CHAPTER 9

Conclusion

It is already three decades since David Harvey, a renowned geographer and anthropologist, wrote his seminal work The Condition of Postmodernity and coined the concept of time-space compression. According to Harvey, at the heart of contemporary, post-modern societies lies the technologies that ‘annihilate[d] space through time’ and have ‘shrunk the world’ to a fraction of its former size. What the famous geographer and anthropologist had in mind was two technologies which forced humans to cope with the ‘overwhelming sense of compression’ [emphasis in original] of our spatial and temporal worlds. With IBM Simon and Nokia 9000 arriving in the market in mid-1990s, Harvey could only foresee the advent of the Internet Age and smartphones. However, by the late 1980s, it was already clear enough that the jet passenger aircraft had fundamentally revolutionised and transformed how a person understands its Dasein, i.e. among other things its presence and perception of time-space relations. Therefore, he regarded the jet revolution of the 1960s as one of the thresholds dividing the post-modern society from its pre-modern and modern predecessors. Whereas ‘horse-drawn coaches and sailing ships’ dominated the pre-modern era, ‘steam locomotives… and steam ships’ the early modern and the ‘propeller aircraft’ the late modern, the speed of jet planes captured the imagination and formed spatial being
in the condition of postmodernity. Yet, except for a simple figure 3.1 on page 241, Harvey did not provide any details on how these revolutions in transportation emerged and what caused them.

With its prevailing focus on the period of the Cold War, this book targeted the last of these major transitions associated with slow, longue durée transformations at supra-systemic level. In doing so, it regarded the moyenne durée, East-West confrontation at systemic level as a primary and the most important stimuli in the transition from propeller to the Jet Age. Yet, albeit recalling the flamboyant jet-set era, the term is rather a catchphrase which reduces the complexity and makes the historical development a little less blurred than it really was.

In fact, in the 1950s and 1960s, first military and then civil aviation underwent a transition from piston engines to turbofans. In this regard, turboprops and jet engines presented only an intermediary stage. Of the latter two, turboprops were much more successful despite being generally disregarded by many contemporaries as a mere stepping stone to jet propellants. Contrary to many younger practitioners, Louis Charles Breguet, a pioneer of French aviation, did not share this ‘jet enthusiasm.’ Arriving in Washington for the International Air Pioneers dinner in October 1953, Breguet told Aviation Week that albeit the ‘turboprop engines [would not] reach their optimum “for many, many years” [they would] eventually power all transport aircraft’ in the future. Elaborating his idea further, he said that turbojets would ‘certainly’ have their place in ‘military war planes.’ But in terms of civil aviation, in terms of ‘aviation for peace,’ the future rested with the turboprops which would ‘enclose the

1 The power of these transportation means was so strong that they eventually transpired from the sphere of technik (technology) to techne (art) and even further beyond. Thus, the ship of state entered, with Plato’s Republic, philosophy and with Leonard Cohen’s song Democracy popular culture. The trains are a subject of numerous folk tunes including, perhaps most famously, a traditional Southern gospel This Train (Is Bound for Glory). Also, inspired by the sound of the steam locomotive, the orchestral work Pacific 231 eventually won Arthur Honegger notoriety and was used in short films by Mikhail Tsekhansky (1931) and Jean Mitry (1949). In a somewhat nostalgic mood, Steve Goodman depicted a transition from trains to jets in a long-distance travel in his City of New Orleans. Yet, a transition from turboprops to jets left a visible mark in popular music, too. While a booklet on Frank Sinatra’s 1958 Come Fly with Me album still came out with the Trans World Airlines’ Super Connies in the background, seven years later, Astrud Gilberto already sung of a silver jet that would bring her Non-Stop to Brazil.

2 David Harvey, The Condition of Postmodernity: An Enquiry into the Origins of Cultural Change (Cambridge and London: Blackwell, 1990), 240–2.
propeller inside the engine.’ Thus, what Breguet foresaw was a geared turbofan engine which effectively performs as a ducted turboprop.³

Already into his 70s, Breguet may have seemed, depending on one’s perspective, either a foolish old man or a prophet much ahead of his time. But he was neither. The French manufacturer Turbomeca, now Safran Helicopter Engines, constructed and successfully tested one such turbofan engine in 1951.⁴ Designed by the company’s founder and director, Joseph Sydlowski, with the sponsorship of the French Air Ministry, in April 1952, the Aspin I eventually became the first turbofan engine to power an aircraft ever (the Fuga Gémeaux IV). Half a year earlier, when reporting on Continental Motors acquiring the US manufacturing rights for this and other eight Turbomeca engines, Aviation Week described a ducted fan as being somewhere ‘between… a turboprop and turbojet’ in its performance characteristics. ‘For a given fuel flow,’ the weekly went on ‘thrust [was] substantially higher under static conditions than a turbojet, but lower than a turboprop. At high flight speed, the condition [was]…

