LISBON
SCHOOL OF
ECONOMICS &
MANAGEMENT
UNIVERSIDADE DE LISBOA

MASTER OF SCIENCE IN
FINANCE

MASTERS FINAL WORK
PROJECT

EQUITY RESEARCH:
GENERAL DYNAMICS CORPORATION

MIGUEL PORTUGAL DA CUNHA PEREIRA CAMPOS

NOVEMBER 2020

LISBON
SCHOOL OF
ECONOMICS &
MANAGEMENT
UNIVERSIDADE DE LISBOA

MASTER OF SCIENCE IN
FINANCE

MASTERS FINAL WORK
PROJECT

EQUITY RESEARCH:
GENERAL DYNAMICS CORPORATION

MIGUEL PORTUGAL DA CUNHA PEREIRA CAMPOS

SUPERVISOR:
PEDRO RINO VIEIRA

NOVEMBER 2020

Abstract

This Master's Final Work consists of an analysis and valuation, followed by a recommendation of GD Corporation share, an American company operating in the Aerospace & Defense industry. This valuation and consequent recommendation takes into consideration assumptions considered to be within reason for the next five years as well as the company's historical financial performance.

This report follows the ISEG Master Final Work standards and it has been written following the CFA Institute recommended guidelines. The decision on evaluating such company was based on the fact that GD is one of the world's largest defense contractors as well as being a key player in the business aviation industry. The current world situation, from both economic and social point of view, has made the valuation quite challenging, as uncertainty rules today's world.

The first step in this Equity Research involves making an overview of the history of the company, its business segments and the governance structure of GD. Part of this initial analysis is analyzing the industry in which it operates as well as understanding the current economic environment and how it will affect the company's financial performance in the future.

The second part of this report consists of an analysis to reach GD's price target at the end of 2021. In such analysis, four different models were applied: the Discounted Cash Flow model, the Discounted Dividend Model, the Adjusted Present Value model and a Multiples Valuation model. Of the approaches just mentioned, the Discounted Cash Flow method is the main model on which this recommendation is been based on. This model yields a price target of $168,75 per share for 2021YE, implying a 12,3% upside potential, resulting in a hold recommendation. This valuation and consequent recommendation is supported by the other three valuation models, which yield similar price targets.

However, it needs to be noted the medium risk intrinsic to this recommendation, namely the volatility and uncertainty present in the financial markets as a consequence of the COVID-19 pandemic, as well as some other operational risks inherent to GD in particular.

JEL Classification: F01, G10, G17, G30, G34, G35, H56, J11, L62, L64

Key Words: Equity Research; Valuation; GD Corporation; Discounted Cash Flows; Aerospace & Defense.

Resumo

Este Trabalho Final de Mestrado consiste numa análise e avaliação, seguidas de uma recomendação da ação da GD Corporation, uma empresa americana que opera na indústria da Aviação e Defesa. Esta avaliação e consequente recomendação tomam em consideração pressupostos para os próximos cinco anos, mas também os dados financeiros históricos da empresa.

Este relatório segue as regras do Trabalho Final de Mestrado do ISEG e foi escrito tendo em conta as diretrizes recomendadas pelo CFA Institute. A decisão de avaliar a empresa foi feita tendo em conta o facto da GD ser uma das maiores empresas na indústria da defesa, mas também na aviação de negócios. A situação atual vivida no mundo, tanto ao nível económico como social, resultante da pandemia, tornou a avaliação da empresa muito difícil.

O primeiro passo neste Equity Research foi analisar a história da empresa, as suas unidades de negócio e a sua estrutura de gestão da empresa. Parte desta análise inicial é também analisar a indústria em que a empresa opera, perceber qual é a situação económica vivida e como é que tal situação vai afetar a performance da empresa no futuro.

A segunda parte deste relatório consiste em fazer uma análise para apurar o price target da GD no final de 2021. Nesta análise, foram aplicados quatro modelos diferentes: o Método dos Fluxos de Caixa Descontados, o Modelo dos Dividendos Descontados, o Modelo do Valor Presente Ajustado e uma Análise por Múltiplos. Dos modelos agora mencionados, o Método dos Fluxos de Caixa Descontados é o principal modelo em que esta recomendação se baseia. Este modelo resulta num price target de $168,75 por ação para o final de 2021, implicado um potencial de valorização de 12,3%, indicando uma recomendação para manter. Esta avaliação é então suportada pelos restantes três modelos, que resultam também em price targets similares.

No entanto, importa referir o risco médio inerente a esta recomendação, nomeadamente para a volatilidade e incerteza presente nos mercados financeiros, como consequência da pandemia, mas também alguns riscos particulares à GD.

Classificação JEL: F01, G10, G17, G30, G34, G35, H56, J11, L62, L64

Palavras-Chave: Equity Research; Avaliação; Fluxos de Caixa Descontados; GD Corporation; Aviação & Defesa.

Index

List of Figures

List of Tables

General Dynamics Corporation

Miguel Campos
Master in Finance

Aerospace & Defense
New York Stock Exchange (NYSE)
November 2020

Date: November 2020
Ticker: GD

Current Price: $150,29

Recommendation: HOLD (12,3% Upside)
Price Target: $168,75 Medium Risk

1. Research Snapshot

HOLD is our recommendation for GD Corporation (GD) with a 2021YE price target of $168,75/sh using a DCF model, implying a 12,3% upside potential from the November 11th, 2020 closing price of $150,29/sh, with medium-risk. GD is an American company operating in the aerospace and defense industry and is one of the world's largest defense contractor. As a consequence of the pandemic, the company saw the demand for its business aircraft plunge as economies were shut down and travel restrictions imposed in an attempt to control the COVID-19 pandemic. This meant a significant drop in revenues and sales for 2020YE, especially in the aerospace segment, the largest segment of GD.

Table 1: GD Market Data

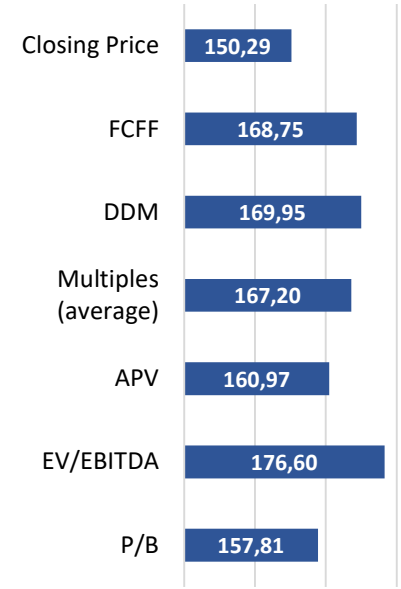
Market Profile	
Closing Price (November 11th)	150,29
52-week price range	100.55 - 190.08
Average daily volume	1.484M
Shares Outstanding	289,61M
Market Capitalization	34.762,46
Dividend Yield (2019F)	2,95%

Source: GD and Reuters

Figure 2: Historical Share Price

Source: Yahoo Finance

Figure 1: GD Price Target



Source: Author's estimates (US dollars)

Sales and earnings affected by COVID-19. The aerospace industry was one of the most affected industries by the pandemic. Aviation traffic came to a halt when economies shut down and travel restrictions were imposed. GD 2020 Q3 earnings release showed a -4,0% decrease in revenues and earnings were also down 12%, from year-ago levels. For 2020YE we forecast revenues to decrease between 3%-4%, compared to 2019. Despite that, we expect GD's sales to grow at 1,4% CAGR during 2020-25, mainly driven by the aerospace segment. As borders open and travel restrictions are lifted, business aircraft traffic will increase faster than commercial aviation and, therefore, the business aircraft industry will recover faster than the commercial aviation industry. The aerospace segment will grow at a 4% CAGR over the 2020-25 period.

2. Business Description

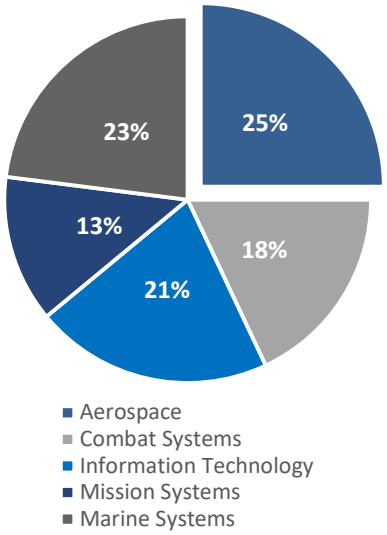
General Dynamics Corporation (GD) is a publicly traded global aerospace and defense company listed on the New York Stock Exchange (NYSE). They offer products and services in business aviation, combat vehicles, weapon systems and munitions, information technology services, C4ISR solutions, and shipbuilding and ship repair. General Dynamics was incorporated in 1952 and is headquartered in Virginia. In the early 1990s, due to a downturn in the industry, the company decided to divest many of its divisions, and start building the basis to the modern-day General Dynamics, by acquiring several businesses that would become key drivers of its profitability. From acquiring Gulfstream Aerospace Corporation in 1999, to completing the CSRA acquisition in 2018, GD continues to position itself for future growth and profitability.

GD operates through five business segments: Aerospace, Combat Systems, Information Technology, Mission Systems and Marine Systems. Whilst the corporate leaders are responsible for allocating capital and setting the overall strategy for the company, each business segment is responsible to set and execute on its own strategy and operational performance.

The **Aerospace** segment offers a family of business aircrafts through Gulfstream Aerospace Corporation and a full range of services for aircrafts, through Jet Aviation, produced by both Gulfstream and other original equipment manufacturers. This segment represents 25% of consolidated revenue, making it the largest business segment for the company. Gulfstream designs, manufactures and services business-jet aircrafts. The Gulfstream G280 is the smallest of a family of six aircraft models currently in production. It is also the only mid-size cabin aircraft and the only model assembled by a non U.S. partner. GD saw the first G600 aircrafts being delivered to clients in 2019, after receiving its type and production certifications from the U.S. Federal Aviation Association (FAA), joining the G500, that received those same certifications in 2018. Both the G500 and G600 are successors to the G550 and the G650, respectively. Despite not having as much range as their predecessors, the newer models have a wider cabin and higher speed. Next in the lineup are the ultra-long range, ultra-large cabin G650 and G650ER, which hold the record for the highest speed and the longest flight for aircrafts of its kind. In 2019, Gulfstream launched the G700, the new flagship aircraft for the industry, which is set to be the world's largest business jet.. As of February 2020, this latest model has successfully completed its first flight, and deliveries are expected to begin in 2022. The group also offers support to the 2,800 Gulfstream aircraft in service around the world, with the largest factory owned service network in the industry, and a 24/7 customer support center, with on-call Gulfstream technicians ready to meet the customers' requirements.

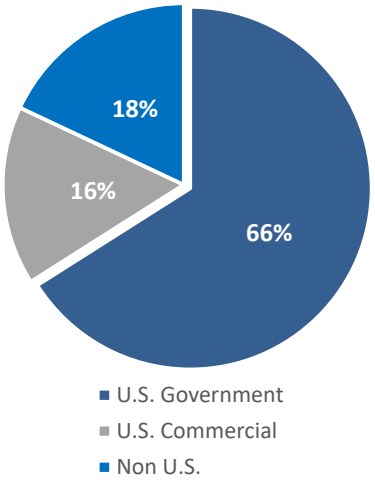
Jet Aviation is a global leader for business aviation services and, with a network of 50 airport locations scattered around the world, they offer services like aircraft maintenance, fixed base operations (FBO), chartering services and staffing. In addition, Jet Aviation also offers custom completions of narrow and wide-body aircrafts.

Figure 3: 2019 Revenues per segment



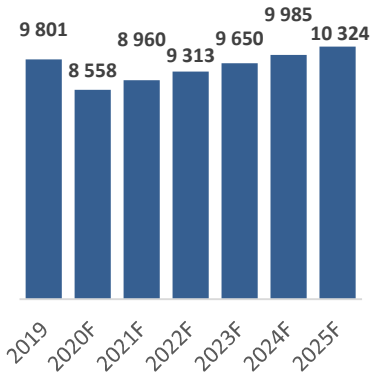
Source: Company Data

Figure 4: 2019 Revenues per client



Source: Company Data

Figure 5: Aerospace Revenue



Source: Author's estimates (USD million)

The **Combat Systems** segment offers combat vehicles, weapon systems and munitions for the U.S. government and its non U.S. partners, and represents 18% of the group's consolidated revenue. The segment is divided in three business units: European Land Systems, Land Systems and Ordinance and Tactical Systems.

