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Research Paper

Brazilian Civil Aviation (2013–2025): A Descriptive Analysis of ANAC Data on Passenger Demand, Airfares, Market Structure, and Operations

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Abstract

This study examines the performance of Brazilian civil aviation through an integrated analysis of passenger demand, operational capacity, market concentration, airfares, and financial indicators. A descriptive quantitative approach was adopted using secondary data from the National Civil Aviation Agency (ANAC). The analysis combines a historical series of domestic revenue passenger-kilometers (RPK) from 2013 to 2025 with a detailed assessment of sector indicators for 2025. The results show that domestic RPK reached 111.27 billion in 2025, representing growth of 10.7% compared with 2024 and exceeding the pre-pandemic level recorded in 2019. Demand growth also surpassed the increase in available capacity, measured by available seat-kilometers (ASK). Market concentration remained high, with the three largest domestic operators accounting for approximately 99.9% of the market. Airfare indicators revealed an average domestic fare of R$647.62, while 23.8% of tickets were sold for less than R$300. The financial data indicated that fuel, aircraft-related expenses, and personnel represented substantial components of operating costs. These findings provide a multidimensional overview of the sector, highlighting the importance of jointly monitoring demand, capacity, competition, fares, and costs. However, the aggregate and predominantly cross-sectional evidence does not establish causal relationships or long-term trends. The study contributes an integrated analytical framework for interpreting Brazilian civil aviation performance and identifying priorities for further investigation.

Keywords: *Civil Aviation, Air Transport, Market Concentration, Operating Costs, Brazil.*

INTRODUCTION

Civil aviation plays an important role in economic development, passenger mobility, and the integration of geographically distant regions. In countries with large territories, such as Brazil, air transport is particularly relevant for connecting major economic centers, supporting tourism and business activities, and facilitating domestic and international mobility. The performance of this sector, however, depends on several interrelated factors, including passenger demand, available capacity, market competition, airfares, and airlines' financial conditions. Consequently, evaluating the development of civil aviation requires a broader perspective than passenger traffic growth alone (Pinchemel et al., 2022; Bießlich et al., 2018).

The Brazilian air transport market has undergone substantial changes over the last decade, particularly in demand patterns, airline operations, and market structure. The COVID-19 pandemic represented a major disruption to this development, significantly reducing passenger mobility and requiring airlines to adjust their operations. Subsequently, the sector experienced a gradual recovery. According to the Brazilian National Civil Aviation Agency (Agência Nacional de Aviação Civil – ANAC, 2026), passenger traffic reached approximately 129.6 million passengers in 2025, considering domestic and international operations. Furthermore, the historical Revenue Passenger Kilometers (RPK) series indicates that demand exceeded its pre-pandemic level. These developments demonstrate the recovery of the Brazilian aviation market while raising questions

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about the operational, competitive, and financial conditions accompanying its expansion.

Previous research has examined relevant aspects of airline performance and market development. Pinchemel et al. (2022), for example, investigated business performance indicators and their relationship with operational efficiency among Brazilian airlines, highlighting the importance of operational and managerial factors. Research on airline market structure has also examined competition and concentration, demonstrating how market shares and competitive conditions influence the organization of air transport services (Ciliberto et al., 2021; Wandelt et al., 2024). Additionally, studies on airline costs have emphasized the relationship between operational expenses, resource allocation, and financial performance (Bießlich et al., 2018; Sakthidharan & Sivaraman, 2018). These contributions provide important analytical foundations, although they generally address specific dimensions of airline performance rather than bringing together historical demand trends, operational indicators, market structure, airfares, and financial conditions within a single assessment of the Brazilian sector.

In the Brazilian context, Santos and Silva (2019) previously addressed the panorama of civil aviation, providing an earlier perspective on the sector. The present study differs from that contribution not merely by extending the observation period, but also by adopting an integrated analytical framework that combines the historical evolution of passenger demand from 2013 to 2025 with a broader examination of operational, competitive, pricing, and financial indicators for 2025. This approach makes it possible to examine how the recovery and expansion of demand coexist with market concentration, changes in available capacity, airfare levels, and the cost structure of airline operations. Thus, the study seeks to advance the existing discussion by connecting dimensions that are frequently examined separately.

Despite the contributions of previous studies, an integrated descriptive assessment of the Brazilian air transport market remains relevant, particularly considering the recent recovery of passenger demand and the availability of updated institutional indicators. Understanding whether the expansion of passenger traffic is accompanied by corresponding changes in available capacity, how market shares are distributed among airlines, and what airfare and cost indicators reveal about the sector's economic conditions can provide a more comprehensive picture of its development. This perspective is particularly important because increased demand does not necessarily imply greater competition, improved affordability, or stronger financial sustainability.

Against this background, this study addresses three research questions: (1) How has passenger demand in Brazilian civil aviation evolved between 2013 and 2025, particularly in relation to the contraction caused by the COVID-19 pandemic and the subsequent recovery? (2) What do the 2025 operational and market indicators reveal about the relationship between passenger demand, available capacity, and airline market structure? (3) What do airfare and financial indicators reveal about the pricing conditions and operating cost structure of Brazilian civil aviation in 2025?

