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Equity Valuation: Qualcomm Inc.

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Master in Finance

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BUSINESS
SCHOOL

Department of Finance

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Resumo

Este documento oferece uma análise detalhada da Qualcomm Inc., uma conhecida empresa multinacional de tecnologia que se especializa no desenvolvimento e fabricação de semicondutores, equipamentos de telecomunicações e outras tecnologias sem fios. O objetivo principal é fornecer uma análise do desempenho financeiro da empresa, das perspetivas de crescimento, da relevância no mercado e da valorização das ações da empresa. Este objetivo será alcançado através da análise das demonstrações financeiras da empresa, da perspetiva atual e futura do mercado, da estratégia da empresa e da sustentabilidade da mesma. Consequentemente, o propósito deste documento é fornecer aos investidores informações importantes sobre o potencial futuro da Qualcomm.

As demonstrações financeiras da Qualcomm são cuidadosamente examinadas na análise financeira, revelando as tendências históricas de crescimento de vendas e rentabilidade durante os últimos trimestres. O relatório analisa em detalhe a situação financeira da empresa e a sua exposição ao risco, através de uma análise aprofundada de parâmetros financeiros importantes como o retorno sobre o capital próprio, o crescimento do fluxo de caixa livre e o retorno sobre o capital investido.

Adicionalmente, o relatório oferece uma visão aprofundada das estratégias da Qualcomm a curto e longo prazo, como a inovação de produtos e as estratégias para ganhar quota de mercado. Uma avaliação detalhada da metodologia de desenvolvimento e fabricação de semicondutores da empresa proporciona uma visão valiosa da sua posição no mercado e da sustentabilidade da Qualcomm. Portanto, combinando todos os métodos de análise financeira, este relatório oferece uma perspetiva de investimento a longo prazo da Qualcomm.

Nesta análise, a aplicação do modelo DCF resultou num preço-alvo de $131,86, representando um potencial de valorização de 16,36%. O método de Avaliação Relativa produziu um preço-alvo de $167,02, correspondendo a um potencial de valorização de 47,39%. Adicionalmente, utilizando o modelo DCF com múltiplo de saída, chegámos a um preço-alvo de $179,17, indicando um potencial de valorização de 58,11%.

Após realizar uma média ponderada destes três métodos, o valor intrínseco por ação foi determinado em $159,35, refletindo um potencial de valorização de 40,62%. Com base nestes resultados, recomendamos uma classificação de Compra para a Qualcomm.

Palavras-Chave: Avaliação Patrimonial; Qualcoom Inc.; Semicondutores; Fluxo de Caixa Descontado; Múltiplos.
Classificação JEL: G30; G32.

Abstract

This project offers a thorough analysis of Qualcomm Inc., a well-known multinational technology company that specializes in the development and manufacturing of semiconductors, telecommunications equipment, and other wireless technologies. Its primary goal is providing an analysis of the company's financial performance, growth prospects, market relevance and company stock valuation. Its will be achieved by analysing the company financial statements, actual and future market perspective, company strategy and sustainability of the firm. Consequently, the purpose of this study is giving important insights of Qualcomm future potential to the investors.

Qualcomm financial statements are carefully examined in the financial analysis, which reveals the historical trends of sales growth and profitability during the last few quarters. The report analyses the company's financial situation and risk exposure in detail by looking closely at important financial parameters like return on equity, free cash flow growth and return on invested capital.

Additionally, the report deep insight of the Qualcomm strategies for the short term and the long term, such product innovation and getting market share strategies. A detailed valuation of the company semiconductor development and manufacturing methodology provides a precious insight of market position and Qualcomm sustainability. Therefore, combining with all financial analysis methods, this report offers a long-term investment perspective of Qualcomm.

In this analysis, the application of the DCF model resulted in a target price of $131.86, representing an upside potential of 16.36%. The Relative Valuation method yielded a target price of $167.02, which corresponds to an upside potential of 47.39%. Additionally, using the DCF with exit multiple, we arrived at a target price of $179.17, indicating an upside potential of 58.11%.

After conducting a weighted average of these three methods, the intrinsic value per share was determined to be $159.35, reflecting an upside potential of 40.62%. Based on these results, we recommend a Buy rating for Qualcomm.

Keywords: Equity Valuation; Qualcoom Inc., Semiconductors; Discounted Cash Flow; Multiples.

JEL Classification System: G30; G32.

Table of Contents

Figure Index

Table Index

Annexes Index

List of Abbreviations

APV – Adjusted Present Value
CAGR – Compound Annual Growth Rate
CAPEX – Capital Expenditures
CAPM – Capital Asset Pricing Model
D&A – Depreciation and Amortization
D/E – Debt to Equity
DCF – Discounted Cash Flow
DDM – Dividend Discount Model
EBIT – Earnings Before Interest and Taxes
EBITDA – Earnings Before Interest, Taxes, Depreciation and Amortization
EMEA – Europe, Africa, and Middle East
EPS – Earnings per Share
EV – Enterprise Value
EVA- Economic Value Added
EV/EBIT – Enterprise Value-to-EBIT
EV/EBITDA – Enterprise Value-to-EBITDA
FCF – Free Cash Flow
FCFE – Free Cash Flow to Equity
FCFF – Free Cash Flow to the Firm
FY – Fiscal Year
GDP – Gross Domestic Product
IMF – International Monetary Fund
IoT – Internet of Things
LATAM – Latin America
LTM – Last Twelve Months
NASDAQ – NASDAQ Composite Index
NOPLAT – Net Operating Profit Less Adjusted Taxes
NPV – Net Present Value
NWC – Net Working Capital
NYU – New York University
MVA – Market Value Added
P/BV – Price-to-Book
P/E – Price-to-Earnings
QSI – Qualcomm Strategic Initiatives
QTL – Qualcomm Technology Licensing
QCT – Qualcomm CDMA Technologies
R&D – Research and Development
ROA – Return on Assets
ROC – Return on Capital
ROE – Return on Equity
ROIC – Return on Invested Capital

S&P 500 – Standard and Poor's 500
SG&A – Selling, General, and Administrative
TGR – Terminal Growth Rate
TV –Terminal Value
WACC – Weighted Average Cost of Capital
WC – Working Capital
YoY – Year-on-Year
YTM – Yield-to-Maturity
10-K – Form 10-K (comprehensive report mandated by SEC that public companies must file annually, detailing their financial performan

1. Introduction

Valuating the Qualcomm Inc. Is the goal of this project, with the main purpose of getting the company shares fair value. It is also necessary to compare it with the sector competitors shares prices that are listed in public market to form an investment recommendation.

The focus of this Equity valuation is to issue a detailed analysis of Qualcomm Inc. Financial performance, company strategy and market position in this extremely competitive sector that is the semiconductor sector.

Throughout the report it will be probed some of the crucial firm valuation points. They are the company growth, market share growth, sustainable competitive advantage, free cash flow growth, capital structure, profitability, and Qualcomm Inc solvency situation. The Qualcomm growth strategy will also be analysed to understand how the company will be positioned in the market.

Besides analysing the company's financial performance, we will approach several other of the firm's topics. They are innovation strategy; market share sustainable strategy and how the company will maintain and increase its competitive advantage. These topics are important due to the high level of competitiveness and innovation in the semiconductors sector.

After introducing the objective, subject, and key inquiries of this thesis, we will now elaborate on the rationale behind selecting an equity report as the research format and elucidate the reasons for selecting Qualcomm Inc for this Equity valuation project.

Firstly, due to our passion for the equity researching sector we realized that project could be a great opportunity to put in practice all the knowledge that we have been getting during our master's and professional career. The elaboration of an Equity valuation report allows us to develop new analytical and research skills in the Finance sector. For instance, learning about new techniques for valuing companies, assessing risk, and getting in-depth knowledge of the semiconductor industry sector that we think has a lot of promise and significance going forward.

In second place, we pretend to explain the reasons behind our choice of Qualcomm Inc, as the company that we will analyse in this report.

Having been established in 1985 and having its main office in San Diego, California, Qualcomm Incorporated is one of the major players in the semiconductor and telecommunications sectors. Given that a sizable percentage of smartphones worldwide are powered by the company's Snapdragon series of processors, its influence on the mobile technology landscape is especially noteworthy.

Studying a company with an enormous dimension and influence allows us to enhance our academic and professional reputation, consequently, to getting a lot of knowledge in the semiconductor industry, that has been increased at an extraordinary rate.

Throughout our Equity Valuation report, we will work with some valuation methods to achieve to the fair value of Qualcomm Inc. shares. To achieve it, it is needed to do a deep research of the sector, company sector position and the financial performance of the firm. Afterwards, we link up all the conditions to do the forecast with the objective to build a (DCF) model that will be linked up with other valuation methods such as the multiples methodology and dividend model.

Lastly, we are going to compare the various outcomes that we were able to get using these different approaches. Then, we will be able to suggest an investment recommendation based on projected returns.

2. Literature Review

Understanding the intrinsic value of a Firm and the factors that are crucial for making informed decisions, particularly in the realm of finance. Valuation is fundamental for a diverse range of stakeholders, including investors, corporation, and financial institutions.

Valuation provides a deep insight that is crucial for investments decisions, capital allocation, corporate finance decision-making, benchmarking, fundraising and strategic planning. In summary, firm valuation is a cornerstone of the finance and investment world, providing essential insights and tools for decision-making, risk management, and strategic planning.

To create a reliable equity value, each asset must be thoroughly assessed, along with its impact on the operational business of the firm. This type of valuation provides transparency, effective capital allocation, increment in the quality of the risk management and optimisation of capital structure. This type of valuation involves uncertainty, and the uncertainty depends on each asset and each type of sector. So, it is important to find the valuation models and metrics that are more appropriate for each type of business in order to decrease the level of uncertainty, and consequently make a valuation as detailed as possible.

2.1 Discounted Cash Flow Valuation

One of the most used methods in finance is the Discounted Cash Flow (DCF) model, which determines the current value of anticipated future cash flows. This valuation model's foundations are found in foundational works like Sharpe's 1964 introduction of the Capital Asset Pricing Model (CAPM) and the ideas of Modigliani and Miller (1958).

Importantly, DCF plays a pivotal role in corporate finance, specifically in capital budgeting and investment decisions. It is featured prominently in educational materials such as "Principles of Corporate Finance" by Brealey, Myers, and Allen (Brealey, Myers, & Allen, 2017) and "Valuation: Measuring and Managing the Value of Companies" by Copeland, Koller, and Murrin (Copeland, Koller, & Murrin, 2000), where its significance in assessing investment projects and guiding strategic decisions within organizations is emphasized.

The DCF model is important due to its ability to provide a structured approach to valuing an investment by estimating the present value of all future cash flows. It also provides flexibility and adaptability across various industries and sectors, making it a powerful tool for financial analysts, investors, and corporate decision-makers.

Moreover, DCF is instrumental in strategic decision-making within corporations. By incorporating the time value of money and discounting future cash flows, companies can effectively allocate capital, prioritize projects, and enhance overall financial performance. Copeland, Koller, and Murrin's research on economic value added (Copeland, Koller, & Murrin, 1995) further explore the integration of DCF principles into corporate finance, showcasing its role in enhancing shareholder value.

In conclusion, the Discounted Cash Flow model has an important role in financial valuation, offering a systematic and theoretically grounded approach to appraising the worth of investments. Its important due to it widespread application in corporate decision-making and investment analysis, as evidenced by the extensive literature and empirical studies that have contributed to its refinement and validation over time.

2.1.1 Free cash flow to the Firm

In the DCF methodology, there are different approaches, the most used by the finance sector experts is the FCFF (Free cash flow to the firm). FCFF is defined as the operating cash flow subtracted by capital expenditures and changes in working capital (Brealey, Myers, & Allen, 2017). Its roots trace back to financial theories, notably contributions by Franco Modigliani (Modigliani, 1963), as it can be represented in the bellowing formula:

$$FCFF = EBIT(1-t) + D\&A - \Delta NWC - CAPEX \quad (1)$$

We shall then reach the first of this model's two phases after computing the value of the FCFF. After it we can calculate the Enterprise Value (EV). Enterprise Value (EV) is a measure of a company's total value, representing the total amount of capital that providers (both debt and equity) have invested in a business. The EV calculation is the sum of the discounting future FCFF to present value by the weighted average cost of capital (WACC), adding the Terminal value (TV) at perpetuity.

$$EV = \sum_{t=1}^{t=n} \frac{FCFF_t}{(1+WACC)^n} + \frac{TV}{(1+WACC)^n} \quad (2)$$

Terminal value refers to the estimated value of an investment or business at the end of a specific forecast period. It is a critical component in financial valuation, especially in Discounted Cash Flow (DCF) analysis, where future cash flows are projected and then discounted back to their present value.

It is worth noting, as per Damodaran (2006), that this stable growth rate should not exceed the growth rate of the economy within which the company operates.

$$Terminal\ Value = \frac{FCFF_{+1}}{WACC-g} \quad (3)$$

Subsequently, it's possible to calculate the Equity value of the Firm:

$$Equity\ Value = EV + NOA - Debt \quad (4)$$

The term NOA refers to non-operating assets that are assets which are not required in the normal operations of a business but that can generate income, nonetheless. Debt refers to all obligations owed by the business, excluding those that are part of working capital.

2.1.1.1 Weighted Average Cost of Capital, WACC

The Weighted Average Cost of Capital is a financial metric that is used to calculate the average rate of return that the company is expected to pay its investors and creditors for using their capital. In other words, it is the average cost that the company supports by raising funds from various sources.

The importance of the Weighted Average Cost of Capital (WACC) in corporate finance is underscored by its pivotal role in guiding capital allocation decisions, determining project viability, and ultimately shaping the financial health and strategic direction of firms (Brealey, Myers, & Ross, 2008).

The Weighted Average Cost of Capital is compounded by different components:

Cost of Equity (Re): The rate of return that is required by the company's equity investors.

Cost of Debt (Rd): The interest rate that a company pays on its debt. It can be the yield to maturity of existing bonds or the interest rate on new debt issuances.

Tax Rate (T): This is the corporate tax rate applicable to the company. The tax shield provided by debt reduce the overall cost of debt.

Capital Structure: These represent the proportions of debt and equity in the company's capital structure, respectively. The weight of Equity and Debt is calculated by dividing the market value of equity and debt by the sum of equity and debt.

This important metric can be calculated using the formula below:

$$WACC = \frac{E}{D+E} \times r_E + \frac{D}{D+E} \times r_D \times (1 - T) \quad (5)$$

Where:

E = Market Value of the Company's Equity

D = Market Value of the Company's Debt

$r_E = Cost\ of\ Equity$

$r_D = Cost\ of\ Debt$

T = Corporate tax rate

2.1.1.1.1 Cost of equity

The cost of equity plays an important role in financial analysis, representing the rate of return required by equity investors. It is crucial to determine the company's cost of capital, when it is combined with cost of debt, forms the Weighted Average Cost of Capital (WACC).

A mainstay of finance, the Capital Asset Pricing Model (CAPM) provides a methodical way to measure the correlation between investment risk and projected return, that allow to calculate the cost of equity.

The Capital Asset Pricing Model (CAPM), which was first presented by William Sharpe in 1964 and then improved upon by John Lintner and Jan Mossin, is now a standard tool for calculating the expected return on an investment relative to its systematic risk.

The Capital Asset Pricing Model (CAPM) involves several key procedures for estimating the expected return on an investment. Here is a step-by-step guide to the CAPM method:

1. **Identify the components**: These components are the risk-free rate (Rf) that is based on the yield of government bonds, particularly Treasury bonds with a maturity similar to the investment horizon and identify the market return (Rm) that is the expected return of the market, typically is used the historical market data or future market expectations to get the market return value.
2. **Calculate the Market Risk Premium**: It is the subtraction between the expected market return and the risk-free rate (Rm-Rf).
3. **Assess Beta(B):** Calculate the Beta coefficient for the asset. Beta measures the assets' sensitivity to the market movements, in the case of Qualcomm Inc., the stock value moves comparing the market movements. The value of the beta expresses the asset volatility compared to the market. If the beta is higher than 1 implies higher volatility and lower than 1 implies lower volatility. This metric is calculated using statistical methods or obtained from financial databases like Bloomberg.
4. **Apply the CAPM Formula:** Estimate the expected return (Re) using the following formula:

$$R_e = R_f + \beta_L \times (R_m - R_f) \quad (6)$$

5. **Interpret the Result**: This rate provides an estimate of the compensation that investors should require for the risk associated with the investment.

