# Seeking ESG and financial sustainability

Intertwined environmental and financial sustainability in aviation are critical success factors. *By Professor David Yu, Ph.D., CFA, Senior ISTAT Certified Aviation Appraiser and Dr. Alessandro Cento*

Environmental and sustainability in aviation have different meanings to different parties. For investors and financiers, they can mean metrics such as ESG (environmental societal and governance) which are not universally defined and can mean different things compared to the one's airlines use in their operations. How can environmental and financial sustainability concepts be intertwined and affect the future of aviation?

One of the biggest environmental areas is greenhouse gas emissions which aviation as an industry has contributed 1 billion ton (2.4%) of all global carbon emissions (CO2) until 2018 with an increase of 32% compared to 2015. In addition to CO2, aviation emissions include other greenhouse gasses, such as nitrous oxides, and produce the contrails which have also a climate-changing effect (Lee et al., 2010). Although these figures are still relatively low (e.g. road traffic emission account for 12%), climate change is a critical issue to address to the aviation industry. Since the onslaught of COVID-19, the effects of these emissions have decreased significantly as the scale of travel has depressed zsignificantly compared to the previous growth periods of the industry.

Financial sustainability independently and also as part of environmental concerns is another one of the main segments that investors and financiers care greatly about. Historically, the industry's operating margin performance since 1971 shows a precarious fluctuation of small profit (average 2.7%, with best 8.3% in the history in 2017) and losses. However, since 2009 the industry has benefited from a decade of small but steady operating profit margin growth.

## ENVIRONMENTAL SUSTAINABILITY

Sustainable development is the idea that human societies must live and meet their needs without compromising the ability of future generations to meet their own needs (Brundtland Report, 1987).

In aviation, the main attention is primarily on greenhouse gas emissions, noise, contrails that contribute to global warming. These are perhaps currently the largest single environmental externality of air transport at the moment, in addition to the use of non-renewable sources, land or and water uses at airports.

At the 39th ICAO Assembly in 2016, the adoption of the Carbon Offset and

Reduction Scheme for International Aviation (CORSIA) was reached after 3 years of efforts. It provides a scheme for capping the growth of aviation's net emissions from 2020 onward, aiming to achieve carbon neutral growth since 2020 and for a 50% cut in 2005 level carbon emissions by 2050. This would mean aviation companies will have to improve fuel efficiency as well.

To achieve these goals, ICAO member states agreed on a global market-based measure approach, consisting of four pillar strategy: technology (including more fuel-efficient aircraft as well as sustainable alternative fuels), more efficient aircraft operations, infrastructure improvement, and a single global market based measure.

However, despite the enormous efforts, the air transport has very limited scope for reductions in emissions in the short to medium term (Hodgkinson et al., 2007) as the technology is locked in through the long investment cycle. Therefore, the main focus of the industry is on alternative sustainable fuels and aircraft consumption efficiency.

Sustainable aviation fuels produced from bio-based feedstocks that have a lower carbon intensity, can reduce CO2 emissions by up to 80%, but the production needs to increase from current 15 million per year to 7 billion liters per year by 2025 so economies of scale can make it less expensive than kerosene (currently 4 times more expensive) and distributed everywhere. So far, there are only five airports with regular biofuel distribution (Bergen, Norway; Brisbane, Australia; Los Angeles; Oslo; and Stockholm), with others offering occasional supply.

The technology related to aircraft propulsion can make a big difference. Each new aircraft generation yields approximately 15% fuel efficiency improvement compared to the previous generation which both directly affects the operating cost but also creates a halo effect of its assets compared to previous generations. Despite the new technology aircraft and engines, there is more room for improvement with the real revolution coming from electricity or cryogenic hydrogen fuel technology. Fully electric - recharged from renewable energy – can reduce emission potentially up to 100%. Electric-powered aircraft or hydrogen fuel is unlikely to be commercially ready soon but there many parties attempting to be first with those under development not expected to be delivered earlier than 2035.

## FINANCIAL SUSTAINABILITY

Financial sustainability has to do with the ability of the industry or firms to earn profits sufficient to make it worthwhile to continue business in the long run. In the last 25 years, the return on invested capital (ROIC) was never above the industry average cost of capital (WACC), which is a measure of what investors could have earned by investing their capital elsewhere. Until 2014, industry-wide airline returns have not been as high as the industry's cost of capital in any of the regions. However, in the last five years, the picture has improved as North American and European airlines have created value for their investors since 2014. On the other hand, regions including Asia Pacific, Latin America, Middle East and Africa continued to destroy investor value in aggregate.

