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Analysis of NVIDIA Corporation

Technical Report · April 2020

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The NVIDIA logo is displayed in a large, bold, black font. A large, stylized green eye graphic is positioned behind the logo, with its center aligned with the 'V' in NVIDIA. A diagonal green band runs from the bottom left towards the top right, passing behind the eye and logo. A red watermark reading '© Nicolette Lunsingh Tonckens' is oriented diagonally across the center of the page, passing over the eye and logo.

Subject: Applied Business Models

Code: IBPABM119FT1

Class: FTY1-102

Lecturers: Davarci, A. & Kaimakis, K.

Date of Submission: 16/04/20

Word Count: ...

Executive Summary

The research conducted in this report regards NVIDIA's GTX 1650 graphics card and is based on the North American market. It is of utmost salience to conduct business market research because it allows for identification of bottlenecks in a company and may prompt helpful suggestions. Understanding the needs of existing customers and why they choose NVIDIA over other competitors allow for carefully-chosen market decisions and may lead to developing more effective strategies.

Moreover, it is evident that a myriad of external, as well as internal, factors are affecting the business operations of NVIDIA with cryptocurrencies being one of the most influential factors. NVIDIA's buyers often stem from cryptocurrency markets and it is advised that NVIDIA monitors the cryptocurrency market wisely. Furthermore, NVIDIA's faces a pool of competitors; one where the Japanese company Fujitsu is putting pressure to develop A.I. processors. Fortunately, NVIDIA may be deemed as "digitally healthy." They are ranked highly across health-check sites and must continue to maintain their status. In addition, the NVIDIA's TOWS Matrix poses several strategies such as upscaling their manufacturing to make supply equal demand. NVIDIA has the workforce to do that and should strive to achieve that goal. NVIDIA makes heterogeneous, luxury shopping goods that are geared towards the American male market and it is thus also suggested that NVIDIA makes amendments in their marketing strategies to tailor their products more towards females. This way, they can increase their consumer reach.

Lastly, financial analyses has concluded that NVIDIA's current asses are growing over the years and also have more financial freedom as a result of its working capital in comparison to its competitor AMD. This is seen positively as it complements NVIDIA's low debt ratio. NVIDIA's gross profit rate is approximately 60% and thus it can be concluded that the majority of their money is profit.

Word count: 303

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1. Current Marketing Situation

1.1 NVIDIA's Vision & Mission

NVIDIA Corporation is first and foremost known for their production of computer graphics cards. The company was founded in 1993 by three computer enthusiasts Jensen Huang, Chris Malachowsky and Curtis Priem. The founders anticipated that one day the PC (Personal Computer) could become more of a consumer device rather than just a working tool; allowing users to enjoy gaming and multimedia. While many former competitors of NVIDIA have exited the market, NVIDIA has remained one of the leading GPU (Graphics Processing Unit) manufacturers. (NVIDIA Corporation, 2020)

NVIDIA claims to be all about “winning”, which leads to their competitive and innovative mindset. As stated on the official website, NVIDIA's number one goal is to continue building one of the most influential technology companies in the world. To achieve this objective, NVIDIA is constantly looking to find elite talent whom could help to further develop the visual computing industry. With a team consisting of smart and hard-working specialists, NVIDIA seeks to continue succeeding in the graphics card market. In addition to manufacturing GPUs, NVIDIA is also looking to develop the AI industry. (NVIDIA Corporation, 2020)

NVIDIA Corporation is an established and reliable brand. Nowadays, their GPU's are used in many computers, laptops and even robots. Furthermore, NVIDIA graphics cards accelerate the world's fastest supercomputer Summit (NVIDIA Corporation, 2020) . Additionally, NVIDIA developed processors for Sony's PlayStation 3 and many other gaming consoles.

Word count: 230

1.2 External Analysis

Among the recent economic trends, Bitcoin and other cryptocurrencies have taken a steady and influential stand. Cryptocurrencies operate independently from a central bank, and it is a digital currency, that is hard to trace. (Sweeney, M., 2020). For NVIDIA, trends on cryptocurrencies are impactful due to the usage of graphics processing units (GPUs) in cryptocurrency mining. According to Seth (2019), GPUs are more efficient than other counterparts in mining cryptocurrencies, being even as high as 800 times more effective than central processing units in the computer. Metz (2018) notes that many GPU suppliers struggle with demand due to the recent rise in cryptocurrencies and make it difficult for the supply to meet the demand. As McCarthy (2018) points out, the GPU prices have been heavily affected by the cryptocurrency boom in late 2017 and early 2018, but have started to stabilize going further into 2018.

Social trends among the PC gaming have a great impact on Nvidia, considering they sell components that are crucial in computers meant for gaming. Stuart and Webber (2015) from The Guardian note that as the first generation of people who grew up among video games are starting to become parents. This makes video gaming more widely accepted and should boost the popularity of gaming. Playing video games has become a part of a person's identity even, referring to themselves with the term *gamer*.

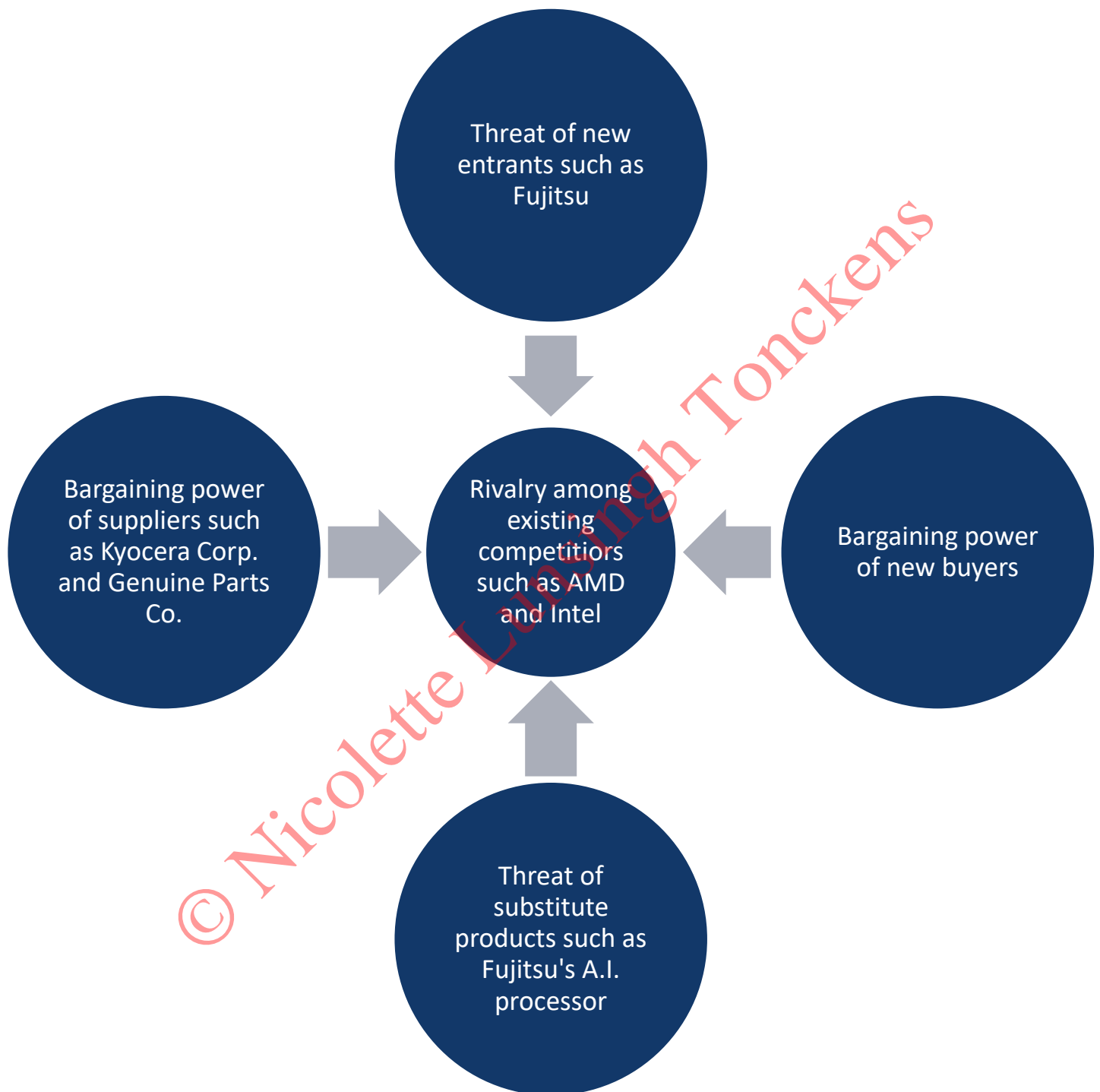
The technological advancements from game creators require the hardware producers to keep up with them, since the players of that video game need to have, or purchase, the required hardware to run the game. The rise of virtual reality gaming requires the computer component manufacturers to step up their game and bring more powerful parts to the market. As Stuart and Webber (2015) cited Ian Baverstock, virtual reality is the place to be, from an investment point of view specifically.

Electronic waste and the poor handling of it is a rising issue in today's world. This affects both the ecological, and the political climate of the computer part industry. According to Mahy (2020), there are up to 50 million tonnes of e-waste generated each year, and it is expected to double to 110 million by 2050. Legislative bodies such as the European Commission have started targeting electronics manufacturers with bans on hazardous substances and requirements for recycling points for their electronic waste. (European Commission, 2019).

As the demographic trends do not pose a large effect on the computer parts industry, it was not included in this analysis.

Word count: 415

1.3 A Review of NVIDIA's Competition



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(Figure 1: A review of NVIDIA's competition using Porter's 4 Forces)

NVIDIA faces a vast pool of competition in North America, specifically against Intel and AMD (Advanced Micro Devices). According to Tayal (2019), the everlasting rivalry on the market between NVIDIA's and AMD's GPUs is one that still exists today. The GPU market has gained the interests of investors since 2016 and thus this market is still rapidly evolving by the day. In the second quarter of 2018, AMD's market share surpassed NVIDIA's and continued to grow (Tayal, 2019). Both companies released hotfixes for their graphics drivers, developed new architectures and partnered with Samsung. Although NVIDIA's performance and power consumption was deemed better than AMD, AMD lowered its prices and tailored their products for masses rather than gamers. This is why AMD's market share exceeded that of NVIDIA's. Furthermore, the rising attention in cryptocurrency in 2018 was also a reason why AMD's market share increased. AMD presented a better price-to-performance ratio for cryptocurrency users.

On the other hand, NVIDIA faces new rivals on their horizon. Fujitsu, a Japanese company, is on the verge of entering the North American market with a massive breakthrough. In order for NVIDIA to remain successful, they need to take into account and analyse their new competitors at all times. Fujitsu is a company comprised of over 159,000 employees and produce one of the most hi-tech processors for super computers (Arora, 2017). They pose a challenge to NVIDIA because their new processor will perform ten times better than NVIDIA's – and even AMD's – processors.

Word count: 257

1.4 An Internal Analysis of NVIDIA

The resources chosen to analyse NVIDIA's skills and capabilities using RBV and VRIO framework are financial resources such as assets, technological resources such as graphic chips, human resources on a social level such as a priority in supply chain management and product quality.

As stated in NVIDIA'S annual report (2019), a graphics processing unit was invented to solve some of the most complex problems in computer science. A significant portion of the executive pay opportunities were tied to achieving rigorous financial measures that drive business value and contributed to Nvidia's long-term success. Due to the invention, a record revenue of \$11.72 billion was achieved for Fiscal 2019 in comparison to Fiscal 2018, which was \$9.71 billion.

The technological advances with graphics processing units are rapid and ever-changing. NVIDIA (2020) mentions in their most recent financial result release that they focus in reinventing and finding new opportunities. Innovation is very important to stay afloat in the technology industry. The chips that companies such as NVIDIA create can be used for many other things than just computers. According to Pressman (2020), NVIDIA recently debuted a robot, that contains NVIDIA chips, essential to run the robot. Other large companies, such as AMD and Intel are constantly releasing new models to keep up with the constant shifting technology market. McDowell (2019) notes that NVIDIA is a leading name in developing machine learning and the necessary GPU technology for AIs. Making the technology of this heterogeneous resource inimitable.

NVIDIA (2019) writes that they engage with suppliers that share their values. They then start to collaborate with them to build a stronger, more responsible supply chain that satisfies their customers' product quality expectations. The company partners up with world-class suppliers for all phases of the manufacturing process, including wafer fabrication, assembly, testing, and packaging. The supply chain is closely managed since the goal is to deliver innovative products in a socially and environmentally conscious manner. NVIDIA also sets contracts with manufacturers to build, test, and distribute their devices. All suppliers including NVIDIA comply with "the Responsible Business Alliance Code of Conduct and use the code as a platform to go above and beyond compliance." By using this, they conduct internal assessments to confirm that all aspects of responsible supply chain management are addressed. According to RBA (2018), the code of conduct is applicable to and already in use by many industries alongside electronics. Consequently, making this form of internal assessment imitable.

NVIDIA (2019) explains that indicators are used for measuring customer DPPM levels (defective parts per million) to assess the performance of their product. This is done to ensure that customers' quality expectations are met. Internally, a cross-functional team manages product quality issues. To verify a product failure, customer quality engineering and customer program management engage the customer. Once a failure is verified, the issue gets addressed using the Eight Discipline (8D) problem solving methodology. However, Rever Team (2019) notes that the 8D has become familiar amongst manufacturers due to its effectiveness and accessibility.

