



Banking & Finance
Society

Investment Research Challenge

hosted by
New Economic School (NES)

Team “Stimulus check”

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Moscow
2021



Date: 7th May 2021

Current price as of
7th May 2020: USD 137.85

Ticker: QCOM

Target price: USD 165.00
(19.7% Total Return)

Exchanges: NASDAQ

Sector: Technology

Recommendation: BUY

Figure 1: Valuation summary

Company name	Qualcomm Inc.
Ticker	QCOM
Closing price, USD	137.85
Target price, USD	165.00
1-year total return	19.7%
Market cap, USD mln	155 495
Enterprise value, USD mln	161 107
EV/EBITDA (NTM)	17.2x
P/E (NTM)	28.9x
EBITDA margin 2021E	29.9%
Net income margin 2021E	20.0%
Net Debt/EBITDA 2021E	(2.1x)
Beta (5y monthly)	1.34
Free Float	73%
52-week Low/High	74.37/167.94

Source: Bloomberg, Company Data, Team Estimates

Figure 2: Revenue breakdown 2020, USD mln

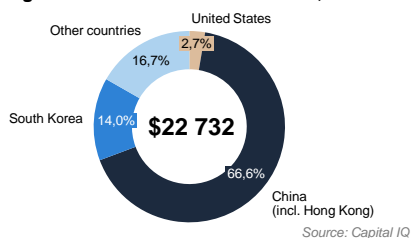


Figure 3: Qualcomm basic business model

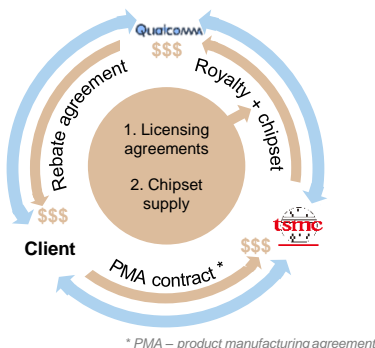
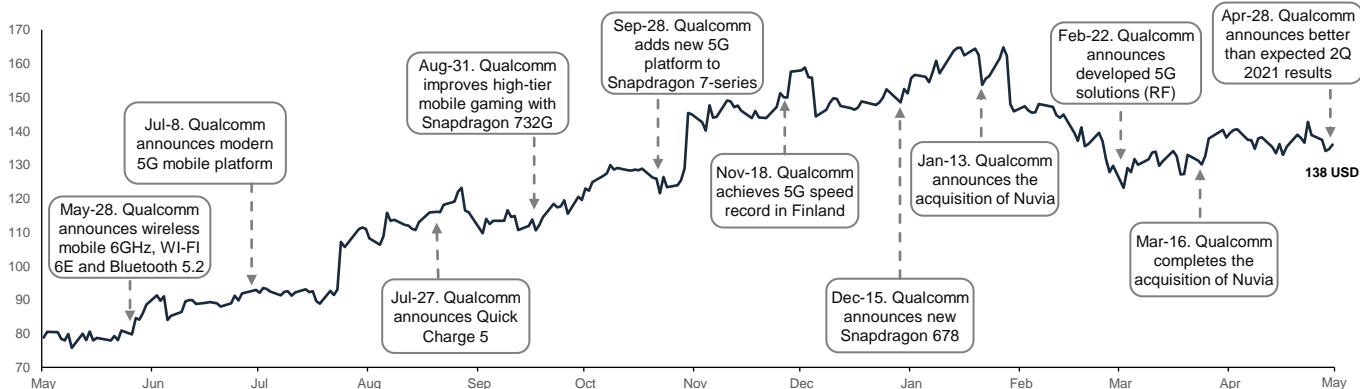


Figure 4: LTM price performance



Source: NASDAQ exchange

Qualcomm is a global leader in the development and commercialization of foundational technologies for the wireless industry. From network equipment and broadband gateway equipment to consumer electronic devices, Qualcomm helps billions of people around the world connect, compute and communicate. Its foundational technologies enable the mobile ecosystem and are found in every 3G, 4G, and 5G smartphone. Qualcomm brings the benefits of mobile to new industries, including automotive, the internet of things and computing, CDMA, technology licensing, and is leading the way to a world where everything and everyone can communicate and interact seamlessly.

Investment Summary

We issue a BUY recommendation on Qualcomm with a 12-month target price of USD 165.00, which implies a total return of 19.7% from its 7th May 2020 closing price.

CHIP MARKET IS BOOMING DRIVEN BY 5G TECHNOLOGIES

We observe an accelerating dynamics of the 5G chip market, which is interconnected with the penetration of smartphones supporting this connection type. The demand for smartphones is growing along with the global economy entering a new growing macroeconomic cycle. The new cycle allows for greater consumer spending, especially on durables.

APPLE IS NOT A CONCERN IN SHORT- AND MID-TERM

According to the conducted analysis, we consider the scenario with Apple shifting completely to its own chips to be highly unlikely. Firstly, it will be technically rather complex to overcome and recreate all the existing technologies and patents owned by Qualcomm. Secondly, the claim of Apple was made before the pandemic and now there are a lot of more urgent issues on the agenda of the Cupertino company (see details in the further sections of the research).

DEMAND IS GREAT BUT IS TEMPORARY RESTRICTED BY SUPPLY CHAIN

Since Qualcomm is a fabless company, it uses the production capacities of TSMC. Since chip-making is a very complex industry with a wide supply chain it was the first one to be disrupted by the pandemic of COVID-19. This resulted in TSMC not being able to timely satisfy all the growing demand. That does not create any loss or legal risks for Qualcomm but implies that deferred demand is growing and will, even more, accelerate future sales.

LICENSING SEGMENT ALLOWS TO ACHIEVE ABOVE-THE-MARKET PROFITABILITY

The profitability of the Company is driven by the QTL (technology licensing) segment. Having a unique portfolio of patents and other intellectual in wireless technologies sphere property Qualcomm positions as the leader in this segment.