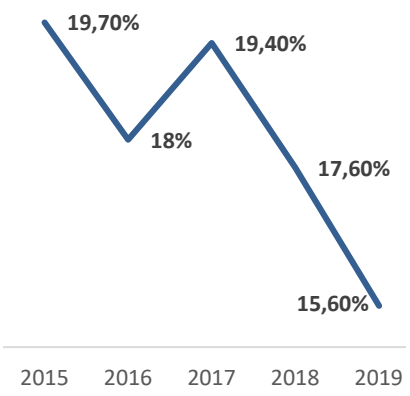
European Land Systems delivers to non U.S. customers high-mobility and versatile Pandur and Piranha armored vehicles. A wide range of variants of both this vehicles are available, to meet the military's needs of adapting such vehicles to different missions with different operational requirements. European Land Systems also offers a wide variety of bridge systems, ranging from 100 kilograms to 100 tons, built to allow heavy vehicles to cross various sizes of water barriers.

GD Land Systems, alongside the U.S. Army, has been developing the Stryker, an eight-wheeled, medium weight and versatile combat vehicle available in 11 different variants, to address the Army's ever-evolving operational requirements. Over 3,300 Strykers have been delivered over time. In its portfolio of combat vehicles, Land Systems also has the Abrams Main Battle Tank, which is the U.S. Army's main battle tank. GD Land Systems is under contract with the Army to upgrade 174 of their Abrams battle tanks. Under the AJAX program, the company is developing for the British Army a medium-weight tracked combat vehicle. This program is transitioning from engineering to testing and is expected to be in production stage in 2024. GD Land Systems also produces light armored vehicles (LAVs), having over 13,000 vehicles in service around the world. The Ordinance and Tactical Systems business unit produces weapon systems for ground forces, airborne platforms and shipboard applications, as well as munitions of all calibers and weapon platforms.

The **Information Technology** segment (GDIT) provides a portfolio of IT related services and capabilities for a broad spectrum of customers in the military, intelligence and federal civilian markets. The segment represents 21% of the group's consolidated revenue. GDIT provides all services related to technology consulting, solution design, operations and maintenance, cloud services and cyber defense for enterprise systems. For the Pentagon, GD provides network security and incident handling. For the centers of Medicare & Medicaid services (CMS), GD provides IT hosting and operating services and maintenance in support of claims processing for 49 million Medicare beneficiaries. GDIT also offers IT infrastructure modernization services, which includes designing, building and operating global IT enterprises, data center consolidation and cloud strategy and operation.. As well as logistics and supply chain management, training and simulation, medical research and specialized mission support services.

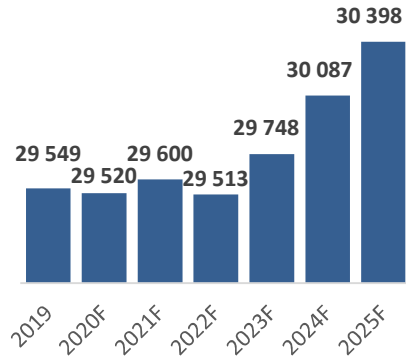
GD's **Mission Systems** segment is a provider of mission critical control, command, communications, computers, intelligence, surveillance and reconnaissance (C4ISR) products and systems. This business segment represents 13% of the group's consolidated revenue. GD designs, builds and supports satellite communications equipment, assured position, navigation and timing components, as well as other communications equipment solutions. GD Mission Systems is the prime contractor for the U.S. Army's mobile communications, providing secure voice, video and

Figure 6: Aerospace Operating Margins



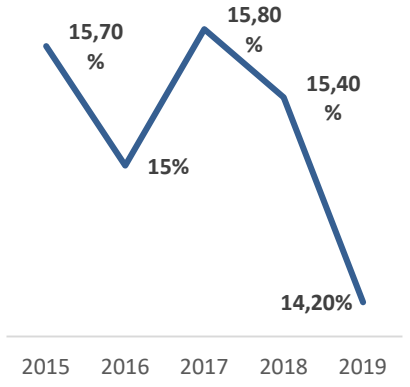
Source: Company Data

Figure 7: Defense Segments Revenues



Source: Author's estimates (USD million)

Figure 8: Combat Systems Operating Margins



Source: Company Data

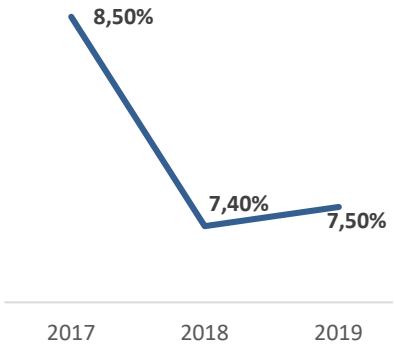
data capabilities for soldiers. The segment offers a range of radio frequency communications and systems for military and government customers, as well as long-term broadband communications networks for first responders. The CM-300/350 V2 digital radios used by the FAA in air traffic control centers, airports and military air stations for reliable ground-to-air communications is also part of the portfolio. The Mission Systems segment's combat and seaframe control systems serve as the technology backbone for the Navy's Independence-variant Littoral Combat Ship (LCS) and the Expeditionary Fast Transport (EPF) ships, as well as providing advanced fire-control systems for the entirety of the Navy's submarine programs, both attack and ballistic missile. The Mission Systems segment's Digital Modular Radio (DMR), a four-channel radio that serves as the Navy's communications hub for surface ships and submarines, is the first software-defined radio to become a communications system standard for the Navy. For airborne platforms, the segment provides display systems, signal and sensor processing, and command-and-control solutions, with its avionics or encrypted communications systems present in nearly every U.S. military aircraft in service.

The **Marine Systems** segment designs and builds nuclear-powered submarines, surface combatants, auxiliary and combat-logistics ships for the U.S. Navy, and container and cargo ships for commercial customers. This segment represents the remaining 23% share of the group's consolidated revenue. It consists of three business units: Electric Boat, Bath Iron Works and NASSCO. More than 90% of the segment's revenue comes from engineering, construction and maintenance services provided to the Navy. Electric Boat, the lead shipyard on all Navy submarines programs, including both the nuclear-powered Virginia-class attack submarine and the future Columbia-class ballistic-missile submarine. The Navy purchases Virginia-class submarines in multi-boat blocks, and, to date, has purchased 18 Virginia-class submarines, from the first three blocks. There are 10 submarines from the fourth block under contract, with delivery scheduled to 2024. Electric Boat was also awarded the construction of the fifth block of submarines, an additional 19 submarines with delivery scheduled for 2029. Electric Boat is also the designer and builder of the Columbia-class ballistic-missile submarines, a 12 boat program, which is the replacement program for the Ohio-class ballistic-missile submarine fleet. The construction of the lead submarine is scheduled to begin in the fourth quarter of 2020.

Bath Iron Works is the builder of the Arleigh Burke-class guided missile destroyers, but also manages the design, modernization and lifecycle support for this class. Bath Iron Works delivered the first destroyer in 2017, there are 11 ships scheduled for delivery through 2026. Bath Iron Works is also the hull, mechanical and electrical (HME) prime contractor for the Zumwalt-class guided-missile destroyer program. The third and final ship of this program is expected to be delivered in 2020.

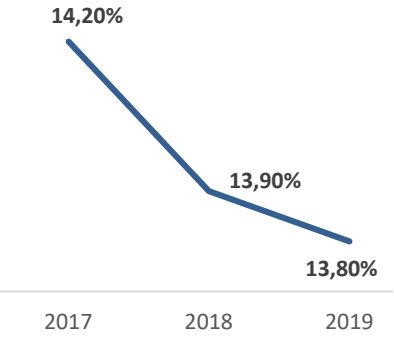
NASSCO specializes in auxiliary and support ships for the U.S. Navy, oil tankers and dry cargo carriers for commercial customers. The U.S. Navy added a third ship as part of the contract celebrated with NASSCO, to improve the Navy's capacity to deliver equipment and military forces to

Figure 9: Information Technology Operating Margins



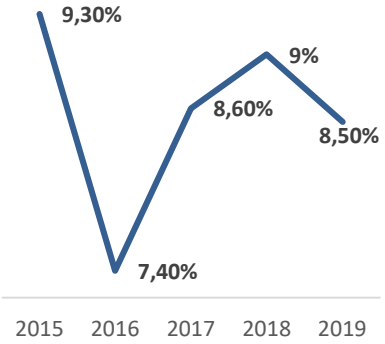
Source: Company Data

Figure 10: Mission Systems Operating Earnings



Source: Company Data

Figure 11: Marine Systems Operating Margins



Source: Company Data

areas with poor port access. NASSCO is also the exclusive builder of the John Lewis-class, a five ship contract of the new class of Navy's replenishment oilers. NASSCO also builds ships for commercial customers and is the only major Jones Act shipyard on the West Coast of the U.S..

Company Strategies

- **Acquisition of strategic businesses.** In the 1990s GD went through a major restructuration of its portfolio of products and services, and one of the main strategies adopted to reinvent the corporation was the acquisition of several strategic companies throughout the years. Since 1995, GD acquired 24 companies from all around the globe. With such acquisitions GD was able to increase its customer base, expand its operations to new markets as well as reinforce its presence in already existing ones. The $9,7 billion acquisition of CSRA, GD's biggest acquisition to date, is the latest example of the implementation of this strategy. This acquisition allowed GD, through its Information Technology business segment, to become the primary contractor of IT services for the government. Many other deals throughout the years laid the foundation for the profitability of the company nowadays.
- **R&D and Capital Expenditures to expand operations and portfolio**. Over the last five years, GD expended more than $3 billion on capital expenditures to expand its operations and over $2,3 billion on research and development to develop new products. Capital expenditures have been increasing over the years to support the growth of, mainly, the Aerospace and Marine Systems segments. Both segments require expansions or significant renovations of facilities to be able to have new production lines to execute on backlog faster, or support clients in key business markets. GD's primary client is the U.S. government and different departments of the U.S. government. Many of this departments operate in a dynamic threat environment, meaning the needs and requirements of such clients evolve as time passes. Along with this comes the fact that GD needs to invest in research and development, to continuously develop new products and variants of already existing ones, to be able to meet their clients evolving requirements.

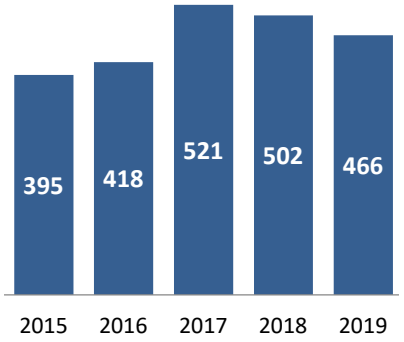
Shareholder Structure. The shareholder structure of General Dynamics has two main types of shareholders, the institutional investors and the individual investors, with 87,16% and 5,94% of the outstanding shares, respectively. The management team ownership accounts for 5,87% of outstanding shares and 2019YE free float reached 93,99%. GD is at 286,9M shares outstanding, however the board provided management with the authority to repurchase 10M shares of the company's outstanding shares in the open market. These shares trade on the New York Stock Exchange (NYSE).

Table 2: M&A Processes

M&A	Year
CSRA Inc.	2018
Bluefin Robotics	2016
Jet Aviation	2008
Gulfstream Aerospace	1999
NASSCO	1998
Bath Iron Works	1995

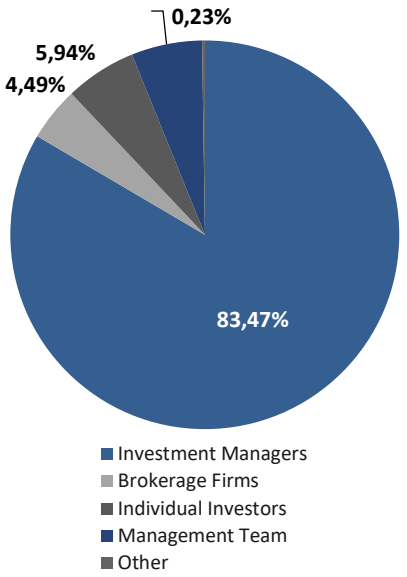
Source: Company Data

Figure 12: R&D Expenses



Source: Company Data (USD million)

Figure 13: Shareholder Structure by type



Source: Reuters

3. Management and Corporate Governance

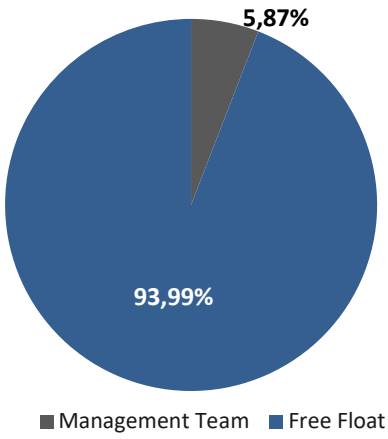
Ms. Phebe Novakovic has been with GD since 2002, having occupied several management positions within the company before being appointed as GD's CEO and Chairman of the Board in 2013. She graduated in Arts/Science from Smith College and holds an MBA from Wharton School of the University of Pennsylvania. Mr. Jason Aiken has been with GD also since 2002 and is currently GD's CFO as well as Senior Vice President of the group. He holds a degree in Business Administration and Accounting from Washington & Lee University and an MBA from Northwestern University.