To answer these questions, this study aims to provide a descriptive documentary analysis of Brazilian civil aviation based on secondary data published by ANAC. The analysis combines the historical evolution of RPK between 2013 and 2025 with operational, market, airfare, and financial indicators for 2025, considering domestic and international operations whenever the data are available separately. By integrating these dimensions, the research contributes to a broader understanding of the Brazilian air transport market, identifying the main characteristics of its recent expansion and the challenges associated with competition, operational performance, and financial sustainability.

LITERATURE REVIEW

Air Transport Demand and Operational Performance

Air transport performance has been widely examined through indicators related to passenger demand, available capacity, and the use of airline resources. Among these indicators, Revenue Passenger Kilometers (RPK) and Available Seat Kilometers (ASK) are particularly important because they provide information about the relationship between passenger demand and the capacity offered by airlines (Tesfay, 2016). The passenger load factor, calculated as the ratio between RPK and ASK, is also commonly used to assess how effectively available capacity is being used. However, operational performance cannot be evaluated through a single indicator. Airlines must balance passenger demand, flight frequency, aircraft size, route length, and operating costs. Increasing the number of flights may improve service availability and provide more travel options, but it can also increase operating expenses. Similarly, using larger aircraft may reduce the cost per available seat, although this strategy depends on demand levels and route characteristics. Therefore, operational decisions involve trade-offs between capacity, service quality, and cost efficiency (Santos & Silva, 2019).

Research conducted in the Brazilian airline industry provides evidence of these relationships. Pinchemel et al. (2022) examined operational performance indicators for four major Brazilian airlines between 2009 and 2017. Their results showed that route availability and flight frequency were relevant to operational efficiency, particularly when airlines adjusted their services to passenger demand. The study also highlighted the importance of flight distance, aircraft operations, and fuel consumption. These findings demonstrate that airline performance depends on the interaction between different operational decisions rather than on passenger growth alone.

Other studies have examined the relationship between operational efficiency and financial results. Huang et al. (2021), using data from nine US airlines between 2015 and 2019, found that operational efficiency improved during the period, while efficiency in the profitability stage remained relatively stable. This distinction is important because improvements in the use of operational resources do not necessarily result in equivalent improvements in financial performance. Although these studies provide useful evidence, their findings also show the limitations of evaluating airlines through isolated indicators or a single stage of performance.

Market Structure and Competition in the Airline Industry

Market structure is another important factor influencing airline performance. The number of operating companies, their market shares, and the availability of competing services can affect pricing decisions, route development, and the quality of air transport services (Cui et al., 2013). In markets with a limited number of large operators, competition may depend not only on the total number of airlines but also on their presence on specific routes and their ability to offer alternative services. The Herfindahl-Hirschman Index (HHI) and concentration ratios are commonly used to examine market structure. These measures provide information about the distribution of market shares among companies (Johnston & Ozment, 2011). Nevertheless, their interpretation requires attention to how the market is defined. Measuring concentration at the national level may produce different results from measuring competition between specific airport pairs, since airlines may compete strongly on some routes while operating with limited direct competition on others.

Ciliberto et al. (2021) developed an econometric framework to examine entry and pricing decisions in airline markets. Their findings show that market entry and pricing decisions are related and that ignoring the conditions influencing airline entry may lead to biased estimates of demand responses. This suggests that market structure cannot be understood only by comparing the size of individual companies. The conditions under which airlines enter markets and compete for passengers must also be considered. More recently, Wandelt et al. (2024) investigated airline

market concentration across global markets between 2010 and 2022. Their results identified differences in the level, trend, and stability of concentration across markets. This finding reinforces the idea that airline competition is not uniform and that market concentration changes according to geographical and market conditions. These studies indicate that concentration measures are useful for describing competitive structures, but they should not be treated as direct evidence of market power or poor consumer outcomes. A concentrated market may still present active competition on particular routes, while a market with several registered airlines may offer limited alternatives to passengers.

Operating Costs and Financial Performance

Airlines operate under a cost structure that includes fuel, aircraft leasing, maintenance, personnel, airport charges, and other operational expenses. These costs are directly related to decisions concerning fleet composition, route planning, flight frequency, and service capacity. In addition, airlines are exposed to external factors such as fuel price changes, exchange-rate movements, economic uncertainty, and unexpected reductions in passenger demand. The relationship between operational efficiency and financial performance has received considerable attention in the literature. Huang et al. (2021) showed that improvements in operational efficiency do not always produce similar improvements in profitability. Their findings suggest that airlines must consider both the efficient use of resources and the ability to generate financial returns from their operations.

Research on operating costs also highlights the importance of fleet and capacity decisions. Bießlich et al. (2018) examined airline cost estimation and demonstrated the relevance of cost information for decisions involving aircraft selection and operational planning. Similarly, Sakthidharan and Sivaraman (2018), studying Indian airlines, identified the influence of operating cost components on airline efficiency, including maintenance and labor expenses.

Fuel management represents another important aspect of airline cost control. Because fuel is a major operating expense, changes in fuel prices can affect financial results even when passenger demand remains stable. However, the impact of fuel costs should not be analyzed separately from aircraft efficiency, flight distance, and capacity utilization. These factors influence the amount of fuel required to transport passengers and therefore affect operating costs per unit of output. The literature also indicates that airline business models may influence the relationship between costs and profitability. Differences between low-cost and full-service carriers affect fleet decisions, service structures, labor requirements, and revenue strategies. As a result, the same operating conditions may produce different financial outcomes across companies.