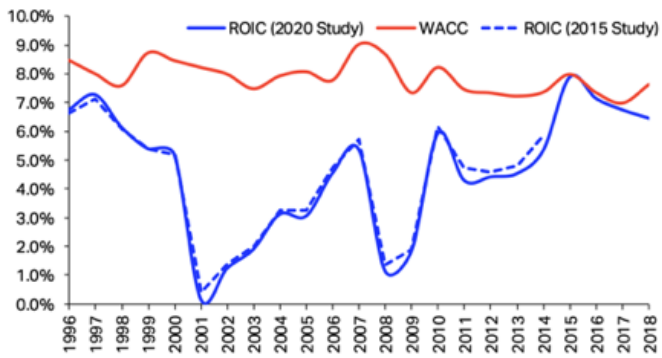
Low fuel prices are clearly associated with the growth trend of ROIC. The fuel price trend explains the fall of the breakeven load factor, but not only. The breakeven load factors were starting to turn down due to two emerging structural changes in the industry: a reduction of fragmentation in North America and Europe leading to efficiency gains; and the growth of product unbundling (ancillaries). Both of these supported yields relative to unit costs and so reduced breakeven load factors (BE load factor = unit cost/yield).

On the other side, the operational efficiency of the airlines as pushed up the operational load factors, so the growing gap between load factors (passenger and cargo) and breakeven load factors have increased, so it did the profit margin. ROIC can be to split into its component parts of operating margin and capital productivity, as a proportion of invested capital:

**ROIC = adjusted EBIT/ invested capital = EBIT/revenue * revenue/ invested capital**

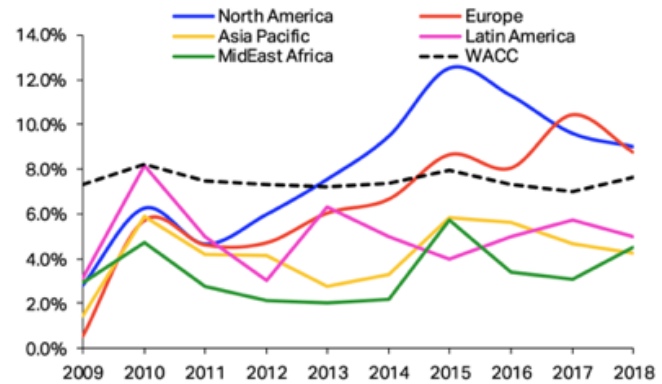
This explains how the growth of product unbundling (ancillaries) revenue affects ROIC improvement, in addition to supply consolidation and fuel price development.

**AIRLINE INDUSTRY ROIC vs WACC**




Source: McKinsey & Company for IATA

**REGIONAL DIFFERENCES in ROIC**




Source: McKinsey& Company for IATA

## THE LINK BETWEEN FINANCIAL AND ENVIRONMENTAL SUSTAINABILITY

The connection between financial and environmental sustainability lays in the measure as the latter became an extra-cost to be absorbed either in cost efficiency improvement or/and increase unit revenue.

Increasing unit revenue depends on the ability to pass on to customers the new cost. The more the market is competitive and the less amount of cost can be passed on the customers, so proportionally airlines and customers have to pay this cost, whether through taxes, or alternative emission schemes. Someone may argue that reducing competition will result in fewer seat supply, increased prices and lower traffic growth. That could be one option to reduce emission and increase profitability, i.e.: an industry down-scale.

Fuel taxation is unpopular with many countries and the response to even an effective policy by aviation is likely to be quite small due to the technological limitation of reducing emissions in the mid-term. The technology is locked in because of the long-lifetime of new aircraft; for example, the fleet in 2030 will substantially comprise the best of today's technology, which has been delivering diminishing returns in terms of fuel efficiency. Moreover, given the four-time more expensive biofuel, without a supportive policy framework, aviation is unlikely to scale up its consumption to become self-sustaining.

In order to achieve combined environmental and financial sustainability, the industry, governments and other stakeholders have to work together to persist in the current structural changes to grow return on invested capital, support the full implementation of CORSIA, boost the usage of SAF, accelerate the introduction of new aircraft technologies (hybrid and full electric or hydrogen fuel) to take advantage of increased revolutionary efficiencies by the opportunities that are presented.