INVESTOR OVERREACTION CREATES A MOMENTUM FOR INVESTMENT

The above-described problems with the supply chain of TSMC and possible leave of Apple were highly negatively met by investors which resulted in an almost 20% drop in the share price of Qualcomm. According to the performed valuation, we see a significant undervaluation of Qualcomm's shares. The trading multiples approach suggests that the median EV/EBITDA multiple among peers is 26.9x whereas Qualcomm has only 17.8x. The DCF modeling output also arrived at the higher implied multiple than the market one. We, therefore, expect that this gap will be fully or partially closed within the next 12 months. We issue the recommendation buy on Qualcomm shares with the target price of \$165 per share (Figure 1).

Figure 5: Qualcomm Revenue Breakdown

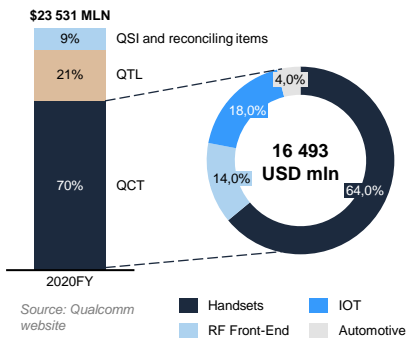


Figure 6: QCT Revenue dynamics, USD mln

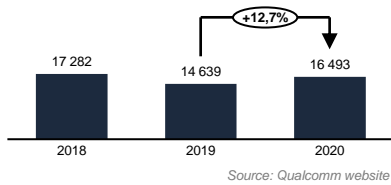
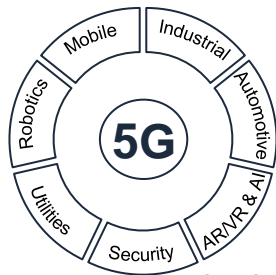


Figure 7: Qualcomm's main 5G segments



Source: Qualcomm website

Figure 8: QTL Revenue dynamics, USD mln

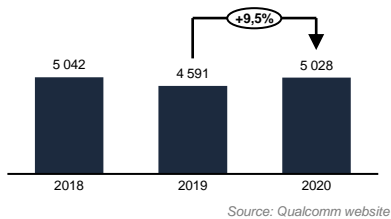


Figure 9: QTL Segment Key Facts

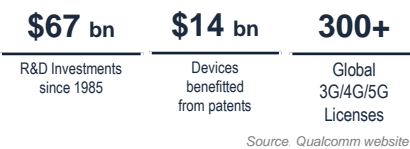


Figure 10: Qualcomm Ventures Portfolio



Source: Qualcomm Ventures website

Business Description

Qualcomm is an American multinational corporation that creates semiconductors, software, and services related to wireless technology. It owns patents critical to the 5G, 4G, CDMA2000, TD-SCDMA, and WCDMA mobile communications standards. Over the years, Qualcomm has expanded from 2G standards and early research on CDMA wireless cell phone technology into selling semiconductor products in a predominantly fabless manufacturing model. Currently, Qualcomm is the largest provider of smartphone SoCs (System on a chip), shipping chips for the majority of flagship, mid-tier, and even low-end smartphone releases each year. Qualcomm's SoCs fall under the Snapdragon branding. It also develops semiconductor components or software for vehicles, watches, laptops, Wi-Fi, and other devices. Its revenue derives from QCT (Qualcomm CDMA Technologies) semiconductor business and QTL (Qualcomm Technology Licensing) licensing business. In addition, QSI (Qualcomm Strategic Initiatives) reportable segment makes strategic investments (Figure 5). Qualcomm operates all over the world, possessing revenue decomposition out of several geographical markets: 60% (China incl. Hong Kong), 13% (South Korea), 5% (USA), 4% (Ireland), and 19% (Other countries).

CDMA TECHNOLOGIES THAT EMPOWER USERS TO DO MORE

QCT (Qualcomm CDMA Technologies). Qualcomm develops and supplies integrated circuits and system software based on 3G/4G/5G and other technologies for use in mobile devices, wireless networks, devices used in the internet of things (IoT), broadband gateway equipment, consumer electronic devices, and automotive systems for telematics and infotainment. **Handsets** includes revenues from products sold for use in mobile handsets. **RF Front-End** includes revenues from sales of 4G, 5G sub 6, and 5G millimeter wave products (substantially all of which are currently sold for use in handsets). **Automotive** includes revenues from products sold for use in automobiles including telematics/connectivity and digital cockpit. **IoT** (Internet of things) includes revenues primarily from products sold for use in non-cellular and cellular-connected devices for use in several industries or applications, including consumer, computing, industrial, fixed wireless broadband, voice and music, and wireless networking (Figure 5). QCT stream beat-driven by +12.7% by IoT strength in 2020 fiscal year. We believe the current strength is at least in part being driven by elevated consumer spending but also note that Qualcomm indicated broad strength across most areas within IoT (Figure 6).

Powering the digital economy. Qualcomm that brought us 3G and 4G is now leading the world to 5G. At Qualcomm, professionals are inventing the technologies of an intelligently connected future, spearheading research efforts for the next global wireless standard, and collaborating with industry leaders to make this future a commercial reality. 5G will be a major economic driver — spurring the innovation of new industries, products, services, and job creation (Figure 7). All products and software are connected to a unifying connectivity 5G fabric that will be expected around the world.

Supply chain for creating purpose-focused platforms. Other than Qualcomm's RFFE modules and RF filter acoustic products, the QCT segment utilizes a fabless production model, which means that the Company does not own or operate foundries for the production of silicon wafers from which our integrated circuits are made. Qualcomm employs both turnkey and two-stage manufacturing models to purchase our integrated circuits.

LICENSES AND PATENTS THAT ENABLE THE TECHNOLOGIES OF TOMORROW

QTL (Qualcomm Technology Licensing). Qualcomm grants licenses or otherwise provides rights to use portions of our intellectual property portfolio, which includes certain patent rights essential to and/or useful in the manufacture, sale, or use of certain wireless products. Qualcomm is the world's leading wireless technology innovator and the driving force behind the development, launch, and expansion of 5G. Since its founding, Qualcomm has invested over \$67B in R&D, including over 20 percent of annual revenue since 2006. With over 120 5G licensing agreements, Qualcomm's industry-leading, highly valuable, and fundamental 5G innovations are the most widely licensed in the industry, including multiyear patent license agreements with every major handset OEM. QTL segment benefitted a lot in 2020 from better than expected handset shipments in China and royalty adjustments, so it gave a +9.5% upside in the form of revenue (Figure 8).