As for the talent strategy selection of NVIDIA, the company is positioned "to attract the industry's most creative and gifted individuals, and they take pride in our dynamic workplace." (NVIDIA, 2019). With this, NVIDIA explains that the company invests in encouraging their employees not only to perform and focus better, but also to invest in the company's future. They are given the opportunity to be shareholders in the company through an employee stock purchase plan (ESPP). Other benefits of NVIDIA include flexible work hours and flexible time off, and programs to help employees deal with stress.

Resource	Type	Valuable?	Rare?	Imperfectly imitable?	No substitutes?	Type of competitive advantage
Company's revenue	Intangible	Yes	No	Yes	Yes	Temporary
Nvidia's technology	Tangible & Heterogeneous	Yes	Yes	Yes	Yes	Sustainable
Supply Chain Management	Intangible	Yes	No	No	No	Competitive parity
Onboarding process	Intangible	Yes	Yes	No	Yes	Temporary

(Figure 2: VRIO framework on NVIDIA'S resources)

Word count: 594

1.5 A Digital Health Check

Report for www.nvidia.com

9.6 Overall
The overall score for this website.

9.9 Accessibility
How accessible the website is to mobile and disabled users.

[Hide contributing tests](#)

The following tests contribute to this score:

- 9.1 Internal links**
- 10 Mobile**
- 10 Page titles**
- 10 Headings**
- 10 URL format**

9.1 Experience
How satisfying the website is likely to be for users.



Nibbler tested a sample of **5 pages** from this website at 11:22 AM on Mar 6, 2020 (CET).

[Retest](#)

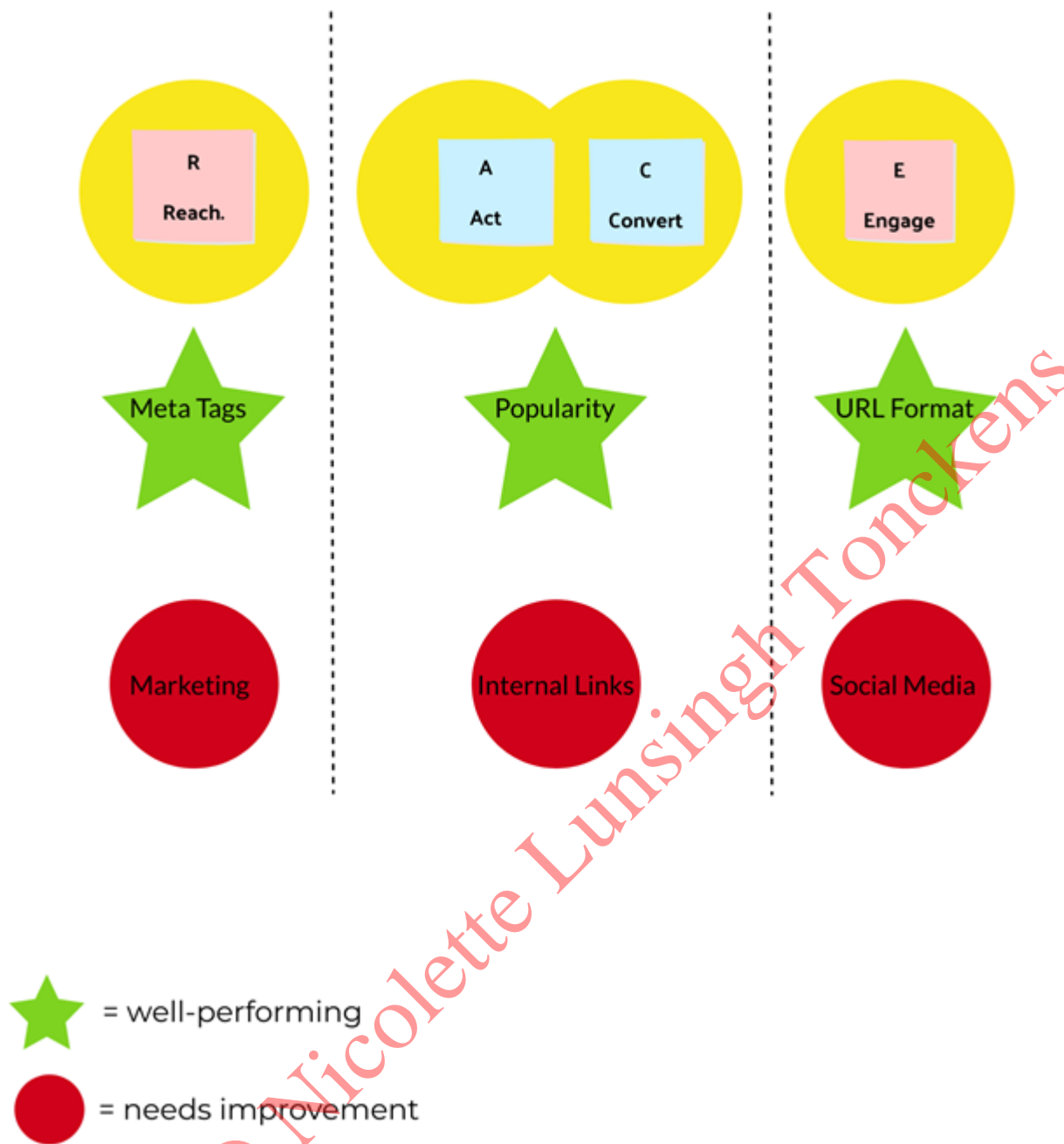
Overview

Printability	0.0
Internal links	9.1
Server behavior	9.3
Amount of content	9.4
Popularity	9.7
Twitter	10
Mobile	10
Analytics	10
Page titles	10
Headings	10
Incoming links	10
Images	10
Meta tags	10
URL format	10
Freshness	10
Domain age	i
More features	+
5 pages tested	

(Figure 3: NVIDIA's annual report, retrieved from www.nibbler.com, 2020)

Engagement							
Dec 2019 - Feb 2020 Worldwide							+
Domain	Monthly Visits	Unique Visitors	Visits / Unique Visitors	Visit Duration	Pages/Visit	Bounce Rate	
nvidia.com	20.70M	12.71M	1.63	00:03:39	4.05	48.47%	
intel.com	22.58M	12.64M	1.79	00:04:00	3.49	55.56%	
amd.com	12.82M	7.197M	1.78	00:03:37	3.05	47.10%	

(Figure 4: Engagement Statistics, retrieved from www.similarweb.com, 2020)



(Figure 5: NVIDIA's Race Model)

According to Nibbler (2020), NVIDIA is rated with a 10 on their use of metatags. Metatags are used to optimise search engines so that the website will occur on top of the list. Consequently, this increases the reach of the company and in turn NVIDIA is found more easily on search engines. Moreover, according to SimilarWeb (2020), NVIDIA has the second-highest monthly visits of its competitors. Only Intel scores higher. From this, we can conclude that NVIDIA is able to reach to a lot of people and that the company has a strong reach. Finally, we can deduce that metatags are a good performance indicator in the race-model.

Furthermore, demographic numbers on SimilarWeb show that only 14.5% of the visitors on their website are female. If NVIDIA were to tailor their products more towards females, this group could pose an opportunity for NVIDIA to expand their target group. Nibbler rates Nvidia's marketing with a 9.8. Attracting more women to their website will improve the marketing quality of NVIDIA. Therefore, marketing is an indicator in the race-model that needs improvement.

Additionally, SimilarWeb shows that NVIDIA's website is the second most-visited website and also the website with the most unique visitors in comparison to its competitors. Nibbler rates the popularity of the website with a 9.7 which is a really high score. A popular website indicates that customers are aware of NVIDIA as a company and that they engage with the company's website which in turn increases awareness. Therefore, popularity is also a good performance indicator in regards to the race model.

Nibbler rates the indicator 'internal links' with a 9.1. Their biggest issue is the use of some weak links that are badly defined which consequently decreases the ability of search engines to index content from a website. This could lead to people having difficulties with searching for NVIDIA on the internet. Improving the internal links can lead to more monthly visits on the website of NVIDIA (act & convert). Currently, the monthly visits on the website of Nvidia is lower than the monthly visits on the website of Intel, according to SimilarWeb (2020). Therefore, internal links is an indicator in the race-model that needs improvement.

Nibbler rates the URL format of Nvidia with a 10. As stated by Nibbler, "Good URLs are easy to remember and exchange between people via email or social media." This allows customers to easily share the website and the products of NVIDIA online. SimilarWeb shows that this exchange is easy, because NVIDIA has the most unique visitors on its website compared to its competitors. Therefore, URL format is also a strong performance indicator in the race-model.

According to SimilarWeb, only 2.49% of the total incoming traffic on the website is from social media. Nibbler rates the usage of Twitter of NVIDIA with a 10. However, this is only based on the fact that their website is connected to their Twitter account. With the increasing popularity of social media, it is important for NVIDIA to be very occupied on social platforms because this is an easy way for customers to share and comment with others about the brand and its products. Consequently, social media poses a lot of opportunities for NVIDIA to gain earned media (influencers) engaging in the brand. Finally, social media is also an indicator in the race-model that needs improvement.

Word count: 557

1.6 TOWS Matrix

The preceding sections broadly describe aspects of NVIDIA as a company. These sections are used to design a TOWS matrix. It is a diagram in which the organisational strengths and weaknesses, as well as the environmental opportunities and threats, are listed and ideas resulting from these factors can be composed. The following TOWS matrix seems to be lucrative. Please note that all organizational and environmental elements are elaborated on in earlier sections of this report.

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		Organizational Strengths	Organizational Weaknesses
		<ol style="list-style-type: none"> 1. NVIDIA is one of the leading GPU manufacturers 2. NVIDIA is one of the leading innovators of Artificial Intelligence and Machine Learning 3. NVIDIA has a large workforce of hard-working specialists 4. NVIDIA has experienced a significant rise in recent revenue as a result of innovation 5. NVIDIA has the second highest number of website visitors in its respective field (after Intel) 	<ol style="list-style-type: none"> 1. NVIDIA has a worse price-to-performance ratio than its main competitor, AMD 2. NVIDIA is falling behind Fujitsu, a competitor which claims to be able to manufacture processors which offer ten times more computational power 3. NVIDIA's website contains some weakly defined links, which in turn makes it harder to find certain pages using search engines
Environmental Opportunities	<ol style="list-style-type: none"> 1. Trends in cryptocurrency are causing a higher demand for GPUs 2. Trends in gaming, like virtual reality gaming, and everything affiliated with it, like content creators, are causing a higher demand for GPUs 3. The GPU market is (consequently) gaining interest of investors rapidly 4. Only a fraction of ~15% of NVIDIA's website visitors is female 	SO Strategies NVIDIA can use its increase in revenue (S4) and attract investors (O3) to increase its intensity of Research & Development (S1, S2, S3) to anticipate the trends in cryptocurrency and gaming (O1, O2).	WO Strategies NVIDIA can define its website links more clearly (W3) to generate an even higher traffic on its website, as well as the possibility of tailoring links to attract more female visitors (O4).
Environmental Threats	<ol style="list-style-type: none"> 1. Due to the rise in demand of GPUs, the market is struggling to make the supply meet the demand 2. The (North American) market consists of many strong competitors, and is at risk of new and strong market entrants 3. Electronic waste due to poor handling of used electronics affects the environment itself, as well as the political climate of the computer part industry 	ST Strategies NVIDIA can upscale its manufacturing to make supply equal demand (T1), using its high revenues (S4). This should be possible, given the workforce (S2, S3). In this way, by the principles of economy of scale, NVIDIA could beat the competitors (within the North American market) (O2).	WT Strategies NVIDIA can start manufacturing specific GPUs to better its price-to-performance ratio (W1), which would weaken the advantage AMD currently has in the market (T2).

(Figure 6: NVIDIA's TOWS Matrix)

The market which NVIDIA is part of is very hard to dominate, as it is largely dependent on technological advancements and optimal manufacturing. Both of these elements are very hard to improve, and would require a lot of expensive resources. In theory, the ideas seem plausible, but the magnitude of resources required to implement the ideas are gargantuan. Two strategies follow, to indicate the contrast between implementation of strategies that are composed.

Firstly, the strengths-opportunities strategy: NVIDIA can use its increase in revenue and attract investors to increase its intensity of Research & Development to anticipate the trends in cryptocurrency and gaming. This is a risky and expensive strategy. NVIDIA then has an obligation to its investors, as well as itself, to make the expected amount of money. If it succeeds, however, NVIDIA is likely to increase its share in the market significantly.

Secondly, the weaknesses-opportunities strategy: NVIDIA can define its website links more clearly to generate an even higher traffic on its website, as well as tailoring links to attract more female visitors. This strategy is remarkably cheaper than the preceding, as it only requires several software engineers. Moreover, there are no vital manufacturing adjustments, as this strategy has mostly to do with marketing. It is not likely to change NVIDIA into the market giant overnight, but it is certainly not as risky and expensive as the first idea.