This approach is a valuable tool in Finance, so it is reasonable to be aware of its limitations and consider alternative models, especially in situations where the assumptions of CAPM may not hold for example when the market is not perfectly competitive that is normal not to be

perfectly competitive, when the risk-free rate is not constant and when the market risk premium is not constant. It is necessary to analyse to understand the result of the CAPM, because almost all the assumptions normally do not hold when comparing the market situations.

2.1.1.1.1.1 Risk-free rate

The risk-free rate is a mainstay concept in financial theory, originating from Harry Markowitz's modern portfolio theory (Markowitz, 1952). It serves as a key benchmark in a variety of financial models and computations, representing the potential return on a risk-free investment.

Verifiable studies such as those by Eugene Fama and Robert Gibbons (1982) and John Campbell and Robert Shiller (1991), have investigated the determinants of the risk-free rate, analysing its relationship with macroeconomic indicators, monetary policy, and market expectations. According to William Sharpe (1964), the risk free plays a pivotal role in financial models like the Capital Asset Pricing Model (CAPM).

The importance of a risk-free rate is perceivable, however, there are challenges in determining the risk-free rate, as highlighted by Fischer Black (1972), due to the absence of a truly risk-free asset in practice and the influence of factors such as liquidity preferences and market distortions.

2.1.1.1.1.2 Beta

Beta is an indicator of asset volatility in relation to the market, The systematic risk that is inherent in an investment is quantified by beta, which was first introduced by William Sharpe in 1964 within the framework of the Capital Asset Pricing Model (CAPM).

A beta of one indicates that the price of the investment generally moves with the market, a beta of more means higher volatility and a beta of less than one denotes reduced volatility. Nevertheless, academics like Eugene Fama and Kenneth French have developed the idea that beta should not be used as a stand-alone risk indicator due to its shortcomings.

The most used methods for calculating beta are the average of similar businesses or the historical industry beta. Although, the degree of operational level and the kind of business should be analysed. At least financial leverage will affect the accuracy of the result.

The calculation of beta(β) is derived from linear regression analysis and is used to measure the systematic risk of a security or portfolio relative to the market. The formula is as follows:

$$\beta = \frac{Covariance(R_{asset}, R_{market})}{Variance(R_{market})} \quad (7)$$

Where:

- $Covariance(R_{asset}, R_{market})$ is the covariance between the returns of the asset (security or portfolio) and the returns of the market (often represented by a benchmark index such as the S&P 500).
- $Variance(R_{market})$ is the variance of the returns of the market.

2.1.1.1.1.3 Market Risk Premium

In financial literature, the market risk premium is a crucial idea. It is the extra return that investors anticipate from holding risky assets in comparison to risk-free investments. This premium serves as compensation for enduring the unpredictability that comes with investing in the stock market. It has a crucial role in asset pricing models, such as the Capital Asset Pricing Model (CAPM), shedding light on the relationship between risk and expected returns (Sharpe, 1964). Fama and French (1992) assert that evaluating investment possibilities and choosing how to allocate a portfolio requires a thorough understanding of the market risk premium. It represents the reward investors seek for exposing themselves to market fluctuations and volatility.

When instability is more substantial, the premiums increase to account for these risks. This component varies over time and is often estimated depending on each country's economic volatility. There are a lot of different ways to approach the market risk premium at the financial level, but there is no agreement on it.

To calculate the market risk premium, one typically begins by identifying the current risk-free rate, often represented by the yield on government bonds with maturities matching the investment horizon. Next, the expected return on the overall market is estimated, typically using historical data or analyst forecasts based on market indices like the S&P 500.

2.1.1.1.2 Cost of Debt

The cost of debt is the effective interest rate that a company pays by its borrowed funds. This idea has been thoroughly studied in academic and real-world financial management literature. The publications of Modigliani and Miller´s (1958) “The Cost of Capital, Corporation Finance and the Theory of Investment" laid the groundwork for understanding the interplay between capital structure and the cost of capital, including the cost of debt.

Normally, the approaches to calculating the cost of debt often involve methodologies outlined in authoritative texts like "Principles of Corporate Finance" by Brealey, Myers, and Allen (2017) and "Corporate Finance" by Ross, Westerfield, and Jordan (2019). These methods involve determining the yield to maturity (YTM) on the exiting company´s debt instruments or calculating the weighted average cost of debt based on the company's outstanding debt portfolio.

The cost of debt is influenced by various factors such as the creditworthiness of the borrower, prevailing market interest rates, the term and structure of the debt, and tax implications. Most of these factors have an empirical research and field evidence background on studies, such as Graham and Harvey's (2001) "The Theory and Practice of Corporate Finance: Evidence from the Field." The cost of debt has a great impact on a company´s overall cost of capital and impacts financial decisions such as capital structure management, investment evaluation, and financial performance assessment.

2.1.1.2 Terminal Value

The terminal value represents the projected value of a company beyond the forecast period in a perpetual way, providing a thorough evaluation of the company´s long-term perspective.

Its importance is emphasized by McKinsey & Company Inc., Koller, Goedhart, and Wessels (2020) in "Valuation: Measuring and Managing the Value of Companies," where they point out that terminal value captures perpetual cash flows, which is essential for figuring out a company's.

The calculation of the terminal value is often divided into 3 different methods. The first method is the perpetuity growth model, which is mentioned by Bodie, Kane, and Marcus (2021) in "Investments. This model assumes perpetual cash flow and applies a perpetual growth rate. It permits analysts to estimate the terminal value by applying a constant growth rate to the final forecasted cash flow.

Koller (2010) emphasized the most accurate estimate for perpetual growth rate should encompass the expected long-term rate specific to the sector in which the firm operates adjusted for inflation. The perpetuity growth model can be calculated as:

$$Terminal\ value = FCF \times \frac{(1+g)}{(r-g)} \quad (8)$$

Where:

- FCF = Free Cash Flow expected in the terminal year
- g = Perpetual growth rate of Free Cash Flow
- r = Discount rate or required rate of return

The second method is the exit multiple approach that was discussed by Ross, Westerfield, and Jaffe (2018) in "Corporate Finance". In this method, after the forecast period, a multiple is applied to a pertinent financial metric, like Net income or EBITDA. The multiple that is selected provides information about the company´s terminal value by considering industry dynamics and market expectations.

At least, the liquidation of firm assets in the terminal year method is an approach used in financial analysis to permit estimating the terminal value of a business. Instead of assuming perpetual cash flows, this method considers a scenario where the business is dissolved, and its assets are sold off. The terminal value is calculated as the net present value (NPV) of the proceeds from selling the firm's assets. This method is relevant in situations where the business is expected to cease operations or undergo liquidation at the end of a specified period.

2.1.2 Free Cash-flow to Equity

Free Cash Flow to Equity (FCFE), which shows the cash left over after debt payments and reinvestment requirements are taken into consideration, is a crucial financial indicator in corporate finance and investment research. The intrinsic value of a company's stock is estimated by scholars like Aswath Damodaran, who highlights it in his book Damodaran, Aswath. Investment Valuation: Tools and Techniques for Determining the Value of Any Asset. John Wiley & Sons, 2012). According to Brealey, Richard A., Stewart C. Myers, and Franklin Allen, FCFE is typically computed by modifying net income to account for capital expenditures, changes in working capital, and net borrowing.

In financial analysis, FCFE serves as a critical tool for assessing a company's financial health, growth prospects, and ability to generate shareholder value. It is widely utilized in valuation methodologies such as discounted cash flow (DCF) analysis and dividend discount models (DDM), aiding investors and analysts in making informed investment decisions.

Academics talk about the difficulties in interpreting FCFE in various industry contexts, the assumptions that go into its computation, and the effect of accounting procedures. Despite these difficulties, FCFE is nevertheless a crucial indicator in corporate finance, helping managers

with choices about capital allocation, dividend policy, and strategic planning. (Smith, Robert, and Lisa, 2021).

According to Damodaran (2002), we can define the FCFE using the following equation:

$$FCFE = Net\ Income + Depreciation\ \&\ Amortization - \Delta NWC - Capex + \Delta Debt \quad (9)$$

Where:

ΔNWC= Changes in Non-Cash Working Capital Needs

$\Delta Debt$ = New Debt Issued – Debt Repayments

To calculate the equity value of the firm is necessary to take the same actions that are used in the FCFF model for the enterprise value to get the total equity value after computing the FCFE using the earlier calculations.

The primary distinction between the two models is that, rather than using the WACC, it will employ the cost of equity, which is a suitable market discount rate.

The formula that follows demonstrates how to determine a company's equity value:

$$Equity\ Value = \sum_{t=1}^{t=n} \frac{FCFE_t}{(1+r_e)^t} + \frac{\frac{FCFE_n \times (1+g)}{(r_e - g)}}{(1+r_e)^n} \quad (10)$$

Where:

$FCFE_t$= Free cash flow to the equity considering t period

r_e = Cost of Equity

g = Expected Perpetual growth rate of the Company

2.1.3 Adjusted Present Value (APV)

The methodology known as Adjusted Present Value (APV) is a sophisticated approach to business valuation that incorporates complex considerations of both financial and operational elements. In this structure, valuation is achieved by carefully breaking down the entity's worth, separating financial assets from operating assets, and factoring in the tax benefits associated with debt financing. First, analysts calculate the present value of cash flows resulting from core company operations. This is often done by forecasting future cash flows and discounting them with the Unlevered cost of Equity, according to Damodaran (2012).

The APV technique, which is also a discount cash flow model, involves evaluating a project's future cash flows as though they were fully funded by equity before considering all

the advantages and disadvantages of employing debt. These include financial distress costs, interest tax shields, subsidies, hedges, and issues among other expenses, as stated by Luehrman (1997).

The culmination of the APV process integrates the values derived from operating and financial assets, including tax benefits, to ascertain the Adjusted Present Value (APV) of the entity. This holistic valuation framework provides a comprehensive understanding of the company's intrinsic worth, shedding light on the intricate dynamics between operational activities, financial structure, and tax implications (Damodaran, 2012).

According to Damodaran (2006), there are three main steps involved in determining the enterprise value of a company using the APV method: first, estimate the value of the unlevered company by discounting the expected free cash flows to the company at the unlevered cost of equity; next, add the expected tax benefit from a given level of debt; and finally, consider the impact of debt on the company's default risk and expected bankruptcy costs.

Enterprise Value = Unlevered Value of the Firm + PV of Expected Tax Shields of Debt – PV of Expected Bankruptcy Costs (11)

As previously stated, the Unlevered Cost of Equity (KU) is used to discount the anticipated free cash flows to the business to determine the value of the Unlevered value of the business:

$$Unlevered\ Value\ of\ the\ Business = \sum_{t=1}^{t=n} \frac{FCFF_t}{(1+K_u)^t} + \frac{\frac{FCFF_n \times (1+g)}{(K_u - g)}}{(1+K_u)^n} \quad (12)$$

Where:

$FCFE_t$= Free cash flow to the equity considering t period

K_u= Unlevered cost of equity

g = Expect Perpetual growth rate of the Company

The second phase involves estimating the present value of the expenses and benefits associated with the company's debt, which must be computed after the unlevered value has been determined.

To calculate the benefits of the tax shields from debt interest payments, it is necessary to calculate the present value of the benefits of debt, also known as the PV of the interest tax shield (Damodaran, 2006). This may be done by discounting the PV of the interest tax shield by the cost of debt. The following is the general formula for the interest tax shield's present value:

$$\text{Pv Interest Tax Shield} \sum_{t=1}^{n} \frac{T \times D \times r_d}{(1+r_d)^t} \quad (13)$$

Where:

T= Corporate tax rate

D= Market value of Debt

r_d = Cost of debt

At, least Understanding the Present Value (PV) of bankruptcy costs is essential for evaluating corporate financial decisions and managing financial distress effectively. The importance of contract responsibilities, market circumstances, and firm-specific variables in determining bankruptcy costs is emphasized by Damodaran (2002). He places particular emphasis on how industry dynamics, asset volatility, and leverage affect the likelihood and severity of financial distress costs. Furthermore, agency conflicts and asymmetric information has an influence on company financing decisions and the expenses associated with bankruptcy, as noted by Myers and Majluf (1984).

According to Damodaran, there are two methods to assess a company's bankruptcy costs and default indirectly: either calculate the risk of default using a statistical technique or estimate the bond rating based on the cost of capital.

The Present value of the expected Bankruptcy cost is calculated by this formula:

$$PV\ Expected\ Bankrupcy\ Costs = \pi_a \times PV\ Bankrupcy\ Costs \quad (14)$$

Where:

π_a = Probability of Bankruptcy

Once all stages have been calculated, it’s needed to apply the following equation to determine the company's APV:

Business Value = Value of unlevered firm + PV of interest tax Shield – PV Expected Bankruptcy Costs (15)

2.1.4 Economic Value Added (EVA)

A financial performance indicator called Economic Value Added (EVA) attempts to quantify the value created by a business's operations after deducting the cost of capital. Unlike traditional accounting measures such as net income, EVA incorporates the opportunity cost of capital, providing a more accurate reflection of a company's economic profitability (Stewart & Chew, 1997).

EVA is calculated by subtracting the cost of capital from the company's net operating profit after taxes (NOPAT). The formula is as follows:

$EVA = Invested\ Capital\ \times (ROIC - WACC)$ or $EVA = NOPLAT - (Invested\ Capital \times WACC)$ (16)

Where:

NOPLAT = After-tax operating income

Invested Capital = Total amount of capital to fund operations

WACC = Weighted Average Cost of Capital

Economic Value Added (EVA) have a significant importance in corporate finance and strategic management for several reasons:

- **The alignment with Shareholder value**: EVA aligns financial performance metrics to maximize shareholder wealth by considering the true economic profit generated by the company's activities (Stewart & Chew, 1997).
- **Focus on Value Creation:** EVA focuses on value creation by emphasizing the return earned above the cost of capital, encouraging managers to pursue projects and strategies that enhance shareholder value over the long term (Bierman & Smidt, 2003).
- **Performance Measurement and Incentives:** After calculating the EVA it's possible to achieve the Market Value Added (MVA). Damodaran defines as "a simple extension of the net present value" that shows the PV of the total economic value created and is typically discounted at WACC.

The following formula illustrates how MVA is calculated:

$$MVA = \sum_{t=1}^{t=n} \frac{EVA_t}{(1+WACC)^t} \quad (17)$$

The Value of MVA permits to calculation of the company Enterprise value by adding the Invested Capital of the firm, as demonstrated in the below formula:

$$EV = Invested\ Capital + MVA \quad (18)$$

At least, it's possible to estimate the Company Equity value by adding the market value of all non-operating assets and subtracting the amount of non-equity claims.

2.2 The Sum of Parts (SOP)

The Sum of Parts (SOP) methodology is a valuation approach that dismembers the business of the company in different individual business segments, valuing each of them autonomously. After that, their values are aggregated for an overall enterprise valuation. This method, often

employed for diversified companies, provides a more nuanced understanding of the distinct contributions of each segment.

The procedure involves identifying business segments, gathering financial data for each, applying appropriate valuation methods, and summing up the individual values (Copeland et al., 2000). Corporate overheads and synergies are considered, and market conditions are assessed to ensure the valuation reflects real-world dynamics. Regular updates and sensitivity analysis are integral components of maintaining the accuracy and relevance of the valuation (Copeland et al., 2000).

Furthermore, the SOP methodology plays a crucial role in mergers and acquisitions, as discussed in "Applied Mergers and Acquisitions" (Bruner, 2004), where it aids in evaluating the value and synergy potential of different business units.