Board Structure and Compensation Policy. GD's Board of Directors is composed of 12 members, of whom just the Chairman of the Board is an executive Director. The remaining 11 are independent members, meaning 92% is independent, above what accepted standard 66% as well as the peer average. The Compensation Committee, however, is entirely composed by independent members. The compensation policy differs between executive and non-executive BoD members. Non-executive members are paid an annual retainer and fees, and an equity stock award. Meanwhile, the only executive BoD member receives an annual fixed base salary and two variable compensation dependent on both the annual performance of the group and the long-term performance, which provides the management with a personal stake in the long-term success of the company. 2020 figures show base salary, annual incentive and long-term incentive to be, respectively, 9%, 20% and 71% of the total compensation.

Corporate Governance. GD follows the Anglo-US corporate governance model in which the shareholders elect the following directors annually:

- **Board of Directors:** 12 members whose main responsibility is advise, counsel and oversee the management of the company;
- **Audit Committee:** 7 independent members that oversees the management of the company, as well as selecting the statutory auditor;
- **Compensation Committee:** 5 independent members, whose role is to review and approve compensation;
- **Finance and Benefit Plans Committee:** 6 independent members responsible for overseeing the company's finance policies;
- **Nominating and Corporate Governance Committee:** 6 independent members that advise the Board on its appropriate size and composition, along with other corporate governance matters;
- **Statutory Auditor:** KPMG LLP audits the group's financial statements since 2002.

Figure 14: Shareholder Structure



Source: Reuters

Table 3: GD's Board Members

Name	Position
Phebe N. Novakovic	CEO and Chairman
James S. Crown	Lead Director
Rudy F. deLeon	Independent Director
Cecil D. Haney	Independent Director
Mark M. Malcolm	Independent Director
James N. Mattis	Independent Director
C. Howard Nye	Independent Director
William A. Osborn	Independent Director
Catherine B. Reynolds	Independent Director
Laura J. Schumacher	Independent Director
John G. Stratton	Independent Director
Peter A. Wall	Independent Director

Source: Company Data

Table 4: Governance Metrics

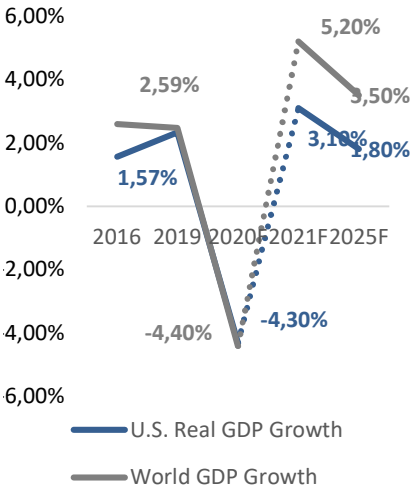
Metric	GD
Bloomberg ESG	22,3
% Independent Directors	92%
% Board Meeting Attendance	100%
% Women on Board	25%

Source: Bloomberg and Company Data

4. Industry Overview and Competitive Positioning

Economic Outlook. Times are uncertain and the global economic outlook is not favorable. In 2020, as a result of the global COVID-19 pandemic that shutdown most economies around the globe. The World GDP is projected at -4,9% in 2020. The US and Europe GDP growth is expected at –8% and -10,2%, respectively. China, on the other hand, is projected to grow at 1% in 2020. However, the projections point to a recovery in 2021. Overall, global growth is expected at 5,4%, a few percentage points lower than the pre-COVID-19 projections. China is projected to grow 8% in 2021. Europe and the US projections point to a GDP growth of 6% and 4,5%, respectively. The forecast, however, assumes that financial conditions will remain the same, meaning that any further lockdown or failure to control infection rates, will, most likely, affect this projections.

Figure 15: Real GDP Growth (%)



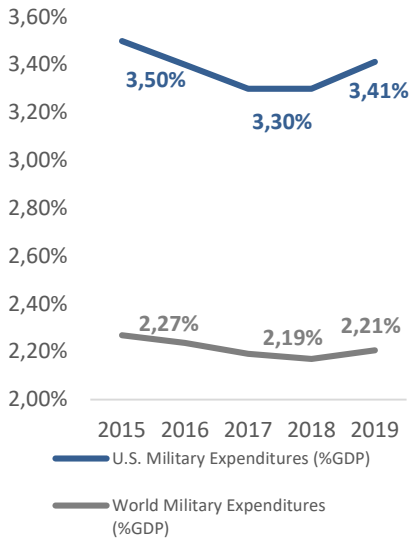
Source: IMF

A&D industry analysis. Covid-19 changed the entire outlook of the A&D industry, as it did for many other industries. Before the pandemic, demand for military equipment was rising due to military modernization. Global defense spending was expected to grow at 3% CAGR over the 2019-2023 period. Backlog of original equipment manufacturers (OEMs) was coming from record-breaking years. However, the COVID-19 pandemic severely affected this industry. Commercial air travel is down 90% from a year ago and it may take up to three years to return to pre-COVID-19 levels. OEMs received fewer orders and deliveries, and more cancelations and order deferrals as a result of the prolonged reduction of passenger demand. In 2020, commercial airlines have 960 new aircraft expected to be delivered, 40% less than originally planned. This number is expected to carry to the second half of the year, as airlines consider further cancelations or deferrals. However, airlines have now the opportunity to replace the older and less efficient aircrafts on their fleet with newer and more efficient models, which will slightly counteract the expected decrease in aircraft deliveries.

The defense sector was not significantly affected by the COVID-19 pandemic, at least not in the short-term. The US Department of Defense (DoD) declared the defense sector as a critical infrastructure sector, which allowed defense companies to remain operational. The major short-term impact of the pandemic in the defense sector was the market value decline of stocks as the US economy shut down. It lost 40% of its value in March, and it is still recovering.

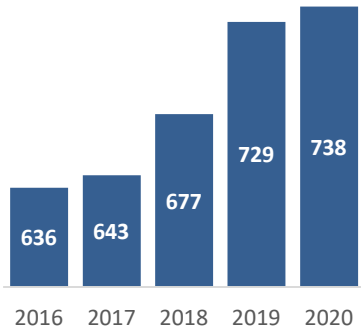
Supply chain disruptions are potential effects of the pandemic in both segments of this industry. OEMs reduction of the production rate might cause some cash-flow and liquidity issues to lower-tier suppliers. Also, disruptions might happen due to the travel restrictions and economic shutdowns. Companies that assess and ensure the availability of critical components in a timely manner, will be in a better position in the long-term. The US Government, as part of the 2$ trillion Coronavirus Aid Relief and Economic Security (CARES) Act, injected over 17$ billion in cash for the defense industry and over 80$ billion in loans for the broader aerospace industry. As well as increasing progress payments to 90% for large contractors and to 95% for small businesses.

Figure 16: Military Expenditures (%GDP)



Source: World Bank

Figure 17: U.S. Military Expenditures



Source: World Bank (USD billion)

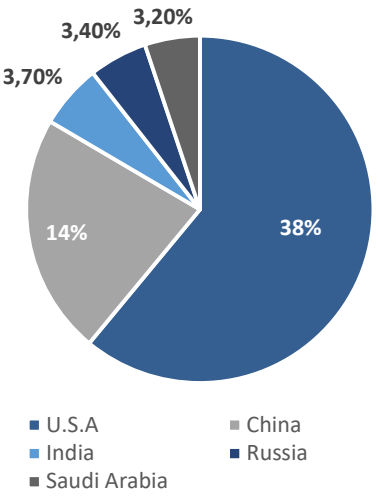
Key drivers of industry's demand. Governments defense spending is the main demand driver for the defense industry. Before COVID-19, global military spending was at its highest since the 2008 global crisis, following five years of straight growth. Military spending is mainly driven by the US, which represent 38% of global military spending. In 2019, military spending in the US increased to a total of $732 billion, a 5,3% growth from 2018. China and India, the second and third largest military spenders in the world also had its military expenditures rise in 2019, a 5,1% and 6,8%, respectively, increase when compared to 2018. Defense spending in Europe has been driven by a reported target of reaching a defense spending representative of 2% of GDP, a common target across all North Atlantic Treaty Organization (NATO) allies. In order to counteract the effects of the pandemic, many countries had to reallocate capital to reinforce health systems and to put in place disaster relief measures, which has put enormous pressure on the government's finances. This may shift the governments priorities and force cuts in other areas such as defense, one of the main ones.

Historically, two factors have had influence on military spending: threats and affordability. While the affordability factor might point to a reduction in such spending, the threat factor might say the contrary. COVID-19 ramped up tensions between the US and China, with the US accusing China of failing to control the pandemic, as well as espionage and human rights violations.

Whilst COVID-19 has put in question if governments can sustain such levels of military spending whilst dealing with all the current economic and social problems, it has also brought and reinforced some geopolitical tensions that might contradict the previous point.

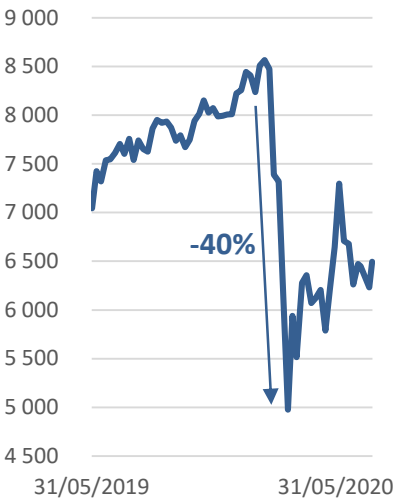
The US November 2020 general election results are unlikely to have a major impact on defense budgets prior to 2022, as budgets are already defined.

Figure 18: Largest Defense Spenders (% Total Defense Spending)



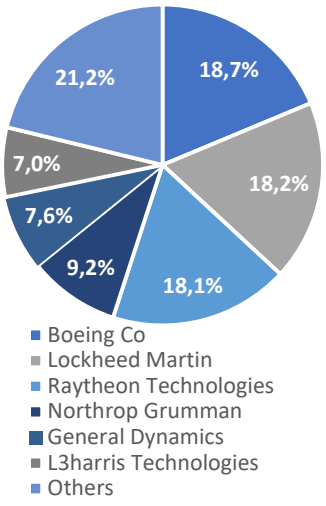
Source: World Bank

Figure 19: SPADE Defense Index



Source: Bloomberg

Figure 20: Market Share



Source: Gurufocus

GD Competitive Positioning.

Porter's Five Forces Analysis.

Threat of New Entrants (VERY LOW)

The threat of new players entering the market is insignificant. This industry is characterized by being capital intensive, due to high initial capital required, as well as the level of investment needed to sustain the business. New companies trying to enter the market don't have the proprietary technology the big players have and neither do they have an established track record that allows the larger companies to land the governmental contracts, on which the companies in this industry are so dependent on. All this factors make the barriers to entry the market significantly high.

Bargaining Power of Suppliers (HIGH)

One of the biggest challenges A&D companies face is the management of the supply chain. Whilst companies are trying to ramp up production, to execute on backlog, the supply chain doesn't have the capacity to keep up with such increase. Additionally, recent M&A activity within the industry enhanced the vertical integration in the supply chain, giving the larger

suppliers more bargaining power. Bearing that in mind, the bargaining power of suppliers is high.

Figure 21: Porter's Five Forces

Source: Author's analysis

Bargaining Power of Buyers (HIGH)

The level of bargaining power of the clients varies between the different segments in the company. The defense segments of the company are highly dependent on one major client, the U.S. government and its contracts, and, therefore, subject to the yearly government defense budget. This fact gives this one client a major bargaining power. However, in the Aerospace segments this is not the case. The segment does not depend on one client for the majority of its revenue, instead has many individual and corporate clients. Despite that and given the importance of the U.S. government as a client in the overall revenue of companies in this industry, the bargaining power of buyers is high.

Threat of Substitute Products (LOW)

Due to the high entry barriers, there are few competitors in the industry leaving few substitute products in the market. Additionally, the contracts celebrated in this industry take years to complete, which makes it hard for the clients to find substitute products.

