Coca-Cola valuation – Vénus ARTUS 22155449

**Presentation of the firm and context**

Coca-Cola is a multinational corporation founded in 1892 in the USA and is a beverage company that sell its products in more than 200 countries. The firm owns approximately 200 masters’ brands across a variety of beverage type such as sparkling soft drinks, sports drinks, hydration drinks, coffee, and tea. The company is number one on the global share position in the non-alcoholic ready to drink industry and represents [32.7 billion](https://www.wallstreetzen.com/stocks/us/nyse/ko/statistics) servings per year across all regions.

I first choose to value Coca-Cola because it is a recognized brand that had worldwide influence for decades. The brand is iconic and has innovative design and creative advertisement that I fin d interesting, especially as it is a good that I purchase on a regular basis. Moreover, this is also one of the most valuable companies in the world and since they have been present in the economy for a long time, I thought it would be interesting to learn more about their financial situation.

**General information about the beverage industry**

The global beverage market size was valued at $1.45 trillion in 2020 and is forecast to grow at a CAGR of [6.6%](https://freepestelanalysis.com/pestle-analysis-of-beverage-industry/) up to the year 2028. Asia-pacific represents the largest market for beverages as well as North America and Europe. Indeed, Coca cola counts approximately [3.3 billion](https://investors.coca-colacompany.com/about/segments) consumers in Asia pacific and 320 million in North America. The brand holds a position as the top of the industry by detaining a market share of [42%](https://www.tutor2u.net/economics/reference/why-is-coca-cola-so-profitable) in the soft drink industry.

**Trends impacting the industry and Coca-Cola.**

New technologies are currently bringing new possibilities of expansion and innovation within the beverage industry. First, the development of AI allows company to strengthen their chain operations but also to track changes within the market and understand consumer’s behaviour. Coca-Cola’s use of AI allows the company to provide innovative and personalized features for its consumers. Indeed, the firm has been using AI to enhance their vending machine by allowing the customers to personalize their drinks and to interact with the machine. Moreover, the brand also integrates AI and algorithms to improve its data collection and analysis and hence generate insights. These new technologies could allow the company to operate more efficiently, to be more increase its competitive advantage as well as its brand loyalty. By being more efficient the company could cut some of its costs and by improving its competitive advantage the brand might acquire a bigger market share and hence its revenue.

On the other hand, the global economy has been negatively affected by the rising inflation rate, as well as the war happening in Ukraine. These two elements have an impact on the prices of goods, raw materials, and transports of goods. We could expect Coca-Cola to raise its prices to fight the inflation, and at the same time some customers might choose to stop purchasing goods from the company until the inflation does down. The costs of Coca-Cola should rise since it will be more expensive to acquire drinks container and to transports goods to various locations, and the company’s revenues might be negatively impacted by a reduction in products sold. Consequently, this could reduce the cash flow of the company and limit its growth rate.

**Free cash flow**

In this project we are performing a discounted cash flow valuation which states that the value of an firm is the present value of the expected cash flow of the company. To be able to perform a DCF valuation we need to estimate the future cash flow based on a growth rate, the discount rate that will allow us to get a present value and the life of the asset.

Free cash flow is a metric that provide a grasp of the company’s financial performance Free cash flow is a key indicator that allow investors to see whether a company is making sufficient cash to support its business. When companies have positive FCF it demonstrates their capacity to invest money back in the business as well as a to distribute dividends to their shareholders. On the contrary, negative cash flow can be alarming as the company is unable to grow its business only with the cash generated from its activities, meaning the firm will have to acquire capital through another way to stay in business. Free cash flow is also essential for business owners to understand how their cash flow is impacted by their expenses and prevent hence prevent cash shortage.

Two approaches to forecast FCF:

1. Apply a constant growth rate to the current free cash flow, if the historical growth rate will apply to the future. Appropriate if the historical cash flow has been growing at a constant rate.
2. Forecasting some components of free cash flow based on a growth rate and the share that each component represents in the revenue.