2.3 Multiples Valuation Approach

A valuation theory known as the multiple method is predicated on the notion that comparable assets trade for comparable values. It is predicated on the idea that comparable businesses will utilize comparable ratios, such as cash flows or operating margins. This approach has a crucial role in the Firm valuation sector, and it is extensively used in corporate finance and investment banking due to its valuable insights into a company's relative performance and overall attractiveness within its industry that this method provided. By facilitating direct comparisons with industry peers, multiples aid in assessing a company's standing, reflecting market sentiment and investor perceptions about its prospects.

In this approach, several crucial steps are involved. Firstly, the selection of comparable companies that are based on similar business characteristics and risk profiles within the same industry. So, the financial data, including metrics like earnings, revenue, and book value, is then collected for both the target company and its chosen comparable. Afterwards, the multiples are calculated and normalized to account for differences in growth rates and risk profiles between the target and the comparable companies. The resulting multiples are applied to the target company, yielding an estimated valuation.

In this approach there are two categories of valuation multiples: enterprise value multiples and equity multiples. Enterprise value multiples include the enterprise-value-to-sales ratio (EV/sales), EV/EBIT, and EV/EBITDA. Equity multiples include the price-to-earnings (P/E) ratio, price-earnings-to-growth (PEG) ratio, price-to-book ratio (P/B), and price-to-sales (P/S) ratio. However, Equity multiples can be artificially impacted by a change in capital structure,

even when there is no change in enterprise value (EV). That is why it is preferable to use EV multiples, since these multiples allow a direct comparison of different firms and their value of the business, regardless of capital structure.

Additionally, this type of approach does not provide a detailed evaluation of the firm, but it can be used by adding it to the other type of valuation methods to make a deep analysis of the firm.

2.4 Dividend model

This approach is an approach of stock valuation that is focused on estimating a company intrinsic value based on its dividend payments. The two prominent dividend models are the Gordon Growth Model (GGM) and the Multi-Stage Dividend Discount Model (DDM), each offering unique insights into valuing stocks based on their dividend characteristics.

The Gordon Growth Model (GGM) is an approach that is used for companies that pay a stable and predictable dividend. This model, is outlined by the formula:

$$P_0 = \frac{D_0 \times (1+g)}{r-g} \quad (19)$$

The P_0 is the current stock price, D_0 is the most recent dividend per share, r is the required rate of return, and g is the constant growth rate of dividends. The seminal book "Security Analysis" (1934) by Graham and Dodd and Gordon's 1962 study are two notable works that address the Gordon Growth Model and its use in valuation.

The Multi-Stage Dividend Discount Model is an approach that is more appropriate for companies with varying dividend growth rates. This model accommodates changing growth rates over different stages of a company's life cycle. The formula is an extension of the GGM, incorporating multiple stages with distinct growth rates as possible to verify in the below formula:

$$P_0 = \frac{D_1}{(1+r)^1} + \frac{D_2}{(1+r)^2} + \frac{D_3}{(1+r)^3} + \cdots + \frac{D_n}{(1+r)^4} + \frac{P_n}{(1+r)^n} \quad (20)$$

Where the P_0 represent the fair value of the stock, the D_n represents the dividend payment in the nth period from now and the P_n represents the stock price in the nth period from now.

In the case of Qualcomm Inc the preferable dividend approach is the Multi-Stage Dividend Discount Model since it is a firm that reinvests its earnings to grow rather than distributing dividends to the shareholders, and due to this growth the growth rate of the dividend payment has been changing over years.

For this type of approach, we need a combination of valuation models to make more comprehensive investment decisions, considering various aspects of a company's financial health.

3.1 Macroeconomic Outlook

The world economy is rebounding very well from the COVID-19 pandemic, Russia's invasion of Ukraine, and the growing cost of living. Because of positive supply-side trends and central bank actions, which have held inflation expectations in check, the inflation is declining from its high in 2022 quicker than anticipated.

In addition, it is predicted that the high interest rates will cause a negative impact on growth in 2024, due to high debt levels.

Economic growth surpassed expectations in the US and several major emerging economies in the latter half of 2023, fuelled by government and private spending, along with real disposable income gains. During 2023 notable supply-side improvements, including labour force participation increased and resolved supply chain issues, which also contributed to the upswing. However, the euro area saw subdued growth due to weak consumer sentiment and high energy prices, while low-income economies struggled with significant output losses amid elevated borrowing costs.

According to World Economic Outlook and Annexes A is projected a steady growth rate for World GDP, expected to be at 3.1 percent in 2024 and 3.2 percent in 2025. Growth in advanced economies is expected to decline slightly from 1.6 percent in 2023 to 1.5 percent in 2024 before rising to 1.8 percent in 2025. For United States is projected a decline in growth from 2.5 percent in 2023 to 2.1 percent in 2024 and 1.7 percent in 2025. The euro area is forecasted to recover from a low rate of 0.5 percent in 2023 to 0.9 percent in 2024 and 1.7 percent in 2025.

Growth in developing and emerging markets is predicted to stay constant at 4.1 percent in 2024 and increase to 4.2 percent in 2025. Although, the growth rate in emerging and developing Asia is predicted to modestly fall from 5.4 percent in 2023 to 5.2 percent in 2024 and 4.8 percent in 2025, with China's economy playing a key role, and India's GDP is expected to rise by 6.5 percent in 2024 and 2025, continuing its high trajectory, but with a lower rate than 2023. The emerging and developing Europe GDP growth is projected an increase from 2,7% in 2023 to 2.8% in 2024 before falling to 2.5% in 2025. At least the Growth in Latin America and the

Caribbean is predicted to slow from 2.5 percent in 2023 to 1.9 percent in 2024 and then rebound to 2.5 percent in 2025.

4.1 Company Overview

Qualcomm Incorporated is a renowned global semiconductor and telecommunications equipment firm based in San Diego, California. Qualcomm was founded in 1985 by Irwin M. Jacobs, Andrew Viterbi, Harvey White, Franklin Antonio, and Adelia Coffman, and it has since evolved to become one of the leading innovators in mobile technology.

The company is well-known for its cutting-edge wireless technologies and contributions to the development of global communication standards. Qualcomm's inventions and innovations have played a pivotal role in improving the mobile landscape, enabling the proliferation of smartphones, tablets, and other connected devices.

Qualcomm's journey began in the 1990s with significant investments in CDMA research, leading to operating losses. To securely fund these losses, the company went public in 1991, raising $68 million, followed by an additional $486 million in 1995 for mass production of CDMA-based equipment. However, faced with financial challenges, Qualcomm carried out a restructuring in 1998, which included layoffs and the spin-off of its base station and cell phone manufacturing divisions. As a result, Qualcomm's financial performance changed rapidly, aided by a jump in profits in succeeding years, propelling it to the top of the market's fastest-growing companies.

In the 2000s, Qualcomm's revenues skyrocketed to $3.2 billion and profits surge to $670 million by 2000. The company expanded globally, setting up offices in vital regions like Europe, Asia Pacific, and Latin America. Qualcomm's strategy was focused on cutting-edge technologies, notably the Internet of Things (IoT), and made strategic acquisitions like Flarion Technologies which fortified its technological arsenal. These decisive actions firmly positioned Qualcomm as a pioneer in the ever-evolving telecommunications landscape.

Qualcomm's expansion and innovation continued well into the 2010s and beyond. Despite problems such as hostile takeovers and regulatory hurdles, the company kept going to increase its business and profitability, announcing historic acquisitions such as NXP Semiconductors and NUVIA. Qualcomm embarked on strategic partnerships and projects in autonomous driving, connected vehicles, and chipmaking, cementing its position as a semiconductor industry leader. As Qualcomm looks to the future, its legacy of pioneering technologies and fostering innovation continues to alter the landscape of wireless communication and beyond.

4.2 Qualcomm Segments and Business Model

The core components of Qualcomm's commercial strategy include connectivity solutions, IP licensing, and chip creation. It creates cutting-edge SoC powering gadgets and makes royalties by licensing proprietary technologies. High-speed internet access is made possible by its modems, especially on mobile devices. The Snapdragon name is a symbol of its high-end SoCs. Qualcomm is looking for development potential by branching out into industries like IoT and automotive. It keeps a leadership edge in semiconductor design and wireless technology thanks to large R&D spending.

Qualcomm operates across several key segments, each contributing to its overall business strategy and revenue generation. Here's an overview of Qualcomm's operating segments:

Qualcomm CDMA Technologies (QCT): The primary goals of QCT are the development and marketing of CDMA (Code Division Multiple Access) technology and associated goods. Cellular networks employ CDMA, a wireless communication technique that allows numerous users to share a frequency channel by giving each user's signal a unique code. CDMA chipsets and other necessary parts for CDMA-based mobile devices, such as feature phones, smartphones like Snapdragon chipsets, and Internet of Things gadgets, are designed and produced by QCT. The widespread use of CDMA technology and its development to enable cutting-edge wireless technologies like 3G, 4G LTE, and 5G are directly attributable to QCT's efforts.

QCT segment has been highly involved in the automotive industry providing solutions for connectivity and telematics systems. The company offers a range of products and technologies tailored to the automotive sector, including wireless communication solutions that enable vehicles to connect to cellular networks, multimedia platforms that power in-car entertainment and infotainment systems, telematics solutions for fleet management, vehicle tracking, and remote diagnostics and technologies that support the development of ADAS features such as collision avoidance, lane departure warning, adaptive cruise control, and automated parking.

Qualcomm Technology Licensing (QTL): The Qualcomm Technology Licensing (QTL) division serves as the cornerstone of Qualcomm's extensive patent portfolio in wireless technologies. Qualcomm has played a leading role in the development of wireless communication technologies, Qualcomm has entrusted QTL with the management and licensing of these patents, which span a broad range from Wi-Fi and Bluetooth to cellular standards including CDMA, LTE, and 5G. Qualcomm grants licenses for its innovations to a wide range of businesses in the mobile ecosystem, including telecoms carriers, device makers,

and chipset suppliers, through QTL. This license arrangement contributes significantly to Qualcomm's business model by providing a sizable cash stream in addition to fostering the broad use and progress of wireless communication technology.

QTL secures equitable licensing terms like SULA for device manufacturers and OEM/ODM agreements. These agreements promote innovation and collaboration, allowing growth in the wireless industry ecosystem.

This Qualcomm segment has clients that are the major giants in the smartphone industry such as Apple, Samsung, Huawei, and Xiaomi that use Qualcomm technologies to power their flagship devices. In addition to these well-known brands, Qualcomm provides its technologies for many OEMs, service providers, and device manufacturers throughout the world, indicating the influence and importance of QTLS licensing agreements in promoting innovation and connectivity in the mobile and wireless industries.

Qualcomm Strategic Initiatives (QSI): This segment includes Qualcomm's diversified business ventures, strategic investments, and emerging technologies initiatives. QSI focuses on exploring new growth opportunities beyond the company's core semiconductor and licensing businesses. It invests in promising startups, explores partnerships in emerging sectors such as IoT, AI, and automotive connectivity, and explores innovative technologies.

These operating segments collectively form Qualcomm's business model, enabling the company to maintain its relevant position in the semiconductor industry, monetize its extensive patent portfolio, explore new growth opportunities, and drive innovation across diverse technology sectors, enabling Qualcomm to continue to shape the future of wireless communication and computing while expanding its footprint in adjacent markets.

5. Industry Overview

5.1 Qualcomm Segments and Business Model

5.1.1 Semiconductor Industry

Prominent in the semiconductor industry, Qualcomm is a leader in mobile CPUs and wireless communication technology. Its Snapdragon processors are the industry leaders in smartphones and tablets because of their outstanding performance and low power consumption.

The notoriously cyclical semiconductor sector saw a difficult year in 2023. Accordingly, to Statista was predicted a sales drop of 9.4% to US$520 billion. That is, due to the less dire than anticipated in the spring. Global sales are now expected to increase in 2024 to US$588 billion, with a growth of 13%. That would be 2.5% more than the record industry revenues of US$574 billion in 2022.

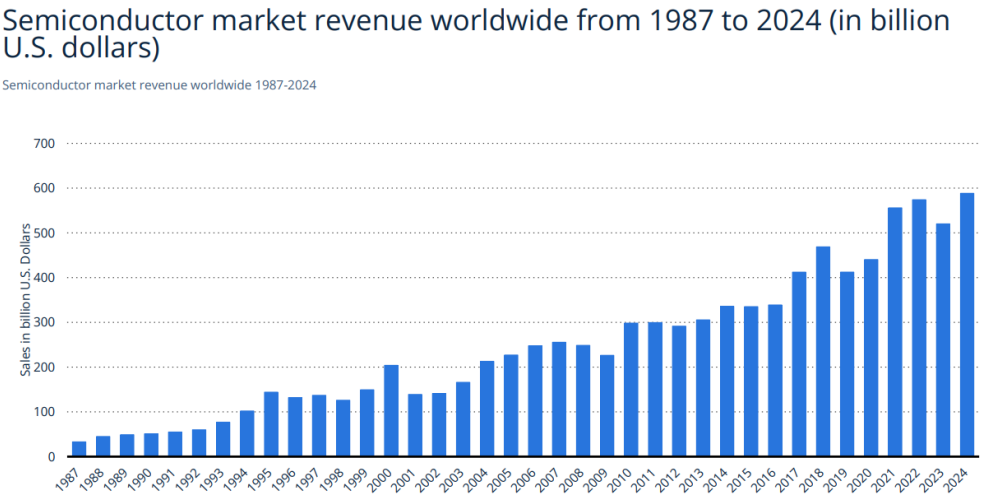

Figure 1: Semiconductor market revenue worldwide from 1987 to 2024 (in B$)

Source: Statista

Accordingly, KPMG's Global Semiconductor Industry Outlook 2024, despite the inventory digestion that took place in 2023 for several areas, thirty percent of semiconductor executives still think there is a surplus of inventory, up from twenty-four percent the previous year. A growing minority (19%), however, believes that rising demand is being prevented from oversupply by AI and other developing technologies. Compared to the previous year, this sentiment is shared by twice as many leaders (nine percent).

The importance of semiconductors nowadays has been rising, consequently, the demand for them has increased subsequently. The semiconductor industry is growing quickly as these tiny devices are starting to become the core of modern technology. All ensuing technologies

are directly impacted by the advancements and discoveries made in this sector. This sector is one of the sectors that have a lot of growth potential and long-term sustainability. This industry is expected to grow from USD 0.72 trillion in 2024 to USD 1.21 trillion by 2029, at a CAGR of 10.86% during the forecast period (2024-2029).

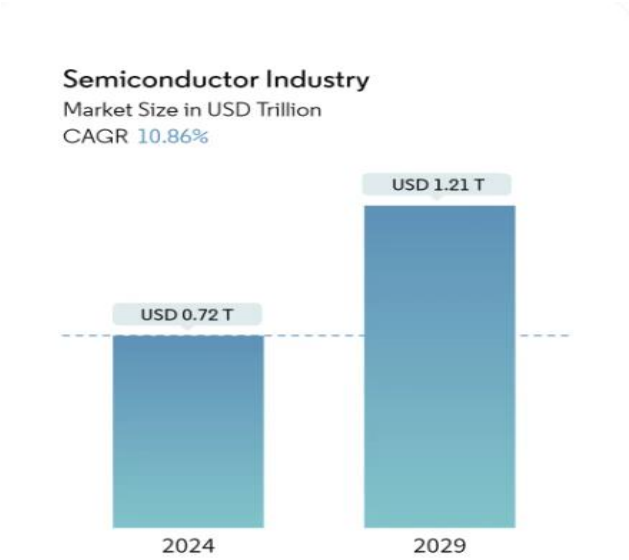

Figure 2: Semiconductor market size in USD Trillion

Source**:** Mordor Intelligence

5.1.1.1 Handsets Semiconductor Segment

The mobile semiconductor market is an important part of the semiconductor industry, fuelled mostly by rising demand for smartphones, tablets, wearables, and other mobile devices.

