

A Work Project presented as part of the requirements for the Award of a Master Degree in Finance from the
NOVA – School of Business and Economics.

GoPro: A Threatening Future

Rita Feio Gebhard de Almeida Coimbra 34453
Matilde Sá Lemos da Cruz Lança 34046

A Project carried out on the Master's in Finance Program, under the supervision of:

Francisco Martins

03/01/2020

Abstract

This report aims to give a sell recommendation for GoPro, Inc. GoPro, as the oldest and first player in the action camera market, has always been recognized for its name and brand status. The Karma Drone failure in 2017 disappointed GoPro's clients and the company is still recovering from that. GoPro is now under huge pressure among other action cameras in a market that is increasing exponentially, especially with the rise of Japanese companies. For GoPro to differentiate itself in the market, new products and features have to come up to impress buyers. For the future, it is expected that GoPro strongly diminishes its market share.

Keywords

Action Camera market

Millennial Generation

Karma Drone

Asia Pacific region

GoPro, Inc.

ACTION CAMERAS

STUDENTS: RITA COIMBRA, MATILDE LANÇA

COMPANY REPORT

03 JANUARY 2020

34453@novasbe.pt; 34046@novasbe.pt

GoPro under pressure

Company surviving due to brand status

- With a \$4.31 share price, comparing with the current market price of \$4.47, investment is expected to yield a negative return of 3,67%, resulting in a SELL investment recommendation.
- With the action camera market growing at a CAGR of 11,24% for the next 10 years, GoPro is operating in a fierce competition and heavily exposed to threats brought by technological advancements.
- The entrance in the drones' market in 2016 was not as successful as expected turning into a failed investment. After having invested \$217M in R&D and Marketing, the company decided to discontinue the production of its Karma drone due to low margins of -31,5%, resulting in a total net loss of \$419M in 2016.
- Revenues are not high enough to support operating expenses. If GoPro is not successful in penetrating Drone market again or in adding new features to its cameras that impress costumers, the company might not be able to grow their revenue like past years, neither recognize benefits from the investment made. There is huge uncertainty from GoPro around new products and new markets.
- Millennials generation hungry for travelling and the rise of social media provide an opportunity for action cameras. We consider brand awareness as an opportunity to expand geographically to Asia Pacific.

Company description

GoPro Inc. is an American company founded in 2002 that rapidly became popular turning into one of the world's most famous brand of action cameras. GoPro's Class A common stock is traded on the Nasdaq stock exchange.

Recommendation: **SELL**

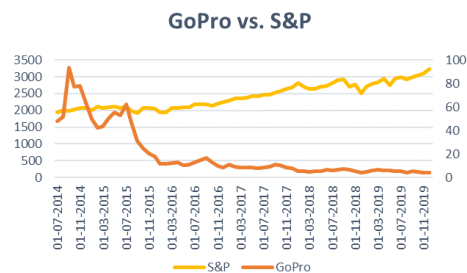
Price Target FY19: **4.31 \$**

Price (as of 30-Dec-2019) **4.47 \$**

Reuters: GPRO.OQ, Bloomberg: GPRO US Equity

52-week range (\$)	3.25 - 7.645
Market Cap (\$m)	799
Outstanding Shares (m)	144
Expected return	-3,67%

Source: Bloomberg



Source: Bloomberg

(Values in \$ millions)	2018	2019	2020F
Revenues	1148	839	907
EBITDA	-58	-107	-80
Net Loss	-109	-149	-126
Gross Margin	31%	35%	41%
Debt/Equity	66%	111%	3731%
ROIC	-41,7%	-63,3%	-49%
EPS	-\$0,78	-\$1,04	

Source: GoPro, Inc. Financial Statements

THIS REPORT WAS PREPARED EXCLUSIVELY FOR ACADEMIC PURPOSES BY RITA COIMBRA AND MATILDE LANÇA, A MASTER'S IN FINANCE STUDENT OF THE NOVA SCHOOL OF BUSINESS AND ECONOMICS. THE REPORT WAS SUPERVISED BY A NOVA SBE FACULTY MEMBER, ACTING IN A MERE ACADEMIC CAPACITY, WHO REVIEWED THE VALUATION METHODOLOGY AND THE FINANCIAL MODEL. (PLEASE REFER TO THE DISCLOSURES AND DISCLAIMERS AT END OF THE DOCUMENT)

Table of Contents

COMPANY OVERVIEW.....	3
BUSINESS MODEL	5
KARMA DRONE EFFECT	6
SHAREHOLDER STRUCTURE.....	7
GEOGRAPHIC PRESENCE	8
MACROECONOMIC ENVIRONMENT	8
ACTION CAMERA MARKET.....	10
PEERS.....	11
MILLENNIAL GENERATION TRENDS	13
DRIVERS & FORECASTING	14
REVENUE VALUE DRIVERS	14
OPERATING COSTS.....	17
CAPITAL EXPENDITURE.....	19
NET WORKING CAPITAL	20
EQUITY AND DEBT	21
VALUATION	22
DCF – INTRINSIC VALUATION	22
MULTIPLES – RELATIVE VALUATION.....	24
SCENARIO ANALYSIS	25
SENSITIVITY ANALYSIS	26
CONCLUSION.....	27
APPENDIX.....	28
DISCLOSURES AND DISCLAIMERS	30
REPORT RECOMMENDATIONS.....	30

Company Overview

Graph 1:



Graph 2:

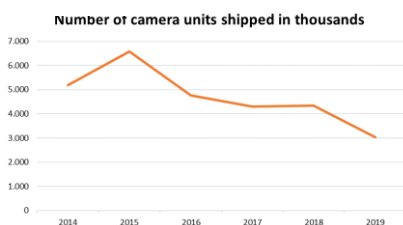


Figure 1:



Table 1:

	2017	2018	2019
Subscription revenue	\$ 123,291	\$ 185,381	\$ 269,471
% of Revenue	10%	16%	32%
Growth rate in %	50%	50%	45%
Number of subscribers	130,000	85,000	305,000

Source: GoPro's Annual Report

Figure 2:



GoPro is an American action camera company founded in 2002 by Nick Woodman, an extreme sports enthusiast. Until that year, cameras were mainly not waterproof and could not capture action in good quality. Therefore, Woodman came up with the idea of developing a durable camera that could help athletes to enjoy the moment while recording themselves practicing sports. GoPro's revenues are composed by a **wide range of products**. All the earnings not related with cameras are reflected in the price as an average (see evolution in graph 1).

In what concerns the number of **camera units shipped**, there was an initial boom in sales when the company first went public in 2014, and expectations were huge for this new retailer (see graph 2).

HERO7 Black was the number one selling camera in 2018 in volume in the digital sector and the first GoPro camera based on the new research-driven design approach. This was a success for the company, gaining lots of positive reviews and GoPro's first quarterly profit in over a year. To be more specific, GoPro's HERO7 line plus Fusion was the top-four selling cameras in their category¹, which helped the company boost its margins, as it was priced at nearly \$600.

Regarding the **mounts and accessories** - either attached to the camera or sold separately – these include handlebar, helmet, roll bar, floaty, charging accessories or cables, camera cases and dive filters.

GoPro Plus **subscription service**, acquired for \$4.99 per month, provides subscribers free replacements for all broken cameras, discounts on camera accessories, and unlimited cloud storage. In 2019 GoPro expanded the Plus business by providing more value and differentiated offerings, which highlights increasing efforts on marketing to drive awareness for new subscribers and to engage GoPro's global consumer base (see table 1).

GoPro's **software apps** – GoPro Quick editing app – are free and enable users to quickly edit videos on-the-go, simplifying content transfer from cameras to mobile phones. Regarding **social media**, GoPro's YouTube

¹ National Purchase Diary Panel Inc. (NDP Group, Inc.). 2019 Market Research.

Figure 3:



channel achieved a record of 178M views in the third quarter of 2019, an increase of 83% YOY. In this same quarter of 2019, the number of followers grew by 1.2 million to more than 42 million across all social media.

The products are available in over 30.000 retail outlets and spread by 100 countries through a combination of **direct sales channel** and **indirect distribution channel**². GoPro's cameras are extremely convenient in the sense that individuals can attach the cameras to themselves, hands-free, enabling physical demanding activities to happen at the same time, particularly extreme sports. The small size and weight of the cameras make them easy to carry.

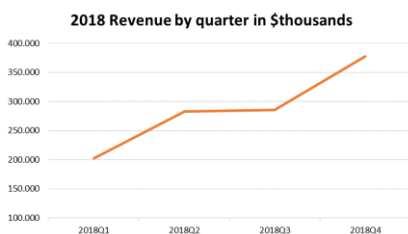
It is important to mention that GoPro's business is affected by **seasonality**, having recorded the highest levels of revenue always in the fourth quarter of the year, coinciding with the holiday shopping season (see graph 3).

Regarding GoPro's **stock performance**³, whereas in 2014 GoPro's cumulative monthly returns of Class A common stock outperformed the market, as of August 2016, GoPro' shares had fallen 59.6% since the IPO, decreasing GoPro's valuation in 90%, while the S&P 500 index returned 11.4%. GoPro's stock performance has been shaped by declining valuations, followed by the drone failure. From this point on, the stock price has substantially declined mainly because of the concerns regarding the disappointing demand of consumers expressing mixed feedback about the latest Hero versions. Customers seem to prefer GoPro Silver's LCD screen which has better video quality.

Through the past 7 years, GoPro's strongest competitors appeared in the market. In 2012 Sony launched its first action camera, Garmin in 2013 and Nikon in 2016. This led to a reduction of GoPro's share in the market, a decline in revenue, in gross margin expectations and consequently in the target price. GoPro's up-to-date stock price return is -3,67%, still underperforming the S&P 500 Index.

At this point we believe that the stock provides a poor opportunity to climb in for investors.

Graph 3:

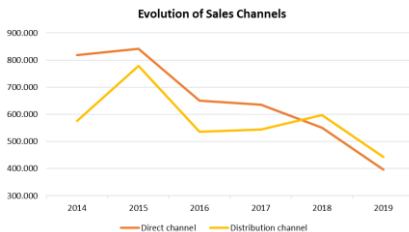


² GoPro, Inc. 2018. "2018 Annual Report".

³ John Kell. 2018. "Here is why GoPro's stock is dropping so much."

Business Model

Graph 4:



GoPro designs and develops its products in the United States, France, Mexico and Romania and its headquarters are present in San Francisco Bay Area. It outsources most of its manufacturing to contract firms in Mexico.

Regarding the sales segment channels, GoPro sells its cameras globally through **direct retailers** and **indirect wholesale distributors** (see evolution in graph 4). The cameras are available in 45.000 stores⁴ mainly in North America and Europe. Its **direct retail sales** accounted for 48% of revenues in 2018 and include:

Independent retailers: location-based manufacturers sell the products to specialty retailers especially in the United States. These retailers are provided with a deep personalized service, including special personnel education about GoPro's products. These costs are included in General and Administrative costs, which in average represent 8,22% of revenues.

Big box retail channels: Amazon.com, Inc., Best Buy - one of the largest U.S. electronics retailers -, Inc., and Wal-Mart, Inc. - world's largest mass retailer - are examples of large retailer to whom GoPro sells.

