

Regarding the cost structure, it is mainly derived from two sources: **the COGS and Operating Expenses**, which included the **Sales & Marketing, R&D, and General, and Administration expenses**.

COGS are highly **dependent to the Revenues** of the company, both Product Revenue and Profession Services and Other Revenues. For this type of costs, we strongly believe that it will **decrease its weight in percentage** related to the revenues in the **expansion phase**. However, as noticed, Snowflake's relation

³⁰ <https://www.industryarc.com/Report/19226/cloud-data-warehouse-market.html>

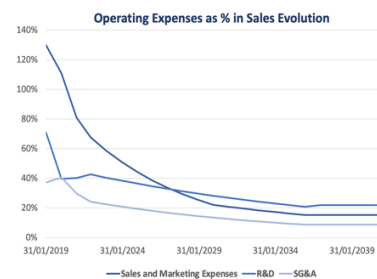
³¹ <https://www.phdata.io/blog/what-is-the-snowflake-data-cloud/>

with its suppliers is not just cooperative, but also competitive. For this reason, we took into consideration the fact that the cloud providers might try to **raise their market share** at the expense of Snowflake's cost of running in their platform. AWS is, by far, the Snowflake's biggest vendor and its current agreement is expected to terminate in 2025 thus **future COGS will depend immensely on the renegotiation of the terms of contracts**. Therefore, we assumed to **increase slightly** the COGS as a percentage of revenues **from 2026 onwards**.

When it comes to the **Operating Expenses**, we identified that the biggest source of costs is caused by **employee wages**. Thus, we decompose the costs into:

$$\begin{aligned}
 \text{Operating Expenses} &= \text{Headcount}_{S\&M} * \text{Average Cost per Headcount}_{S\&M} \\
 &+ \text{Headcount}_{R\&D} * \text{Average Cost per Headcount}_{R\&D} \\
 &+ \text{Headcount}_{SG\&A} * \text{Average Cost per Headcount}_{SG\&A}
 \end{aligned}$$

Figure 27 Base Case Operating Expenses as % in Sales Evolution (2019 - 2040)



Source: Annual Reports; Analysts Estimates

We estimate a more **aggressive drop on the weights** of each Expense as a percentage of revenues, on all scenarios, especially the weight to Sales & Marketing, as shown in *Figure 27*. Along the expansion of the company, we predict a more stable weight in the future, reaching about **15% for Sales & Marketing, 22% for R&D, and 9% for SG&A**. The first two expenses are typically **heavy on Tech Industry**, and Snowflake is not the exception.

In relation to the evolvement of the **Headcount**, we used as a proxy the **Employment Growth Rate in Computer and Information Technology Occupations (U.S.)**. According to **U.S. Bureau of Labor Statistics**, employment in computer and IT occupations is projected to grow **13 percent** from 2020 to 2030, which is a CAGR of **1.23%**³². After 2030, we assume that the growth will **decelerate by 30%** per year.

Scenario Analysis

After careful analysis, we decided to not only forecast the base case for Snowflake since it still needs to grow for many years to reach its steady state. At the same time, the growth of the firm could be **highly volatile** as its limited historical figures could be **not indicative about prospects**. For the aforementioned reasons, we decided to use **probability-weighted scenarios**.

Our approach for the forecasting process was **top-down** by looking firstly at a **higher-level market data** and narrowing down to our company's projections. Then, we will deepen the analysis by **breaking down the revenue**, and **cost's**

³² <https://www.bls.gov/ooh/computer-and-information-technology/home.htm>

Figure 28 Clientele Structure

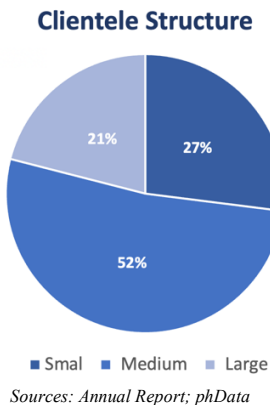


Figure 29 Average Spending per Customer from 2021 to 2040

per Customer (in 000's \$)	2021	2040
Small	25	115
Medium	98	700
Large	362	6329

Sources: phData; Analysts Estimates

structure. Finally, we study the **differences** and **impact** that each case scenario will bring to the overall valuation.

For all scenarios, we **kept the market size** of our industry the same. We consider this industry more certain to expand, and our market share more volatile as the demand of our products could **depend on company's long-term sustainability** in an **increased competitive environment**. Also, we conserved the percentage split of our clientele (Small, Medium, and Large) as shown in *Figure 28* since we consider that this structure will **prevail or won't suffer significant changes**, having the **medium customers** accounting for more than half of the total customers. Nonetheless, we expect a growing average spending per customer in every type during the projected period as shown in *Figure 29*.

Moreover, the evolution of Headcount on Operating Expenses was also identical, since we believe that this number won't be that affected depending on different conjecture.

Regarding the core invested capital, we set each caption's drivers to follow the path that would lead the firm's Capital Turnover ratio, at the steady state, to be 200%, a value that is in between the industry's average and median of 223% and 191% respectively.

Scenario 1: Base Case

Share Price: \$338.55

We consider **Base Case** the scenario with highest probability of happening, amounting to **70%**. In this scenario, we expect the company to **grow at a moderate rate**, expecting to attain a **market share of 22% by 2040**. In an industry expected with increased competition and characterized by rivals from very large corporations such as Amazon, Microsoft and Google, Snowflake's market share is expected to be noticeable, but we **don't expect it to reach values superior to one quarter of the whole market**.

At a firm-level, we have good prospects of Snowflake's capability of **attracting more new customers**, especially with this **digital transformation trend** on all companies around the globe. However, precisely due to its newness, the base will be relatively small causing a much more **aggressive growth** in the early stage of the company. We expect Snowflake's **total customers to increase**, but we expect the rate of that increase to **decelerate 10%** for future periods until 2040, and with a **higher decreasing rate on the first year of forecast 2022** in

Figure 30 Market Share Evolution of each Scenario

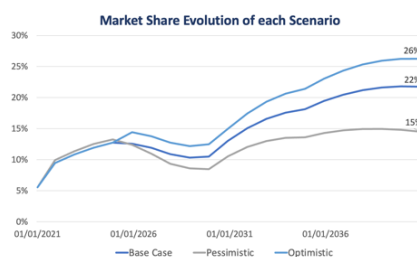


Figure 31 Product Revenue COGS as % Total Product Revenue

	2021	2025	2040
Pessimistic	32%	24%	40%
Base	32%	24%	36%
Optimistic	32%	24%	34%

Sources: Annual Report; Analysts Estimates

which we divided by 2 the previous total customers growth (from 2020 to 2021) to incorporate last couple of year's **declaration of 50%** in the customer growth rate. There are just **two exceptions** emerging in 2026 and 2027 in which we will have a **decreasing rate of 15%**. The reason we assume this higher deceleration of the growth rate will occur is the fact that **third party cloud suppliers will try to increase their market share** in the cloud data warehousing market thus **snowflake's COGS will increase** and, in order to maintain margins, the **increase in the firm's prices** will affect the demand for Snowflake's product. On this scenario, we **don't expect major security problems** that might hinder Snowflake's capacity to collect more customers, to occur³³. Also, we expect the current **revenue per customer to increase steeply in the first 5 years** of the forecasted period, leveraging on the **recovery of GDP** after the pandemic, **short term inflationary period** and our vision for the **increase in data storage** and the **number of queries** ran by clients due to **data migration trend**³⁴.

All in all, in this scenario we expect Snowflake to reach **positive NOPLAT in 12/2029** and **positive Free Cash Flow in 12/2030**. Regarding the evolution of the **Return on Invested Capital**, we forecast it to reach **28% by 12/2039** and this results primarily due to the **improvement of the Sales & Marketing expenses** (we assumed that, as the firm gets bigger and more recognizable it doesn't need to invest as much in Sales & Marketing to generate sales), and these numbers aren't higher because the **firm's invested capital turnover decreases** since the firm will need to invest more to generate returns.

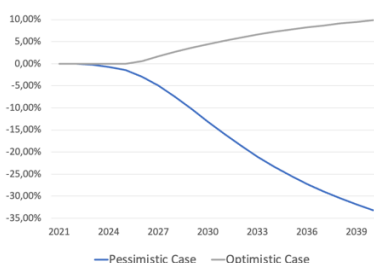
In this case, the **corporate tax rate** was set to be equal to **26.5%** following the proposal from the house of democrats that falls a little bit below Biden's original proposal of 28% in order to secure the support from pro-business Democrats.

Scenario 2: Pessimistic (Increased Competition)

Share Price: \$159.19

On a more pessimistic perspective, we assumed that Snowflake **cannot strengthen its product** and competitors such as Amazon Redshift or Microsoft Azure can provide **more complete ecosystems** to the clients. Therefore, we estimate a **more conservative growth** of Snowflake's market share, attaining only **15%** of the total industry at the end of our forecasted period. Still, the path of the **expansion of number of Total Customers will be similar** to the base case. We assume that the Big Public Cloud providers retaliate to **gain market share** and **potential Cloud Security breaches** could happen causing a **reduce the**

Figure 32 % Change in Total Customers of each scenario relative to Base Case



Sources: Analysts Estimates

³³ As stated in the competitive landscape section, cloud is considered more secure than legacy solutions

³⁴ Previously we stated our beliefs for the trend of data migration from legacy to cloud on the competitive landscape section

Figure 33 Growth of Total Customers in each Scenario

	2021	2026	2030	2040
Pessimistic	34%	-20%	-15%	-12%
Base	34%	-15%	-10%	-10%
Optimistic	34%	-12%	-10%	-10%

Sources: Analysts Estimates

pricing power and customer growth. In the 10-year period from 2030-2040, the customer growth **stabilizes at a faster rate than the base case** and **average billings slowly grow reaching the base case ones** by 2040 (*Figure 33*).

At the same time, we assume **higher dependence on the third-parties' providers** and our firm cannot present other solutions rather than partnering with them. So, the weight of Product Revenue COGS in total Product Revenues will move up until almost **40%** at the end of 2040, significantly **squeezing our Gross Profit Margins**.

In this scenario, the corporate tax rate was set to be equal to **28%**, following President Biden's proposal.

Scenario 3: Optimistic Case (Product Strength)

Share Price: \$546.87

This is a more **positive** case when comparing to the previously mentioned scenarios in the sense that Snowflake can keep managing its **strong competitive advantage** regardless of the threatens posed by competitors. We believe in a **more accentuate growth of retention of market share** from 2026 onwards in this scenario, achieving **26%** of the total Cloud Data Warehousing industry (as shown in *FIGURE 30*).