This market expansion is being driven by factors such as increased smartphone use, expanding internet penetration, and the advent of novel use cases like as IoT devices. Two consequences of it are the pricing pressures and supply chain interruptions. Despite obstacles, the market is expected to develop due to 5G networks deployment, AI advance and machine learning emergency.

The handset semiconductor segment is highly fragmented and dominated by a few significant competitors, such as Qualcomm, MediaTek, Samsung Electronics, and Apple which have been constantly innovating to improve performance, power efficiency, and connectivity in mobile devices. Consequently, the key players are leveraging strategic collaborative initiatives to increase their market share and increase their profitability.

According to Mordor Intelligence, the mobile Phone Semiconductor Market is predicted to grow at a CAGR of 7.49% during between 2024 and 2029. This growth is mainly driven by smart technology adoption and 5G advancements. The incorporation of RF applications into

smartphones emanated marginal growth to continue despite industry stagnation. The upcoming 5G rollout offers significant market prospects in opposition to the smartphone industry's approaching maturity.

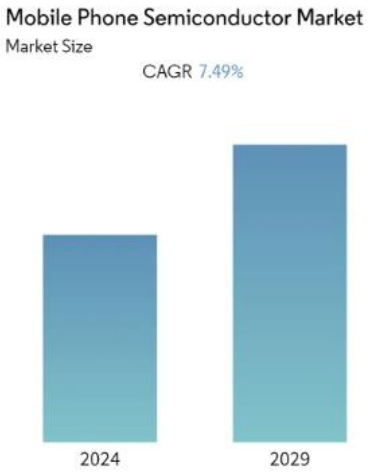

Figure 3: Mobile Semiconductor Market Growth 2024-2029

Source**:** Mordor Intelligence

5.1.1.2 IoT Semiconductor Segment

The IoT semiconductor market focuses on chips tailored for Internet of Things devices, enabling data processing and connectivity. It includes products like sensors, microcontrollers, processors, and connectivity modules. These chips play a vital role in enabling smart and interconnected ecosystems. The market growth of this sector is driven by innovation, efficiency, and security to meet diverse IoT needs.

The IoT sector has a sizable number of regional competitors, but it is moderately competitive. The firms are doing smart joint ventures and procurements to increase their market presence and financial gains.

During the pandemic, several industries experienced a slowdown in the expansion of IoT connections due to supply-side and demand-side issues. Certain IoT contracts were cancelled or delayed because of businesses closing their doors or cutting back on their investment. However, the adoption of IoT devices is also being fuelled by the growing need for automation and the expanding usage of IoT devices in a variety of end-user sectors, including consumer electronics, healthcare, automotive, BFSI, and retail.

The IoT Semiconductor Market size is estimated at USD 0.58 trillion in 2024 and is expected to reach USD 1.16 trillion by 2029, growing at a CAGR of 14.70% as mentioned in the below image.

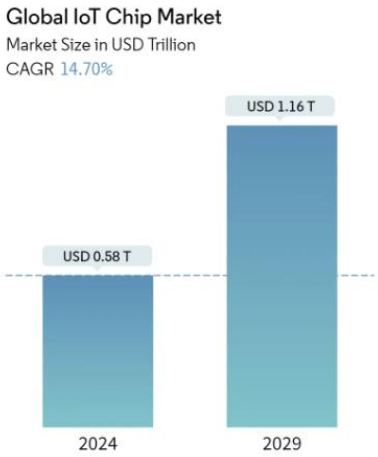

Figure 4: IoT Semiconductor Market Growth 2024-2029

Source: Mordor Intelligence

The development of various networking protocols in conjunction with the integration of connection capability in a broad variety of devices and applications is mainly responsible for this level of growth, which has been observed in the IoT chip market across many end-user sectors.

This sector has a great influence in different sectors such as the Industrial segment, with Industry 4.0 IoT semiconductors have become very important for the new technological approaches in production, development, and logistics chains. That's why the demand for Industrial IoT Objects has been growing at a steady significant rate, with approximately a CAGR of 21,55% between 2018 and 2023, and is expected to continue to grow at a significant rate as mentioned in the below image.

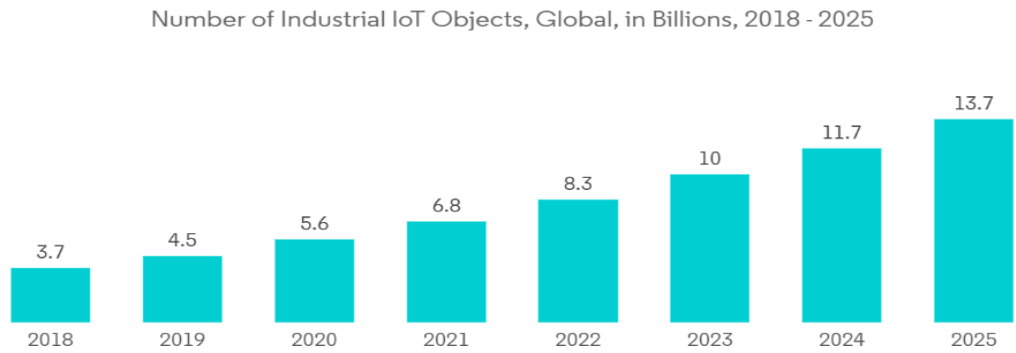

Figure 5: Number of Industrial IoT Objects, Global, in Billions, 2018 - 2025

Source**:** Mordor Intelligence

5.1.1.3 Automotive Semiconductor Segment

The automotive semiconductor market stands at the forefront of innovation, driven by the convergence of automotive and semiconductor technologies. This dynamic sector provides the vital parts and systems that support the performance, safety, and usefulness of modern automobiles, and it is a major source of energy.

The auto industry is expected to develop due to secular electrification trends, growing consumer demand for infotainment and autonomous driving, and growing adoption of AI technology as the main driver of data processing growth.

The automotive semiconductor sector growth is mainly driven by the accelerating adoption of electric vehicles (EVs) worldwide and Advanced Driver Assistance Systems (ADAS) integration and increasing safety regulations propel demand for semiconductor components in vehicles, consequently, thousands of semiconductor chips are crucial for automobiles today.

This sector is highly competitive, driven by highly technological innovation, global market dynamics, and the pursuit of strategic partnerships. Companies must continuously invest in R&D, maintain strong customer relationships, and adapt to evolving market trends to thrive in this competitive landscape. The major players are companies with extensive experience, advanced technology capabilities, and broad product portfolios such as Intel, Texas Instruments, Infineon Technologies AG, NXP Semiconductors N.V., and Renesas Electronics Corporation.

According to the information from Bloomberg Semiconductor research the segment of automotive electronics will grow at a CAGR of 13% between 2022 and 2032. This significant rate is mainly due to the increment of electronic mechanisms in the automobile sector and the high demand and favourable legislation for EVs.

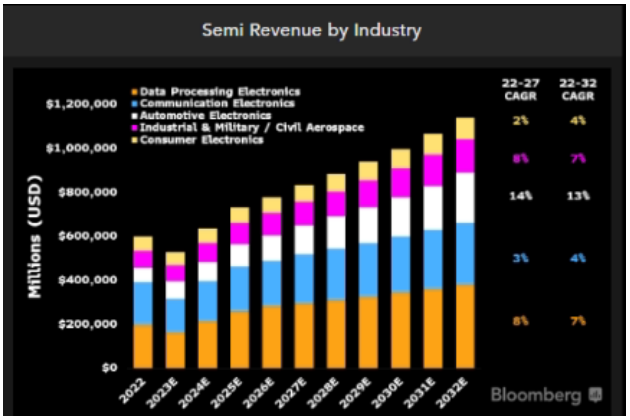

Figure 6: Semiconductor Revenue by Industry, 2022 - 2032

Source**:** Bloomberg Intelligence

6. Company Analysis and Forecasting

6.1Stock Performance

In the five years between December 2018 and December 2023, Qualcomm's stock had a remarkable performance and remained robust in the face of diverse market conditions. The company began trading at $57.40 in late 2018 and increased quickly, reaching $140.23 by the end of 2023. This represents an annual return of 20.30%, excluding dividends. On December 15, 2021, the stock price reached an all-time high of $189.28, demonstrating great investor confidence amid a time of rapid technical developments, especially in 5G technology.

Qualcomm saw a few market developments during this period that affected the performance of its shares. The COVID-19 pandemic caused a global market downturn in the first few months of 2020, which caused Qualcomm's stock and other stocks to fall precipitously from their pre-pandemic levels. However, the tech sector quickly recovered as the value of digital connectivity and remote work became clear, and by the end of 2020, Qualcomm's stock had recovered and exceeded its pre-pandemic highs. The momentum of Qualcomm's 5G technological advancements contributed to the company's stock price increases in 2021. With price swings between $120 and $180, the stock continued its general upward track. The company's deliberate forays into untapped areas, like the automotive and Internet of Things (IoT) domains, have positively impacted investor confidence.

During 2022, some market uncertainties such as inflation concerns and supply chain disruptions impacted all tech sectors, also affecting Qualcomm's stock performance. Despite these challenges and uncertainties around the market, Qualcomm stock remained resilient, with its stock generally trading between $130 and $160, and in 2023, Qualcomm continued to face challenges, including global semiconductor shortages and geopolitical tensions. These factors influenced stock performance, leading to fluctuations with prices ranging from $140 to $170. However, Qualcomm's strategic initiatives, including expanding its product portfolio and forming key partnerships in critical sectors, provided stability despite the external pressures.

During the period under analysis, Qualcomm outperformed the market. While Qualcomm achieved an annual return of 20.30%, the Nasdaq provided an annual return of 17.24%, and the S&P 500 gave an annual return of 13.57%. This significant outperformance underscores Qualcomm's strong market position and effective strategic decisions. (Figure 7- QCOM Returns comparing to benchmark).

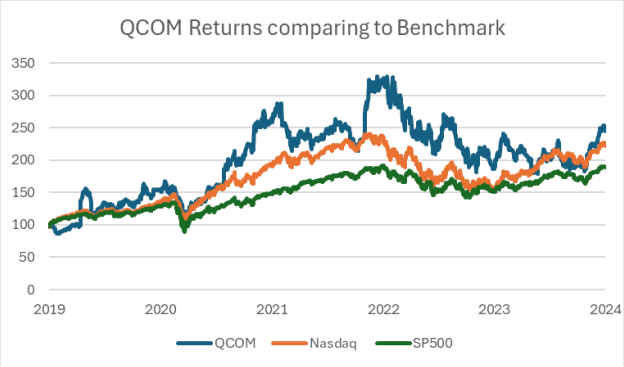

Figure 7: QCOM Returns comparing to benchmark

Source**:** Yahoo Finance

Overall, Qualcomm's success during the last five years demonstrates its capacity for innovation and flexibility in response to shifting market dynamics. The company's focus on strategic diversification and technological leadership in 5G, despite obstacles and ups and downs, helped to continue growth and create value for shareholders.

6.2 Revenues

In the last years, Qualcomm's revenue growth has been driven by the widespread adoption of 5G technology, where the company has established itself as a leader with advanced modems and infrastructure solutions. Lucrative licensing agreements with major smartphone manufacturers like Apple and Samsung, alongside strategic acquisitions such as RF360 Holdings, have bolstered Qualcomm's market position. Additionally, the company has successfully expanded into the IoT and automotive markets, offering innovative solutions for smart devices, home automation, industrial IoT, and advanced automotive technology.

Qualcomm's revenue is segmented into four key divisions, each playing a distinct role in its Revenues. Among these, the Handsets semiconductor segment stands out with the most significant impact, reflecting Qualcomm's dominant position in supplying chips for mobile devices. Concurrently, the Technology Licensing division, while historically influential, has seen fluctuating growth trends, resulting in a gradual decrease in its contribution as a percentage of Qualcomm's total revenue. On the other hand, both the IoT (Internet of Things) and Automotive segments have experienced high growth rates, mainly the Automotive segment, which has markedly increased its share of Qualcomm's revenue over recent periods, underscoring Qualcomm's strategic expansion into automotive technologies.

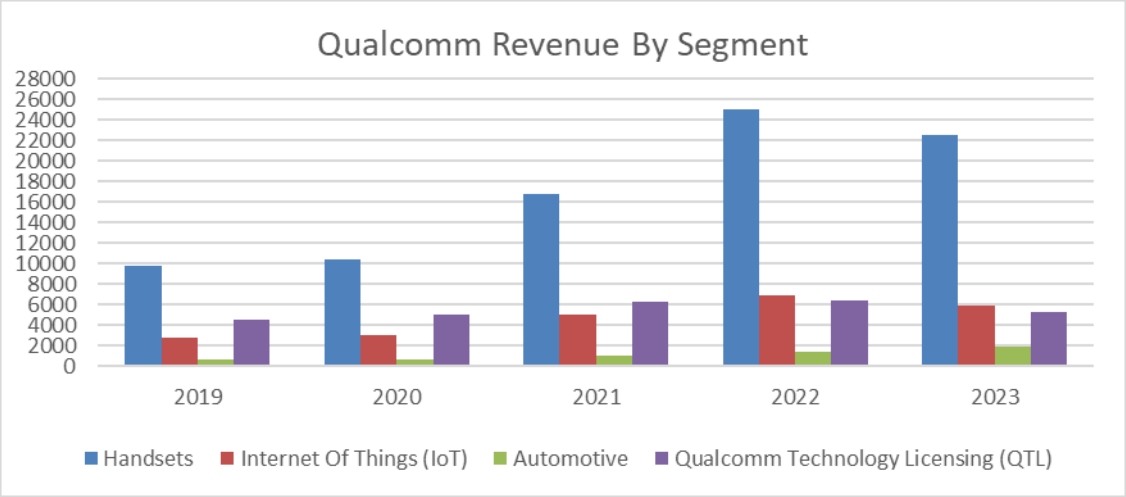

Figure 8: Qualcomm Revenue by Segment

Source: Bloomberg

Qualcomm has led the way in 5G technology, which has experienced significant worldwide acceptance over the past five years, driving the company's handset sales growth, which has attained a CAGR of 23.21%. Qualcomm has thrived on the 5G transition, dominating with essential modems and processors in smartphones through partnerships with Samsung, Apple, and key Chinese brands. Innovations in AI, camera tech, and battery efficiency bolster its chipset appeal across high-end and budget markets. Expansion into growing smartphone markets and post-pandemic market recovery have boosted sales. A diversified product portfolio meets diverse consumer demands, while robust revenues from extensive patents complement chipset sales. Qualcomm stands strong with financial resilience and market leadership in mobile technology.

It is expected that the handsets market will grow at a CAGR of 7.49% until 2029. However, I assumed Qualcomm will outpace this growth, with projections indicating the company will grow 3% above the market rate in 2024 and 2025, and 2% above the market rate until 2029. This optimistic outlook is due to Qualcomm's strong market position, high level of innovation, and historically high growth in this sector.

The spread of IoT applications across industries including smart homes, healthcare, and automotive has been the driving force behind Qualcomm's IoT revenue growth over the last five years, which has attained a CAGR of 21.47%. Their cutting-edge connection solutions particularly in 5G and Wi-Fi 6 have been essential in enabling IoT devices to operate at the high speeds they require. Novel offerings such as the Snapdragon Wear platforms and the Qualcomm IoT Services Suite have addressed a wide range of consumer demands. Their IoT

portfolio has been further expanded through strategic collaborations and acquisitions. The usefulness and attractiveness of devices have improved with the integration of AI into IoT chipsets. Furthermore, Qualcomm's revenue growth has been largely attributed to its investments in developing a strong Internet of Things ecosystem and the general market demand for connected products.

The impact of AI on the globe is predicted to drive the IoT market's growth at a compound annual growth rate (CAGR) of 14.70% through 2029. However, Qualcomm is anticipated to outpace this growth, with projections indicating the company will grow 4% above the market rate in 2024, 3% above the market rate in 2025, 2% above the market rate in 2026, and 1% above the market rate in 2027. After that, Qualcomm is expected to grow at the same level as the market. This optimistic outlook is due to Qualcomm's high level of innovation, high expenditures in research and development, and historically high growth in this sector.