³In essence, the higher the bypass ratio, the more a turbofan engine resembles, performance and operation-wise, a ducted turboprop than a turbojet. This is because the kinetic energy (thrust) is in a turbofan delivered both by turbine and fan. Since the early turbofans were developed from turbojets, they produced thrust mostly through the hot section and were rather considered a variant of a turbojet with forward low-pressure compressor (fan). See below ft. 5 and for original reference, cf. ‘Turboprops Top Jets For Liners: Breguet’, Aviation Week, 2 November 1953, 22 and 24.

⁴Unlike most turbosfans over next five decades, the Aspin I came with a gearbox which optimised the revolutions-per-minute rate of the fan. Since jet engines used no gearbox, either, the mechanism surely reminded Breguet of the geared propeller engines which prevailed on the aircraft of 1930–1940s. This, most likely, induced him to speak of a propeller rather than of a fan. In early 1950s, the General Electric experimented with the idea of gearing the fan, too, but its D-2 test engine proved underpowered until reaching the optimum revolutions-per-minute ratio to which it was designed. Albeit smaller turbofans that employed the gearbox, Garrett TFE731 and Lycoming ALF502/LF507, became common on private jets in 1970–1980s, the large turbofans dropped this feature and producers opted for a clean two- or three-spool layout. The first large geared turbofan engine (Pratt&Whitney 1000G) was certified by the Federal Aviation Administration only in 2014 and can now be found on the latest generation of the narrow-bodied short-to-medium range airliners by Airbus (A220/A320neo family) and Embraer (E-Jet E2 family). This engine was also selected for the Russian Irkut MC-21 twinjet which was developed by Yakovlev Design Bureau and is undergoing certification at the moment. A geared turbofan by Rolls-Royce, Trent UltraFan, should be ready for service by the mid-2020s. Cf. George E. Smith and David A. Mindell, ‘The Emergence of the Turbofan Engine’, in Peter Galison and Alex Roland (eds.), Atmospheric Flight in the Twentieth Century (Boston: Kluwer Academic Publishers, 2000), 126–7.
reversed, the ducted fan developing more thrust than the turboprop but somewhat less than the pure jet.’ In general, wrote the same magazine in October 1952, ‘the by-pass, or dilution, jet [was] first and foremost a design for fuel economy’ that ‘look[ed] good for transport types’ as offering ‘low-cost high thrust for climb [and] cruise.’

Nonetheless, by the mid-1950s, the turbofan propulsion was still in its infancy. The choice of airlines in the West therefore seemed to be between the turbojet or turboprop power plants with a supercharged Wright R-3350 Duplex Cyclone turbo-compound engine fitted to DC-7s and Lockheed L-1049 Super Constellations continuing to hold the last stand for propeller propulsion in large airliners. Yet, with the Rolls-Royce Conway, Pratt&Whitney JT3D and General Electric CJ805-23 turbofans starting to roll out of production lines in large number by the turn of 1950–1960s, airlines hastily shifted to these more economic and efficient alternatives ordering either new planes or upgrading their recently acquired B-707/720s and DC-8s from turbojets to turbofans.

However, it was the desire to retain strategic nuclear superiority but by more powerful and, at the same time, fuel-efficient engines which prompted the development of turbofan engines. And, given the tremendous costs of initial defence programmes, the commercial airlines in non-communist countries adapted the new technology at relatively low price. The same pattern of military-civilian cross-fertilisation worked on

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5 Cf. ‘Test Resumed on French Aspin I’, *Aviation Week*, 2 April 1951, 30–1; ‘French Turbines Enter US Field’, *Aviation Week*, 15 October 1951, 32–6; ‘Gemeaux IV Flies with Aspin I Ducted Fan’, *Aviation Week*, 28 April 1952, 35 and ‘By-Pass Engine Promises Fuel Economy’, *Aviation Week & Space Technology*, 24 November 1952, 23–6.

6 Cf. e.g. ‘TWA Dilemma: Turboprops or Jets’, *Aviation Week*, 27 December 1954, 17; ‘AA Nears Decision on Turboprop Order’, *Aviation Week*, 16 May 1955, 13–4; ‘American orders Area-Ruled Jetliners’, *Aviation Week*, 4 August 1958, 38–9; ‘American Schedules Turbofan Retrofits’, *Aviation Week*, 11 April 1960, 50 and ‘TWA Orders 30 Turbofan Transports’, *Aviation Week*, 4 August 1958, 39.

