EQUITA

AVIO | Downgrade

HOLD *(prev. BUY)*

Target: € 16.3 *(unchanged)* | Risk: High

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EQUITY RESEARCH

Italy | Space

STOCK DATA	
Price €	13.22
Bloomberg Code	AVIO IM
Market Cap. (€ mn)	348
Free Float	71%
Shares Out. (mn)	26.4
52-week range	9.57 - 16.64
Daily Volumes (mn)	0.06

PERFORMANCE	1M	3M	12M
Absolute	1%	-11%	7%
Rel. to FTSE all shares	-8%	-18%	14%

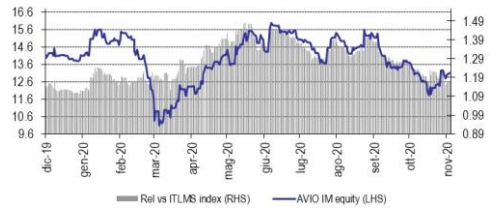
MAIN METRICS	2019	2020E	2021E
Net revenues	368.6	334.7	384.8
Adjusted EBITDA	44.0	42.0	43.6
Adj. net income	21.2	21.2	22.2
Adj. EPS - € cents	80.3	80.3	84.1
Adj. EPS FD - € cents	77.9	77.9	81.6
DPS ord - € cents	0.0	44.0	44.0

MULTIPLES	2019	2020E	2021E
P/E adj	13.7 x	16.5 x	15.7 x
P/E adj FD	14.1 x	17.0 x	16.2 x
EV/Adj. EBITDA	5.3 x	7.3 x	7.3 x

REMUNERATION	2019	2020E	2021E
Div. Yield ord	0.0%	3.3%	3.3%
FCF yield	7.9%	-4.7%	-0.1%

INDEBTEDNESS	2019	2020E	2021E
Net financial position FD	68.2	52.0	40.2
Debt/Adj. EBITDA FD	n.m.	n.m.	n.m.
Interests cov	n.m.	87.5 x	135.2 x

PRICE ORD LAST 365 DAYS



A SECOND VEGA ANOMALY IMPOSES A BREAK

Although the empirical evidence demonstrated that the business model is resilient (even when the first ever Vega failure occurred), the second Vega failure may cause undesirable side effects. Yesterday for this reason we downgraded to Hold despite the potential valuation upside (unchanged pending the investigation outcome). We know that Avio has a key role for the European space launch system and we expect ESA "will protect it", but some issues must be cleared.

A second anomaly for Vega launcher

On Nov-16th night, the Vega VV17 mission carrying the satellites SEOSAT-Ingenio (for the European Space Agency - ESA), and Taranis (for CNES, the French space agency), suffered an anomaly occurring 8 minutes after the take-off, **causing the premature end of the mission.** According to Arianespace the initial investigations identified **a problem related to the integration of the fourth-stage AVUM** nozzle activation system is the most likely cause, attributable to a **human error** (see also appendix 3); if so it would be less worrying than a structural issue.

Despite the ESA protection some side effects must be cleared

We acknowledge **the empirical evidence showed that the Avio's business model is resilient** (since the VV15 failure costs were covered by ESA, Arianespace and insurance policy) and we also know that it is difficult for customers who have already booked Vega flights to find alternatives (i.e. very low cancellation risk).
Nevertheless, **we believe that a second anomaly in less than 2 years,** whether the causes of the anomaly were not quickly identified and solved, **might cause some problems on the Vega production** (~30% of FY19 revenues) related to the
- **commercial activity**: the on-going negotiations may be put on hold
- **bargaining power:** likely reduced at least towards commercial customers (~20%)
- **Vega C: final development phase and therefore the maiden flight** (currently scheduled in 2Q21) **might suffer a further delay.**

We downgrade to Hold pending investigation outcome …

In light of these uncertainties (unlike we did after the first anomaly occurred in July 2019 where we confirmed our Buy) **we downgrade to Hold**
- despite knowing that this business must be evaluated over a medium-/long-term horizon
- and in spite of the formal upside from a quantitative point of view.

So far estimates and DFCF-based target at €16.3 PS remain unchanged (or fully diluted FY21E adj. PE ~19x and EV/adj. EBITDA ~10x incl. pension liabilities), but **pending the outcome of the investigation to assess the impact**.

… although knowing Avio is "protected" for its key role in Europe

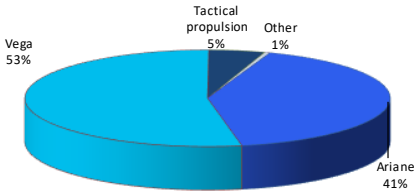
The positive features of the equity story we always underlined are still valid:
- **key role in the European launchers business** (being the only provider of all boosters for both Ariane and Vega), **guaranteeing full support from ESA**
- **growing reference market** (although COVID-19 will slow it down a bit) driven by several end-market applications (navigation, meteorology, earth observation, …) and replacement demand (satellites avg. useful life is 2/7 or 10/15 years depending on the orbit)
- **growing number of targeted launches** (from 9 to 16 in 2023) and relevant **new development projects** funded by the **ESA Ministerial Council**
- **new P120 engine** (in production phase) for both Ariane 6 and Vega C: up to 36 units p.a., exploiting **economies of scale**
- **new methane oxygen engine M10** (under development) to expand the value-added chain (substituting third party's AVUM stage)