Rivalry Among Competitors (HIGH)

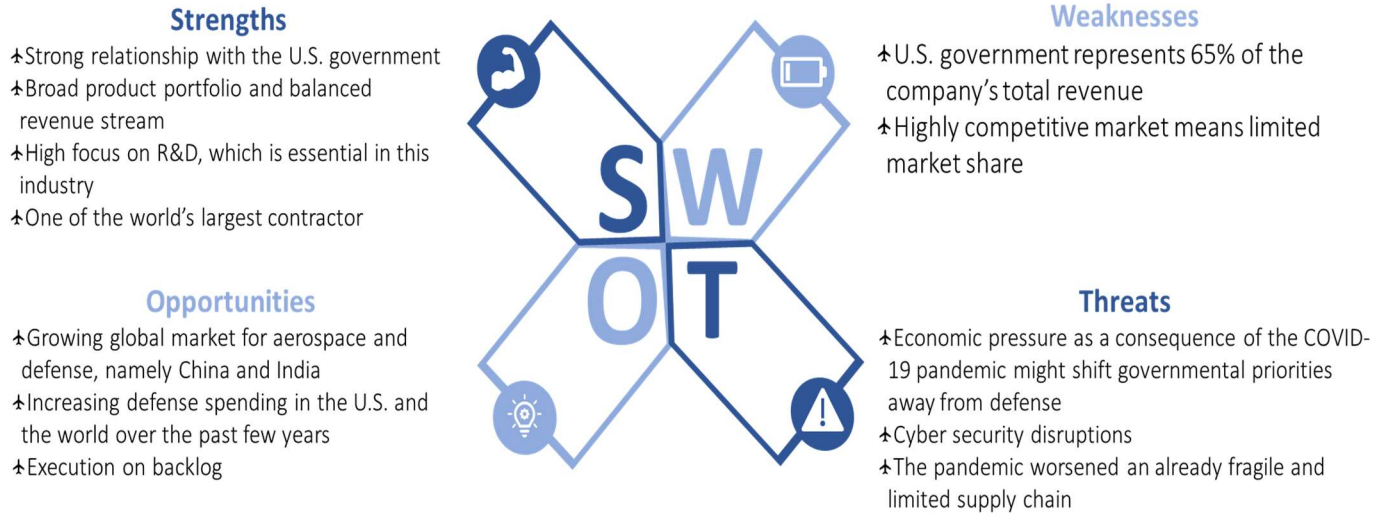
Competition among competitors is high in this industry, both in the aerospace segments and the defense segments. In the aerospace segment, there are a couple of big players fighting for market share by bringing the most technological advanced and most efficient aircraft to the market. Meanwhile, in the defense segments, the players are hugely dependent on their ability to land governmental contracts, which increases the competition between the players.

Figure 22: GD's Price Target

GD	g	
Enterprise Value (USD)	0,82%	57 470
Net Debt (USD)		-8 598
Equity Value (USD)		48 871
Number of shares Outstanding		289,61
Price Target (USD)		168,75

Source: Author's estimates

Figure 23: GD's SWOT Analysis



Source: Author's analysis

5. Investment Summary

We issue a **HOLD** recommendation on GD with a target price of $168,75/sh for 2021YE using a FCFF method with an upside potential of 12,3%, with medium-risk. The Adjusted Present Value (APV), Dividend Discount Model (DDM) and Relative valuation, support this HOLD recommendation, with price targets of $160,97/sh, $169,95/sh and $167,20/sh, respectively. We attribute this undervaluation, partially, to the drop in price in line with the entire global stock market in the beginning of 2020, as the world economies shut down. The aerospace and defense industry lost 40% of its value in March of 2020 and it still didn't completely recover.

Over the year of 2020, General Dynamics has suffered significant disruptions in terms of production and aircraft delivery schedule due to travel restrictions and consequent low aircraft demand, and supply chain issues, caused by the COVID-19 pandemic. As a result, GD's aerospace segment's half-year performance took a significant hit, both in revenues and profitability. In the third quarter of 2020, revenues and operating earnings were down 4% and 13,7%, respectively, from year-ago levels. Earnings per share (EPS) were down to $7,54, a 11,8% drop from year-ago results. The impact of coronavirus is still governing the globe and, despite an expected second half of the year better than the first half in terms of business aircraft traffic, the aerospace segment is still expected to end 2020 significantly below 2019 levels.

From a more positive point of view, the defense segments of General Dynamics have been performing at a similar pace to 2019. This is because the defense business is backed, to a large extent, by the U.S. government, which has allowed GD to keep a steady flow of orders from the Pentagon during 2020. During the third quarter of 2020, GD has secured and announced a number of multi-million dollar contracts for its defense business units that will be reflected in both revenues and backlog.

GD has maintained the same dividend policy for several years and 2020 is not an exception. For 2020YE, the company declared a quarterly dividend of $1,10/sh, a 7,84% increase over the $0,93 quarterly dividend registered in 2019. This increase in dividend represents the 23rd consecutive annual dividend increase authorized by the General Dynamics board, allowing us to conclude that GD will always pay dividends to its shareholders, even when it gets negative EPS (it happened in 2012).

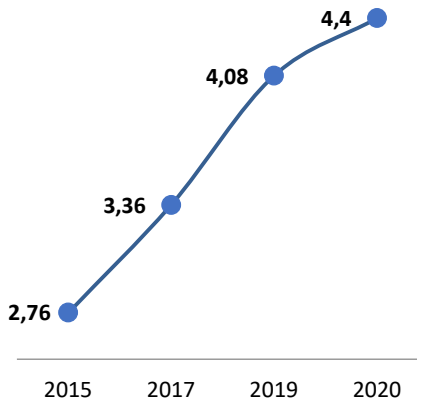
Valuation Methods. To reach GD's price target we used Free Cash Flow to the Firm (FCFF) as the main cash-flow proxy to estimate the enterprise value, achieving a target price of $183,08/sh. We also used the Adjusted Present Value (APV), Dividend Discount Model (DDM) and a Multiples approach as complementary methods to our analysis, which yielded target prices of $160,97/sh, $169,95/sh and $167,20/sh, respectively. All three approaches are in line with our recommendation.

Table 5: GD's WACC

DCF Analysis	2020F	Terminal
Cost of equity		
Risk-Free rate	0,75%	1,54%
Beta	1,140	1,140
Market Risk Premium	5,23%	5,23%
Cost of Equity	6,71%	7,50%
Cost of Debt	3,14%	3,14%
Effective Tax Rate	17%	17%
After-tax Cost of Debt	2,60%	2,60%
Weight of Debt	27,87%	20,75%
Weight of Equity	72,13%	79,25%
WACC	**5,57%**	**6,48%**

Source: Author's estimates

Figure 24: Annual Dividend per Share



Source: Company Data (USD)

Table 6: Relative Valuation Price Target

	P/B	EV/EBITDA
Enterprise Value (USD)	54 302	59 743
Equity value (USD)	45 703	51 145
No. Shares Outstanding	289,61M	289,61M
Price Target (USD)	157,8	176,60

Source: Author's estimates

6. Valuation

DCF Approach. GD's business is valued using Free Cash Flow to the Firm (FCFF) as the main cash-flow model to estimate the enterprise value of GD. We have then adjusted that value for net debt in order to arrive at a final Equity value, which yielded a price target of $168,75 per outstanding share for 2021YE. Representing a 12,3% upside potential against the current market price of $150,29/sh.

Revenues Forecast. To forecast revenues for the 2020YE to 2025YE period, it was necessary to decompose total revenues into Aerospace and Defense related sales. The aerospace revenues include only the Aerospace business unit, whilst Defense related revenues include the remaining four business units.

Sales from the Aerospace business segment consist mainly of aircraft manufacturing and completions, and aircraft services. The COVID-19 pandemic majorly impacted the business aviation as a whole. Business jet usage, in the peak of the pandemic, was 75-80% lower on a YoY basis compared to the 85-90% drop in airline flights. However, whilst airline flight activity was still down 45-50% from year-ago levels, business aviation traffic has recovered much faster, being only 20% below and triple what they were in the peak of the pandemic. Travel restrictions imposed in commercial aviation has increased activity in the charter industry, especially during the summer season, however charter activity it's still 12% below year-ago levels. We can expect a drop in new jet sales in 2020YE as the fact that business aviation has recovered faster than airline flights and increased charter activity haven't translated into jet sales for business aircraft manufacturers. From 2021YE onwards we expect to see an increase in new jet sales and increasing to 2025YE at a 4% CAGR, in line with worldwide economic recovery.

Regarding **aircraft services**, this drop in business aviation activity affects the overall revenues of flight related activities, including aircraft services. This downturn in the economy and, consequently, flight activity is expected to reduce the spending capabilities of companies towards aircraft maintenance, repair and overhaul (MRO) services. Still, North America currently dominates the MRO market with key market-dominating players building new facilities in the region to increase their presence. As such, aircraft services revenue is expected to drop in 2020YE, but grow at a 3% CAGR through 2025YE.

Defense revenues, contrary to aerospace revenues, have not been significantly affected by disruptions caused by the pandemic, mainly due to the nature of the clients of this segments. The majority of revenues in the defense segments come from the U.S. Government, and as a result the major driver of such revenues it's the governmental defense budget, which has already been set for both 2020YE and 2021YE. From 2022YE onwards, we took into consideration military expenditures in % of GDP (3,4%), during the current U.S. administration (2016-present). Yet, a shift in governmental priorities brought up by the pandemic or even a change in administration in the November 2020 election have been considered, so military expenditures decreased as a % of GDP, representing only 3,3% of GDP by 2025YE instead of the 3,4% registered in previous years. We kept the same market share of GD (% of military expenditures) as well as the same revenue distribution for the four defense business units in the forecasted period.

Table 7: DDM Price Target

DDM	g	g_t	
Dividends paid (USD)	7,80%	4%	1 374
Equity Value (USD)			49 220
No. of outstanding shares			289,61M
Price Target (USD)			169,95

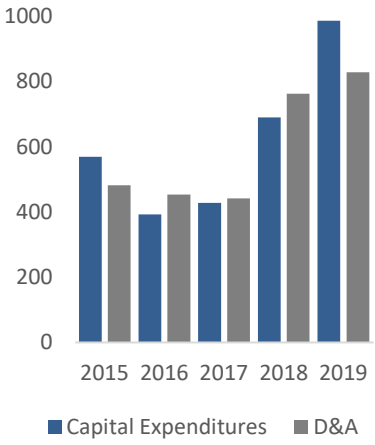
Source: Author's estimates

Table 8: APV Price Target

APV	
Enterprise Value (USD)	58 147
Adjustments (USD)	-8 598
Equity Value (USD)	49 549
PV (ITS) (USD)	-2 930
No. Shares Outstanding	289,61M
Price Target (USD)	160,97

Source: Author's estimates

Figure 25: CAPEX and D&A



Source: Company Data (USD million)

Debt. Both long and short-term debt is forecasted to decline through 2025YE. In 2018, GD issued a significant amount of debt, around $7 billion, to finance its acquisition of CSRA. In 2020, as a result of the pandemic and to finance its operations, GD issued an additional $4 billion in new deb. Therefore, we do not foresee any new issuance of debt over the coming years, as the company amortizes the recently issued $11 billion.

Capex and D&A. Based on historical values, GD's capital expenditures have increased over the years, especially in years of release of new aircraft models. In 2019, capital expenditures passed the $900 million mark, with the announcement of the newest G700 business aircraft. Therefore, we assumed capital expenditures to remain at the $900 million per year for the forecasted period. To estimate GD's D&A, it was assumed a depreciation rate of 4,7%, based on the historical average of the last 6 years.

WACC Assumptions. The Weighted Average Cost of Capital (WACC) method was used to discount the cash-flows. We reached a Cost of equity of 6,71% in the forecasted period, applying the Capital Asset Pricing Model (CAPM). As for the **Risk-Free Rate (RFR),** we used the United States 10-year treasury note yield as the benchmark for the RFR, assuming a yield of 0,75%. For the terminal period, however, we considered the United States 30-year treasury note yield of 1,54%, to account for an expected increase of interest rates. We, therefore, considered a different Cost of Equity for the terminal period, due to the difference in interest rates. The **Beta** is around 1.1 and is calculated trough a regression of the company's returns against the S&P500 returns. As for the **Market Risk Premium (MRP),** we have used the Aswath Damodaran calculations (7 July of 2020), which yielded an MRP of 5,23%.

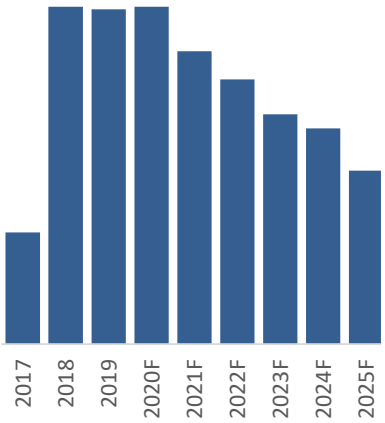
Cost of debt. The Cost of Debt is calculated considering all noted of debt the company has outstanding. Considering the different coupon rates and amount outstanding we calculated a weighted average rate of all the company's currently issued debt notes, reaching a value of 3,14%.

Thus, given a GD's market capital structure of around 20% D/EV, WACC will range from 5,57% in 2020F to 6,48% in Terminal Value.

Peers' Selection. The peer group consists of six companies, from an initial selection of eleven aerospace and defense companies. Companies with similar size, market capitalization, profit margin, as well as similar multiples. This peer group served as a benchmark to reach a price target for GD, through both P/B and EV/EBITDA multiples.

