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# DECOUPLING OF PAKISTAN CIVIL AVIATION AUTHORITY: IMPLICATIONS FOR AVIATION SUPPLY CHAIN INDUSTRY IN PAKISTAN

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## Abstract
*Pakistan's aviation restructuring addressed a fundamental governance problem: the historic Civil Aviation Authority simultaneously supervised the safety of activities from which it also earned service and infrastructure revenue. The 2020 licensing controversy and foreign safety restrictions exposed the international costs of deficient regulatory credibility. This narrative review critically evaluates whether the 2023 legislative separation can improve supply-chain efficiency, investment incentives, safety accountability and financial sustainability. The Pakistan Civil Aviation Act, 2023 (Act XLIX), Pakistan Airports Authority Act, 2023 (Act XLV), Pakistan Air Safety Investigation Act, 2023 (Act L), National Aviation Policies of 2019 and 2023, and the 2026 airports amendment are examined against ICAO oversight and charging principles. The synthesis covers aircraft maintenance and rotable spares, ground handling and concessions, aviation fuel, air cargo and cold chains, air-navigation finance, regional airports, and public-private partnerships. Organizational separation reduces one form of operator-regulator conflict but does not itself create competitive procurement, reliable customs clearance, cost-reflective tariffs or an independent economic regulator. Crucially, the Airports Authority also provides air-navigation services; overflight income was not simply removed from the airport entity. Parliamentary evidence of the PKR 4.1 billion overflight-revenue shortfall in 2025 demonstrates the financial exposure of that service-provider model. The published evidence cannot establish the alleged number of loss-making regional airports or the size of internal cross-subsidies without audited airport-level accounts. A credible reform sequence requires transparent segment accounts, ring-fenced safety funding, non-discriminatory access to essential facilities, competitive concessions, time-bound bonded-spares clearance, interoperable cargo data and measurable service-level obligations. Separation is a necessary institutional precondition, not a sufficient explanation of logistics performance. Its success must be judged by safety outcomes, transparent cost recovery, aircraft availability, cargo dwell time and the distribution of benefits across the aviation network.*

**Keywords:** Aviation deregulation; Pakistan Civil Aviation Authority; Pakistan Airports Authority; maintenance repair and overhaul; cold-chain air freight; airport privatization.

## 1 Introduction Legislative Genesis and the Dual Role Paradox

### 1.1 Review question and evidence method

Civil aviation is a really peculiar value chain. The availability of aircraft has to rely on the availability of certified technicians and imported parts, and flight departure relies on air-traffic services, fuel, ramp equipment, security and passenger handling services; high value exports rely on customs clearance, terminal refrigeration and route capacity. If any one activity causes a bottleneck effect, the advantages of investment in all other activities will be nullified. The post-2023 reorganization in Pakistan therefore raises a more pointed question than that of two versus one agencies: what are the circumstances that warrant a change in institutional boundaries, and how would such a change enhance the performance of tightly coupled aviation transactions?

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This article is a narrative policy and supply-chain synthesis, utilizing the six SANRA quality domains: justification, explicit aims, transparent source selection, referencing, scientific reasoning and presentation of relevant evidence (Baethge et al., 2019). The evidence search focused on enacted instruments for Pakistan's National Assembly, Senate, Ministry of Law and Justice, Ministry of Defence, Pakistan Single Window trade information records, Official documents of ICAO, FAA, European Commission, IFC, State Bank, Customs and Auditor-General and peer-reviewed articles on airport economics and resilience scholarship. The sources were chosen for their jurisdiction, their relevance to the 2019-2026 transition, and their ability to confirm or refute causal or fiscal claims. Statutory powers and policy intentions are separated from foreign safety decisions and domestic accusations; documented financial observations from plausible but unmeasured mechanisms. The review is not a meta-analysis: Laws, audit records and institutional announcements are too heterogeneous to create a common dataset of treatment effects to be statistically treated.

### 1.2 Legal trajectory and the original governance problem

The administrative framework of a vertically integrated public aviation system was based on two Ordinances, namely, Civil Aviation Ordinance, 1960 and Pakistan Civil Aviation Authority Ordinance, 1982. In 1982, the authority took over the regulation of aviation and the provision of commercial airport infrastructure and air-navigation service delivery. Section 152 of the new Civil Aviation Act explicitly states the repeal of predecessor ordinances after the implementation of the new framework, and section 153 will ensure the continuity of rights, contracts, licences and subordinate instruments that are compatible with the new framework (Government of Pakistan, 2023d). It is also a legal continuity that is relevant when it comes to the economy: the contracts of investors in hangars, cargo facilities, fuel systems must also survive a change of public counterparty, and the certificates of regulators must remain valid during migration.

Integration used to provide coordination economies. With less traffic and less money available, one public hierarchy might coordinate runway development, navigational equipment, terminal expansion and route facilitation. It did, however, generate an ongoing agency problem: the owner of the airport has an incentive to cover revenues and advocate for both charges and other operational decisions, while an aviation safety regulator has an incentive to suspend, limit or sanction unsafe activity for whatever commercial impact. These roles are combined, creating a conflict of interest between a supplier's interest and a sovereign inspector's responsibility. The conflict that ensues is structural even if no individual corruption is found. It may manifest itself as a failure to enforce, favors towards the incumbent providers, an understatement on safety capital expenditures or a disinclination to report poor operational performance.

The fiscal aspect added to the confusion. Commercial revenue from landing, parking, rentals and terminal concessions would be mixed with navigation charges, and losses at distant airports might be hidden by big profits at the major hubs. However, this pooling is not necessarily incompatible with national connectivity financing, provided that there are segment accounts to make it possible to check which routes or facilities are being funded and whether the subsidy is in line with an open or explicit public-service obligation. Ennen and Batool (2018) applied data-envelopment analysis to 12 major airports of Pakistan, and found it to be a case of over-staffing and inefficiently small operating scale at several airports, and excess capacity. Their results provide information on the heterogeneous cost performance, and not that all small airports are loss-making or that all cross-subsidization is unhelpful.

