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Resilience and efficiency through Leadership and Cooperation

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Introduction

The global coronavirus (COVID-19) pandemic has placed extreme strain on the aviation industry. However, it has also given cause for reflection on the broader organisation of the sector and current models of governance. The dramatic decline in traffic has stress-tested the financial viability of the industry with companies going out of business, jobs lost, and extreme hardship experienced by most.

An event of the scale of the COVID-19 pandemic is an existential threat at a systemic level. It is an instance of a factor that reaches across borders, jurisdictions, and has effects across the global industry. Any response requires a coordinated approach to hazard recognition, short-term risk mitigation and long-term recovery.

It is important to remember that aviation contributed to the pandemic in two ways:

- Firstly, by facilitating global trade, it forms parts of a system that creates the conditions for zoonotic disease outbreaks and,

- Secondly, by facilitating the rapid transmission of the virus through the carriage of passengers.

  The pandemic also cast a harsh light on the harmful by-products of aviation: emissions and vapour trails. Clear blue skies became a hallmark of the first phase of lockdown in many countries. Any lessons we take from this experience must look at the broadest possible picture.

  The first section of this paper will address the shared goals of stakeholders, the tensions that arise and the implication of cross-scale effects at a system level. The second section of the paper will deal with governance.

  Stakeholder Goals, Tensions and Risk

  What, then, are the shared goals of the stakeholders in the aviation industry and does the achievement of these shared goals benefit all stakeholders? A year after the World Health Organization (WHO) declared COVID-19 for a global pandemic and throughout the ambivalent course of public health management, three main themes can be identified: maintaining trust; ensuring viability and mitigating anthropogenic risk.

  Trust is an emergent property of the aviation system and, quite simply, is a measure of the willingness of people and organisations (airlines, shippers, etc.) to board or put cargo on an aircraft. One well-known effect of the 9/11 terrorist attacks was the increase in road traffic fatalities in the United States as travelers chose to drive rather than fly. At an organisational level, we might argue that trust flows from internal processes used to regulate work and to mitigate external operational hazards, usually under the heading of Safety Management Systems. These

factors are, to a degree, within the control of single business entities. Geopolitical threats (terrorism, regional tension, conflict), atmospheric disturbances on a mega scale (volcanic ash, extreme weather events) and pandemics exceed the capacity of a single business entity and require a response at an international level. It seems that this class of threat is the most likely to increase in frequency and will have the biggest consequences for all. Finally, the Boeing 737MAX experience has shown that regulatory oversight, itself, represents a significant process risk but also one that can have a significant impact on trust.

Commercial viability can be improved through reducing operating risks. Two areas of interest are efficiency and effectiveness. Efficiency gains would flow from increased harmonisation and reduced process risk. Harmonisation includes a suite of activities that result in the seamless operation across jurisdictions (ATC interfaces, global routing, weather avoidance, notification of change, common compliance requirement). Process risk mitigation looks at cost and risk transference meaning when activity in one part of the system creates consequences elsewhere (incorrect documentation and packaging for Dangerous Goods, inaccurate/fraudulent freight forwarder processes, fuel quality monitoring). Effectiveness describes non-revenue impositions such as training, audit and compliance. Unless these activities represent genuine added value they serve merely to act as financial burdens. To this list we should add the implications of emerging airspace usage, such as Unmanned Aircraft Vehicles (UAV) and extra-terrestrial vehicles. Activities such as these will probably result in more, albeit temporary, airspace restrictions which might have implications for traffic routing and, thus, fuel consumption.

Anthropogenic risk flows from the impact of human activity. In this case, the term is used to describe the consequences of aviation-related processes. The most obvious example of risk in this category flows from direct emissions (CO2, vapour trails (albedo), Nitrous Oxide (local effects, global effects)) but we also need to consider carbon budgets associated with infrastructure (construction, operation). Future developments will need to consider the sustainability agenda (lifecycle costs of aircraft, delivery of service, infrastructure) and all regulation should probably tested against this specific criterion. For example, in the area of pilot recurrent training, the onus should be on the regulator to demonstrate why alternative, more sustainable, technologies (networked VR simulation, say) do NOT meet the requirements for accreditation. But the systemic risk here is not simply the direct effects of emissions on climate change, but the implication of shifts in public opinion. First, airline carbon offsetting schemes do nothing to address the historic record on emissions, simply attempting to mitigate the effect of on-going operations. The question is one of moral hazard. In short, will the public continue to tolerate an industry that does not bear its full costs? Linked to this is the issue of employee well-being. As our understanding of the health effects of fatigue and the broader problem of mental health, generally, it is becoming clear that some of the cost of doing business is being borne by individuals and by State healthcare systems. Addressing personnel issues will have implications for business models (asset utilisation, cost of staff turnover, insurance risk)