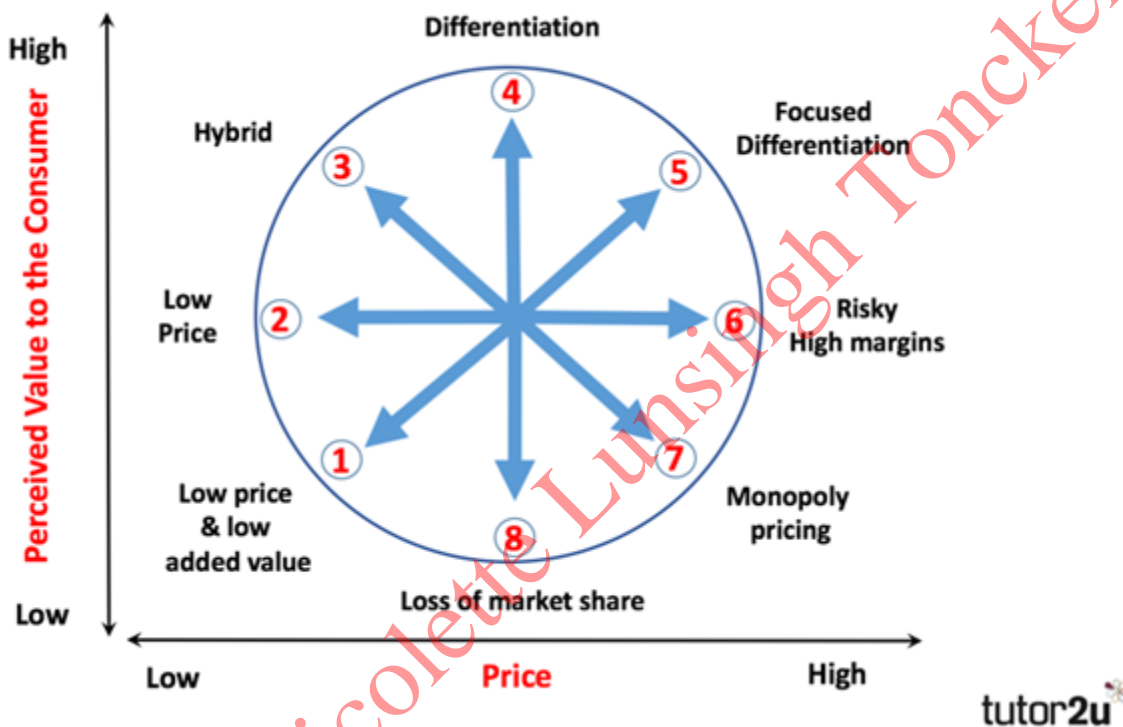
Conclusively, the strategies offer good theoretical plans to make the company grow. Nevertheless, decisions on implementing any of these strategies have to be made based on a trade-off between mainly gains, risks and costs.

Word count: 344

2. Marketing Strategy

2.1 Bowman's Strategy Clock & Ansoff's Matrix

To analyse the marketing strategy of NVIDIA, the model of Bowman's Strategy Clock will be used. Using this particular model, it is possible to analyse which strategic positioning a business currently holds in the market. The indicators considered in this model are price and perceived value of products manufactured by the business. (Bhasin, 2019)



(Figure 7: Bowman's Strategy Clock retrieved from www.tutor2u.net)

Considering the pricing of NVIDIA's graphics cards, the affordable solutions are at a similar price range as competitors. However, AMD still tends to have a bit of an upper hand, as their graphics cards provide significantly better performance while barely costing more than what NVIDIA is offering at the price range of 250\$-350\$. When it comes to high-end GPU's, NVIDIA owns a monopoly. Due to that, NVIDIA's graphics cards costing over 350\$ have higher price than similar cards manufactured by the competitors', but the performance is also better. (GamingScan, 2019)

Generally, NVIDIA's graphics cards are more advanced overall: they perform better, generate less heat and consume less power than those of competitors. Currently, NVIDIA's consumer-grade flagship graphics card RTX 2080 Ti with 11GB of GDDR6 memory and high-end Tensor beats every other competitor in the market in terms of performance. However, in order to get the best performance, the consumers must be willing to accept a hefty price tag of €1259 (price from NVIDIA's official website). (Carey, 2019)

Regarding the 8 positions of Bowman's Strategy Clock, NVIDIA can be positioned as "Focused Differentiation". According to Bowman's Clock, businesses in "Focused Differentiation" position are applicable for luxury brands with products of high price, but the customers are still buying the products for high perceived value. The information mentioned before suggests that NVIDIA's products are in the higher end of pricing. However, while the prices might be high, there is also a lot of focus on providing customers with the newest innovations and best performance available. Still, the competitors of NVIDIA are able to offer better solutions in lower-end graphics cards. Therefore, "Focused Differentiation" may be the most appropriate position for NVIDIA according to Bowman's Strategy Clock model.

NVIDIA's GeForce GTX 1650 is available on both NVIDIA's website, as well as on many 3rd party retailers (NVIDIA, n.d.). The graphics card market is also already existing in the US, with capable competition such as AMD, as analyzed earlier in the Review of NVIDIA's competition. NVIDIA's GeForce GTX 1650 graphics card best benefits from market penetration strategy, as it is both an existing product, and an existing market in the US.

The market penetration strategy's goal is to increase sales of an existing product, in an existing market. Out of all 4 strategies in the Ansoff's Matrix, market penetration can be considered as the one which comes with the least risks. There are several ways to approach the market penetration strategy, such as lowering prices, increasing advertising, or even buying out the competition. (Corporate Finance Institution, n.d.)

For NVIDIA market penetration is a great choice for it has a low risk, and NVIDIA has the capability to influence the market since it is a large competitor. NVIDIA even has the opportunity to create barriers to entry with its widely recognized knowledge of the field. According to Trefis Team on Forbes (2020) NVIDIA is leading the GPU market, having made 10,2 billion USD in profit in 2019, and is expected to keep the lead until at least 2025, increasing its profits to almost 20 billion USD.

As mentioned in chapter 1.2, the cryptocurrency mining trend has hiked up the prices of GPUs. NVIDIA has an opportunity to increase their sales by adjusting their prices lower, as per market penetration strategy. As higher prices will deter possible customers, NVIDIA has a great opportunity by providing still affordable GPUs even in the midst of the cryptocurrency mining boom.

2.2 STP Model and Value Proposition Model

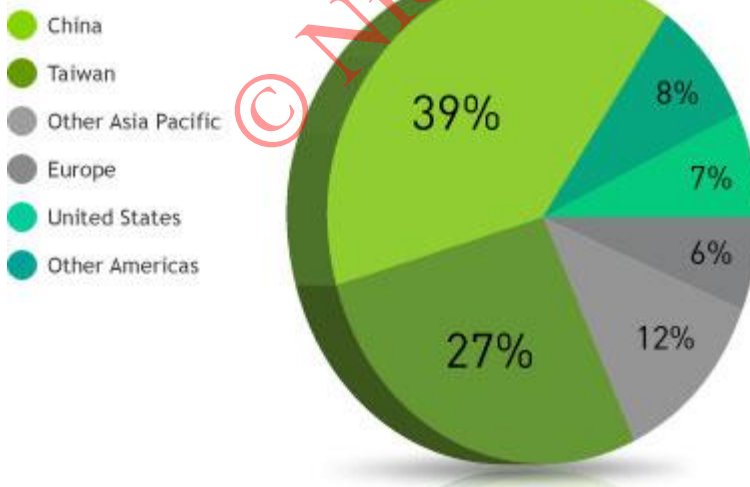
An important part of a company's success relies on market segmentation. To investigate NVIDIA's strategy, geographic, demographic, psychographic and behavioural segmentation criteria will be taken into consideration.

2.2.1 Geographic Segmentation

While NVIDIA does have headquarters and regional offices in 14 different countries, there are no physical stores in their possession. Therefore, NVIDIA relies on different distribution channels, with their main production line being in Taiwan. From there, most products are shipped to retailers all over the world (ex. BestBuy in US, MediaMarkt in NL). In addition to providing products to retailers, NVIDIA also has their own official web site with a dedicated store. It has been shown that in most situations, computer hardware consumers prefer to shop online (Tapalaga, 2019).

Manufacturing and distributing GPUs are NVIDIA's two most common activities. The sales of computer hardware depend on a specific market with ability to afford such investments. Due to that, majority of NVIDIA's revenue is generated from first- and second-world regions, with other regions accounting for just 14% of the revenue.

Revenue by Region

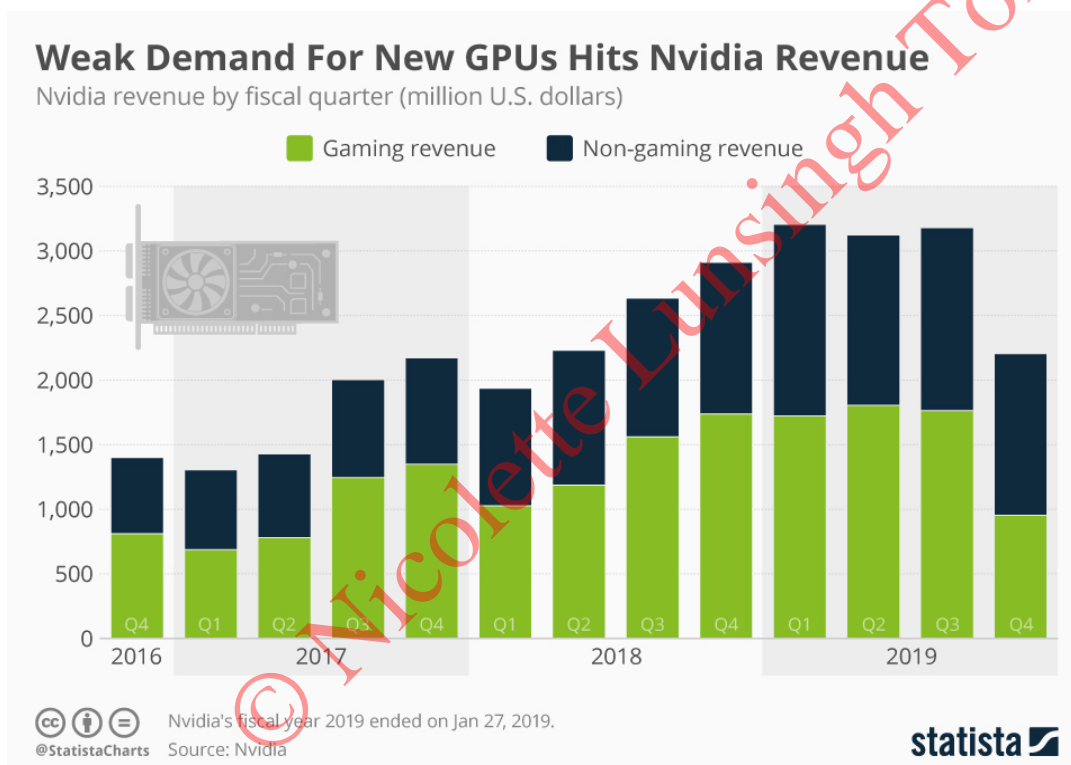


(Figure 8: Nvidia's revenue by region)

This comes to show that NVIDIA operates mostly online, but relies heavily on different distribution channels to reach their products to their consumers. While NVIDIA tries to distribute their products all over the world, most of their earnings come from more developed countries, allowing consumers to afford investing in GPUs.

2.2.2 Psychographic Segmentation

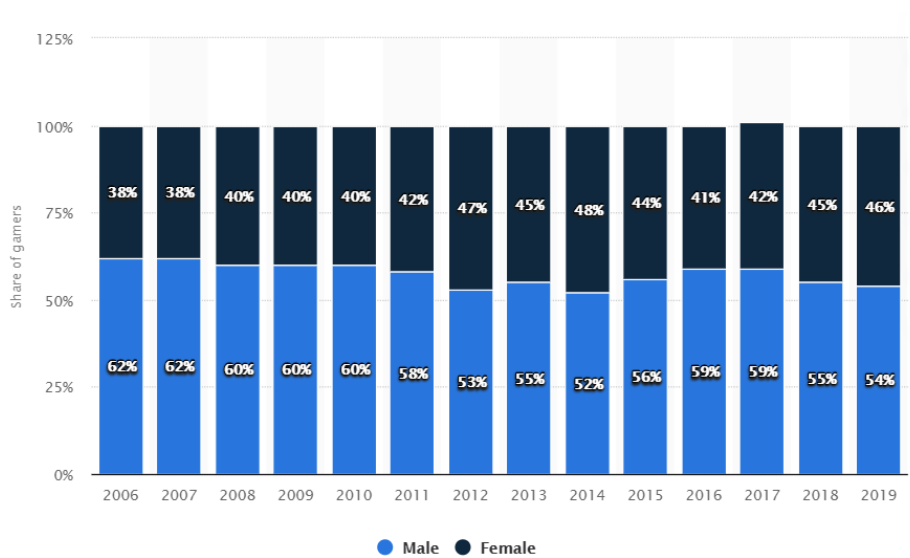
The main customer segment of NVIDIA includes PC gamers, streamers and private businesses building custom computers. While the trend has been declining, another customer segment of NVIDIA includes cryptocurrency miners. In most cases, regular computer usage does not require a dedicated GPU, meaning an average consumer does not have a need for this product. This comes to show that NVIDIA's customers are mostly serious computer enthusiasts with specific needs.



(Figure 9: NVIDIA revenue by fiscal quarter. Gaming revenue vs non-gaming revenue)

While NVIDIA did not do that well in the end of 2019, the chart above proves that a significant amount of NVIDIA's customers are into gaming. However, it is important to note that non-gaming revenue can still include customers with specific needs, such as cryptocurrency miners, programmers, video-editors etc.