When observing the *Figure 33*, there is **no major differences** regarding the evolution of Total Customers against the base case in the short-term period (until 2025). After 2025, we assume a **successful renegotiation of cloud contracts** that allows Snowflake to **increase its customer base** without having to reduce prices when compared with the base case until 2030. Subsequently, we expect a path with **little security issues** on Snowflake and cloud provider's side that implies a **slower rate of customer growth**. Due to success on suppliers' agreements, we also assume that there won't big changes on its profitability in which the Product Revenue COGS as a percentage of Total Product Revenues will **go back to starting year's similar levels**, about **32% to 34%** (shown in *Figure 31*).

In an optimal case, the U.S. President's suggestion of **corporate tax rate** will be rejected, and it will remain equal to the previous **21%**.

Sensitivity Analysis

At the end of our valuation process, we believe it is pivotal to perform a sensitivity analysis to observe and determine the **impacts that changes on inputs could affect on our result**. Since we don't foresee any substantial long-term competitive advantage we've set, at the **Terminal Stage**, the **WACC equal to RONIC**, thus our terminal growth won't affect the value of the company, because we are **neither creating value nor destroying**. For this reason, we opted to perform the sensitivity analysis on the WACC and the growth rate of the Core Result in the Annuity Period (from 2041 to 2051).

Furthermore, our target price is obtained through a **weighted-probability scenario**, we followed the same rationale for the sensitivity analysis. Firstly, we found the prices that each scenario (**Pessimistic, Base Case, and Optimistic**) could result in this set of indicators and weighted the individual prices according to their likelihood of happening (**20%, 70%, and 10%**).

By analyzing the *Figure 34*, one can conclude that our Share Price is **more sensitive to changes in WACC than in changes on our growth rate on the Annuity Period**, for identical percentage changes (+/-10%) on the variables. However, this outcome is awaited due to the fact that a slight change in WACC **affects our entire valuation model** from present to terminal, while a change in the Core Result Annuity Period Growth Rate only **impacts those 10 years**.

This method provides us a wide range of possible target prices, and we can conclude that it follows our recommendation of **SELLING** as **60%** of the 25 prices are **below \$371,24** (Snowflake's stock price as of 10th Dec 2021). What is more, if we take a closer look on the range of prices, a **median of \$340,45** further reinforces the research proposal.

Recommendation

Snowflake has been on the eye of many investors since its IPO. Since then, the stock has made a **cumulative return of 59.51%**. The **Cloud Data Warehousing** market is forecasted to grow, for the next decade, up to impressive figures of **31.9% of CAGR** and this is mainly driven by its **potential on solving limitations of traditional data warehouses (cost and physical space)** using little to none added risk.

Figure 34 Sensitivity Analysis of the Weighted-Probability Scenario

WEIGHTED-PROBABILITY SCENARIO						
Sensitivity Analysis		WACC				
		5,51%	6,12%	6,80%	7,48%	8,23%
Core Result Annuity Period Growth Rate	5,67%	529,01	427,07	340,45	275,67	224,62
	6,30%	526,51	425,36	339,32	274,92	224,20
	7,00%	524,78	424,22	338,60	274,48	223,98
	7,70%	550,39	442,92	351,98	284,12	230,60
	8,47%	577,69	462,82	366,20	294,35	237,60

Expected Return		WACC				
		5,51%	6,12%	6,80%	7,48%	8,23%
Core Result Annuity Period Growth Rate	5,67%	42,11%	14,65%	-8,68%	-26,14%	-39,89%
	6,30%	41,43%	14,19%	-8,99%	-26,34%	-40,00%
	7,00%	40,97%	13,88%	-9,18%	-26,46%	-40,06%
	7,70%	47,86%	18,92%	-5,58%	-23,86%	-38,27%
	8,47%	55,22%	24,28%	-1,75%	-21,10%	-36,39%

Recommendation		WACC				
		5,51%	6,12%	6,80%	7,48%	8,23%
Core Result Annuity Period Growth Rate	5,67%	BUY	BUY	SELL	SELL	SELL
	6,30%	BUY	BUY	SELL	SELL	SELL
	7,00%	BUY	BUY	SELL	SELL	SELL
	7,70%	BUY	BUY	SELL	SELL	SELL
	8,47%	BUY	BUY	SELL	SELL	SELL

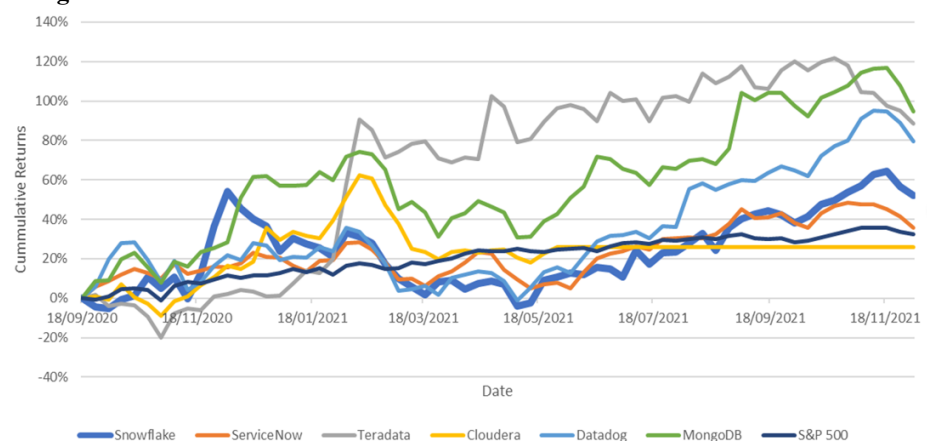
Source: Analysts Estimates

Leveraging on this organic market growth, Snowflake is **increasing its market share** in this market and positioning itself as one of the most prominent figures due to its capacity to **lock-in clients** (shown by its **high revenue retention rate of 173%**), **creating new opportunities to monetize and share data** and, lastly, due to the fact that its product offering is considered as the **second best product** in the entire cloud data warehousing market.

Despite all these positive traits, we believe that, for a one-year investment, Snowflake is **overvalued**. The main reasons that drive our beliefs are the high probability in experiencing a **downturn in the firm's profitability expectations** caused by a **misalignment of interests in the relationship with its cloud providers/ main competitors** in the cloud data warehousing market, and the **potential for replicas** in the macroeconomic landscape after the pandemic which might lead to **longer than usual inflationary period** and a **slower GDP growth**.

After considering different possible scenarios (pessimistic, base, and optimistic with probabilities 20%, 70%, 10%, respectively), we expect the Target Price of **\$323.51** per share, and if we invest in this precise moment in Snowflake and hold it until the end of 2022 would **yield a negative return of 12.63%** after capital losses and net transaction from shareholders into the firm. Hence our final recommendation for the Snowflake's Stock (SNOW US EQUITY) is to **SELL**.

Figure 2 Cumulative Returns: SNOW vs. Peers vs. SPX



Source: Bloomberg

SNOWFLAKE, INC.

"CLOUD DATA WAREHOUSING"

CARINE SHU,
RICARDO PIMENTA MACHADO

COMPANY REPORT

17 DECEMBER 2021

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44754@novasbe.pt

Blizzard in the Big Data world

Cloud changing the way we store and analyse data

- Snowflake stock, given our 2022 expected price of **\$323.51**, with an expected return of **-12.63%**, we recommend the investors to **SELL** the share.
- Snowflake is presented in an **increasing market share** on a fast-growing **Cloud Data Warehousing industry (31.9% CAGR until 2026)**.
- Snowflake is, among the software services companies, the firm that enhances current clients to **increase their spending** on the platform with a **revenue retention rate of 173%**.
- **Negative correlation** of Equity Values with inflationary periods alongside **possible slow GDP recovery** might affect the risk profile and revenue growth of the firm.

Company description

Snowflake Inc, founded in 2012, is a cloud computing-based data warehousing company, and it is present mainly in the United States. The company's platform provides access to the Data Cloud, allowing its customers to consolidate data into a single source of data lake in which they can derive meaningful business insights, build data-driven applications, and share data within its company.

Recommendation: **SELL**

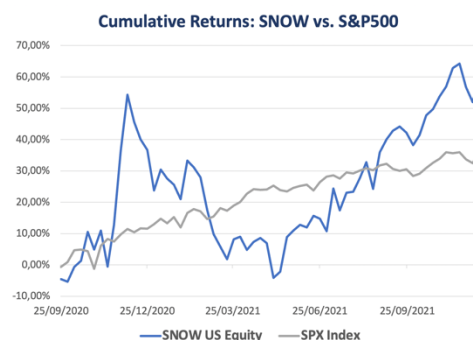
Price Target FY22: **\$323.51**

Price (as of 17-Dec-21) **\$371.24**

Bloomberg: SNOW US EQUITY

52-week range (\$)	184.71-405.00
Market Cap (€m)	113.71
Outstanding Shares (m)	306.3

Source: Bloomberg



Source: Bloomberg

(In \$ millions and %)	2020	2021E	2022F
Revenues	592	1327	1997
NOPLAT	-487	-997	-1207
FCF	-518	-1711	-1957
CORE ROIC	-224%	-432%	-254%

Source: Annual Report: Analysts Estimates

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Snowflake until today

Company Description

Snowflake is a **cloud-based Data Warehouse** provided as a service founded in 2012 by former Oracle data scientists, **Benoit Dageville** and **Thierry Cruanes**. The company hired, in 2019, former ServiceNow CEO and CFO, **Frank Sloatman** and **Mike Scarpelli**, intending to take the firm to the public equity market and, subsequently, raising a respectful amount of capital that would be crucial to catalyse the firm's transformation into one of the most important players in the Cloud Data Warehousing industry. It is worthwhile to mention that this new management team had a reputable experience in taking companies public and delivering great financial results with Frank Sloatman, for example, already been CEO of 2 companies that went public during his tenure (Data Domain and ServiceNow). According to Comparably¹, Snowflake's management team ranked in the second highest place compared to its peers, with a score of **79** out of 100. This ranking is derived from Snowflake's employee feedback to questions like "How would you rate your manager?" and "Does your manager seem to care about you as a person?". Eventually, during the second wave of the COVID-19 pandemic, on **September 16, 2020**, Snowflake went public with its IPO being the largest Software IPO to date, raising around **\$3.4Bn**², topping VMWare's IPO that rose nearly **\$1Bn**, and it's now a constituent of the New York Stock Exchange.