7 While Conway was developed from Rolls-Royce Avon turbojet engine and intended for the Vickers V-1000 airlifter, it eventually found its home in an updated version of the Handley Page Victor strategic bomber and Vickers VC10s transport and refuelling aircraft, the Pratt&Whitney JT3D and General Electric CJ805-23 turbofans emerged from J57, respectively, J79 military turbojets and powered a variety of military aircraft. Whereas the J57s were among others fitted to B-52 Stratofortress, C-135 Stratolifter and KC-135 Stratotanker produced by Boeing or Lockheed U-2 spy plane, the J79s powered several interceptor and fighter-bomber aircraft including the F-4 Phantom II, F-104 Starfighter, North American A-5 Vigilante and some versions of the F-16 Fighting Falcon. Cf. Smith
the other side of the Iron Curtain as well, but there was one essential difference in the Soviet approach stemming from the success of a particular aircraft design. This was the Tu-95 Bear strategic long-range bomber, one of the most iconic airplanes of the Cold War era, and it led the Soviets to place their faith in turboprops for the future. Indeed, it was a safe bet. As a response to the B-52 Stratofortress, the Tu-95 was almost as fast as its jet-powered competitor while having about the same range. With the plane good enough to keep it in the air for at least the next few decades from now, the Soviet military and designers lacked any particular incentives to boost up the performance of Tu-16 Badger and Myasishchev M-4 Bison strategic bombers, particularly when even the former Secretary of the Air Force, Stuart Symington, came to believe that ‘the United States, along with the rest of the free world, may have lost control of the air’ albeit the West still had the ‘advantages in base location and training.’

While the Red Army’s ‘spin doctors’ played their cards well and tricked Washington into reckoning that the USSR was quickly catching up with the US in strategic bombing capacity, the Soviet leader Khrushchev became dissatisfied by the fact that the range of the latter bomber was only 9000–9500 kilometres (5600–5900 miles) instead of desired 12,000–16,000 kilometres (7500–9940 miles). The bomber was thus unable to reach the US, drop its load and return safely to the USSR without in-flight refuelling, which was what in 1949 its chief designer, Vladimir Myasishchev, had promised Generalissimo Stalin to deliver. This displeased Khrushchev, and in 1960, he ordered the Myasishchev design bureau to merge with the OKB-52. Founded by Vladimir Chelomey in 1944, this design bureau focused on development and production of

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8The Tu-95s should be flying at least until 2040. The same also applies to B-52s which should be in service until the 2050s after the last upgrade.

9Cf. ‘Symington Shocked’, *Aviation Week*, 23 May 1955, 12.

10Cf. ‘Russian Jet Airpower Gains Fast on US’ and ‘Double Shock for Americans’, *Aviation Week*, 23 May 1955, 12–5 and 122, respectively.
tactical missiles, which, as Khrushchev correctly believed, would make strategic bombers obsolete.\footnote{John T. Greenwood, ‘The Designers: Their Design Bureaux and Aircraft’, in Robin Higham, John T. Greenwood, and Von Hardesty (eds.), \textit{Russian Aviation and Air Power in the Twentieth Century} (London and Portland, OR: Frank Cass, 1998), 188–9.}

Soviet civil aviation, consequently, entered the 1960s with great confidence in turboprop technology, but with only one turbofan engine, Soloviev D-20P, on which to build for the future. A non-afterburning derivate of an engine intended for the ‘113’ (Tu-113) air-to-surface missile which Tupolev was developing for the Tu-95 bombers, the power plant first appeared with the Tu-118 short-haul airliner in March 1960 delivering a maximum thrust of 5400 kgp (53KN/11,900 lbf). Yet, this was not enough for larger medium- to long-haul planes which Khrushchev desired as a Soviet response to the immensely successful B-707 and DC-8 jetliners. Impressed in 1960 by the smoothness and quietness of his flight in a Sud-Aviation Caravelle, which came with aft-mounted engines, Khrushchev requested Ilyushin and Tupolev to design similar transports while insisting on the same structural layout. Simultaneously, the Kuznetsov and Soloviev bureaus were solicited to furnish the turbofan engines suitable for supporting such planes. The jetliners should also be developed and produced at a relatively quickly pace since a Soviet-Czechoslovak framework agreement envisaged the delivery of the first aircraft to the CSA in 1964.\footnote{NACR, KSC-UV-AN I, folder 171, Karlík (Director CSA) to Novotný (Chairman of the KSC), 2 December 1966. See also Gordon and Rigmant, OKB Tupolev, 233–6 and 239.}