MAIN FIGURES € mn	2017	2018	2019	2020E	2021E	2022E
Net revenues	**343.8**	**388.7**	**368.6**	**334.7**	**384.8**	**427.0**
Growth	18%	13%	-5%	-9%	15%	11%
Adjusted EBITDA	**46.5**	**47.3**	**44.0**	**42.0**	**43.6**	**49.1**
Growth	27%	2%	-7%	-5%	4%	13%
Adjusted EBIT	**32.3**	**33.2**	**28.0**	**24.4**	**25.5**	**30.5**
Growth	20%	3%	-16%	-13%	4%	20%
EBIT	**25.0**	**28.5**	**26.5**	**17.4**	**22.5**	**29.5**
Growth	89%	14%	-7%	-34%	29%	31%
Profit before tax	**21.5**	**27.9**	**27.0**	**17.0**	**22.2**	**29.2**
Growth	243%	30%	-3%	-37%	30%	32%
Net income	**18.2**	**24.3**	**26.2**	**14.3**	**19.4**	**26.2**
Growth	1260%	34%	8%	-45%	35%	35%
Adj. net income	**21.8**	**26.9**	**21.2**	**21.2**	**22.2**	**26.8**
Growth	63%	23%	-21%	0%	5%	21%
MARGIN	**2017**	**2018**	**2019**	**2020E**	**2021E**	**2022E**
Adj. EBITDA margin	13.5%	12.2%	11.9%	12.5%	11.3%	11.5%
Adj. EBIT margin	9.4%	8.5%	7.6%	7.3%	6.6%	7.1%
EBIT margin	7.3%	7.3%	7.2%	5.2%	5.8%	6.9%
Profit before tax margin	6.2%	7.2%	7.3%	5.1%	5.8%	6.8%
Net income margin	5.3%	6.3%	7.1%	4.3%	5.0%	6.1%
Adj. net income margin	6.3%	6.9%	5.7%	6.3%	5.8%	6.3%
SHARE DATA	**2017**	**2018**	**2019**	**2020E**	**2021E**	**2022E**
EPS - € cents	73.5	92.2	99.4	54.4	73.6	99.4
Adj. EPS - € cents	88.1	102.1	80.3	80.3	84.1	101.7
Adj. EPS FD - € cents	80.3	99.1	77.9	77.9	81.6	98.7
Growth	63%	23%	-21%	0%	5%	21%
DPS ord - € cents	38.0	44.0	0.0	44.0	44.0	44.0
VARIOUS - € mn	**2017**	**2018**	**2019**	**2020E**	**2021E**	**2022E**
Capital employed	296	254	257	273	298	316
FCF	-7	17	23	-16	0	10
Capex	29	23	29	33	27	25
Net working capital	-86	-41	-54	-42	-35	-29
INDEBTNESS - €mn	**2017**	**2018**	**2019**	**2020E**	**2021E**	**2022E**
Net financial position	42	49	58	42	30	28
D/E	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.
Debt/EBITDA	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.
Interests cov	11.0 x	64.2 x	n.m.	87.5 x	135.2 x	160.2 x
Net financial position FD	52	60	68	52	40	39
MARKET RATIOS	**2017**	**2018**	**2019**	**2020E**	**2021E**	**2022E**
P/E	18.6 x	11.9 x	11.0 x	24.3 x	18.0 x	13.3 x
P/E FD	20.4 x	12.3 x	11.4 x	25.0 x	18.5 x	13.7 x
P/E adj	15.5 x	10.7 x	13.7 x	16.5 x	15.7 x	13.0 x
P/E adj FD	17.0 x	11.1 x	14.1 x	17.0 x	16.2 x	13.4 x
MARKET RATIOS	**2017**	**2018**	**2019**	**2020E**	**2021E**	**2022E**
EV/Net revenues	0.92 x	0.62 x	0.63 x	0.92 x	0.83 x	0.75 x
EV/Adj. EBITDA	6.8 x	5.1 x	5.3 x	7.3 x	7.3 x	6.5 x
EV/Adj. EBIT	9.9 x	7.2 x	8.3 x	12.6 x	12.5 x	10.5 x
EV/CE	1.1 x	0.9 x	0.9 x	1.1 x	1.1 x	1.0 x
REMUNERATION	**2017**	**2018**	**2019**	**2020E**	**2021E**	**2022E**
Div. Yield ord	2.8%	4.0%	0.0%	3.3%	3.3%	3.3%
FCF yield	-2.0%	6.0%	7.9%	-4.7%	-0.1%	2.9%
ROE	7.6%	9.7%	7.3%	7.0%	7.1%	8.3%
Adj. ROCE	11.0%	12.3%	10.9%	8.4%	8.1%	9.1%
Adj. ROCE ex-goodwill	43.8%	93.2%	76.8%	44.4%	31.2%	30.4%
BACKLOG	**2017**	**2018**	**2019**	**2020E**	**2021E**	**2022E**
Order backlog	952	877	669	665	846	619
Order intake	521	314	161	331	565	200
Book to bill	1.5 x	0.8 x	0.4 x	1.0 x	1.5 x	0.5 x
Book to revenues	2.8 x	2.3 x	1.8 x	2.0 x	2.2 x	1.4 x