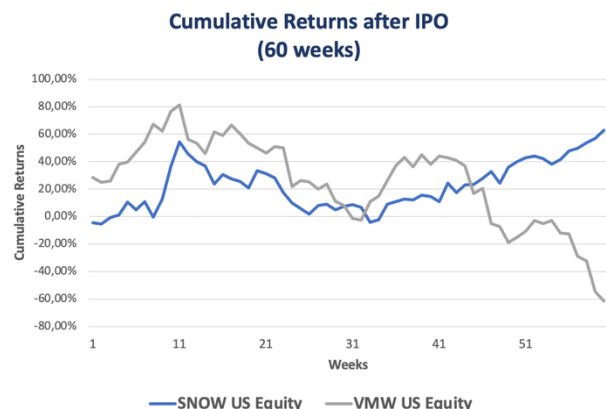
Management team with great reputation

Figure 1 Management Score from Snowflake and Peers

Peer Companies	Comparably Managers Score
Teradata	69/100
Cloudera	72/100
Datadog	79/100
MongoDB	81/100
ServiceNow	75/100
Snowflake	79/100

Source: Comparably

Figure 2 Cumulative Returns of 60 weeks after IPO: SNOW vs. VMW



Source: Bloomberg; Yahoo Finance

¹ <https://www.comparably.com/companies/snowflake-computing/manager>

² <https://edition.cnn.com/2020/09/16/investing/snowflake-ipo/index.html>

Snowflake Value Proposition: Solving problems of Legacy Data Warehouses

Figure 3 Creation Data of Cloud Data Warehousing Services

Cloud Data Warehouse Services	Creation Date
Google BigQuery	2011
Amazon Redshift	2012
Snowflake	2012
Microsoft 1st Gen SQL DW	2016
Teradata Vantage	2018
Oracle Autonomous DW	2018
Cloudera DW	2019

Source: Companies' websites

Cloud DW users can increase efficiency and save money when comparing with legacy solutions

Snowflake is a reputable solution for cloud DW that allows to tackle Legacy limitations

Snowflake was one of the first comers in the Cloud-Based Data Warehousing market. The firm's product was the first cloud solution that enabled **decoupling computing from storage**³. This separation allows users of the platform to benefit mainly from **usage** and cost **efficiency**, because the user has the possibility of halting the use of computing resources whenever there is not a necessity, thus not paying for that usage when there is the case. Snowflake's platform has evolved into a Data Cloud which aims to **eliminate the problem of legacy in-house solutions that eventually creates various Data Silos within companies' various departments**. That is, by having valuable data separated, company will be hurting the capability of different divisions to perform analysis with data stored in other division's silo. Common examples of the problems that rise from Data Silos are **inefficient decision making** due to incomplete datasets or inconsistent data, and **costly capacity management**⁴ due to duplicate data between different silos. This way, firms will be required to pay for more memory and computing costs when they scale up and run out of capacity⁵. Following the study "The Economic Advantages of Migrating Enterprise Data Warehouse Workloads to Google BigQuery", the Enterprise Strategy Group suggests that cloud Data Warehouse solutions such as Amazon Redshift and Google BigQuery can **reduce a firm's overall 3-year costs** by 41% and 52% when compared to on-premises solutions⁶. [Forrester Wave: Cloud Data Warehouse, Q4 2018](#) report also states that cloud-adopting "organizations find at least a 20% savings over on-premises data warehouses, while some have seen as high as 70% to 80% savings".

After all, storing data in a Cloud allows gathering all information in a unique location, solving the Data Silo's limitations. Snowflake's Data Cloud allows clients to **store, share, analyse and monetize data**. Its Cloud-Native Platform is capable of reading and storing data of different formats as well as performing intensive computations and grant access to a Data Marketplace where firms can share and sell data to other firms. [Forrester Wave: Cloud Data Warehouse, Q1 2021](#) reports Snowflake as the 5th better Cloud Data Warehouse solution in the market, and it fits in the 2nd better product offering, and the 7th offering with the best strategy, as shown in **Figure 4**.

³ <https://marker.medium.com/demystifying-snowflake-the-biggest-software-ipo-in-history-61e57c476289>

⁴ <https://searchdatamanagement.techtarget.com/definition/data-silo>

⁵ <https://www.stitchdata.com/resources/compare-on-premises-and-cloud-data-warehouse/>

⁶ <https://www.esg-global.com/hubfs/pdf/ESG-Economic-Validation-Migrating-to-Google-BigQuery-for-EDW.pdf>

Figure 4 Forrester Cloud Data Warehousing Ranking

Forrester Cloud DW Ranking	Alibaba	Redshift	Cloudera	Exasol	BigQuery	IBM	Micro Focus	Azure Synapse	Oracle	SAP	Snowflake	Teradata	Yellowbrick
Current Offering	3,74	4,46	3,96	3,22	4,22	2,94	3,44	3,74	3,52	2,68	4,26	3,98	2,60
Strategy	2,30	3,58	3,08	2,28	4,20	3,00	3,00	4,18	3,60	3,58	3,10	3,52	2,48
Total Score	3,02	4,02	3,52	2,75	4,21	2,97	3,22	3,96	3,56	3,13	3,68	3,75	2,54
Ranking	10	2	7	12	1	11	8	3	6	9	5	4	13

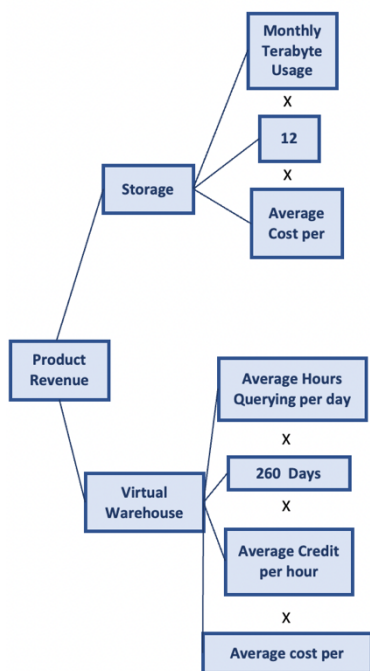
Source: Forrester

Business Model

■ Pricing Scheme

Snowflake's **pricing scheme** is considerably sophisticated, but once automated, the billing of each performance is straightforward. The pricing scheme is divided into 4 main functions: **Storage**, **Compute**, **Cloud Services**, and **Serverless Features**⁷.

Figure 5 Product Revenue Breakdown



Source: Company's Website

Storage: For on-demand contracts, the monthly fee can range from \$35-\$68 per terabyte, while for capacity arrangements, it ranges between \$20-\$39 per terabyte. Prices also differ according to the cloud provider that the client chooses and its respective region. Then, the monthly cost results from the average terabytes of data that a user stores in the platform per month.

Virtual Warehouse (Compute): In this function, Snowflake charges specific credits to price. A Snowflake Credit is worth between \$2-\$9.3 depending on the snowflake subscription, the cloud provider, and its region. It ranges from 1-512 credits per hour, depending on the size of its Virtual Warehouse. In particular, the greater is the warehouse, the better the performance of the query.

Cloud Services: Cloud Services are general services that are essential to operate Snowflake Data Cloud. These services charge 4.4 credits per compute hour. However, this service could be free of charges if the daily credit usage is less or equal to 10% of the daily computation credit usage.

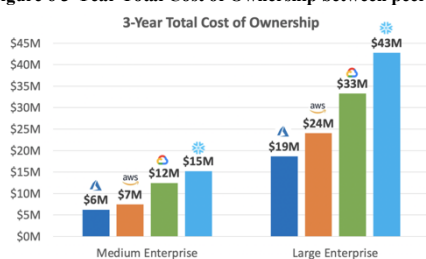
Serverless Features: These are additional features that the firm offers to its users. These features range from 1-10 credits depending on if they are related with compute or cloud services.

⁷ <https://www.snowflake.com/legal-files/CreditConsumptionTable.pdf>

Snowflake's billing tends to be more predictable but more expensive than its competitors

Snowflake's **main competitors**, Amazon Redshift, Microsoft Azure, and Google BigQuery, have different billing models. **Redshift** yearly pricing results of its *Price Per Hour*Cluster Size*Hours per Year*. **BigQuery**, very much like Snowflake, separates storage billing from computing billing. Its storage prices per terabyte are about \$10 for long-term storage and \$20 for short-term storage. When compared to our company, BigQuery's storage price is more competitive. Unlike Snowflake, BigQuery computing billings are based on data returned rather than hourly usage. In this sense, Snowflake's solution facilitates users to forecast their expenses more accurately as the number of hours needed is easier to predict rather than the need for querying and storage. **Azure Synapse** has a similar billing system when compared with Snowflake. In this case, the biggest difference relies upon the price that the companies charge per service. Lastly, following GIGAOM's studies on Total Cost of Ownership on Cloud Analytics Platform⁸, we can conclude that, among all peers, Snowflake tends to be the **most expensive** solution when it comes to both **medium and large enterprises** (Figure 6).

Figure 6 3-Year Total Cost of Ownership between peers



Source: GIGAOM

Figure 30 Market Share Evolution of each Scenario
Revenue Breakdown as of 31/10/2021

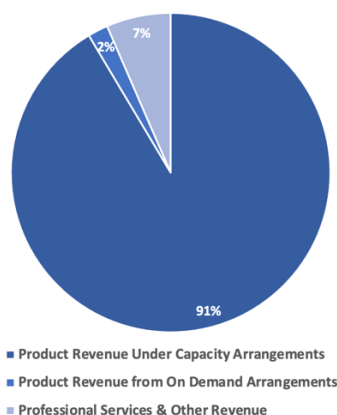


Figure 2 Cumulative Returns:
SNOW vs. Peers vs. SPX

■ Sources of Revenue and Costs

As presented in Figure 7, **Revenue streams** disaggregate into:

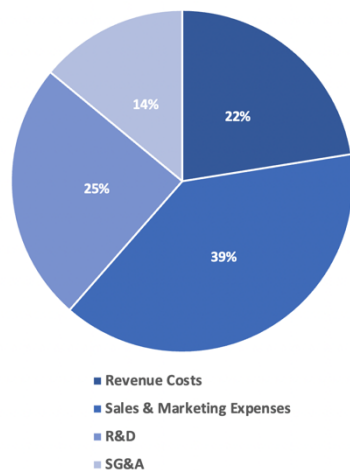
- **Revenues from customers under capacity arrangements:** The most common source of revenue, weighing around **97%** of the Total Product Revenue. A remarkable part of customers prefers to enter into contracts up to a certain capacity level that lasts 1 to 4 years.
- **Revenues from on-demand arrangements:** The on-demand arrangements are contracts that have 1 month of duration, and customers have the right to cease the contract whenever they intend to do it. It accounts for **3%** of the Total Product Revenue.
- **Revenues from professional services:** The professional services are designed to prepare the firm's customers on exploiting the benefits of the platform and it justifies about **7%** of Total Revenues.