Yet, by December 1966, neither the long-range Il-62 nor the medium-range Tu-134 transport had met airworthiness criteria. According to a report for the Politburo of the Czechoslovak Communist Party, both planes were underpowered while the airframes were prone to fatigue and were not up to international standards. For these reasons, the delivery of both aircraft to CSA was rescheduled to 1969. Despite Aeroflot eventually launching services with both airliners in 1967, this did not change the fact that the Soviet aircraft industry could only deliver its alternatives to turbofan-powered versions of the B-707 and DC-8 some 7–8 years...
As Chapter 6 demonstrated, however, by the late 1960s, Western industries began to re-tool for a transition from narrow-bodied airliners powered by low-bypass engines to wide-body transports fitted with high-bypass turbofans. While in the US these developments were once again driven by Air Force requirements, a decision to form Airbus was a sort of last resort option for West European civil aviation producers in order to survive in a market dominated by American manufacturers. The Soviet aviation industry responded to these Western developments with the Il-86 wide-body airliner but rather than cutting the turbofan gap, this, in fact, grew to 10 years and even that figure did not reflect the true gap behind its Western competitors.

Despite the arrival of the monstrously big Antonov An-124 and An-225 Mriya airlifters in the 1980s, the Soviet aviation industry eventually failed to deliver a single modern civilian airliner with low positioned wings with high-bypass turbofans mounted underneath them. Effectively, the Tupolev and Yakovlev designs remained frozen in the late 1950s and early 1960s with the French Caravelle as their initial inspiration while Ilyushin’s Il-86 was an uneconomic mismatch of a heavy wide-body airframe and fully tweaked low-bypass turbofans, which resulted in extremely high fuel consumption. But excessive usage of oil was something which neither Soviet civil aviation nor economy could afford, particularly in a situation when the US seemed to orchestrate a surprise ‘bolt from the blue’ nuclear strike. The indefatigable desire on part of Politburo members to secure against such eventualities by conserving the scarce fuel resources for strategic reasons along with their putting the whole economy on a warlike footing brought the civil aviation industry in the socialist camp to the verge of collapse because of lack of resources. Since the production of civilian and military aircraft was and still remains richly interdependent and mutually beneficial, a radical turn to concentrate on the production of military designs alone made the long-lasting and unending issues with low-quality and short service life of Soviet civil equipment even more pronounced. Consequently, in a ‘brain dead’ situation, the bloc’s

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13 While the Rolls-Royce Conway powered B-707-420 and DC-8-40 series entered service in 1960, the 707-320B/C and 8-50/55 series with the JT3D turbofans by Pratt & Whitney began flying in 1961.

14 An ultimate propellant of the aircraft, the NK-86 engines, presented a final evolution of the NK-8 family of low-bypass turbofans which Kuznetsov design bureau began to develop upon Khrushchev’s order for Il-62 quadjet in 1960.
civil aviation flew on autopilot until the whole system was, like the bloc
regimes themselves, shattered by spontaneous pressure from below in
1989 and 1990.

Thus, it was that East-West competition triggered all essential techno-
logical advances in aviation during the Cold War. Rapidly spreading from
military to civil aviation at relatively low costs, these innovations then
provided the ‘critical infrastructures’ for a transition of air travel from a
post-World War II experience of privilege and delight for a selected few,
to global mass air transportation. Or, as the *Flight International* already
predicted in April 1966, the Boeing B-747 and other planes which were
yet to emerge from the US Air Force CX-HLS programme ‘[would]
continue the *vulgarisation* [emphasis in original] of worldwide travel
beyond the possibilities of existing aircraft’ while bringing the opportu-
nities of air transport ‘to [yet] unprecedented proportion of the world’s
population.’

In this transition, the civil aviation of the Moscow led bloc remained
stranded somewhere in the middle. From a systemic perspective, this
was because of two factors. The first was Kremlin’s excessive reliance
on turboprop technology which was responsible for an initial gap of 7–
8 years *vis-à-vis* the West in turbofan propulsion. The second and equally
important element here was restrictions which the Western countries,
either individually or within the Coordinating Committee for Multilat-
eral Export Controls (CoCom), imposed on trade with the communist
countries. The unwillingness of Washington to provide the Soviets with
know-how about production of large-bodied airliners and high-bypass
turbofan engines in combination with British fears of repeating the same
mistake as they had made in 1947 with the sale of Nene and Derwent
turbojet engines, meant that Moscow was deprived of the possibility to
reproduce well-proven Western designs. The failed acquisition of turbofan
engines by the USSR from the US and the UK thus provided vocal testi-
mony that the sanctions and trade restrictions could work particularly in a
situation when the desired goods or technologies could not be obtained
by other means such as industrial espionage or illicit purchases.