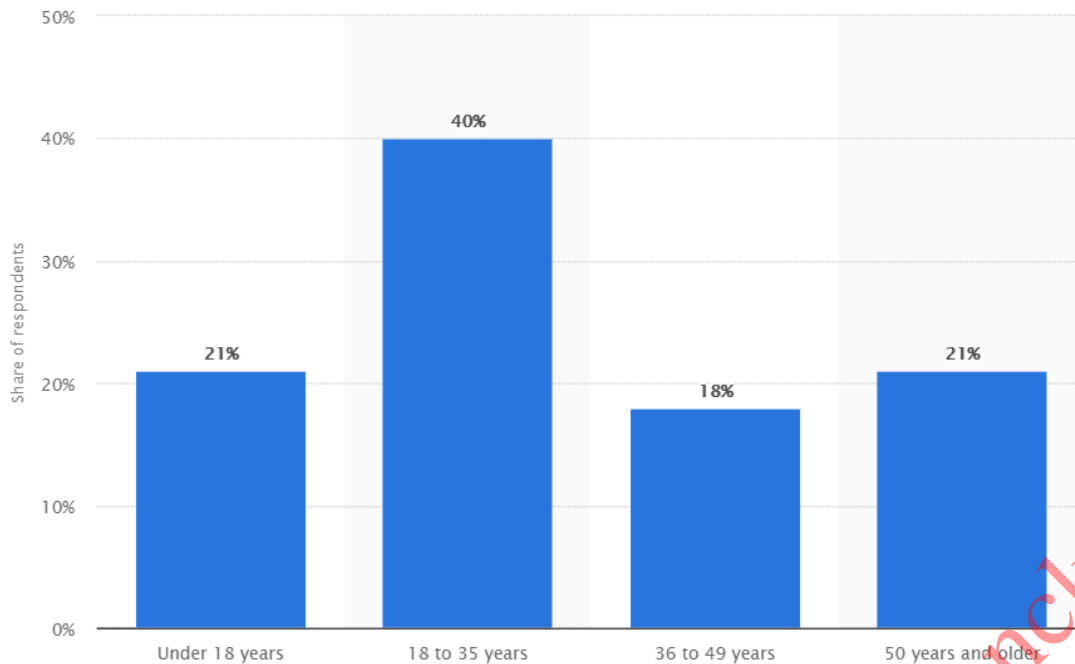
2.2.3 Demographic Segmentation



(Figure 10: Gender based classification of people considering themselves 'gamers'. Retrieved from www.statista.com)

As both the gaming and streaming community have become more popular, there is little difference in gender proportions. It can be assumed that the ratio of male-female consumers is roughly the same for NVIDIA. In terms of age group, consumers of dedicated graphics cards tend to be rather younger, as they are more into gaming and streaming (ages up to 35 are responsible for 61% of gamers).

As mentioned before, a dedicated graphics card is usually seen in mid-tier or high-end computers, meaning a sufficient capital is necessary and not everyone can afford one.



(Figure 11: Gamers grouped into age categories. Retrieved from www.statista.com)

2.2.4 Behavioral Segmentation

In most cases, customers who have purchased NVIDIA products tend to stay brand loyal, as they are dependent on NVIDIA software support, their ecosystem and just for the reason of what NVIDIA brings to the market in terms of performance and reputation. In addition to that, consumers such as gamers, streamers and even cryptominers tend to have a high usage rate with their product, being up to many hours a day.

Targeting

Based on the findings of the previous chapter, NVIDIA's psychographic and behavioral segmentation can be used to create one market for targeting. On the basis of this, the best targeting strategy for NVIDIA Corporation could be niche marketing. By definition, niche marketing sets to "achieve high penetration among the narrowly defined target segments" (LumenLearning, 2016). Niche marketing can be considered the best fit, as there is a specific group of consumers with needs of high performance for their PC (gamers, streamers, cryptominers). By focusing on creating the best performing GPUs, NVIDIA can maintain their dominance in the market of graphics cards. It must be considered that when implying niche marketing other segments and side projects of the company will be more vulnerable. However, as long as there is still demand for NVIDIA's graphics cards, the company will be in a strong financial position.

Positioning

As described previously, NVIDIA's biggest competitor is Intel, with many other up and coming GPU manufacturers such as Fujitsu entering the market. It is for certain that NVIDIA's competitors offer GPUs at a lower price. However, the performance and quality of NVIDIA's competitor cards tend to be worse as well. While Intel is improving on the quality of their graphics cards, they still tend to be worse than NVIDIA's cards. It is important to note that while the prices of alternative graphics cards are lower, this does not mean they are cheap. The current popularity of cryptocurrency mining has skyrocketed all graphics cards prices, only recently having started to decline (Crider, 2018). This leaves us with many overpriced graphics cards with mediocre quality and performance. A positioning opportunity for NVIDIA could be to lower their price, while trying to maintain or even improve the quality of their products.

Unique Selling Propositions (USP) of NVIDIA:

- Best quality and performance on market
- Software support and updates
- Many differently priced and performing products for different needs

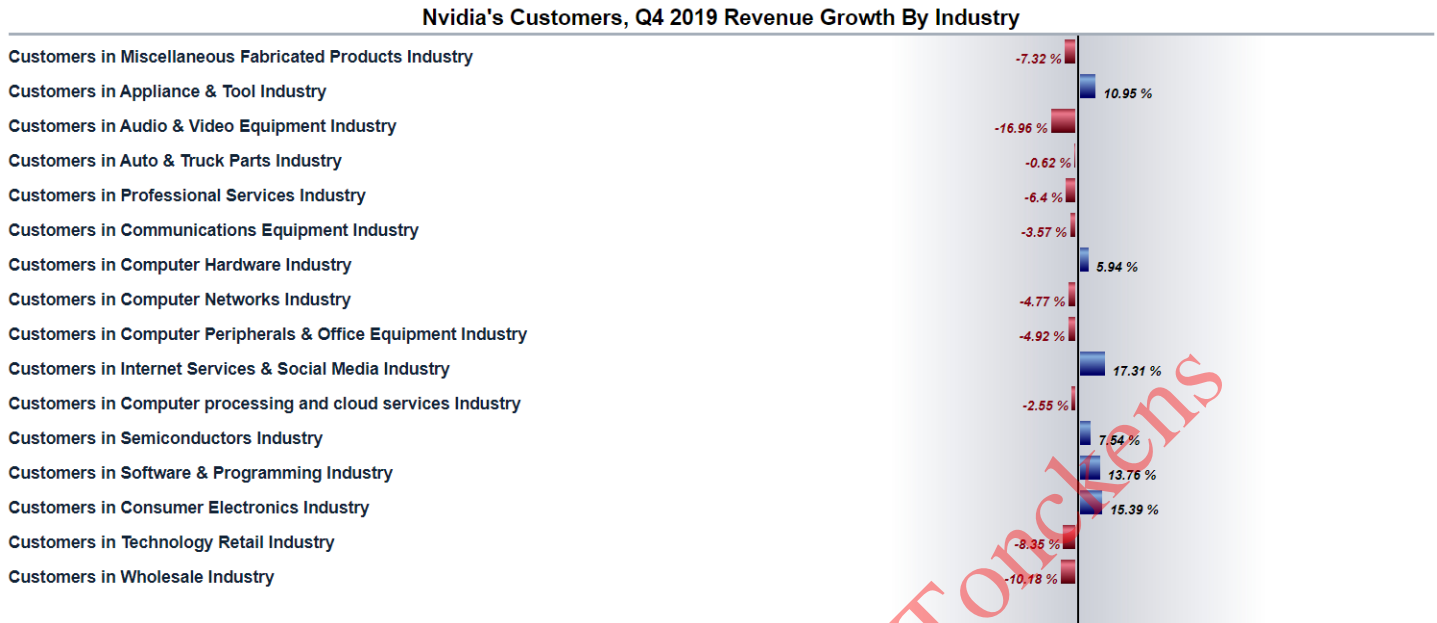
Emotional Selling Propositions (ESP) of NVIDIA:

- A recognized brand in GPU markets
- Sponsorships for streamers/gamers has built trust in customers
- Necessary for high-end computer usage

Value Proposition

To create a value proposition for NVIDIA, their consumers' behavior must be analyzed. First and foremost, NVIDIA customers are usually looking for products to increase performance of their device, in this case computers. To address this, NVIDIA has focused on "unique contributions" to solve the world's most stimulating technology problems. Furthermore, as stated by NVIDIA themselves, they provide their employees with excellent pay and benefits, relaxed setting and a flexible approach to time off in order to challenge them to do their best work on improving technology. By taking continuous risks and regarding failures as steps towards success, NVIDIA strives for excellence in whatever they do, as stated. Furthermore, customers that look for the specific uses out of NVIDIA products tend to be younger, more commonly under 35 years old. Due to that, NVIDIA has manufactured many different GPUs for consumers with needs for different levels of performance.

It is important to note that customers of NVIDIA tend to be more wealthier, as in recent years cryptocurrency mining has increased GPU prices, making them a significant investment for many people.



(Figure 12: NVIDIA's customers by industry. Retrieved from www.csimarket.com)

As can be seen from the chart above, newest trending incomes of revenue for NVIDIA are industries such as appliance & tool, computer hardware, internet services & social media, semiconductors, software & programming and consumer electronics industry. This proves that a large number of NVIDIA's customers are engaged in mining cryptocurrency (appliance & tool), streaming (internet services & social media) and gaming (consumer electronics, computer hardware, software & programming).

Considering these factors and behaviors of NVIDIA's customers, an example value proposition can be made up: "NVIDIA's graphics cards are crafted and manufactured by the best engineers in the world. This allows us to provide you with advanced technology, extreme performance, constant support & software updates and a product known for its quality. NVIDIA provides you with the tools to take your gaming and streaming to the next level."

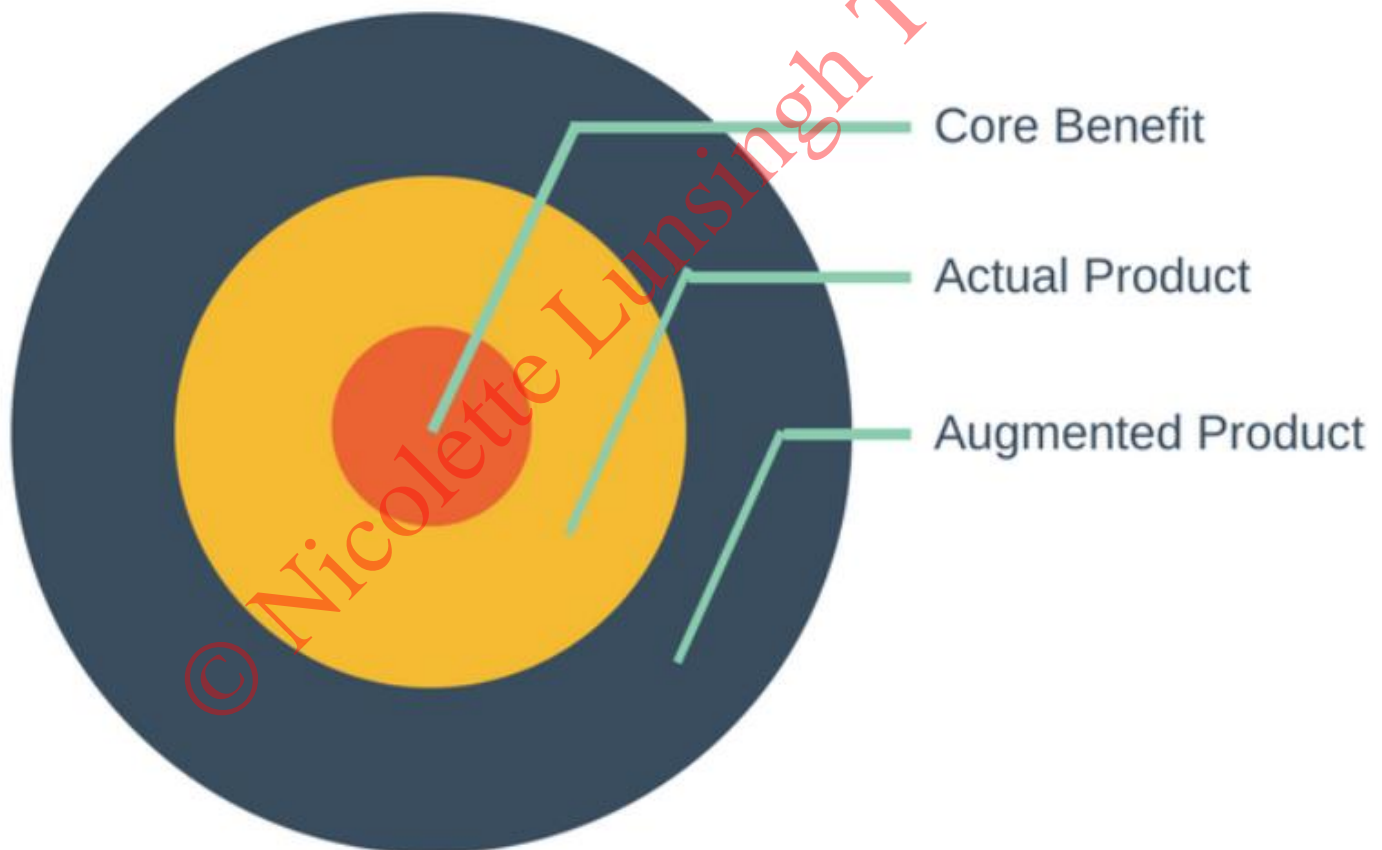
3. Marketing Tactics

3.1 Product

3.1.1 Product Anatomy

NVIDIA's GTX1650 graphics card is comprised of three levels concerning its anatomy according to Kotler (2017):

1. The Core Benefit → The reason why NVIDIA's customers buy this specific graphics card; to be able to play and run high-quality content
2. The Actual Product → The GTX1650's features alongside its packaging
3. The Augmented Product → The graphics card has a three-year warranty as stated on their warranty section on their site



(Figure 13: Three Product levels (Kotler). Retrieved from: <https://expertprogrammanagement.com/wp-content/uploads/2018/04/Three-Product-Levels.png>)

3.1.1.1 The Core Benefit

The GTX1650 brings about a myriad of benefits. It allows for gamers on a strict budget to enjoy very similar content to gamers with high-end computers. The product itself can be bought for only \$150 which is astonishingly low for a gaming graphics card, hence why it appeals to a variety of people, specifically the younger gamers with little pocket money to spend on their luxuries. As stated by Chacos (2019), “The graphics card is built to slip easily into pre-existing PCs and start playing 1080p games with minimal fuss. It joins the more powerful GTX1660 and GTX1660 Ti in the current GTX 16-series lineup.” The GTX1650 is easily set-up and thus requires minimal effort to work.