What is more, the firm states that clients tend to exceed the chosen capacity arrangements. This is a pleasant scenario since it leads the customers to renew its capacity arrangements. On the contrary, if expected capacity is not fulfilled by the contract's term, Snowflake offers the client the right to defer that remaining

⁸ <https://gigaom.com/report/cloud-analytics-platform-total-cost-of-ownership/>

Figure 8 Cost Breakdown of Trailing 12m P&L
30/12/2021

**Cost Breakdown of Trailing 12m P&L
30/10/2021**



Source: Company's reports

**Negative operating results
have been driven mostly from
high sales and marketing
costs**

**Margins have been
improving over the last 3
years**

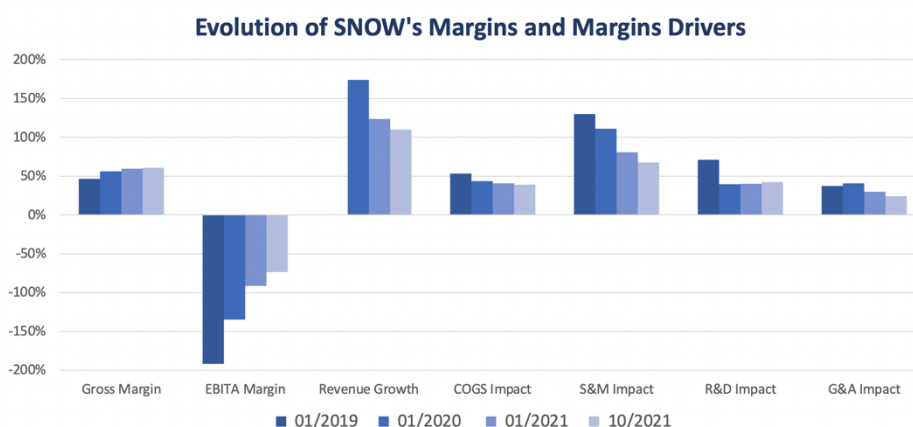
capacity onto a new capacity arrangement. In fact, this is a strategy of the company to retain its clientele and create loyal relations among them.

Snowflake's **costs** arise from four different sources:

- **Cost of Revenue** (22% of total expenses): Mainly driven by costs in **acquiring third-party cloud infrastructure** since the product runs on 3 of the largest public clouds in the world, **Amazon Web Services**, **Microsoft Azure**, and **Google Cloud**. Other relevant costs of revenues derive from the cost with engineers and human capital that assist in delivering the platform.
- **Sales and Marketing** (39% of total expenses): Mostly comprised of personal related costs such as salaries, stock options, and commissions. Besides that, it also includes advertising & contractor expenses, and travel costs.
- **Research and Development** (25% of total expenses): Rise from costs related to Software Engineering, User Experience, Product Management, Data Science and Technical program management, and writing teams.
- **General and Administrative** (14% of total expenses): Mostly imputable to personal related costs and software subscriptions used to support administrative functions.

Although Snowflake's Operating Income has always been negative, over the last 3 years, we have noticed a decrease in operating costs as a percentage of revenues and an increase of both Gross and Operating Margin.

Figure 9 Evolution of SNOW's Margins and its Drivers



Source: Company's Financials

Cloud Data Warehousing Competitive Landscape

Industry Participants

The major cloud providers also rival with Cloud DW that run on their Clouds

Cloud DW is a recent fast-growing market that is capitalizing on the limitations of legacy DW to grow

Data Warehouses can be defined as systems used to **store and perform analysis on data**. **Cloud Data Warehouses** differ from Legacy On-Premises Data Warehouses in the sense that the latter require physical data silos to work whilst the preceding are **incorporated either in public or private clouds**. Cloud providers can also host their own Data Warehouse (the case of Amazon, Microsoft, and Google).

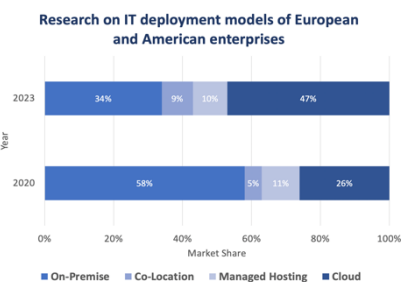
The **Cloud Data Warehousing market** is a relatively recent industry, surging **first cloud data warehouse (Amazon Redshift)**. Redshift was created in 2012 and made available to the public a year later⁹. Some of the most significant participants in the industry are **Amazon Web Services, Microsoft Azure, Google Cloud, Snowflake, Cloudera, Oracle, SAP SE, Datadog, MongoDB, and Teradata**. Currently, the **total Market Size** is around **\$9.98Bn** and it has prospects to grow up to **\$39.1Bn in 2026** at a **CAGR of 31.4%**¹⁰.

What is driving this industry's growth

This **Enterprise Cloud Software industry** competes directly with **legacy On-Premises Data Warehouses**. These legacy products still have a meaningful market share in the total Data Warehousing market. However, we foresee a growth in the Cloud Data Warehousing market which will definitely steal significant market stake from physical Data Warehouses, as shown in *Figure 10*. Some arguments to support this tendency are:

Goodbye Data Silos. We await an increase in the demand for cloud offerings since they allow for **greater flexibility** in data storage and data analytics than the legacy offerings¹¹. Nevertheless, we expect that this transition occurs throughout the **next 10-15 years** rather than in a shorter period because there are **significant costs** associated with transferring data to a cloud offering. According to [2021 Legacy-to-Cloud Survey ran by Lemongrass](#), we found out that, although firms are keen on moving from legacy to cloud, the **high up-front costs of**

Figure 10 Research on IT deployment models of European and American Enterprises

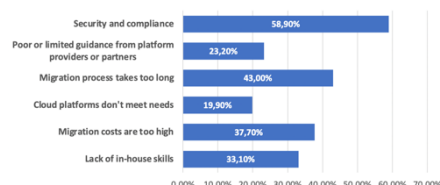


⁹ <https://sonra.io/data-warehouse/the-evolution-of-cloud-data-warehousing/>

¹⁰ <https://www.industryarc.com/Report/19226/cloud-data-warehouse-market.html>

¹¹ Refer to Data Silos limitations in chapter “**Snowflake Value Proposition: Solving problems of Legacy Data Warehouses**”

Figure 11 What challenges are enterprises facing when migrating legacy systems to the cloud?



Source: Lemongrass

Cloud DW's growth expectation is justified by the capability of eliminating most of legacy DW's problems, the increase in data creation and its potential to create new markets such as data monetization.

migration, reaching around **\$100k-\$250k** per system, are one of the main challenges posed to this transition (concern of **37.7%** of the inquiry respondents).

Cost-effectiveness. Cloud-Based Data Warehouses are not constrained by the limited capacity of a typical physical Warehouse. Also, most of them allow for automatic scaling according to their computing needs. Thus, customers only need to demand more cloud capacity whenever the urgency surges. This way, companies scale up the desired amount of data rather than buying a whole new physical infrastructure that is not just costly but also occupies physical space. With Autoscaling, Data Warehouses can automatically manage their required computational power according to the firm's cyclical/ seasonal needs allowing for better cost efficiency when compared with legacy solutions. As the importance of data analytics is being noticed across all industries and, at the same path, data storage demands are expected to increase (IDC forecasts data creation's growth of 64.2 zettabytes to 181 zettabytes from 2020 to 2025)¹², this industry is characterized as full of opportunities to exploit. As stated previously, Cloud Data Warehouse solutions expect to reduce a firm's overall 3-year costs by about 41% and 52%, when compared to on-premises solutions¹³.

Ability to share and create a marketplace for Data. Players like Snowflake are taking advantage of the endless cloud capacity to create a whole new market for firms: a **Data marketplace** where firms can easily **share and monetize data**. In a world where Data is decisive for every strategy, having the possibility to buy necessary data is enticing for firms. Hence, it can provide a path for growth in the cloud Data Warehousing industry.

Security. Although it is perceived that an in-house Data Warehouse security is superior to the security of data stored outdoors, this isn't as straightforward as that. Cloud providers are amongst the firms who spend **more money in cybersecurity**¹⁴ with Google, Amazon and Microsoft leading to spend over \$31Bn in cybersecurity¹⁵, among tech firms, and they are entitled to the highest security certifications such as **ISO 27001** and **SOC 2**. Unlike Cloud Data Warehouses, security on On-Premises Data Warehouses is 100% dealt by the firm itself and, if data access policies aren't rigid enough, they are prone to have major security breaches¹⁶. Overall, in our base case valuation¹⁷, we considered this topic to be dealt better by cloud providers. But, on our **pessimistic scenario**,

¹² <https://www.red-gate.com/blog/database-development/whats-the-real-story-behind-the-explosive-growth-of-data>

¹³ <https://www.esg-global.com/hubfs/pdf/ESG-Economic-Validation-Migrating-to-Google-BigQuery-for-EDW.pdf>

¹⁴ <https://www.geekwire.com/2021/report-microsoft-quadruple-cybersecurity-investments-spending-20b-five-years/>

¹⁵ <https://www.businessinsider.com/apple-amazon-google-microsoft-ibm-pledge-31-billion-to-cybersecurity-2021-8>

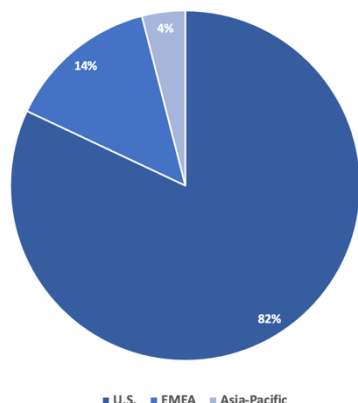
¹⁶ <https://www.xplenty.com/blog/cloud-vs-onpremise/>

¹⁷ More detailed information on chapter of DCF Valuation – Scenario Analysis

we incorporated the **possibility of security breaches** in Cloud providers leading to a **slower rate of customer migration to Cloud**.

What the numbers tell us about the industry

Figure 12 Product Revenue by Location



Source: Company's reports

As of 10th December of 2021, Snowflake displays a **Market Capitalization** of **\$113.71Bn** driven by a share price of **\$371.24** and **300 600 million shares outstanding**, Net Debt of **-\$4.55Bn** driven by **\$0.20Bn** Lease Liabilities, and **\$5.10Bn** Excess Cash leading to an **Enterprise Value** of **\$109.16Bn**. Last quarter, Snowflake's majority stake of product revenues came from **U.S. customers** (82%), and more residual customers come from **EMEA** (14%) and **Asia-Pacific** (4%), as you can observe in *Figure 12*.

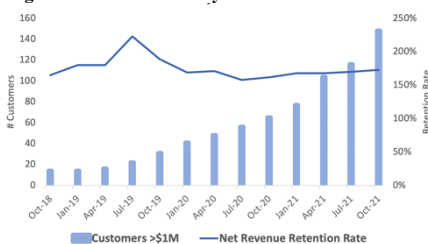
Set side by side with its competitors, Snowflake is one of the **smallest companies in terms of revenues** that operate in the cloud data warehouse market. Despite being a **fast-growing** firm, it still has the lowest **after-tax operating margin**, indicating that the firm is, by far, **destroying more value** than its competitors. Even though its status of value destruction, investors believe that it has great potential in its future value creation since it presents an **EV/Sales multiple** of **100.23**, well above its peer's median of 33.13. Meanwhile, it could also show signs of **overvaluation** regarding the company's share price.