An important implication of these studies is that revenue growth should not be considered sufficient evidence of financial sustainability. Higher passenger volumes may increase revenue, but profitability also depends on cost control, resource allocation, and the ability to respond to external economic changes (Santos et al., 2026). Accordingly, this study examines the relationship between the revenue, costs, and financial results reported for Brazilian civil aviation, while recognizing that aggregated indicators do not allow a complete assessment of the performance of each individual airline.

Air Connectivity and Regional Development

Air connectivity is an important dimension of transport performance because it determines how easily people and businesses can access destinations through the air transport network. The availability of direct flights, the frequency of services, the number of destinations, and the quality of connections influence the usefulness of air transport for passengers and regional economies. However, connectivity is not equally distributed across geographical areas. Major urban centers

generally attract higher passenger demand and more frequent services, while smaller cities may have fewer routes and depend on connections through larger airports. This difference raises questions about the relationship between commercial demand and the broader territorial role of civil aviation.

Yoo et al. (2024) reviewed research on long-distance accessibility by air transport and emphasized that accessibility involves more than the physical presence of transport infrastructure. It also depends on travel time, available services, geographical conditions, and individual characteristics. Their review indicates that the assessment of air accessibility requires a broader perspective than the simple measurement of airport or route connectivity.

Similarly, research by Ceulemans et al. (2025) examined the relationship between airport connectivity and regional development in Europe. Their findings show that changes in air connectivity can be relevant to regional employment and economic development. The study also highlights the importance of considering different connectivity measures, since the number of available connections does not necessarily reflect the quality or convenience of the transport network. These findings are relevant to Brazil because the country's large territory and regional economic differences create distinct conditions for air transport development. An increase in national passenger numbers may occur alongside unequal access to flights and destinations. Consequently, the expansion of the aviation market should not be interpreted as evidence that all regions have benefited equally from improved connectivity.

Research Gap and Analytical Framework

The literature reviewed shows that civil aviation performance is a multidimensional subject involving demand, operational capacity, market competition, operating costs, and territorial connectivity. Previous studies have made important contributions by examining specific aspects of these relationships. Research on operational efficiency has identified the importance of route planning, aircraft use, and capacity management, while studies on market structure have shown that airline competition varies across geographical markets. Other research has demonstrated that operational improvements do not always lead to equivalent financial gains and that air connectivity has implications beyond passenger transportation. Despite these contributions, the studies discussed generally focus on specific airlines, selected geographical markets, or particular dimensions of performance.

The present study addresses this opportunity by examining the historical evolution of air transport demand and the main operational and economic indicators reported for Brazil, with particular attention to 2025. The analysis considers the relationship between passenger demand and available capacity, the distribution of market shares among airlines, the composition of operating costs, and the financial results of the sector. It also discusses the implications of these findings for competition and territorial connectivity.

Rather than assuming that passenger growth represents overall sector development, the study adopts a broader perspective in which market expansion is assessed in relation to operational efficiency, financial sustainability, and access to air transport. This approach provides a basis for identifying both the progress achieved by Brazilian civil aviation and the structural challenges that may influence its future development.

RESEARCH METHOD

Research Design

This study adopts a descriptive and documentary research design based on secondary data published by the Brazilian National Civil Aviation Agency (Agência Nacional de Aviação Civil – ANAC). The approach is quantitative-descriptive, as it organizes and examines numerical indicators

to characterize the evolution and main operational, competitive, and financial aspects of Brazilian civil aviation. No primary data collection, econometric estimation, or causal inference was performed.

The empirical analysis relies on two complementary ANAC resources: (i) the Statistical Data on Air Transport, which provides historical information on passenger traffic and airline operations; and (ii) the Air Transport Indicators Dashboard (Painel de Indicadores do Transporte Aéreo), which consolidates operational, market, airfare, and financial indicators. The statistical database includes information reported by Brazilian and foreign airlines operating in Brazil, while the dashboard provides aggregated indicators for domestic and international operations, according to the availability of each variable (ANAC, 2026). The study covers two distinct analytical periods. The first comprises annual Revenue Passenger Kilometers (RPK) observations from 2013 to 2025, used to examine the historical evolution of passenger demand, including the pre-pandemic period, the contraction in 2020, and the subsequent recovery. The second focuses on operational, market, airfare, and financial indicators for the 2025 reference year, representing the most recent complete annual period considered in the analysis.

The 2025 operational and market assessment distinguishes between domestic and international operations whenever ANAC provides separate information. Domestic indicators include passenger traffic, available capacity, airline market shares, average airfares, average yield, ticket-price distribution, and financial performance. International indicators include passenger volumes, flight operations, demand and capacity growth, and airline market shares, where available. The market-share analysis considers the airlines individually identified in the ANAC dashboard and the residual category of other operators whenever reported.

The financial assessment focuses on the aggregate indicators made available by ANAC, including revenue from air services, operating costs and expenses, net results, and the relative participation of the main cost categories. These indicators are analyzed at the level of aggregation provided by the agency and are not interpreted as individual financial statements for each airline. The 2026 publication year refers to the release or consultation of the institutional information and does not mean that 2026 observations were incorporated into the annual analysis. Although partial 2026 information covering January to September was available at the time of data collection, these observations were excluded from the analytical dataset to preserve comparability between complete annual periods. Therefore, the empirical analysis ends in December 2025.