### 1.3 External credibility shock and its limits

The parliamentary row over the pilot licenses in June 2020 had affected the confidence in the certification process at a time when the crash of PIA flight PK8303 had already brought the

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subject under focus. The US Federal Aviation Administration (FAA) rated Pakistan as Category 2 on 15 July 2020, finding that the State's oversight system failed to meet relevant International Civil Aviation Organization (ICAO) standards (Federal Aviation Administration [FAA], 2020). For Category 2, there are limitations on new service to the United States and some code-sharing. There are additional market impacts in terms of US route volumes, as well as code sharing, leasing diligence, insurance and international contracting which all rely on the credibility of State-level certification.

EASA's intervention had to do with third country operator authorisations and not with the European Commission's EU Air Safety List. On 29 November 2024, the European Commission noted that EASA revoked the suspension of PIA's TCO and Airblue was granted TCO authorisation (European Commission, 2024), specifically citing improvements to PIA's safety standards and PCAA supervision. It's important to recognize this rebound to prevent 2020's suspension to be permanent. Additionally, ICAO's Regional Aviation Safety Group noted the resolution of Pakistan's important safety concern on 20 January 2022 (International Civil Aviation Organization [ICAO], 2023). Addressing an item of concern does not mean that the institutional risk is resolved, but nor does it mean it is not a concern if it is cited as such.

These external events are more aptly thought of as a credibility shock, which increased the political worth of provably independent oversight. They do not indicate that the initial improvement was due to structural bifurcation, which happened later. Safety recovery activities included international reassessment, operator corrective action, and supervision. The legal acts alone would be insufficient to conclude outcomes are the result of these interventions without a timeline of when the interventions were used and the presence of similar safety metrics. The economic implication of the reform is that unreliable regulatory recognition is a "non-tariff trade barrier": it provides fewer ways of contracting, fewer acceptable MOCs and fewer acceptable OCs, and it increases contracting costs across the aviation value chain.

**1.4 Tripartite restructuring and incomplete decoupling**

The Case Studies in the Year Book of the Cabinet Division, 2019-20 finds support in the institutional-reforms programme of Dr. Ishrat Husain, which included one body for regulation and enforcement and another for commercial activities and private-sector contracts of the airport (Cabinet Division, 2020). The formal architecture was then passed as the Pakistan Civil Aviation Act, 2023 (XLIX), Pakistan Airports Authority Act 2023 (XLV), and Pakistan Air Safety Investigation Act 2023 (L). This statutory chronology is more reliable than relying on detailed financial proposals in a separately named 2020 CCIR final CAA report with no published text available. The implementation was noted till August 2024 restructuring instruments (Auditor-General of Pakistan, 2025).

The continuing PCAA is established under the Civil Aviation Act, 2023, section 3, and has the power to regulate aviation, airports, aircraft maintenance, compliance of airspace & service providers under section 4 of the same act (Government of Pakistan, 2023d). The PAA is the service provider and the asset operator under its Act, and the air-safety investigation legislation places the responsibility of a specialized investigative bureau and demand for air accident inquiry as a means for prevention and not apportionment of blame (Government of Pakistan, 2023b, 2023c). The separation is broadly aligned with the focus of ICAO Doc 9734, effective State oversight, Annex 14, aerodrome requirements and Annex 19, safety-management system and independence logic of the accident investigation (ICAO, 2017, 2022a, 2025b).

However, the division is not a pure division of income from sovereign airspace from airports. The Civil Aviation Act considers a part of navigation services fees paid to Airports Authority as notified by government to be paid to PCAA (Government of Pakistan, 2023d). The PAA is

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responsible for air-navigation service provision while the PCAA regulates the use of airspace. This statutory allocation dispels the simplistic argument that PAA must survive as all revenues from overflight are allocated elsewhere. The real issue is to clearly differentiate service costs, regulation costs and permissible transfers – using navigation income to camouflage inefficient airport operations.

An institutional independence aspect is also relevant for the amendment of the Airports Authority in 2026. It made changes in the ministerial references with the change in the allocation of federal business, changed PAA Board arrangements, expanded PAA Director General criteria, and added conflict of interest disclosures for the officers (Government of Pakistan, 2026). These provisions address administrative power and private influence, however, political intervention and cross-agency coordination issues remain. So, institutional independence can mean at least four different things: regulatory independence, investigative independence, freedom in contracting with commercial entities and external oversight of monopoly prices that can be believed. The three Acts move toward and help accomplish the first three, but without any one of them assuring the fourth.

## 2 Theoretical Foundations in Supply Chain Economics and Regulatory Governance

### 2.1 Principal agent conflicts and regulatory capture

The principal-agent theory provides an explanation for the separation of formally delegated authority to create outcomes which are not in line with the public's welfare when objectives, information and monitoring capacity do not align (Jensen & Meckling, 1976). In the above context, the principals are the Pakistani taxpayers and travelers/exporters, while the agents are PCAA, PAA, concessionaires and regulated airlines, and political principal is the federal government, which has different information and incentives. In the historic integrated authority, senior hierarchy and financing was shared between regulatory and commercial aspects. The agent who is supposed to verify the risks that are created by revenue-seeking activity could indirectly affect the agent who generates airport revenue. There is a separate PCAA that lowers that internal channel, but raises the risk for inter-organizational bargaining and appointments.