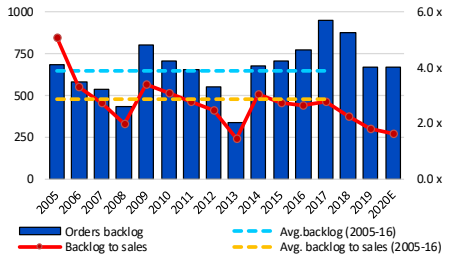
Source: Company data and EQUITA SIM estimates

Ariane 5 launcher | Vega launcher

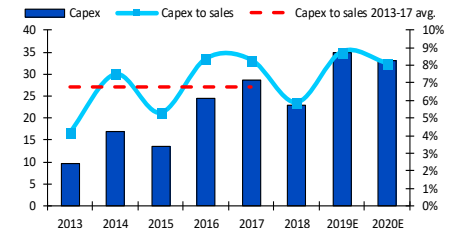
Divisional net revenues breakdown (2019)



Orders backlog (€ mn) and backlog to sales (x)



Capex (€ mn) and capex to sales (%)



BUSINESS DESCRIPTION

AVIO is a leading international space propulsion system provider (solid, liquid and cryogenic) founded in 1912 as explosive maker (a pre-requisite to enter in the space business) and in the past 50 years evolved from supplier of solid rocket motors to system integrator and prime contractor. It was listed in Apr-17 through the business combination with Space2 SPAC.

It plays a **strategic role** in the space industry through 2 European launcher programmes:
- **it provides the boosters** and liquid-oxygen turbopumps **to Ariane 5**, the European heavy launcher for satellites up to 10 tons (for broadcasting and telecom applications) in the Geostationary Earth Orbit (GEO) at 36k km altitude
- **it is the prime contractor for Vega**, the European light launcher for satellites up to 2 tons (for weather forecasting, earth observation and satellite internet constellations) in the Low Earth Orbit (LEO) at 300-2k km altitude.

A launcher is a rocket capable of placing satellites accurately into space for both institutional (public authorities or government agencies) and commercial clients (private companies). According to the Satellite Industry Association, **the launchers sector in FY18 was worth $ 6.2bn; it enables the access to space** with a **multiplier** effect on satellite manufacturing (~3x) and ground and satellite services ~20x.

The critical success factor for a launcher is reliability. The European launchers remain the best-in-class worldwide: 1998-2019 combined (Ariane+Vega) failure rate is <3% vs market avg. of ~6% (Ariane 5 at 2% on over 140 launches while Vega is now at ~12% with 15 successful launches out of 17).

The launchers sector is oligopolistic (~90% of the market was accounted for by Russia, US, China and Europe), **typically funded by massive public financial investments** (in Europe the European Space Agency-ESA), **with very high technological entry barriers, long-cycle business** (18-24 months from order intake, launcher production and effective launch) and with **no Chinese/Japanese competition** (operating only in their closed markets).

The **most important demand drivers are emerging commercial customers for mega LEO constellations deployment** (such as Space X, eightyLEO, Globalstar and One Web) and **replacement demand** given the avg. useful life of 10-15 years for a GEO/MEO satellite and 2-7 years for a LEO one (>2k satellites are into orbit).

The strategy envisages:
- **consolidation of its existing market position**
- **supply chain consolidation** through insourcing/acquisition of critical industrial supplies to improve margins and reduce dependency on external suppliers
- **efficiency improvements** (streamlining ground infrastructure operations and flight readiness as well as launch frequency)
- **new product development** (P120 engine, Vega C/E and Ariane 6, lowering the launch costs and improving the launchers versatility)
- **industrial evolution** towards production automation, volume scale up and reduction of product platforms leveraging the commonalities provided especially by the new P120 motor across the Ariane 6 and Vega C launchers

In Orbit (the investment vehicle participated by **67 Avio managers,** including the CEO, first-line, second-line, third-line and retired managers) **owns 4%.** The Italian State-controlled aerospace and defense group **Leonardo** (AVIO shareholder since 2003) owns 29.6% and **Space Holding** (the company that promoted the business combination) owns 4.8%. Treasury shares are currently around 2.55% of capital.

Strengths/opportunities	Weaknesses/threats
• Key role in the European Space sector	• Smaller size and no diversification compared to much larger competitors
• Oligopolistic market/high technological entry barriers	• Only one spaceport (French Guiana)
• High reliability of Ariane5 and Vega launchers	• Public budgets constraints
• Growing market, particularly for LEO	• Price pressure
• High visibility supported by the order backlog	• Competitors reusable technology
• Innovation: new launchers (Ariane 6, Vega-C and Vega-M and new P120C engine)	• Flights failure causing costs and delays
• Carried forward tax losses (est. >€100mn)	• Erratic orders intake/down payments

ESA CONFIRMED THE MAIDEN FLIGHT OF THE VEGA C IN JUNE 2021, WHILE POSTPONED THE ARIANE 6 BY ONE SEMESTER TO 2Q22

On October 29th the ESA announced the

- **confirmation of the Vega C maiden flight in June 2021**
- **postponement of Ariane 6`s maiden flight by one semester**, moving it to 2Q22 due to delays in the development of some components due to the pandemic (no problems for Avio`s new P120 engine).