Mid-market retailers: with a large regional influence, these retailers are focused on specific matters, and so the products are available in consumer electronics stores like Apple store and in sports stores such as Quicksilver, Billabong or ProDirect. Middle-market companies reported an increased revenue of 77% in the year ending 2019, which indicates a growth opportunity for GoPro.

E-commerce channel: worldwide sell of products through online store *gopro.com* (both online and offline advertising).

Regarding **indirect wholesale distribution** channel, GoPro sells its products to more than 55 distributors - accounted for 52% of revenues in 2018 - who resell the items to chains in foreign international and domestic markets in the U.S.



⁴GoPro, Inc. 2017.

Karma Drone Effect

GoPro entered the Drone Market in September 2016. At the launch of the **Karma Drone**, there was a huge excitement, even though the company had no competitive advantage in that market. Despite the CEO's optimistic announcements about Karma drone before the holiday shopping season in November 2017 - "a fantastic platform capable to further its capabilities with next-generation drone offerings" -, the production did not go as planned.

Figure 4:



The first reason for the failure occurred due to the late entrance of GoPro in the market drone, which was already dominated by specialized companies as **DJI Innovations**⁵, whose first line of Phantom drone appeared in 2013. The second reason for this early exit, was due to GoPro's underestimation about the difficulty of producing a drone. And so, late in 2016, to combat the slow revenue growth driven by the low demand for action cameras, it rushed launching the Karma drone to the market without properly testing it. With low experts in the area and few technology preparations, the product was created with power failure issues and sold at a higher price than its best competitors. The company overestimated its own brand strength by attributing the Karma Drone (without the camera in itself) a price of \$799, being more expensive than its direct competitor the DJI Mavic Pro.

To finish with, costumers started realizing the danger of drones in a matter of privacy concerns, leading to restrictions for the use of these devices. Having no other solution, the device had to be pulled off the market in 2017. As a consequence, in terms of **regulatory actions**, Europe and the United States will probably reduce the total addressable market in the next years.

The Karma Drone situation was responsible for a 37% drop in the fourth quarter revenue of 2017. The 2018 revenue was affected as well, dropping to \$1.15 billion compared to \$1.18 billion in 2017. Consequently, since the business was not going as well as expected, GoPro decided to cut more than 254 jobs, a fifth of its total workforce. The company decided to exit the drone market, and there is no expectation to reenter it. Besides, the Karma Drone situation ultimately resulted in a decrease of the average selling price in 2018. It would have increased 1% YOY if not for the Karma Drone. GoPro's exit from the aerial business in 2018 prejudicated the company a lot (see table 2) since it was the company's best opportunity to differentiate itself in such a saturated market. With this, GoPro immediately fell behind competitors.

Table 2:

Karma Drone Effect	
Operating margin 2016	-31,5%
R&D Expense Increase 2016	48,5%
Sales & Marketing Expense Increase 2016	37,1%
Net loss increase 2016	1260%
Decrease in average selling price in 2018	-3,43%

⁵ "DJI action camera poses threat to GoPro". 2019. *BBC News*.

Shareholder structure

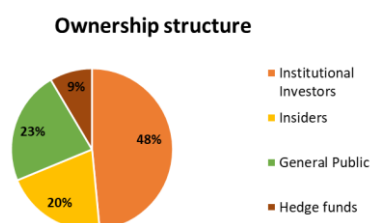
Table 3:

shares in thousands	Class A	Class B
Shares outstanding	120.428	33.097
Holders of record	135	33

Source: Annual Report

GoPro completed the initial public offering in July 2014 at \$24 per share. It possesses two types of shares. According to the company’s annual report, GoPro’s “(..) Class A common stock is listed on the Nasdaq Global Select Market under the symbol “GPRO”. Class B common stock is not listed on any stock exchange” (see table 3 for the number of shares). The shareholders have been diluted in 2018 with total shares outstanding growing by 3,4% to 2019. GoPro’s ownership structure is divided in **Institutional investors, Insiders, General Public and Hedge Funds** (see graph 5).

Graph 5:



In GoPro the biggest stake of shares outstanding, 48%, is held by **Institutions**, while **Hedge funds** own 9% of the company’s total shares. In this case investors don’t need to be worried about the volatility of stock prices because hedge funds don’t owe a significant stake. We believe institutional shareholders still influence the value of the company due to their high stake capable of exercising significant voting power and of promoting high value-driven decisions. The largest institutional holders of GoPro are the Vanguard Group with 8,48% ownership and Blackrock Fund Advisors, accounting for 6,64% of the company.

General public account for 23% of outstanding shares. With such a stake, retail investors can, collectively, play an important role in the company policies, as well as exercise the power of decline a merge or acquisition.

The higher the **Insider** ownership, the greater the likelihood for insiders to be an incentive to handle the company for the long term. GoPro insiders own about 20% of total shares, which is large enough to impact shareholder’s return. This kind of ownership does increase the chance that the company runs in the interest of all shareholders.

Currently, GoPro’s **board of directors**⁶ has Mr. Woodman serving as Chief Executive Officer - given his knowledge of the company, and industry. GoPro’s board of directors are not considered much experienced since they have only 2,7 years average of work in the company. The compensation of the board seems quite adequate since the composition of the board leadership and the division of responsibilities is maintained effectively and supports the approach for addressing the risks.

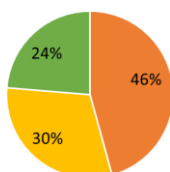
⁶ Board of directors consists of 14 directors and executive officers. GoPro’s Class A or Class B common stock is owned by more than 5% of stockholders.

Geographic Presence

Graph 6:

Revenues by region 2019

- Americas
- Middle-Europe, Middle East and Africa
- Asia and Pacific (APAC)



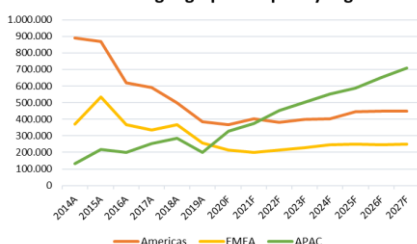
GoPro operates all over the world, and its revenue is organized based on its ship-to destinations: Americas, EMEA and APAC (see graph 6).

Americas is the geographic region holding the biggest slice of the revenues, being now responsible for 46%. However, in the past three years its share has been reduced by 5%, which can be explained by the entrance of other players in the market like Garmin, Polaroid etc. We predict this share to decline in the years to come, albeit slowly.

Korea and Thailand were recognized by their two years of consecutive sell-through growth, since unit sales rose by 27% and 88% respectively, year-over-year in 2018², according to German market research (*GfK*). As it can be seen, **APAC** represents a constant growth of its slice in GoPro’s total revenues, accounting for 24% in 2019, which goes in line with the overall market.

Graph 7:

Evolution of geographical split by region



We believe that a more aggressive reinforcement of GoPro in this market, by its expansion, can accelerate its revenues growth. With the rise of marketing efforts and POP displays provided to retailers in APAC region, we forecast GoPro’s share to grow faster in APAC than in the other regions in further years.

EMEA represents the second largest percentage, namely 30% of the company’s revenue and has been representing a stable share for the past years. Lately in 2019, GoPro had three of the top five cameras in the action camera category in Europe, according to GfK. For the future we assumed this share will decrease (see graph 7 for future evolution).

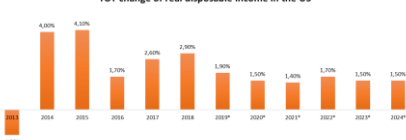
Macroeconomic Environment

This sector is likely to benefit from the economic performance, backed by improving macroeconomic environment and rise in costumers’ disposable income (graph 8). The level of consumer spending in an action camera company depends on fluctuations in inflation, volatility of GDP, tourism indicators, etc.

Looking at the economic situation in each region of importance to GoPro: Despite the Brexit issues, European economy is continuing to gradually recover thanks to steady personal consumption. Driven by improved employment, the U.S. economy is also improving due to solid personal consumption. On the contrary, the Chinese economy is seeing a slowdown trend due to trade friction between the U.S. and China. The economic situation in Japan is gradually recovering supported by steady personal consumption and an increase in capital investment.

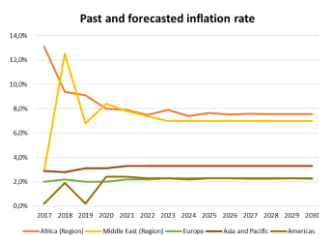
Graph 8:

YOY change of real disposable income in the US



Source: Statista, 2019

Graph 9:



Source: IMF, 2019

Since GoPro's cash flows are all in USD, we used the 2%-dollar **inflation rate YOY** to predict GoPro's revenues for all the regions, according to IMF forecasts, and turn them into nominal values (graph 9).

Another indicator with relevance for GoPro is the GDP. The action camera market is increasing in the same direction as the GDP growth, due to the positive correlation between GDP and consumer spending on goods and services. It is of extreme importance that the **GDP⁷** in Asia Pacific is expected to increase at 7% from 2021 until 2024, which highlights prospects of growth and signs of opportunity for GoPro and its peers to invest in this region. Considering the **EMEA** region, in **Africa** the GDP is increasing since 2017. In what concerns **Europe**, IMF forecasts a quite volatile GDP growth stabilizing at 4,3% from 2024 on (graph 10).

The GDP in **Middle East** rose 10,2% in 2018 and increased at a lower rate after that. **Americas** register a quite volatile GDP growth rate until 2021, which then stabilizes at 4% until 2024. IMF forecasts American GDP to increase at 2,9% YOY until 2030.

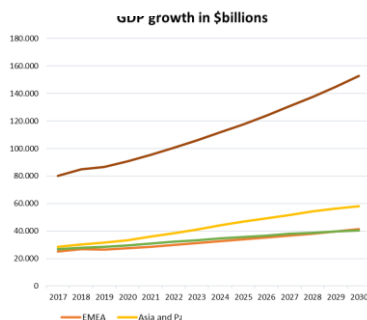
Since GoPro's action camera is a product that most of consumers resort to when travelling, we checked that **the international tourism industry (ITA)** has experienced steady growth almost every year (graph 11). It is forecasted that the number of international visitor arrivals in Asia Pacific will amount to approximately 767 billion in 2020 with a YOY change of 5.4%, according to Statista (graph 12). Within the region, it is predicted that Vietnam will dominate the Asia Pacific destinations in terms of average annual growth.

Extreme Sports⁹ has witnessed a boom in the last 5 years, becoming more popular than ever the willingness for adventure and creativity to push limits and self-challenge. Due to its increased popularity, extreme and adventurous sports are likely to display popularity trends for the foreseeable future. Its predicted that GoPro can benefit from this boom if it continues to invest in new and innovative products.

"Today, snowboarding is accepted as skiing in most ski resorts worldwide and so the number of snowboarders increased by 77% making snowboarding the fastest growing winter sport in the US."