In the Automotive segment, Qualcomm has also demonstrated robust growth, achieving a remarkable 30.78% Compound Annual Growth Rate (CAGR) over the past five years. This growth underscores Qualcomm's strong market position and the increasing adoption of its technologies in automotive advancements, including Advanced Driver Assistance Systems (ADAS), 5G, and Cellular Vehicle-to-Everything (C-V2X) technologies. Through strategic partnerships with major automakers like General Motors and BMW, Qualcomm has effectively expanded its footprint across various vehicle models, contributing significantly to vehicle safety, traffic efficiency, and the progression toward autonomous driving.

The automotive semiconductor market is projected to grow at a compound annual growth rate (CAGR) of 13%. Qualcomm is expected to outperform this market growth, with projections showing a 10% growth above the market in 2024. In the following years, the company is anticipated to continue exceeding market growth by 5% in both 2025 and 2026, 3% in 2027, and 2% in 2028, before aligning with the market growth rate in 2029. This consistent outperformance highlights Qualcomm's strong position in the evolving automotive semiconductor sector.

Historical Growth	CAGR %
Qualcomm Technology Licensing (QTL)	-3,19%
Handsets Qualcomn Growth	23,21%
Iot Qualcomn Growth	21,47%
Automotive Qualcomn Growth	30,78%

Table 1: Qualcomm Historical CAGR

Source: Bloomberg

6.3 Profitability

Qualcomm has witnessed a significant increase in profitability over the past five years. Despite some fluctuations, the company's overall financial trajectory has been remarkably positive. The key metrics underscore this growth: the five-year compound annual growth rate (CAGR) of Qualcomm's net income stands at an impressive 19.6%, while its free cash flow has seen a robust CAGR of 14.8% (Table 2).

Profitability Growth	CAGR %
Revenue	8,2%
Ebitda	18,6%
Operating Income	20,0%
Net Income	19,6%
Free Cash Flow	14,8%

Table 2: Qualcomm Profitability 5Y CAGR

Source: Bloomberg

Over the past five years, Qualcomm has demonstrated strong financial health despite some challenges. The company's gross margin has been declining, due to increased production costs and competitive pressures, but still has a solid gross margin, averaging 59,26% over five years (Annexes B). Strategic investments in innovation might help stabilize this trend. Qualcomm has maintained a solid EBITDA margin, averaging 34.56%, though it saw a notable decline in 2023 likely due to temporary factors (Annexes C). This suggests the potential for increased cash generation soon.

The operating income margin has remained stable, averaging 28.99% over five years, but experienced a decline in 2023 (Annexes D). This drop appears to be influenced by temporary disruptions, with expectations of recovery soon. Qualcomm's net income margin has been ascending, reflecting improved profitability (Annexes E), despite a sporadic decline in 2023 likely caused by one-off expenses.

Overall, Qualcomm's profitability ratios indicate a resilient company facing temporary challenges in 2023. With a strong strategic direction, Qualcomm is expected to continue generating substantial cash flow and maintaining robust profitability in the long term.

Qualcomm has demonstrated robust profitability metrics, particularly in terms of return on invested capital (ROIC) and return on assets (ROA), which highlight the company's efficient use of capital and assets to generate profits. Qualcomm's five-year average ROIC stands at a solid 22% (Annexes F). ROIC measures the return a company earns on its invested capital,

including equity and debt. A high ROIC indicates that Qualcomm is effectively utilizing its capital to generate profits, signifying efficient management and a strong competitive advantage. This efficiency attracts investors, as it suggests that the company can generate returns above its cost of capital, leading to sustainable growth and profitability.

Additionally, Qualcomm has maintained a strong return on assets (ROA), with a five-year average of 14.46% (Annexes G). ROA measures how efficiently a company uses its assets to generate earnings. A high ROA indicates that Qualcomm is proficient in converting its investment in assets into net income. This is crucial for assessing the overall effectiveness of the company's operations and its ability to manage resources.

Qualcomm's gross margin and EBITDA should continue to average steadily over the next five years, assuming the business sustains its present level of profitability. Additionally, I see a little rise in the operating income margin due to Qualcomm's astute cost control and targeted investments. Simultaneously, it is anticipated that the net income margin would sustain its steady state. Qualcomm's solid operating results and capacity to adjust to shifting market conditions while maintaining value delivery to shareholders underpin this expectation (Table 3).

Profitability Ratios	Next 5 Years
Gross Margin	59,26%
Ebitda Margin	34,56%
Operating income Margin	30,68%
Net income Margin	22,71%

Table 3: Qualcomm Profitability Assumptions for the next 5 years

Source: Bloomberg

6.4 Liquidity and Solvency

Qualcomm has significantly improved its short-term liquidity over the last five years, maintaining solid solvency indicators and a better balance sheet, all of which highlight the company's strong financial standing and stable operations.

The current ratio, which gauges Qualcomm's capacity to meet its short-term commitments with its short-term assets, is one important metric for assessing the company's liquidity. In 2019, Qualcomm's current ratio was 1.88. By 2023, this ratio had increased to 2.33 (Annexes H). This improvement means that Qualcomm is better positioned to meet its short-term obligations without resourcing to external financing. An increasing current ratio reflects improved liquidity

and financial flexibility, reducing the risk of liquidity crunches and enhancing the company's ability to invest in growth opportunities or weather economic downturns.

Qualcomm has also made significant efforts in managing its long-term solvency by decreasing its debt-to-equity ratio. In 2019, the company had a debt-to-equity ratio of 324.57%, indicating a high level of debt relative to its equity. However, by 2023, this ratio had a significant decrease to 74.75% (Annexes I). A lower debt-to-equity ratio indicates that the firm has a healthier balance sheet. This reduction in leverage reduces financial risk and interest expenses, providing Qualcomm a greater financial stability and the ability to invest in long-term strategic initiatives without the burden of excessive debt.

Furthermore, Qualcomm has maintained a solid net debt to EBITDA ratio, consistently keeping it below 0.70 over the last five years (Annexes J). The net debt to EBITDA ratio is a critical measure of a company's ability to pay off its debt with its cash generation. This level of ratio means that Qualcomm generates sufficient earnings to cover its debt, highlighting its strong cash flow generation and operational efficiency. This metric is often considered the most crucial among the three because it directly ties the company's debt levels to its operating performance, offering a clear picture of financial health and debt sustainability.

In summary, these Qualcomm actions have helped the company to maintain a strong balance sheet and high levels of solvency. The company is now better positioned for future development and resilience in the face of economic challenges.

6.5 Strategy and Risks

Qualcomm is ideally situated to take advantage of the global shift towards 5G technology, which promises to transform not only smartphones but also the Internet of Things (IoT) and automotive sectors. Qualcomm hopes to benefit from its broad portfolio of intellectual property and its position as a leading supplier of 5G integrated circuit components as a pioneer in the development and standardization of 5G technology. This strategy is critical because 5G has the potential to significantly progress technology and create new markets outside of traditional consumer electronics due to its high-performance and low-power processing capabilities.

In short-term view, Qualcomm faces several challenges that could impact its growth trajectory. The company anticipates a continued drawdown of elevated inventory levels by its customers, that will affect negatively revenue, operational results, and cash flow.

Despite these challenges, Qualcomm remains optimistic about the ongoing deployment of 5G networks and devices, which should sustain demand for their advanced 5G technologies.

However, Qualcomm must navigate intense competition from vertically integrated companies like Samsung and Huawei, which threatens to erode its market share and profitability. To maintain its competitive position in the market, Qualcomm will continue to have significant capital expenditures and invest in new technologies. It is assumed that the value of these capital expenditures will increase over the next five years in accordance with the company's growth.

Additionally, geopolitical risks, especially the U.S./China trade tensions, pose a significant threat to Qualcomm's operations. A substantial portion of Qualcomm's business is concentrated in China, making the company vulnerable to adverse developments in trade relations and national security policies. Qualcomm will make educational efforts to promote the benefits of their licensing programs and to navigate regulatory challenges, but ongoing disputes over royalties and regulatory scrutiny remain potential hurdles, and it will be needed adaptive strategies to sustain its leadership in the evolving 5G landscape.

6.6 Peer Group

Analysing peer groups is essential for assessing company's performance within its industry. This approach allows investors and analysts to benchmark a company's efficiency, profitability, and strategic positioning against its competitors.

Ticker	Name	ROIC	ROE	EBITDA Margin	Profit margin %	Net Sales - 5 Yr CAGR	Market Cap IN B$
QCOM US Equity	QUALCOMM INC	21,40%	36,53%	27,36%	20,19%	8,36%	160,97 USD
Median	Median (Excluding QCOM US)	12,69%	17,04%	29,90%	18,30%	9,96%	9,60 USD

Ticker	Name	ROIC	ROE	EBITDA Margin	Profit margin %	Net Sales - 5 Yr CAGR	Market Cap IN B$
OLED US Equity	UNIVERSAL DISPLAY CORP	14,95%	15,91%	47,95%	36,52%	12,71%	8,19 USD
AVGO US Equity	BROADCOM INC	23,58%	60,31%	55,95%	37,91%	11,29%	472,29 USD
IPGP US Equity	IPG PHOTONICS CORP	2,02%	3,41%	13,55%	18,25%	-3,29%	4,60 USD
COHR US Equity	COHERENT CORP	-0,46%	-9,09%	12,83%	-6,41%	27,35%	5,96 USD
2379 TT Equity	REALTEK SEMICONDUCTOR CORP	12,11%	20,44%	10,88%	9,64%	17,16%	7,15 USD
2454 TT Equity	MEDIATEK INC	12,15%	17,07%	20,06%	16,78%	10,43%	47,99 USD
TXN US Equity	TEXAS INSTRUMENTS INC	28,50%	45,38%	50,45%	37,71%	1,24%	139,92 USD
ADI US Equity	ANALOG DEVICES INC	7,86%	9,20%	49,70%	18,35%	12,08%	89,06 USD
MCHP US Equity	MICROCHIP TECHNOLOGY INC	22,91%	38,52%	48,93%	29,57%	9,49%	44,10 USD
6965 JP Equity	HAMAMATSU PHOTONICS KK	13,26%	14,29%	32,15%	18,18%	9,19%	6,14 USD
ON US Equity	ON SEMICONDUCTOR	22,45%	33,87%	38,97%	26,72%	7,18%	32,52 USD
SWKS US Equity	SKYWORKS SOLUTIONS INC	13,24%	17,02%	36,43%	20,09%	3,86%	16,25 USD
3034 TT Equity	NOVATEK MICROELECTRONICS COR	33,45%	35,84%	25,42%	22,00%	12,92%	9,30 USD
6723 JP Equity	RENESAS ELECTRONICS CORP	11,63%	18,51%	40,06%	19,86%	16,10%	32,04 USD
6963 JP Equity	ROHM CO LTD	4,52%	7,02%	27,65%	14,41%	1,68%	7,15 USD

Table 4: Qualcomm Peer Group

Source: Bloomberg

Qualcomm, a notable member of its peer group, demonstrates a strong Return on Invested Capital (ROIC) of 21.40%. This is significantly higher than the median ROIC of 12.69% for the peer group, indicating Qualcomm's superior capability in generating returns on its invested capital. Within this group, Texas Instruments Inc. and Novatek Microelectronics Corp. have

the highest ROICs at 28.50% and 33.45%, respectively. Despite these figures, Qualcomm's ROIC still signifies a commendable performance. This high ROIC means that Qualcomm have an effective capital management and strategic investments, positioning it favourably compared to its peers. Therefore, it can be concluded that Qualcomm has been managing its capital well to achieve impressive returns, which means in a strong operational efficiency comparing with this competitive industry.

According to the ROE, Qualcomm, demonstrates a robust Return on Equity (ROE) of 36.53%, significantly higher than the median ROE of 17.04%. Broadcom Inc. leads with an ROE of 60.31%, followed by Texas Instruments at 45.38%. High ROE means an effective use of shareholders' equity to generate profits. Qualcomm's superior ROE suggests efficient management and strong operational performance comparing to the peer group.

Qualcomm demonstrates strong financial metrics. The EBITDA margin is 27.36%, which was close to the median of 29.90%, indicating solid operational efficiency. Furthermore, Qualcomm's profit margin stands at 20.19%, surpassing the peer group's median of 18.30%.

Qualcomm's sales growth indicators show that it is marginally below the median of its competitors. In contrast to the peer median of 9.96%, Qualcomm's 5-year Compound Annual Growth Rate (CAGR) stands at 8.36%. The firms that have most grown in this period are Coherent Corp. (27.35%), Renesas Electronics Corp. (16.10%), and Realtek Semiconductor Corp. (17.16%). Despite this, Qualcomm has grown well over the years, especially considering its significant market share, which makes it more challenging to achieve the same growth rates as smaller or less dominant companies.

Based on Qualcomm's impressive ROIC and robust ROE, we conclude that the firm has done a great job of managing capital and running its operations. Its competitive strength is shown by its great profitability and efficient use of resources, even though Qualcomm is outperformed by Microchip Technology Inc. and Broadcom Inc. in all criteria. Despite slightly slower growth rates, Qualcomm's consistent performance and substantial market presence demonstrate the company's solid position in the industry (Table 4).

7. Valuation

we looked at the semiconductor industry and did thorough macroeconomic research before estimating Qualcomm Inc.'s future course by looking at its past financial results. To determine Qualcomm's fair value, we will employ various valuation methods, including a Discounted Cash Flow (DCF) analysis, which involves calculating the Weighted Average Cost of Capital (WACC). Additionally, we will use relative valuation by comparing Qualcomm with its peers in the semiconductor industry and perform a DCF analysis with an exit multiple approach. To ensure a solid and comprehensive assessment of Qualcomm's fair share price, we will integrate scenario analysis and sensitivity analysis to fully grasp possible hazards.

7.1 Cost of Equity, R_e

The CAPM (Capital Asset Pricing Model) method was used to determine the cost of equity. The relationship between systematic risk and expected return for assets, especially stocks, is best described by using CAPM model. The cost of equity, or the return that investors demand for purchasing stock in a company, is estimated using this method.

Firstly, was needed to get the value of the Risk-free rate. It represents the return on an investment with zero risk, serving as the baseline for evaluating the cost of equity. For this calculation, we obtained the value of the risk-free rate from Bloomberg. We selected the yield on US 10-year Treasury Bonds in particular, which is recognized as a trustworthy proxy for the risk-free rate because US government securities have a low default risk and the Cash flow of QCOM is in US dollars. The yield value of US 10-year government bonds was 3.88% on December 31, 2023.

As Qualcomm operates in multiple countries, each with its own level of risk. To accurately reflect the additional risks posed by these various countries, we calculated a weighted average of the country risk premiums (CRP). The CRP values for different countries were sourced from the NYU Stern website, which values is expressed in Table 5. The weight of each country is according to the weight of operations in Qualcomm's business, sourced from Bloomberg, and we assumed the same weight for the next years. (Annexes K), and for Other Foreign (Excluding South Korea, Ireland, China) was assumed the CRP of the world. This weighted CRP value, calculated based on Qualcomm's geographic operations, is 1.97%, capturing the additional risk premium that Qualcomm faces in its international markets.

CRP items	Value	Source
CRP China	1,03%	Damadoran
CRP Vietnam	4,40%	Damadoran
CRP World	5,75%	Damadoran
CRP South Korea	0,72%	Damadoran
Weighted Average CRP	1,97%	Damadoran

Table 5: Qualcomm Weight Average CRP

Source: NYU Stern website

For the beta calculation, we used the sector beta, which represents the risk of the sector in which Qualcomm operates. The sector beta is advantageous because it provides a broader measure of systematic risk that is less affected by company-specific anomalies or short-term fluctuations. Unlike the individual beta, which is calculated based on the correlation of Qualcomm's stock price with the overall market, the sector beta captures the average risk profile of the entire sector. To get the semiconductor unlevered beta, we used the same weighted average approach and the unlevered beta of the sector in different regions were sourced from the NYU Stern website. For Vietnam, Other Foreign (excluding South Korea, Ireland, China), and South Korea, we considered the emerging markets semiconductor beta. After averaging the different unlevered betas, we got a value of 1.38 (Table 6).