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15 Cf. ‘Boeing 747 Ordered’, *Flight International*, 21 April 1966, 655.
16 It is of course completely different matter whether, to what extent and how the
sanctions could be effectively applied today when states like Iran and North Korea may
share the P-2 centrifuges and other technologies which could allow the former to build
new larger nuclear missiles (Nodong type) or, eventually, such technologies and arms
Yet, from a systemic perspective, this study of civil aviation sector provided further evidence on how to understand the Cold War policy-making at national as well as at intra- and cross-bloc levels. Let me start here with the United States, by far the mightiest aviation nation of the Cold War era.

Despite the above mentioned, it would be misleading to regard Washington’s attitude towards trade with the East as something overly rigid. Because of its close ties to the military, civil aviation provided a very good case to understand the evolution of American policy in this regard. After abandoning a zero contacts policy prevalent in the late 1940s and early 1950s, US actions became more targeted, informed by the desire of preventing the USSR and other socialist countries from acquiring the latest state-of-the-art equipment which would eventually enhance their military potential. This policy did not entail foreclosure on trade as such. In fact, in four years between 1960 and 1964, the US alone exported to the bloc countries wheat worth of $15.5 million in addition to other goods worth about $1 million. At the same time, bloc exports to the US reached $420,000. While these figures were relatively negligible for overall US export-import balance, as Chapter 7 showed, even such a ‘bellicose hawk’ as Ronald Reagan refused to cut all trade with the Soviet bloc in the aftermath of the 1983 KAL 007 shoot-down considering such a step entirely counterproductive.

The sale of the latest hi-tech equipment was a completely different matter, however. In this regard, besides the turbofan engines, another good example involves the case of the Swedish firm, Datasaab Contracting. In 1975, this company concluded a contract with the Soviets to build a new Terminal and En Route Control Automated System

could be obtained from multiple-sources including non-state actors. Cf. e.g. ‘A North Korean in Iran’, *Foreign Policy*, 23 July 2014, https://foreignpolicy.com/2014/07/23/a-north-korean-in-iran. Accessed 1 April 2020.

17 This indeed impacted on CSA so hardly that the airline was able to keep their DC-3s operating only by borrowing the wheels and other equipment from the Dutch KLM and Belgian Sabena, cf. NACR, KSC-UV-60, folder 27, item 371, Zpráva o situaci v zajišťování náhradních dílu pro civilní letectví [Situation report on acquisition of spare parts for civil aviation], undated but most likely 1954.

18 In 1964, the trade with the Soviet bloc countries, Mongolia and China represented 1.3 per cent of all US exports and 0.5 per cent of imports in given year. Cf. NARA, RG 237, CRR, Box 1, folder Problems with USSR and Satellites #3, North&South America 1963, Trade of the United States with the Sino-Soviet Bloc, 1962–64, June 1965.
(TERCAS) and applied to the US Department of Commerce for clearance for American made components. At a second attempt, in 1977, the request was approved provided that the system would contain no secondary radars and that certain limitations on hardware and software equipment would be met. After acquiring the company in 1981, LM Ericsson notified the US authorities that, contrary to undertakings given, Datasaab’s shipments included both primary and secondary radars, which were installed at seven monitoring sites including the airports at Kiev and Mineralnye Vody and supplied computerised data to the main control centre at Moscow Vnukovo airport for semi-automatic area tracking. For this ‘treacherous conduct… accomplished in a… deceitful manner,’ as the Judge Gerhard A. Gesell of the federal district court for Washington, DC, stated during the case, the Datasaab was in April 1984 fined $3.1 million. This was equivalent in value to all the US components in the $75 million contract. To the verdict, Ericsson ‘pleaded no contest.’

The cautious attitude as towards trading relations with the bloc encompassed the activities of the bloc airlines too. According to its policy of aerial containment, at cross-bloc level, the US strove to limit the bloc’s air services within their own orbit. Despite the initial reluctance on the part of France and the UK, in the first half of 1950s, this policy affected CSA in particular since the carrier was the only communist airline that maintained a large number of routes beyond the Iron Curtain: Prague was a main gateway for East-West air travel. In response to the general relaxation of mutual relations after Stalin’s death, the once interrupted air routes began to re-emerge. While restricted to Europe, the US supported their growth as the pressure on the British not to hinder the opening of the Paris-Prague-Moscow route demonstrated. But once the ambitions of Aeroflot and CSA turned to the Near East, Africa, East Asia and Latin America, in the late 1950s, the US responded with a policy of global aerial containment.

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19 Communicating with an aircraft’s transponder, the secondary surveillance radars display the targets’ bearing, position, altitude and speed in addition to their identity: military/civilian and friend/unknown. The primary radars only display the bearing and position since relying on reflection of emitted radio signals (Doppler effect).