Source: Reuters, 2019

Graph 10:



Source: IMF, 2019

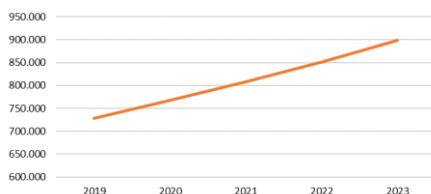
Graph 11:



Source: Statista, 2019

Graph 12:

Number of ITAs in the Asia Pacific region in millions



Source: Statista, 2019

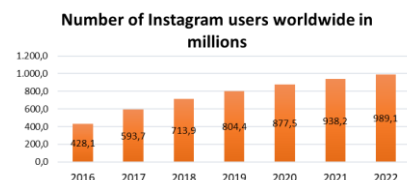
⁷ International Monetary Fund. World Economic Outlook

⁹ Sports Niche Markets. 2019. *Onecaribbean.org*

⁹ "The rise and rise of extreme sports". April 2019. *Teton Gravity Research*.

Action Camera Market

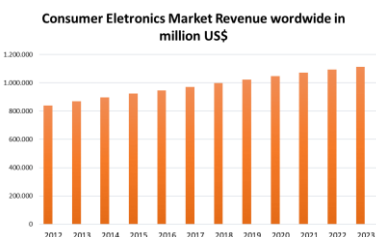
Graph 13:



Source: Statista, 2019

In terms of brand recognition, GoPro is one of the leading players operating in the action camera market. Driven by the booming consumer electronics industry and the strong trend of sharing content on social networks (see graph 13), the **global action camera market** is expected to witness substantial growth during our forecasted period.

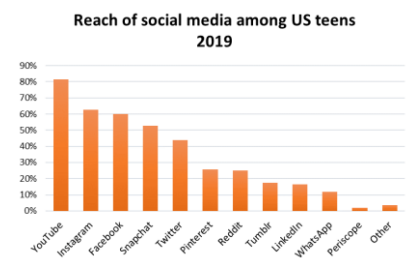
Graph 14:



Source: Statista, 2019

In a broader perspective, revenue in the Consumer Electronics¹⁰ segment is expected to show a CAGR of 2,1% from 2019 until 2023 (see graph 14). Most of the revenue is generated in China, registering a market volume of US\$245M in 2019. This indicates that 1,1% of the world GDP will be spent on consumer electronics in 2023. Besides, the user penetration rate is 23.8% in 2019 and is expected to amount 34,9% by 2023.

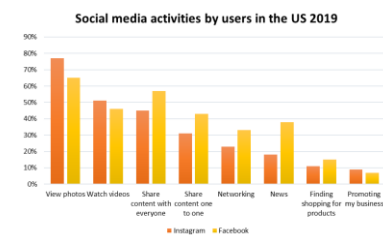
Graph 15:



Source: Statista, 2019

Today, contrary to previous generations, there is a greater use of small, compact, lightweight, designed for rugged conditions devices thanks to the disruption of the consumer electronics industry. As followed, the camera segment has witnessed a great advancement in terms of product quality, efficiency, and practice application. For example, the adoption of 360° cameras with the integration of image stabilization (VR-vibration reduction), offers the user a real-life experience of any event and is becoming a famous trend in the emerging markets.

Graph 16:



Source: Statista, 2019

Increasing popularity of mobile apps and social networking websites such as Facebook, Twitter, and Instagram (graph 15) will leverage the action camera industry growth over the next years, even for professional usage, which is visible through the 80% of US teens that use YouTube to share content and to watch videos of their sports activities captured by action cameras in this case (graph 15 and 16).

Graph 17:



Source: Statista and Market Research 2019

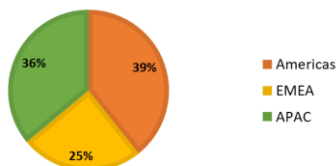
Based on all this, the market value of the global action camera market¹¹ accounted for \$4.237M in 2017 and is expected to reach \$16.767M by 2030, registering a **CAGR of 11,16%** (graph 17). Despite being a market demonstrating prospects of growth, in relation to the rest of the economy, the action camera market is positioned with a 0,01% share of the world GDP.

¹⁰ Statista, November 2019, based on IMF, World Bank, UN and Eurostat

¹¹ "Total action camera market revenue amounted to nearly 4.5 billion U.S. dollars in 2018 and Statista predicts the market to reach over 10 billion by 2026."

Graph 18:

ACTION CAMERA MARKET SHARE BY REGION
2019



Source: Statista and Market Research 2019

In what concerns the action camera market share by region, 39% of the market has already been captured by America. In 2020 this share will start to decrease until 2030 when it will represent 34,82%. 36% of the market belongs to APAC and this region is the only one that is expected to increase its percentage – to 47% in 2030. This growth can be explained by the growing internet connectivity in Asia - reaching this year 48% of global digital connectivity -, high density of population and travelers and a big rise in active social users. **EMEA** accounts for 25% of the action camera market and is expected to decline slowly until 2030, reaching a percentage of 18% (graph 18).

Peers

The action camera industry is increasing, rising the probability of new competitors to enter the market, which may affect GoPro’s market share in the future. Currently, the largest threat to the action camera’s American brand is the rise of Asian companies that manufacture products with similar design and almost the same (good) quality as GoPro. Most of these peers are not listed in the market. GoPro, despite being the oldest player and most recognized brand in the action camera market, doesn't have a compelling, reasonably priced product yet in comparison to its peers. Instead, the company stands as one of the most expensive action camera manufacturers (table 4), and still registers a negative return on investment (table 5). The features present in GoPros’ cameras are similar enough to its competitors, being indifferent for the consumers which brand to choose at the moment of purchase. Being more expensive to buy a GoPro, people tend to prefer one of its competitors.

Table 4:

Latest action camera model price	
GoPro	\$ 499,00
Nikon	\$ 499,95
Xiaomi	\$ 423,32
Sony	\$ 399,99
Garmin	\$ 399,99
Ricoh	\$ 392,00
Olympus	\$ 335,99
DJI	\$ 279,00

Source: Companies' websites

Table 5:	in thousands	GoPro	Garmin	Nikon	Sony
	ROIC	-17,43%	14,12%	4,50%	3,09%
	Investment \$	427.999	\$ 1.251.951	\$ 1.865.946	\$ 13.942.885

Source: Annual Reports and Bloomberg

In this sense, the key players are gaining competitive advantage in this market because they are coming up with new ideas followed by the continuous and consistent innovation of technology features at reasonable prices. The number of large vendors that operate internationally and seek market expansion through investments, research and development or cost efficiency, is rising rapidly.

To start with, **SZ DJI Technology Ltd** is a Chinese privately held, manufacturing company found in 2010, that designs, manufactures and sells aerial photography and flying devices, particularly drones. Its production is set up in Shenzhen, a very strong and **cheap** consumer electronics industry place thanks to the hire of active scientists and engineers, turning DJI into a cost leadership company. Recently, in 2018, DJI has launched the first handheld, mobile pocket action

Figure 5:



THE FUTURE OF POSSIBLE

camera, the Osmo Action Camera¹² (adequate for vloggers and selfie generation), competing directly and having a lot in common with the GoPro HERO7 Black model, since they look alike. DJI differentiates itself by its brand value in the industry, resulting in a fierce competitor for GoPro.

Garmin Ltd., with a sales volume of around \$2,6billion¹³ in 2019, is a 1989 American multinational, specialty technology company, that follows a differentiation strategy by being a multi-faceted company selling GPS features in 5 different markets: Automotive, Fitness, Wellness, and Outdoor. Garmin's main product is the GPs, but it also sells a 4K action cameras through the outdoor segment with a similar outlook as GoPro. Garmin achieved a net income in 2019 of \$591M and a gross margin 60%. Its focus on innovation let Garmin conquer a 5% share on Fitness wearable's market beating companies like Polar, Apple and Fitbit. Also focusing on having superior engineering departments and better design qualities, Garmin is being the first to market with new GPS technology, resulting in consumer loyalty since buyers perceive the engineers as experts and trend setters. Part of its great success was achieved thanks to the large and permanent investment in Research & Development.

Figure 6:



Figure 7:



Meanwhile, **Sony's Corporation**¹⁴ founded in 1946 in Japan, is one of the leaders in the camera industry recognized for its high-quality products. The company has more than 10.000 employees. In the action camera segment, it offers product quality at flexible prices. Since 2017, Sony's profit grew exponentially, reaching a 74% gross profit margin, net income of \$3.361M and is worth \$78.996M all in 2019. Since Sony has a much-diversified product portfolio, it is considered a generic competitor.

Figure 8:



Nikon Corporation, despite having joined the action camera market later than the others, offers three different cameras in its action camera range. The KeyMission 170 is the closest competitor to GoPros' cameras. However, it lags a little behind among the brands of action cameras. Nikon's financial outlook is positive, with \$6.505M revenues¹⁵, while its gross profit margin has been increasing these last few years, achieving 43% and accounting for a net income of \$611M¹¹ in 2019. In fact, the company has been experiencing a slight increase since 2015.

¹² David Coleman Photography. 2019. *Have Camerawilltravel.com*. "GoPro Competitors | 4K Action Cameras that Aren't Go Pros"

¹³ Garmin financial filings. 2019. "Garmin's Growth Is Still a Long Way from the Finish Line".

¹⁴ Garmin, LTD. 2018. "Garmin 2018 Annual Report".

¹⁵ Sony Corporation. 2019. "Sony 2019 Annual Report".

¹⁶ Nikon Corporation. 2018. "Nikon Report 2018"

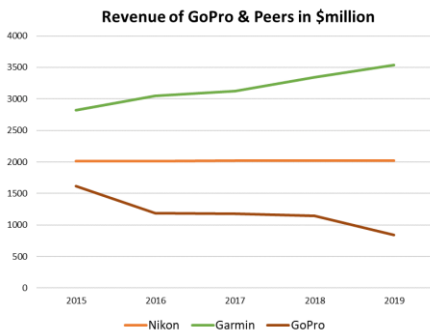
¹⁷ Nikon Corporation. 2019. "Consolidated Financial Results of the First Half Ended September 30, 2019."

Table 6:

KPIs as of September 2019					
in thousands	GoPro	Garmin	Nikon	Sony	
Return on investment	-17,43%	14,12%	4,50%	3,09%	
Gross profit margin	32%	60%	43%	74%	
Asset turnover	1,20	0,48	0,63	0,40	
Revenues \$	839	\$ 2.655.273	\$ 6.505.532	\$ 78.996.012	
R&D Expense \$	153.847	\$ 443.361	\$ 587.183	N/A	
Net Income \$	-110.462	\$ 591.695	\$ 611.364	\$ 854.800	
Operating Expenses \$	427.999	\$ 1.251.951	\$ 1.865.946	\$ 13.942.885	

Source: Annual Reports and Bloomberg

Graph 19:



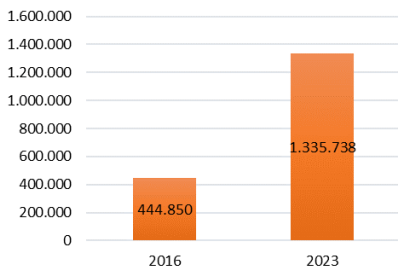
Looking at some key performance indicators of the peers, GoPro is running poorly in most of the captions presented above, registering negative net income and return on investment. In terms of market size, GoPro is the smallest, presenting lower gross margins. In relation to others, GoPro has stopped grown in the last years. Despite from 2014 until 2017 GoPro grew more than its competitors, from 2017 until now, a turndown movement has been dominating (graph 19).