Figure 13 SNOW and Competitors Statistics

SNOW and Competitors Statistics					
Firms	Revenues	Revenue Growth	After-Tax Operating Margin	Net Debt to EV	Capital Turnover
Amazon Web Services	57 164 000	34,24%	23,22%	1,17%	
Microsoft Intelligent Cloud	61 926 000	22,61%	34,78%	-2,64%	
Google Cloud	17 496 000		-15,59%	-6,36%	
Oracle Cloud and Licensing	34 451 000	5,23%	53,50%	14,00%	96,60%
SAP SE	32 753 576	5,03%	23,90%	0,18%	76,34%
Teradata	1 933 000	5,11%	10,59%	12,91%	177,80%
Cloudera	904 802	5,90%	-7,44%	3,34%	66,43%
Datadog	880 117	63,11%	-3,26%	-0,70%	359,33%
MongoDB	778 287	43,36%	-27,42%	-1,10%	353,29%
ServiceNow	5 531 330	31,05%	3,68%	-0,34%	204,52%
Snowflake	1 089 123	122,60%	-55,37%	-4,00%	478,58%

Source: Bloomberg

Figure 14 Snowflake's Key Business Metrics



Source: Company's reports

Overall, Snowflake is a company still with few past records available. However, one can understand in part what all the fuzz is about.

One example is Snowflake's **net revenue retention rate of 173%**

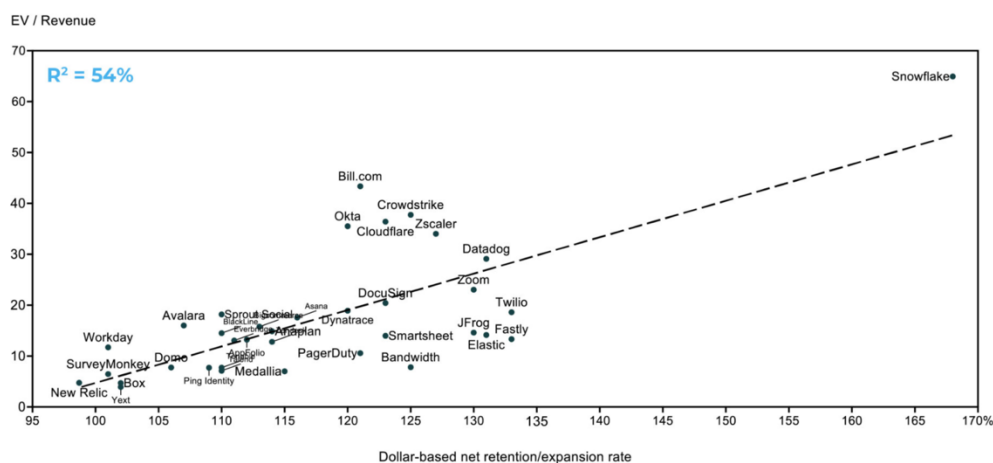
($RR = \frac{\text{Annual Product Revenue } t}{\text{Annual Product Revenue } t-1}$ from all the users under contractual arrangements that used the platform 24 months prior to the month that we make the calculation). This percentage is the **highest** when compared with a large cohort

Snowflake's Net Revenue Retention rate indicates good capacity to continue to grow revenues rapidly.

of Software-as-a-Service firms¹⁸, evidencing the **significant usage expansion in their platform**. Despite the firm's ability to generate a high level of retention rate, we should be aware of the challenges in sustaining these extraordinary values and **foresee a decrease in the rate in the long term**. It is crucial to keep track of this indicator as it measures the company's ability on upselling existing customers. In addition, it is worthwhile to mention **Gainsight's insight** on "How the retention rate metric influences the market price of firms?". In order to find a response, they ran a **regression of EV/Sales** with the **revenue retention rate**. From this analysis, they found out that the latter explains **52% of the variance in the valuation multiple**¹⁹. With these high retention rates, we are comfortable in forecasting increasing in the average billings snowflake charges to its customers.

Figure 15 Net Retention Rate explains about half of the variance in EV/Revenue

All SaaS companies, only 'net' retention rates



Source: Gainsight

Another indicator that calls special attention is **the growth in the number of customers with >\$1M Product Revenue Arrangements**. This metric has grown roughly at the same speed as the total customers, representing about **2% of total customers**. In October 2021, the **year-on-year growth** amounted to **128%**. Keeping track of the number of customers that spend the most in the company is crucial because it demonstrates the **attractiveness** and demand of companies with larger budgets. Furthermore, since it has still much market to explore, many large corporations have great potential to migrate workloads to Snowflake's cloud data platform which, in turn, generates revenues for the company. So, it is beneficial for both Snowflake and its cloud providers. Also, it allows to lock the customers in this type of working method and provides

The increase in customers with large budgets means that there is potential for higher revenues and migration of workloads can also be beneficial to the cloud suppliers

¹⁸ <https://cloudindex.bvp.com/companies>

¹⁹ <https://www.gainsight.com/blog/net-revenue-retention-drives-market-cap/>

integration of the business's ecosystem by complementing with other functionalities offered by the cloud providers²⁰.

Profitability, Liquidity and Capital Structure

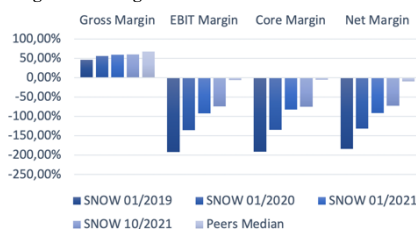
In comparison with its peers, Snowflake delivered outstanding **revenue growth**, on the trailing 12 months ending in October 2021, of **122.60%**, which is, by far, the highest among them as the median is only about **38.18%**. Contrarily, if we look at the firm's **after-tax Operating Margin**, the **-59%** that our company presents is the lowest across all peers. By having a **Capital Turnover** of **5.74**, it is no wonder that Snowflake displays the **lowest Return on Invested Capital** amongst the companies, totaling **-432%**, which is well below the median of **-8.32%**. To analyze deeply those numbers, we must further understand what drives the Core Margin and the Capital Turnover.

Since 2019, Snowflake's **margins** have been **improving (Figure 16)**. As a matter of fact, this is a consequence of the **reduction of all operating costs**, with the exception of professional services costs. The high revenue growth offset the nominal increases in costs. As so, Snowflake's operations **became more profitable**.

With respect to its **Capital Turnover**, considering that Snowflake is a software company, it is expected to have **high** capital turnover ratios. This is a result of the fact that firms within this sector typically aren't required to enter into many hefty capital investments. This reality can be verified through peers' median ratio of **2.79**. Given the fact that the invested capital requirements to generate revenues are **low**, Snowflake's operation's negative profitability is **magnified by its asset turnover leading to a large negative return on invested capital**. Studies from **McKinsey** support this view of **magnified ROICs on software companies** since, between 1963-2004, the Software services industry was one of the three industries with higher and wider ROICs²¹. In the Valuation section, we'll detail the roadmap for Snowflake to continue to **improve its profitability** and how that will lead to **high ROICs** during the first stage of abnormal growth (2021-2040).

Regarding its **liquidity**, Snowflake demonstrates a healthy financial condition even when compared with its peers' high standards. With a **Current Ratio** and **Cash Ratio** of **6.24** and **5.81**, respectively, Snowflake shows a good capability to fulfill its short-term obligations. This achievement is mainly caused by the fact

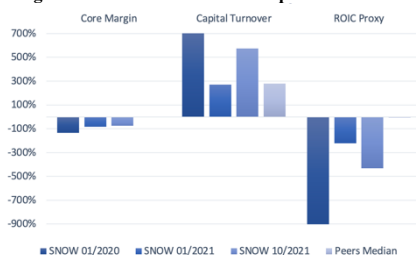
Figure 16 Margins



Source: Company's reports; Bloomberg

Snowflake's margins have improved but they are still way lower than its peers.

Figure 17 Return on Invested Capital



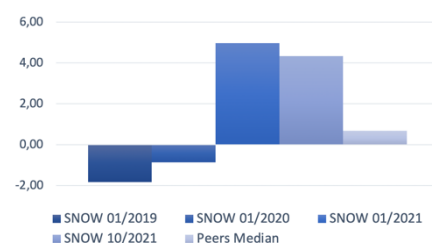
Source: Company's reports; Bloomberg

²⁰ Specificities about the relationship between Snowflake and its cloud providers analyzed on the Opportunities and Challenges section

²¹ <https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/a-long-term-look-at-roic>

Snowflake's liquidity ratios suggest capacity to pay short-term obligations and its high amount of liquid marketable securities allow to pursue investments that might increase RONIC

Figure 18 Solvency Ratio (Equity/Liabilities)



Source: Company's reports

that the company presents a very **low level of Leases and Traditional Debt**, and its recent IPO raised the firm **\$3.4Bn in cash**. On the grounds that the firm holds a big cash balance, it is important to allow it to forage value-creating investments with little worries about coming shortly on its liability payments since it's a prepondering fact in the firm's capacity to increase its future profitability and value creation. Snowflake's **Market Net Debt to EV** is -4% versus its Median of -0.52%. It is the lowest D/EV among all peers showing signs that the firm **prioritizes investment flexibility over potential Tax Shields** which isn't invaluable for growth firms like Snowflake²². Since the industry has little and, in many cases, negative Net Debt to Equity, and we don't have any evidence of changing the capital structure, we **assumed Snowflake targets its current debt to equity**. It's worth mentioning that Snowflake's **higher than median solvability ratio** also indicates that the firm can withstand some years of **value destruction** until it can reach positive free cash flows.

Opportunities and Challenges

Macroeconomic Landscape

The 2000s have been, so far, a rocky period. Economically speaking, the world has dealt with the **dot com boom**, the **financial crisis**, **sovereign debt crisis**, and the **COVID-19 pandemic** all in a period of 20 years. Thus, investors are more woke than ever to the dangers that macroeconomic shifts can pose to our firm's valuations. In this section, we identified some macroeconomic risks that might affect our valuation model²³ both on the Free Cash Flow projections and on the Discount Rates we used to return a present Enterprise Value.

GDP comeback after the pandemic. Although the pandemic counted as an **opportunity** for Snowflake to beneficiate from the **strong digital shift** in which firms were forced to undertake during these last 2 years, its effects on the economy also **threaten its operations**. Existing customers might face financial restrictions forcing them to **reduce the platform's usage**. On one hand, if the GDP recovery isn't fast enough, it will harm the revenue growth coming from existing customers, that is, **lower net revenue retention rates**. On the other hand, it will also **reduce the rate of new clients** since data migrations are

Figure 19 Market Cap Performance with U.S. GDP

From 1993-2020	Market Cap Correlation With US GDP
SAP	91,75%
Microsoft	67,48%
Adobe	74,79%
Oracle	83,54%
IBM	16,71%
US GDP	100,00%
Average Correlation	66,86%

Source: Bloomberg

²² DeAngelo, Harry, and Linda DeAngelo. "Capital structure, payout policy, and financial flexibility." Marshall school of business working paper no. FBE (2007): 02-06.

²³ Macro scenarios are incorporated in the scenario analysis chapter.