Qualcomm is the global 5G intellectual property leader. Qualcomm invented fundamental technologies that make 5G work, enabling 5G's speed, low latency, reliability, capacity, and expansion to new industries. Our portfolio of inventions includes wireless innovations that began years ahead of the industry—early, foundational inventions with broad geographic coverage resulting in an unmatched global 5G licensing program. Qualcomm's global licensing program enables the Company to share our world-leading inventions with licensees so they can focus on providing the best possible products to their customers. Across more than 300 licensing agreements, over 14B devices have benefitted from licensing Qualcomm's patents (Figure 9).

INVESTING IN THE FUTURE OF INNOVATIONS

QSI (Qualcomm Strategic Initiatives). Qualcomm makes strategic decisions and investments through this stream. Many of Qualcomm's strategic investments include early-stage companies within a variety of industries and applications, including artificial intelligence, automotive, telematics, networks, mobile and smart devices, digital healthcare, enterprises, and the internet of things (Figure 10).

Qualcomm Ventures. Qualcomm Ventures is the corporate venture capital arm of Qualcomm that offers deep industry expertise to entrepreneurs in the mobile technology ecosystem and helps them connect to the resources and relationships they need to succeed. Qualcomm has more than \$1B assets under management across 7 world regions such as the USA, China, India, Israel, Europe, Latin America, and South Korea. Within 150+ portfolio companies, Qualcomm brings its technologies, patents, and developments into reality.

Figure 11: World Macro Indicators
Growth rates in %

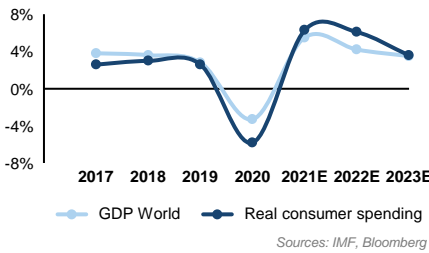


Figure 12: World CPI index
In %

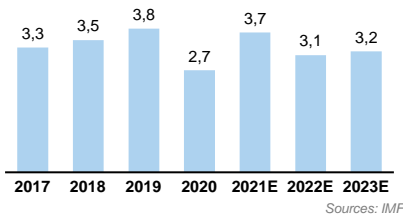


Figure 13: Worldwide Mobile Phone Shipment
In mln

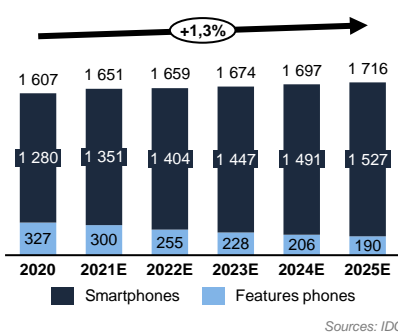


Figure 14: Worldwide Mobile Phone Shipments by Air Interface Group
In mln

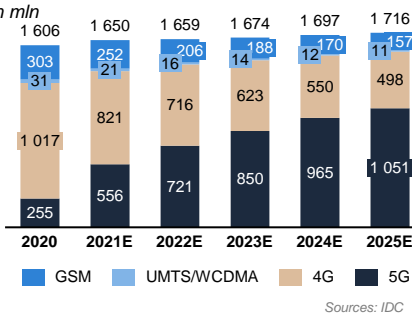
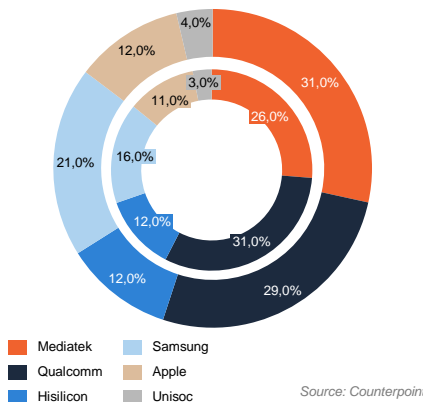


Figure 15: Smartphone chipset market shares, 2019 (inner) – 2020 (outer)



Macroeconomy & Industry overview

MACROECONOMIC IS AT THE BEGINNING OF NEW GROWTH CYCLE

World GDP. Amid exceptional uncertainty, the global economy is projected to grow 5.5 percent in 2021 and 4.2 percent in 2022. The 2021 forecast, reflecting expectations of a vaccine-powered strengthening of activity later in the year and additional policy support in a few large economies. Despite the high and rising human toll of the pandemic, economic activity appears to be adapting to subdued contact-intensive activity over time. Additional policy measures announced at the end of 2020 are expected to provide further support in 2021–22 to the global economy. These developments indicate a stronger starting point for the 2021–22 global outlook.

Consumption. During the pandemic, household spending shifted from services to information technology, home furnishings, food at home, and recreational equipment. As COVID-19-related restrictions are eased and more people are vaccinated, spending on travel, sporting, and cultural events, dining out, and personal services will revive. In many advanced countries, household finances, on average, have strengthened as a result of fiscal stimulus payments and rising equity and home prices. After a 5.8% global decline in 2020, real private consumption is projected to advance by 6.3% in 2021 and 6.1% in 2022.

Inflation. At the start of 2021 central banks shift to waiting for actual outcomes to materialize rather than acting on expected ones, in the context of revising their inflation targeting strategies, it implies more tolerance for running the economy. This will result in some inflation overshooting and create a two-way risk. In this case, World Inflation will increase by 1 pp at the end of the period. In the long-term, world inflation will come close to a 3% level (Figure 12).

INDUSTRY IS ENTERING THE GROWING STAGE

The worldwide mobile phone market, inclusive of smartphones, will reach a total of 1.65 billion units in 2021, growing 2.7% from the 1.61 billion units shipped in 2020. From a product category standpoint, growth can be attributed to near 6% growth from smartphones, offset by an 8.0% decline in feature phone shipments. Smartphone volumes increase slightly in the coming years, with a growth of 4.0% in 2022 and average growth of around 3.1% during the forecast period. By 2025, total mobile phone shipments will grow to 1,716.0 million units worldwide, resulting in a CAGR of 1.3% for 2020–2025 (figure 13).