20 Cf. ICAO, *Annual Report of the Council for 1981*, 1982, 48 as well as ‘Datasaab Fined $3.1 Million’, *Aviation Week & Space Technology*, 7 May 1984, 20 and ‘Moscow Airport Uses Datasaab Air Traffic Control Facility’, *Aviation Week & Space Technology*, 25 March 1985, 107.
Relying on aid from its NATO partners and local allies, US efforts only had limited success, however. Being prevented from flying to Cuba via Africa and Latin America, Aeroflot turned to an alternative: it opened a Moscow–Havana route with great pomp via Murmansk pushing the Tu-114 turboprops to their technical limits. Similarly, with the Portuguese blocking CSA flights to Cuba via Azores in violation of the 1944 Transit Agreement, the Czechoslovaks launched a Prague–Havana route via Denmark, UK, Ireland and Canada since none of those countries desired to infringe their obligations under international law. By the late 1960s, using CSA initially as a proxy because of its ICAO membership, Aeroflot thus established a foothold wherever the airline or the Kremlin wanted and in doing so sought to build two alternative round-the-world routes. A northern one was either to be an extension of Moscow–Montreal route to Tokyo via the US East Cost or an extension of Moscow–New York route to Khabarovsk via Anchorage. The alternative southern great circle route was to be an extension of the carrier’s Cuban or West African services to Latin America, and from thence across the Southern Pacific Ocean to Sydney, Australia, and from there to Jakarta where it would connect with an already existing service to the Indonesian capital.21

Yet, as their American rivals, the Soviets achieved only mixed results: in September 1971, a Soviet-Colombian air services agreement providing for an extension of the Havana route to Bogota was signed and by the mid-1970s, Aeroflot was also flying to Lima in Peru. The main factor limiting Soviet carrier’s ambitions was the obstruction on the part of Americans and Australians. The former did not wish to see Aeroflot scheduled services expanding beyond the US East Coast as Chapter 7 detailed, and the latter wished to keep the Soviet carrier out of the world’s smallest continent for good.22 At bilateral level, in 1974, after a period of ‘internal

21 Cf. ‘Aeroflot to Seek Alternate Global Routes’, *Aviation Week & Space Technology*, 20 October 1969, 112–5 and ‘Aeroflot Expansion’, *Flight International*, 18 January 1971, 227.

22 Cf. ‘Aeroflot to Australia?’, *Flight International*, 27 January 1970, 109 and ‘Aeroflot to Bogota’, *Flight International*, 30 September 1971, 499. See also Johannes L. Kneifel, *Fluggesellschaften und Luftverkehrssysteme der sozialistischen Staaten* (Nördlingen: Verlag F. Steinmeier, 1980), 137 and 140 respectively and David R. Jones, ‘The Rise and Fall of Aeroflot: Civil Aviation in the Soviet Union, 1920–91’, in Robin Higham, John T. Greenwood, and Von Hardesty (eds.), *Russian Aviation and Air Power in the Twentieth Century* (London and Portland, OR: Frank Cass, 1998), 261.
coldness’ following the long-delayed signature of the air services agreement in 1966 and introduction of flights between Moscow and New York two years later, aviation détente was over and relations between the two superpowers quickly began to deteriorate again.

Aeroflot taking the lion’s share of the traffic between the two countries, Pan Am was forced to terminate its own services to Moscow in 1978. Despite the growing tension over the Soviet invasion of Afghanistan, which resulted in the cessation of Aeroflot services to New York in January 1980, the Soviet airline continued to monopolise the market until January 1982. At that point, the Reagan Administration barred all scheduled flights between the US and USSR in response to the proclamation of martial law in Poland the previous month. The downing of the Korean Airlines 007 flight en route from New York to Seoul near Sakhalin in September 1981 precluded any hopes for an early resumption of the bilateral air services. Nonetheless, once these had been re-established in late April 1986, Aeroflot was only able to serve half of its assigned capacity. The extent of the bloc’s technological gap fully surfaced in 1988, when the Soviet carrier was forced to share capacity on Pan Am’s Super Jumbos as it had no wide-bodied planes capable of flying Moscow–New York non-stop.