Relative Valuation. Relative valuation was used as a complementary methodology to the valuation. The peer group served as a benchmark to achieve a price target for GD through the EV/EBITDA and P/B multiples. The multiples P/Sales and P/E were not considered as those values would significantly influence the share price achieved through this approach.
EV/EBITDA and P/B yielded a price target of $157,4/sh and $176,51/sh, respectively, representing a 4,03% and 16,55% upside potential. Both multiples suggest that there is some room for the appreciation of the share price. Taking into consideration the two multiples, this approach yields an

Figure 26: Debt



Source: Company Data and Author's estimates

Table 9: Peers' Group

Peer Group
Honeywell International Inc
Raytheon Technologies Corp
Northrop Grumman Corp
Textron Inc
Huntington Ingalls Industries Inc
L3harris Technologies Inc

Source: Author's analysis

Table 10: Peers' Group Data

Peers	EBIT Margin	Mkt Cap (USD)
Honeywell	21,90%	100,5B
Raytheon	12,20%	77,2B
Northrop	11,70%	44,2B
Textron	7,90%	7,1B
Huntington	8,30%	5B
L3harris	9,61%	32B

Source: Reuters

average price target of $167,2/sh meaning a 10,3% upside potential, supporting the investment recommendation.

However, the FCFF method is considered to be a more accurate estimate of GD's value, as this peer group does not include some important players of this industry.

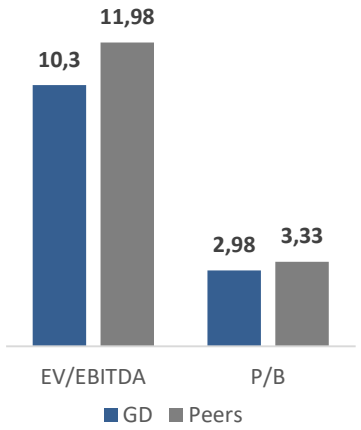
7. Financial Analysis

Cash generation. GD has been facing some adjustments in terms of liquidity and its ability to generate cash, which were caused by the $9,7 billion acquisition of CSRA in 2018. Whilst up until 2017 the company's cash ratio was around 0.2, this M&A process caused this ratio to be lower than 0.1, both in 2018 and in 2019. Despite a cash ratio of 0,21 in 2020F, which is a result of the new issuance of debt, GD's cash generation is expected to improve form a ratio of 0,05 in 2019 to 0,13 in 2025F. Current ratio, which was also impacted with the acquisition, is forecasted to climb from 1,18 in 2019 to 1,5 in 2025F and quick ratio following a similar trend, growing from 0,33 in 2019 to 0,5 in 2025F.

Profitability. GD, as most companies did, saw its operating costs and expenses increase significantly as a consequence of the pandemic which allied with the decline in revenues, impacted the overall profitability of the company. EBITDA margin to drop to 12,98% which represents a -94 bps decrease when compared to 2019, with Net Profit margin also declining from 8,9% in 2019 to 8,2% in 2020F. However, pressure on profit margins will be relieved as aircraft demand picks up in the following years and operating costs go back to pre-pandemic levels. Thus, EBITDA margin is forecasted to increase back up to 14% by 2025F. Both ROA and ROE project the same decline in profitability, with both showing a decline when compared to 2019. ROA is expected to increase to 7,7% in 2025F and ROE will stabilize at 18%-21% in the following years.

Coronavirus delayed solvency recovery. To acquire CSRA in 2018, GD issued almost $7 billion of debt and affected both the solvency of the company and its capital structure. Interest coverage ratio decreased from 40x in 2017YE to 12x in 2018YE and long and short-term debt ratio increased to 27% in 2018YE, from 11% registered in 2017YE. In 2019YE, the capital structure of the company showed signs of returning to levels registered prior to the acquisition. However, the pandemic delayed such recovery with GD issuing an additional $4 billion in debt, in 2020, to finance its operations. Meaning that Long and short-term Debt ratio is expected to increase to 29% in 2020F, compared to the 24,4% registered in 2019YE. This new issuance of debt affected the solvency capacity of the company as well, as Interest Coverage Ratio is expected to decrease from 10x in 2019YE to 7,5x in 2020F.
Despite that, GD's capital structure is expected to return to levels registered prior to 2018YE, with Long and short-term Debt Ratio reaching 15,3% of total assets in 2025F. As well as recovering some of its solvency capacity by the end of the forecasted period.

Figure 27: GD vs Peers Multiples



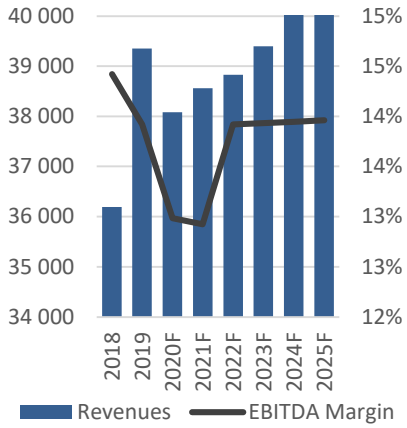
Source: Reuters

Table 11: Liquidity Ratios

	2019	2020F
Current Ratio	1,18	1,30
Quick Ratio	0,33	0,51
Cash Ratio	0,05	0,21

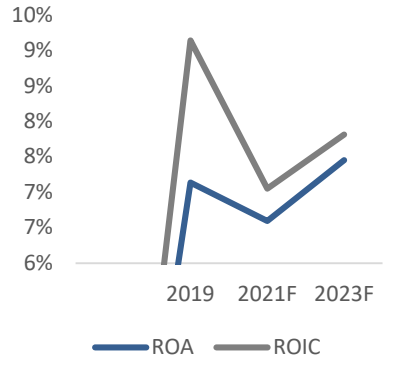
Source: Author's estimates

Figure 28: EBITDA Margin



Source: Author's estimates

Figure 29: ROA and ROIC



Source: Author's estimates

8. Investment Risks

Operational Risk | Dependence on one client (OPR 1)

The U.S. government, in 2019, represented 65% of General Dynamics consolidated revenue. Levels of U.S. defense spending are driven by both affordability and threats to national security. Coronavirus brought an enormous pressure to the economy and funds that were once destined for defense spending, might shift and go towards other more essential areas. Any decrease in the governmental defense spending or a shift in federal funds allocation can result in one or more programs being reduced, delayed or even terminated, which would impact GD's financial performance.

Operational Risk | Supply Chain Management (OPR2)

One of the fragile points of the aerospace & defense industry is the supply chain and risk factors driven by trade wars and the coronavirus outbreak have impacted an already fragile global supply chain. Companies operating in this industry are facing serious shortages and delays from Chinese suppliers. Most A&D suppliers are highly specialized and with unique expertise and cannot simply wind down or increase production to meet the OEM's demand. Despite the enormous impact this issue can have in the viability of the industry, this is not an intractable problems.

Economic and Political Risk | World GDP Growth (EPR 1)

One of the key drivers of the General Dynamics business the demand for business-aviation aircrafts and services. This is strongly influenced by the overall general economic conditions. The Aerospace segment performance also depend on the availability of credit, pricing pressures and market trends. Thus, an economic downturn can and has negatively affected GD's financial results and future performance. The impact that the COVID-19 pandemic had on revenues from the aerospace segment is proof of how much an economic downturn affects the demand of aircraft and the overall business.

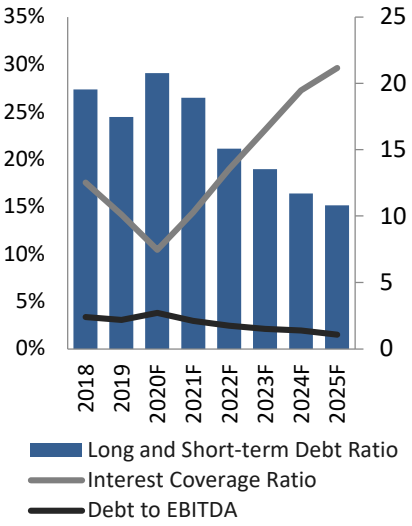
External Risk | Cyber Security (EXT 1)

General Dynamics face various cybersecurity threats to internal systems as well as customer systems. This includes threats to GD's information technology (IT) infrastructure and attempts to gain access to proprietary information, threats to the physical security of its facilities and employees. In addition, they face threats that target the IT systems of their clients, or even threats that target GD through customers. Cybersecurity threats such as viruses and attacks target the IT systems are common but haven't had any material impact on the overall financial condition. However, this type of events can have an impact in terms of financial results but also the company's reputation and eligibility for future contracts on classified governmental contracts.

Regulatory Risk | Reputational Risk (REG 1)

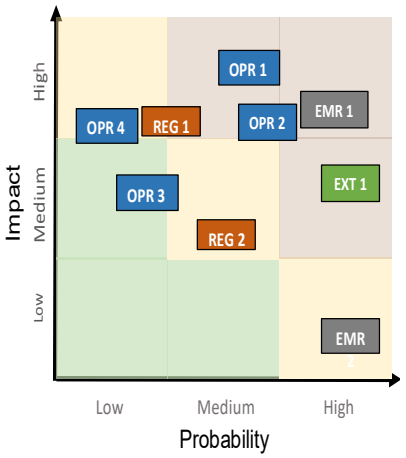
Incidents like cybersecurity breaches or the inability to perform on key contracts can damage GD's reputation. Maintaining an intact reputation makes a difference in an industry where companies are so dependent on governmental contracts, which involve classified information. Any

Figure 30: Debt Ratio and Interest Coverage Ratio



Source: Author's estimates

Figure 31: Risk Matrix



Source: Author's analysis

reputation damages can impact the ability to land future contracts and, consequently, the company's future financial position.

Other relevant risks are detailed in Appendix 13.

Risks to Price Target. To measure the impact of key variables on GD's price target we computed a sensitivity analysis. We computed two different tests. In the first one we tested the impact of a change in the terminal growth rate (g) as well as a change in WACC. A minor change in both variables can alter our investment recommendation. Thus, we can conclude that, as expected, GD's price target is extremely sensitive to its terminal value.

Table 12: Recommendation System

Level of Risk	Medium Risk	
	From	To
Sell	-	142,78
Reduce	142,78	157,8
Hold	157,8	172,83
Buy	172,83	195,38
Strong Buy	195,38	-

Source: Author's estimates (USD)

Table 13: Sensitivity Analysis for the Terminal Growth Rate and WACC

		g						
WACC	$ 168,75	0,34%	0,47%	0,60%	0,73%	0,86%	0,99%	1,12%
	4,98%	217,0273	223,246	229,833	236,823	244,255	252,171	260,62
	5,48%	192,5997	197,558	202,78	208,288	214,106	220,261	226,783
	5,98%	172,6149	176,646	180,873	185,308	189,969	194,873	200,039
	6,48%	155,9843	159,316	162,795	166,432	170,236	174,221	178,399
	6,98%	141,947	144,738	147,644	150,67	153,824	157,116	160,554
	7,48%	129,9557	132,322	134,778	137,328	139,978	142,735	145,604
	7,98%	119,6061	121,632	123,73	125,903	128,155	130,491	132,915

Source: Author's estimates

In the second sensitivity analysis we studied the impact of a variation in the Risk-Free rate against the variation of the Market Risk Premium. We concluded that the valuation model is not as sensitive as it was for a change in the terminal value (previous test). However, a combined variation of both variables can change our investment recommendation.