On Avio`s 2021 figures, **the postponement of Ariane 6**

- **has no impact on development activities** (which we estimate to represent 40% of sales)
- **could have a slightly negative impact on production** (the remaining 60% of sales)

To date, Avio`s backlog includes about 40 P120 engines (3-4 for Vega C, 20 for Ariane 6.4 and 10 for Ariane 6.2 +8 optional).

The management had forecasted a production of 10/15 units of P120 in 2021 that we estimate can generate €35-50mn; in the worst case scenario a portion of this revenues could be postponed to 2022 (assuming the 50%, it would represent 5/6% of the group revenues).

However, **Avio benefits from a certain operating and industrial flexibility** in order to sustain the production volumes of the P120s that, regardless to their usage, can be stored in warehouse and therefore continue to generate the related revenues. However, before all the production volumes for 2021 must be agreed with the Prime contractor Ariane Group.

We also do not rule out that ESA (which has declared to be closely monitoring the effects of the pandemic on the entire space supply chain) **may take action with some supportive initiatives.**

3Q RESULTS SLIGHTLY WORSE THAN EXPECTED

3Q slightly was worse than expected due to the delay of some events such as

- Vega return to flight that also delayed Vega C development activity
- and the last P120 firing test carried out in early October (thus 4Q) instead of mid-July.

The 3Q recorded €2mn of non-recurring costs, increasing the total YTD to €5.6mn, **coherent with management indication of about €7mn for the full year.**

AVIO: QUARTERLY RESULTS (€ mn)

	1Q20	%	2Q20	%	3Q20 *Expected*	%	3Q20 *Declared*	%	Change	9M20 *Expected*	%	4Q20 *Declared*	%
Revenues	**80.0**	100.0	**87.9**	100.0	**70.1**	100.0	**48.2**	100.0	-31%	**216.1**	100.0	**118.6**	100.0
Incr. %	-3%		-17%		-14%		-41%			-20%		21%	
Adj.EBITDA	**7.8**	9.8	**12.1**	13.8	**4.1**	5.8	**3.2**	6.6	-22%	**23.1**	10.7	**18.9**	15.9
Incr. %	10%		24%		-52%		-62%			-9%		1%	
EBITDA	**7.2**	9.0	**9.7**	11.1	**2.1**	3.0	**0.6**	1.2	-72%	**17.5**	8.1	**17.5**	14.8
Incr. %	3%		7%		-72%		-92%			-26%		-8%	
Adj. EBIT	**3.8**	4.8	**7.7**	8.8	**2.1**	3.0	**(1.2)**	-2.5	-157%	**10.3**	4.8	**14.1**	11.9
Incr. %	19%		36%		-56%		n.m.			-24%		-2%	
EBIT	**3.1**	3.9	**5.2**	6.0	**(2.4)**	-3.5	**(3.8)**	-7.9	58%	**4.7**	2.2	**12.7**	10.7
Incr. %	0%		5%		**n.m.**		**n.m.**			**(.6)**		-14%	
NF Position	**42.1**		**26.9**		**28.9**		**26.2**		-9%	**26.2**		**41.6**	

Source: Company data and Equita SIM estimates

FY20 guidance confirmed (as already known affected by delays accumulated both in the development of Vega C/Ariane 6 due to the pandemic and Vega return to flight):

- net revenues -12/-6% YoY to €325-345mn (with 6 launches)
- EBIT -20/-15% to €34-36mn (with incentives for R&D similar to 6mn in 2019), factoring in 7mn of non-recurring charges mostly related to COVID; adj. EBITDA €41-43mn
- net income pre-minorities -41/-30% to €16-19mn
- order backlog -3/+2% to €650-680mn (=order intake about 330mn in the mid-point).

Insights from the conference call held on November 5th:

- **the backlog includes 18 launches** of which
  - 8 Ariane 5
  - 5 Ariane 6.2 (using 2 P120 engines) +4 optioned
  - 5 Ariane 6.4 (using 4 P120 engines)
  - and 9 Vega
- the Vega maiden flight was indicated in Jun-21 whilst that of Ariane 6 postponed from 2H21 to 2Q22
- the postponement of the Ariane 6 maiden flight to 2Q22 implies the need to negotiate with Arianespace to continue to produce the engines in stock while receiving cash payments and with ESA for the possibility to get a partial reimbursement of the costs (as it happened with the Vega flight failure).
- on M&A: no news, but caution in the current scenario the management highlighted a certain cautiousness.

VALUATION UNCHANGED PENDING THE INVESTIGATION OUTCOME

Estimates unchanged (after the fine tuning following 3Q results) **and DFCF-based target confirmed at € 16.3PS,** pending the outcome of the investigation to understand what could be the impact on estimates/valuation.