Data Sources and Scope

The primary data source was ANAC's official statistical information and its Air Transport Indicators Dashboard (Painel de Indicadores do Transporte Aéreo). The agency provides historical information on passenger traffic, flight operations, available capacity, market shares, airfares, and airline financial performance. Its statistical database is updated periodically and contains information reported by Brazilian and foreign airlines operating in the country (ANAC, n.d.). The analysis covers two complementary periods. First, the historical demand analysis considers annual Revenue Passenger Kilometers (RPK) from 2013 to 2025. This period makes it possible to examine the sector's development before the COVID-19 pandemic, the sharp contraction in 2020, and the subsequent recovery. Second, the operational, market, and financial assessment uses the indicators reported for 2025, the most recent complete annual period considered in the study. The 2026 figures available at the time of data collection cover only January to September. They are therefore not included in the comparison of complete annual results. Where relevant, they may be used as a supplementary indication of recent developments, provided that comparisons are restricted to equivalent periods. The dataset comprises the following groups of indicators:

- Demand and operational performance: RPK, Available Seat Kilometers (ASK), number of passengers transported, and number of flights.
- Market structure: domestic and international airline market shares, measured by RPK.
- Airfares and accessibility: average domestic airfare, average yield, and the proportion of tickets sold below R$300.
- Financial performance and cost structure: airline revenue from air services, costs and expenses, net result, and the relative contribution of major operating cost categories.

The analysis distinguishes between domestic and international operations whenever the indicators are reported separately by ANAC. The historical RPK series is treated according to the scope and aggregation presented in the corresponding ANAC dataset.

Data Collection and Treatment

Data were collected from ANAC's publicly available statistical resources and the 2025 air transport indicators dashboard. The annual RPK observations were organized chronologically in a spreadsheet, while the 2025 indicators were grouped according to the four analytical dimensions described above. Before analysis, the indicators were classified by unit of measurement and operational meaning. Passenger volumes and flight numbers were treated as absolute values; RPK and ASK were treated as transport demand and available capacity measures, respectively; market shares and cost components were expressed as percentages; and financial indicators and airfares were maintained in Brazilian reais (R$). Annual growth rates were calculated to identify changes in demand and other indicators over time. The percentage variation between two consecutive periods was calculated as:

$$Growth_t = \frac{x_t - x_{t-1}}{x_{t-1}} \, x \, 100 \quad (01)$$

where (X_t) represents the indicator in the current period and (X_{t-1}) represents its value in the previous period. To examine the effects of the COVID-19 pandemic and the subsequent recovery, the 2020 RPK value was compared with the 2019 level. The 2025 value was also compared with the pre-pandemic level recorded in 2019. These comparisons provide a descriptive assessment of the magnitude of the contraction and the extent of the recovery.

The relationship between demand and available capacity was examined through the annual variation in RPK and ASK. These indicators were interpreted jointly to assess whether passenger traffic and airline capacity expanded at similar rates. When both indicators are available consistently, the passenger load factor can be calculated as:

$$Load\ Factor = \frac{RPK}{ASK} \, x \, 100 \quad (02)$$

This indicator measures the proportion of available seat capacity used by paying passengers. It should not be confused with the average number of passengers per flight, which does not account for aircraft capacity or flight distance.

Market Concentration and Financial Indicators

Market concentration was examined using the market shares of the three largest airlines in the Brazilian domestic market, as reported by ANAC for 2025. The concentration ratio of the three largest firms (CR3) was calculated by adding their respective market shares:

$$CR3 = s1 + s2 + s3 \ (03)$$

where s1, s2, and s3 represent the market shares of the three largest airlines. The Herfindahl–Hirschman Index (HHI) was also calculated as the sum of the squared market shares of the airlines:

$$HHI = \sum_{i=1}^{n} s_i^2 \ (04)$$

where s_i is the market share of airline (i), expressed as a percentage, and (n) is the number of airlines included in the calculation. The index ranges from values close to zero to 10,000 when market shares are expressed as percentages. The HHI was used as a descriptive measure of market concentration, rather than as direct evidence of market power or its effects on prices. Financial performance was assessed by examining reported revenue from air services, costs and expenses, and net results. The cost structure was analyzed through the relative participation of the main cost categories in total reported costs. Particular attention was given to fuel and lubricants, aircraft leases, insurance and maintenance, personnel, and other operational expenses. These categories were considered in relation to their potential implications for airline cost exposure and financial sustainability.

For descriptive interpretation, the study refers to the concentration framework presented in the 2023 Merger Guidelines issued by the U.S. Department of Justice and the Federal Trade Commission. Under this framework, markets with an HHI above 1,800 points are classified as highly concentrated. These thresholds are used exclusively as an analytical reference for describing market structure and do not constitute a formal antitrust assessment of the Brazilian airline industry (U.S. Department of Justice & Federal Trade Commission, 2023).

The CR3 and HHI calculations are restricted to the domestic market because the international market-share information is presented with a substantial aggregated category of other operators, preventing an equivalent firm-level calculation using the available breakdown. National market concentration is therefore interpreted as a descriptive indicator and not as direct evidence of market power or competitive conditions on individual routes.