Regulatory capture does not necessarily imply direct bribery. Repeated job changes, asymmetric information, and monopoly over the use of a scarce resource like airport space can over time induce a regulatory official to shift his preferences in favor of the big guys. A lax response-time requirement in the maintenance approvals could lead to superficial certification, while a lax staffing requirement in a ground handling context could lead to an acceptance of the less than optimal. Therefore, effective separation needs to be achieved through published inspections findings at a suitable level of detail, rotation of inspectors, declaration of conflict, protected technical budgets and appeals protected from commercial pressure. While the 2026 conflict of interest amendment at PAA takes care of one end of this principal-agent chain, similar safeguards are needed for contractors, tariff reviewers and those authorizing safety deviations.

The key design issue is a duality of accountability. Regulators should be held accountable on quality of oversight, follow-up of deficiencies and competence, and not on maximising landing / transit charges. Operators should be held responsible for capital condition, customer service, runway availability and unit cost, and should be held to account through sanctions. Both, measured in terms of a common denominator of aviation income, continue the old struggle in new organizational garb. In the relevant performance contract, it is defined that there are specific outcome measures and in the event that safety restrictions result in commercial losses, exceptions are communicated.

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### 2.2 Transaction cost economics and airport-specific investments

The governance of an exchange is determined by transaction cost economics which suggests that the asset specificity, uncertainty, frequency and hazards of incomplete contracting determine the governance of an exchange (Williamson, 1979). An airport has investments that have very little alternative use: an apron maintenance hangar can only be used where it is needed, a bonded cargo village must be near an international customs gate, and a hydrant network cannot be located in another city. This specificity makes that sunk investment subject to ex-post renegotiation by the public landlord. Even if headline investment incentives seem very high, a short-term contract along with discretionary rent escalation will undermine the incentive to invest in high quality cold stores or renovate workshops.

The countervailing danger is for a concessionaire to be opportunistic, by being the sole operator of key facilities. Switching costs may be charged by a ground handler, fuel-storage company or terminal operator, or indirectly through scheduling; companies can deny access, can bundle monopolized infrastructure and competitive services. Tendering identifies a bidder but does not induce competition once the "exclusivity" period has started. Contract design should therefore distinguish the competitive activities from common-user assets, impose regulated access restrictions on bottlenecks, include tariff escalation (with transparency) and measurable termination rights, and include audit and step-in rights. Independent economic oversight is particularly relevant when PAA at the same time acts as landlord, joint venture partner and beneficiary of concession fees.

The public monopoly versus private efficiency dichotomy is not very robust. Studies by Oum et al. (2006) revealed differences in ownership and performance among airports worldwide depending on the type of airport ownership and management, while Graham (2020) stated that the regulatory and competitive environment plays a crucial role in the success of airport privatization. More specifically, Muslim et al. (2024) found that in the context of their study, privatization was not an automatic cure for efficiency, when they compared Pakistani airports with those of the world. The samples and assumptions used for benchmarking in these studies are different and should not be considered as equivalent estimates. Together, they warrant ex ante competition analysis and independent service-quality assessment prior to the choice of any concession model.

### 2.3 Supply chain resilience as an operational evaluation lens

The concept of supply chain resilience is related to preparing for disturbance, continuing the operations, quick recovery and organizational learning (Christopher & Peck, 2004; Ponomarov & Holcomb, 2009). Ivanov and Dolgui (2020) expand the worry from quick recuperation to more drawn out network viability. In aviation, a traceability dispute or missing rotable component can hold up a high value asset, a failure in the fuel quality can end up grounding several flights, and a failure in the refrigeration system in the cargo terminal can ruin an entire cargo shipment, not just delay it. If these are nonlinear losses, a small administrative or physical constraint at one point can have disproportionate consequences further downstream.

Resilience is broken down into four stages: prevention, absorption, recovery and adaptation, for analytical purposes. Prevention includes quality assured fuel, cold-chain telemetry, and proper certification and predictive maintenance. Absorption means ground equipment must be substituted and pools are available for rotation, electrical power is provided and alternate cargo routes are available. Recovery requires emergency import privileges, airside access protocols and predefined contingency contracts. Adaptation involves learning from incident data, and redesigning service obligations. This operational lens does not make the incorrect assumption

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that a statutory split necessarily leads to a shorter aircraft turnaround time. Specific governance instruments and operational decisions form part of the chain of causation.

Useable evaluation should include safety and economic service measures: median time for customs clearance of AOG spares, 95th percentile time for customs clearance of AOG spares, aircraft turnaround variance by airport, flight and operator, ground-equipment serviceability, fuel hydrant downtime, cargo truck-gate dwell time, percentage of consignment in which temperatures have exceeded normal, and total route-disruption recovery time. The comparison of unit costs and service continuity should be done at a consistent traffic volume and security requirement. A cap on the intensity of inspections would not be a desirable period of turnaround. The scorecard should be evaluated together between the regulatory (and operational) and owned by different institutions.

## 3 Critical Domain Analysis of Aviation Supply Chains

### 3.1 Maintenance repair and overhaul and rotable spare parts

The most obvious divide between regulatory permission and commercial access is in maintenance, repair and overhaul (MRO). A repair organization must have the authority to perform specified technical work, qualified personnel, approved exposition, tool calibration and quality systems and auditable component traceability. It requires hangar space, apron access and utilities, fire protection, bonded storage, and secure land tenure on its own. After the separation, the former is regulated by PCAA's airworthiness and organisation oversight while the latter (PAA as airport owner/operator) has a controlling influence on much of it (Government of Pakistan, 2023c, 2023d). The danger is a serial approval procedure in which each institution deems itself to have given the nod and an investor is yet to receive permission to open.

An integrated investor interface can maintain substantive separation, while eliminating unnecessary sequence. PAA would bid on hangar parcels with predetermined load-bearing and apron and utilities requirements; PCAA would publish airside access and inspection timeframe for a maintenance-organization certification checklist; FBR would determine warehouse licensing and bonded-material control; and security agencies would determine airside access. One tracking number might reveal a dependency and one commercial landlord might not be able to certify maintenance safety. This transparency diminishes the shadow cost of discretion, a key transaction-cost issue of a market with few potential suppliers.