ASSUMPTIONS	
g	2.0%
WACC	7.1%

Valuation	
NPV of Free Cash Flows	41
NPV of Terminal Value	362
Estimated Enterprise Value	**403**
2019A NFP	58
Adjustment to NFP	-26
Equity	**434**
Peripherals & other	8
Total Equity	**442**
# of shares fully diluted	27.2
Target Price	**16.3**
Upside (Downside)	**23%**

AVIO: DFCF ANALYSIS (€ mn)

	2020E	2021E	2022E	2023E	2024E	Beyond
Sales	**335**	**385**	**427**	**453**	**484**	**494**
Change %	*-9.2%*	*15.0%*	*11.0%*	*6.0%*	*7.0%*	*2.0%*
EBITDA	**35**	**41**	**48**	**54**	**55**	**41**
Change %	*-17.8%*	*15.9%*	*18.5%*	*12.5%*	*0.9%*	*-24.9%*
Margin	10.5	10.5	11.3	11.9	11.3	8.3
D&A	-18	-18	-19	-19	-20	-11
EBIT	**17**	**23**	**30**	**35**	**35**	**30**
Change %	*-34.3%*	*29.0%*	*31.1%*	*18.6%*	*0.0%*	*-14.7%*
Margin	5.2	5.8	6.9	7.7	7.2	6.0
Taxes	-2	-2	-2	-2	-2	-2
EBIT after Tax	**16**	**21**	**28**	**33**	**33**	**28**
Change %	*-40.0%*	*31.9%*	*32.9%*	*18.3%*	*0.1%*	*-14.7%*
Capex	-33	-27	-25	-24	-24	-11
(increase) decrease in WC	-11	-7	-6	-3	-4	-3
Free Cash Flow before minorities	**-11**	**5**	**15**	**26**	**25**	**26**
FCF Minorities	-1	-1	-1	-2	-2	-2
Free Cash Flow after minorities	**-12**	**4**	**14**	**24**	**23**	**24**
Discount Factor	1.00	1.07	1.15	1.23	1.31	1.31
PV of FCF	**-12**	**4**	**12**	**20**	**18**	**18**

Source: Equita SIM estimates

AVIO: DFCF SENSITIVITY ANALYSIS (€ PS - FULLY DILUTED)

		WACC		
		7.6%	7.1%	6.6%
G factor	1.5%	*13.8*	15.0	16.5
	2.0%	*14.8*	**16.3**	18.0
	2.5%	*16.1*	17.8	20.0

Source: Equita SIM estimates

As of today, the multiple comparison (we use to perform as a valuation double check) is less meaningful without a clear understanding of the failure consequences.

STATEMENT OF RISKS

The primary elements that **could negatively impact the stock include**:
- Significant deterioration in the reference macroeconomic scenario
- Significant increase in short term interest rates
- European Space budget cuts and European Governments instability
- Launch failures affecting the reliability
- More expensive and longer than expected development programmes
- Worsening R&D fiscal incentives schemes
- New competitors technological innovation generating price pressure

The primary elements that **could positively impact the stock include**:
- Significant improvement in the reference macroeconomic scenario
- Significant decrease in short term interest rates
- European Space budget increase
- Quick solution of the issue causing the Vega failure
- Less expensive and shorter than expected development programmes
- Improvement in the R&D fiscal incentives schemes
- Technological innovations improving the performance of the existing launchers

SWOT ANALYSIS

Strengths/opportunities	Weaknesses
• Oligopolistic market with high technological entry barriers • Key role in the European Space launcher sector • European launchers historical reliability • Vega proven multi-payload and multi-orbit ability • Growing market particularly for LEO • High visibility supported by the high backlog destined to grow further • European countries public funding for common programmes • Huge tax-credits	• Smaller size and no diversification compared to much larger competitors • Erratic orders intake and thus not easy to predict down payments • Access to only one spaceport in French Guiana (also exposed to the social crisis risk) • Past few years some non-recurring costs • Smaller public budgets to finance new development projects
Opportunities	**Threats**
• New launchers currently under development (Ariane 6, Vega-C and Vega-E) • AVIO's new first stage solid propellant engine P120 to be used for both new Ariane 6 and Vega C/Vega E from 2021 • AVIO's new methane oxygen engine M10 engine to replace AVUM upper stage (produced by a third party) from 2024 • Planned increase in the number of launches with heavier payload • Insourcing/acquisition of critical industrial supplies to consolidate margins and reduce dependency on external suppliers • New markets access	• Flights failure causing costs, delays and worsened reliability • Public spending budget constraint • Aggressive pricing strategy from some competitor • Competition from Chinese CZ6 (although limited to a portion of the accessible market) • Long-term technological innovations (multi payload/multi-orbit and smaller satellite size) which could reduce launchers demand • SpaceX's reusable rocket technology • Social/political problems in French Guiana

APPENDIX 1: RECAP OF THE FIRST VEGA FAILURE

On Jul-11th 2019 **the 15th launch of the Vega (VV15) suffered a premature end of the mission** (the first failure after 14 in-a-row successful flights - a global first).