In order to compute the FCF for Coca-Cola, I decided to adopt the revenue approach by first calculating the EBIT:

*EBIT = Revenue – Cost of goods sold – operating expenses*

From there, I applied the formula of the FCF starting from the EBIT:

*EBIT x (1 – tax rate) + depreciation & amortization – Variation of working capital – CAPEX*

* The variation of working capital is calculated from the change in current assets – current liabilities. An increase in the working capital could therefore mean an increase in the assets (for example the receivables) or/and has decreased its liabilities (paying off short-term debts). Hence, an increase in the working capital could be a sign for a healthy financial situation.
* The capex was calculated from the change in the ‘property, plant & equipment’ element observable in the cash flow statement. I also subtracted from the PP&E, ‘proceeds from disposals of PP&E’ as it represents a decrease.

To compute the future cash flow, it is also necessary to determine a forecast period, which is usually between 5 to 10 years. Here I choose to compute over 5 years as over this period of time, the uncertainty about a company and the market increases substantially.

Moreover, it is necessary to decide which discount rate to perform the valuation. For Coca-Cola, we will use the weighted average cost of capital as the rate used to discount cash flows. The WACC and its components can be useful to observe the risks associated with each type of capital. Equity and debts are not financed in the same way, and equity is often considered to be riskier hence we should see a higher cost of equity than a cost of debt.

When looking at the free cash flow computation made for Coca-Cola, we can observe that the revenues of the company are quite stable, with a growth rate of 5% over the past 5 years. On the other hand, the free cash flow is unsteady, notably due to an extremely high tax rate in 2017 which gives us a very low cash flow for that year. Moreover, we can observe a decrease in the growth of the cash flow for both 2020 and 2021 which could be explain by the sanitary crisis leading to a decrease of consumption and hence a slight decrease of the revenue in the year 2020.   
When computing the average growth of the free cash flow for the past five years, I hence observed an unrealistic number that I tried to adjust. I attempted two approaches, (see the ‘Free cash flow’ tab) and concluded that the adjustment N°2 (3.51%) was more reasonable, because it was closer to the average growth rate for the revenue and hence made more sense.

Lastly, based on the information provided about the industry, Coca-Cola is a company that is at the top of its market and the firm should keep this position in the future years, hence providing a steady growth. Nevertheless, the economy has been heavily impacted by the Ukrainian war and the global inflation which increase the price of raw material but also of transport. We can assume that Coca-Cola will grow but that it will be affected by the inflation rate and the following consequences. Therefore, I decided to set the growth rate (g) as the one calculated with the cash-flow, hence g=3.51%.

**Long run growth rate**

The long-run growth rate represents the growth rate of a company that we assume will be sustainable and achievable over a continued period of time. Since the long-term growth rate of a company is affected by microeconomics and macroeconomic factors, it is more reasonable to compute an average of the growth rate based on historical data.

To compute the long-term growth rate of Coca-Cola I took in consideration several factors:

First, Coca-Cola is a mature firm that has been operating business for over a century and it has achieved a considerable size and market share. Large companies usually are not expected to substantially grow because they are limited in the innovation they can make and in the portion of market they can acquire. Despite Coca-Cola implementing new smart vending machines, the company is not expecting a completely new technology that will considerably impact its growth.

Second, like any industry the beverage sector is impacted by macroeconomic events and the global economy growth. Based on historical data of March 2023, the US economy has an annual growth rate of [1.60%](https://tradingeconomics.com/united-states/gdp-growth-annual) while the global beverage and the NARTD sectors have a growth rate forecasted at respectively 6.6% and [4.3%.](https://www.statista.com/topics/1662/non-alcoholic-beverages-and-soft-drinks-in-the-us/#topicOverview) While this represents a positive growth for these industries, there are not expected to be the principal markets that will support the US GDP growth. Therefore, because Coca-Cola is both impacted by the general economy as well as factors impacting the beverage industry, we should not expect a long run growth rate above the one of the global economies.