Table 14: Sensitivity Analysis to the RFR and MRP

		Risk-Free Rate						
MRP	$ 168,75	0,90%	1,10%	1,30%	1,54%	1,70%	1,90%	2,10%
	4,63%	214,98	206,76	199,07	190,49	185,13	178,78	172,81
	4,83%	205,47	197,86	190,73	182,75	177,75	171,83	166,24
	5,03%	196,65	189,59	182,95	175,52	170,85	165,31	160,07
	5,23%	196,65	189,59	182,95	175,52	170,85	165,31	160,07
	5,43%	180,82	174,69	168,91	162,40	158,30	153,43	148,81
	5,63%	173,68	167,95	162,54	156,44	152,59	148,00	143,65
	5,83%	167,00	161,64	156,56	150,83	147,21	142,88	138,77

Source: Author's estimates

Appendices

Appendix 1: Statement of Financial Position

Balance Sheet								
in million $	2018	2019	2020F	2021F	2022F	2023F	2024F	2025F
Assets								
Current assets:								
Cash and equivalents	$963	$902	$3 515	$1 832	$1 928	$1 779	$2 430	$2 040
Accounts receivable	$3 759	$3 544	$4 069	$4 120	$4 148	$4 210	$4 282	$4 351
Unbilled receivables	$6 576	$7 857	$7 715	$7 715	$7 715	$7 715	$7 715	$7 715
Inventories	$5 977	$6 306	$5 648	$5 914	$6 146	$6 369	$6 590	$6 814
Other current assets	$914	$1 171	$939	$939	$939	$939	$939	$939
Total currents assets	$18 189	$19 780	$21 886	$20 520	$20 877	$21 012	$21 956	$21 858
Noncurrent assets:								
PP&E	$3 978	$4 475	$4 638	$4 769	$4 870	$4 940	$4 979	$4 988
Intangible assets, net	$2 585	$2 315	$2 051	$1 977	$1 859	$1 800	$1 695	$1 648
Goodwill	$19 594	$19 677	$19 718	$19 718	$19 718	$19 718	$19 718	$19 718
Other assets	$1 062	$2 594	$2 451	$2 451	$2 451	$2 451	$2 451	$2 451
Total noncurrent assets	$27 219	$29 061	$28 858	$28 915	$28 898	$28 909	$28 843	$28 805
Total assets	$45 408	$48 841	$50 744	$49 435	$49 775	$49 921	$50 799	$50 663
Liabilities and Shareholders' Equity								
Current liabilities:								
Short-term debt and current portion of long term debt	$973	$2 920	$3 420	$1 420	$1 670	$920	$1 920	$920
Accounts payble	$3 179	$3 162	$3 290	$3 332	$3 315	$3 363	$3 421	$3 476
Customer advances and deposits	$7 270	$7 148	$6 212	$6 212	$6 212	$6 212	$6 212	$6 212
Other current liabilities	$3 317	$3 571	$3 890	$3 890	$3 890	$3 890	$3 890	$3 890
Total current liabilities	$14 739	$16 801	$16 812	$14 854	$15 087	$14 385	$15 443	$14 498
Noncurrent liabilities:								
Long-term debt	$11 444	$9 010	$10 010	$9 010	$7 760	$7 260	$5 760	$5 260
Other liabilities	$7 493	$9 453	$9 256	$9 256	$9 256	$9 256	$9 256	$9 256
Total noncurrent liabilities	$18 937	$18 463	$19 266	$18 266	$17 016	$16 516	$15 016	$14 516
Total Liabilities	$33 676	$35 264	$36 078	$33 120	$32 103	$30 901	$30 459	$29 014
Shareholders' equity:								
Common Stock	$482	$482	$482	$482	$482	$482	$482	$482
Surplus	$2 946	$3 039	$3 050	$3 050	$3 050	$3 050	$3 050	$3 050
Retained earnings	$29 326	$31 633	$33 618	$36 268	$38 625	$40 973	$43 293	$45 602
Treasury stock	(17 244)	(17 358)	(18 358)	(19 358)	(20 358)	(21 358)	(22 358)	(23 358)
Accumulated other comprehensive loss	(3 778)	(4 219)	(4 127)	(4 127)	(4 127)	(4 127)	(4 127)	(4 127)
Total shareholders' equity	$11 732	$13 577	$14 665	$16 315	$17 672	$19 020	$20 340	$21 649
Total liabilities and shareholders' equity	$45 408	$48 841	$50 744	$49 435	$49 775	$49 921	$50 799	$50 663

Appendix 2: Income Statement

in million $	2018	2019	2020F	2021F	2022F	2023F	2024F	2025F
Revenue	$ 36 193	$ 39 350	$ 38 078	$ 38 560	$ 38 826	$ 39 398	$ 40 072	$ 40 721
Aerospace	8 455	9 801	8 558	8 960	9 313	9 650	9 985	10 324
Combat Systems	6 241	7 007	6 821	6 840	6 819	6 874	6 952	7 024
Information Technology	8 269	8 422	8 607	8 630	8 605	8 673	8 772	8 863
Mission Systems	4 726	4 937	4 981	4 994	4 980	5 019	5 076	5 129
Marine Systems	8 502	9 183	9 111	9 136	9 109	9 181	9 286	9 382
Cost of Sales	(29 478)	(32 291)	(31 605)	(32 005)	(31 837)	(32 306)	(32 859)	(33 392)
General and administrative expenses	(2 258)	(2 411)	(2 285)	(2 314)	(2 330)	(2 364)	(2 404)	(2 443)
Operating earnings	4 457	4 648	4 189	4 242	4 659	4 728	4 809	4 887
Interest, net	(356)	(460)	(408)	(314)	(282)	(243)	(227)	(180)
Other, net	(16)	14	4	4	4	4	4	4
Earnings before income tax	4 085	4 202	3 785	3 932	4 381	4 489	4 585	4 710
Provision for income tax, net	(727)	(718)	(647)	(672)	(749)	(768)	(784)	(805)
Discontinued operations, net of tax	(13)	0	0	0	0	0	0	0
Net earnings	3 345	3 484	3 137	3 260	3 632	3 721	3 801	3 905

Appendix 3: Cash Flow Statement

in million $	2018	2019	2020F	2021F	2022F	2023F	2024F	2025F
Cash flows from operating activities:								
Net earnings	3 345	3 484	3 137	3 260	3 632	3 721	3 801	3 905
Depreciation of property, plant and equipment	436	466	492	522	553	584	615	646
Amortization of intangible assets	327	363	264	220	192	177	164	152
Equity based compensation expense	140	133	-	-	-	-	-	-
Deferred income tax (benefit) provision	(3)	92	-	-	-	-	-	-
Discontinued operations, net of tax	13	-	-	-	-	-	-	-
Other, net	(1 110)	(1 557)	394	588	100	115	191	162
Net cash used by operating activities	3 148	2 981	4 288	4 590	4 477	4 598	4 772	4 865
Cash flows from investing activities:								
Business acquisitions, net of cash acquired	(10 099)	-	-	-	-	-	-	-
Capital expenditures	(690)	(987)	(900)	(900)	(900)	(900)	(900)	(900)
Proceeds from the sale of assets	562	-	-	-	-	-	-	-
Other, net	(7)	(7)	-	-	-	-	-	-
Net cash used by investing activities	(10 234)	(994)	(900)	(900)	(900)	(900)	(900)	(900)
Cash flows from financing activities:								
Proceeds from fixed-rate notes	6 461	-	4 000	-	-	-	-	-
Repayment of fixed-rate notes	-	-	(2 000)	(2 500)	(1 000)	(1 250)	(500)	(1 500)
Purchases of common stock	(1 769)	(231)	(1 000)	(1 000)	(1 000)	(1 000)	(1 000)	(1 000)
Dividends paid	(1 075)	(1 152)	(1 274)	(1 374)	(1 481)	(1 596)	(1 721)	(1 855)
Proceeds from floating-rate notes	1 000	-	-	-	-	-	-	-
Repayment of floating-rate notes	-	-	(500)	(500)	-	-	-	-
Repayments of commercial paper, net	850	(850)	-	-	-	-	-	-
Repayment of CSRA accounts receivable purchase agreement	(450)	0	-	-	-	-	-	-
Other, net	69	236	-	-	-	-	-	-
Net cash used by financing activities	5 086	(1 997)	(774)	(5 374)	(3 481)	(3 846)	(3 221)	(4 355)
Net cash used by discontinued operations	(20)	(51)	-	-	-	-	-	-
Net increase/decrease in cash and equivalents	(2 020)	(61)	2 613	(1 684)	96	(149)	651	(390)
Cash and equivalents at beginning of year	2 983	963	902	3 515	1 832	1 928	1 779	2 430
Cash and equivalents at end of year	963	902	3 515	1 832	1 928	1 779	2 430	2 040

Appendix 4: Key Financial Ratios

Key Financial Ratios		2018	2019	2020F	2021F	2022F	2023F	2024F	2025F
Liquidity Ratios									
Current Ratio	times	1,23	1,18	1,30	1,38	1,38	1,46	1,42	1,51
Quick Ratio	times	0,38	0,33	0,51	0,46	0,46	0,48	0,50	0,51
Cash Ratio	times	0,07	0,05	0,21	0,12	0,13	0,12	0,16	0,14
Efficiency Ratios									
Total Assets Turnover	times	0,90	0,84	0,76	0,77	0,77	0,79	0,80	0,81
Accounts Receivables Turnover	times	9,81	10,78	10,00	10,10	9,45	9,46	9,51	9,51
Collection Period	days	37,19	33,87	36,49	36,14	38,62	38,59	38,39	38,37
Inventory Turnover	times	5,23	5,26	5,29	5,09	5,40	5,26	5,16	5,07
Days in Inventory	days	69,84	69,42	69,03	71,73	67,61	69,39	70,74	72,05
Payables Turnover	times	9,23	10,18	9,80	11,20	9,64	9,65	9,76	9,76
Payables Period	days	39,54	35,84	37,26	32,59	37,86	37,82	37,41	37,38
Operating Cycle	days	107,03	103,29	105,52	107,87	106,24	107,97	109,13	110,42
Cash Cycle	days	67,49	67,45	68,26	75,28	68,37	70,15	71,72	73,03
Profitability Ratios									
EBITDA Margin	%	14,42%	13,92%	12,98%	12,93%	13,92%	13,93%	13,94%	13,96%
EBIT Margin	%	12,31%	11,81%	11,00%	11,00%	12,00%	12,00%	12,00%	12,00%
Net Profit Margin	%	9,24%	8,85%	8,24%	8,45%	9,35%	9,44%	9,49%	9,59%
ROA	%	7,37%	7,13%	6,18%	6,59%	7,30%	7,45%	7,48%	7,71%
ROCE	%	14,53%	14,51%	12,34%	12,27%	13,43%	13,30%	13,60%	13,51%
ROE	%	28,51%	25,66%	21,39%	19,98%	20,55%	19,56%	18,69%	18,04%
ROIC	%	9,40%	9,14%	6,63%	7,05%	7,94%	7,81%	7,42%	7,37%
EPS	USD	11,55	12,03	10,83	11,25	12,54	12,85	13,13	13,48
Solvency Ratios									
Long and short-term Debt Ratio	%	27,35%	24,43%	29,05%	26,47%	21,10%	18,95%	16,39%	15,12%
Long-term Debt Ratio	%	25,20%	18,45%	20,85%	19,73%	18,23%	15,59%	14,54%	11,34%
Debt to Equity	%	105,84%	87,87%	91,58%	63,93%	53,36%	43,01%	37,76%	28,55%
Equity Multiplier	times	3,87	3,60	3,62	3,46	3,03	2,82	2,62	2,50
Debt to EBITDA	times	2,38	2,18	2,72	2,09	1,74	1,49	1,37	1,09
Interest Coverage Ratio	times	12,52	10,10	7,46	10,27	13,52	16,51	19,45	21,15

Appendix 5: Common-Size Statement of Financial Position

Balance Sheet (Common Size)	2018	2019	2020F	2021F	2022F	2023F	2024F	2025F
Assets								
Current assets:								
Cash and equivalents	2,12%	1,85%	6,93%	3,71%	3,87%	3,56%	4,78%	4,03%
Accounts receivable	8,28%	7,26%	8,02%	8,33%	8,33%	8,43%	8,43%	8,59%
Unbilled receivables	14,48%	16,09%	15,20%	15,61%	15,50%	15,45%	15,19%	15,23%
Inventories	13,16%	12,91%	11,13%	11,96%	12,35%	12,76%	12,97%	13,45%
Other current assets	2,01%	2,40%	1,85%	1,90%	1,89%	1,88%	1,85%	1,85%
Total currents assets	40,06%	40,50%	43,13%	41,51%	41,94%	42,09%	43,22%	43,14%
Noncurrent assets:								
PP&E	8,76%	9,16%	9,14%	9,65%	9,78%	9,90%	9,80%	9,84%
Intangible assets, net	5,69%	4,74%	4,04%	4,00%	3,73%	3,61%	3,34%	3,25%
Goodwill	43,15%	40,29%	38,86%	39,89%	39,61%	39,50%	38,82%	38,92%
Other assets	2,34%	5,31%	4,83%	4,96%	4,92%	4,91%	4,82%	4,84%
Total noncurrent assets	59,94%	59,50%	56,87%	58,49%	58,06%	57,91%	56,78%	56,86%
Total assets	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%
Liabilities and Shareholders' Equity								
Current liabilities:								
Short-term debt and current portion of long term debt	2,14%	5,98%	6,74%	2,87%	3,36%	1,84%	3,78%	1,82%
Accounts payble	7,00%	6,47%	6,48%	6,74%	6,66%	6,74%	6,73%	6,86%
Customer advances and deposits	16,01%	14,64%	12,24%	12,57%	12,48%	12,44%	12,23%	12,26%
Other current liabilities	7,30%	7,31%	7,67%	7,87%	7,82%	7,79%	7,66%	7,68%
Total current liabilities	32,46%	34,40%	33,13%	30,05%	30,31%	28,82%	30,40%	28,62%
Noncurrent liabilities:								
Long-term debt	25,20%	18,45%	19,73%	18,23%	15,59%	14,54%	11,34%	10,38%
Other liabilities	16,50%	19,35%	18,24%	18,72%	18,60%	18,54%	18,22%	18,27%
Total noncurrent liabilities	41,70%	37,80%	37,97%	36,95%	34,19%	33,08%	29,56%	28,65%
Total Liabilities	74,16%	72,20%	71,10%	67,00%	64,50%	61,90%	59,96%	57,27%
Shareholders' equity:								
Common Stock	1,06%	0,99%	0,95%	0,98%	0,97%	0,97%	0,95%	0,95%
Surplus	6,49%	6,22%	6,01%	6,17%	6,13%	6,11%	6,00%	6,02%
Retained earnings	64,58%	64,77%	66,25%	73,36%	77,60%	82,07%	85,22%	90,01%
Treasury stock	-37,98%	-35,54%	-36,18%	-39,16%	-40,90%	-42,78%	-44,01%	-46,10%
Accumulated othe comprehensive loss	-8,32%	-8,64%	-8,13%	-8,35%	-8,29%	-8,27%	-8,12%	-8,15%
Total shareholders' equity	25,84%	27,80%	28,90%	33,00%	35,50%	38,10%	40,04%	42,73%
Total liabilities and shareholders' equity	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%