Furthermore, the GTX1650 avoids the requirement for a supplemental power connector entirely for some computers. This means that gamers can now avoid buying an extra power supply which in turn saves money. It also makes the graphics card great for small form factor builds and perfect for budget gamers. Moreover, it is 50% faster than the GTX1050 and roughly 30% faster than the GTX1050 Ti according to Walton (2019). It guarantees a pleasant gaming experience with more memory bandwidth and is also engineered so that it is clocked quite a bit higher. To paint a clearer picture, with the GTX1650 we now have a high-end card worth \$330 from 4.5 years ago moulded into a cheaper card for \$150. Back in the day, the card would also require an extra power supply.

3.1.1.2 The Actual Product

The actual product, the GTX1650 itself, entails only its features and its design. Usually these traits do not directly benefit the customer but are merely just part of the product. The actual product is as follows:

GPU Engine Specifications

NVIDIA CUDA Cores	896
Giga Rays	N/A
Boost Clock (MHz)	1665
Base Clock (Mhz)	1485

Memory Specifications

Memory Speed	8Gbps
Standard Memory Configuration	4GB GDDR5
Memory Interface Width	128-bit
Memory Bandwidth (GB/sec)	128

Technology Support

Hardware Accelerated Ray Tracing	No
NVIDIA GeForce Experience	Yes
NVIDIA Ansel	Yes
NVIDIA Highlights	Yes
NVIDIA G-SYNC Compatible	Yes
Game Ready Drivers	Yes
Microsoft DirectX	Yes
DisplayPort 1.4a, HDMI 2.0b	Yes
HDCP 2.2	Yes
NVIDIA GPU Boost	Yes
VR Ready	No
Designed for USB Type-C and VirtualLink	No
NVIDIA Encoder (NVENC)	Yes

Display Support

Maximum Digital Resolution	7680x4320@120Hz
Standard Display Connectors	HDMI 2.0b, DL-DVI-D
Multi Monitor	Yes
HDCP	Yes

Graphics Card Dimensions

Height	4.37"
Length	5.1"
Width	2.Slot

Thermal and Power Specifications

Maximum GPU Temperature in Celsius	92
Graphics Card Power (W)	75
Recommended System Power (W)	300W
Supplementary Power Connectors	None

In terms of quality, as stated in the first chapter, NVIDIA aims to “win.” The product definitely delivers what NVIDIA engineered it to be and thus may be deemed as a high-quality product. As for the brand itself, NVIDIA is very well-known in the gaming market with millions of sales worldwide. Their brand equity is well-established and thus NVIDIA has a strong competitive advantage. Last but not least, the packaging is sleek. The card comes in a black box with hints of green which complement the brand’s logo colour.

3.1.1.3 The Augmented Product

The augmented product entails any non-physical parts of the product. The warranty of the GTX1650 is up to three years and customer service is always readily available online. In terms of delivery, the card can be delivered within North America on the same day. Moreover, the card is compatible with certain apps that gaming computers have. Users can enjoy monitoring their gaming performance on external applications while using the graphics card.

3.1.2 Product Classification

The GTX1650 graphics card falls under a consumer product. This means that it is a product that is bought by the final customer for use. Under consumer products, the graphics card then falls under a shopping product. Shopping products are priced higher than convenience products and less frequently bought than convenience products. The graphics card is a shopping product because gamers spend time and effort researching what graphics card they want before they purchase it. They consider the price, quality, features and applicability before making their purchase.

"Shopping Good" Characteristic	GTX1650
Durable and long-lasting	Yes
High-priced item	Yes
Require more shopping time	Yes
Is not focused on brand identity	Yes

Furthermore, the GTX1650 is a heterogeneous good because gamers compare it for quality and suitability to give them the best gaming performance that meets their standards and wishes. The GTX1650 is not made for every gamer, hence why it is not a homogeneous good. It is heterogeneous because graphics cards vary in many aspects; not all cards are the same and not all cards perform the same. Consumers have to consciously choose which product to buy which matches their demands.

3.1.3 Suggestions

In terms of improvements within the three levels, only the actual product and augmented product could use some amendments. The core benefit is a level that is hard to change or improve because the GTX1650 is tailored and engineered in a specific way so that it is only applicable to a certain type of consumer: the gamer. In regards to the actual product, one could say that there is room for improvement. As seen in chapter 1.5, only 14.5% of the individuals that visit NVIDIA's website are female. This implies that NVIDIA could gain even more revenue and awareness if more females were willing to buy their products. As for the actual product, it entails the packaging. Often on the packaging, the company mentions which games the card is compatible with. NVIDIA often makes references to Battlefield and Rainbow Six Siege. These are games that are primarily played by males. A suggestion for NVIDIA would be to make references to games that are primarily played by females, such as The Sims.

Secondly, there is room for amendments in the augmented product level. If NVIDIA wants to get more engagement from female consumers, they should partner with companies that are primarily involved with female products. NVIDIA could possibly offer discounts for games and/or other products that female gamers enjoy.

3.2 Pricing Strategies

3.2.1 Factors Influencing Price

Cryptocurrency

High-end graphics cards are utilised for cryptocurrency mining. Since cryptocurrencies are very valuable, there are people that invest and buy graphics whom do not mind spending extra money for it. Due to the fact that companies such as NVIDIA are aware of this phenomenon, they can, and will, increase the price of their graphics cards accordingly. Cryptocurrency miners demand high-end graphics cards and suppliers sell them for inflated prices.

The price of video games

The newer video games are often pricy upon release. Consequently, these games require more powerful graphics cards to be able to run them. Pricy games are often big and very high in definition. Due to the fact that these newer games require more power, the price to design and engineer graphics cards that suit those games inevitably increase the price that graphics cards are sold at. A more expensive cost of production can only be successful and profitable if the product is also sold at a higher price.

3.2.2 Pricing Strategy

“How much the customer is willing to pay for the product has very little to do with cost and has very much to do with how much they value the product or service they’re buying,” states Eric Dolansky, Associate Professor of Marketing at Brock University in St. Catharines. This in turn means that the decision regarding how high or how low to price the GTX1650 requires careful and strategic planning rather than taking the easy route of calculating the cost of production and increasing the sale price. As mentioned in chapter 2.1, NVIDIA falls under the “Focused Differentiation” position according to Bowman’s Clock. This position entails luxury brands with high-priced products. Moreover, the perceived value is also high as a consequence of NVIDIA’s customers always getting the latest innovated products in-store and online.

Moreover, due to the fact that NVIDIA is a differentiated business, it is well-suited for a value-based pricing approach. It is well-suited for this type of pricing because NVIDIA offers products that stand out in the market – they sell luxury graphic cards – and value-based pricing will convey the value they offer in a better way. Since NVIDIA's customers have certain expectations of the GTX1650, they will be willing to pay the price for what they get. For example, a customer may want a card that entails: 8Gbps memory speed, 4GB GDDR5 standard memory configuration, no supplementary power connectors and compatibility with Microsoft DirectX and GeForce Experience. From chapter 3.1.1.2, we can see that the GTX1650 ticks all the boxes that the customer requires. NVIDIA can then increase their price for their card because customers will probably be willing to buy a card with those exact specifications.

Furthermore, using this strategy, NVIDIA should set their prices based on customer interest and data (Decker, 2020). If this strategy is used accordingly, NVIDIA can boost their customer sentiment and customer loyalty. If NVIDIA promises to deliver the quality with the cards they sell, customers will be willing to buy the product regardless of the price. Due to the fact that the world is evolving rapidly in technology, customers may change their desires and needs accordingly. This means that NVIDIA needs to always be up-to-date with their customer profiles and buyer personas. Consequently, value-based pricing could also mean that the GTX1650's price may need to be adapted in future when buyer personas change. If customers are asking for newer and more-innovated products, NVIDIA may need to lower the price of the GTX1650 and increase the price of the next graphics card being produced or launched.

Finally, using value-based pricing, it provides real data that will force NVIDIA into a profit-generating price within their pricing strategy (Guo, 2019). It will aid NVIDIA in their development regarding higher-quality products and as stated by Guo, "Products and features will be driven by consumer demand, which raises perceived value, thereby resulting in a higher price." Lastly, it will allow for NVIDIA to provide phenomenal customer service because a large portion of customer data in value-based pricing is collected through surveys. The results from those surveys will result in more personable and considerate services.

3.3 Distribution Strategies

In North America, NVIDIA states on their North American site that customers can get NVIDIA products from these distributors: Amazon, Cyber Space Abacus Pvt Ltd, Flipkart, Md Computers Pvt Ltd, SMC INTERNATIONAL, Starcomp, Vedant Computer Sales Pvt Ltd, Ankit Infotech, Dart Frog Technology, Golchha Inter-Trade, Prime Abgb Pvt Ltd, PCB Worldtech and TLG Gaming. Due to the fact that NVIDIA primarily sells through intermediaries, they fall in the indirect distribution channel which makes use of wholesalers and/or retailers. The Business Dictionary defines an indirect channel of distribution to be “a chain of intermediaries through which a product moves in order to be made available for purchase by a consumer. An indirect channel of distribution typically involves a product passing through additional steps as it moves from the manufacturing business via distributors to wholesalers and then retail stores.”

Additionally, NVIDIA’s business network is intrinsically devised for adaptability, as the distinctive abilities of NVIDIA’s partner’s can be added or excluded from their network as determined by demand. NVIDIA’s network entails semiconductor foundries, assembly companies, testing companies and channel partners. The multi-tiered distribution channel entails a myriad of card manufacturers, channel partners and retailers. To successfully handle its disaggregated supply chain, NVIDIA keeps track of their manufactured and finished products. Furthermore, NVIDIA recommends its channel partners to use NVIDIA’s published data to maximise their own business. Word (2009) states, “To optimise its supply chain and distribution channels, NVIDIA provides a governance framework that provides clear instruction to each of its partners. To carry out this task, NVIDIA has developed systems for securely collecting information at every step along its supply and distribution networks. Orders are then communicated to partners along with supporting analysis.” This information gives a bit of detailed insight on how NVIDIA’s operations work behind-the-scene. Word (2009) also mentions that NVIDIA has developed its own application to monitor the flow of inventory throughout the manufacturing process. Alongside that, NVIDIA collects data twice a day and uses a third-party channel called InfoNow to manage their data even more efficiently.

In conclusion, NVIDIA’s channel partners provide the company with efficient and far-reaching distribution.

3.4 Promotion Strategies

3.4.1 Elements of the Promotion Mix

Advertising means promoting a business through newspapers, radio, television and social media. It is crucial to determine targeting customers, and observing how they respond to the advertising message. Social media has gained traction heavily, and is taking over the more traditional form of advertising. (Acutt, n.d.). As for many companies, advertising is crucial to NVIDIA as well. Without the necessary customer awareness, they cannot boost their sales. Advertising is also useful in reaching new clients and clients outside their target groups, to widen their customer base. As NVIDIA's target group are the people who need more powerful computers for example for gaming, NVIDIA can use many gaming social media channels to advertise GTX 1650.

To build long-lasting relationships with customers, companies can use personal selling. It is costly, but it is among the most effective tools in the promotion mix strategy. (Acutt, n.d.). NVIDIA can reach out to larger organizations and clients with a need for a larger amount of graphics cards, such as teaching institutions or gaming organizations. This will boost their customer satisfaction and loyalty, as customers are handled individually and personally.

According to Acutt (n.d.), direct marketing involves targeting clients individually via telephone calls, emails, or apps for example. NVIDIA can easily reach out to their prior customers who have bought older models of their graphics cards, and suggest their next GTX 1650 to appeal to improving the customers' computers.

Public relations are crucial for every company, and it is used to deal with both positive and negative situations. Public relations campaigns can be realized through newsletters, social media, press releases, and major events. (Acutt, n.d.). NVIDIA can take advantage of many major gaming events organized worldwide.

3.4.2 The Promotion Mix Strategy and Channels

As per chapter 2.1, NVIDIA best benefits of the market penetration strategy. To best utilize it, the promotion strategy used would be the "pull" strategy. According to the Corporate Finance Institute (n.d.), pull marketing strategy involves getting directly to the consumer and to make them want the product. The goal is that the consumers themselves will actively seek the product, which will in turn create a demand for retailers to stock

the product. For this NVIDIA needs an active sales and PR teams to ensure the product awareness is increased among possible customers, and that it is viewed in a positive light.

Social media advertisements are a great and popular way to reach people online. People who would be interested in buying computer parts, can reasonably be expected to spend time on the computers, thus advertising online is a great way to reach as many possible consumers as possible.

Paid promotions with popular influencers, such as Twitch-streamers is also to be used to reach as many new clients as possible. Streamers with large audiences, such as Pewdiepie (100 million Youtube subscribers), Trick2g (1.5 million Twitch followers), Summit1g (3.9 million Twitch followers), Pokimane (3.4 million Twitch followers) or Tfue (7.1 million Twitch followers) can be contacted to create a promotional partnership with them. Some of these streamers are already known to promote brands, such as HyperX (Pokimane). (Williams, 2019). This means is reasonable to expect they would be interested in other promotional partnerships as well.

According to videogamescons.com (n.d.) there are a hundreds of gaming conventions in the United States alone, giving NVIDIA great opportunities to reach new and old clients by appearing at these conventions. By having a booth, they can provide a direct channel to purchase or order the GTX 1650, and also create awareness of both the brand, and the product. With biggest conventions entertaining tens of thousands of visitors, NVIDIA would have a great opportunity reaching customers that will also spread the company word of mouth.