Smartphones. The worldwide smartphone market will reach a total of 1.35 billion units in 2021, up 5.5% from the 1.28 billion units shipped in 2020. The 5.5% growth will be driven by triple-digit growth of 5G units in 2021, as 5G units will make up 41% of all smartphone shipments by the end of the year. Looking past 2021, the shift to 5G will continue to drive growth throughout the forecast period at an average of 3.1%. The future trend is strong end-user demand from carriers and end users, more vendors transitioning their product portfolios to highlight smartphones, and, more importantly, the arrival of more affordable 5G handsets. By 2025, the final year of our forecast period, smartphone shipments will reach a total of 1.53 billion units worldwide, resulting in a CAGR of 3.6% for 2020–2025.

Shipments of 5G mobile phones will steadily increase throughout the forecast period as more affordable models enter the market that will eventually displace 4G units. The future of 5G mobile phones will consist of smartphones only as feature phones will not adopt 5G technologies. 5G-enabled mobile phones are expected to make up 61.2% of all mobile phone shipments in 2025. By 2025, total 5G shipments will reach 1,050.6 million units, resulting in a CAGR of 32.7% for 2020–2025. **Shipments of 4G mobile phones** (including LTE, TD-FD-LTE, and TD-LTE) will reach 821.4 million units in 2020, down 19.3% from the 1,017.4 million units shipped in 2020. Upon the growth of the smartphone market and reliable 4G network coverage across the globe. 4G-enabled mobile phones are expected to make up 29.0% of all mobile phone shipments in 2025, compared with 49.8% in 2020 (figure 14).

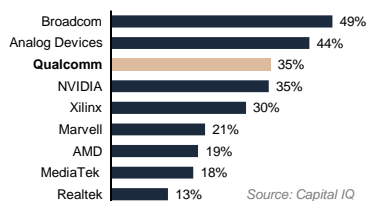
MediaTek is a strong competitor, but Qualcomm is well set for the future. MediaTek is the only strong competitor with a comparable market share – it became the largest chipset vendor in Q3 2020 driven by the strong performance of smartphones within the \$100-\$250 price range in China and India. However, MediaTek is only trying waters in the premium sector, where Qualcomm remains unbeatable with positions getting a boost after the US government lifted sanctions on Huawei. But what makes Qualcomm more competitive is its winning position in the 5G space where the Company is the largest chipset provider. We expect Qualcomm to regain the market share in China in the nearest future with the increased share of 5G-powered devices and the release of a few 5G-enabled chips for mid and low-tier smartphones (Figure 15).

SUPPLY CHAINS ARE THE ONLY CONSTRAINING FACTOR

At the end of 2020, the global semiconductor industry faced an unexpected spike in demand that overwhelmed production capacities and, thus, created a wide supply shortage. Semiconductor manufacturers have announced investments in new factories, but those are not expected to be put into operation before 2022. It implies that fabless semiconductor companies are forced to seek additional chip capacity from existing factories. To translate growing demand into revenue growth, Qualcomm will exploit options at (1) Huawei's freed 7nm capacity at TSMC, (2) Samsung's 5nm fab, and (3) TSMC's new 5 nm capacity.

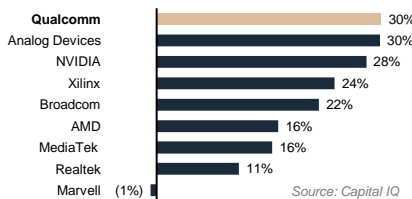
According to Oxford Economics, the electronics sector is the most vulnerable to disruptions in supply chains since the production is very complex and involves a lot of suppliers. It is also mentioned that during 1Q 2021 the duration of chips orders and getting filled extended to 22.2 weeks from 10 weeks.

Figure 17: EBITDA margin, LTM



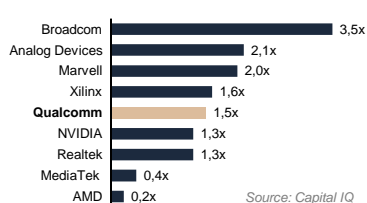
Source: Capital IQ

Figure 18: EBIT margin, LTM



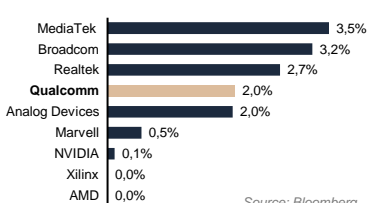
Source: Capital IQ

Figure 19: Total Debt / EBITDA, LTM



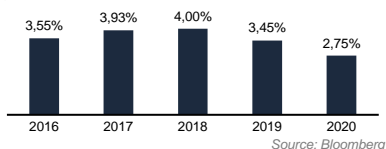
Source: Capital IQ

Figure 20: Dividend yield, LTM



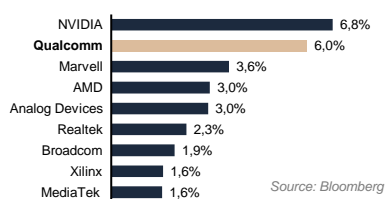
Source: Bloomberg

Figure 21: Qualcomm historical dividend yield



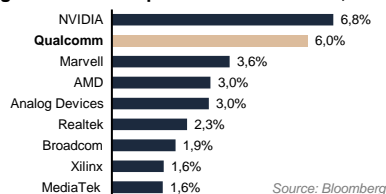
Source: Bloomberg

Figure 22: Capex-to-Sales ratio, 2020



Source: Bloomberg

Figure 23: R&D Expenditure to Net sales, 2020



Source: Bloomberg

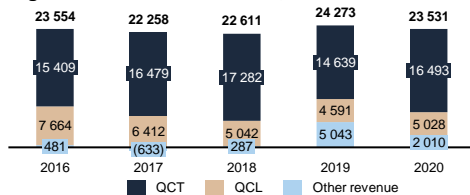
Peer and financial analysis

In this section, we conducted a comprehensive financial of Qualcomm and compared the key operational metrics with its peers. For comparative purposes, we selected only semiconductor producing companies with no own manufacturing facilities (fabless).