Millennial Generation Trends

“Help people to capture and share their most meaningful experiences”

Graph 20:

Global adventure tourism market value in \$ million



Source: Statista, 2019

The U.S. Census Bureau characterizes Millennials as people born between 1980 and 2000. The Millennial generation makes up around half of the U.S. workforce, according to a Global Millennial survey made by Deloitte in 2019¹⁶. Based on 13.416 millennials questioned across 42 countries, 57% of them aspire to travel and see the world, whereas 49% want to buy a home or start families or have children. Interestingly, 62% of millennials are women more interested in exploring the world than are men. Unlike previous generations, 78% of Millennials are less likely to spend their money on physical products, but instead they are investing more into desirable experiences such as music festivals, traveling and sporting events.

Driven by the strong incentive for a healthier lifestyle¹⁷ in today's generation (table 7), the world is witnessing a trend towards **adventure tourism** (graph 20). Activities such as skydiving, bungee jumping, rock and mountain climbing, surfing, scuba diving, snorkeling, skiing and wakeboarding, are becoming a demand driver for action cameras that enable people to record recreational activities and to capture lifetime experiences.

Table 7:

Health Trends	
Growth of consumer spending on food&nutrition since 2010	108%
Market Value of health sector in \$billion	3.400
Outdoor consumers that use apps for health and fitness	17%
Woman's age following a fitness "guro" on social media	13-32y

Source: Outdoor Industry Association (OIA), 2019

¹⁶ Deloitte Global Millennial Survey. 2019. "Societal Discord and technological transformation create a "generation disrupted".

¹⁷ Outdoor Industry Association. 2019. "2020 Forecasting Report"

They are as well the first generation of digital natives, with a great affinity for technology and used to access instantaneously to price comparisons, peer reviews and information. 90% of Millennials have a smartphone—most of whom (93%) use it to access the Internet. Half of the Millennial generation are regular users of smart TVs, computers and mobile device, online websites and social apps. According to the financial times, it is forecasted that by 2020, millennials will make up 35% of the global workforce and are expected to account for 30% of retail sales in the United States - \$1.4 trillion in spending. Bearing this in mind, creating, sharing, and capturing memories during experiences, as action cameras enable, goes along with the enumerated trends.

Drivers & Forecasting

Revenue Value Drivers

GoPro’s revenue is defined by **average selling price** multiplied by **camera units shipped** and the company does not disclose revenue by product category. What generates most of GoPro’s revenues are the cameras. In order to forecast revenues, we used the estimated action camera growth by region as a value driver: Americas, Europe, Middle East and Africa (EMEA) and Asia Pacific (APAC). Knowing the correspondent compound annual growth rates (CAGRs) for each region, we were able to determine the evolution of the action camera market from 2017 until 2030.

In the past, GoPro has experienced the highest levels of revenue in the fourth quarter of the year, coinciding with the holiday shopping season, mainly in the United States and Europe. Usually, around 35% of GoPro’s total revenue come in the holiday season quarter. Beginning 2019, the early sales of the new HERO8 action camera appeared to be strong, however the fourth quarter differed from the years before, not yielding the usual revenue growth. Each year the holiday shopping season can last anywhere between 25 and 31 days from Thanksgiving until the Christmas. Since in 2019 Thanksgiving was on November 28 (fourth Thursday of November), the holiday season was six days shorter that year, marking the shortest possible holiday shopping season since 2013 in the United States.

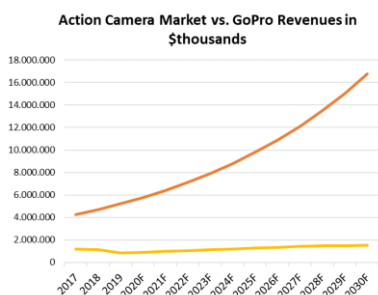
GoPro is conscious that the company “does not expect to continue to grow in the future at the same rate as it has in the past.”, according to GoPro. Before getting public, GoPro already had a lot of success. From 2017 on, the company started decreasing its revenues. Revenues declined by 27% from 2018 to 2019, mainly due to the production delays of HERO8 Black, according to annual report. From

Graph 21:

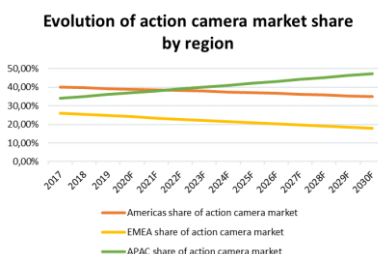
GoPro Revenues



Graph 22:

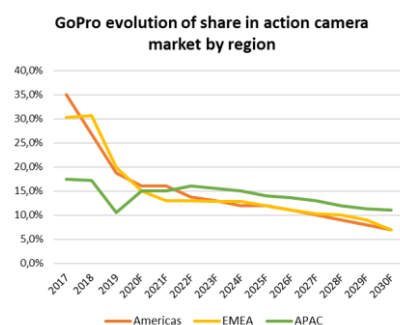


Graph 23:



Source: Market Research Future, Press Release 2019

Graph 24:



2020 on, the company is expected to increase its revenues but at a slower rate than the action camera market, registering a CAGR of 5,30% from 2020 until 2030, compared to 11,24% in the action camera market (graph 22).

AMERICAS

Looking at each region in detail, according to GoPro’s annual report, the Americas represented “46% of GoPro’s revenue in 2018, 43% in 2017 and 50% in 2016”. USA represents the greatest share of GoPro’s American revenues, comprising 39%, 45% and 47% of the total revenue in 2018, 2017 and 2016, respectively. Most leading industry players are located in the US – Drift, Garmin and iON. In comparison to other regions, people in North America tend to be more sportive and enthusiastic about the adoption of the latest technology products, which are often introduced there first. In line with this, Americas held the largest market share in 2017, registering a market value of \$1.691M and this region is projected to grow at a CAGR of 10% during the forecasted period. In this way, the action camera market in Americas will increase from \$2.046M in 2019 to \$5.837M in 2030.

ASIA PACIFIC (APAC)

Meanwhile, the Asia-Pacific region - accounting for the second largest region as percentage of action camera revenues with 34.07% in 2017 - is expected to reach the highest CAGR of 14%. This is mainly due to the fact that Asia Pacific is witnessing a growth in the action camera due to the rise in disposable income in countries like Philippines, China, Hong Kong, India and Japan, which are gaining awareness about advance technologies and smart devices. APAC is a region, where action cameras are mostly perceived as a novelty. Besides, the tourism industry in Asia Pacific is expected to grow significantly. Consequently, these countries are heavily contributing to the overall market share and the higher CAGR. For this region the action camera market will increase from \$1.876M in 2019 to \$7.930M in 2030.

Table 8:	Share in Action Camera Market	CAGR Action Camera market
	2017	2017-2030
Americas	39,90%	10,00%
APAC	34,07%	14,00%
EMEA	26,03%	8,00%

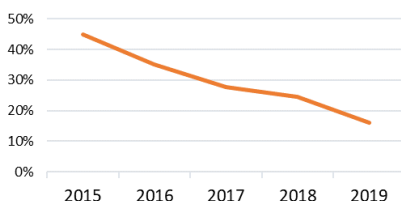
Source: Statista, Market Research Analysis

EMEA

Furthermore, GoPro currently has foreign operations in France, Germany, Netherlands, Romania and United Kingdom. As per industry estimates, the action camera market in Europe is a continent strongly dependent of technologies as well. However, this region has already reached the entire targeted population, indicating that EMEA will decrease its share in the market. Indeed, EMEA region is estimated to grow at the lowest **CAGR of 8%**, achieving \$2.999M revenues of the action camera market in 2030.

Since GoPro's cash flows are all in USD, we used the dollar inflation rate as a driver to predict GoPro's future revenues. For each region, apart from determining the growth of the action camera market revenue, we obtained the past GoPro market share and estimated the future share for the company.

Graph 25:
GoPro Total Share in Action Camera Market



"With a rapidly growing industry comes increased competition."

Source: Reuters, 2019

In 2015, one year after getting public, GoPro accounted for over 45% of the action camera industry sales. Right now, it is an industry that is forecasting a flood of competition with new companies emerging and offering competitive products directly in GoPro's category. Until now, GoPro's share in the market has been decreasing, accounting for 16% in 2019. This tendency has been present in the past four years¹⁸ (see graph 25) and we expect it to continue as the industry grows. The lack of specific standard features, allied to high prices and the inability to diversify product lines among a drastic increase in competition, caused GoPro's stock price to reduce 86% in less than a year. Contrarily, it opened the opportunity for other companies to hit the market with new products and new features practicing lower prices. Sony, for example became increasingly successful in the action camera market, introducing technologically advanced devices. Sony expects operating income to increase in 3,7% and net income to increase 8%.

"GoPro Hero Max has the best stereo sound ever." (since it has 6 microphones) – GoPro Inc. Press Release, 2019

In terms of **new products** for 2020, the company has recently launched two new cameras: the \$399 limited edition HERO8 Black and GoPro Hero Max¹⁹ for 499\$, both shipped on October 2019. During this Black Friday period *GoPro.com* achieved more than 120% YOY growth in total camera unit sales, where HERO8 Black sold at high levels, comprising more than 90% of total sales. GoPro Hero Max has some new features acting as three cameras in one: a standard Hero action camera, a vlogging camera, thanks to the front-facing LCD display, and a 360-degree camera. According to the CEO Nick Woodman, the company is going to increase its 2020 value due to the strength of new products launched late 2019. Recently in the third quarter 2019, both HERO8 Black and MAX represented more than 75% of the camera revenues. This is one of the reasons that lead us to assume that in 2020 GoPro's revenues will slightly increase again. GoPro also recently announced three new modular add-on accessories to help enhance some of the recently launched cameras' features. The first is the \$80 Display Mod, that can be applied on the front or back of the camera to help users to better frame pictures, and the second one is the \$50 waterproof light to attach to the top of the cameras.

¹⁸ Reuters. "According to TechStockInsider.com, Big Opportunity for Small Action Camera Makers as GoPro Suffers".

¹⁹ Digital Photography Review. 2019. "GoPro Max: a second-generation 360° action camera with Hyper Smooth, 360 Audio and more."

¹⁹ TechNews.com. 2019. "GoPro Hero 8 Black and GoPro Max Action Cameras Are All About Versatility"

The launch of these two accessories, which are essential to have a full GoPro experience - allowing the use of camera in extreme situations - will address the needs of vloggers and any other traveler enthusiast and expand the company's market beyond GoPro's core customers – extreme athletes.

Operating Costs

GoPro's cost structure is highly dependent on sales, marketing and cost of revenue, being its biggest cost drivers. Although it was once a dominant player in the market, now GoPro faces profitability constraints and low operating margins due to high costs of marketing, inventory and research & development (see table 9).

The cost of revenue is the most representative part of the COGS, which consist of shipping and handling costs, costs of manufacturing for production, logistics and warranty repair costs. This caption increased in 2017 due to one of GoPros' developments in September 2017, namely the launch of the new mainstream 4K60 video feature in action cameras.

Being the greatest caption as a percentage of revenue, we expect the company to be more efficient and to converge towards its peers in terms of gross margin. Looking at Garmin's outdoor segment as a benchmark, GoPro's gross margin is lower. Therefore, we assume GoPro will decrease its COGS as a percentage of revenues, changing from 64% in 2019 to 55% in 2030. GoPro follows the strategy of shipping cameras via air, while accessories are ocean freighter from the facility in Hong Kong to their fulfillment centers, which allows the company to reduce shipping costs.