Airfare analysis was restricted to the 2025 indicators available from ANAC, including average domestic airfare, average yield, and the proportion of tickets sold below R$300. These indicators were examined to characterize the price conditions of the domestic market during the reference year. No historical airfare variation was estimated because a comparable time series was not included in the analytical dataset. Financial performance was assessed by examining reported revenue from air services, costs and expenses, and net results. The cost structure was analyzed through the relative participation of the main cost categories in total reported costs, with particular attention to fuel and lubricants, aircraft leases, insurance and maintenance, personnel, and other operational expenses. These indicators were considered in relation to their potential implications for airline cost exposure and financial sustainability.

Analytical Procedure

The analysis was conducted in three stages. First, the historical RPK series was examined to identify the main phases of sector development between 2013 and 2025, including pre-pandemic growth, the 2020 contraction, and the subsequent recovery. Second, the 2025 operational, market, and airfare indicators were analyzed to characterize domestic and international activity, compare demand and capacity growth, and examine the distribution of domestic market shares through CR3 and HHI. Third, the financial indicators were examined to identify the main cost components and characterize the reported financial performance of the sector. The findings were interpreted in light of the literature on airline operational performance, market concentration, cost structures, and air

transport development. This procedure enabled the study to examine the main characteristics of Brazilian civil aviation through a descriptive integration of historical demand, operational, competitive, pricing, and financial indicators.

Methodological Limitations

The study has limitations related to the use of aggregated secondary data. National-level indicators may conceal differences between airlines, airports, routes, and geographical regions. In particular, market shares calculated for the domestic market do not necessarily represent the competitive conditions of individual city-pair markets. Similarly, changes in demand, supply, airfares, and financial results cannot be interpreted as evidence of direct causal relationships. The HHI calculation is also subject to the level of market-share disaggregation made available by ANAC. The inability to identify and incorporate carriers grouped within an aggregated category may affect the precision of the concentration estimate. Furthermore, airfare indicators for 2025 do not allow the identification of historical price trends or the assessment of affordability across different consumer groups. The analysis also depends on the definitions, reporting procedures, and revisions adopted by ANAC. The agency's statistical information may be subject to corrections and updates. Consequently, the results should be understood in relation to the data available on the dates of collection. These limitations are considered when interpreting the findings and defining the scope of the conclusions.

FINDINGS AND DISCUSSION

Demand Recovery and Operational Expansion

The historical RPK series reveals three distinct phases in Brazilian civil aviation. Between 2013 and 2019, passenger demand increased from approximately 87.74 billion to 96.44 billion passenger-kilometers, indicating sustained expansion before the COVID-19 pandemic. In 2020, RPK fell to 48.73 billion, a reduction of approximately 49.5% compared with 2019. The recovery was gradual but consistent: demand reached 89.37 billion in 2022, returned to a level close to the pre-pandemic figure in 2023, and exceeded it in 2024. In 2025, RPK reached approximately 111.27 billion, representing growth of 10.7% over the previous year and an increase of 15.4% compared with 2019. These results indicate that the recovery of Brazilian air transport went beyond restoring pre-pandemic demand.

The historical evolution of air transport demand provides an overview of the structural changes experienced by Brazilian civil aviation over the last decade. As shown in Figure 1, passenger demand increased between 2013 and 2019, followed by a sharp decline in 2020 due to the COVID-19 pandemic. Although recovery occurred gradually, RPK surpassed its pre-pandemic level in 2024 and continued to increase in 2025. This trend highlights the sector's capacity to recover from a major external shock and achieve a new level of passenger demand.

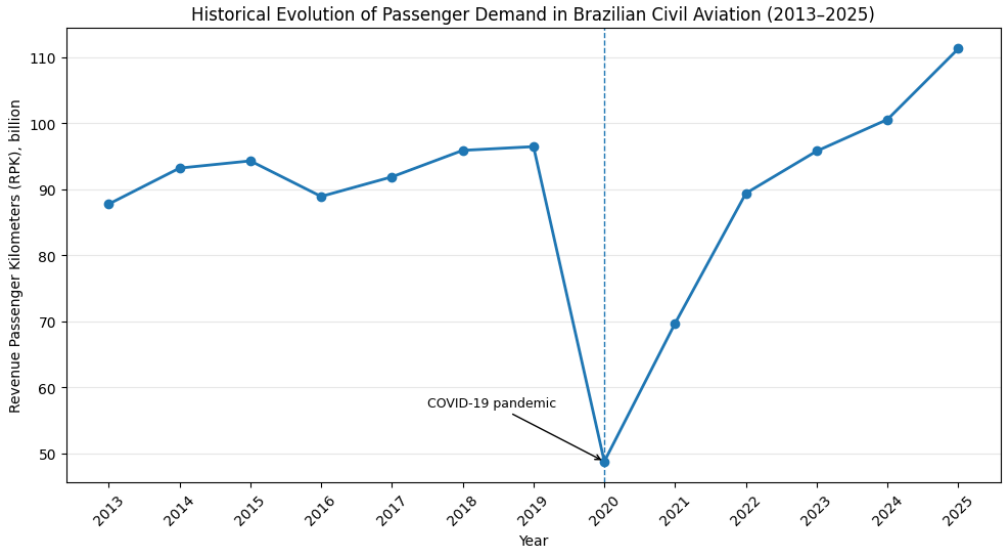


Figure 1. Historical Evolution of Passenger Demand in Brazilian Civil Aviation (2013–2025).
Source: Prepared by the authors based on ANAC data (2026).