THE REVENUE HAS POTENTIAL WITH 5G PENETRATING THE TELECOM MARKET

Although the Company's revenue has been flattening the last 4 years there is a great potential for revenue growth with the 5G entering the communication market. We expect that the risk associated with Apple leave will not realize in the next 5 years since it will take plenty of time not only to develop an own chip but also to overcome the patents of Qualcomm. We assume that by that time a new standard in the wireless segment will emerge and further 5G development will become economically not feasible for Apple. Based on this we remain positive about the future revenue growth of Qualcomm and exclude this risk in our valuation.

Figure 16: Qualcomm revenue, USD mln



QUALCOMM HAS ABOVE-MARKET MARGINS DUE TO LICENSING SEGMENT

Historically Qualcomm had the margins above the market in comparison with its peers and the main direct competitor – MediaTek, whose margins are almost 2 times lower (Figures 1 and 2). The Company can achieve higher margins due to its QCL segment which is much more profitable than its QCT segment: 3-year average QCT EBIT margin is 16.3% vs QCL – 67%. The current management strategy is aimed at increasing the licensing share of the revenue.

WISE CAPITAL STRUCTURE MANAGEMENT IS ONE OF THE SUCCESS PILLARS

Until 2017 Qualcomm had negative Net Debt, while during the last three years, the Company had a conservative average Net Debt/EBITDA ratio of 0.62x and a solid EBIT/Interest ratio of 12.8x, with most of the debt to be repaid after 2025. These comfortable debt levels combined with the Company using debt for corporate purposes and share repurchases while still holding large cash balances point that Qualcomm is using debt to optimize capital structure. In the long-term, we expect the Company to converge to industry-average debt levels (Figure 19).

STABLE DIVIDEND PAYMENTS, EVEN IN HARD TIMES

Despite retaining most of the earnings within the business, Qualcomm has been giving out a solid 2.8% average dividend yield for the past 10 years. With the massive stock run in 2020, this dividend yield is currently projected at 2.0%, which is still higher than the average S&P yield of 1.36%. Overall, the Company had a compounded annual payout growth rate of more than 10% for the last decade and it has not been distracted even during the highly unfavorable operating environment caused by COVID-19. These dividend payments constitute a modest 76% of recurring earnings and 37% of free cash flows which makes them fully covered and therefore sustainable in the long-term perspective (Figure 20 and 21).

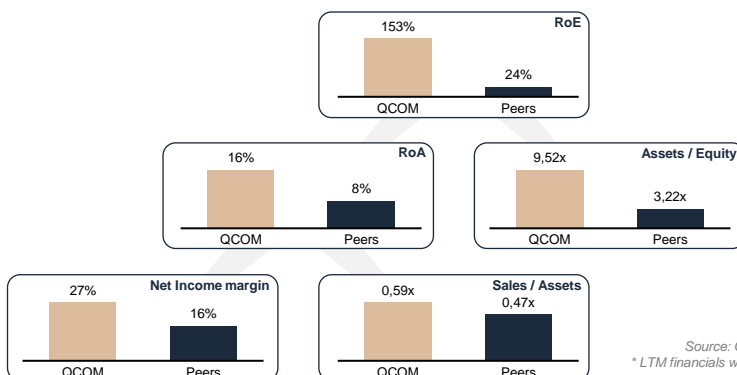
THE ONE-IN-KIND PORTFOLIO OF WIRELESS TECHNOLOGY PATENTS

To enhance leadership in the markets of presence Qualcomm heavily invests in technological advancements - more than its key competitors (Figures 22 and 23). In 2020 there was a significant increase in capital expenditures with a large portion coming from purchases of machinery and equipment for 5G development. During the last 4 years, Qualcomm has not been investing in intangible assets, but we expect some expenditures on intellectual property with the rollout of 5G. Even though Qualcomm owns the most extensive portfolio of wireless patents worldwide, maintaining this portfolio and acquisition of new patents does not require significant capital expenditures and comes almost at no cost.

QUALCOMM IS FINANCIALLY MORE ATTRACTIVE THAN AN AVERAGE INDUSTRY PEER

To make an overview of the financial and operational efficiency, we conducted a DuPont decomposition for Qualcomm and the peers mentioned above (Figure 24). The results imply that the Company is well ahead of its peers in terms of profitability and investor value creation. We would like to underline the strong return on equity (RoE) which justifies the thesis. Qualcomm has not achieved such enormous results just in the momentum, the historical 5-year average RoE was 48% which proves the sustainability of the strong financial performance.

Figure 24: DuPont profitability decomposition for Qualcomm and peer-companies*



Source: Capital IQ, team analysis
* LTM financials were used for calculations



Figure 25: Valuation Summary

Terminal Value - Perpetuity Growth Method		
Terminal growth rate:	%	2.0%
PV of Terminal Value:	USD bn	119,081
Sum of PV of Free Cash Flows:	USD bn	61,073
Implied Enterprise Value:	USD bn	180,155
Net Debt	USD bn	4,512
Non-controlling interest	USD bn	--
Assets held for sale	USD bn	--
Implied Equity Value:	USD bn	175,643
Diluted shares Outstanding:	mln	1,131
Implied share price from DCF	USD	155
12-month Target price	USD	166
Current share price	USD	138
Expected 12-month total return	%	20.1%
Recommendation		BUY

Source: Bloomberg, Company data, Team estimates

Figure 26: WACC Calculation

Metric	Measure	Value
Risk-free rate	%, USD	1.6%
Equity risk premium	%, USD	4.7%
Levered beta (bottom-up)	x	1.0
Country risk premium	%	0.7%
Size risk premium	x	0.0%
Cost of equity	%, USD	7.1%
Pre-tax cost of debt	%, USD	3.8%
Marginal tax rate	%	24.9%
Post-tax cost of debt	%, USD	2.9%
E / (D+E) ratio	x	0.9x
D / (D+E) ratio	x	0.1x
WACC	%, USD	6.7%