Regulatory clarity is needed around claims of setting up a ‘Part-145 hub’ in the region. EASA Part-145 is a specific European approval regime and an approval obtained under the Pakistan civil aviation regulations or Air Navigation Orders will not automatically be an EASA approval. A business looking to outsourcing work to foreign registered aircraft should determine the following: Bilateral recognition, foreign approvals, customer maintenance programmes and release-to-service requirements. According to Pakistan's policy 2023, aircraft maintenance organizations and MRO investment is supported but investment incentives are not provided for international maintenance authorization (Government of Pakistan, 2023a). The brand of internationally certified would create the credibility problems that reform is meant to address before such certifications even exist.

But the economics are complicated by rotatable parts. Engines, avionics and wheels and other areas of repairability are shared among airlines, warehouses and workshops; a physical spare can only be accepted if its serial history, serviceability documentation and remaining life are deemed acceptable. The number of inventory is not the only factor in determining aircraft availability; the rate of material flow and certification will also play a role. Local pools lower emergency freight costs, but create financing, obsolescence, and currency risk. A rational industrial policy would have focused on pooled high frequency rotables, approved exchange programmes,

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traceability system and targeted line maintenance before supporting a complete heavy maintenance campus with low workloads.

Customs and foreign exchange will probably be as significant as hangar rent. Import-payment circulars issued by the State Bank reveal that the rules and regulations governing advance remittances and documentation have evolved over time, with a relaxation in import-payment documentation in 2024 (State Bank of Pakistan, 2018, 2024). FBR is the operator of electronic clearance system WeBOC, and recognizes customs warehouse registration (Federal Board of Revenue [FBR], n.d.). But electronic declaration does not equal physical release: valuations, tariff classification, banking clearance and aviation-security checks and agency off-loading can all hold up an AOG shipment. The reform lever is not an inappropriate exemption from safety and fiscal controls – but a controlled fast lane for traceable aircraft-on-ground parts, followed by audit.

It should not be overlooked that the policy is also a distributional one. A big carrier with engineers, spare pools, and political access to multiple agencies can go through several agencies more easily than a small repair start-up. Regulatory unbundling can lead to greater concentration if PAA concessions are opaque renewal for the most favorable apron-adjacent sites to incumbents. In contrast, long-term competitively tendered access to shared hangars and bonded stores may benefit the existence of third party maintenance, technicians, training and regional clients. If it is the number of independent approved organisations, foreign-customer volume, mean part-release time and the proportion of hangar capacity given out via open competition, rather than the number of announced MRO projects, that count, then the numbers look quite different.

### 3.2 Ground handling ramp operations and airport concessions

Ground handling is an integrated series of passenger and baggage check-in, pushback, load control, catering coordination, aircraft cleaning and ramp equipment. It relies on accurate resource synchronisation and risks are a vehicle strike, foreign object debris, misloads, fatigue and apron congestion. In other words, there's a commercial value in PAA's landlord capacity, but PCAA's regulatory capacity is necessary because if a handler is a big source of rent, safety conditions have to be enforceable. ICAO Annex 14 stipulates the aerodrome design and operating requirements, while Annex 19 and Doc 9859 offer the corresponding safety-management logic (ICAO, 2018, 2022a, 2025b).

The issue is not whether or not all airports can have unlimited numbers of handlers. Unrestricted competition at congested stands can lead to more equipment, traffic and coordination problems. If those are at a low-volume regional airport, two handlers could be duplicating fixed equipment and are not financially sustainable. A structure of competition should therefore be based on minimum efficient scale and common user facilities. Tenders should allow for multiple providers with interoperable stand and equipment standards where feasible, and if a single provider is warranted, a licence should be competitive, limited, disciplined by performance criteria, and periodically rebid, and nondiscriminatory access to subcontracts should be allowed.

At the ramp, the separation of safety and security from commercial allocation needs to be achieved. The right of a handler to store their aircraft does not imply that they are authorized to operate it; the airport operator's direction to store on a stand cannot supersede PCAA's direction for safety. Security screening and access will be shared with the Airports Security Force and other lawful agencies. The reform therefore calls for a responsibility map for pavement condition, inspection of equipment, ground-service training, apron passes, wildlife hazards and emergency response to be published. Otherwise operators may find themselves receiving

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conflicting directions and an accident investigation could result in a confusing lack of accountability in the face of the three-body structure.

A good concession has measurable obligations that concessionaires can control: first bag delivery time, last bag delivery time, groundpower availability, equipment breakdown, completion of cabin service, reportable damage rate. It does not include false incentives, such as forfeiting safe working practices in order to make a departure time. Penalties should be based on outside investigation and outside processes, or else the airport landlord can threaten sanctions and get concessions from the smaller handlers. There is also a neutral digital allocation system and time stamped logs, which helps to minimise preferential treatment of dominant airlines.

Commercial incentives call for express anti-bundling provisions. A concessionaire can also make an attractive headline payment by predicting higher fees to carriers, vendors and travellers, while PAA may prefer the bidder that makes the highest prediction of rent, even if the quality of the service discourages traffic. Net system value – operating efficiency, safety, airline competitiveness, passenger experience and verifiable investment – is the right objective. From Graham (2020) and the different outcomes of ownership as revealed in Oum et al. (2006), the competitive environment and monitoring quality frequently have a more significant impact than the legal form of the airport operator.

### 3.3 Aviation turbine fuel and the Jet A-1 supply chain

Availability of jet A-1 is a logistics-security and market-structure question and a procurement issue. Requires imported or refined product, inland transport, quality assured storage, fuel farms, filters, hydrants, into plane vehicles, testing records and aircraft refuelling schedules. One airport tank farm or pipeline interface can exacerbate a failure upstream. Fuel can be a significant variable cost for operators, and the impact of airport governance will vary depending on how much of the delivered price it can affect. Throughput fees and access terms are more manageable; international oil markets, taxes, inland freight and exchange rates are largely beyond PAA's control.