The expansion recorded in 2025 suggests that the sector entered a new growth phase. This finding is consistent with Pinchemel et al. (2022), who identified the importance of route availability and flight frequency in supporting passenger demand and operational performance among Brazilian airlines. However, the present analysis extends that discussion by considering a longer period, including the pandemic shock and the subsequent recovery. The 2025 dashboard also reports 101.2 million domestic passengers and 28.4 million international passengers. The domestic market therefore remains central to the scale of Brazilian aviation, while international operations represent an important additional component of sector activity. Nevertheless, passenger growth alone does not establish whether the expansion has been distributed evenly across regions or routes.

Supply, Market Structure, and Competition

In 2025, the Brazilian domestic market transported approximately 101.25 million passengers through 796,630 flights. These figures indicate the scale of domestic operations and provide an operational complement to the RPK series. The number of passengers transported measures the volume of users, whereas RPK incorporates the distance flown by paying passengers. Therefore, the two indicators should not be treated as interchangeable measures of demand.

The ANAC dashboard reports that domestic RPK increased by 10.7% in 2025, while Available Seat Kilometers (ASK) increased by 8.6%. The difference between these growth rates indicates that passenger demand expanded more rapidly than the available capacity measured in seat-kilometers. This pattern is compatible with an increase in the use of existing capacity, but it does not, by itself, establish the magnitude of the change in the passenger load factor. The latter must be calculated using RPK and ASK values extracted from the same database version, period, and operational scope. Accordingly, the load factor should only be reported after this consistency check has been completed.

The market-share distribution reveals a highly concentrated domestic market. LATAM accounted for approximately 39.86% of domestic RPK, followed by GOL with 30.89% and Azul with 29.15%. The combined share of these three airlines produces a concentration ratio (CR3) of approximately 99.90%. The remaining 0.10% is attributable to other operators and/or rounding in

the reported shares. The corresponding Herfindahl–Hirschman Index (HHI), calculated from the three individually reported market shares, is approximately 3,393 points. The CR3 and HHI results indicate that domestic passenger demand was overwhelmingly concentrated among three airlines in 2025. The HHI is above the 1,800-point threshold used to classify a market as highly concentrated in the U.S. Department of Justice and Federal Trade Commission's 2023 Merger Guidelines. This benchmark should be interpreted cautiously: it is a descriptive reference adopted in merger assessment and does not establish, on its own, the existence of market power, anticompetitive conduct, or adverse effects on consumers in Brazil.

This distinction is particularly important in air transport. As discussed by Johnston and Ozment (2011), Ciliberto et al. (2021), and Wandelt et al. (2024), market concentration provides information about the distribution of activity among firms, but the competitive conditions of airline markets also depend on the geographical and operational definition of the market. A national-level concentration index does not reveal whether passengers have alternative operators on specific airport-pair routes, nor does it capture differences in flight frequency, schedules, or airport access. Thus, the high domestic CR3 and HHI describe the national distribution of demand, but they cannot be used as direct evidence that competition is equally limited across all Brazilian routes. International operations presented a different distribution. In 2025, the international market recorded approximately 28.43 million passengers and 162,362 flights. Demand increased by 11.9%, while available capacity expanded by 11.5%. LATAM accounted for 18.9% of international demand, followed by TAP (9.3%), Azul (6.0%), Air France (4.8%), and American Airlines (4.7%). Other operators collectively represented 56.3% of the market. This residual share indicates a more dispersed distribution among international operators than in the domestic market. However, because the available dashboard groups a substantial proportion of international demand under “other operators,” a directly comparable international HHI cannot be calculated from the individually reported shares. The domestic and international concentration results should therefore not be compared as if they were based on equally detailed market-share distributions.

Airfares and Financial Sustainability

The 2025 ANAC dashboard reports an average domestic airfare of approximately R$647.62 and an average yield of R$0.4980 per passenger-kilometer, subject to confirmation of the dashboard's unit and price basis. The average airfare represents the average amount paid per ticket, whereas yield expresses the average fare in relation to the distance traveled. These indicators provide complementary information: the average ticket price reflects the monetary cost of a journey, while yield allows comparisons across journeys of different distances. The dashboard also indicates that 23.8% of domestic tickets were sold for less than R$300. This proportion confirms the presence of lower-priced tickets in the market, but it should not be interpreted as evidence that air transport is affordable for all income groups or on all routes. Average prices and ticket-price distributions may conceal differences associated with distance, route competition, seasonality, booking time, and passenger purchasing conditions.

For a temporal comparison, the real airfare series published by ANAC should be distinguished from the nominal average airfare reported in the dashboard. ANAC's 2025 management report presents the real domestic average airfare adjusted by the IPCA, with a reduction from R$542.33 in 2024 to R$500.99 in 2025. This corresponds to a real decrease of approximately 7.6%. The nominal dashboard figure and the IPCA-adjusted series should not be combined in the same comparison without explicitly identifying their different price bases. This distinction is necessary to avoid interpreting nominal price levels as changes in purchasing power. The airfare indicators complement the market-concentration analysis, but they do not establish a causal relationship between concentration and ticket prices. The present study does not estimate

route-level price differences or control for distance, competition, seasonality, and other determinants of fares. Therefore, the results do not support the conclusion that the observed concentration caused higher or lower prices. A more detailed investigation would require fare observations by route and airline, together with information on the competitive conditions of each market.