Emerging out of the day-to-day decision-making, there was one particular moment that clearly distinguished Washington’s aviation policy towards the bloc from those of its allies. While most West European countries and Canada tended to regard civil aviation more in terms of commerce, Washington’s focus was through a politico-military perspective. Reflecting their own World War II experience when its commercial airlines flew on military business for the US Air Transport Command, the Americans were convinced that the primary motivation of bloc airlines was to ‘export’ the idea of communism, create diversion opportunities, increase Soviet airlift potential to critical hot-spot areas and gather intelligence. Such views were not entirely unfounded either. For example, shortly before the invasion of Czechoslovakia in 1968, two Aeroflot Antonov transports carrying KGB assault teams landed at Prague Ruzyňe airport at 8 and 11 p.m. on 20 August. With a number of KGB operatives wearing the airline’s uniforms, the first team swiftly secured the Party headquarters while the second later arrested on-duty airport employees. A group of Soviet air traffic controllers then began to clear an airlift operation with military An-12s landing in one-minute intervals ‘throughout the early morning, bringing in several thousand troops and
light armoured vehicles.’ In the same way, the KGB operatives seized the airports in Brno and Bratislava with the Prague deployed assault teams allegedly leaving Czechoslovakia three days later. 23

Yet, despite all the indignation which the invasion of Czechoslovakia and similar Soviet actions aroused in the West, few outside the US were convinced that aviation was a kind of ‘super-vehicle’ for subversive activities and export of communism or one which eventually drove these processes. As the British Minister of Aviation, Julian Amery, tried to explain to Najeeb E. Halaby, the Federal Aviation Administrator, and Alan S. Boyd, Chairman of the Civil Aeronautics Board during their meeting on 8 February 1963, the ‘aviation penetration by the Soviets [used to occur] only after political understanding [was] reached, and Soviet aviation activities per se affect[ed] very little a… decision’ by individual African countries to build the ties with the Eastern bloc. ‘Although the matter [Soviet air penetration of Africa] had been treated heretofore as a political matter, i.e. through the Foreign Office,’ Amery and his subordinates at the Ministry of Aviation believed that ‘in reality it was an economic problem and [therefore could] more satisfactorily be handled on that level.’ 24

With such a business-like approach prevailing in connection to Africa and the Third World in general, not surprisingly the British, the second mightiest aviation nation in the West, adopted similar position with regards to their bilateral relations with the Soviet Union and other communist nations. This forward-looking attitude entailed two dimensions.

The first was the sale of technical equipment. This included mainly avionics and ground-based electronic hardware which the British producers as mentioned in Chapter 5 furnished to bloc countries in order to enable Eastern carriers to fly to the West and Western carriers vice versa. Yet, with the sole exception of six new and two refurbished BAC One-Eleven short-haul aircraft which Rumania purchased in 1968 and 1972,

23 In all their haste, however, the KGB operatives forgot to switch off the airport Telex centre, so the European airline reservation network eventually became one of the first channels through which the words of the invasion spread to Western Europe. Cf. ‘Prague Invasion Vanguard Used Aeroflot’, Aviation Week & Space Technology, 20 October 1969, 16–8.

24 Cf. NARA, RG 59, SF, Box 3, folder Civil Air: U.S. Policies International, Halaby (FAA) and Boyd (CAB) to Johnson (Ass. Sec. for Economic Aff., DoS), 8 February 1963.
respectively, these sales did not involve any ‘big or very advanced projects’ as the British weekly *Flight International* realistically noted in June 1974. Five years later, however, in June 1979, such advanced projects seemed to emerge as a possibility with a £250 million UK-Romanian contract for a joint production of One-Elevens in Bucharest. Nonetheless, out of the envisaged 82 airplanes for prospective markets in China and the Soviet bloc countries, only nine were ever completed with seven going to the Romanian national carrier TAROM.  

Similarly, ambiguous results for the British applied with regard to the second dimension, namely, the mutual exchange of routes. Uniquely positioned for facilitating Aeroflot’s operations across the North Atlantic in exchange for trans-Siberian rights for the British Overseas Airways Corporation (BOAC), London eventually held the line with Washington. This precluded the Soviet carrier from flying to Cuba more economically with a stop in Britain or Ireland until 1967 when agreement with three Scandinavian countries was reached. This shows that, despite bold statements, the British route policy, and country’s bloc aviation policy as such, desired to avoid any moves which would be overly counterproductive *vis-à-vis* relations with the Americans. On the other hand, London refused to bend to Washington’s wishes if that meant protracted violations of international aviation law as the episode regarding CSA flights to Havana clearly demonstrated.