4. Objectives and KPI's

Objectives	KPI's	Strategy
<p>Specific: Tailor the product more towards females to gain more revenue.</p> <p>Measurable: Present the product more towards games which females play.</p> <p>Attainable and Realistic: To increase brand recognition amongst females.</p> <p>Time-bound: Within the first month of the launch.</p>	Brand awareness	To target the product more towards games which females play. Advertise not only games played by men I.e.: Shooting games, but also games played mostly by females I.e: The Sims.
<p>Specific: Maintain its value-based pricing approach.</p> <p>Measurable: By setting the price based on the value of the product.</p> <p>Attainable and Realistic: Attainable due to the fact that customers are willing to pay for the product.</p> <p>Time-bound: Before launching the product.</p>	<p>Net Dollar Retention Rate (NDR)</p> <p>Customer Acquisition Cost (CAC)</p>	It requires careful and strategic planning to base the price on the value of the product rather than just calculating the cost of production and increasing the sale price.

<p>Specific: Keep up-to-date with customer profiles and buyer personas.</p> <p>Measurable: Trackable using the right analytics on the website.</p> <p>Attainable and Realistic: The goal is to target customers' needs and expectations towards the product.</p> <p>Time-bound: Before launching the next product.</p>	Customer engagement	<p>Track customers data and searches in order to adapt new prices and products (desires)</p> <p>Engage with customers about their experience with the product</p>
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5. Marketing Action Plan

5.1 Marketing Action Plan

	Conventions	Streamers	Advertising	Website	In-store
6-3 weeks before	<p>Find possible conventions to attend</p> <p>Calculate costs for conventions</p> <p>Reach out to selected conventions</p> <p>Hire/dedicate staff to run the booth</p>	<p>List possible streamers to partner with</p> <p>Create the email which will be sent to influencers</p> <p>Reach out to the streamers</p>	<p>Design and film commercials for social media, both videos, and pictures/posts</p>	<p>Design new section on the website to be uploaded regarding the new product</p> <p>Design advertisements that lead to the new product from other parts of NVIDIA's website</p>	<p>Reach out to retailers to discuss product placement and promotional material in-store</p>

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2 weeks before	<p>Plan booth layout at the convention venues</p> <p>Calculate estimates of how many pieces are expected to be sold at the convention</p> <p>Announce appearance at the convention on social media and website</p>	<p>Continue communication with those who have responded, send another email to those who have not responded</p> <p>Sign contracts</p>	<p>Edit commercials</p> <p>Make the deals with appropriate channels, such as YouTube, to air the commercial on release</p>	<p>Countdown clock on the website where the new product will be released</p>	<p>Start setting up the promotional material with links to the company website for the countdown</p> <p>Ship the product to stores</p>
1 week before	<p>Start building the booths at venues</p> <p>Send out the stock of the product that will be sold at the convention</p>	<p>Drop hints of collaboration on social media and the streams</p> <p>Ensure the streamers are aware of the schedule and plan of posting</p> <p>Gather videos of streamers' reviews and testing</p>	<p>Finalize editing</p> <p>Post videos for announcing the launch</p> <p>Email old customers with a link to launch website</p>	-	<p>Make sure promotional material is ready for launch day</p>

Week of	Continue building Create the display for the stock	Monitor the posting and engagement of streamers	Monitor advertisements engagement	Countdown clock for launch	Ensure displays are ready
Day before	Ensure booths are ready to go, and that there is enough stock	Prepare streamers' promotional videos to be streamed on social media and in stores	Play the commercials	Put the product online, but not available for purchase	Place products and prices
During	Post on social media where to find the booth Provide service to everyone that visits the booth	Reviews, ratings, usage of the product on stream	Play the commercials Email old customers and consumers on the mailing list about the new product	Monitor site visitors and purchases made Add advertisements on other parts of NVIDIA's website leading to the new product	Customer service for customers in-store
After	Clean up, shipping possible remaining stock to retailers Engage with visitors via social media	Note down who may be contacted for the next product launch	Keep the commercials playing	Add reviews and ratings of the product Update the list of products on the website	Keeping up the promotional material and shelving Possible discounts

Short-term

The primary short-term goal of the marketing action plan is to raise awareness among the consumers about NVIDIA's GTX 1650 graphics card. As long as the marketing plan is followed, this should be reasonably easy to reach. The plan targets consumers through various different channels, which will diversify the reach. The short-term strategies include direct advertising via email newsletters and taking advantage of NVIDIA's already existing website, creating traffic flow to the new product's page. NVIDIA will actively attend gaming conventions to ensure the brand is also seen offline, and not just online.

Mid-term

When it comes to the mid-term goal, the key is long-lasting customer loyalty. This can be reached via streamers, and NVIDIA will provide the streamers with early access to new launches, and promotional codes to offer the streamers so they can provide them to their viewers, offering a discount on the product. NVIDIA will also send a few extra copies of the product to the partnered streamers to give away to boost the brand image. NVIDIA will also keep a strong social media presence through their partnered streamers. The website of the company will focus on the capability of writing and viewing reviews and signing up for newsletter emails, to be notified of future products and sales. The company will ensure that the advertisements online will keep playing and being displayed to reach more consumers.

Long-term

In the long-term, NVIDIA will strive to maintain good customer loyalty and brand image. A portion of this includes reviewing feedback and responding to it. Using the experience they have amassed from the GTX 1650 launch, NVIDIA can plan their future launches even better. Having amassed a loyal, steady customer base, NVIDIA can lessen the amount of streamers they are partnered with, only leaving the best, selected few. Conventions will still be attended but on a less regular basis, with less stock and promotional material. This also promotes customer satisfaction, as they get to speak to the company's representatives face-to-face, instead of just online. Customers may also be more inclined to give feedback in person. Previous and existing customers are provided with exclusive deals and early access to new releases.

5.2 Potential Risks and Bottlenecks

1. Risk of delays; with many people inside and outside of the company being involved, delays become a bigger risk. If the production delays the whole launch would have to be delayed. Also failure of meeting deadlines from both the teams in charge of commercials, and the streamers that NVIDIA decides to partner with, will lead to drastically minimized consumer reach.
2. Risk of failed advertisements; the advertisements made may be displayed online at the wrong time, to the wrong people. This will cause the target groups to miss out on the launch information, decreasing sales. Consumers might not understand why the new GTX 1650 is much better, and have no desire to upgrade their already functioning old graphics cards.
3. Risk of bad publicity from partnerships; partnering up with people outside the company puts the company and its image at risk. The streamers that NVIDIA associates with may do independent acts that tarnishes their own image, thus tarnishing NVIDIA's image too. This can even lead to boycotting NVIDIA by the consumers, as especially if the streamers bad reputation goes against the consumers' values, they would not want to support a company that affiliates with such personalities.

6. Corporate Governance

6.1 Purpose and Sector

In 1993 NVIDIA was founded in the United States and entered the market of graphic chips (NVIDIA, NVIDIA History, 2020). Over the years, NVIDIA introduced various products in different markets. Nowadays, the company is indispensable in the world of computing and PC's.

NVIDIA plays a big role in the world of gaming. Computer gaming is the biggest entertainment industry of the world and the invention of the GPU by NVIDIA in 1999 changed video gaming for ever (NVIDIA, Leader in GPU Computing, 2020). The GPU lays the foundation for high-end 3D graphics.

NVIDIA is not only important for gamers. Powering the most powerful computers in the world, NVIDIA is part of scientific research. Furthermore, NVIDIA is of great importance for technological breakthroughs with the help of artificial intelligence. The development of, for example, Google Assistant, self-driving cars and medical equipment is partly made possible with the usage of NVIDIA products.

The sector NVIDIA operates in is the semiconductors industry in the technology sector (VerizonMedia, 2020). Its products are designed to be used in gaming, professional visualization, datacentre, and automotive markets. NVIDIA's sells mainly Business2Business (B2B).

A big challenge for NVIDIA the coming years is the threat of competition. Although NVIDIA has an impressive market share in the technical chips market, many start-ups established players want to expand their dominancy in this market (Crichton, 2018). Companies like Facebook, Apple and Google are designing their own chips and Amazon wants to do so as well. These companies used to be customers of NVIDIA, but are now turned into competitors.

Another risk for NVIDIA is the trade war between the United States and China (Crichton, 2018). In 2017, almost 20% of NVIDIA's revenue came from China. The company has invested a lot in China's expanding AI industry. If China makes it difficult for American companies to do business in China, NVIDIA faces a big long-term problem.

6.2 Organisational Structure and Governance Model

NVIDIA has over 13.000 full-time employees worldwide (VerizonMedia, 2020). The key executives functions are divided as follows:

<u>Name</u>	<u>Title</u>	<u>Born</u>
Mr. Jen-Hsun Huang	Co-Founder, CEO, Pres & Director	1963
Ms. Colette M. Kress	Exec. VP & CFO	1967
Ms. Deborah Shoquist	Exec. VP of Operations	1955
Mr. Timothy S. Teter	Exec. VP, Gen. Counsel & Sec.	1967
Mr. Ajay K. Puri	Exec. VP of Worldwide Field Operations	

(VerizonMedia, 2020)

The shares of Nvidia are divided over many shareholders. The biggest shareholder is The Vanguard Group, Inc. and possesses 7.55% of the share capital (MarketScreener NVIDIA Corporation).

At NVIDIA, the board of directors is committed to corporate governance (Governance Documents NVIDIA). The purpose of this corporate governance is to guarantee that the long-term interests of the shareholders are being served. The corporate governance of NIVDIA consist of codes of conduct, Corporation Governance Policies, the Board committee charters, a Certificate of Incorporation and Bylaws. All these documents are publicly viewable on the website of the company. Focusing the corporate governance on the shareholders is good, because shareholders are the fundament of the company and need to be satisfied.

7. Financial Analysis

This chapter contains an attempt to assess NVIDIA's finances over the past three years. Moreover, its financial performance is compared to those of AMD – NVIDIA's main competitor – and the average financial performance within the industry. Afterwards, the notes to financial statements of NVIDIA will be discussed.

NVIDIA's financial reports can be found on NVIDIA's website. They contain all financial information that is relevant to investors. From these reports, the income statement as well as the balance sheet are extracted. Please note that the income statements and balance sheets of NVIDIA are consolidated. This implies that income statements and balance sheets of subsidiaries – which have NVIDIA as a parent company – are merged.

The financial data of NVIDIA can be found in figure on the next page (NVIDIA, 2019). It contains the income statement, the balance sheet as well as measures for several different significant amounts of money, ratios and percentages. The numbers are calculated as described in the educational book used in class (Williams, Haka, Bettner, & Carcello, 2015). Important indicators like current and quick ratios, will be described in more detail in the following sections.

Statistics on AMD's financial performance and average performance within the industry can be retrieved from many websites. In this case, Investing.com offers a great overview of the relevant statistics, hence it is used. The data provided by this website is used for analysis in this report. The exact data (Investing.com, 2019) can be found in the Excel part of this assignment, from which the diagrams used are also extracted.

<i>All amounts are in millions, except the per share data</i>			
NVIDIA CORPORATION AND SUBSIDIARIES CONSOLIDATED STATEMENTS OF INCOME			
Year ended	January 27, 2019	January 28, 2018	January 29, 2017
Revenue	\$11.716,00	\$9.714,00	\$6.910,00
Cost of revenue	\$4.545,00	\$2.892,00	\$2.847,00
Gross profit	\$7.171,00	\$5.822,00	\$4.063,00
Operating expenses			
Research and development	\$2.376,00	\$1.797,00	\$1.463,00
Sales, general and administrative	\$991,00	\$815,00	\$663,00
Restructuring and other charges			\$3,00
Total operating expenses	\$3.367,00	\$2.612,00	\$2.129,00
Income from operations	\$3.804,00	\$3.210,00	\$1.934,00
Interest income	\$136,00	\$69,00	\$54,00
Interest expense	-\$58,00	-\$61,00	-\$58,00
Other, net.	\$14,00	-\$22,00	-\$25,00
Total other income (expense)	\$92,00	-\$14,00	-\$29,00
Income before income tax	\$3.896,00	\$3.196,00	\$1.905,00
Income tax expense (benefit)	-\$245,00	\$149,00	\$239,00
Net income	\$4.141,00	\$3.047,00	\$1.666,00
Net income per share:			
Basic	\$6,81	\$5,09	\$3,08
Diluted	\$6,63	\$4,82	\$2,57
Weighted average shares used in per share computation:			
Basic	608	599	541
Diluted	625	632	649
Cash dividends declared and paid per common share	\$0,61	\$0,57	\$0,49
NVIDIA CORPORATION AND SUBSIDIARIES CONSOLIDATED BALANCE SHEETS			
Year ended	January 27, 2019	January 28, 2018	January 29, 2017
ASSETS			
Current assets:			
Cash and cash equivalents	\$782,00	\$4.002,00	\$1.766,00
Marketable securities	\$6.640,00	\$3.106,00	\$5.032,00
Accounts receivable	\$1.424,00	\$1.265,00	\$826,00
Inventories	\$1.575,00	\$796,00	\$794,00
Prepaid expenses and other current assets	\$136,00	\$86,00	\$118,00
Total current assets	\$10.557,00	\$9.255,00	\$8.536,00
Property and equipment, net	\$1.404,00	\$997,00	\$521,00
Goodwill	\$618,00	\$618,00	\$618,00
Intangible assets, net	\$45,00	\$52,00	\$104,00
Other assets	\$668,00	\$319,00	\$62,00
Total assets	\$13.292,00	\$11.241,00	\$9.841,00
LIABILITIES AND SHAREHOLDERS' EQUITY			
Current liabilities:			
Accounts payable	\$511,00	\$596,00	\$485,00
Accrued and other current liabilities	\$818,00	\$542,00	\$507,00
Convertible short-term debt		\$15,00	\$796,00
Total current liabilities	\$1.329,00	\$1.153,00	\$1.788,00
Long-term debt	\$1.988,00	\$1.985,00	\$1.983,00
Other long-term liabilities	\$633,00	\$632,00	\$277,00
Total liabilities	\$3.950,00	\$3.770,00	\$4.048,00
Commitments and contingencies			
Convertible debt obligation			\$31,00
Shareholders' equity			
Preferred stock			
Common stock	\$1,00	\$1,00	\$1,00
Additional paid-in capital	\$6.051,00	\$5.351,00	\$4.708,00
Treasury stock	-\$9.263,00	-\$6.650,00	-\$5.039,00
Accumulated other comprehensive loss	-\$12,00	-\$18,00	-\$16,00
Retained earnings	\$12.565,00	\$8.787,00	\$6.108,00
Total shareholders' equity	\$9.342,00	\$7.471,00	\$5.762,00
Total liabilities and shareholders' equity	\$13.292,00	\$11.241,00	\$9.841,00