International Operations and Overall Implications

International operations recorded 28.43 million passengers and 162,362 flights in 2025. The dashboard reports international demand growth of 11.9% and capacity growth of 11.5%. These figures indicate expansion in international activity, with demand and supply growing at relatively similar rates. LATAM accounted for 18.9% of international demand, while TAP represented 9.3%, Azul 6.0%, Air France 4.8%, and American Airlines 4.7%. Other operators collectively represented 56.3%, indicating a more diversified distribution than that observed in the domestic market.

Table 1 summarizes the main operational, market, and financial indicators of Brazilian civil aviation in 2025. The results reveal a sector characterized by strong passenger demand, concentrated domestic market shares, and substantial operating costs. While demand growth exceeded the expansion of available domestic capacity, the market structure remained dominated by three major airlines. In addition, fuel and aircraft-related expenses represented a substantial proportion of reported costs. Taken together, these indicators highlight the coexistence of market expansion, concentration, and cost pressures in the Brazilian aviation sector.

Table 1. Main indicators of Brazilian civil aviation (2025)

Dimension	Indicator	Result	Analytical interpretation
Demand	Domestic passengers	101.25 million	Strong domestic market activity
Demand	International passengers	28.43 million	Expansion of international operations
Demand	Total RPK	111.27 billion	Demand exceeded the pre-pandemic level
Operational performance	Domestic RPK growth	+10.7%	Demand expanded significantly
Operational performance	Domestic ASK growth	+8.6%	Capacity growth was below demand growth
Market structure	LATAM domestic market share	39.86%	Largest domestic operator
Market structure	GOL domestic market share	30.89%	Second-largest domestic operator
Market structure	Azul domestic market share	29.15%	Third-largest domestic operator
Market structure	Domestic HHI	3,393	High national market concentration
Airfares	Average domestic airfare	R$647.62	Average ticket price indicator
Airfares	Tickets below R$300	23.8%	Presence of lower-priced tickets
Financial performance	Revenue from air services	R$78.83 billion	Scale of domestic airline revenues

Financial performance	Costs and expenses	R$70.76 billion	Substantial operating expenditure
Financial performance	Net result	R$4.143 billion	Positive reported financial result
Cost structure	Fuel and lubricants	29.3%	Largest individual cost category
Cost structure	Leasing, insurance and maintenance	21.0%	Significant aircraft-related expenditure
Cost structure	Personnel	13.7%	Relevant labor cost component

Source: Prepared by the authors based on ANAC (2026).
Note: RPK = Revenue Passenger Kilometers; ASK = Available Seat Kilometers; HHI = Herfindahl–Hirschman Index. The HHI was calculated using the domestic market shares reported for the three airlines. Financial indicators refer to the reporting scope adopted by ANAC.

Overall, the findings show that Brazilian civil aviation experienced substantial demand growth after the pandemic, but this expansion coexists with a concentrated domestic market and significant operating cost pressures. The results complement previous studies by bringing together historical demand, market structure, airfares, and financial indicators in a single assessment of the Brazilian sector. They also highlight an important distinction: operational expansion, competitive conditions, affordability, and financial sustainability are related but separate dimensions. Therefore, the growth of passenger traffic should not be considered, by itself, sufficient evidence of improved efficiency, broader territorial accessibility, or stronger economic sustainability.

The national indicators analyzed in this study provide information about passenger volumes, flights, available capacity, and market shares, but they do not directly measure the territorial distribution of air connectivity. The fact that Brazil transported more than 129 million passengers in 2025 does not demonstrate that access to air transport improved uniformly across regions or municipalities. Likewise, the concentration of domestic demand among three airlines does not reveal whether smaller cities gained or lost direct connections, flight frequencies, or access to alternative routes.

This limitation is relevant to the discussion of air connectivity and regional development. Ceulemans et al. (2025) and Yoo et al. (2024) emphasize that connectivity and accessibility require measures that consider the availability and characteristics of connections, rather than relying exclusively on aggregate passenger volumes. In the Brazilian context, an assessment of territorial connectivity would require, at a minimum, information on active routes, airport-pair connections, flight frequencies, the number of municipalities and regions served, and changes in these indicators over time. These variables were not systematically examined in the present study. For this reason, territorial connectivity is treated here as an implication for further research rather than as an empirically demonstrated outcome or a central objective of the current analysis. The findings support the conclusion that national demand expanded, but they do not establish whether this expansion reduced regional inequalities in access to air transport. A dedicated route- and airport-level study would be necessary to address that question.

Taken together, the results describe a Brazilian domestic aviation market that experienced a substantial recovery in passenger demand after the pandemic, reached a new demand level in 2025, and remained highly concentrated among three major airlines. Domestic demand grew faster than available capacity in 2025, while international operations also expanded in terms of passengers, flights, demand, and capacity. At the same time, the reported cost structure reveals the importance of fuel, aircraft-related expenses, and personnel, while the financial indicators require caution

because the available aggregate figures do not provide a complete reconciliation of revenue, expenses, and net result. The findings complement previous studies by bringing together historical domestic demand, operational indicators, market concentration, airfares, and cost structure in a single descriptive assessment. However, they do not establish causal relationships between these dimensions. In particular, the results do not demonstrate that market concentration determines airfare levels, that demand growth necessarily improves financial performance, or that national passenger expansion produces more balanced territorial connectivity. These questions remain relevant for future research using route-level, airline-level, and longitudinal data.