Allied-service providers and fuel-supply services are included as a separate chapter in the 2023 policy (Government of Pakistan, 2023a). The issue that is relevant to the commercial problem is whether there is an essential facility that is in the control of a dominant supplier or exclusive fuel-farm operator where it becomes difficult for additional OMCs to operate. A tender for exclusive fuel storage may generate a large initial concession fee, and can also lead to high handling fees downstream. Similarly, replication of tank farms for each OMC would be a waste due to environmental, safety and land restrictions. The potential solution is efficient use of shared infrastructure, with published quality protocols, capacity booking and regulated third party access.

Technically, there shall be limitations on access regulation. If the airlines try to outsource fuel filtration, documentation, sampling or emergency isolation arrangements to compete on price, they may find themselves without a viable option. PCAA should be able to conduct its own audit on the relevant aviation-safety systems, and mandate incident reporting, while PAA should be able to purchase construction, maintenance, and physical throughput capacity. A neutral operator (or a concessionaire with access and accounting responsibilities) can split the bulk-storage monopoly from downstream contestable fuel supply and inplane services. Agreements should include provisions for ownership of tanks, hydrology and environment liabilities, capital replacement, minimum throughput commitments and force majeure supply continuity. Although the 2026 PAA conflict of interest rules apply to procurement integrity, they do not, per se, provide for open access (Government of Pakistan, 2026).

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Price transparency involves breaking down the final cost of fuel delivered to include product, freight, taxes, storage, and hydrant throughput and into-plane service. A claim such as 'Fuel prices are high' is vague enough that it doesn't tell us who is at fault, or who should be at fault, nor what to do about it. Although the full commodity price of Jet A-1 is not an aeronautical user charge, the principles of non-discrimination, cost-relatedness, transparency and consultation of airport and air-navigation charging expressed in ICAO Doc 9082 (ICAO, 2024) can be useful disciplines for airport-controlled access fees. A third party tariff audit should verify that the throughput charges are reasonably cost of asset, rather than revenue maximization by a captive landlord.

Resilience design should include minimum quality-assured stocks at each location that is commensurate with site demand, redundancies in the delivery routes if possible, backup electrical power from other sources, mutual assistance between suppliers, and a common emergency dispatch system. Stock requirements shall be determined on the basis of traffic, replenishment time and credible disruption scenarios, rather than being the same on all airfields. A public dashboard of fuel-outage events could highlight bottlenecks that can't be seen in national fuel-consumption statistics, and average refuelling delay and infrastructure downtime. This domain reflects the core theme: that there is a bifurcation in the accountabilities of the organization and that the supply security and contestability need a second layer of physical investments and of economic governance.

**3.4 Air cargo perishable cold chain and multimodal freight**

Cargo, is the closest point at which airport decisions relate to manufacturing, to agriculture and export diversification. When the reliability premium is greater than the cost premium of air freight, high value pharmaceuticals, diagnostic products, temperature sensitive foods, fresh fruit, seafood, textiles with a need for speedy delivery and urgent industrial components can all justify airfreight. This goes all the way back to the factory to unit pick-up, inspection, documentation, truck movement, security, refrigerated storage, aircraft load, transshipment, and arrival clearance. Thus, a modern terminal that is not certain for customs clearance and has no reliable foreign uplift is a stranded asset.

The strongest explicit liberalization commitment in this vertical is found in the 2023 National Aviation Policy. It provides for a two-year unilateral open skies arrangement for services with all-cargo rights (third, fourth and fifth freedom rights) on a regional basis and expands it on a case-by-case basis after an assessment, while also referring to the coterminal rights in certain cases (Government of Pakistan, 2023a). This is a policy commitment that is time-bound, and not necessarily a result of permanent and universal adoption of free foreign freighter operations. It is necessary to test the effectiveness of the policy by means of designated carriers, operating permits, cargo frequencies, accepted fifth freedom and traffic volumes. The freeing up of traffic rights is not sufficient to foster export if the customs and security and warehouse costs are high.

Economy is often not a space but a time problem. It's not just about a big warehouse, exporters need predictable cut-off times and dwell time. Remaining shelf life of perishables is lost in queues of trucks, manual release checks, inadequate cold docks, and uncoordinated agricultural inspections. The facilitation approach of ICAO Annex 9 is relevant as the border-control and aviation institutions must coordinate inspections of aircraft, cargo and people and Annex 17 addresses the security regime within which faster cargo movement must happen (ICAO, 2022b, 2025a). The domain of aviation security compliance and facilitation standards is handled by PCAAs, while PAAs provide the necessary space and service contracts and FBR maintains statutory customs powers. It is not possible for an airport operator to override a customs requirement on their own.

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Dedicated cargo villages can be commercially viable at a gateway, given that there is a critical mass of these villages, but needs phased capacity planning. A cold store is a fixed cost energy-intensive investment – if it is under-used, then the unit cost in each store is increased, and a concession that provides exclusive access can dampen the level of competition between freight forwarders. Phasing should be initiated in multi-temperature rooms, reefer plug points, covered truck docks, online slot booking and calibrated temperature logging; and then expanded to specialized pharmaceutical chambers based on product flows and validated handling procedures. More important to a pharmaceutical shipper is continuous power, alarm escalation, contingency storage and independently auditable temperature data than a nebulous “international-standard” label.

Data Integration is another key investment. One electronic consignment identifier should bind the airline air waybill, customs declaration, security status, warehouse event and truck gate timestamp without compromising the lawful control of each agency. The WeBOC customs interface is not a proof of complete inter-operability, it is an existing platform (FBR, n.d.). Real-time status minimises exceptions based on phone calls and enables exporters to pinpoint exactly why an export is late – whether due to shipping line, document mismatch, border agency (or handler/aircraft uplift shortage). If it is not attributed, each institution can pass the buck to the other and users are unable to hold a poor concessionaire to account.