On Sep-5th the **independent investigation** jointly carried out by ESA and Arianespace:
- **identified in the failure of the thermo-structure of the second-stage Zefiro 23 engine** produced by Avio as the most likely cause of the Vega VV15 launch failure; it is worth remembering that according to the plans, the Zefiro 23 will be replaced by the Zefiro 40 in the new configuration of Vega C
- **indicated a set of corrective actions to be implemented**.

The outcome of the investigation **removed the worst-case scenario**, which could have materialized in case of a substantial revision of the Vega program, implying high costs, long delays and a lot of uncertainty.

The return to fly was scheduled on March 23rd 2020; unfortunately, on March 16th the French Government announced the **lockdown of the Kourou spaceport** for precautionary reasons due to the COVID-19 pandemic thus postponing the event to June. Later in June it was further delayed due to **unfavourable weather conditions**.

On September 2nd 2020 Vega finally returned to fly with a successful mission (VV16) even more positive because for the first time **simultaneously placed in orbit 53 micro satellites** (7 microsatellites weighing between 15 kg and 150 kg + 46 smaller CubeSats for various applications including earth observation, telecommunications, science, technology and education), **using the innovative Small Spacecraft Mission Service** (SSMS), a modular carbon fiber dispenser designed by Avio for launches in low orbit (300 km from Earth) for small satellites weighing between 1 and 400 kg.

The resilience of AVIO business model was demonstrated by the achievement of 2019 EBITDA guidance in spite of this painful event because:
- Arianespace and French government are responsible for failures after take-off, beyond the usual insurance policies coverage
- ESA contributed to cover the costs: the Ministerial Council held in November approved the existing **programs specifically devoted to flight anomalies** which covered the non-recurring costs associated with the failure (such as investigation and corrective actions).

This confirms its ability to manage critical issues and its **essential role in guaranteeing the access to space for all European countries which the whole system is willing to protect**.

The only **side effect** concerns the reputation damage with potential implications on pricing power and insurance costs (4-8% of the launch cost in proportion to proven reliability over time), although the **company denied significant consequences**

APPENDIX 2: THE EUROPEAN LAUNCHERS RELIABILITY

The critical success factor for a launcher is its reliability, which is inversely proportional to the number of failures (i.e. explosion of the launcher, damages caused to the satellite during transit, positioning in an incorrect orbit/location, …).

For AVIO the direct risk of bearing non-recurring costs is limited because in case of failure:
- **before Vega's delivery, the prime contractor AVIO is held responsible;**
- **after launcher delivery** (for both Ariane 5 and Vega), **Arianespace,** in its capacity as Launch Service Provider, **is liable to pay up to a maximum of €60 mn**; **ESA and the French Government** are liable for the amount exceeding €60 mn.

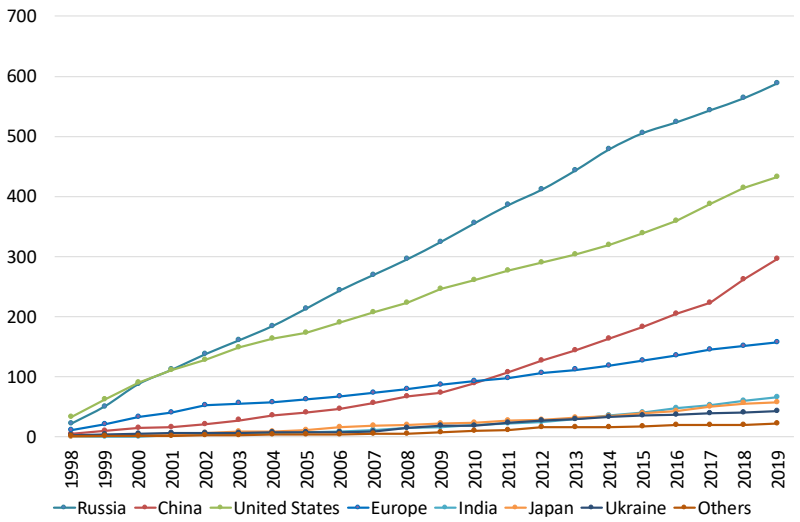
Furthermore, in case of **delays due to external factors**, Arianespace is responsible for managing the schedule.

For Avio the most important direct and indirect consequences of a launch failure are:

- **deterioration in perceived reliability**, thus a risk of lower bargaining power;
- **increased insurance costs** for future launches;
- **costs** incurred to resolve the problem;
- **flights suspension** until the problem is identified and resolved;
- **production inefficiencies because of launch delays;**
- **cancellation of scheduled launches** (the worst-case scenario).

As we always highlighted, the launchers business is not immune from risks: According to Space Launch Report, around **1.67k launches took place worldwide between 1998 and 2019** (54% in LEO and 46% in higher orbits).