Unlevered Beta	Value	Source
Semiconductor Unlevered Beta China	1,26	Damadoran
Semiconductor Unlevered Beta Emergin MKT	1,59	Damadoran
Semiconductor Unlevered Beta US	1,43	Damadoran
Semiconductor Sector Unlevered Beta	1,38	Damadoran

Table 6: Qualcomm Weight Average Semiconductor Unlevered Beta

Source: NYU Stern website

To account for the extra risk brought on by the capital structure of the company, we had to compute the levered beta of the company after obtaining its unlevered beta. The levered beta incorporates the effects of the firm's debt on its risk profile. To determine this, we used the levered beta formula, which adjusts the unlevered beta based on the firm's debt-to-equity ratio (D/E) and the corporate tax rate. Specifically, with a D/E ratio of 9,98% and a corporate tax rate of 21%, the formula accounts for the increased risk associated with financial leverage.

$$Levered\ Beta = Unlevered\ Beta \times \left[1 + (1 - Tax\ rate) \times \frac{D}{E}\right] \quad (19)$$

This adjustment resulted in a levered beta of 1.49, representing the firm's risk relative to the market after including the impact of its debt.

Lastly, to determine the cost of equity, it is needed to obtain the Equity Risk Premium (ERP), which indicates the extra return that investors expect for taking on the risk of equities over a risk-free investment like government bonds. This ERP for a mature market, such as the USA, is 4,60%, that was provided by NYU Stern. How Qualcomm has operations in other countries, we added the value of Country Risk Premium (CRP), obtaining the value of Equity risk premium of 6,57%.

Finally, all the requirements to calculate the cost of equity are satisfied, and we obtained the cost of equity of 13.65% (Table 7) using the following formula:

$$R_e = R_f + \beta_L \times ERP \tag{20}$$

Cost of Capital items	Value	Source
Semiconductor Sector Beta	1,38	Damadoran
Levered Beta Qualcoom	1,49	Damadoran
Risk Free	3,88%	Bloomberg
Equity Risk Premium USA	4,60%	Damadoran
Weight Average CRP	1,97%	Damadoran
Equity Risk Premium	6,57%	Damadoran
D/E	9,98%	Bloomberg
Corporate taxes	21,00%	Bloomberg
Re	**13,65%**	**Bloomberg**

Table 7: Qualcomm Cost of Equity

Source: NYU Stern website and Bloomberg

7.2 Weighted Average Cost of Capital (WACC)

The Weighted Average Cost of Capital is a financial metric that is used to calculate the average rate of return that the company is expected to pay its investors and creditors for using their capital. In other words, it is the average cost that the company supports by raising funds from various sources.

To calculate the Weighted Average Cost of Capital (WACC), one of the essential components required is the cost of debt. In this case, the cost of debt has been determined to be 5.67% (Table 8), a value sourced from Bloomberg.

With this crucial information in hand, all the necessary conditions are now satisfied to proceed with the WACC calculation. After incorporating the cost of debt along with other relevant financial metrics, the calculated WACC stands at 12.82% (Table 8).

WACC itens	Value	Source
Re	13,65%	Bloomberg
Cost of Debt	5,67%	Bloomberg
Market Cap	160 973 190 000,00 USD	Bloomberg
Market Value Debt	16 067 000 000,00 USD	Bloomberg
E/V	90,92%	Bloomberg
D/V	9,08%	Bloomberg
Corporate taxes	21,00%	Bloomberg
WACC	**12,82%**	**Bloomberg**

Table 8: Qualcomm WACC

Source: NYU Stern website and Bloomberg

7.3 Terminal Growth Rate

It becomes essential to maintain the implicit premise that Qualcomm will continue to produce cash flows in a perpetuity manner to evaluate this semiconductor business. Consequently, the terminal value of the company, which is based on a continuous growth rate, must be ascertained.

We used a method that combines the predicted real GDP growth rate and the expected inflation rate to determine the terminal growth rate. This method considers both the real growth in economic output and the rise in price levels to produce a thorough and realistic estimate of long-term growth, using the following formula:

$$TGR = (1 + LT\ Inflation\ Rate) \times (1 + LT\ Real\ GDP\ Growth\ Rate) - 1 \quad (21)$$

To estimate the terminal growth rate, we used a weighted average approach to account for both the expected inflation rate and the expected real GDP growth rate, according to Qualcomm's business operations as discussed in the previous chapters. This method provides a more accurate and realistic projection by considering the specific economic factors that influence Qualcomm's diverse markets and operations. Based on this approach, the value of the terminal growth rate is 6.57% (Table 9).

TGR Items	Value	Source
GDP China long term rate	4,20%	Bloomberg
GDP Vietnam long term rate	6,55%	Bloomberg
GDP World long term rate	3,10%	Bloomberg
GDP South Korea Rate long term rate	2,20%	Bloomberg
GDP Long term growth rate	**4,10%**	**Bloomberg**
Inflation China Long term growth rate	2,00%	Bloomberg
Inflation Vietnam Long term growth rate	3,70%	Bloomberg
Inflation World Long term growth rate	3,20%	Bloomberg
Inflation South Korea Long term growth rate	2,00%	Bloomberg
Inflation Long term growth rate	**2,37%**	**Bloomberg**
Terminal Growth Rate	**6,57%**	**Bloomberg**

Table 9: Qualcomm Terminal Growth Rate

Source: Bloomberg

7.4 Present Value of the Free Cash Flow to the Firm

According to my projections, we anticipate that free cash flow will grow at a compound annual growth rate (CAGR) of 4,83% between 2023 and 2029 (Table 10). This growth rate is primarily driven by the optimism around Semiconductor sector. Semiconductors are the backbone of modern technology, powering everything from smartphones to data centres. The continuous innovation and scaling in this sector, coupled with the surge in demand for high-performance chips to support AI, 5G, and other emerging technologies, are set to drive substantial growth. Qualcomm's significant presence in the semiconductor sector positions is advantageous to capitalize on these trends and generate high levels of free cash-flow.

Cash Flow	2024	2025	2026	2027	2028	2029	Terminal Value
Operating Cash flow Items							
NOPLAT	9 622,5	10 702,4	11 820,3	13 037,5	14 362,9	15 819,1	
Depreciation & Amort.	1 541,8	1 714,8	1 893,9	2 089,0	2 301,3	2 534,7	
WC Capital Variation	2 425,5	1 911,0	1 978,3	2 154,0	2 345,5	2 577,1	
Operating Cash Flow	**8 738,7**	**10 506,1**	**11 735,9**	**12 972,5**	**14 318,7**	**15 776,7**	
Investing Cash flow							
Capex	1 169,0	1 589,0	1 681,0	1 851,9	2 039,7	2 701,3	
Investing Cash flow	**(1 169,0)**	**(1 589,0)**	**(1 681,0)**	**(1 851,9)**	**(2 039,7)**	**(2 701,3)**	
Free Cash Flow	5 677,3	8 917,1	10 054,9	11 120,6	12 279,0	13 075,4	223 074,8
PV Free Cash Flow	5 186,2	7 220,1	7 216,1	7 073,9	6 923,1	6 534,3	111 480,5
Enterprise Value	**151634,16**						

Table 10: Qualcomm Forecasted Free Cash Flow to the Firm

Source: Own Projections

Based on our estimation, the terminal value of Qualcomm is projected to be $223074.8 million. To get the Enterprise value of the Firm is needed to discount the Future Cash flow and the Terminal Value to the Present and sum them. After summing these present values, we obtained an enterprise value of $151634,16 million for Qualcomm. This enterprise value reflects the combined worth of all projected cash flows, adjusted for the time value of money, and provides a comprehensive valuation of the company based on current expectations and future growth prospects.

7.5 Intrinsic Value (DCF Approach)

To obtain the fair value of Qualcomm equity shares, it is needed to add the value of Cash and Equivalents ($8.45B) and Short-term Investments ($2.874B) to the Enterprise Value ($151B) and subtract the value of Debt ($16B). After calculating the Total Intrinsic Equity Value ($196B), we divided it by the number of Shares Outstanding (1.11B), arriving at a value of $113,32 per share (Table 11). This represents an upside potential of 16,36% compared to the current share price of $113.23 as of December 31, 2023, indicating a Buy Recommendation.

Intrinsic Fair value	Value
Firm Enterprise Value DCF Model	151 634 160 024,01 USD
Cash and Equivalents	8 450 000 000,00 USD
Short term investments	2 874 000 000,00 USD
Market Value Debt	16 067 000 000,00 USD
Equity Value	146 891 160 024,01 USD
Shares outstanding	1114000000,00
Implied Intrinsic Value	**131,86 USD**
Current Share Price	**113,32 USD**
Upside Potential	**16,36%**

Table 11: Qualcomm Intrinsic Share Value (DCF Approach)

Source: Own Estimations

7.6 Relative Valuation

Relative valuation is a widely used technique in financial analysis that involves comparing a company to its peers to determine its market value. This method is particularly useful in industries like semiconductors, where companies often exhibit similar financial characteristics and growth prospects.

To conduct a relative valuation analysis, the first step is to gather data on semiconductor companies. For this purpose, we obtained the necessary data from Bloomberg, a trusted source of financial information and analysis. Bloomberg provides extensive financial metrics and ratios for companies across various sectors, including semiconductors. The next step was to refine the peer group to ensure a meaningful comparison. we applied a specific filtering criteria based on three critical financial multiples: EV/EBITDA (Enterprise Value to Earnings Before Interest, Taxes, Depreciation, and Amortization) and EV/EBIT adjusted (Enterprise Value to Earnings Before Interest and Taxes adjusted) and EV/SALES (Enterprise Value to Sales). To focus on relevant comparisons, we excluded firms that had an EV/EBITDA multiple higher than 40 and an EV/EBIT adjusted multiple higher than 40 (Annexes L). This exclusion helps in removing outliers that could distort the valuation analysis.

After filtering the peer group, we proceeded to calculate the average values for the multiples. These averages provide a benchmark for assessing the relative value of companies within the semiconductor industry. By comparing a target company's multiples against these averages, we can determine whether it is overvalued or undervalued relative to its peers.

After calculating the multiples, we determined the fair value of the share price according to this approach. The fair value is $150.27 based on the EV/EBITDA multiple of 18,75 (Annexes M), $140.96 based on the EV/EBIT adjusted multiple of 19,88 (Annexes M), and $209.82 based on the EV/SALES multiple of 6,66 (Annexes M). To arrive at the overall fair value, I took the average of these three multiples, resulting in a final value of $167.02 per share (Table 12).

Relative Valuation	Value
EV/EBITDA Intrinsic Value	150,27 USD
EV/EBIT Adj Intrinsic Value	140,96 USD
EV/Sales Intrinsic Value	209,82 USD
Implied Intrinsic Value	**167,02 USD**

Table 12: Qualcomm Intrinsic Share Value (Relative Valuation Approach)

Source: Own Estimations

7.7 Intrinsic Value (Exit Multiple Approach)

In the DCF valuation with an exit multiple we choose a multiple based on EV/EBITDA, and we used two different approaches: the 5-Year Average Multiple and the Current Market Multiple. The 5-Year Average Multiple approach calculates the average EV/EBITDA multiple over the past five years, providing a stable, historical perspective by smoothing out short-term market fluctuations. On the other hand, the Current Market Multiple approach uses the latest EV/EBITDA multiples of similar companies of the peer group, reflecting current market conditions and trends. This method is especially relevant in dynamic industries, offering a real-time benchmark that aligns the valuation with contemporary industry standards. By combining both approaches, the DCF valuation balances historical stability with current market dynamics, providing a comprehensive estimate of the company's value at exit.

According to Bloomberg, the average for the 5-Year Average Multiple on December 24, 2023, is 11.77 (Annexes N), and the EV/EBITDA of the peer group is 18,75 that was utilized in relative valuation approach.

To achieve a more reliable exit multiple, we decided to incorporate a weight of 60% for the 5-Year Average Multiple and 40% for the current market multiple, resulting in a value of 14.56 (Annexes O) and an enterprise value of $204 billion (Annexes O). we believe the 5-Year Average Multiple is more accurate than the current market expectation due to Qualcomm's size, which indicates less growth potential compared to some firms within Qualcomm's peer group.

Applying this method, we calculated an intrinsic value of $179,17 per share (Table 13), reflecting an upside potential of 58,11% and leading to a BUY recommendation.

Intrinsic Fair value	Value
5Y QCOM Average EV/EBITDA	11,77 USD
Peer EV/EBITDA	18,75 USD
Combined EV/EBITDA Multiple	14,56 USD
Firm Enterprise Value DCF Exit Multiple	204 342 160 405,58 USD
Cash and Equivalents	8 450 000 000,00 USD
Short term investments	2 874 000 000,00 USD
Market Value Debt	16 067 000 000,00 USD
Equity Value	199 599 160 405,58 USD
Shares outstanding	1114000000,00
Implied Intrinsic Value	**179,17 USD**
Current Share Price	**113,32 USD**
Upside Potential	**58,11%**

Table 13: Qualcomm Intrinsic Share Value (DCF Exit Multiple Approach)

Source: Own Estimations

7.8 Scenario Analysis

In our projections, we considered three scenarios—Low, Medium, and High assumptions for Handsets, IoT growth, Automotive growth and Profitability margins. These scenarios are based on different percentage gaps relative to the Medium assumption (Annexes P).

For Handsets and IoT growth, under the Low assumption, we assumed a negative gap of 2% relative to the Medium assumption. This means that in the Low scenario, the growth rate for Handsets and IoT will be 2% lower than the Medium assumption. The Medium assumption represents the baseline growth projection for Handsets and IoT. Under the High assumption, we assumed a positive gap of 2% relative to the Medium assumption. In this scenario, the growth rate will be 2% higher than the Medium assumption.

For Automotive growth, the assumptions are as follows: Under the Low assumption for 2024 and 2025, we assumed a negative gap of 4% relative to the Medium assumption for these years. From 2026 onwards, the negative gap reduces to 2%. The Medium assumption serves as the baseline projection for Automotive growth. Under the High assumption for 2024 and 2025, we assumed a positive gap of 4% relative to the Medium assumption for these years. Starting from 2026, this positive gap decreases to 2%.

Related to profitability, under the Low assumption, we assumed a negative gap of 1.5% in gross margin and EBITDA margin relative to the Medium assumption. Under the High assumption, we assumed a positive gap of 1.5% relative to the Medium assumption.

The Low assumption corresponds to a share price of $116.60 representing an upside potential of 2.89%. The Medium assumption indicates a share price of $131.86, representing an upside potential of 16.36%. The High assumption projects a share price of $148.88, representing an upside potential of 31,39% (Table 14).

Based on these scenarios, it is evident that, given the current price of $113.32, Qualcomm's share price is undervalued, making it a BUY recommendation.

Scenario Analysis	Value	Upside Potential
Low Assumptions Share Price	116,60 USD	2,89%
Medium Assumptions Share Price	131,86 USD	16,36%
High Assumptions Share Price	148,88 USD	31,39%

Table 14: Qualcomm Scenario Analysis

Source: Own Estimations

7.9 Sensitivity Analysis

Sensitivity analysis is a crucial tool in equity valuation that allows investors to understand how different variables impact the value of a stock. By examining how changes in key inputs affect a company's projected financial performance and, ultimately, its stock price, investors can better assess the risks and potential returns associated with their investments. This analysis helps to identify the range of possible outcomes and guides the investors in making more informed decisions.

Two critical variables often scrutinized in sensitivity analysis are the Terminal Growth Rate and the Weighted Average Cost of Capital (WACC). In the case of Qualcomm, sensitivity analysis has shown that the current stock price is lower than the majority of the price points derived from varying assumptions about the Terminal Growth Rate and WACC (Table 15). This undervaluation indicates that the current share price is lower than what is justified by the sensitivity analysis, suggesting a buying opportunity. At the current share price is perceivable that there is a good risk/reward relation, making Qualcomm an attractive investment. Thus, a buy recommendation is warranted based on the potential for substantial upside.