Lastly, inflation rate negatively impacts the growth rate of the economy and hence the one of companies. In order to compute a realistic and reasonable long run growth rate it is important to correct the inflation effect. Recently, the economy has been impacted by extremely high inflation rates (6%-7%) that do not reflect the level generally expected within the economy. To avoid getting a negative long-term growth rate, I choose to rely on a forward inflation expectation rate. As explained in the FCF section, we expect the growth rate for the free cash flow to be 3.51%. Additionally, on the May 10th the 5-year forward inflation expectation rate was [2.21%](https://fred.stlouisfed.org/series/T5YIFR)

Therefore, we obtain the following real long-term growth rate:

*LTG = 3.51% - 2.21% = 1.3%*

This growth rate is below the GDP growth rate and is also below the discounted growth rate which will allow us to compute the final valuation.

**Cost of equity**

The cost of equity is one of the elements that we need to calculate first to later be able to compute the weighted average cost of capital. The cost of equity represents the return required by investors when making an equity investment. The cost of equity is affected by the volatility and risks of the markets, hence there is no guarantee for an investor to the money from their investment back. Hence, because investors face more risks that debtholders, the cost of equity is expected to be higher than the cost of debt.

To compute the cost of equity we use the Capital Asset Pricing Model (CAPM) which is a financial model that provide a linear relationship between the risk of an investment and its required return. It takes into account three components: a beta, the risk-free rate and the equity risk premium:

Cost of equity: Re

Risk free rate: Rf

Beta of the industry: B

Expected return: ER

Market risk premium: Expected return – Risk free rate

*Re = Rf + B x (ER – Rf)*

A picture containing text, line, diagram, font

Description automatically generated

This one representation of the CAPM model which visually represents various sets of point based on the expected return and the expected risk. The ‘Efficient frontier’ represents all the optimal combinations of investments that maxims the return for a certain level of risk. The purple dots represent inferior investments that either have a lower return for the same risk or a higher risk for a lower return, therefore they are not desirable for an investor.

To compute the cost of equity I first had to look at each of the components individually:

Beta:

Beta in an important variable of the cost of equity and it represents the volatility of a certain stock compared to the global market. It measures the sensitivity of that stock when the market fluctuates. If beta is equal to one, the stock is said to be in line with the market fluctuations, whereas a beta superior to one will suggests that the stock is more sensitive and hence is facing greater price swings. If this is the case, a company will be expected to have higher return because the investors are taking more risks. Lastly, a beta inferior to one will suggest that a stock is less volatile than the market considered.

To calculate the value of beta we use a regression method where we regress the stock of the company against the returns of a chosen market. The value of beta represents the slope of the regression where each points represent a stock’s returns against the return of the market. Since Coca-cola is part of the S&P 5000 I choose to perform the regression based on this market, and I collected historical data for the last 13 years. We obtain a beta of 43.29% which indicates that Coca-Cola is less volatile that the market. Consumers staples tend to be less volatile than other goods because they are considered non-cyclical. These types of goods are usually necessities that individuals need to purchase regardless of the economic situation. Therefore, Coca-Cola is a less risky stock compared to other segments of the stock market.

The Risk-free rate:

In theory, the risk-free rate represents the rate of return that an investor would get for an investment that has zero risk. The risk-free rate allows investors to compare the expected return of a investment to the risk free rate to evaluate if the risk taken for that investment is justified. We considered an asset to be risk-free rate when the expected return is the same as the actual return, therefore there is no variance (fluctuations) around the return.

In practice, governments securities rates are used as a risk-free rate because it is considered to have zero (or the less) risk as they are issued by the US government. An increase in the value of the risk-free rate would increase the value of the cost of equity because investors require a higher return to compensate the loss they could suffer from investing in a risk free asset. To compute the risk-free rate for my valuation I collected data about different US bonds and calculated the average rate for the 5 years one, for which I obtained 3.86%.

The equity risk premium: Mathematically the equity risk premium represents the value obtained when we subtract the risk-free rate to the expected rate of return of the market. The value of equity risk premium indicates the compensation that investors expect in exchange for taking the risk to invest in the equity market.