"We are more focused on better understanding the customers that are encountering problems (...) with our marketing messages so that we can do a more effective job at educating them and converting them into paying customers." – GoPro CEO

Graph 26:

Operating expenses evolution

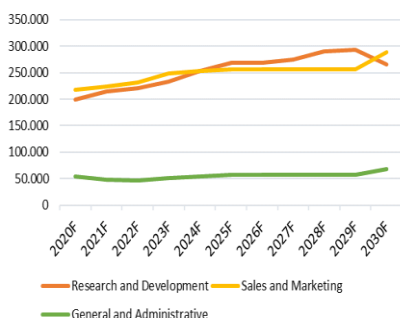


Table 9:

	Operating costs as % of Revenue					
<i>in \$ thousands</i>	2014	2015	2016	2017	2018	2019
Research and Development	151.852	241.694	358.902	229.265	167.296	173.151
% Revenues	11%	15%	30%	19%	15%	21%
Sales and Marketing	194.377	268.939	368.620	236.581	222.096	222.096
% Revenues	14%	17%	31%	20%	19%	26%
General and Administrative	93.971	107.833	107.367	82.144	66.004	70.190
% Revenues	7%	7%	9%	7%	6%	8%
Operating costs	440.200	618.466	834.889	547.990	455.396	465.437
Operating Income	187.035	54.748	-372.969	-163.460	-93.962	-131.833
Operating Margin	13%	3%	-31%	-14%	-8%	-16%

In what concerns operating expenses, GoPro is expected to resort more frequently to online sales. Despite the **Sales and marketing** investment has been gradually losing its weight since 2016, there are still prospects of investment in this area from 2019 on. In order to increase brand awareness, we expect to see an increase in marketing expenditure, driven by GoPro's desire to actively promote its brand, especially in the Asia Pacific market, by resorting to marketing

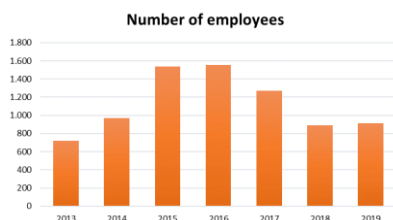
partnerships through physical distribution and by introducing more retail locations there. To sum up, marketing and distribution costs are expected to grow but at a low level until 2026 and then stabilize until the last forecasted year. This is certainly in line with Garmin, which is predicted to increase media advertising in the outdoor segment as well.

General & Administrative expense is composed by salaries and personnel-related costs. The fact that GoPro gave up on many employees, led to a decrease over the years in this caption. Right now, there are 912 employees. It plans to hire less, and so these costs are expected to decrease at least until 2022 and to increase at a lower rate after that (graph 24). Once again, looking at Garmin, it has a higher number of employees. As of December 2018, the company had approximately 13.000 full and part-time employees worldwide²⁰.

For many years, GoPro had a lot of success with each product it invented. Blinded by that and expecting to grow like that forever, the CEO confessed that in early days the company didn't make any consumer research. The investment in **Research & Development** has been decreasing from \$358.9M in 2016 to \$153.8M in 2019. The company invested in significant resources in the support for the launch of the Karma drone, and that is the reason why the highest number for this caption was hit in 2016. From now on, GoPro will focus on serving its customers by building the cameras while relying on surveys, feedback and testing among GoPro's customers. This will require an increase in **Research and Development (R&D)**. We expect expenses in this area to increase for the future as the company desires to develop innovative technologies in the advanced capabilities of cameras. R&D will increase from 18% of revenues to 22% in the first two forecasted years. From 2023 on, it will slowly decrease as a percentage of revenues.

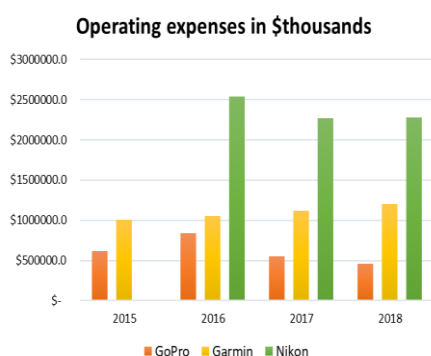
Looking at peers, Sony states that it will continue to actively resort to technologies such as Fintech to improve operation efficiency mainly in the areas of product development and customer support, indicating it will increase investment in Marketing and R&D as well. Garmin is committed to grow the level of innovative design and development of new products toward improving technological aspects, turning into a cash-generating company. Its strong emphasis on R&D and the partnership between manufacturing and engineering teams drive innovation for its products.

Graph 24:



"By doing consumer research, we learned how important things like video stabilization are to them,"
– Nick Woodman, CEO of GoPro.

Graph 25:



²⁰ 5.000 employees in North America, 5.300 in Taiwan, 1.600 in Europe, and 1.100 other global locations.

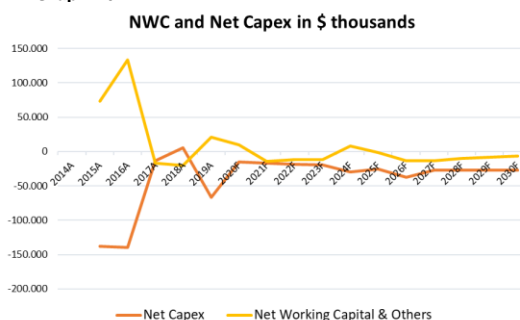
Smartphone companies like Apple, are extremely focused on introducing new features in their cameras, heavily investing in R&D for that. In order to differentiate in the market, GoPro will have to follow this trend.

Capital Expenditure

Operating lease right-of-use-assets is a caption that appeared only in 2019 with GoPro’s move of most of its US-bound camera production out of China. Instead, the company started to produce in Guadalajara, Mexico²¹, registering a value of \$53M operating lease assets in 2019. We expect the value of the lease assets to remain flat until 2030. This new investment in fixed assets will impact ROIC, making it lower. Similarly, Garmin is planning to relocate its distribution center and to do a renovation of office²² for the next 5 years.

In 2016, GoPro acquired two privately-held mobile editing application companies for \$104M, part of this amount belonging to **intangible assets**. Since from 2017 until now this caption remained stable, we assume it will continue to represent the same 1% of revenues for the future.

Graph 26:



GoPro has a high asset turnover ratio of 1.2, compared to Garmin, Sony and Nikon, which means that it is efficiently using its assets to generate sales. It registered negative capex in 2016, 2017 and 2019, which is not reasonable in comparison to its peers. Garmin’s net capex, for example, has risen significantly over the last 3 years, a trend expected to continue²³.

Table 10:

Garmin				
in thousands	2015	2016	2017	2018
Net Capex		\$ 81.082	\$ 263.274	\$ 264.457
Gross FCF	\$ 516.981	\$ 598.303	\$ 781.825	\$ 743.370
R&D	\$ 427.043	\$ 467.960	\$ 511.634	\$ 567.805

Source: Garmin’s Annual Report

²¹Reuters. 2019. “GoPro - Under tariff threat, Mexico less attractive to companies avoiding China trade war”.

²¹ Reuters. 2019. “GoPro to move U.S.-bound camera production out of China.”

²²Garmin’s vertically integrated manufacturing capabilities is one of its core competencies, having production facilities in Taiwan - Xizhi, Jhongli and LinKou – in China – Yangzhou - and in the U.S. - Olathe, Kansas, Salem and Oregon, which enables an easier application of resources necessary to serve its several products.

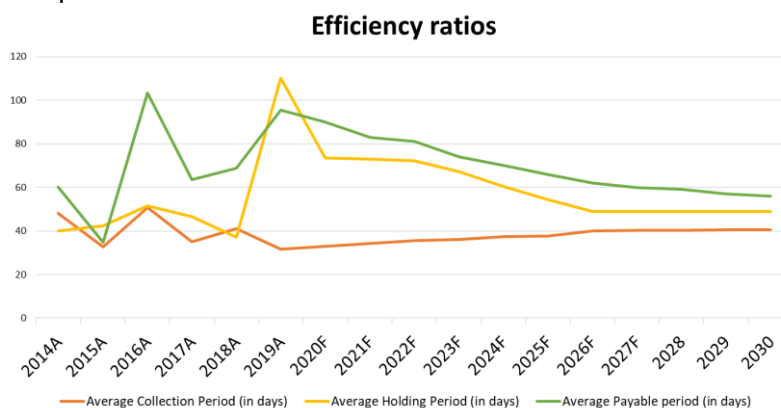
²³Garmin Ltd. Investor Relations Press Release, 2019.

Net Working Capital

The captions that constitute the greatest weight of Net Working Capital in 2019 are: Accounts Receivable (\$72M), Inventory (\$253M), Accounts Payable (\$142M) and Accrued Liabilities (\$161M).

Contrary to its peers, GoPro’s payable period is longer than its average collection and holding period, demonstrating that GoPro holds money in the company for a long time.

Graph 27:



Regarding **inventory**, in the past GoPro overbuilt the costs to have its products displayed in stores because it expected to sell more than it actually sold. In 2018 the average holding period dropped in relation to 2017, where there was accumulation of inventory. After the exit of the aerial products business, the inventory of the Karma drone was sold throughout 2018, which indicates a prospect of decrease for the future average holding period. Today, in order to nullify the impact of trade war and related tariffs, a shift in production facilities was done from China to Mexico. This led to production delays, more precisely of the Hero8 Black cameras shipment, and to an increase in inventory during 2019, where the company registered high levels of physical inventory, namely of \$253M compared with \$116.5M in 2018.

In the fourth quarter of 2019 GoPro aimed to improve inventory management and to free up cash to run the business, and so it is expected to “lower the channel inventory” in order to be well-positioned for the first quarter in 2020. The average holding period will be reduced from 110 days in 2019 to 74 in 2020, achieving 49 days in 2030.

Concerning the **accounts receivable**, GoPro took 32 days in 2019 to receive from its customers. Nikon and Sony registered an average collection period of 43 days in the same year. Therefore, we assume GoPro will converge toward that

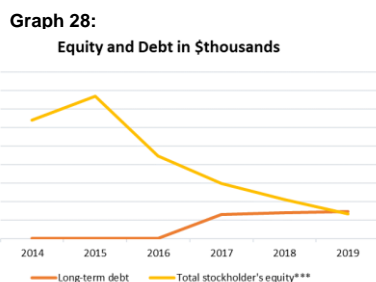
value until 2030. Driven by revenue growth, we foresee accounts receivable to increase from \$72M in 2019 to \$169M in 2030.

We foresee the **accounts payable** to increase as well. This caption has been quite volatile over the past years, registering the highest payable period in 2016, namely of 103 days, mainly due to the difficulty to pay to its suppliers at the time of the Karma drone incident. The average payable period is going to slowly convert towards industry average, 40 days.

The same occurred to the **accrued liabilities**, registering the highest values in 2016 and 2017, and we expect this caption to increase in 2020 mostly due to obligations with the new products launched late 2019 and due to the increased accrued sales incentives. This caption is very high – \$161M - in 2019 in comparison to its peers.

To sum up, we expect the investment in Networking Capital to rise from -\$20M in 2019 to \$54M in 2020.