		WACC											
	131,86 USD	11,02%	11,32%	11,62%	11,92%	12,22%	12,52%	12,82%	13,12%	13,42%	13,72%	14,02%	14,32%	14,62%
Terminal Growth rate	4,47%	136,90 USD	130,52 USD	124,68 USD	119,31 USD	114,36 USD	109,78 USD	105,53 USD	101,58 USD	97,89 USD	94,45 USD	91,22 USD	88,19 USD	85,34 USD
	4,82%	143,01 USD	136,02 USD	129,64 USD	123,81 USD	118,46 USD	113,52 USD	108,96 USD	104,72 USD	100,79 USD	97,12 USD	93,69 USD	90,48 USD	87,47 USD
	5,17%	149,85 USD	142,14 USD	135,15 USD	128,79 USD	122,97 USD	117,62 USD	112,70 USD	108,15 USD	103,93 USD	100,01 USD	96,36 USD	92,95 USD	89,75 USD
	5,52%	157,56 USD	149,00 USD	141,29 USD	134,30 USD	127,94 USD	122,13 USD	116,80 USD	111,89 USD	107,35 USD	103,15 USD	99,25 USD	95,61 USD	92,21 USD
	5,87%	166,32 USD	156,75 USD	148,18 USD	140,46 USD	133,47 USD	127,12 USD	121,31 USD	115,99 USD	111,09 USD	106,57 USD	102,38 USD	98,49 USD	94,87 USD
	6,22%	176,36 USD	165,56 USD	155,96 USD	147,37 USD	139,65 USD	132,66 USD	126,31 USD	120,51 USD	115,20 USD	110,31 USD	105,80 USD	101,63 USD	97,75 USD
	6,57%	187,98 USD	175,67 USD	164,82 USD	155,19 USD	146,58 USD	138,85 USD	131,86 USD	125,51 USD	119,72 USD	114,42 USD	109,54 USD	105,04 USD	100,88 USD
	6,92%	201,58 USD	187,38 USD	175,00 USD	164,10 USD	154,44 USD	145,82 USD	138,07 USD	131,08 USD	124,73 USD	118,94 USD	113,65 USD	108,78 USD	104,30 USD
	7,27%	217,73 USD	201,13 USD	186,82 USD	174,36 USD	163,41 USD	153,71 USD	145,07 USD	137,31 USD	130,31 USD	123,96 USD	118,18 USD	112,89 USD	108,04 USD
	7,62%	237,21 USD	217,47 USD	200,71 USD	186,28 USD	173,74 USD	162,74 USD	153,00 USD	144,34 USD	136,56 USD	129,56 USD	123,21 USD	117,43 USD	112,15 USD
	7,97%	261,15 USD	237,24 USD	217,26 USD	200,32 USD	185,78 USD	173,15 USD	162,09 USD	152,32 USD	143,62 USD	135,84 USD	128,82 USD	122,47 USD	116,70 USD
	8,32%	291,32 USD	261,62 USD	237,33 USD	217,10 USD	199,97 USD	185,30 USD	172,59 USD	161,46 USD	151,65 USD	142,93 USD	135,13 USD	128,10 USD	121,75 USD
	8,67%	330,48 USD	292,45 USD	262,17 USD	237,48 USD	216,97 USD	199,66 USD	184,86 USD	172,05 USD	160,86 USD	151,00 USD	142,25 USD	134,43 USD	127,40 USD

Table 15: Qualcomm Sensitivity Analysis

Source: Own Estimations

8. Investment Snapshot

The semiconductor sector is predicted to experience substantial growth driven by advancements in artificial intelligence (AI). Qualcomm, with its strong market influence and innovative technology, is well-positioned to capitalize on this trend.

Using the Discounted Cash Flow (DCF) approach, Qualcomm's intrinsic share value is estimated at $131.86. This valuation model considers the company's long-term growth prospects and market conditions, aligning with the expected expansion in the semiconductor sector due to AI developments. Additionally, the DCF exit multiple approach, which factors in the company’s terminal value, estimates the share price at $179.17, further reinforcing Qualcomm's growth potential.

In the relative valuation, the estimated share price is $167.02. This method, based on market comparables and near-term multiples, suggests a lower valuation than the DCF models but still indicates a significant upside from current levels. By averaging the results from the three methodologies, we arrive at a target price of $159,35 (Table 16), representing an upside potential of 40.62%.

Both scenario analysis predicted a significant upside potential for Qualcomm, and according to the sensitivity analysis is predicted an upside potential in all scenarios. These analyses suggest that Qualcomm is likely to be undervalued and presents a compelling investment opportunity. Given the strong growth prospects of the semiconductor sector, Qualcomm's influential market position, and the consistent valuation upside across different models, Qualcomm Inc. is recommended as a BUY. The intrinsic and relative valuations all point towards substantial appreciation potential, making it an attractive investment for both short-term gains and long-term growth.

Intrisic Value	Value
DCF Model	131,86 USD
DCF Exit Multiple Approach	179,17 USD
Relative Valuation	167,02 USD
Average Intrinsic Value	**159,35 USD**
Current Share Price	**113,32 USD**
Upside Potential	**40,62%**

Table 16: Qualcomm Average Intrinsic Value

Source: Own Estimations

9. Conclusion

In this project, we painstakingly developed a series of hypotheses that faithfully captured the features of the semiconductor market in which Qualcomm is active, as well as the company's maturity level, all while accounting for the anticipated macroeconomic development that played a major role in the short-term volatility of Qualcomm's share's fair value.

The goal of our equity valuation is to provide investors a well-founded estimation so they could evaluate the asset and make wise choices by contrasting the present price with my target price, which was determined using reliable techniques that are often used in corporate finance.

In this sense, the primary approach was the Discounted Cash Flow (DCF) model derived through the Free Cash Flow to the Firm (FCFF) over a six-year projection. At the date of publication of this dissertation, this period was selected due to the availability of rigorous internal and external information, worked on by renowned entities in the market, which increased the robustness of our assumptions. The target price was $159.35, suggesting significant growth potential despite market challenges, with Qualcomm benefiting from its strong position in the semiconductor sector, particularly in 5G technology and IoT applications, which require close monitoring of Qualcomm's activities.

We concluded that these conditions support a robust CAGR of FCFF, justifying a strong growth rate compared to typical rates observed in the tech sector. Given the specificity of the present value of the projected FCFF, which is markedly smaller compared to the proportion of the terminal value, it did not explicitly demonstrate this adjustment made, being camouflaged by the fact that most of the enterprise value comes from the terminal value. This is standard in companies in the maturity phase with slower growth, where most of the value is associated with the cash flow generated after the explicit projection period, derived from the belief that the company will continue to generate cash at a stable and consistent pace in the long term.

In conclusion, we have chosen to rely primarily on the first approach for our recommendation within this project. According to this approach, the target price of $159.35 suggests that Qualcomm is significantly undervalued. Therefore, Qualcomm should be considered a Buy position in the investment portfolio.

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Annexes A – World Economic Outlook GDP Growth Projections

WORLD ECONOMIC OUTLOOK UPDATE, JANUARY 2024

Table 1. Overview of the *World Economic Outlook* Projections

(Percent change, unless noted otherwise)

	Year over Year						Q4 over Q4 2/		
		Estimate	Projections		Difference from October 2023 WEO Projections 1/		Estimate	Projections	
	2022	2023	2024	2025	2024	2025	2023	2024	2025
World Output	**3.5**	**3.1**	**3.1**	**3.2**	**0.2**	**0.0**	**3.1**	**3.1**	**3.1**
Advanced Economies	**2.6**	**1.6**	**1.5**	**1.8**	**0.1**	**0.0**	**1.6**	**1.6**	**1.7**
United States	1.9	2.5	2.1	1.7	0.6	−0.1	2.9	1.5	1.9
Euro Area	3.4	0.5	0.9	1.7	−0.3	−0.1	0.2	1.5	1.6
Germany	1.8	−0.3	0.5	1.6	−0.4	−0.4	−0.1	1.1	1.9
France	2.5	0.8	1.0	1.7	−0.3	−0.1	0.6	1.4	1.8
Italy	3.7	0.7	0.7	1.1	0.0	0.1	0.2	1.3	1.0
Spain	5.8	2.4	1.5	2.1	−0.2	0.0	1.5	1.8	2.1
Japan	1.0	1.9	0.9	0.8	−0.1	0.2	1.4	1.6	0.5
United Kingdom	4.3	0.5	0.6	1.6	0.0	−0.4	0.9	0.6	1.8
Canada	3.8	1.1	1.4	2.3	−0.2	−0.1	1.1	1.9	2.2
Other Advanced Economies 3/	2.7	1.7	2.1	2.5	−0.1	0.2	1.5	2.6	2.0
Emerging Market and Developing Economies	**4.1**	**4.1**	**4.1**	**4.2**	**0.1**	**0.1**	**4.3**	**4.3**	**4.1**
Emerging and Developing Asia	4.5	5.4	5.2	4.8	0.4	−0.1	5.2	5.5	4.7
China	3.0	5.2	4.6	4.1	0.4	0.0	5.4	4.4	4.0
India 4/	7.2	6.7	6.5	6.5	0.2	0.2	5.0	7.8	6.7
Emerging and Developing Europe	1.2	2.7	2.8	2.5	0.6	0.0	4.1	2.0	2.9
Russia	−1.2	3.0	2.6	1.1	1.5	0.1	4.4	1.4	1.0
Latin America and the Caribbean	4.2	2.5	1.9	2.5	−0.4	0.1	2.2	1.7	2.6
Brazil	3.0	3.1	1.7	1.9	0.2	0.0	2.3	2.6	1.4
Mexico	3.9	3.4	2.7	1.5	0.6	0.0	3.4	1.9	1.4
Middle East and Central Asia	5.5	2.0	2.9	4.2	−0.5	0.3	. . .	. . .	. . .
Saudi Arabia	8.7	−1.1	2.7	5.5	−1.3	1.3	−4.5	2.8	5.4
Sub-Saharan Africa	4.0	3.3	3.8	4.1	−0.2	0.0	. . .	. . .	. . .
Nigeria	3.3	2.8	3.0	3.1	−0.1	0.0	2.7	3.3	2.9
South Africa	1.9	0.6	1.0	1.3	−0.8	−0.3	1.0	1.2	1.3
Memorandum									
World Growth Based on Market Exchange Rates	3.0	2.7	2.6	2.7	0.2	0.0	2.7	2.5	2.6
European Union	3.6	0.6	1.2	1.9	−0.3	−0.2	0.7	1.4	2.3
ASEAN-5 5/	5.5	4.2	4.7	4.4	0.2	−0.1	4.1	5.2	3.5
Middle East and North Africa	5.6	2.0	2.9	4.2	−0.5	0.3	. . .	. . .	. . .
Emerging Market and Middle-Income Economies	4.0	4.2	4.0	4.0	0.1	0.0	4.3	4.3	4.1
Low-Income Developing Countries	5.2	4.0	5.0	5.6	−0.1	0.0	. . .	. . .	. . .
World Trade Volume (goods and services) 6/	**5.2**	**0.4**	**3.3**	**3.6**	**−0.2**	**−0.1**	. . .	. . .	. . .
Advanced Economies	6.1	0.3	2.6	3.2	−0.4	−0.1	. . .	. . .	. . .
Emerging Market and Developing Economies	3.7	0.6	4.5	4.4	0.2	0.0	. . .	. . .	. . .
Commodity Prices									
Oil 7/	39.2	−16.0	−2.3	−4.8	−1.6	0.1	−2.8	−6.1	−4.9
Nonfuel (average based on world commodity import	7.9	−6.1	−0.9	−0.4	1.8	−0.3	−2.0	1.5	0.2
World Consumer Prices 8/	**8.7**	**6.8**	**5.8**	**4.4**	**0.0**	**−0.2**	**6.0**	**5.3**	**3.8**
Advanced Economies 9/	7.3	4.6	2.6	2.0	−0.4	−0.2	3.1	2.3	2.0
Emerging Market and Developing Economies 8/	9.8	8.4	8.1	6.0	0.3	−0.2	8.4	7.7	5.2

Note: Real effective exchange rates are assumed to remain constant at the levels prevailing during October 30–November 27, 2023. Economies are listed on the basis of economic size. The aggregated quarterly data are seasonally adjusted. WEO = *World Economic Outlook* .

1/ Difference based on rounded figures for the current and October 2023 WEO forecasts. Countries for which forecasts have been updated relative to October 2023 WEO forecasts account for approximately 90 percent of world GDP measured at purchasing-power-parity weights.

2/ For World Output (Emerging Market and Developing Economies), the quarterly estimates and projections account for approximately 90 percent (80 percent) of annual world (emerging market and developing economies') output at purchasing-power-parity weights.

3/ Excludes the Group of Seven (Canada, France, Germany, Italy, Japan, United Kingdom, United States) and euro area countries.

4/ For India, data and projections are presented on a fiscal year (FY) basis, with FY 2022/23 (starting in April 2022) shown in the 2022 column. India's growth projections are 5.7 percent in 2024 and 6.8 percent in 2025 based on calendar year.

5/ Indonesia, Malaysia, Philippines, Singapore, Thailand.

6/ Simple average of growth rates for export and import volumes (goods and services).

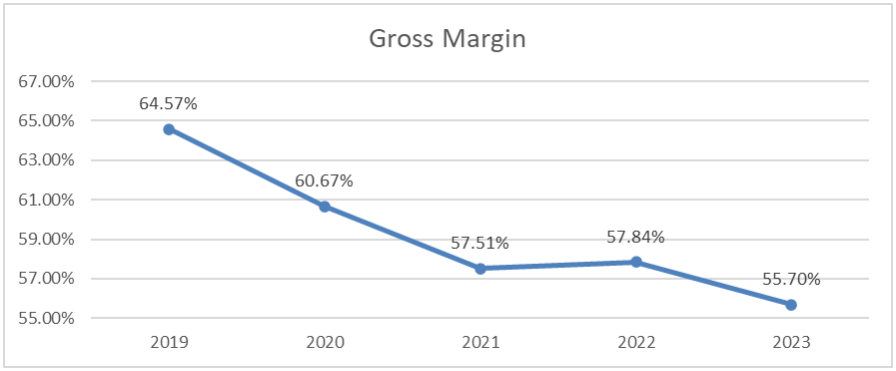
7/ Simple average of prices of UK Brent, Dubai Fateh, and West Texas Intermediate crude oil. The average assumed price of oil in US dollars a barrel, based on futures markets (as of November 29, 2023), is $79.10 in 2024 and $75.31 in 2025.

8/ Excludes Venezuela.

9/ The assumed inflation rate for the euro area is 2.8% in 2024 and 2.1% in 2025, that for Japan is 2.7% in 2024 and 2.0% in 2025, and that for the United States is 2.2% in 2024 and 1.9% in 2025.