Outside the airport fence, multimodal corridors need to be considered. Roads and sanitary handling are essential for cold-chain transport from production areas in Punjab to Lahore, Karachi or Islamabad, as is consolidation and scheduled access to terminals. For pre-clearance to be beneficial (as allowed by customs legislation), a bonded inland facility would be required, but the financial advantage would be based on the logistics density and audit controls. Socially optimal hub may vary depending on the product: fresh exports may require a hub close to the farm; pharmaceutical freight may require a hub with good quality systems and direct international connections; or emergency industrial spares may require a hub where the import can be released quickly. The same model of cargo-village for all the airports would result in inefficient overcapacity that has been observed in other airports of Pakistan's airport network (Ennen & Batool, 2018).

The best reconfirm result thus is dependent on the availability of new traffic rights, contestable terminal access, auditable cold-chain standards, exchange of customs data and reliable cargo uplift for export. Carriers might continue to use existing overseas hubs for their cargo operations, if implementation merely involves the announcement of open skies and the lease of airport space. Policy evaluation should monitor door-to-aircraft time, customs clearance median, and number of temperature-sensitive cargo rejected, as well as cargo tonnes per terminal capacity and freight rates by lane and actual 5th freedom cargo connectivity. These are not "declared aspirations" but falsifiable outcomes in the supply chain.

The strongest reform outcome is therefore conditional: if new traffic rights are combined with contestable terminal access, auditable cold-chain standards, customs data exchange and reliable cargo uplift, exporters may gain lower total logistics cost and improved market reach. If implementation stops at announcing open skies and leasing airport land, carriers may still route freight through established foreign hubs while domestic cargo facilities remain underutilized. Policy evaluation should track door-to-aircraft time, median customs release, rejected temperature-sensitive shipments, cargo tonnes per unit of terminal capacity, freight rates by lane and actual fifth-freedom cargo connectivity. These are falsifiable supply-chain outcomes, unlike declarations of aspiration.

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## 4 Institutional Fractures Fiscal Viability and Transition Friction

### 4.1 The cross subsidy question is about accounts not labels

It is sometimes suggested that the PAA used to collect 'sovereign overflight royalties' and that the PAA lost all such income after bifurcation. A separate analysis of the actual legal and administrative allocation of the water needs to be done. The Airports Authority is responsible for providing air-navigation services, the airspace is regulated by the PCAA, and the Civil Aviation Act allows for the transfer of a government-notified portion of the navigation-service fees to the regulator. It is not an unrestricted sovereign royalty – charges for air-navigation facilities and services are not conceptually unrestricted sovereign royalties, ICAO makes a distinction between user charges related to service provision and general taxes, and cost-relatedness and transparency in allocation are promoted (ICAO 2024). The relevant issues are whether the navigation cash flow is treated as being a pooled cash flow with the airport and whether the costs for both segments are verifiable.

The exposure is attested to in the public records. In a reply given by Government to the National Assembly in 2025, PAA reported that there was an estimated shortfall of Rs 4.1 billion in the overflight revenue in the period 24th April to 30th June 2025 due to the restrictions imposed on the Indian registered and associated flights (National Assembly Secretariat, 2025). This is an estimated counterfactual loss and not a published figure of the overall profit of PAA or a direct estimate of the cross subsidisation. It also shows that the Airports Authority, rather than just the regulator after the split, was on the hook for overflight revenues. An airport system relying on navigation receipts should have an open reserve and stabilization policy rather than assuming that these receipts are guaranteed and recurring revenues, if they are subject to fluctuations due to geopolitical closure.

The often cited figure of over 30 regional or feeder airports being individually loss-making is unverifiable, since there are no published, reconciled airport-by-airport revenue, operating expenditure, depreciation, capital charges or allocated overhead. For instance, Panjgur, Moenjodaro, Skardu and Gwadar do not necessarily have the same welfare value which can be read from a single annual profit number. Tourism demand of Skardu is seasonal, infrastructure of Gwadar can also contribute to strategic connectivity, remote strips can contribute to resilience and emergency access. But none of those functions gives an operator the right to hide cost overruns. First, the fiscal reform is to distinguish the revenues and direct operating costs, support subsidy and capacity utilisation of each airport and to clearly define the losses that the government chooses to cover.

National network can cross subsidize socially desired lines, but cross subsidization have to be disciplined. In an essential-air-service style obligation, the area that is eligible, minimum connectivity or emergency readiness, procurement method and fiscal limit per year should be specified. The ability to competitively tender for a minimum subsidy when possible, can provide a more accurate picture of the cost of service, than can automatic transfer from a profitable gateway. On the other hand, surplus funds from profitable airports should not be taken away from them in order to finance airplane runway reconstruction, terminal systems and firefighting equipment. The financial model should differentiate between regulated navigation charges, the airport aeronautical charges and competition-oriented commercial rents and social commitments which are funded out of the budget. The fiscal leakage would be revealed in such accounts and not just rhetorical.

### 4.2 Solvency governance and independent tariff discipline

The cash-flow statement and segment ratios are the means to test post-split solvency, not gross receipts. PAA should have at least four distinct income and expenditure schedules – airport

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services, air-navigation services, concessions, and capital grants and public-service operations. Debts, leases, receivables, gains on revaluation of assets and pension obligations accrued should be compared to opening transfer balances. In its Audit Report for the year 2024-25, the Auditor-General has identified the historical integrated CAA as regulator, air-navigation service provider, and airport-services provider (Auditor-General of Pakistan, 2025). These historical reports cannot just be retitled as a separate PAA profit and loss statement.