These three goals of maintaining trust, ensuring viability and mitigating the anthropogenic impact of the industry undoubtedly benefit all stakeholders in the interconnected system of aviation. An issue with systems is that this interconnectedness can create unanticipated problems. For example, post-pandemic air carrier recovery will not simply be a case of revalidating pilot licenses. Competence will have to be rebuilt over time. Grounded aircraft have been subject to degradation and will need more than routine inspection before they can be returned to service. The disruption caused by the pandemic points to a broader set of contingencies for which the industry must plan in anticipation of the next such disruption. In future, Emergency Response Planning (ERP) will need

to consider longer time horizons so that cross-scale effects and unintended outcomes from recovery management under uncertainty can be accommodated.

Action in support of these shared goals will benefit the industry as whole but there will be local variations in the significance of the goals and between entities in their ability to act in support of the goals. For example, regional differences in investment in infrastructure will affect system efficiency.

Having established three target areas of policy that should contribute to the future of the global industry, in the next section we will look at the challenges of delivering solutions in a competitive environment.

Governance and the Future of Aviation

Because of territorial differences in funding, existing infrastructure, level of maturity of the industry and existing states of stakeholder integration and coordination, it is important that work directed at achieving shared goals does not adversely disadvantage groups of stakeholders. Coordination between State versus non-State actors already presents challenges. State National Aviation Authorities operate under resource constraints and even existing oversight requirements can be challenging to meet. Trends towards delegation of aspects of oversight to third parties, to clients (performance-based regulation) and management through compliance regimes runs the risk of weakening oversight. Negotiated, discretionary participation (witness the US's actions in relation to the Paris Climate Accord and the WHO under President Trump) mean that effort in relation to shared goals might not be guaranteed. An uncoordinated approach would make it difficult to preventing entities avoiding restrictions and thereby gaining advantage. Before looking at what a control structure might look like for a future global aviation system, we need to explore new approaches to regulation, generally.

The COVID-19 pandemic caused anticipated stress to risk management at all international levels. Yet, it has revealed a woeful lack of preparedness in most countries. Individual States have elements of an effective response but no State has the complete solution. Although initiatives are now emerging to support the return to normal working (International Air Transport Association (IATA) vaccine passport being an example), there is a need for a single 'future risk' research body that can support contingency planning. Solutions need to be evidence-based. An evidence-based approach is one that looks at all possible interventions and identifies those which will have the most efficacy for a given set of conditions. Importantly, the evidence is provided by controlled trials. Cultural differences as well as access to supplies are influencing vaccine uptake, so any response must be able to accommodate geographic, cultural and temporal variations. An evidence-based approach must be extended to all areas of regulation to support the shared goal of economic viability. For example, training transfer trials over the past 40 years have shown that high fidelity simulation is not necessary for pilot training. The Volpe Research Centre, USA, did work on low-cost motion systems 20 years ago. There are now readily available low-cost networked virtual reality capabilities that could revolutionise pilot training. However, an extensive installed equipment base linked to a regulatory framework rooted in the 1960s is an impediment to innovation, a barrier to entry for new technology and a possibly unjustified cost to the industry. A centralised research capability that addresses the range of challenges to the shared industry goals would lead to compliance regimes directed solely at effective outcomes. Linked to this is a need for improved personnel training, with increased professionalisation of all levels of management in the industry.