Measures of short-term liquidity			
Year ended	January 27, 2019	January 28, 2018	January 29, 2017
Current ratio	7,94	8,03	4,77
Quick ratio	6,66	7,26	4,26
<i>Quick assets are calculated as the sum of cash, cash equivalents, marketable securities and accounts receivable.</i>			
Working capital	\$9.228,00	\$8.102,00	\$6.748,00
Measures of long-term credit risk			
Year ended	January 27, 2019	January 28, 2018	January 29, 2017
Debt ratio	0,30	0,34	0,41
Interest coverage ratio	65,59	52,62	33,34
Measures of profitability			
Year ended	January 27, 2019	January 28, 2018	January 29, 2017
Percentage changes: net sales	20,61%	40,58%	37,92%
<i>The net sales (given in terms of revenue) as published in the balance sheet of January 31, 2016 (which is not included in this Excel) is \$5010</i>			
Percentage changes: net income	35,90%	82,89%	171,34%
<i>The net income as published in the balance sheet of January 31, 2016 (which is not included in this Excel) is \$614</i>			
Gross profit rate	61,21%	59,93%	58,80%
<i>It is assumed that revenue equals net sales</i>			
Operating expense ratio	0,29	0,27	0,31
Operating income	\$3.804,00	\$3.210,00	\$1.934,00
Net income as a percentage of net sales	35,34%	31,37%	24,11%

(Figure 14: NVIDIA's annual financial data from 2017 until 2019)

7.1 Measures of Short-Term Liquidity

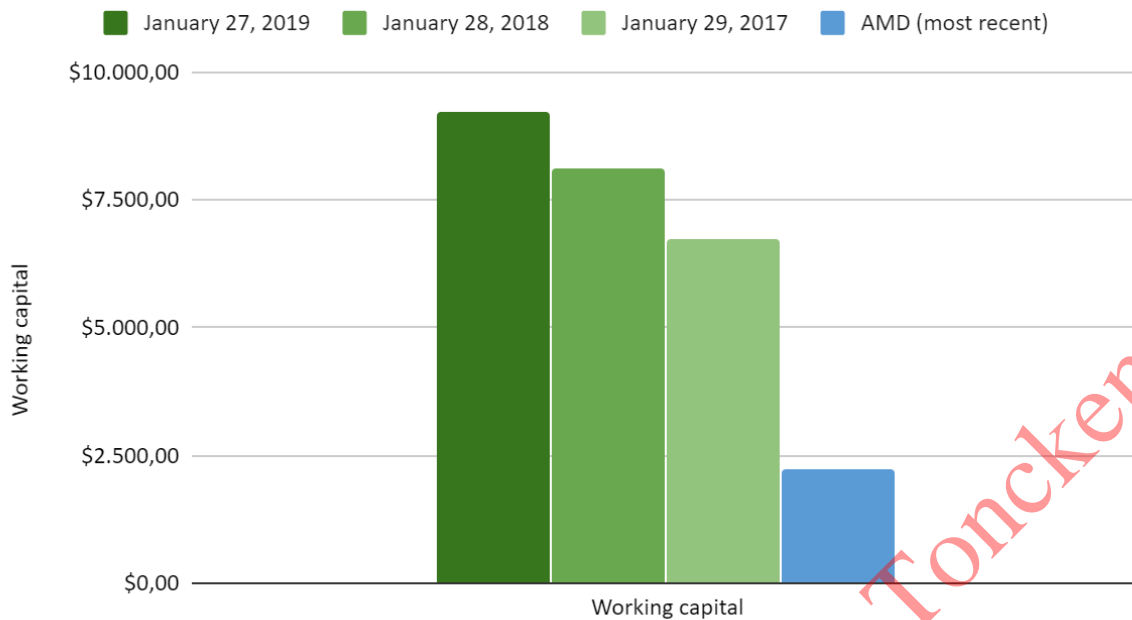
There are many ways of assessing short-term liquidity. Here, several indicators will be elaborated on. Firstly, the working capital of NVIDIA is considered. Working capital is defined as follows:

$$\text{working capital} = \text{current assets} - \text{current liabilities}$$

Non-negative amounts of working capital can be considered financially healthy. Looking at the formula of working capital, it is clear that this number is positive as long as the current assets are greater than the current liabilities. In other words, the company has the ability to pay off its debts. An extremely high working capital,

however, can be an indication of a company handling its assets ineffectively.

Working capital



(Figure 15: working capitals of NVIDIA and AMD)

NVIDIA's working capital seems to have been growing over the last three years, as can be seen in the figure. It also indicates that NVIDIA's current assets have been growing, whereas it looks as if the current liabilities are being held to a minimum each year.

The most recent working capital of AMD seems to be significantly less than that of NVIDIA, although AMD's assets are less than half those of NVIDIA. It can be concluded, however, that NVIDIA has more financial freedom as a result of its working capital than AMD does.

Next, current ratios and quick ratios are considered. These are so-called liquidity ratios. They are calculated as follows:

$$\text{current ratio} = \frac{\text{current assets}}{\text{current liabilities}}$$

$$\text{quick ratio} = \frac{\text{quick assets}}{\text{current liabilities}}$$

The current ratio is a measure of the ability of paying short-term creditors, or liquidity. A high current ratio, meaning that current assets are (much) greater than current liabilities, is desired. This would lead to a current ratio of greater than 1.

The quick ratio differs slightly, as not the current assets are regarded, but only a part of it which is relatively very liquid. This excludes inventory and prepaid expenses, because they cannot easily be transformed into cash within a short timespan. The quick ratio is – like the current ratio – a measure of liquidity, but more conservative. Ideally, it is greater than 1.

Current ratio and quick ratio

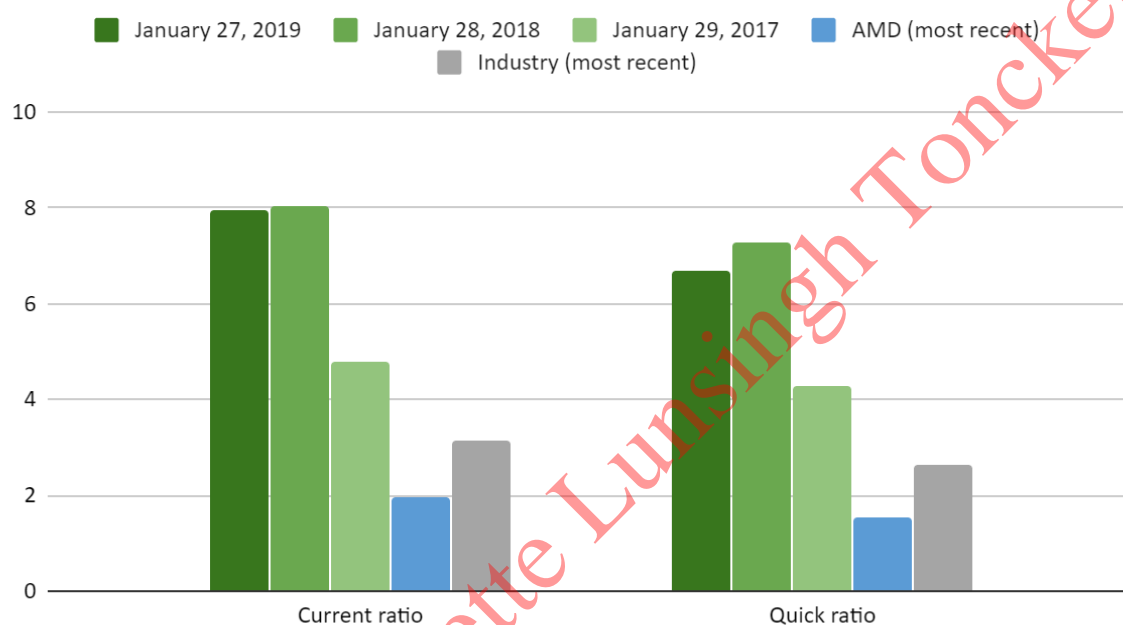


Figure 16: current and quick ratios of NVIDIA, AMD and industry

NVIDIA has had very high current and quick ratios over the last years. In the report of January 28, 2018, the ratios are especially high. This means that NVIDIA is very likely to be able to pay creditors, because its liquidity is high.

AMD has a much lower ratios than NVIDIA does. This indicates that AMD is less likely to be able to pay its creditors as consistently as NVIDIA is. However, AMD's ratios are still greater than 1, meaning that it is safe to assume that there is sufficient liquidity. Within the industry, ratios are generally higher than the most recent ratios of AMD, but generally much lower than those of NVIDIA.

7.2 Measures of Long-Term Credit Risk

To assess long-term credit risk, one way is to consider debt ratios. A debt ratio is calculated as follows:

$$\text{debt ratio} = \frac{\text{total liabilities}}{\text{total assets}}$$

This ratio indicates the total amount of assets financed by liabilities. The higher the ratio is, the more assets are actually financed by creditors. Ideally, the ratio is low. In that case, many of the assets of a company are actually owned by it, the company has fewer obligations to pay for its assets. A debt ratio of 0 is highly unlikely, because financial growth can be stimulated by liabilities.

Debt ratio



Figure 1: debt ratios of NVIDIA and AMD

NVIDIA's debt ratio is low, and has been declining over the last couple of years. It seems like the company is trying to own assets that are not financed by third parties. If NVIDIA continues doing this, much wealth (in terms of assets) can be accumulated in the long run.

AMD has a higher debt ratio. Its assets are mostly financed by creditors, through liabilities. To be precise, AMD has a debt ratio of 0.53. In the long run, this can lead to financial problems regarding creditors.

7.3 Measures of Profitability

Profitability can be assessed in multiple ways, but here gross profit rates are considered. The gross profit rate formula is as follows:

$$\text{gross profit rate} = \frac{\text{gross profit}}{\text{net sales}}$$

The gross profit rate indicates the profitability of the products that a company manufactures. It is the portion of profit over the total amount of net sales, so it indicates the part of net sales that is profitable. Ideally, this rate is high, but this is not generally the case. It depends on the kind of product and on the market.

Gross profit rate



NVIDIA has a high gross profit rate of approximately 60%. This means that a majority of the money that is received for goods is actually profit. Moreover, the figure indicates that the rate has been growing over the last years. This is very desirable for any company, as it can make more and more money from its manufactured products.

AMD, however, has a much lower gross profit rate. The company gains less profit from goods sold than NVIDIA, generally. A possible explanation of this is that NVIDIA has the advantage of economy of scale, relative to AMD.

7.4 Notes to NVIDIA's Consolidated Financial Statements

In NVIDIA's annual reports, notes are added to the financial statements to elaborate on any inconsistencies, oddities or changes in the ways of accounting. In this report, the notes to the financial statements in NVIDIA's annual financial report published at the start of 2019 will be discussed.

NVIDIA uses current market prices of products, or products of its kind, to assess the value of assets and obligations. The most important assets and liabilities seem to be valued correctly, but part of the evaluations are "...based on unobservable inputs to the valuation methodology and include our own data about assumptions market participants would use in pricing the asset or liability based on the best information available under the circumstances" (NVIDIA, 2019). This is quite a liberal way of valuation. Although it is not likely that valuation is not accurate, it is not completely reliable either.

Moreover, the notes indicate that NVIDIA frequently takes part in lawsuits, often being on the defensive party. Many of these lawsuits have to do with patents or shares. Ultimately, the notes say that "...we believe that the ultimate outcome of these actions will not have a material adverse effect on our operating results, liquidity or financial position", which is a bold statement to make. Patent infringement and betrayal of shareholders are very serious cases, and these should not be underestimated.

7.5 Financial Performance

The short-term ratios of NVIDIA are excellent. In 2019, the current ratio was 7,94 and the quick ratio was 6,66. These ratios give insights in the company's liquidity. The higher the ratio, the more liquid the company is. Liquidity means the extent to which the company is able to pay his short-term liabilities. For the current ratio (current assets/current liabilities) it is recommended to have a number higher than 1,5. So the current ratio of NVIDIA is far above this recommendation. For calculating the quick ratio, inventories and prepaid expenses are excluded from the current assets, because these cannot be transferred into cash on a very short notice. Therefore, the quick ratio is recommended to be higher than 1. The quick ratio of NVIDIA is a lot higher than this recommendation. In conclusion, NVIDIA is very well able to pay its short-term obligations. In other words, NVIDIA is liquid.

Compared with its short-term ratios of 2018, the liquidity of NVIDIA is declined in 2019. Although the company is still liquid, it is necessary to keep this liquidity high. One way this can be achieved, is to sell some of the company's shares. In this way, equity is transferred into cash, increasing the current assets. Because the current liabilities do not change in this measure, both the current ratio and the quick ratio increase. So this leads to a higher liquidity.