ICAO Doc 9082 provides an immediate template for economic-regulation: charges should be non-discriminatory, tied to prudent costs, transparent and consulted upon (ICAO, 2024). PCAA's technical jurisdiction does not imply an independent economic regulator with the sufficient resources. An asset review mechanism should, therefore, check asset bases, highlight unit costs and consider cross-subsidies and listen to appeals from airlines, cargo handlers and fuel suppliers. It should identify the cost of meeting safety requirements and separately show any discount to the state for developmental traffic. An immediate substantial rise in the airport tariff can have a positive impact on the cash flow of PAA, and can lead to a decrease in the frequencies of airlines and in the overall activity of the supply chain, and in order to assess the net system welfare, it is essential.

**4.3 Airport outsourcing and contingent public liabilities**

The international concession programme is an example of the gap between plans for privatization and an actual transaction. In 2023, IFC announced that it was advising on Islamabad, Lahore and Karachi airport concessions, and presented a potential operations and maintenance (O&M) or concession approach (International Finance Corporation [IFC], 2023, 2026). The three airports were later announced to be part of an open and competitive long-term concession programme. The Privatisation Commission and Asian Development Bank signed a transaction-advisory agreement in July 2026 for Islamabad, with more approvals announced in August 2026 for Lahore and Karachi (Privatisation Commission, 2026a, 2026b). These are procurement and advisory milestones, not proof that all three airports had been successfully passed to private management.

An airport concession can unlock investments, professionalize and commercialize the property of terminals. It can also transform an accountable public monopoly into a private exclusive monopoly that has greater incentive for price discrimination. The concession perimeter is the key: for the runways, air-traffic services, security, customs buildings, cargo terminals, land development and fuel systems, the characteristics of safety and competition vary. Some concession fees may appear to be high, and can be funded by increasing handling fees, underfunding maintenance or securing the best retail leases. Before comparing financial bids, government must inform about the allocation of rehabilitation capital, rights to land, existing debt, staff costs, change in tax, currency-conversion risk and force-majeure losses.

Concession appraisal ought to thus be grounded on lifecycle net public value, rather than a one-off revenue-sharing percentage. Bid documents should include publications of baseline assets, demand scenarios, service standards, investment milestones, tariff-adjustment formulae, competition obligations, step-in rights, and rules for dispute resolution. Prior to handover, engineering audits performed by an independent contractor can verify assets such as the pavement, fire, and baggage and energy. A formal value-for-money assessment shall be carried out that compares a competitively procured concession with an equivalent corporatised public operator, on the basis of the same investment and service conditions. The Pakistani airport comparison by Muslim et al. (2024) is especially germane to the extent that it challenges the notion that the mere transfer of ownership is sufficient to ensure better efficiency.

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### 4.4 Workforce and interagency transition risks

Reform also redistributes individuals, institutional knowledge and contingent liabilities. Other professionals, such as air-traffic controllers, airport engineers and inspectors, commercial staff and investigators have transferable skills with varying professional ethics and liability exposure. The 2023 laws include continuity and transfer provisions, such as the protection of certain terms for employees, and the investigation statute provides for the transfer of personnel and related assets to the bureau (Government of Pakistan, 2023b, 2023c, 2023d). Those safeguards help to eliminate a shock to the legal system, but they do not calculate the actuarial value of pension liabilities, nor do they resolve promotion battles or the lack of specialized inspectors.

There are three possible transitions failures. Firstly, the same few experts can be required on both sides of a regulatory decision, diluting separation with secondments. Second, these uncertain pension and seniority treatment can lead to labor opposition or lawsuit, which can slow down procurement or maintenance. Third, commercial employers might hire trained technical staff more rapidly than public authorities can replace them, lessening the power of oversight that was a motivation for reform. A credible workforce plan must include independently valued liabilities, staff-mapping based on safety-critical skills, transparent transfer options, inspector pay structures and continuous professional development. Accident investigation should preserve protected expertise and access to evidence while not being subject to commercial and enforcement interests.

Unowned interface is the most dangerous institutional fracture. In cases involving equipment causing an apron accident, PAA might have control of the stand, a handler could control the equipment, PCAA can control the safety requirements, ASF security access, and a bureau independent investigation. Analogous chains are seen in contaminated fuel and in pharmaceuticals that are not accepted. Agencies must have published interface agreements with the following: A lead agency, information sharing method, immediate stop-work authority, standard for incident notification, and escalation time limit. The agreements can be coordinated through a transition office, but this does not substitute for each organisation's statutory responsibilities. The economic test is the number of conflicting approvals, unnecessary delays, and access to fair redress.

## 5 Strategic Policy Matrix and Sequenced Roadmap

The most robust reform package is one that focuses on disclosure prior to privatisation, safety capacity prior to traffic liberalisation and interoperable processes prior to greenfield investment. In the short term, legally binding limits and measurable base lines should be set; in the medium term, access should be competitive and there should be investment tied to performance; and in the long term, there should be scaling up of specialised logistics nodes depending on traffic and demonstrable comparative advantage. The sequence is by design: public commitments that can't be taken back require evidence of demand for very big MRO campuses and cargo villages, while demands for inspector independence and fuel quality require quick responses.