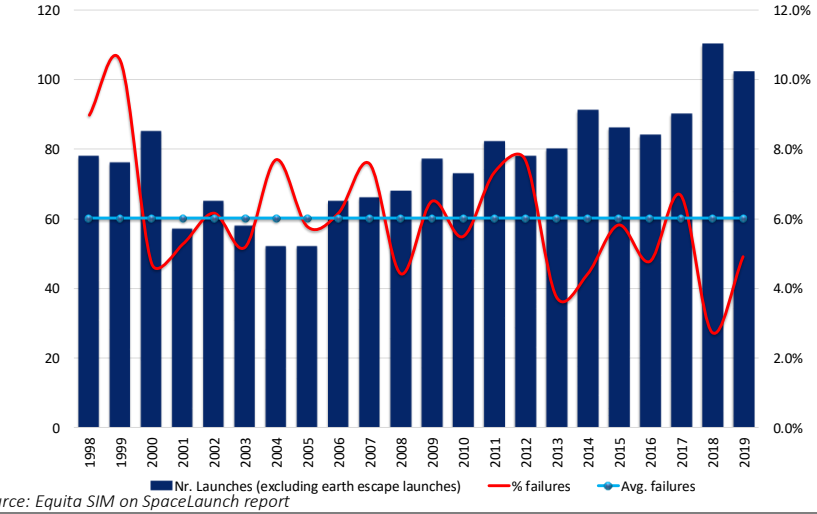
SPACE LAUNCHES: TOTAL LAUNCHES/FAILURE RATE and CUMULATE BY COUNTRY (1998-2019)



Source: Equita SIM on Space Launch report

Failures were 99, or 5.9% of total launches (same figure both in LEO and in other orbits).

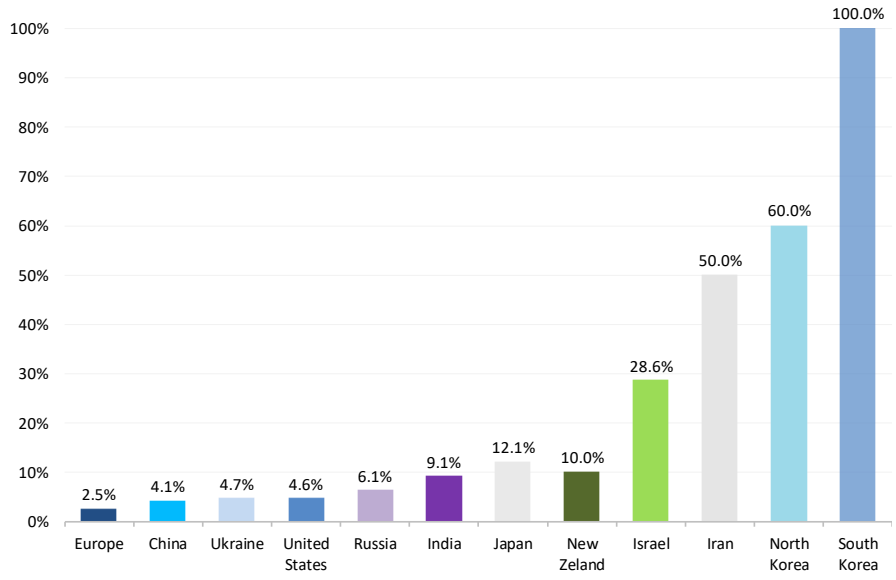
SPACE LAUNCHES: TOTAL LAUNCHES/FAILURE RATE and CUMULATE BY COUNTRY (1998-19)



Source: Equita SIM on SpaceLaunch report

The **European launchers** (i.e. Ariane for which Avio provides the boosters and Vega of which Avio is prime contractor) **remain the most reliable** even factoring in the two recent Vega failures: summing up Ariane and Vega the combined failure rate is <3%, but if we take **Vega alone this percentage now grows to almost 12% (=2 out 17 launches).**

SPACE LAUNCHES: FAILURE RATE (number of failures/number of flights – 1998-2019)



Source: Equita SIM on Space Launch report

Since the start of the programme Ariane 5 suffered 4 failures (of which 3 were qualification flights - when the failure risk is typically higher)**. The last one dates back as far as 19 years ago**, whereas the others date back even further (1996, 1997 and 2001).

APPENDIX 3: ABSTRACT FROM ARIANESPACE PRESS RELEASE

From yesterday's Arianespace press release: "… the first three stages functioned nominally until the ignition of the AVUM upper stage (produced by the Ukrainian Yuzhnoye), eight minutes after departure from the launch pad. At that time, a degraded trajectory was detected, followed by a loss of control of the vehicle and the subsequent loss of the mission … Initial investigations conducted overnight with the available data identified **a problem related to the integration of the fourth-stage AVUM nozzle activation system is the most likely cause** of the loss of control of the launcher. In accordance with their standard protocols, Arianespace and the European Space Agency (ESA) will set up an independent inquiry commission … will provide detailed evidence to explain why steps were not taken to identify and correct the integration error. …".

Some websites (i.e. spacenews.com) citing the contents of a press conference, talked about incorrect configuration of two connectors of the thrust direction control system; in practice **it would be attributable to a human error in the assembly of the various stages attributable to the prime contractor Avio.**

If confirmed,
- on one hand **it would be positive** because it would not be a structural problem and would be easily corrected without causing significant delays to the next Vega launches
- on the other hand, **it would highlight the need to strengthen the quality control procedures.**

We look forward to more details in the coming weeks or months; just as purely indicative purposes, the investigation for the failed VV15 mission took about 2 months.