Source: Bloomberg, Company data, Team estimates

Figure 27: Forecasted Return Sensitivity

(based on 12-month target price sensitivity)

		Terminal growth rate				
		1.50%	1.75%	2.00%	2.25%	2.50%
WACC	7.8%	-8%	-5%	-2%	0%	4%
	7.3%	1%	4%	7%	11%	15%
	6.8%	11%	14%	19%	23%	29%
	6.3%	23%	27%	33%	39%	46%
	5.8%	37%	44%	51%	59%	69%

Source: Team estimates

Figure 28: Implied EV in multiple approach

Metric	Measure	Value
EBITDA, LTM	USD mln	7 161
Median EV / LTM EBITDA	x	23.3x
Implied current EV	USD mln	166 851
Implied target EV	USD mln	178 030

Source: Team estimates

Valuation

We issue a **BUY** recommendation based on 50/50 mix of DCF analysis and Trading Multiples approach. We arrived at the target price of USD 165 which accounts for 19.3% overall return over the closing price of USD 138 per share. We would have assigned **HOLD** recommendation for positive 12-month returns below the cost of equity (7.1%) and **SELL** recommendation in case of negative return.

DCF APPROACH

We used a 10-year forecasting period and a mid-year convention. We believe that the chosen forecasting period better accounts for a rollout of the 5G growth cycle as opposed to three-year and five-year periods, and therefore, we could better account for Qualcomm's high growth potential. We used the 2% terminal growth rate which is the average long-term inflation rate in the countries where Qualcomm operates weighted by the revenue share. Using the EV-Equity bridge, we attained USD 187 bn equity value or USD 165 per share (19.3% upside over the closing price of 1 May 2021). See Figure 25.

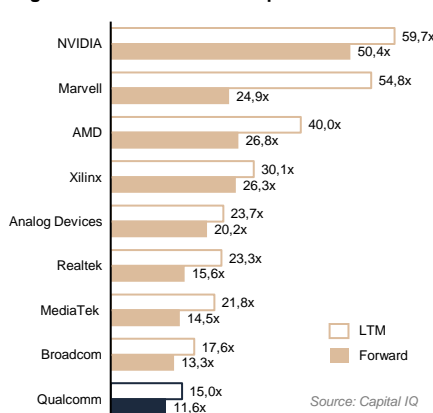
WACC CALCULATION

Cost of equity was calculated using the CAPM model. We used 1.63% YTM of 10-y US Treasury bonds as a risk-free rate. We took the 4.72% equity-risk premium from Aswath Damodaran's database, it represents mature markets. Unlevered beta of 0.94 was calculated using the bottom-up method. We assumed that Qualcomm would stick to the current capital structure, therefore, we used it as a base for discount rate calculations. Country risk-premium of 0.71% reflects the average country risk of countries where Qualcomm operates weighted by the revenue share, the data was taken from Aswath Damodaran's database. According to Duff & Phelps database, Qualcomm has a negative 0.3% size premium, but for conservative purposes, we held it equal to 0%. After combining these components, we arrived at the dollar-denominated cost of equity equal to 7.1%. See Figure 26.

TRADING MULTIPLES APPROACH

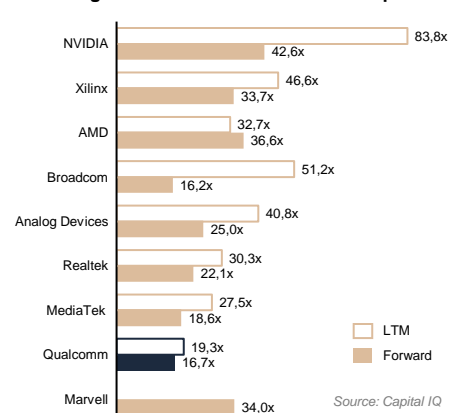
We valued Qualcomm against five fabless semiconductor companies: Xilinx, Analog Devices, Broadcom, Realtek Semiconductor, and MediaTek. We excluded AMD, Nvidia, and Marvell Technologies from the peer-set since all of these firms produce processing chips that are actively used in cryptocurrency mining. Due to the latest spike in BTC price and enormous deficit of video- and ASIC-chips for mining the stock prices sky-rocketed, so did the multiples. This makes these companies not comparable with Qualcomm. Within the chosen group, Qualcomm's multiples are relatively low. Part of that discount can be explained by the uncertainty towards the timing of Apple's transition from Qualcomm to own solutions which is monitored since Apple constitutes around 20% of the Company's revenue. For conservative purposes, we used the floor valuation, which was derived by applying the median peer multiple to the Company's EBITDA excluding Apple. Even with that in place, we arrived at the 23.3x EV/EBITDA NTM target multiple, which implies USD 164 price per share, or a 19.3% upside over the closing price on a 12-months horizon. Multiple expansions will be driven by a longer-lasting 5G growth cycle, which is not yet reflected in typical three-year brokers forecasts, secured by Qualcomm's strong market positions. Our BUY recommendation is also supported by EV/EBIT, EV/Sales, and P/E trading multiples. See Figures 28, 29 and 30.

Figure 29: EV / EBITDA multiple



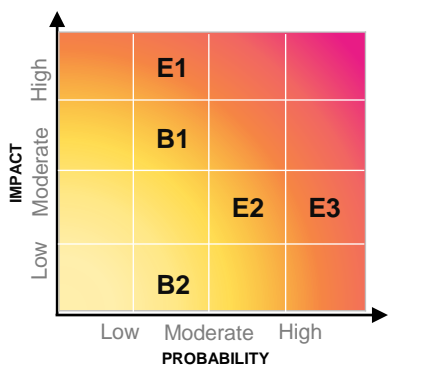
Source: Capital IQ

Figure 30: Price / diluted EPS multiple



Source: Capital IQ

Figure 31: Qualcomm Risk Matrix



Source: Team estimates

Figure 32: Qualcomm SWOT Analysis

<p>Strengths</p> <ol style="list-style-type: none"> Advanced technological know-how supported by high R&D expenses Very well-positioned for 5G growth Almost monopolistic position in CDMA patents Supply deficit of chips and semiconductors is the chance to outperform the market 	<p>Weaknesses</p> <ol style="list-style-type: none"> The cyclical nature of the semiconductor industry Weak presence in non-CDMA technologies Brand recall and marketing strategy is limited as the Company does not indulge in a lot of marketing globally
<p>Opportunities</p> <ol style="list-style-type: none"> 5G Sector development and growth period Internet of Things spreading across plenty of business industries and markets Automotive segment growth due to electric vehicles popularity Favorable prospects of portfolio companies in a wide range of IT-spheres 	<p>Threats</p> <ol style="list-style-type: none"> Fierce competition in the industry – competitive offering from MediaTek, Intel and others Customers developing in-house know-how Legal issues with multiple parties, which might lead to lower royalty rates Exposure to possible sanctions between the USA and China