Equity and Debt



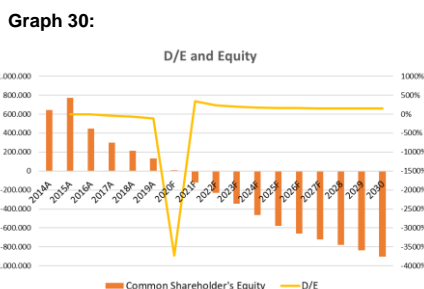
Taking into consideration GoPro’s capital structure, the company is mainly dependent on **debt financing**. With debt reaching 111% of equity in 2019 (graph 30), GoPro is considered a relatively high levered company, which is common for a small-cap company, since debt tends to be cheaper and sometimes more accessible. Compared to the competitors’ median market debt to equity ratio, which is 28,4%, we can state that GoPro is above the industry median (graph 29). On the contrary, Garmin’s cash flow is very strong thanks to shareholders’ dividends and buybacks, being able to grow the business almost debt free.

Graph 29:

Market D/E

GoPro	65,53%
Garmin	0,31%
Nikon	20,50%
Sony	36,29%
Median	28,40%

The graph on the side shows that in 2019 GoPro had long-term debt of \$148M, up from \$138M in one year (graph 28). However, because it has a cash reserve of \$27M in 2019, its net debt is about \$121M. Moreover, GoPro generated \$46M in operating cash flow during this same period, yielding an operating cash to total debt ratio of 31%, which implies that GoPro’s current level of operating cash is not high enough to support debt. This percentage indicates a sign of lack of operational efficiency for loss making companies like GoPro.



For the future GoPro intends to keep its operations financed by a high level of debt. This combined with low earnings and extreme negative net loss can be risky resulting in unexpected downturns since liquidity may dry up in the long term, making it hard to operate. That is why GoPro’s sustainability of its current state of

Graph 31:
Liabilities covered by Assets



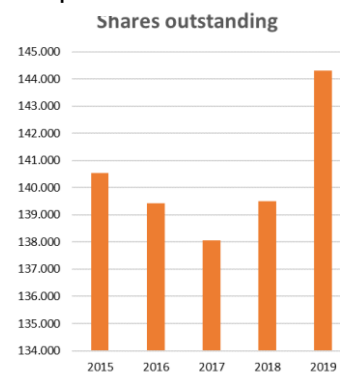
operations become a concern. GoPro has a negative interest coverage ratio, while its competitors have a positive one. This indicates that GoPro has difficulties in paying its interest payments on outstanding debt. However, thanks to its current level of short-term assets GoPro will be able to pay its upcoming liabilities. Regarding short-term liquidity, GoPro presents a quick ratio of 55%, which, despite being lower than its peers, indicates that GoPro’s debt is covered by assets. Short term assets of \$431M exceed long-term - \$238M - and short-term liabilities - \$325M - in 2019 (graph 31).

In terms of **equity**, past payout ratios have been quite volatile due to the entry and exit of the aerial business, so it is hard to predict how they will be in the future. The ratio was assumed to be 0 for the future, due to GoPro’s low, negative unlevered FCF (graph 32).

Graph 32:



Graph 33:



Valuation

DCF – Intrinsic Valuation

To be able to value GoPro, Inc through a DCF, we had to compute the discount rates in order to reach WACC, which impact our results and conclusions. The unlevered cashflows were obtained and are presented in graph 33.

The **cost of equity (Re)** was estimated under the Capital Asset Pricing Model (CAPM), according to three inputs: Risk-free rate, market risk premium and levered beta.

First, regarding **risk-free rate**, we chose the last observed rate of the 10-year maturity US Government Bond – 1,9% - as a proxy for our risk-free rate, since most of GoPro’s business is done in the United Sates. In what concerns the **market risk premium**, the S&P500 as the return on the market, was used as market proxy, once again for being situated in the United States. We assumed a **MRP** of 6% according to the range acceptable by literature and analysts. The levered (rolling) **Beta** of GoPro is 1,002 and was computed with data from July 2014 until December 2019, taking into account GoPros’ monthly returns and the above-mentioned US Government Bond. After calculating the previous inputs, we derived the **cost of equity**, being 7.9 % (table 11).

To estimate the **cost of debt** we used the 5,9% return on the yield to maturity of GoPro’s most recent bond issued with maturity of 8 years, accounting for the cost

Table 11:

RE Computation	
RF	1,9%
MRP	6,0%
Rolling Beta	1,002602
Confidence Interval	[0,288;1,35]
RE	7,9%

Table 12:

RD Computation	
GoPro Bond's Yield	5,9%
Recovery Rate	53,90%
LGD	46,10%
Cummulative PD	3,18%
PD (Annualized)	0,392%
RD	5,7%

it would take to finance the company at the date of valuation. According to available data in Moody's, we reached an annualized probability of default of 0,392%. As such, cost of debt was then adjusted considering this value and the loss given default of 46,1% (table 12).

When calculating cost of capital, it is very important to account for the **capital structure** input. GoPro intends to maintain a high level of debt to finance its operations, reaching a market debt-to equity ratio of 66%. Taking this and the American current statutory tax rate of 21% into consideration we reached the **Weighted Average Cost of Capital** of 6,57% (table 13).

After analyzing GoPro's past performance, as well as its value drivers, relevant inputs and assumptions, a valuation of the company was done through the **DCF method**. The **Gordon Growth Model** was applied to the intrinsic valuation model, in which all the future operating unlevered free cash were discounted at the WACC in order to account for risk and capital structure decisions. The cash flows were estimated on a 10-year horizon, starting in 2020 until 2030, applying the long-term growth rate and a growing perpetuity subsequently. It is of extreme importance to have an accurate estimation of the terminal value, because it accounts for a large percentage of GoPro's total value. The **terminal value** was computed by applying a perpetuity growth formula (GGM) to the last projected free cash flow of 2030. For each year, by adding non-cash expenses back to the NOPLAT and by subtracting all investment in fixed assets – capex and networking capital – we arrive at the core free cash flow, which is then discounted at the WACC rate for the estimation horizon 2020-2030 (table 14).

Table 13:

WACC Computation	
RE	7,9%
RD	5,7%
Tax	21%
Debt (Mkt Value)	\$ 524.212.598
Equity (Mkt Cap)	\$ 799.958.183
WACC	6,57%

Graph 33:

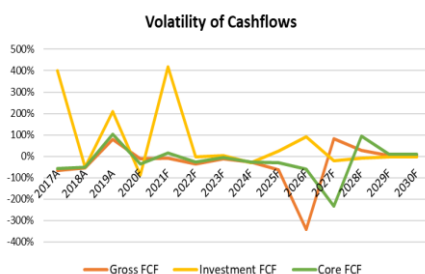


Table 14:

in thousands	DCF Valuation											
	2020 (Today)	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Terminal Value
Unlevered FCF	-104.180	-120.383	-87.591	-82.802	-59.622	-41.447	-16.942	22.304	43.171	47.236	51.615	
Terminal Value												655.762
Discounted Unlevered FCF	-97.756	-105.994	-72.366	-64.190	-43.371	-28.290	-10.851	13.405	24.345	24.995	25.628	

Observing GoPro's Return on Invested Capital, one gets a perception of the performance of the company when using its capital to generate returns. Considering that the company's ROIC has been quite volatile, experiencing returns on investment from approximately -49% in 2020 and reaching a positive ROIC of 17% in 2030, it is possible to conclude that GoPro will manage to create some value for its investors throughout the next years. The positive **ROIC** together with the high **reinvestment rate** generate a positive growth rate of around 3,2% and 2,6%, in 2029 and 2030, respectively (table 15).

Table 15:

	ROIC and Growth rate										
	2020 (Toc)	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
RR	-194%	-237%	-361%	-412%	-517%	-818%	2517%	834%	618%	614%	604%
ROIC	-49%	-45%	-30%	-26%	-20%	-12%	4%	13%	17%	17%	17%
g	-5%	8%	6%	6%	2%	2%	10%	6%	4%	3%	3%

To confirm if this growth rate is actually consistent with the long-term nominal growth rate (4,52%), we used the expected long-term (2030) local real growth per geography (weighted average according to GoPro's revenues) of 2,47% and the 2%-dollar inflation 2019/2020. Since GoPro is a global company, the growth rate obtained in the terminal value shall not be greater than the one of the global economies.

Driven by growth rate in perpetuity, the Core Enterprise Value is \$321M. By adding the non-core assets - \$61M -, discounting non-core liabilities - \$21M - and net debt of -\$259M, we arrived at a Common Equity Value of \$621M. Since the company has 144M shares outstanding, we were able to calculate a **target price** per share of \$4.31 (see table 16). As of December, 30 2019, GoPro is trading at a market price of \$4.47, which leads to a total shareholder return of -3,67%. Therefore, we assign GoPro a **SELL** investment recommendation. Despite GoPro's expanding investment in such a demanded sector, worldwide, GoPro's expected return is not high enough to a hold recommendation, due to the uncertainties associated with the business for the long-term.

Table 16:

Share price computation	
Core EV	321.317
Common Equity Value	621.388
Share price	4,31

Multiples – Relative Valuation

Finally, with the purpose of strengthening our investment decision, we conducted a multiples approach. We have selected GoPro's 3 major comparable companies (Garmin, Nikon and Sony) that operate internationally and that seem to have the most similar kind of business. Given the available – despite limited - information for 2019, we benchmarked the **Price to Sales** ratio - the only one applicable to GoPro. GoPro registers a 0,67x price to sales ratio, which means investors are willing to pay 0,67 times GoPro's sales for the stock.

We decided to make an individual comparison between GoPro and its peers one by one. Contrarily to GoPro, Garmin registers a high price to sales ratio of 5,09x. This peer is the one that yields the higher share price namely of \$32, far above the market. After comparing GoPro with the peers one by one (table 17), we reach the conclusion that the three peers, separately, result in higher share prices than the one computed by the DCF, meaning GoPro is undervalued by the market.

Table 17:

Individual Comparison between GoPro and peers					
Garmin		Nikon		Sony	
Sales 2020	907.202	Sales 2020	907.202	Sales 2020	907.202
Garmin Price/Sales	5,1x	Nikon Price/Sales	0,9x	Sony Price/Sales	0,98x
=Equity Value	4.617.656	=Equity Value	816.481	=Equity Value	889.058
Shares Outstanding	144.306	Shares Outstanding	144.306	Shares Outstanding	144.306
Share Price	32,00	Share Price	5,66	Share Price	6,16

When it comes to analyze the multiple as a whole, we obtain a range of 0.8x to 5.1x, presenting a median Equity Value of \$852M, which traduces into an average share price of 5.91\$, indicating the GoPro's stock is undervalued as well. We believe this multiple is not the best proxy for enterprise value since it doesn't take into consideration the differences in cost structures and efficiencies across companies, nevertheless it was the only one that could be applied to GoPro, being the only one that yields a positive share price.

We performed a **football field** summary, where we drew the conclusion, that the price reached in the Price/Sales multiple valuation is higher than the one reached in our DCF valuation, meaning that the DCF – where we incorporated our own expectations of the current strategic view plan for the company - trailed behind.