The rate of the US GDP Comeback after the pandemic as well as the resilience of the inflationary period drive some of the uncertainty about the firm's future

Figure 20 Market Cap Performance with CPI

From 1993-2020	Market Cap Correlation With CPI
SAP	-27,03%
Microsoft	-20,68%
Adobe	-18,30%
Oracle	-37,48%
IBM	-4,98%
Consumer Price Index	100,00%
Average Correlation	-21,70%

Source: Bloomberg

Analyzing software firm's performance vs inflation, we see that inflation tends to damage equity value.

Snowflake competes with its supplier's solutions, but its existence also allows big cash inflows for the supplier's products.

Their relationship is supported by the belief that both sides can win from this dynamic.

expensive²⁴. Therefore, it will accumulate the firm's losses far into the future which would affect the business' liquidity, and thus, endangering its viability. After performing an analysis with long-term public U.S. software firms, we found that in most cases, with no surprise, a **firm's Equity Value correlates strongly with the US GDP evolution**.

Rising inflation. After the COVID-19 pandemic, most economies diploid **stimulus packages or similar benefits** to help population getting through the economic downturn. More, many businesses had **impactful demand breaks** which lead to **big price reductions**. With the reopening of economies, businesses, especially the ones that had major losses in their operations, **pushed their prices up**, which led to a long-time unseen **CPI rate of 6.8%**. Although we believe that this phenomenon is a short-term correction to the effects of the pandemic, we are also aware of the fact that **strong economic stimulus** injected available money to families and, if they can withstand the rise in prices, it is reasonable to believe that they can **push this inflation** further into the future. If rising inflation holds, it will certainly drive to **increases in WACC** through **rising in the risk-free rate** and it will possibly drive **Snowflake's prices to rise**. Thus, it might affect the demand for the product which directs towards a reduction in Snowflake's value. Again, we performed a **correlation analysis of market capitalization evolution with CPI's evolution** on this sample of software firms and it showed a trend that **growth in CPI negatively affects the value prospectus of these firms**.

Frenemy relationship with cloud providers

Snowflake only operates in the public cloud. Public cloud providers such as **Amazon Web Services, Microsoft Intelligent Cloud, and Google Cloud** are the suppliers of the most important "Raw Material" for Snowflake's platform. At the same time, these third parties also host in their platforms their cloud data warehouse solutions, constituting then Snowflake's major competitors, **Amazon Redshift, Google BigQuery, and Azure Synapse**.

In fact, Snowflake has the inherent risk of **pricing pressure** in the future caused by its suppliers. The providers might see the potential in **gaining market share** in the cloud data warehousing market and adopt the strategy of squeezing Snowflake by **increasing cloud infrastructure prices** and/or **reducing its own querying and storage prices**. Frank Sliotman, Snowflake's CEO, stated that this relationship with cloud providers has moments of tension and it must be

²⁴ See again Lemongrass' study on the upfront costs of migrating data

managed carefully due to the fact that there are clear motivations for providers to desire greater market share, but they also win hefty amounts from **Snowflake's cloud contracts** and transference of large amounts of **on-premises workloads** to their own ecosystem. In our valuation, we incorporated the **risk-return relationship of these affiliations in each scenario** by affecting the **rate of decrease in the growth of total customers** given the competitive positioning of cloud providers and affecting the **margins** of Snowflake given the success or not of attaining good cloud supply prices.

Valuation Model

Discounted Cash Flow Valuation

- From the Past to the Future

In this research paper, we adopted the **Discounted Cash Flow**, the so-called DCF method, to value **Snowflake's Enterprise Value**.

Firstly, we appeal to this method since it looks into the **intrinsic value** of the company and allows to make **detailed assumptions** based on our firm-specific and industry-specific knowledge. Furthermore, the fact that we can perform **different scenario analyses** by using the DCF model is extremely valuable since as our company is still in its early stage, its prospects are thus far easy to foretell.

As Snowflake just became public in September of 2020, and its cash flows aren't close to being stable, we expect a larger number of years of forecasting for our company to reach its steady-state. As so, we defined the first 18 years as the **expansion phase** (from 2022-2040), following a more **mature phase with a slowing growth** (from 2041-2051), where we stopped detailing the financial statement's structure and used a growing annuity that was driven by assumptions about long-term growth rate and return on new invested capital, and then reaching the **steady state** (from 2041-2050) in which we applied the growing perpetuity formula. All projected cash flows were discounted back to the present at a **weighted average cost of capital**²⁵ according to their respective scenarios. The **long-term growth rate (g)** was estimated to be **2,46%**, and this value was based on the average of the **last 5 years of nominal GDP growth** of the United States. We excluded the year 2020 since it was an exceptional year due to the

²⁵ For more detailed information, please refer to the section of WACC Calculation.

pandemic, and we adopted the **nominal growth** instead of the real in order to align with our cash flows projections which were also in nominal terms.

As mentioned before, our company's value is extremely dependent on the future conditions of the economy and on the management of Snowflake. To tackle this problem, we conducted three scenario analyses (pessimistic, base case, and optimistic²⁶). We then weighted averaged the values according to their likelihood of occurring, resulting in our **final target price of \$323.51**, yielding a total return of **-12.63%**. According to our standards, we recommend to **SELL** the SNOW stock.

▪ WACC Calculation

To compute the Weighted Average Cost of Capital (WACC) for Snowflake, we **fixed the Market Debt-to-Equity ratio** for valuation purposes since the company presents no evidence of making significant changes in its capital structure during the forecasted period. The **market capitalization** of the company equaled **\$113.71Bn**, and the **Net Debt** equaled to **-\$4.55Bn**, originating a **Net Debt-to-Equity** ratio of **-4%**.

• Cost of Equity:

To compute the cost of equity, we used the Capital Asset Pricing Model (CAPM), and it is built upon three main factors: **the risk-free rate**, **the market risk premium**, and a **firm-specific risk adjustment**.

For the **risk-free asset**, we selected the **U.S. Government 10Y Treasury Bond (USGG10YR)** since it is a highly liquid and long-term asset. On 10th Dec 2021, it amounted to **1.485%**, despite being rising in this last year, it still depicts the low-interest-rate environment of the U.S. economy.

Moreover, we calculated the **raw beta** (Figure 21) of Snowflake through a regression analysis against the **S&P500** from 22nd Dec 2017, or whenever is the most recent data. We opt for **weekly returns** so that we can avoid the noisiness of daily data and have considerable sample data since Snowflake has just gone public in the recent past. If we look solely at Snowflake's **raw beta**, it resulted in **1.21** with a confidence interval of **[0.35; 2.07]**. With such a large confidence interval, we decided that the best strategy was to compute the **median adjusted beta of the selected comparable companies**, including Snowflake, resulting in

Figure 31 Raw Beta and its Confidence Interval

Company	Raw Beta	Confidence Interval 95%	
		Lower	Upper
SNOW	1,21	0,35	2,07
NOW	0,95	0,76	1,14
TDC	0,99	0,68	1,30
CLDR	0,85	0,47	1,24
DDOG	0,64	0,20	1,08
MDB	1,00	0,62	1,38
Median	0,94		

Source: Bloomberg; Analysts Estimates

²⁶ For more detailed information, please refer to the section of scenario analysis

Figure 22 Adjusted Betas and Unlevered Adjusted Betas

Company	Adjusted Beta	Unlevered Adjusted Beta
SNOW	1,14	1,19
NOW	0,97	0,97
TDC	0,99	0,88
CLDR	0,90	0,87
DDOG	0,76	0,77
MDB	1,00	1,01
Median	0,98	0,93

Source: Bloomberg; Analysts Estimates

a figure of **0.89**. The Adjusted Beta ($Adjusted \beta = \frac{2}{3} * Raw \beta + 1/3 * 1$)

approach is based on evidence that, in the long run, firms tend to have betas of 1. After getting the adjusted beta for each company, we unlevered the adjusted betas to eliminate capital structure's effects and levered back the median of it using our company's D/E structure. Furthermore, since the risk of default of this type of company is nearly inexistent, we also assume that the beta of debt is equal to 0.

Considering the fact that there is not a single and widely accepted model to calculate the **Market Risk Premium**, we chose two proxies for accuracy purposes:

○ Implied Market Risk Premium

We chose **SPX Index** as the well-diversified market portfolio since Snowflake is based in the **U.S.** and its main activities are also delivered to this country. For the market return, we used the next formula:

$$Nominal \text{ Market Return} = \left(\frac{P}{E}\right)^{-1} \times \left(1 - \frac{real \text{ } g + inflation}{ROE}\right) + (real \text{ } g + inflation)$$

Figure 24 Calculation of Implied Market Risk Premium

S&P 500 median P/E	25,97
US Real GDP 2019	19,092
US Real GDP 1932	0,828
Real Growth Rate	2205,80%
US GDP Real Growth Rate (CAGR)	3,67%
Inflation Rate	2,80%
Historical S&P 500 ROE	13,04%
Nominal Return on Equity	8,41%
Real Market Return	5,89%
10y TIPS Rate	-1,01%
10Y US T-Bond	1,49%
Expected Inflation	2,52%
Nominal Expected Market Risk Premium	6,93%
Real Expected Market Risk Premium	4,41%

Source: Bloomberg; OECD; The Balance; Analysts Estimates

From our calculations, the **Market Return** equaled **8.41%**. The **real growth rate** was assumed to be the same for the future as the CAGR of Real US GDP from 1932-2019 and the inflation adjustment, followed McKinsey's suggestion of averaging the previous 5 year's inflation rate as a proxy of each year's expected inflation²⁷.

Finally, to arrive at the **nominal Implied Market Risk Premium**, we used:

$$Implied \text{ MRP} = Market \text{ Return} - Risk \text{ Free Rate}$$

We end up with an **expected market risk premium** of **6.93%**. We used **nominal risk premium** to maintain consistency with our nominal cash flow projection.

○ Historical Market Risk Premium

If we assume that, over the last century, the **level of risk aversion of investors had remained unchanged**, we consider the **historical excess returns** as a good metric to project future premiums. In this scenario, we assumed the 5%²⁸

²⁷ <https://www.mckinsey.com/~/media/mckinsey/business%20functions/strategy%20and%20corporate%20finance/our%20insights/the%20real%20cost%20of%20equity/the%20real%20cost%20of%20equity.pdf?shouldIndex=false>

²⁸ E. Dimson, P. Marsh, M. Staunton, and J. Wilmot, Credit Suisse Global Investment Returns Yearbook 2009 (London: Credit Suisse Research Institute, February 2009).

which is derived from the premium vs. the treasury bills of 1-year from the period studied (from 1900 – 2008), following the studies of Dimson, Marsh, and Staunton & Blume.