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**Table 1 Phased reform matrix by authority and supply chain domain**

| Policy domain and accountable lead | Immediate 1–2 years | Medium 3–5 years | Long term 5+ years | Verification indicator |
|---|---|---|---|---|
| Governance and oversight — federal ministry and PCAA | Publish operating boundary agreements, inspection service standards and conflict registers | Independent regulatory performance review and interoperable occurrence reporting | Sustain risk-based oversight with externally benchmarked inspector competence | Corrective-action closure; audit findings; recurrence rates |
| Airport finance and tariffs — PAA and economic reviewer | Publish airport and navigation segment accounts and subsidy ledger | Apply transparent cost-based tariff reviews and competitive service obligations | Maintain funded asset renewal and stress-tested contingency reserves | Audited segment margin; unit charges; renewal backlog |
| MRO and spares — PCAA, PAA, FBR | Joint approval tracker; controlled AOG import lane; common hangar access rules | Develop approved rotable pools and competitively leased shared facilities | Expand internationally recognized work scopes where demand and approvals justify them | Spare release hours; AOG duration; third-party maintenance volume |
| Ground handling and fuel — PAA, PCAA, competition authorities | Map essential facilities; publish safety and access codes | Tender contestable services and regulate shared fuel-farm access | Invest in redundant fuel links and interoperable ramp systems | Handling damage; hydrant downtime; price dispersion |
| Cargo and trade — PAA, FBR, airlines and exporters | Link customs and cargo event timestamps; standardize cold-chain alarms | Tender multi-user cold facilities and inland consolidation services | Scale dedicated cargo villages and corridor investments by verified throughput | Truck-gate time; temperature excursions; cargo yield |

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It should be distinguished from the regulators technical authority that the Ministry responsible for aviation policy and the current administrative arrangements of the Defence Division have to be separated. The ministry's foremost responsibilities include approving public-service subsidies, designating an open and transparent system of economic oversight and ensuring a clear ownership policy and independent funding for safety. It should produce one interagency score card of reform, with clear definitions, baseline measurements and quarterly track of progress, and without interfering in the operation of each inspectorate's decisions. For its review each year, it should clearly state when a performance target interferes with a safety and/or national-security requirement.

PCAA's immediate contribution is a risk-based enforcement programme that includes public procedures for certification, surveillance, corrective action and appeal. It should define a full application for a maintenance organization and ground handlers and publish real decision time distributions. Its mission with fuel and cargo should continue to be the assurance of safety and security, not the commercial winners. At the same time, PAA should also publish the landlord access regulations, the tender results, the operating data at the airport level and all the relevant terms of the concession. A separate economic review may consider questions of transparency and nondiscrimination in cases where minimum safety requirements are not being violated by the airport or navigation charges.

FBR and other border agencies can make quick wins through redesigning high-friction handoffs. A priority risk-based examination of authorized AOG spares, using serial number, approved-user, post-clearance audit fields should be conducted. Declaring, securing, warehousing and lifting must all be connected by a common digital sequence for cargo exports. Service-time reporting should include both average (medians) and high-percentile delay to avoid exceptional cases being camouflaged. The State Bank and authorized dealers can provide transparency and up-to-date guidance on the payment of aviation parts, without resorting to informal guidance on a case-by-case basis. In exchange for certain government interfaces, private suppliers will need to invest in traceability, calibrated equipment, inventory pooling and auditable service records.

Hard choices are necessary for roadmap financing. Limited resources have a greater yield in providing safety oversight, customs time reduction, existing runway reliability, and shared essential facilities during the first budget cycle than in building prestige infrastructure. In years 3-5, tendering can determine if there is demand for MRO and cold chain assets and is not an open-ended occupancy agreement. New airport construction and construction of large cargo villages or regional overhaul hubs should only be built beyond the fifth year if the combination of traffic, technical capacities and international approvals and lifecycle financing, reaches disclosed thresholds. The state should have the flexibility to facilitate emergency connectivity but these responsibilities should be within a budget and not within an opaque tariff structure.

Evaluation needs a counterfactual. Before and after comparisons must take account of post-pandemic recovery, airline fleet changes, lack of dollars, geopolitical airspace restrictions and overall trade demand. Airport level panel reporting (if available) can be used to compare changes in turnaround and cargo dwell, as well as safety incidents and unit cost across airports under different concession and investment programmes. The overflight shortfall of 2025 may be a reminder of how exogenous shocks can offset managerial efficiencies. A reform which is considered successful for one year's total revenues may not have been successful for the carriers, exporters and the general public.

## 6 Conclusion

Pakistan's aviation laws for 2023 are institutionally significant as they distinguish between the regulator and a significant class of commercial service provision and create a dedicated function

for aviation accident investigation. Those changes for 2026 suggest that the governance structure is still up for grabs. History of regulation clashes, foreign safety regulations and known inefficiency of certain airports provide a clear motivation for reform. But the argument is not as strong that organizational separation is necessarily the means to a competitive aviation supply chain, or that the private airport is necessarily more efficient than the well-governed public airport.

The most critical fiscal adjustment is that PAA's portfolio of service-provider revenue comprises air navigation and related overflight revenue. The analytical question is not just about lost sovereign royalties to PCAA, it's about whether accounts make transparent distinctions between navigation costs, airport costs, regulatory funding, and budget financed regional connectivity. The risks of fluctuations of pooled receipts are highlighted by the revenue shortfalls documented for the overflights of 2025, and the number of loss-making feeder airports and the amount of cross-subsidies per year are not known due to public availability of evidence. Closures and redesign of subsidies or transfer of assets must start with audited segment data.

The operational consequence is also straightforward. International acceptance of authorization, secure hangars and fast bonded-parts transport are key to the competitiveness of MRO. Competition is needed for ground handling, compatibility for access to shared infrastructure and quality assurance for fuel, while continuity of the cold chain and timely cargo release and customs compatibility are required for perishables. These activities are managed by several agencies, contracts and property. Transaction costs can be shifted by a reform agenda that changes agency names, but does not make these interfaces transparent.

A governed network of specialised public bodies and competitive private providers, with cost-reflective charging mechanisms, independent audits and binding service-level agreements and explicit social commitments are the preferred strategy. Credibility of safety oversight, logistics reliability, equitable infrastructure access, and financial transparency and resilience under disruption should be the metrics used to measure its performance. The economic dividend of this enabling change, decoupling, is dependent upon institutional implementation on these criteria.

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