Another notable number in the balance sheet is marketable securities. This number covers a large part of the current assets. The danger that lies in this, is the fact that the marketable securities are prone to changes in value. It is possible that the securities drop in value within very short time. This would mean that the liquidity ratios will decrease significantly, jeopardizing the company's liquidity. Therefore, it is recommended to sell a part of the marketable securities and turn it into cash. In this way, the short-term ratios can be remained high.

In general, the financial performance of NVIDIA is fine. The debt ratio decreases every year and is low, which means most of the assets of the company are financed with equity instead of debt. Also, interest coverage ratio and gross profit rate increase every year, which indicates that the company is performing very well. When our advices are being followed, NVIDIA is able to remain a financially healthy company.

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Appendix

1. Logbook

Name	Task	Date	Time Start	Time End
Nicolette	<ul style="list-style-type: none"> Designed + uploaded assignment layout 	14/02/20	18:30	19:15
Markus	<ul style="list-style-type: none"> Finished chapter 1.1 	15/02/20	17:00	18:15
Nicolette	<ul style="list-style-type: none"> Made Porter's 5 Forces diagram Desk research into NVIDIA's competitors 	15/02/20	18:30	18:50
Jenna	<ul style="list-style-type: none"> Finished chapter 1.2 	18/02/20	15:00	17:00
Nicolette	<ul style="list-style-type: none"> Finished chapter 1.3 	19/02/20	22:00	23:30
Remco	<ul style="list-style-type: none"> Finished chapter 1.5 	21/02/20	19:00	22:00
Ferdi	<ul style="list-style-type: none"> Finished chapter 1.6 	23/02/20	18:00	18:30
Mary-Ann	<ul style="list-style-type: none"> Finished chapter 1.4 	30/03/20	15:00	18:00
Markus	<ul style="list-style-type: none"> Finished chapter 2.1 (Bowman's Clock) 	09/03/20	16:30	18:15
Nicolette	<ul style="list-style-type: none"> Made amendments to chapter 1.5 Started chapter 3 	31/03/20	17:00	21:00
Nicolette	<ul style="list-style-type: none"> Finished chapter 3.1 Started chapter 3.2 	01/04/20	14:00	18:00
Ferdi	<ul style="list-style-type: none"> Big revision and amendments to chapter 1.6 (TOWS matrix) 	02/04/20	14:30	17:30
Markus	<ul style="list-style-type: none"> Worked on chapter 2.2 	07/04/20	10:30	12:00

Nicolette	<ul style="list-style-type: none"> Finished chapter 3.2 Finished chapter 3.3 Started chapter 3.4 	07/04/20	13:30	17:30
Markus	<ul style="list-style-type: none"> Finished chapter 2.2 	08/04/20	16:00	17:20
Remco	<ul style="list-style-type: none"> Started chapter 6 	07/04/20	10:45	12:45
Remco	<ul style="list-style-type: none"> Finished chapter 6 Helped with chapter 7 	08/04/20	10:45	15:00
Ferdi	<ul style="list-style-type: none"> Started chapter 7.1 -7.4 Looked into NVIDIA finances, AMD finances and industry finances 	09/04/20	10:45	17:00
Remco	<ul style="list-style-type: none"> Started chapter 7.5 	09/04/20	11:45	12:45
Ferdi	<ul style="list-style-type: none"> Created Excel file Revised 7.1 – 7.4 Finished 7.1 – 7.4 	09/04/20	11:45	18:30
Remco	<ul style="list-style-type: none"> Finished chapter 7.5 	10/04/20	10:30	12:00
Jenna	<ul style="list-style-type: none"> Finished 2.1 Finished chapter 3.4 Finished chapter 5 	11/04/20	10:00	19:00
Mary-Ann	<ul style="list-style-type: none"> Finished chapter 4 	13/04/20	16:00	19:00

Nicolette	<ul style="list-style-type: none"> • Wrote executive summary • Final proofread before submission 	14/04/20	11:30	12:30
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2. Excel Sheets

All amounts are in millions, except the per share data

NVIDIA CORPORATION AND SUBSIDIARIES CONSOLIDATED STATEMENTS OF INCOME			
Year ended	January 27, 2019	January 28, 2018	January 29, 2017
Revenue	\$11,716.00	\$9,714.00	\$6,910.00
Cost of revenue	\$4,545.00	\$2,892.00	\$2,847.00
Gross profit	\$7,171.00	\$5,822.00	\$4,063.00
Operating expenses			
Research and development	\$2,376.00	\$1,797.00	\$1,463.00
Sales, general and administrative	\$991.00	\$815.00	\$663.00
Restructuring and other charges			\$3.00
Total operating expenses	\$3,367.00	\$2,612.00	\$2,129.00
Income from operations	\$3,804.00	\$3,210.00	\$1,934.00
Interest income	\$136.00	\$69.00	\$54.00
Interest expense	-\$58.00	-\$61.00	-\$58.00
Other, net.	\$14.00	-\$22.00	-\$25.00
Total other income (expense)	\$92.00	-\$14.00	-\$29.00
Income before income tax	\$3,896.00	\$3,196.00	\$1,905.00
Income tax expense (benefit)	-\$245.00	\$149.00	\$239.00
Net income	\$4,141.00	\$3,047.00	\$1,666.00
Net income per share:			
Basic	\$6.81	\$5.09	\$3.08
Diluted	\$6.63	\$4.82	\$2.57
Weighted average shares used in per share computation:			
Basic	608	599	541
Diluted	625	632	649
Cash dividends declared and paid per common share	\$0.61	\$0.57	\$0.49

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NVIDIA CORPORATION AND SUBSIDIARIES CONSOLIDATED BALANCE SHEETS

Year ended	January 27, 2019	January 28, 2018	January 29, 2017
ASSETS			
Current assets:			
Cash and cash equivalents	\$782.00	\$4,002.00	\$1,766.00
Marketable securities	\$6,640.00	\$3,106.00	\$5,032.00
Accounts receivable	\$1,424.00	\$1,265.00	\$826.00
Inventories	\$1,575.00	\$796.00	\$794.00
Prepaid expenses and other current assets	\$136.00	\$86.00	\$118.00
Total current assets	\$10,557.00	\$9,255.00	\$8,536.00
Property and equipment, net	\$1,404.00	\$997.00	\$521.00
Goodwill	\$618.00	\$618.00	\$618.00
Intangible assets, net	\$45.00	\$52.00	\$104.00
Other assets	\$668.00	\$319.00	\$62.00
Total assets	\$13,292.00	\$11,241.00	\$9,841.00
LIABILITIES AND SHAREHOLDERS' EQUITY			
Current liabilities:			
Accounts payable	\$511.00	\$596.00	\$485.00
Accrued and other current liabilities	\$818.00	\$542.00	\$507.00
Convertible short-term debt		\$15.00	\$796.00
Total current liabilities	\$1,329.00	\$1,153.00	\$1,788.00
Long-term debt	\$1,988.00	\$1,985.00	\$1,983.00
Other long-term liabilities	\$633.00	\$632.00	\$277.00
Total liabilities	\$3,950.00	\$3,770.00	\$4,048.00
Commitments and contingencies			
Convertible debt obligation			\$31.00
Shareholders' equity			
Preferred stock			
Common stock	\$1.00	\$1.00	\$1.00
Additional paid-in capital	\$6,051.00	\$5,351.00	\$4,708.00
Treasury stock	-\$9,263.00	-\$6,650.00	-\$5,039.00
Accumulated other comprehensive loss	-\$12.00	-\$18.00	-\$16.00
Retained earnings	\$12,565.00	\$8,787.00	\$6,108.00
Total shareholders' equity	\$9,342.00	\$7,471.00	\$5,762.00
Total liabilities and shareholders' equity	\$13,292.00	\$11,241.00	\$9,841.00

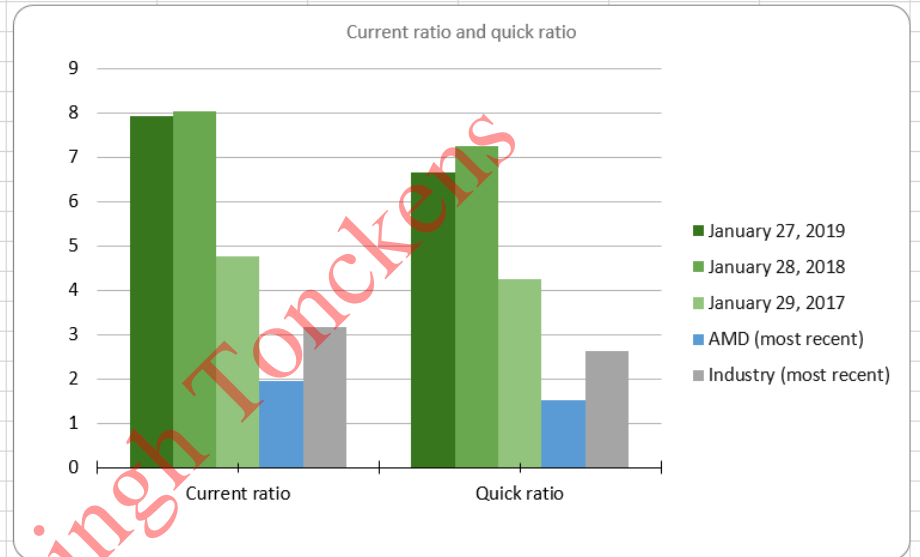
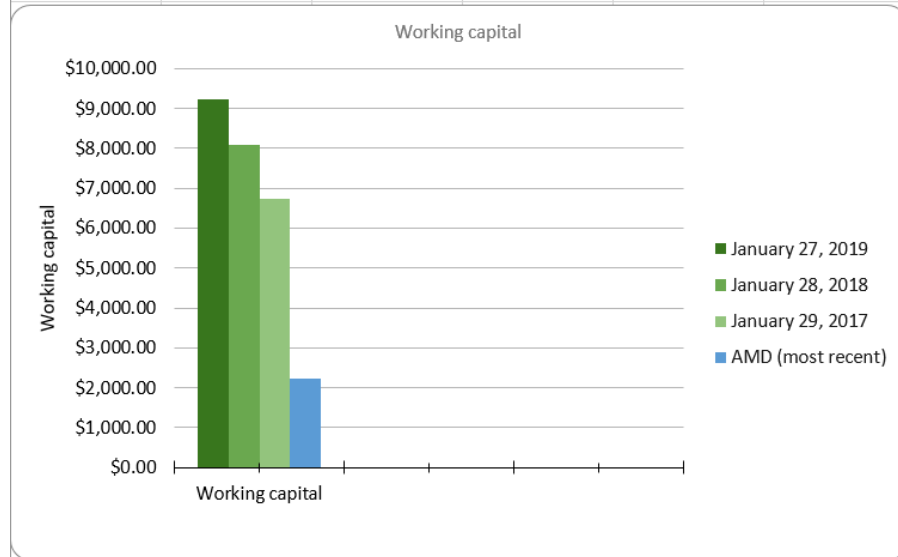
Measures of short-term liquidity		https://investor.nvidia.com/financial-info/financial-reports/default.aspx		
Year ended	January 27, 2019	January 28, 2018	January 29, 2017	
Current ratio	7.94	8.03	4.77	
Quick ratio	6.66	7.26	4.26	
Quick assets are calculated as the sum of cash, cash equivalents, marketable securities and accounts receivable.				
Working capital	\$9,228.00	\$8,102.00	\$6,748.00	
Measures of long-term credit risk				
Year ended	January 27, 2019	January 28, 2018	January 29, 2017	
Debt ratio	0.30	0.34	0.41	
Interest coverage ratio	65.59	52.62	33.34	
Measures of profitability				
Year ended	January 27, 2019	January 28, 2018	January 29, 2017	
Percentage changes: net sales	20.61%	40.58%	37.92%	
The net sales (given in terms of revenue) as published in the balance sheet of January 31, 2016 (which is not included in this Excel) is \$5010				
Percentage changes: net income	35.90%	82.89%	171.34%	
The net income as published in the balance sheet of January 31, 2016 (which is not included in this Excel) is \$614				
Gross profit rate	61.21%	59.93%	58.80%	
It is assumed that revenue equals net sales				
Operating expense ratio	0.29	0.27	0.31	
Operating income	\$3,804.00	\$3,210.00	\$1,934.00	
Net income as a percentage of net sales	35.34%	31.37%	24.11%	

<i>All amounts are in millions, except the per share data</i>			
Measures of short-term liquidity	https://www.investing.com/equities/adv-micro-device-financial-summary		
Entity regarded	AMD (most recent)	Industry (most recent)	
Current ratio	1.95	3.16	
Quick ratio	1.53	2.64	
Working capital	\$2,238.00		
Measures of long-term credit risk			
Entity regarded	AMD (most recent)	Industry (most recent)	
Debt ratio	0.53		
Interest coverage ratio	12.94		
Measures of profitability			
Entity regarded	AMD (most recent)	Industry (most recent)	
Percentage changes: net sales	18.10%		
Percentage changes: net income	41.67%		
Gross profit rate	44.62%	54.00%	
Operating expense ratio	0.90		
Operating income	\$220.00		
Net income as a percentage of net sales	74.89%		

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	January 27, 2019	January 28, 2018	January 29, 2017	AMD (most recent)		January 27, 2019	January 28, 2018	January 29, 2017	AMD (most recent)	Industry (most recent)
Working capital	\$9,228.00	\$8,102.00	\$6,748.00	\$2,238.00	Current ratio	7.94	8.03	4.77	1.95	3.16
					Quick ratio	6.66	7.26	4.26	1.53	2.64



	January 27, 2019	January 28, 2018	January 29, 2017	AMD (most recent)	Industry (most recent)
Gross profit rate	61.21%	59.93%	58.80%	44.62%	54.00%

	January 27, 2019	January 28, 2018	January 29, 2017	AMD (most recent)	Industry (most recent)
Debt ratio	0.3	0.34	0.41	0.53	