- Cost of Debt:

Figure 25 Scenarios of Cost of Debt

Minimum Possible Cost of Debt		
Rd = 10Y US T-Bond		1,49%
3% Cost of Debt		
Rd		3%
Maximum Possible Cost of Debt		
	Implied MRP	Historical MRP
Rd = Re	7,06%	5,68%

Source: Bloomberg; Analysts Estimates

Due to the fact that Snowflake **neither issued a bond instrument nor have a credit rating attributed** and since its low Net Debt to Equity capital structure implies that the cost of debt won't affect much our final WACC estimation, we considered **3 scenarios** for computing the cost of debt (Figure 24).

Firstly, we computed the **minimum possible cost of debt**, which happens when it is **equal to the risk-free asset**, meaning that the credit spread of the company is equal to 0%. For a **medium** scenario, we set the **cost of debt equal to 3%**. And finally, **the maximum possible cost of debt** happens when **the cost of debt coincides with the cost of equity**. When using **the implied MRP**, the cost of debt equals **7.06%**. If taking **Historical MRP** into consideration, the cost of debt will then amount to **5.68%**.

After having all the necessary inputs, we end up with a WACC ranging from [5.91%; 7.91%]. We assumed the **median figures** of **6.93%**, **6.92%**, and **6.93%** for the base case, optimistic and pessimistic scenarios, respectively. These minor changes in WACC between scenarios are due to **different marginal tax rates** assumed per scenario (the current 21% on the optimistic scenario, 28% proposed by Joe Biden for the pessimistic scenario, and 26.5% proposed by the house of democrats for the base case²⁹).

Figure 26 Range of WACC in different scenarios

Statistical Range	WACC		
	Optimistic WACC	Base Case WACC	Pessimistic WACC
High	7,91%	7,91%	7,91%
3rd Quartile	7,82%	7,83%	7,83%
Median	6,92%	6,93%	6,93%
Average	6,94%	6,95%	6,95%
1st Quartile	6,09%	6,09%	6,10%
Low	5,98%	5,99%	6,00%

Source: Analysts Estimates

Revenue Breakdown and Cost Structure

As mentioned previously, Snowflake sells only one product which is its biggest source of revenues, **93% of Total Revenues**, and from those Product Sales, it rises additional **professional service revenues** that come from support to the

²⁹ <https://fortune.com/2021/09/13/democrats-slash-biden-corporate-tax-rate-appeal-pro-business-moderates/>

migration of data from legacy data warehouses to Snowflake's platform, accounting for **7% of total revenue**.

Therefore, it is pivotal to **breakdown** its product revenue drivers to make forecasting more explicit in the next stage. Its Product Revenue model is characterized by the following equations:

- At a higher level by sizing the market

$$\text{Product Revenue} = \text{Cloud Data Warehousing Market} * \text{Market Share}$$

Following the studies of **IndustryARC**³⁰, the Cloud Data Warehousing market is expected to reach **\$39,1bn in 2026**, after growing at a **CAGR of 31,4%** during 2021-2026. However, we expect this exponential growth to remain until 2029, and from this time onwards, a slowdown of the growth can be foreseen.

- At a firm level

$$\begin{aligned} \text{Product Revenue} &= \% \text{ of Small} * \text{Average Spending Small} \\ &+ \% \text{ of Medium} * \text{Average Spending (M)} \\ &+ \% \text{ of Large} * \text{Average Spending (L)} \end{aligned}$$

We divided the customers into 3 different types: Small, Medium, and Large. The characteristics of S, M, and L-type of customers are based on **phData** estimates³¹, as shown in *Figure 26*.

Figure 27 Characteristics of Snowflake's customers

Customers	Revenue Size	Analytics Users	ELT Pipelines	TB of Data	Typical Spending (in \$)
Small	<\$10M	10 to 20	10 to 20	<5	<75k
Medium	\$10M to \$1000M	30 to 50	30 to 50	<50	<300k
Large	>\$1000M	100+	100 to 1000	>100	>300k

Source: phData

Regarding the cost structure, it is mainly derived from two sources: **the COGS and Operating Expenses**, which included the **Sales & Marketing, R&D, and General, and Administration expenses**.

COGS are highly **dependent to the Revenues** of the company, both Product Revenue and Profession Services and Other Revenues. For this type of costs, we strongly believe that it will **decrease its weight in percentage** related to the revenues in the **expansion phase**. However, as noticed, Snowflake's relation

³⁰ <https://www.industryarc.com/Report/19226/cloud-data-warehouse-market.html>

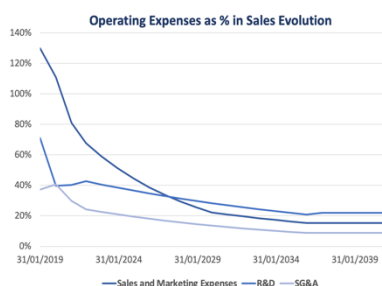
³¹ <https://www.phdata.io/blog/what-is-the-snowflake-data-cloud/>

with its suppliers is not just cooperative, but also competitive. For this reason, we took into consideration the fact that the cloud providers might try to **raise their market share** at the expense of Snowflake's cost of running in their platform. AWS is, by far, the Snowflake's biggest vendor and its current agreement is expected to terminate in 2025 thus **future COGS will depend immensely on the renegotiation of the terms of contracts**. Therefore, we assumed to **increase slightly** the COGS as a percentage of revenues **from 2026 onwards**.

When it comes to the **Operating Expenses**, we identified that the biggest source of costs is caused by **employee wages**. Thus, we decompose the costs into:

$$\begin{aligned}
 \text{Operating Expenses} &= \text{Headcount}_{S\&M} * \text{Average Cost per Headcount}_{S\&M} \\
 &+ \text{Headcount}_{R\&D} * \text{Average Cost per Headcount}_{R\&D} \\
 &+ \text{Headcount}_{SG\&A} * \text{Average Cost per Headcount}_{SG\&A}
 \end{aligned}$$

Figure 27 Base Case Operating Expenses as % in Sales Evolution (2019 - 2040)



Source: Annual Reports; Analysts Estimates

We estimate a more **aggressive drop on the weights** of each Expense as a percentage of revenues, on all scenarios, especially the weight to Sales & Marketing, as shown in *Figure 27*. Along the expansion of the company, we predict a more stable weight in the future, reaching about **15% for Sales & Marketing, 22% for R&D, and 9% for SG&A**. The first two expenses are typically **heavy on Tech Industry**, and Snowflake is not the exception.

In relation to the evolvement of the **Headcount**, we used as a proxy the **Employment Growth Rate in Computer and Information Technology Occupations (U.S.)**. According to **U.S. Bureau of Labor Statistics**, employment in computer and IT occupations is projected to grow **13 percent** from 2020 to 2030, which is a CAGR of **1.23%**³². After 2030, we assume that the growth will **decelerate by 30%** per year.

Scenario Analysis

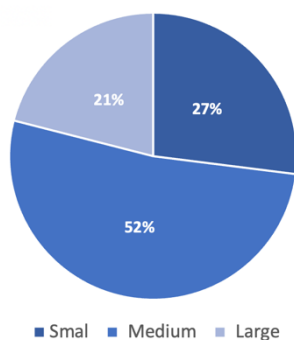
After careful analysis, we decided to not only forecast the base case for Snowflake since it still needs to grow for many years to reach its steady state. At the same time, the growth of the firm could be **highly volatile** as its limited historical figures could be **not indicative about prospects**. For the aforementioned reasons, we decided to use **probability-weighted scenarios**.

Our approach for the forecasting process was **top-down** by looking firstly at a **higher-level market data** and narrowing down to our company's projections. Then, we will deepen the analysis by **breaking down the revenue**, and **cost's**

³² <https://www.bls.gov/ooh/computer-and-information-technology/home.htm>

Figure 28 Clientele Structure

Clientele Structure



■ Small ■ Medium ■ Large

Sources: Annual Report; phData

Figure 29 Average Spending per Customer from 2021 to 2040

per Customer (in 000's \$)	2021	2040
Small	25	115
Medium	98	700
Large	362	6329

Sources: phData; Analysts Estimates

structure. Finally, we study the **differences** and **impact** that each case scenario will bring to the overall valuation.

For all scenarios, we **kept the market size** of our industry the same. We consider this industry more certain to expand, and our market share more volatile as the demand of our products could **depend on company's long-term sustainability** in an **increased competitive environment**. Also, we conserved the percentage split of our clientele (Small, Medium, and Large) as shown in *Figure 28* since we consider that this structure will **prevail or won't suffer significant changes**, having the **medium customers** accounting for more than half of the total customers. Nonetheless, we expect a growing average spending per customer in every type during the projected period as shown in *Figure 29*.

Moreover, the evolution of Headcount on Operating Expenses was also identical, since we believe that this number won't be that affected depending on different conjecture.

Regarding the core invested capital, we set each caption's drivers to follow the path that would lead the firm's Capital Turnover ratio, at the steady state, to be 200%, a value that is in between the industry's average and median of 223% and 191% respectively.

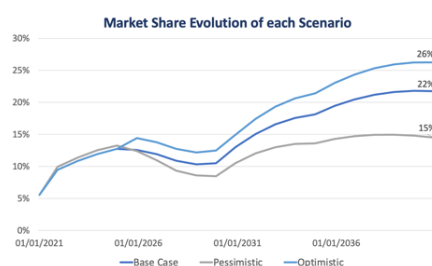
Scenario 1: Base Case

Share Price: \$338.55

We consider **Base Case** the scenario with highest probability of happening, amounting to **70%**. In this scenario, we expect the company to **grow at a moderate rate**, expecting to attain a **market share of 22% by 2040**. In an industry expected with increased competition and characterized by rivals from very large corporations such as Amazon, Microsoft and Google, Snowflake's market share is expected to be noticeable, but we **don't expect it to reach values superior to one quarter of the whole market**.

At a firm-level, we have good prospects of Snowflake's capability of **attracting more new customers**, especially with this **digital transformation trend** on all companies around the globe. However, precisely due to its newness, the base will be relatively small causing a much more **aggressive growth** in the early stage of the company. We expect Snowflake's **total customers to increase**, but we expect the rate of that increase to **decelerate 10%** for future periods until 2040, and with a **higher decreasing rate on the first year of forecast 2022** in

Figure 30 Market Share Evolution of each Scenario



Source: Annual Report; Analyst Estimates

Figure 31 Product Revenue COGS as % Total Product Revenue

	2021	2025	2040
Pessimistic	32%	24%	40%
Base	32%	24%	36%
Optimistic	32%	24%	34%

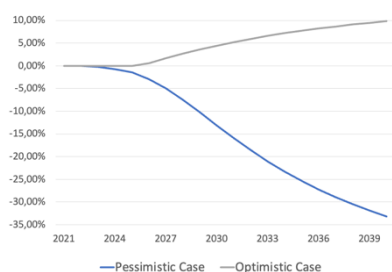
Sources: Annual Report; Analysts Estimates

which we divided by 2 the previous total customers growth (from 2020 to 2021) to incorporate last couple of year's **declaration of 50%** in the customer growth rate. There are just **two exceptions** emerging in 2026 and 2027 in which we will have a **decreasing rate of 15%**. The reason we assume this higher deceleration of the growth rate will occur is the fact that **third party cloud suppliers will try to increase their market share** in the cloud data warehousing market thus **snowflake's COGS will increase** and, in order to maintain margins, the **increase in the firm's prices** will affect the demand for Snowflake's product. On this scenario, we **don't expect major security problems** that might hinder Snowflake's capacity to collect more customers, to occur³³. Also, we expect the current **revenue per customer to increase steeply in the first 5 years** of the forecasted period, leveraging on the **recovery of GDP** after the pandemic, **short term inflationary period** and our vision for the **increase in data storage** and the **number of queries** ran by clients due to **data migration trend**³⁴.