Appendix 6: Common-Size Income Statement

Common-Size Income Statement	2018	2019	2020F	2021F	2022F	2023F	2024F	2025F
Revenue	100%	100%	100%	100%	100%	100%	100%	100%
Aerospace	23%	25%	22%	23%	24%	24%	25%	25%
Combat Systems	17%	18%	18%	18%	18%	17%	17%	17%
Information Technology	23%	21%	23%	22%	22%	22%	22%	22%
Mission Systems	13%	13%	13%	13%	13%	13%	13%	13%
Marine Systems	23%	23%	24%	24%	23%	23%	23%	23%
Cost of Sales	-81%	-82%	-83%	-83%	-82%	-82%	-82%	-82%
General and administrative expense:	-6%	-6%	-6%	-6%	-6%	-6%	-6%	-6%
Operating earnings	12%	12%	11%	11%	12%	12%	12%	12%
Interest, net	-1%	-1%	-1%	-1%	-1%	-1%	-1%	0%
Other, net	0%	0%	0%	0%	0%	0%	0%	0%
Earnings before income tax	11%	11%	10%	10%	11%	11%	11%	12%
Provision for income tax, net	-2%	-2%	-2%	-2%	-2%	-2%	-2%	-2%
Discontinued operations, net of tax	0%	0%	0%	0%	0%	0%	0%	0%
Net earnings	9%	9%	8%	8%	9%	9%	9%	10%

Appendix 7: Income Statement Forecasting Assumptions

Income Statement	Notes	2020F	2021F	2022F	2023F	2024F	2025F	Assumption
Revenue								According to Revenues Forecast.
Cost of Sales	% Rev	83,00%	83,00%	82,00%	82,00%	82,00%	82,00%	For 2020F and 2021F, assumed a 1%
General and administrative expense:	% Rev	6,00%	6,00%	6,00%	6,00%	6,00%	6,00%	Assuming the same %Sales as of 2019.
Interest, net		3,14%	3,14%	3,14%	3,14%	3,14%	3,14%	GD's cost of debt.
Other, net	% Rev	0,01%	0,01%	0,01%	0,01%	0,01%	0,01%	Equal to the 2019YE %Rev.
Provision for income tax, net		17,1%	17,1%	17,1%	17,1%	17,1%	17,1%	Assuming the same effective income tax rate as in 2019.
Discontinued operations, net of tax		0%	0%	0%	0%	0%	0%	Equal to the 2020 HY nominal value.
Effective Tax Rate		17,10%	17,10%	17,10%	17,10%	17,10%	17,10%	
Statutory Tax Rate		21%	21%	21%	21%	21%	21%	

Appendix 8: Statement of Financial Position Forecasting Assumptions

Balance Sheet	Notes	2020F	2021F	2022F	2023F	2024F	2025F	Assumption
Current assets								
Accounts Receivables	days	39	39	39	39	39	39	Assuming a constant Days Receivable
Unbilled Receivables		0%	0%	0%	0%	0%	0%	Equal to the 2020 HY nominal value.
Inventories	% Aerospace Rev	66%	66%	66%	66%	66%	66%	According to information provided by the company, the majority of inventories are for business-jet aircraft.
Other current assets		0%	0%	0%	0%	0%	0%	Equal to the 2020HY nominal value.
Non-current assets								
PP&E		65%	65%	65%	65%	65%	65%	PP&Et=PP&Et-1-DEPt+PP&ECAPEXt. 65,4% of
Intangible assets, net		0%	0%	0%	0%	0%	0%	INTt=INTt-1-AMORTt.
Goodwill		0%	0%	0%	0%	0%	0%	Goodwill is reviewed for impairment annually and therefore assumed constant over the period.
Other assets		0%	0%	0%	0%	0%	0%	Equal to the 2020HY nominal value.
Current liabilities								
Short-term debt and current portion of long term debt		0%	0%	0%	0%	0%	0%	Assuming no new issuance of debt. Therefore short-term debt represents only the current portion of long-term debt.
Accounts payable	days	38	38	38	38	38	38	Assuming a constant DPO, bases on the historical average over the 2015-19 period.
Customer advances and deposits		0%	0%	0%	0%	0%	0%	Equal to the 2020 HY nominal value.
Other current liabilities		0%	0%	0%	0%	0%	0%	Equal to the 2020 HY nominal value.
Non-current liabilities								
Long-term debt		0%	0%	0%	0%	0%	0%	After 2020F, we assume there is no new issuance of debt.
Other liabilities		0%	0%	0%	0%	0%	0%	Equal to the 2020 HY nominal value.
Equity								
Common stock		0%	0%	0%	0%	0%	0%	No share issue is expected.
Surplus		0%	0%	0%	0%	0%	0%	Equal to the 2020 HY nominal value.
Retained earnings		0%	0%	0%	0%	0%	0%	RE t=RE t-1 +NI t -DIV
Treasury stock		0%	0%	0%	0%	0%	0%	Equal to the 2020 HY nominal value.
Accumulated othe comprehensive loss		0%	0%	0%	0%	0%	0%	Equal to the 2020 HY nominal value.

Appendix 9: Business and Corporate Structure

Corporate Leadership	
Name	**Position**
Phebe N. Novakovic	Chief Executive Officer and Chairman of the BoD
Jason W. Aiken	Chief Financial Officer, Senior Vice President
Gregory S. Gallopoulos	General Counsel and Secretary, Senior Vice President
Kimberly A. Kuryea	Human Resources and Administration, Senior Vice President
Thomas W. Kirchmaier	Planning, Communications and Trade Compliance, Senior Vice President
David H. Fogg	Treasurer, Vice President
Kenneth R. Hayduk	Tax, Vice President
William A. Moss	Controller, Vice President
Howard A. Rubel	Investor Relations, Vice President
Elizabeth L. Schmid	Government Relations, Vice President

Business Leadership	
Name	**Position**
Mark L. Burns	President Gulfstream, Vice President
David Paddock	President Jet Aviation, Vice President
Ira P. Berman	Senior Vice President Administration and General Counsel Gulfstream, Vice President
Daniel G. Clare	Chief Financial Officer Gulfstream, Vice President
Mark C. Roualet	Executive Vice President, Combat Systems
Gary L. Whited	President Land Systems, Vice President
Firat H. Gezen	President Ordnance and Tactical Systems, Vice President
Alfonso J. Ramonet	President European Land Systems, Vice President
Christopher Marzilli	Executive Vice President, Information Technology and Mission Systems
M. Amy Gilliland	President Information Technology, Senior Vice President
Christopher Brady	President Mission Systems, Vice President
Robert E. Smith	Executive Vice President, Marine Systems
Kevin M. Graney	President Electric Boat, Vice President
David J. Carver	President NASSCO, Vice President
Dirk A. Lesko	President Bath Iron Works, Vice President

Appendix 10: BoD Remuneration

- **Non-management Directors compensation:** GD compensates each non-management director for service on the BoD. This compensation is reviewed annually by the Compensation Committee. This directors' pay program is approximate to the median of the peer group, as a result, the BoD approved for 2020, an increase of $10,000 for the annual retainer and an increase of $10,000 for the annual equity award. Each non-management director has the option of receiving all or part of the annual retainer in the form of Common Stock.

Compensation Element	Amount
Annual Retainer	$85,000
Lead Director Retainer	$25,000
Committee Chair Annual Retainer	$10,000
Attendance Fees	$3,000 for each meeting of the Board of Directors; $2,000 for each meeting of any committee; and $3,000 per day for attending strategic or financial planning meetings sponsored by General Dynamics
Annual Equity Award	Approximately $150,000 on the date of award
Per Diem Fee for Non-Employee Directors Performing Specific Projects for the Company	$10,000

Name	Fees Earned or Paid in Cash[a]	Stock Awards[b]	Option Awards[c]	All Other Compensation[d]	Total
James S. Crown	$186,000	$74,586	$75,162	$2,140	$337,888
Rudy F. deLeon	$155,000	$74,586	$75,162	$2,140	$306,888
Cecil D. Haney[e]	$114,111	$74,586	$75,162	$2,504	$266,363
Lester L. Lyles	$151,000	$74,586	$75,162	$4,080	$304,828
Mark M. Malcolm	$153,000	$74,586	$75,162	$2,140	$304,888
James N. Mattis[e]	$ 61,489	$31,184	$31,135	$3,650	$127,458
C. Howard Nye	$135,000	$74,586	$75,162	$2,140	$286,888
William A. Osborn	$161,000	$74,586	$75,162	$4,180	$314,928
Catherine B. Reynolds	$163,000	$74,586	$75,162	$2,140	$314,888
Laura J. Schumacher	$135,000	$74,586	$75,162	$2,140	$286,888
Peter A. Wall	$163,000	$74,586	$75,162	$2,140	$314,888

- **Executive compensation.** Executive compensation has 4 components:
  - **Annual Base Salary:** Fixed compensation level.
  - **Annual Incentive Compensation:** directly linked to financial metrics of earnings from continuing operations (35%), free cash flow (35%) and operational performance (30%).
  - **Long-Term Incentive Compensation:**
    - Performance Stock Units (PSUs): connected to company's financial performance and shareholder return;
    - Stock Options: connects the executives to the company's share price performance, aligning the executive team with shareholders for the long-term;
    - Restricted Stock: connects the executive with total shareholder return performance.
  - **Benefits and Perquisites: retirement, health and welfare.**

Name and Principal Position	Year	Salary	Stock Awards[a]	Option Awards[a]	Non-Equity Incentive Plan Compensation[b]	Change in Pension Value and Nonqualified Deferred Compensation Earnings[c]	All Other Compensation[d]	Total
Phebe N. Novakovic Chairman and Chief Executive Officer	2019	$1,585,000	$8,630,680	$3,746,192	$3,482,000	$484,613	$384,719	$18,313,204
	2018	1,585,000	7,000,052	6,999,708	4,727,000	—	408,494	20,720,254
	2017	1,585,000	6,999,332	7,000,390	5,300,000	300,661	316,046	21,501,429
Jason W. Aiken Senior Vice President and Chief Financial Officer	2019	$ 850,000	$2,052,799	$ 890,624	$1,098,000	$158,659	$ 73,227	$ 5,123,309
	2018	830,000	1,650,364	1,649,508	1,275,000	—	66,158	5,471,030
	2017	755,000	1,625,701	1,624,228	1,386,000	85,192	65,619	5,541,740
Mark C. Roualet Executive Vice President, Combat Systems	2019	$ 800,000	$2,003,157	$ 868,859	$1,010,000	$542,898	$ 81,760	$ 5,306,674
	2018	795,000	1,610,057	1,609,715	1,288,000	—	78,162	5,380,934
	2017	773,750	1,610,364	1,609,342	1,404,000	330,396	83,926	5,811,778
Mark L. Burns Vice President of the Company and President, Gulfstream Aerospace	2019	$ 655,000	$1,272,160	$1,272,817	$ 840,000	$267,984	$ 64,524	$ 4,372,485
Gregory S. Gallopoulos Senior Vice President and General Counsel	2019	$ 735,000	$1,225,229	$1,225,515	$ 956,000	$ —	$ 67,747	$ 4,209,491

Appendix 11: Revenues Forecast

Real GDP Growth Forecast	2020	2021	2022	2023	2024	2025
World	-4,40%	5,20%	4,20%	3,80%	3,60%	3,50%
United States	-4,30%	3,10%	2,90%	2,30%	1,90%	1,80%

Aerospace Revenue Forecast	2020	2021	2022	2023	2024	2025
Aircraft	-10,00%	5,20%	4,20%	3,80%	3,60%	3,50%
Aircraft Services	-10,00%	3,00%	3,00%	3,00%	3,00%	3,00%