Scenario Analysis

GoPro operates in foreign countries, making operating expenses account to a significant share of revenue, being thus subject to challenges. Since international revenue outside the US accounts for 63%, 55% and 53% of revenue in 2018, 2017 and 2016, respectively, the effect of interest rates and foreign currency exchange rates can affect GoPro's business.

With the competition arising in Japanese companies, GoPro wants to invest more in the APAC market, however, this requires significant resources and the company may have limited experience in marketing, selling, and in deploying their products. International expansion will require GoPro to invest important funds and it cannot be assured to be successful in this matter. Staffing and managing foreign operations will be another difficulty faced by GoPro, since the company may have to bring their existing employees to foreign countries or hire new ones and so, different employment practices may have to be adopted.

Besides, GoPro is being affected by the competitors' arising sales of the drone. To better understand the potential impact in Gopro's business of both APAC's tendency to increase consumer electronic demand and the increasingly Drone

market, a scenario analysis was conducted. Through our research, we came across, several times, with these two tendencies.

The Drone market has been growing in a strong and rapid way. It is forecasted that the market of Drones will reach \$65.300M by 2024. APAC is the region with the highest growth prospects for consumer electronics. In the scenario analysis we took into consideration 3 different scenarios: a base case scenario when everything remains as in the model, a best-case scenario, where the Drone's market decreases its share, leading to an increase of 1% in GoPro's market share and a 1% increase in demand for action cameras in the APAC region. Finally, we put in hypothesis a worst-case scenario, where the Drone market increases its market share, leading to a decrease of 1% of GoPro's market share, and APAC stays stable.

After running this analysis, we could detect that the share price increased from \$4.31 to \$4.37, not suffering a great change. It is also important to highlight that the hypothesis tested are not likely to happen.

Sensitivity Analysis

Since the outcome of the DCF valuation method is highly sensitive to the assumptions made, at this point, we performed a sensitivity analysis to study the impact of the above-mentioned uncertainties and risks on the valuation. Since in our valuation the **terminal value** represents a positive, high amount, this may impact NOPLAT, and so it is crucial to conduct an analysis to quantify the impact of changes in the **cost of capital (WACC)** and **terminal growth rate** in the company's share price. The results are shown in the following table, where changes of 0,5% in growth rate and WACC were analyzed.

Table 19:

Beta Regression	
Garmin	
Beta	1,062
Confidence Interval	[0,78;1,35]
R-Square	0,205
Nikon	
Beta	0,725
Confidence Interval	[0,34;1,10]
R-Square	0,110
Sony	
Beta	1,218
Confidence Interval	[0,96;1,47]
R-Square	0,255

Table 18:

		WACC					
		4,31	5,57%	6,07%	6,57%	7,07%	7,57%
Growth Rate	1,56%	4,729278	3,962715	3,363240	2,884848	2,496867	
	2,06%	5,468763	4,511614	3,782360	3,212193	2,757309	
	2,56%	6,454064	5,216971	4,306044	3,612147	3,069753	
	3,06%	7,832182	6,156800	4,978998	4,111884	3,451501	
	3,56%	9,896515	7,471317	5,875653	4,754065	3,928490	

By changing these two parameters, we obtain a range of prices between \$2.49 and \$9.89. Apart from that, since **WACC** is given by the Beta, we also tested the sensitivity specifically to various other betas: GoPro and competitors unlevered beta, confidence interval beta, relevered GoPro and industry Beta (table 19).

A regression was done for the competitors (Garmin, Nikon, Sony) to obtain their levered betas, which were averaged in the end (table 20).

Table 20:

Beta Sensitivity	Beta	Share Price
	1,00	4,31
Beta Lower 95%	0,29	3,5919
Relevered Industry Beta (wit	0,44	3,7387
Relevered GoPro Beta (witl	0,54	3,8430
Unlevered Beta GoPro	0,66	3,9641
Unlevered Industry Beta	0,80	4,1072
Beta Upper 95%	1,35	4,6553

Table 21:

Unlevered Betas	
GoPro	0,661
Garmin	1,059
Nikon	0,624
Sony	0,947
Median	0,804

Apart from that, we also obtained the unlevered ones (table 21), which are lower because they do not consider the company’s debt risks. Considering the competitors median unlevered beta of 0.804 and GoPro’s rolling Beta of 1.002, a sensitivity analysis to the competitors unlevered betas was run through - which removes the financial effects of leverage.

Conclusion

In order to disclose our opinion, after an extensive research of GoPro, Inc., an analysis of market trends and future developments, we computed an intrinsic and relative valuation with regards to the financial statements, comprising the years 2014 until 2019.

Finally, we can acknowledge that, according to both the multiple- and the DCF Gordon Growth Model analysis, the target price obtained is just below GoPro’s current market trading share price, meaning the stock is underpriced. Therefore, our report aims to give the final investment recommendation to **SELL** GoPro’s stock. GoPro, with very few chances to become successful outside the core action camera business, once drones have flopped and 360 cameras suffer huge competition, is now facing profitability constraints, due to high costs and low revenues. To overcome the risk of becoming obsolete in the long term, a new product has to come out to excite consumers. According to our estimates and considering a target price of \$4.31, compared with the current market price of \$4.47 as of the 30 December 2019, we conclude that the company’s outlook for the next years seems to be threatening, whose investment is expected to yield a negative return of -3,67%.

Disclosures and Disclaimers

Report Recommendations

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

This report was prepared by Rita Coimbra and Matilde Lança, Master's in Finance students of Nova School of Business and Economics ("Nova SBE"), within the context of the Field Lab – Equity Research.

This report is issued and published exclusively for academic purposes, namely for academic evaluation and master graduation purposes, within the context of said Field Lab – Equity Research. It is not to be construed as an offer or a solicitation of an offer to buy or sell any security or financial instrument.

This report was supervised by a Nova SBE faculty member, acting merely in an academic capacity, who revised the valuation methodology and the financial model.

Given the exclusive academic purpose of the reports produced by Nova SBE students, it is Nova SBE understanding that Nova SBE, the author, the present report and its publishing, are excluded from the persons and activities requiring previous registration from local regulatory authorities. As such, Nova SBE, its faculty and the author of this report have not sought or obtained registration with or certification as financial analyst by any local regulator, in any jurisdiction. In Portugal, neither the author of this report nor his/her academic supervisor is registered with or qualified under COMISSÃO DO MERCADO DE VALORES MOBILIÁRIOS ("CMVM", the Portuguese Securities Market Authority) as a financial analyst. No approval for publication or distribution of this report was required and/or obtained from any local authority, given the exclusive academic nature of the report.

The additional disclaimers also apply:

USA: Pursuant to Section 202 (a) (11) of the Investment Advisers Act of 1940, neither Nova SBE nor the author of this report are to be qualified as an investment adviser and, thus, registration with the Securities and Exchange Commission ("SEC", United States of America's securities market authority) is not necessary. Neither the author nor Nova SBE receive any compensation of any kind for the preparation of the reports.

Germany: Pursuant to §34c of the WpHG (*Wertpapierhandelsgesetz*, i.e., the German Securities Trading Act), this entity is not required to register with or otherwise notify the *Bundesanstalt für Finanzdienstleistungsaufsicht* (“BaFin”, the German Federal Financial Supervisory Authority). It should be noted that Nova SBE is a fully-owned state university and there is no relation between the student’s equity reports and any fund raising programme.

UK: Pursuant to section 22 of the Financial Services and Markets Act 2000 (the “FSMA”), for an activity to be a regulated activity, it must be carried on “by way of business”. All regulated activities are subject to prior authorization by the Financial Conduct Authority (“FCA”). However, this report serves an exclusively academic purpose and, as such, was not prepared by way of business. The author - a Master’s student - is the **sole and exclusive responsible** for the information, estimates and forecasts contained herein, and for the opinions expressed, which exclusively reflect his/her own judgment at the date of the report. Nova SBE and its faculty have no single and formal position in relation to the most appropriate valuation method, estimates or projections used in the report and may not be held liable by the author’s choice of the latter.

The information contained in this report was compiled by students from public sources believed to be reliable, but Nova SBE, its faculty, or the students make no representation that it is accurate or complete and accept no liability whatsoever for any direct or indirect loss resulting from the use of this report or of its content.

Students are free to choose the target companies of the reports. Therefore, Nova SBE may start covering and/or suspend the coverage of any listed company, at any time, without prior notice. The students or Nova SBE are not responsible for updating this report, and the opinions and recommendations expressed herein may change without further notice.

The target company or security of this report may be simultaneously covered by more than one student. Because each student is free to choose the valuation method, and make his/her own assumptions and estimates, the resulting projections, price target and recommendations may differ widely, even when referring to the same security. Moreover, changing market conditions and/or changing subjective opinions may lead to significantly different valuation results. Other students’ opinions estimates and recommendations, as well as the advisor and other faculty members’ opinions may be inconsistent with the views expressed in this report. Any recipient of this report should understand that statements regarding future prospects and performance are, by nature, subjective, and may be fallible.

This report does not necessarily mention and/or analyze all possible risks arising from the investment in the target company and/or security, namely the possible exchange rate risk resulting from the security being denominated in a currency either than the investor’s currency, among many other risks.

The purpose of publishing this report is merely academic and it is not intended for distribution among private investors. The information and opinions expressed in this report are not intended to be available to any person other than Portuguese natural or legal persons or persons domiciled in Portugal. While preparing this report, students did not have in consideration the specific investment objectives, financial situation or particular needs of any specific person. Investors should seek financial advice regarding the appropriateness of investing in any security, namely in the security covered by this report.

The author hereby certifies that the views expressed in this report accurately reflect his/her personal opinion about the target company and its securities. He/ She has not received or been promised any direct or indirect compensation for expressing the opinions or recommendation included in this report.

The content of each report has been shown or made public to restricted parties prior to its publication in Nova SBE's website or in Bloomberg Professional, for academic purposes such as its distribution among faculty members for students' academic evaluation.

Nova SBE is a state-owned university, mainly financed by state subsidies, student's tuition fees and companies, through donations, or indirectly by hiring educational programs, among other possibilities. Thus, Nova SBE may have received compensation from the target company during the last 12 months, related to its fundraising programs, or indirectly through the sale of educational, consulting or research services. Nevertheless, no compensation eventually received by Nova SBE is in any way related to or dependent on the opinions expressed in this report. The Nova School of Business and Economics does not deal for or otherwise offer any investment or intermediation services to market counterparties, private or intermediate customers.

This report may not be reproduced, distributed or published, in whole or in part, without the explicit previous consent of its author, unless when used by Nova SBE for academic purposes only. At any time, Nova SBE may decide to suspend this report reproduction or distribution without further notice. Neither this document nor any copy of it may be taken, transmitted or distributed, directly or indirectly, in any country either than Portugal or to any resident outside this country. The dissemination of this document other than in Portugal or to Portuguese citizens is therefore prohibited and unlawful.

A Work Project presented as part of the requirements for the Award of a Master's Degree in Finance from the NOVA – School of Business and Economics.

Disruption of the Action Camera Market by the
Smartphone Era

Rita Feio Gebhard de Almeida Coimbra 34453

A Project carried out on the Master's in Finance Program, under the supervision of:

Francisco Martins

03/01/2020

Abstract

The action camera market is being disrupted by the growing consumer trend for choosing smartphones with new and better camera features, replacing the traditional cameras. In this report I analyzed the effect of the smartphone era in GoPro's core business. Taken Apple as an example, and following the future innovation of the iPhone camera, a sensitivity analysis was performed, to measure the impact of a higher than usual investment of GoPro in Research and Development in the company's revenues and target price.