All in all, in this scenario we expect Snowflake to reach **positive NOPLAT in 12/2029** and **positive Free Cash Flow in 12/2030**. Regarding the evolution of the **Return on Invested Capital**, we forecast it to reach **28% by 12/2039** and this results primarily due to the **improvement of the Sales & Marketing expenses** (we assumed that, as the firm gets bigger and more recognizable it doesn't need to invest as much in Sales & Marketing to generate sales), and these numbers aren't higher because the **firm's invested capital turnover decreases** since the firm will need to invest more to generate returns.

In this case, the **corporate tax rate** was set to be equal to **26.5%** following the proposal from the house of democrats that falls a little bit below Biden's original proposal of 28% in order to secure the support from pro-business Democrats.

Figure 32 % Change in Total Customers of each scenario relative to Base Case



Sources: Analysts Estimates

Scenario 2: Pessimistic (Increased Competition)

Share Price: \$159.19

On a more pessimistic perspective, we assumed that Snowflake **cannot strengthen its product** and competitors such as Amazon Redshift or Microsoft Azure can provide **more complete ecosystems** to the clients. Therefore, we estimate a **more conservative growth** of Snowflake's market share, attaining only **15%** of the total industry at the end of our forecasted period. Still, the path of the **expansion of number of Total Customers will be similar** to the base case. We assume that the Big Public Cloud providers retaliate to **gain market share** and **potential Cloud Security breaches** could happen causing a **reduce the**

³³ As stated in the competitive landscape section, cloud is considered more secure than legacy solutions

³⁴ Previously we stated our beliefs for the trend of data migration from legacy to cloud on the competitive landscape section

Figure 33 Growth of Total Customers in each Scenario

	2021	2026	2030	2040
Pessimistic	34%	-20%	-15%	-12%
Base	34%	-15%	-10%	-10%
Optimistic	34%	-12%	-10%	-10%

Sources: Analysts Estimates

pricing power and customer growth. In the 10-year period from 2030-2040, the customer growth **stabilizes at a faster rate than the base case** and **average billings slowly grow reaching the base case ones** by 2040 (*Figure 33*).

At the same time, we assume **higher dependence on the third-parties' providers** and our firm cannot present other solutions rather than partnering with them. So, the weight of Product Revenue COGS in total Product Revenues will move up until almost **40%** at the end of 2040, significantly **squeezing our Gross Profit Margins**.

In this scenario, the corporate tax rate was set to be equal to **28%**, following President Biden's proposal.

Scenario 3: Optimistic Case (Product Strength)

Share Price: \$546.87

This is a more **positive** case when comparing to the previously mentioned scenarios in the sense that Snowflake can keep managing its **strong competitive advantage** regardless of the threatens posed by competitors. We believe in a **more accentuate growth of retention of market share** from 2026 onwards in this scenario, achieving **26%** of the total Cloud Data Warehousing industry (as shown in *FIGURE 30*).

When observing the *Figure 33*, there is **no major differences** regarding the evolution of Total Customers against the base case in the short-term period (until 2025). After 2025, we assume a **successful renegotiation of cloud contracts** that allows Snowflake to **increase its customer base** without having to reduce prices when compared with the base case until 2030. Subsequently, we expect a path with **little security issues** on Snowflake and cloud provider's side that implies a **slower rate of customer growth**. Due to success on suppliers' agreements, we also assume that there won't big changes on its profitability in which the Product Revenue COGS as a percentage of Total Product Revenues will **go back to starting year's similar levels**, about **32% to 34%** (shown in *Figure 31*).

In an optimal case, the U.S. President's suggestion of **corporate tax rate** will be rejected, and it will remain equal to the previous **21%**.

Sensitivity Analysis

At the end of our valuation process, we believe it is pivotal to perform a sensitivity analysis to observe and determine the **impacts that changes on inputs could affect on our result**. Since we don't foresee any substantial long-term competitive advantage we've set, at the **Terminal Stage**, the **WACC equal to RONIC**, thus our terminal growth won't affect the value of the company, because we are **neither creating value nor destroying**. For this reason, we opted to perform the sensitivity analysis on the WACC and the growth rate of the Core Result in the Annuity Period (from 2041 to 2051).

Figure 34 Sensitivity Analysis of the Weighted-Probability Scenario

WEIGHTED-PROBABILITY SCENARIO

Sensitivity Analysis		WACC				
		5,51%	6,12%	6,80%	7,48%	8,23%
Core Result Annuity Period Growth Rate	5,67%	529,01	427,07	340,45	275,67	224,62
	6,30%	526,51	425,36	339,32	274,92	224,20
	7,00%	524,78	424,22	338,60	274,48	223,98
	7,70%	550,39	442,92	351,98	284,12	230,60
	8,47%	577,69	462,82	366,20	294,35	237,60

Expected Return		WACC				
		5,51%	6,12%	6,80%	7,48%	8,23%
Core Result Annuity Period Growth Rate	5,67%	42,11%	14,65%	-8,68%	-26,14%	-39,89%
	6,30%	41,43%	14,19%	-8,99%	-26,34%	-40,00%
	7,00%	40,97%	13,88%	-9,18%	-26,46%	-40,06%
	7,70%	47,86%	18,92%	-5,58%	-23,86%	-38,27%
	8,47%	55,22%	24,28%	-1,75%	-21,10%	-36,39%

Recommendation		WACC				
		5,51%	6,12%	6,80%	7,48%	8,23%
Core Result Annuity Period Growth Rate	5,67%	BUY	BUY	SELL	SELL	SELL
	6,30%	BUY	BUY	SELL	SELL	SELL
	7,00%	BUY	BUY	SELL	SELL	SELL
	7,70%	BUY	BUY	SELL	SELL	SELL
	8,47%	BUY	BUY	SELL	SELL	SELL

Source: Analysts Estimates

Furthermore, our target price is obtained through a **weighted-probability scenario**, we followed the same rationale for the sensitivity analysis. Firstly, we found the prices that each scenario (**Pessimistic, Base Case, and Optimistic**) could result in this set of indicators and weighted the individual prices according to their likelihood of happening (**20%, 70%, and 10%**).

By analyzing the *Figure 34*, one can conclude that our Share Price **is more sensitive to changes in WACC than in changes on our growth rate on the Annuity Period**, for identical percentage changes (+/-10%) on the variables. However, this outcome is awaited due to the fact that a slight change in WACC **affects our entire valuation model** from present to terminal, while a change in the Core Result Annuity Period Growth Rate only **impacts those 10 years**.

This method provides us a wide range of possible target prices, and we can conclude that it follows our recommendation of **SELLING** as **60%** of the 25 prices are **below \$371,24** (Snowflake's stock price as of 10th Dec 2021). What is more, if we take a closer look on the range of prices, a **median of \$340,45** further reinforces the research proposal.

Recommendation

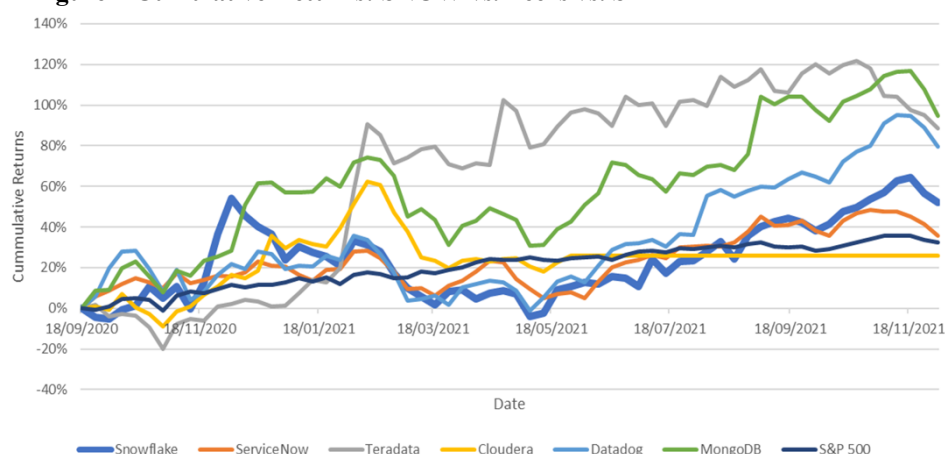
Snowflake has been on the eye of many investors since its IPO. Since then, the stock has made a **cumulative return of 59.51%**. The **Cloud Data Warehousing** market is forecasted to grow, for the next decade, up to impressive figures of **31.9% of CAGR** and this is mainly driven by its **potential on solving limitations of traditional data warehouses (cost and physical space)** using little to none added risk.

Leveraging on this organic market growth, Snowflake is **increasing its market share** in this market and positioning itself as one of the most prominent figures due to its capacity to **lock-in clients** (shown by its **high revenue retention rate of 173%**), **creating new opportunities to monetize and share data** and, lastly, due to the fact that its product offering is considered as the **second best product** in the entire cloud data warehousing market.

Despite all these positive traits, we believe that, for a one-year investment, Snowflake is **overvalued**. The main reasons that drive our beliefs are the high probability in experiencing a **downturn in the firm's profitability expectations** caused by a **misalignment of interests in the relationship with its cloud providers/ main competitors** in the cloud data warehousing market, and the **potential for replicas** in the macroeconomic landscape after the pandemic which might lead to **longer than usual inflationary period** and a **slower GDP growth**.

After considering different possible scenarios (pessimistic, base, and optimistic with probabilities 20%, 70%, 10%, respectively), we expect the Target Price of **\$323.51** per share, and if we invest in this precise moment in Snowflake and hold it until the end of 2022 would **yield a negative return of 12.63%** after capital losses and net transaction from shareholders into the firm. Hence our final recommendation for the Snowflake's Stock (SNOW US EQUITY) is to **SELL**.

Figure 2 Cumulative Returns: SNOW vs. Peers vs. SPX



Source: Bloomberg

Appendix 2 Balance Sheet

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Report Recommendations

Buy	Expected total return (including expected capital gains and expected dividend yield) of more than 10% over a 12-month period.
Hold	Expected total return (including expected capital gains and expected dividend yield) between 0% and 10% over a 12-month period.
Sell	Expected negative total return (including expected capital gains and expected dividend yield) over a 12-month period.

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