A coordinated approach to supporting these shared industry goals will require an entity with both credibility and the authority to act. A Systemic Threat Centre would provide a faster, more agile responses to risk. Responsible for the constant monitoring of significant systemic threats

(atmospheric, health, airworthiness), the centre would coordinate a research programme, develop responses and providing input to ERP at State and entity level. Recognising regional differences, there would need to be a network of centres empowered to coordinate action and escalate responses as required. The centres would therefore need funding and powers. Such an approach would reduce opportunities for divergence and, hence, reduce unfair competitive advantage accruing to individual States or entities.

The challenge of developing unified responses to system threats is clearly illustrated by the COVID-19 pandemic. While the shift to increasingly contactless processes should act as a catalyst for ever smarter uses of technology, the real issue is how to restore traffic in ways that reduce barriers. Differences in State testing and vaccination regimes, access to individual data, local track and trace capabilities, the implications of inter-State differences in vaccine approval, quarantine requirements and subsequent management all affect passenger willingness, and ability, to travel. Furthermore, it is not clear how differences in vaccine approval might impact the validity of flight crew medical certificates. Finally, unilateral bans on direct flight between countries have resulted in travelers finding alternative routes via the remaining open borders (for example, passengers from South Africa to the UK routing via the Gulf region; because of BREXIT, passengers to the UK from proscribed ports of embarkation can land in the Republic of Ireland and cross the open border to continue to the UK via Belfast). Although IATA has launched its Travel Pass, which brings together data about a passenger's test record and current vaccine status, the concept of a 'vaccine passport' is highly contentious in many States. An industry response would need to be able to offer authoritative guidance on dealing with these issues, accepting that the risk of providing poor advice would be catastrophic. Guidance must accommodate local variations in capability.

Of course, such is the political nature of an individual States' response to a pandemic that enforcement of a code of coordinated best practice would be problematic. Unfortunately, arbitrary impositions act in ways similar to non-tariff trade barriers. They represent a constraint on the limited existing opportunities, impede recovery and afford opportunities for protectionist policies. The experience of the WHO during the current pandemic illustrates the challenges faced by a UN body working in a dynamic situation with uncooperative stakeholders. In some ways, the problem reflects the challenge of an organisation that is essentially designed to create policy and to coordinate but with limited executive capabilities, always dependent upon support for Member States. Any future systemic risk structure will need global reach, must have independence but must also have executive power, the ability to arbitrate and, also, to sanction if necessary. Working through trade or military alliances might offer executive power but will only offer piecemeal coverage and present too many political obstacles. An independent agency sponsored by key stakeholders should be the goal.

The Financial Stability Board (FSB) offers an analogy we can look to for an international institutional innovation body that can provide future leadership. Like the FSB, a future Global Aviation Stability and Recovery organisation will need top-level commitment from all States and be staffed by recognised experts. It must be independent and have a duty to actively create solutions appropriate for the needs of all States. It will, ultimately, need powers of intervention, although recourse to a Court of Arbitration, such as that of the World Trade Organization (WTO), might suffice.

Conclusion

The threat of significant disruption to global aviation, even an existential threat to large segments of the industry is a reality. In order to sustain a viable aviation sector, the industry needs to be able to

respond quickly and, more importantly, with interventions that will have maximum efficacy while recognising differences between geographic regions and types of operation.

An effective response would be predicated on sound, research-driven policies. There needs to be effective regular, communication with stakeholders. There also needs to be a 'professionalisation' of management in aviation such that local implementation of action is more reliable. Caution is needed, however, to guard against cross-scale effects that might result in unintended outcomes propagating across the system. To meet the future needs of the global aviation system, two agencies are required.

First, there is a requirement for a research body that is tasked with creating a future risk register that identifies both emerging threats and potential hazardous conditions based on current trends. The body will examine emerging technologies and models of collaborative behaviour to potential solutions and suites of responses. The goal will be to have repertoires of prototypical solutions capable of being rapidly scaled up in the event of a crisis. The research body will undertake original research, coordinate research through networks of experts and test the products of research to ensure that recommendations are evidence-based.

Second, control must be exercised through an agency that has global reach, has executive powers and has access to meaningful sanctions. The suggested Stability and Recovery organisation would provide the leadership needed in a time of crisis. The agency must be capable of independent, impartial action. Enforcement must be either directly through its own court of arbitration or facilitated through agreements with other executive agencies. The purpose of this agency is to guarantee equitable response that support the global industry in a crisis.

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