**Cost of debt**

The cost of debt is the other component allowing us to compute the WACC. The cost of debt is the return provided by a company to its debtholders, this reflects the default risk of company. Like investors, creditors and debtholders need to be compensated for the risk associated with bringing capital to a company. This is an effective interest rate that a company pay on its debts, and it is usually less than the cost of equity because creditors have priority when the company must pay back individuals for their financing. The cost of debt of a company can be affected its choice of acquiring capital through debts. Indeed, while a company can finance its activities through debts, this can also have negative consequences on the financial health of the business. The increase of debt can increase the interest expenses and its risk of default, which could lead to a diminution of the company’s profitability and its credit rating. To perform the calculation of the cost of debt we consider the interest expense and the debt of the company:

*Cost of debt = (total interest expense/total Debt balance) x (1 – tax rate)*

Because interest expenses are tax deductible, we include our tax rate in order to obtain an after-tax cost of debt. A higher tax rate would lower the effective cost of debt because. In the valuation of Coca-Cola, I choose to take the previous year tax rate (18%) instead of the 5 years average tax rate (30%) as it would have given us an extremely low cost of debt and therefore not represent the reality. I obtained a cost of debt of 1.08% which is as expected lower than the cost of equity.

**Cost of equity & Cost of debt – WACC**

With both the cost of equity and the cost of debt, we can compute the WACC that will be used the discounted rate for our cash flows. The weighted average cost of capital is a financial metric that determine the average cost of financing a firm while taking into account its capital structure. Both the cost of equity and cost of debt are express as a proportion of the whole company’s capital structure. Hence, we obtain this formula:

Market value of equity: E

Market value of debt: D

Cost of equity: Re

Cost of debt: Rd

Tax rate: T

*WACC = [E/(E+D)]\*Re+[D/(E+D)]\*Rd\*(1-T)*

For Coca-Cola the WACC computed was 6.409%

**Valuation & Coherence**

To compute the final valuation result I first started to forecast the next five years cash flows of the company by using the growth rate determine earlier with g=3.51% and I additionally computed the terminal value with the help of the Gordon Shapiro method and the long-term growth of 1.3%. I then discounted the cash flow with discounted a cash rate of 6.264% to bring back the value of the cash flows to a present value. I summed up all the DCF to obtain a final value of the company of $277,618 million. To calculate the stock price, I simply divided the total value of the company by the number of outstanding shares and obtained a share price of $64.14. When comparing the computed share price to the actual stock price of Coca-Cola on the 10th of May we observe a difference of 1%. The value that I calculated is higher than the historical price on that specific date, however we can consider this value to be reasonable and in line with the real stock value of Coca-Cola. Moreover, when comparing the value found in this valuation to projection made by other analysts, the share price appears to be in the bracket. Indeed, analysts have forecasted the stock price of Coca-Cola to reach a median of [70.00](https://money.cnn.com/quote/forecast/forecast.html?symb=KO#:~:text=Stock%20Price%20Forecast,the%20last%20price%20of%2059.99.) with a low estimate of 63.00, hence including our value.

Nevertheless, the valuation model used in this module requires to numerous assumptions in order to compute values and it is relevant to consider its limitations.

First, the beta coefficient theory assumes that stock returns are normally distributed, yet financial markets are subject to short-term and long-term validity, which make the computation of the beta complicate. Moreover, when performing the linear regression, we simply look at historical data relative to the market and the company, therefore beta does not provide suggestions for the future. Additionally, the value of the beta can fluctuate depending on the range of data used for the regression and it can strongly impact the coefficient we obtain.

Secondly, the CAPM model rely on the assumption that investors can borrow money at risk free rate which is not realistic. Very often, the risk-free rate will be impacted by country’s economy and political aspects. Indeed, the risk-free rate in the US might not be the same as the one in a country where the government is corrupted, because their rate would be higher. Moreover, the yield of government securities is subject to change, and it creates volatility.

Lastly, computing the long-run growth rate of the company is challenging for several reasons. Setting a growth rate requires to estimate a value in the future which involves uncertainty, and which rely on historical data rather than on future performance. Historical data were influenced by the conditions of the market at this specific time, and we cannot be sure that the cycle will be repeated in the same way. Moreover, there is not a single growth rate that can be applicable, and many factors can drive an assumption, therefore a small change in the growth rate can strongly influence the valuation made.