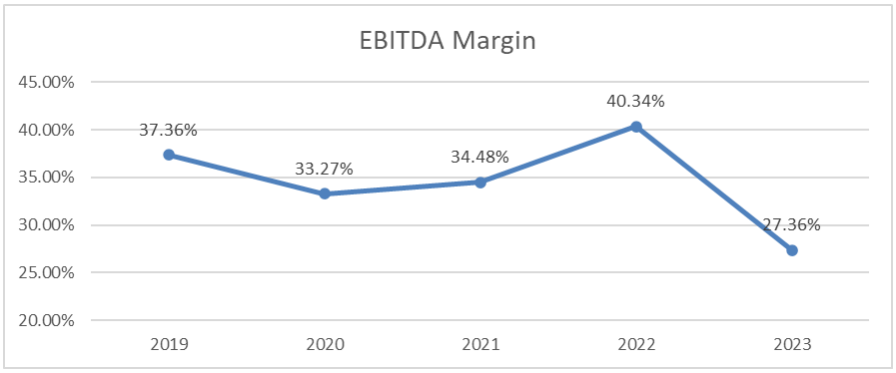
Source: World Economic Outlook

Annexes B- Qualcomm's last 5 Years Gross Margin



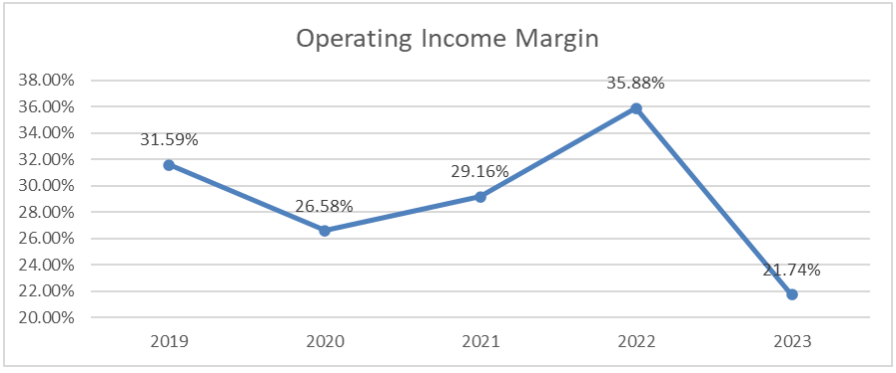
Source: Bloomberg

Annexes C - Qualcomm's last 5 Years EBITDA Margin



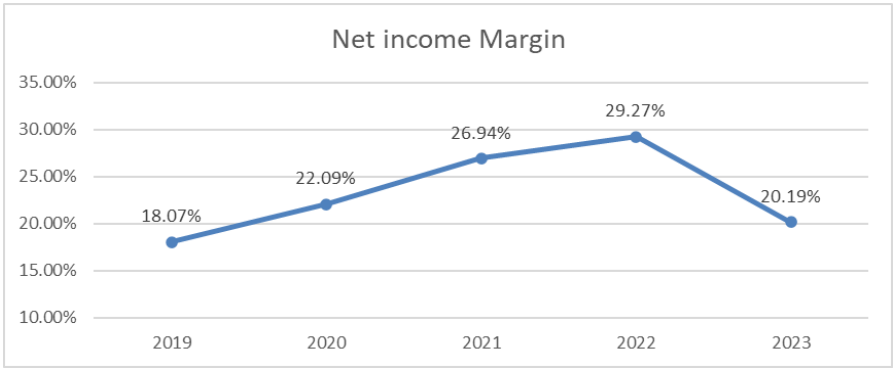
Source: Bloomberg

Annexes D - Qualcomm's last 5 Years Operating income Margin



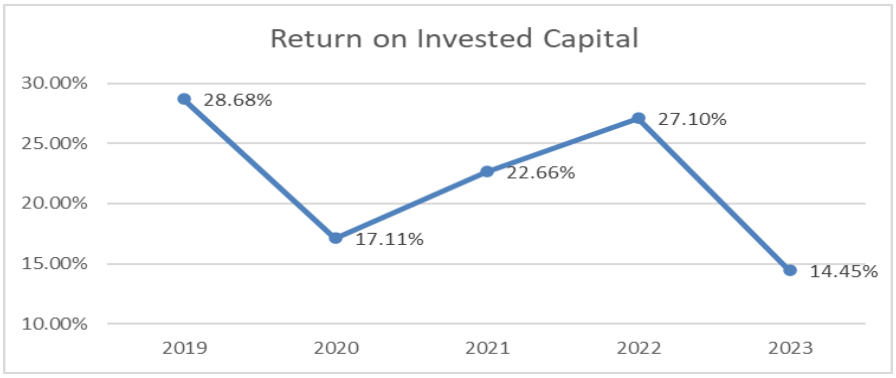
Source: Bloomberg

Annexes E - Qualcomm's last 5 Years Net income Margin



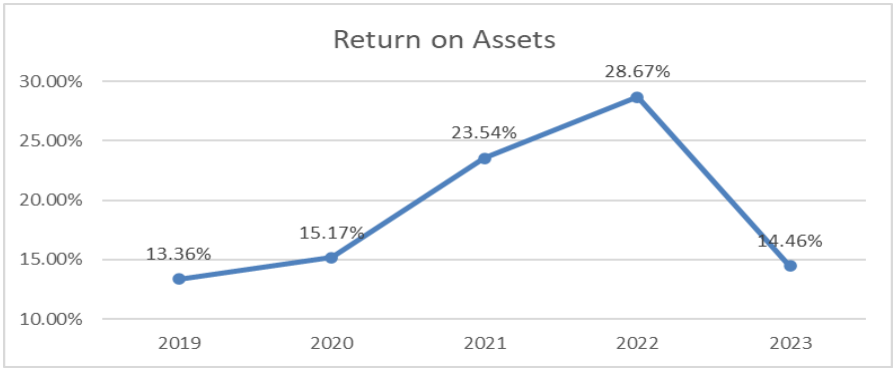
Source: Bloomberg

Annexes F - Qualcomm's last 5 Years ROIC



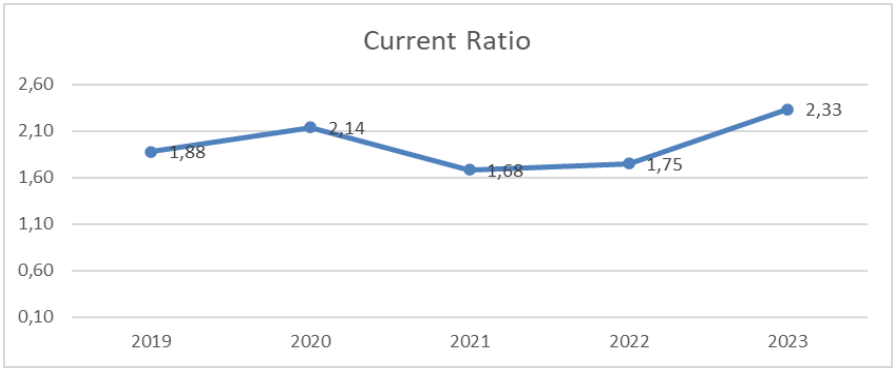
Source: Bloomberg

Annexes G - Qualcomm's last 5 Years ROA



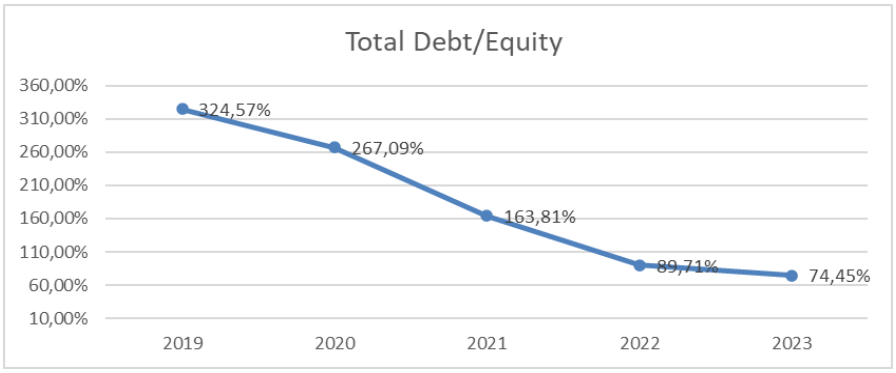
Source: Bloomberg

Annexes H - Qualcomm's last 5 Years Current Ratio



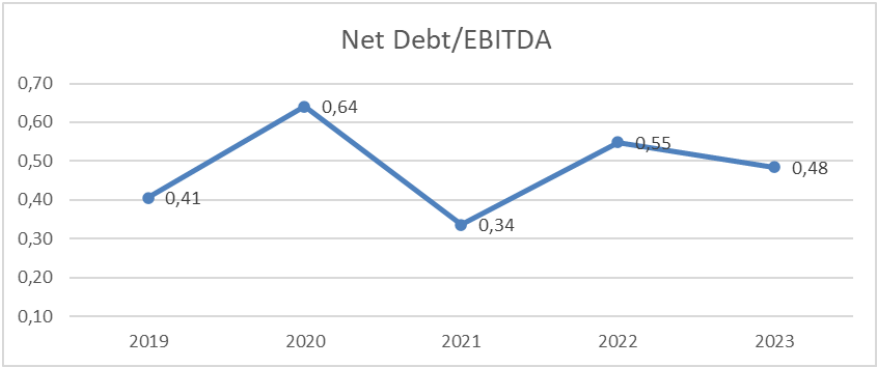
Source: Bloomberg

Annexes I - Qualcomm's last 5 Years Debt to equity Ratio



Source: Bloomberg

Annexes J - Qualcomm's last 5 Years Net Debt to EBITDA



Source: Bloomberg

Annexes K - Qualcomm Operations by Geography

Operations By Geography	% QCOM Operations	Source
China (Including Hong Kong)	62,5%	Bloomberg
Vietnam	12,7%	Bloomberg
Other Foreign (Excluding South Korea, Ireland, China)	12,2%	Bloomberg
South Korea	9,1%	Bloomberg
United States	3,5%	Bloomberg

Source: Bloomberg

Annexes L - Qualcomm Relative Valuation Peer Group

Ticker	Name	EV/EBITDA T12M	EV / EBIT Adj	EV/Sales T12M	Market Cap
QCOM US Equity	QUALCOMM INC	17,27	18,66	4,63	160 973 190 000,00 USD
Average (Excluding QCOM US)		18,75	19,88	6,66	
Ticker	**Name**	**EV/EBITDA T12M**	**EV / EBIT Adj**	**EV/Sales T12M**	**Market Cap**
6963 JP Equity	ROHM CO LTD	8,58	16,12	2,37	7 905 353 000,00 USD
6723 JP Equity	RENESAS ELECTRONICS CORP	8,82	13,51	3,54	35 443 905 062,85 USD
3034 TT Equity	NOVATEK MICROELECTRONICS COR	10,03	10,54	2,55	10 288 063 244,63 USD
SWKS US Equity	SKYWORKS SOLUTIONS INC	10,79	15,22	3,93	17 982 126 148,14 USD
ON US Equity	ON SEMICONDUCTOR	11,41	13,70	4,45	35 976 169 442,11 USD
6965 JP Equity	HAMAMATSU PHOTONICS KK	12,01	15,09	3,86	6 797 415 738,64 USD
MCHP US Equity	MICROCHIP TECHNOLOGY INC	12,48	15,79	6,11	48 791 464 973,64 USD
ADI US Equity	ANALOG DEVICES INC	17,16	17,46	8,53	98 537 718 783,68 USD
TXN US Equity	TEXAS INSTRUMENTS INC	17,19	19,58	8,67	154 812 469 692,78 USD
2454 TT Equity	MEDIATEK INC	18,81	23,87	3,77	53 096 348 197,45 USD
2379 TT Equity	REALTEK SEMICONDUCTOR CORP	18,90	26,70	2,06	7 907 840 890,53 USD
COHR US Equity	COHERENT CORP	19,84	79,90	2,55	6 594 025 563,72 USD
IPGP US Equity	IPG PHOTONICS CORP	22,20	21,47	3,01	5 092 963 157,16 USD
AVGO US Equity	BROADCOM INC	27,34	32,80	15,30	522 561 910 146,25 USD
OLED US Equity	UNIVERSAL DISPLAY CORP	30,52	36,49	14,64	9 057 705 615,76 USD
LSCC US Equity	LATTICE SEMICONDUCTOR CORP	36,25	41,43	12,69	9 522 577 729,23 USD
RMBS US Equity	RAMBUS INC	36,47	88,88	15,16	7 337 505 698,25 USD

Source: Bloomberg

Annexes M - Qualcomm Relative Valuation

Relative Valuation	Value
EBITDA 12M	9 179 000 000,00 USD
EBIT Adj	8 137 000 000,00 USD
Revenue 12M	35 820 000 000,00 USD
EV/EBITDA Multiple	18,75
EV/EBIT Adj Multiple	19,88
EV/Sales Multiple	6,66
Firm Enterprise Value Relative Valuation Model EV/EBITDA	172 148 715 057,84 USD
Firm Enterprise Value Relative Valuation Model EV/EBIT Adj	161 776 784 001,43 USD
Firm Enterprise Value Relative Valuation Model EV/Sales	238 484 141 134,57 USD
Enterprise Value (Average of 3 Relative Valuation)	190 803 213 397,95 USD
Cash and Equivalents	8 450 000 000,00 USD
Short term investments	2 874 000 000,00 USD
Long term Debt	16 067 000 000,00 USD
Equity Value	186 060 213 397,95 USD
Shares outstanding	1114000000,00
EV/EBITDA Intrinsic Value	150,27 USD
EV/EBIT Adj Intrinsic Value	140,96 USD
EV/Sales Intrinsic Value	209,82 USD
Implied Intrinsic Value	**167,02 USD**

Source: Own Estimations

Annexes N - Qualcomm 5Y Average EV to EBITDA

Source: Bloomberg

Annexes O - Qualcomm DCF EXIT Multiple Approach

Cash Flow	2024	2025	2026	2027	2028	2029	Terminal Value
Operating Cash flow Items							
NOPLAT	9 622.5	10 702.4	11 820.3	13 037.5	14 362.9	15 819.1	
Depreciation & Amort.	1 541.8	1 714.8	1 893.9	2 089.0	2 301.3	2 534.7	
WC Capital Variation	2 425.5	1 911.0	1 978.3	2 154.0	2 345.5	2 577.1	
Operating Cash Flow	**8 738.7**	**10 506.1**	**11 735.9**	**12 972.5**	**14 318.7**	**15 776.7**	
Investing Cash flow							
Capex	1 169.0	1 589.0	1 681.0	1 851.9	2 039.7	2 701.3	
Investing Cash flow	**(1 169.0)**	**(1 589.0)**	**(1 681.0)**	**(1 851.9)**	**(2 039.7)**	**(2 701.3)**	
Free Cash Flow	5 677.3	8 917.1	10 054.9	11 120.6	12 279.0	13 075.4	328 544.6
PV Free Cash Flow	5 186.2	7 220.1	7 216.1	7 073.9	6 923.1	6 534.3	164 188.5
Enterprise Value	**204342.16**						

Multiples	Value	Source
5Y Average EV/EBITDA	11.77	Bloomberg
Peer EV/EBITDA	18.75	Bloomberg
Combined multiple	14.56	

Source: Own Estimations

Annexes P - Qualcomm Low, Medium, High Assumptions

Revenue Projections	2024	2025	2026	2027	2028	2029
Handsets Growth Low	7,49%	7,49%	6,49%	6,49%	6,49%	6,49%
Handsets Growth Medium	9,49%	9,49%	8,49%	8,49%	8,49%	8,49%
Handsets Growth High	11,49%	11,49%	10,49%	10,49%	10,49%	10,49%

Revenue Projections	2024	2025	2026	2027	2028	2029
Iot Growth Low	15,70%	14,70%	13,70%	13,70%	12,70%	12,70%
Iot Growth Medium	17,70%	16,70%	15,70%	15,70%	14,70%	14,70%
Iot Growth High	19,70%	18,70%	17,70%	17,70%	16,70%	16,70%

Revenue Projections	2024	2025	2026	2027	2028	2029
Automotive Growth Low	19,00%	14,00%	14,00%	13,00%	11,00%	11,00%
Automotive Growth Medium	23,00%	18,00%	16,00%	15,00%	13,00%	13,00%
Automotive Growth High	27,00%	22,00%	18,00%	17,00%	15,00%	15,00%

Profitability Projections	2024	2025	2026	2027	2028	2029
Gross Margin Low	57,76%	57,76%	57,76%	57,76%	57,76%	57,76%
Gross Margin Medium	59,26%	59,26%	59,26%	59,26%	59,26%	59,26%
Gross Margin High	60,76%	60,76%	60,76%	60,76%	60,76%	60,76%

Profitability Projections	2024	2025	2026	2027	2028	2029
EBITDA Margin Low	33,06%	33,06%	33,06%	33,06%	33,06%	33,06%
EBITDA Margin Medium	34,56%	34,56%	34,56%	34,56%	34,56%	34,56%
EBITDA Margin High	36,06%	36,06%	36,06%	36,06%	36,06%	36,06%

Source: Own Estimations