Finally, turning to the other side of the Curtain, it was evident that Moscow used CSA throughout the late 1950s and the early 1960s as a master key to open the door for Aeroflot around the world albeit, most likely, there were no formal or informal agreements about this. Indeed, no such agreements were necessary. As one of many reports which passed through the Politburo of the Czechoslovak Communist Party in the latter half of the 1950s critically stated:

> From an international perspective, the outstanding pace of development of our civil aviation [would not] allow us to compete successfully with the capitalists countries. While, for example, in the production of

25 Cf. TNA, FV 14/160, Call by Mr. Bujor, Romanian Chargé d’affaires, on Mr. Butler (FO): Background note on BAC 1–11s, 31 July 1979. See also ‘Selling to Eastern Europe’, *Flight International*, 13 June 1974, 771–6 and ‘Rombac’, *Flight International*, 4–10 September 1991, 70–1.
steel, coal mining, machine building and other industries Czechoslovakia [held] leading positions in the world, in civil aviation it [belonged] to the economically underdeveloped countries such as Turkey, Peru, Burma or Ethiopia and [lagged] significantly behind even countries like Spain, Ireland, the Philippines or Finland. The most urgent task therefore [was] to devise a plan which would, in the shortest possible time, enable Czechoslovak aviation to overcome the existing gap and allow the Czechoslovak Republic to assume the corresponding place in world ranking by the volume of air traffic carried by individual countries.26

The local communists in Prague thus evidently did not lack ambitions of their own. Since these coincided with those of Moscow, unlike in 1968, the Kremlin did not preclude them from sending CSA to countries in the Middle East, East Asia and Africa and in fact often readily followed the path.27

While the expansion of bloc air carriers into developing countries was significantly motivated by ideology and also encompassed elements of prestige and military considerations, for CSA and Aeroflot their undertakings soon turned into a reckless run for hard currency income. Already in June 1959, less than a year after CSA launched its service to Cairo, an area manager at Scandinavian Airlines System (SAS) complained to an official of the US Embassy in Prague that the Czechoslovaks evidently concluded ‘secret interline agreements [with] local carriers in the Middle East.’ These enabled the airline passengers ‘to travel free between Damascus and Cairo in order to avail themselves of CSA services rather than SAS services which include[d] Damascus,’ too. Albeit the flights by the Czechoslovak carrier ‘had a passenger load factor of only about 10 to 15 [per cent] and [were] obviously uneconomical,’ this was enough to oust the SAS out of the market and monopolise the routes from Prague to the Middle East for CSA.28 Over the years, as several chapters of this book demonstrated,

26Cf. e.g. NA, KSC-UV-60, folder 27, item 361, Podrobná zpráva o rozvoji letecké dopravy a jeho zajištění [Detailed Report on Development of Civil Aviation and Steps How to Achieve It], 18 November 1958.
27An American historian, Philip Muehlenbeck, recently presented a similar argument in his monograph Czechoslovakia in Africa, 1945–1968 (Basingstoke and New York: Palgrave Macmillan, 2016).
28NARA, RG 197, RRIAAN, Box 26, folder Czechoslovakia–US Negotiations: October 1948–August 1959, Embassy Prague to DoS, 24 June 1959.
the same scenario repeated itself continuously with only one minor difference: the more debts in foreign currencies bloc countries accumulated, the more aggressive these practices became, even within the bloc.29

Albeit the bloc airlines and bloc aviation sector ultimately lost this battle and remained ‘trapped’ somewhere between the modern and the post-modern world, it was the East-West confrontation which brought the engines, planes and route structure essential for rapid growth of globalisation in the 1990s. Now, however, the crucial question seems to be how long the post-Cold War system can survive and what might follow it. One thing is indeed for sure: aviation will again play an important part in this story.30

29 Cf. ‘Soviets Pushing Exports to Cut Deficits’, *Aviation Week & Space Technology*, 6 June 1977 and Stephen Kotkin, ‘The Kiss of Debt: The East Bloc Goes Borrowing’, in Niall Ferguson, Charles S. Maier, Erez Manela, and Daniel J. Sargen (eds.), *The Shock of the Global: The 1970s in Perspective* (London and Cambridge: The Belknap Press of Harvard University Press, 2010), 80–93.

30 Cf. e.g. Richard N. Haass, ‘The Pandemic Will Accelerate History Rather Than Reshape: Not Every Crisis Is a Turning Point’, *Foreign Affairs*, 7 April 2020, https://www.foreignaffairs.com/articles/united-states/2020-04-07/pandemic-will-accelerate-history-rather-reshape-it; “From Russia with Love”: Putin Sends Aid to Italy to Fright Virus’, *Euractiv*, 23 March 2020, https://www.euractiv.com/section/global-europe/news/from-russia-with-love-putin-sends-aid-to-italy-to-fight-virus and ‘Chinese Virus Aid to Europe Raises Long-Term Concerns’, *Voice of America*, 23 March 2020, https://www.voanews.com/science-health/coronavirus-outbreak/chinese-virus-aid-europe-raises-long-term-concerns. All Accessed 8 April 2020.