Keywords

Apple

Research & Development

Artificial Intelligence

Investment on smartphone's camera features

This work used infrastructure and resources funded by Fundação para a Ciência e a Tecnologia (UID/ECO/00124/2013, UID/ECO/00124/2019 and Social Sciences DataLab, Project 22209), POR Lisboa (LISBOA-01-0145-FEDER-007722 and Social Sciences DataLab, Project 22209) and POR Norte (Social Sciences DataLab, Project 22209).

Appendix II: Disruption of the Action Camera market by the Smartphone Era

Rita Coimbra 34453

In today's generation the action camera market is being disrupted. With the constant development of smartphones, GoPro is being forced to work on different features to become more user-friendly. Examples of that are the Quick mobile editing applications and the GoPro Plus cloud service, that offer the possibility to share photos directly from GoPro's mobile apps focusing on "making the smartphone a key component in the GoPro user"¹. This proves that GoPro has already assumed that the smartphone will always act as an intermediary.

In the past, GoPro was lucky because, as the first player in the market, never had a direct competitor, other than some late interventions from Sony, Garmin or DJI. What GoPro cannot combat, is a product with almost the same capacities that does not need an intermediary – the smartphone. Today, smartphones with high photo and video functionality seem to be displacing the market for traditional camera sales.

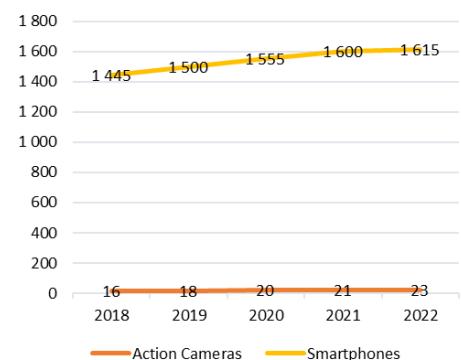
According to Statista, the number of smartphone units shipped² is forecasted to be 1.615M in 2022 worldwide, whereas it is predicted that the action cameras amount to 23M units in the same year (see Exhibit 1).

The reason behind this, is the high improvement that companies like Samsung, Huawei and Apple, who dominate the smartphone market, are doing on smartphone cameras through deep

learning. The manufacturers of these companies are heavily investing in the versatility and advanced

Exhibit 1:

Unit shipments worldwide in millions



Source Statista, 2019

¹“Financials & Filings - Annual Reports and Proxies | GoPro Inc. *Investor.gopro.com*. Available at: <https://investor.gopro.com/financials-and-filings/annual-reports-and-proxies/default.aspx>

²2019. “Global Smartphone Market Share: By Quarter - Counterpoint Research”. *Counterpoint Research*. Available at: <https://www.counterpointresearch.com/global-smartphone-share/>

system of functions of the smartphone cameras, introducing new products with proper designs to handle the same conditions as GoPro, such as waterproof or challenging physical environments³.

A lot of exciting features that improve user experience will be implemented, including image sensors by integrating a low-cost, complex processor into the cameras.

According to research, machine learning is consequently becoming a **disruptive trend in the market**. Considering the demanding **Artificial Intelligence** of today's generation, and all the applications that require deep learning technologies⁴, companies have to be aware of the specific techniques necessary to develop a differentiated product. According to the Camera and Imaging Products Association (CIPA) a disturbing downward trend is visible⁵. In comparison to June 2018, the number of digital cameras shipped declined by 74.8% in June 2019, and there are no signs for this situation to get better. The use of compact cameras has dropped by 88% because of the smartphone. "In Imaging System, we expect sales and profit of interchangeable-lens cameras to decline, due to the continued impact of mainly entry-class DSLR market contraction"⁶ according to Canon's Executive Vice President and the CFO.

Consumers are now passing through a time-age of surging innovation characterized by the new technologies like cloud computing and the "Internet of Things", which are gaining great scale. Analysts highlighted that not only Apple, but also its competitors - Samsung or Huawei - are resorting to **machine learning techniques** to develop their devices with the purpose of combining photos to achieve results with better quality. One of their aim is to manage to brighten photographs taken in low light performance or night mode.



³Nasim Mansurov. 2019. "The Smartphone vs The Camera Industry.". *Photographylife.com*. Available at: <https://photographylife.com/smartphone-vs-camera-industry>

⁴2019. "Smart Camera Trend in the Future – Innomiles". *Innomiles*. Available at: <https://www.innomiles.com/smart-camera-trend-in-the-future/>

⁵2019. "CIPA - Camera & Imaging Products Association: HOME". *Cipa.jp*. Available at: http://www.cipa.jp/index_e.html

⁶2019. "The Digital Camera Market Is In Serious Trouble". *No Film School*. Available at: <https://nofilmschool.com/digital-camera-market-sales-low>

The new, recently launched iPhone 11, is an example of a potential future replacement of action cameras. Consequently, it is getting difficult for the consumer to create more value as before within the action camera market. Deutsche Bank analyst's reaction to the new launch was like: "Camera, Camera, Camera is the new iPhone 11".

Apple, by launching the new iPhone with a dual camera system², is offering enhanced features like high image and video. Apple CEO Tim Cook has said there are indeed 800 people dedicated to improving the iPhones cameras.

This year Apple is heavily focused on camera improvements. The reason for this is the fact that today consumers care a lot about camera quality. Apple is using **artificial intelligence** and **machine learning** to capture multiple pictures at the same time, which requires high-end hardware. The company has developed a new software feature named "*Deep Fusion*", which guarantees more details to the scenarios captured by cameras, by taking 9 pictures at the same time. "Consumers upgrade for better cameras – among other reasons," Forrester analyst stated. It seems that today the number of cameras on the back of one's iPhone is becoming a **social signal**, according to Cybart⁷.

Moreover, Apple is looking to develop its video capabilities through the introduction of the new triple camera system, probably meaning a better 4K or 8k or even 3D for the future. The video recording software was improved in the new iPhone as well, by developing a new *app* for the 11 Pro Max camera to record with the 3 cameras at the same time. What is happening is that the camera is being recognized as the iPhone's distinguishing feature. "Camera is what consumers still care about most and where most expect innovation to happen"⁷. Apart from that, since the cameras are easy to observe and test before buying, it is used as a benchmark for users. Apple's analyst predicts for 2020 iPhones to have a 3D **time-of-flight (ToF)**⁸ sensor.

⁷Kif Leswing. 2019. "Apple is becoming a camera company." *CNBC*. Available at: <https://www.cnbc.com/2019/09/15/apple-iphone-11-shows-transformation-to-camera-company.html>

⁸Raymond Wong. 2019. "iPhone 2020: What the iPhone of the future will look like". *Mashable*. Available at: <https://mashable.com/feature/apple-iphone-2020/?europa=true>

This feature is typically used in cameras connected to **drones** or self-driving cars (to prevent them from crash) because it efficiently measures how long it takes for a laser, liquid or light for example to travel a certain distance. According to Bloomberg, given the prevalence of Apple’s hardware and the impact it tends to have on the industry and since several phones on the market already contain ToF cameras, it is worth for Apple to develop this type of technology. By doing this, the company aims to focus on allowing the future iPhone to scan the room in three dimensions.

It is expected that Apple keeps improving its dual-camera system, a feature that will likely become standard not only in the “Plus model”, but in all future iPhones.

Photo quality take three aspects into account: **the image sensor** measuring the light amount entering through it, the **quality of the lens** and the **image signal processor**, which helps to compose the final picture. According to an analysis made by the venture capitalist from CIPA, the forecasted rise of “pro” cameras on smartphones can negatively impact action camera sales in the future. Once again, a heavy investment in Research & Development was required to produce such a developed product. Apple had to increase its R&D Expense⁹ in 15%, 23% and 14% in 2017, 2018 and 2019, respectively (see Exhibit 2).

Exhibit 2:

Apple			
All values in \$ millions	2017	2018	2019
Research and Development	11 581	14 236	16 217
Growth %	15%	23%	14%
% of revenue	5%	5%	6%

Source Apple, Inc. Annual Report, 2019

Given the success achieved through his investment, I performed a sensitivity analysis to measure the impact of an increase of the same caption in GoPro’s share price. I assumed that R&D will maintain the same percentage of revenues (Exhibit 3) over the years and will increase in value in line with Apple’s average growth rate of the last 3 year (2017, 2018 and 2019), traducing into a 17% growth YOY.

⁹“Apple - Investor Relations”. *Investor.apple.com*. Available at: <https://investor.apple.com/investorrelations/default.aspx>

Looking at the scenario in which GoPro becomes successful in integrating these new, innovative features into its products, meanings it manages to substantial increase the level of revenues with the investment made, I reached the following results:

Exhibit 3:

All values in \$ thousands	2019A	2020F	2021F	2022F	2023F	2024F	2025F	2026F	2027F	2028F	2029F	2030F
Revenues	839 490	818 189	959 574	1 178 981	1 402 752	1 621 650	1 901 876	2 230 526	2 615 967	3 034 522	3 520 046	4 083 253
Growth %		8,1%	17,3%	22,9%	19,0%	15,6%	17,3%	17,3%	17,3%	16,0%	16,0%	16,0%
Action Camera Market Revenues	5 209 135	5 779 374	6 415 086	7 124 126	7 915 324	8 798 617	9 785 187	10 887 621	12 120 096	13 498 585	15 041 088	16 767 897
Share of GoPro in Action Camera Market	16,1%	14,2%	15,0%	16,5%	17,7%	18,4%	19,4%	20,5%	21,6%	22,5%	23,4%	24,4%
Research and Development	153 847	180 001	211 106	247 586	290 370	340 546	399 394	468 410	549 353	637 250	739 210	857 483
% revenues	18%	22%	22%	21%	21%	21%	21%	21%	21%	21%	21%	21%
Growth %		17%	17%	17%	17%	17%	17%	17%	17%	16%	16%	16%

To conclude, the revenue's CAGR (2020-2030) is now 17,44% instead of 5,3%. Considering this scenario, where GoPro heavily invests in R&D from 2020 onwards, GoPro's share in the action camera market will increase from 14,2% in 2020 to 24,4% in 2030 due to the higher revenues. Driven by higher growth rates in the forecasted years (see Exhibit 4), the share price becomes \$4,71 yielding a 5,4% expected return (see Exhibit 5). A HOLD investment recommendation was achieved for GoPro. Still, GoPro didn't manage to get a BUY recommendation, given the challenging environment it is facing.

Exhibit 4:

Growth rate	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Base Scenario	-5,13%	7,93%	6,48%	6,17%	1,95%	2,28%	10,29%	5,61%	3,88%	3,18%	2,56%
Sensitivity to R&D Increase	-5,13%	12,73%	15,11%	13,80%	7,63%	9,79%	22,05%	17,00%	15,32%	15,30%	15,28%

Exhibit 5:

	Revenue CAGR (2020-2030)	Share Price \$	Expected Return	Recommendation
Base scenario	5,30%	4,31	-3,67%	Sell
Sensitivity to R&D Increase	17,44%	4,71	5,40%	Hold