P&L	2017	2018	2019	2020E	2021E	2022E
Net revenues	**343.8**	**388.7**	**368.6**	**334.7**	**384.8**	**427.0**
Growth	18%	13%	-5%	-9%	15%	11%
Gross revenues	**385.2**	**439.7**	**391.1**	**334.7**	**384.8**	**427.0**
Growth	13%	14%	-11%	-14%	15%	11%
Total opex	-304.6	-346.1	-326.0	-299.7	-344.2	-378.9
Growth	15%	14%	-6%	-8%	15%	10%
Margin	-88.6%	-89.1%	-88.4%	-89.5%	-89.5%	-88.7%
Adjusted EBITDA	**46.5**	**47.3**	**44.0**	**42.0**	**43.6**	**49.1**
Growth	27%	2%	-7%	-5%	4%	13%
Adj. EBITDA margin	13.5%	12.2%	11.9%	12.5%	11.3%	11.5%
EBITDA	**39.2**	**42.6**	**42.6**	**35.0**	**40.6**	**48.1**
Growth	46%	8%	0%	-18%	16%	18%
EBITDA margin	11.4%	10.9%	11.6%	10.5%	10.5%	11.3%
Depreciation&amortization	-14.2	-14.0	-16.1	-17.6	-18.1	-18.6
Provisions	na	na	na	na	na	na
Depreciation&provision	**-14.2**	**-14.0**	**-16.1**	**-17.6**	**-18.1**	**-18.6**
Adjusted EBIT	**32.3**	**33.2**	**28.0**	**24.4**	**25.5**	**30.5**
Growth	20%	3%	-16%	-13%	4%	20%
Adj. EBIT margin	9.4%	8.5%	7.6%	7.3%	6.6%	7.1%
Non-recurring costs	-7.2	-4.7	-1.4	-7.0	-3.0	-1.0
EBIT	**25.0**	**28.5**	**26.5**	**17.4**	**22.5**	**29.5**
Growth	89%	14%	-7%	-34%	29%	31%
EBIT margin	7.3%	7.3%	7.2%	5.2%	5.8%	6.9%
Net financial profit/Expenses	-3.6	-0.7	0.5	-0.4	-0.3	-0.3
Other financial profit/Exp	0.0	0.0	0.0	0.0	0.0	0.0
Total financial expenses	**-3.6**	**-0.7**	**0.5**	**-0.4**	**-0.3**	**-0.3**
Non recurring pre tax	0.0	0.0	0.0	0.0	0.0	0.0
Profit before tax	**21.5**	**27.9**	**27.0**	**17.0**	**22.2**	**29.2**
Growth	243%	30%	-3%	-37%	30%	32%
Taxes	**0.3**	**-2.0**	**0.0**	**-1.5**	**-1.5**	**-1.6**
Tax rate	-2%	7%	0%	9%	7%	5%
Minoritiy interests	**-3.6**	**-1.5**	**-0.8**	**-1.2**	**-1.3**	**-1.4**
Non recurring post tax	**na**	**na**	**na**	**na**	**na**	**na**
Net income	**18.2**	**24.3**	**26.2**	**14.3**	**19.4**	**26.2**
Growth	1260%	34%	8%	-45%	35%	35%
Net income margin	5.3%	6.3%	7.1%	4.3%	5.0%	6.1%
Adj. net income	**21.8**	**26.9**	**21.2**	**21.2**	**22.2**	**26.8**
Growth	63%	23%	-21%	0%	5%	21%
Adj. net income margin	6.3%	6.9%	5.7%	6.3%	5.8%	6.3%

CF Statement	2017	2018	2019	2020E	2021E	2022E
Cash Flow from Operations	36.0	39.8	43.0	33.1	38.8	46.2
(Increase) decrease in OWC	46.2	3.7	12.0	-11.3	-6.9	-6.0
(Purchase of fixed assets)	-28.6	-22.9	-28.6	-33.0	-27.0	-25.0
(Other net investments)	67.0	0.2	-2.7	0.0	0.0	0.0
(Distribution of dividends)	0.0	-10.0	-11.6	0.0	-11.6	-11.6
Rights issue	0.2	0.0	0.0	0.0	0.0	0.0
Other	-60.5	-3.3	-3.6	-5.0	-5.0	-5.0
(Increase) Decrease in Net Debt	**60.3**	**7.4**	**8.7**	**-16.2**	**-11.8**	**-1.4**

Source: Equita SIM estimates and company data

INFORMATION PURSUANT TO EU REGULATION 2016/958 supplementing Regulation EU 596/2014 (c.d. MAR)

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RECOMMENDATION/RATING	Low Risk	Medium Risk	High Risk
BUY	ETR >= 10%	ETR >= 15%	ETR >= 20%
HOLD	-5% <ETR< 10%	-5% <ETR< 15%	0% <ETR< 20%
REDUCE	ETR <= -5%	ETR <= -5%	ETR <= 0%

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Date	Rec.	Target Price (€)	Risk	Comment
nil				

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REDUCE	1.8%	1.4%
NOT RATED	1.8%	2.7%

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