Source: Team estimates

Figure 33: Qualcomm PESTLE Analysis

Political	<ul style="list-style-type: none"> US Ban on selling to Huawei Tax Regulations USA-China trade war
Economical	<ul style="list-style-type: none"> Impact of currency fluctuations
Social	<ul style="list-style-type: none"> Promotion of STEM Education
Technological	<ul style="list-style-type: none"> Potential for XR Advancements in AI High R&D expenses
Legal	<ul style="list-style-type: none"> Intellectual property laws
Environmental	<ul style="list-style-type: none"> Sustainable supply chain Measures to tackle water scarcity

Source: Team estimates

Investment Risks

Probabilities and impact of the following risks are presented in Figure 31.

ECONOMIC AND MARKET RISKS

[E1] Exposure to possible sanctions between the USA and China, which can seriously affect revenue gaining. The majority of Qualcomm's revenues come from China. According to Statista, in the fiscal year 2020, Qualcomm earned \$14,001 million from the Chinese market compared to \$1,129 in the U.S. market. While the Trump administration did little to build confidence in Qualcomm's strong market presence in the China market, the new Joe Biden administration may not help the tensions with China to a noticeably greater extent. Chinese telecom giant Huawei responded to U.S. blacklisting last year by focusing more on its home market where it is gaining market share. Retaliation from China could target chip giants like Qualcomm, Broadcom, and Apple, who depend on chip makers for iPhone manufacturing. The last time Qualcomm got caught up in the United States-China trade war, it withdrew from the acquisition of NXP Semiconductors. For Qualcomm, there is a huge opportunity with 5G smartphones and 5G laptops although China-U.S. tensions and the coronavirus shock to the global economy represent strong headwinds.

Mitigation: In the short-term, with the new Biden administration, a trade war with China that would be significantly detrimental to the U.S. semiconductor industry is unlikely. US and Japan pledge to strengthen the alliance to counter China's rise. In another swipe at China, the US and Japan announced to invest together in areas such as 5G, artificial intelligence, quantum computing, genomics, and semiconductor supply chains.

[E2] Revenue is much dependent on CDMA segment and top four customers. One risk Qualcomm has to contend with is customer concentration risk. Specifically, Qualcomm's top four customers (Apple, Samsung, HP, and Alphabet) account for nearly half of the Company's revenue. The loss of a major customer could have a disproportionate impact on the Company's financial outlook.

Mitigation: Having said that, Qualcomm's indispensable technology and unique licensing business model limits this risk significantly. Qualcomm is one of the most attractive plays in the 5G ecosystem. And as 5G grows, we expect Qualcomm's industry-leading position to result in increased product pricing and significant profitability gains. Further, the shares trade at an attractive valuation multiple, thereby offering a compelling risk-reward opportunity.

[E3] Supply chain problems due to CoVid-19 outbreak. Qualcomm noted that semiconductor supply constraints are impacting their ability to fulfill demand across most of all their business lines. The most complex and expensive pieces of silicon these days are logic chips from Qualcomm, Nvidia, or Apple that give computers and smartphones their intelligence. But these "fabless" companies don't operate their own fabrication plants; they just design the semiconductors. Manufacturing happens at advanced factories called foundries that produce the designs of those big-name electronics companies. This is another key bottleneck. Just three or four foundries now account for the majority of global chip fabrication—TSMC and Samsung and their more distant rivals, California-based GlobalFoundries Inc., controlled by Abu Dhabi's investment arm, and United Microelectronics Corp. Looking at it another way, an estimated 91% of the contract chipmaking business is housed within Asia, the lion's share of which is divided between just two regions: Taiwan and South Korea.

Mitigation: Officials from the U.S. and Europe have beseeched Taiwan's officials for help in resolving the global chip crunch, and are pushing for the creation of domestic chipmaking capabilities. Stimulus packages were widely announced to get a boost for this industry. However, management noted that they expect to see a material improvement in supply by the end of the year due to capacity builds and multi-sourcing initiatives.

BUSINESS RISKS

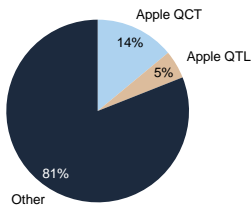
[B1] Tightening competition on Qualcomm's strategic markets. Qualcomm ranks #1 in the communication/internet equipment sector with more than double the score of the next competitor in terms of patent value. The company's closest competitor is MediaTek with both companies holding a market share of nearly 30% each in the mobile phone chipsets market. Having said that, Qualcomm enjoys strong market leadership in the 5G chipset market with a 39% market share as of Q3 2020.

Mitigation: Due to leadership in 5G, the transition from 4G to 5G will also enable the Company to capture a much larger market share in the overall chipsets market. In November 2020, Qualcomm introduced Snapdragon 888 mobile platform to enhance its 5G capabilities. It will help lower device costs and increase battery life. The Company also recently launched Snapdragon 480 5G chipset to bring 5G capabilities to budget smartphones. This initiative will help Qualcomm increase market penetration in emerging markets as well. In addition, Qualcomm Ventures owns more than 150+ fast-growing companies in various IT subgroups with fascinating prospects for further development.