GD Aerospace Revenue	2020	2021	2022	2023	2024	2025	CAGR
Total Aerospace	8558	8960	9313	9650	9985	10324	
Aircraft manufacturing	6620	6964	7256	7532	7803	8076	4,06%
Aircraft services	1939	1997	2057	2118	2182	2247	3,00%

Defense Revenue Forecast	2020	2021	2022	2023	2024	2025
Total Revenues	29520	29600	29513	29748	30087	30398
Combat Systems	6821	6840	6819	6874	6952	7024
Information Technology	8607	8630	8605	8673	8772	8863
Mission Systems	4981	4994	4980	5019	5076	5129
Marine Systems	9111	9136	9109	9181	9286	9382

Appendix 12: Discounted Cash Flow Assumptions

Cost of Equity. The cost of Equity was calculated using the Capital Asset Pricing Model (CAPM):

$$Re = RFR + \beta * MRP$$

Re	2022F	2023F	2024F	2025F	Terminal Period
Ke	6,712%	6,712%	6,712%	6,712%	7,502%
Rf	0,750%	0,750%	0,750%	0,750%	1,540%
β	1,140	1,140	1,140	1,140	1,140
Equity Risk Premium	5,23%	5,23%	5,23%	5,23%	5,23%

Cost of Debt. Cost of Debt was calculated as the weighted average of the following notes:

Debt				
Maturity	Amount Outstanding	Rate	Class	Issue Date
24-Nov-2020	-	-	-	-
03-Dec-2020	-	-	-	-
10-Dec-2020	-	-	-	-
17-Dec-2020	-	-	-	-
11-May-2021	2000	3,0%	Fixed rate	11-May-2018
11-May-2021	500	0,6325%	Floating rate	11-May-2018
15-Jul-2021	500	3,875%	Fixed rate	12-Jul-2011
15-Nov-2022	1000	2,25%	Fixed rate	06-Nov-2012
15-May-2023	750	3,375%	Fixed rate	11-May-2018
15-Aug-2023	500	1,875%	Fixed rate	12-Aug-2016
15-Nov-2024	500	2,375%	Fixed rate	14-Sep-2017
01-Apr-2025	750	3,25%	Fixed rate	25-Mar-2020
15-May-2025	750	3,5%	Fixed rate	11-May-2018
15-Aug-2026	500	2,125%	Fixed rate	12-Aug-2016
01-Apr-2027	750	3,5%	Fixed rate	25-Mar-2020
15-Nov-2027	500	2,625%	Fixed rate	14-Sep-2017
15-May-2028	1000	3,75%	Fixed rate	11-May-2018
01-Apr-2030	1000	3,625%	Fixed rate	25-Mar-2020
01-Apr-2040	750	4,25%	Fixed rate	25-Mar-2020
15-Nov-2042	500	3,6%	Fixed rate	06-Nov-2012
01-Apr-2050	750	4,25%	Fixed rate	25-Mar-2020
Total	13000			

WACC. The Weighted Average Cost of Capital (WACC) was calculated using the following formula:

$$WACC = \frac{E}{EV} * Re + \frac{D}{EV} * Rd * (1 - Tax\ Rate)$$

WACC	2022F	2023F	2024F	2025F	Terminal Period
Ke	6,712%	6,712%	6,712%	6,712%	7,502%
Rf	0,750%	0,750%	0,750%	0,750%	1,540%
β	1,140	1,140	1,140	1,140	1,140
Equity Risk Premium	5,23%	5,23%	5,23%	5,23%	5,23%
Kd (after tax)	2,60%	2,60%	2,60%	2,60%	2,60%
Kd	3,14%	3,14%	3,14%	3,14%	3,14%
WACC	**5,83%**	**5,93%**	**5,97%**	**6,09%**	**6,48%**
D/V	21,34%	19,05%	18,10%	15,09%	20,75%
E/V	78,66%	80,95%	81,90%	84,91%	79,25%

Terminal Growth Rate. The Terminal Growth Rate (g) was calculated using the following formula, according to the Stable Growth Model:

$$Terminal\ Growth\ Rate = \frac{CAPEX - D\&A + \Delta NWC}{EBIT(1-T)} * ROIC$$

FCFF. The Free Cash Flow to the Firm was calculated using the formula:

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

FCFF	2022F	2023F	2024F	2025F	Terminal Value
EBIT(1-t)	3 681	3 735	3 799	3 860	
D&A	745	761	779	798	
CAPEX	-900	-900	-900	-900	
DNWC	-278	-235	-235	-237	
FCFF	**3 248**	**3 361**	**3 443**	**3 521**	**3 549,69**
PV	3069	2995	2893	2779	

Enterprise Value	
Terminal Growth Rate	0,82%
Perpetual WACC	6,48%
Terminal Value	62 614
PV of Terminal Value	45 733
NPV of FCFF	11 736
Enterprise Value	57 470

Price Target		
Enterprise Value		57 470
Net Debt		-8 598
Equity Value		48 871
No. Of Outstanding Shares		289,61
Equity Value per share	**$**	**168,75**
Price at end of 2019	$	176,35
Current share price	$	150,29
Upside Potential		**12,28%**

Appendix 13: Dividend Discount Model

DDM. GD's dividend has been growing for 23 consecutive years, meaning that we can assume a stable dividend paying policy, even if earnings are negative. Thus, we believe that the Dividend Discount Model (DDM) is an appropriate one to use given the circumstances. We employed a Two-Stage DDM, with a dividend growth rate of 7,8% up to 2025F and 3,8% for the terminal period.

DDM	
g up to 2025	7,80%
Terminal g	3,8%
Terminal Cost of Equity	7,50%
PV of Dividends	7 010
PV of Terminal Value	42 210
Equity Value (USD)	**49 220**
No. Shares Outstanding (million)	289,61
Equity Value per share	**$169,95**
Upside	13,08%

Appendix 14: Adjusted Present Value

APV. The APV model differs from other DCF models because it takes into consideration the benefits of raising debt (ex: interest tax shield), which given the recent history of the company, seems appropriate to use.

APV	
Enterprise Value	58 147
Adjustments	-8 598
Equity Value	49 549
PV (ITS)	-2 930
Equity Value + PV (ITS)	46 619
Shares Outstanding	289,61
Price Target	**160,97**

Appendix 15: Investment Risks

Operational Risk | Termination Clause (OPR 3)

Contracts celebrated with the U.S. government usually permit the government to terminate a contract, in whole or in part, for default, in the event of a breach by the contractor, or for convenience. In the case of default, the government will only pay for the work it has accepted. If a contract is terminated for convenience, the contractor is usually entitled to receive for its costs incurred and proportionate fees for the work performed. The termination of several programs can put in question the company's future revenues and earnings.

Economic and Political Risk | Tax Rate Changes (EPR2)

GD operates in the U.S. and therefore is subject to U.S. taxes. The current U.S. administration, in office since 2016, has in 2017 decreased the statutory federal income tax rate from 35% to 21%, which yielded in an improvement on the company's net earnings. However, with the November 2020 election likely resulting in a change in administration, an increase, in the coming years, of that same tax rate is likely as well. That would mean a decrease of the profitability of the company.

Regulatory Risk | Regulation and consequent penalties (REG 2)

Government contractors operate in a highly regulated environment and are subject to audit by the U.S. government. Numerous U.S. government agencies routinely review a contractor's performance under its contracts and compliance with applicable laws and regulations. In some cases, audits may result in delayed payments or even, if such audits were to result in allegations against the contractor, civil or criminal penalties and prohibition from doing business with the U.S. government. In addition, the aerospace segment has to comply with all FAA regulations in terms of developing and constructing an aircraft. New laws, regulations and standards can increase the company's costs and reduce profitability.

Operational Risk | Key Contracts (OPR 4)

The inability to perform in key contracts can seriously affect the company. Any delay, technical or performance issue, and failure to comply with the budget can result in penalties, loss of already existing orders or even termination of contract. Furthermore, any of the issues just stated can impact the company's reputation and, consequently, influence the company's capability to land important new contracts with major clients. The failure to deliver on contracts can put in question the company's present and future financial results.

References

General Dynamics Corporation (2014). General Dynamics Corporation Annual Report 2014. Available on: www.investorrelations.gd.com (Consulted in 01/04/2020)

General Dynamics Corporation (2015). General Dynamics Corporation Annual Report 2015. Available on: www.investorrelations.gd.com (Consulted in 01/04/2020)

General Dynamics Corporation (2016). General Dynamics Corporation Annual Report 2016. Available on: www.investorrelations.gd.com (Consulted in 01/04/2020)

General Dynamics Corporation (2017). General Dynamics Corporation Annual Report 2017. Available on: www.investorrelations.gd.com (Consulted in 01/04/2020)

General Dynamics Corporation (2018). General Dynamics Corporation Annual Report 2018. Available on: www.investorrelations.gd.com (Consulted in 01/04/2020)

General Dynamics Corporation (2019). General Dynamics Corporation Annual Report 2019. Available on: www.investorrelations.gd.com (Consulted in 01/04/2020)

General Dynamics Corporation (2020). General Dynamics Corporation Second-Quarter 2020 Earnings Release. Available on: www.investorrelations.gd.com (Consulted in 01/08/2020)

General Dynamics Corporation (2020). General Dynamics Corporation Third-Quarter 2020 Earnings Release. Available on: www.investorrelations.gd.com (Consulted in 28/10/2020)

General Dynamics Corporation (2020). General Dynamics Corporation Proxy Statement 2020. Available on: www.investorrelations.gd.com (Consulted in 01/04/2020)

General Dynamics Corporation (2020). General Dynamics Corporation Second-Quarter 2020 Earnings Release. Available on: www.investorrelations.gd.com (Consulted in 01/08/2020)

General Dynamics Corporation (2020). General Dynamics Corporation Corporate Governance Guidelines. Available on: www.investorrelations.gd.com (Consulted in 01/06/2020)

Accenture (2020). COVID-19: Address disruption and build resilience in Aerospace and Defense. Available on: www.accenture.com (Consulted in 01/08/2020)

Deloitte (2020). Understanding the sector impact of COVID-19: Aerospace & Defense. Available on: www2.deloitte.com (Consulted in 01/06/2020)

Honeywell (2020). Honeywell Forecasts Business Jet Usage Will Recover to 2019 Levels by the Second Half of 2021. Available on: www.honeywell.com (Consulted in 15/10/2020)

Forbes (2020). Business Jet Makers Downsize Despite Rebound in Private Air Travel. Available on: www.forbes.com (Consulted in 15/10/2020)

KPMG (2020). After the shock. What's ahead for aerospace & defense. Available on: www.home.kpmg (Consulted on 01/09/2020)

The Balance (2020). US Military Budget, Its Components, Challenges, and Growth. Available on: www.thebalance.com (Consulted in 01/09/2020)

IMF World Economic Outlook April 2020 database. Available on: www.imf.org (Consulted in 01/06/2020)

IMF World Economic Outlook October 2020 database. Available on: www.imf.org (Consulted in 01/10/2020)

World Bank database. Available on: www.data.worldbank.org (Consulted in 01/10/2020)

Disclosures and Disclaimer

This report is published for educational purposes by Master students and does not constitute an offer or a solicitation of an offer to buy or sell any security, nor is it an investment recommendation as defined by Article 12º A of the *Código do Mercado de Valores Mobiliários* (*Portuguese Securities Market Code*). The students are not registered with *Comissão de Mercado de Valores Mobiliários* (*CMVM*) as financial analysts, financial intermediaries or entities/persons offering any service of financial intermediation, to which Regulamento (Regulation) 3º/2010 of CMVM would be applicable.

This report was prepared by a Master's student in Finance at ISEG – Lisbon School of Economics and Management, exclusively for the Master's Final Work. The opinions expressed and estimates contained herein reflect the personal views of the author about the subject company, for which he/she is sole responsible. Neither ISEG, nor its faculty accepts responsibility whatsoever for the content of this report or any consequences of its use. The report was supervised by Prof. Pedro Rino Vieira, who revised the valuation methodologies and the financial model.

The information set forth herein has been obtained or derived from sources generally available to the public and believed by the author to be reliable, but the author does not make any representation or warranty, express or implied, as to its accuracy or completeness. The information is not intended to be used as the basis of any investment decisions by any person or entity.

Recommendation System

Level of Risk	SELL	REDUCE	HOLD/NEUTRAL	BUY	STRONG BUY
High Risk	0%≤	>0% & ≤10%	>10% & ≤20%	>20% & ≤45%	>45%
Medium Risk	-5%≤	>-5% & ≤5%	>5% & ≤15%	>15% & ≤30%	>30%
Low Risk	-10%≤	>-10% & ≤0%	>0% & ≤10%	>10% & ≤20%	>20%