CONCLUSIONS

This study examined the panorama of civil aviation in Brazil by analyzing historical passenger demand, operational performance, market concentration, airfares, and financial indicators. The findings show that the sector has experienced a strong recovery following the COVID-19 pandemic, with passenger demand reaching a level above that recorded before the crisis. In 2025, RPK reached approximately 111.27 billion passenger-kilometers, representing an increase of 15.4% compared with 2019. This result indicates that the recovery was followed by a new phase of demand expansion.

The main theoretical contribution lies in the application of a multidimensional perspective to the analysis of airline-sector performance. Rather than treating passenger demand as a sufficient indicator of sector development, the study connects four complementary dimensions: demand and capacity, market structure, airfares, and cost and financial conditions. This perspective contributes to the literature on airline performance by distinguishing between the expansion of transport activity, the distribution of market shares, the prices paid by passengers, and the financial indicators reported by the sector. These dimensions provide different types of information and should not be interpreted as interchangeable measures of efficiency, competitiveness, affordability, or economic sustainability.

This distinction is particularly relevant to the interpretation of the 2025 results. Domestic RPK grew faster than available capacity, indicating that demand expanded more rapidly than supply measured in seat-kilometers. The domestic market also presented a high level of national concentration, with LATAM, GOL, and Azul accounting for approximately 99.90% of the reported market shares. Meanwhile, the cost structure showed that fuel and lubricants, aircraft leasing, insurance and maintenance, and personnel represented substantial components of reported operating costs. These findings demonstrate the coexistence of demand expansion, concentrated market shares, and significant cost components. However, the descriptive design does not establish causal relationships among these dimensions or demonstrate that demand growth resulted in greater efficiency or financial stability.

This study extends previous panorama-type analyses by combining a historical demand series with a detailed examination of operational, market, airfare, and cost indicators for a common reference year. Rather than establishing causal relationships or developing predictive models, it integrates complementary indicators within a consistent framework to provide a structured understanding of Brazilian civil aviation.

The findings have practical implications for regulatory authorities, sector analysts, and airline managers. First, domestic RPK and ASK should be monitored jointly, given the faster growth of demand than capacity in 2025. Load factor assessments should rely on consistent observations of both indicators. Second, the high national CR3 and HHI support complementing market-wide monitoring with route-level analyses of concentration, flight frequency, and alternative operators. Third, airfare monitoring should consider nominal and inflation-adjusted prices, fare distributions across routes, and purchasing conditions. Average fares and the share of tickets below R$300 offer

an initial market profile but cannot establish affordability across income groups or geographic areas. Assessments of passenger access should therefore incorporate route-level fares and purchasing power.

The cost structure highlights fuel and lubricants, aircraft-related expenses, and personnel as priorities for operational and financial monitoring. These categories can inform cost-control reviews, fleet planning, maintenance, and resource allocation, although aggregate data cannot establish individual airline efficiency or the effects of management decisions. Similarly, positive aggregate net results in 2025 should be interpreted cautiously because the available indicators do not fully reconcile revenues, costs and expenses, and net results. GOL and Azul's restructuring processes further underscore the need for airline-level financial statements and multi-year data. Accordingly, the 2025 figures represent a sector snapshot, not evidence of sustained profitability, solvency, or long-term financial sustainability.

LIMITATION & FURTHER RESEARCH

This study has limitations that should be considered when interpreting its findings. First, the analysis relies on aggregated secondary data published by ANAC. Although these data provide a broad view of the Brazilian aviation market, they do not allow detailed comparisons among individual routes, airports, airlines, or geographic regions. Consequently, national market concentration indicators may conceal differences in competitive conditions across specific city-pair markets. Second, the analysis is primarily descriptive and does not establish causal relationships between demand, capacity, market concentration, airfares, and financial performance. Changes in these indicators may also reflect external factors, including economic conditions, fuel prices, exchange-rate fluctuations, regulatory changes, and variations in household income. These factors were not separately estimated in the present study.

Third, the financial assessment is based on the indicators available in the ANAC dashboard. More detailed financial statements would be necessary to examine differences in profitability, indebtedness, liquidity, and cost efficiency among airlines. In addition, the 2026 information available at the time of analysis covered only January to September and was therefore not treated as a complete annual observation.

Future research could address these limitations through airline-level and route-level analyses. Studies using panel data could investigate how operational capacity, fuel costs, fleet characteristics, and market structure are associated with airline efficiency and financial performance in Brazil. Further research could also examine the relationship between market concentration and airfares at the city-pair level, providing a more detailed assessment of competition. Another relevant direction concerns territorial accessibility. Research combining flight frequency, ticket prices, airport connectivity, population distribution, and regional economic indicators could identify geographic inequalities in access to air transport. Finally, future studies could use longer time series and econometric methods to investigate the effects of the COVID-19 pandemic and subsequent market changes, as well as assess whether the recent expansion of Brazilian civil aviation can be sustained over the long term.

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