[B2] Flaw in Qualcomm modems enables backdoor for hackers to break users' privacy. A security flaw has been discovered in Qualcomm's chipsets that make it vulnerable to hackers. A report by Check Point Research says Qualcomm modems can be exploited to listen to conversations by a phone user, steal data and hide malware. The vulnerability is higher for users without regular updates of their security patches, and regular software updates should be done. When the hackers gain access to a vulnerable device, they may be able to listen to calls, read through messages, and possibly unlock the SIM to gain access to private data for criminal purposes. The jacket could inject malicious code into the modem via Android, and access the smartphone user's call history, messages, etc.

Mitigation: However, an official statement from Qualcomm indicates that the security issue has already been fixed since December 2020 with the appropriate software updates. Therefore we believe that subsequent software updates since then could have further enhanced the security of the devices from attackers.

Figure 33: Apple in the revenue of Qualcomm



Source: Qualcomm 10-K report and 10-Q report

Apple as Qualcomm's client

In this section we describe the position of Apple in revenue of Qualcomm and analyze the possibility of scenario in which Apple switches to the own development and production of smartphone chips.

QUALCOMM HAS ABOVE-MARKET MARGINS DUE TO LICENSING SEGMENT

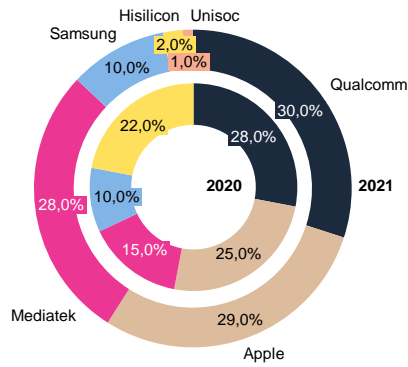
The risk of Apple's possible substitution of Qualcomm's chipsets on iPhones with an internally developed solution has been known since 2019 when Apple acquired Intel's modem business. However, early 2021 brought new concerns on the timing of the transition after Apple has announced to increase investments in the Munich facility with a focus on 5G technologies. That issue is closely monitored by the investors since Apple constitutes around 20% of Qualcomm's total revenues. Even though the transition will hurt Qualcomm's operations, we think that the current stock price levels reflect the market's underestimation of the task Apple will face in coming years, and already account for the worst-case scenario. Previously Apple has successfully moved away from Intel solutions on Mac laptops in two years, and there are no signs for this transition to accelerate this time. Intel's modem business was not successful in joining the 5G race, and it might take a long time before Apple manages to transform Intel's technology into a worthy 5G chipset. Even Samsung and Huawei were struggling to develop competitive chipsets for a decade, and these companies do have a track record of making networking equipment as opposed to Apple. With these challenges, we see Apple's ability to come up with a solution in the next two years as highly unlikely. That means that first-generation 5G iPhones launched before 2023 will still run on Qualcomm's SoCs, and will be protected by a multi-year chipset supply agreement with Apple. In addition, Qualcomm participates in developing new wireless standards for the whole industry which gives its chipsets a competitive first-mover edge. As a result, even companies that have in-house modem solutions, like Samsung, still often use Qualcomm's chipsets in their smartphones. It means that Qualcomm will remain a major supplier of Apple for years to come. At the same time, Qualcomm's high-margin QTL business is protected by a 6-year agreement on licensing which mitigates the impact on the licensing revenues at least in the medium-term..

PORTFOLIO OF INTELLECTUAL PROPERTY IS ANOTHER AIRBAG FOR QUALCOMM

Qualcomm is the recognized leader in intellectual property licensing of wireless technologies due to its one-in-kind portfolio of patents. This allows the company to maintain its position on the market and creates barriers for other players trying to enter the market (the case of Apple). If Apple plans to switch to own chips it will have to overcome the patents already created by Qualcomm in order not to fall into a raw of lawsuits.

Appendices

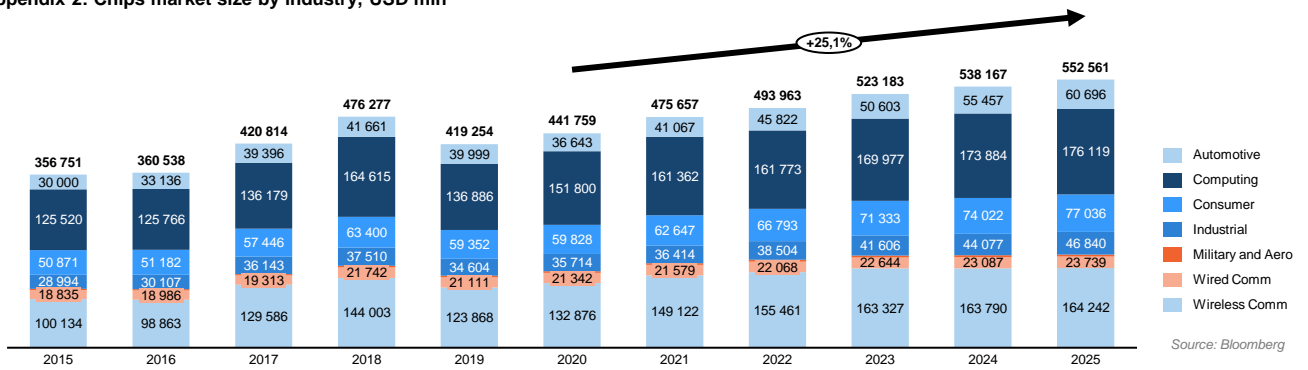
Appendix 1: Global 5G Smartphone AP/SoC Market Share



Source: Counterpoint

Qualcomm to increase its 5G SoC market share to grow to a 30% mark in 2021, with 5G solutions across the tiers, from Snapdragon 8-series down to 4-series. If you include 5G baseband shipments to Apple, the overall 5G chipset market share jumps to 59% level. In an ideal scenario, Qualcomm's market share in the 5G segment would have been even higher if it did not face the unfortunate supply constraints in the first half of 2021. As Qualcomm turns to place more wafer orders on TSMC's 6nm/5nm from Q2 2021, following the below-expectation wafer output of the Snapdragon 888 at the beginning of the year, we expect it to resume its 5G SoC shipment growth from H2 2021.

Appendix 2: Chips market size by industry, USD mln



Source: Bloomberg

Appendix 3: name