

Analyzing Market Concentration in the Indonesian Domestic Commercial Airline Industry: Firm-Level and Group-Level Evidence

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Abstract

This study examines competition in Indonesia's domestic commercial airline industry during the 2019–2024 period. While prior studies have measured market concentration at the firm level, few have examined how ownership-group structures may reshape our understanding of effective competition. Using a quantitative descriptive approach, the study addresses this gap by applying the Four-Firm Concentration Ratio (CR4) and the Herfindahl-Hirschman Index (HHI) at two distinct levels of analysis: firm level and group level. The findings reveal a tight oligopoly, with CR4 consistently remaining above 70% and HHI values declining to the moderately concentrated category in 2023–2024. However, group-level HHI remained highly concentrated, exceeding 3,900. Parallel conduct, such as synchronized baggage policy changes, market segmentation, similar service offerings, and firm consolidation, was observed alongside the effects of the market structure. This condition suggests limited competition, which may influence pricing strategies and consumer welfare. These findings emphasize that firm-level analysis may underestimate the true degree of market concentration when group affiliations are ignored. Practically, group-level dominance provides a foundation for monitoring market concentration at the group level rather than solely at the individual-firm level. Effective competition in the industry remains highly concentrated within two dominant groups.

I. INTRODUCTION

Market structure shapes the competitive behavior and welfare outcomes of industries. In industrial economics, the level of market concentration influences whether a sector tends toward effective competition or a more concentrated market structure. In an archipelago of over 17,000 islands, domestic commercial aviation serves not only as a vital connector for public mobility but also enables national market integration, interregional economic distribution, and supports tourism development. Given the industry's high costs and intense competition, firms tend to possess considerable market power (Miller, 2025). In 2024, the sector directly contributed 336,500 jobs and IDR 321.1 trillion in economic output (based on an exchange rate of IDR 16,900 per USD), equivalent to 1.4% of the nation's GDP. The sector also indirectly generates additional benefits through expanded supply chains, labor spending, and tourism-related activities, contributing IDR 1,057 trillion to GDP and creating 6 million jobs (International Air Transport Association, 2024).

These figures indicate that the air transportation sector has a positive multiplier effect on the national economy. However, these figures do not explain the domestic commercial aviation market's level of competition, concentration, or the distribution of market power, all of which affect more than industry performance alone.

Despite its importance, the sector continues to face persistent concerns regarding fare affordability. Airline ticket fares are an essential determinant of demand. The relationship between ticket fares and demand is negative, implying that as fares increase, demand decreases (Kayhan et al., 2023). Jisman (2022) highlights that high domestic airline fares place a significant burden on society, particularly on individuals traveling to their hometowns. Media reports and industry associations have linked fare increases to external macroeconomic pressures, such as the depreciation of the Indonesian Rupiah against the United States (US) dollar and rising Aviation Turbine Fuel (Avtur) prices (Rahman & Maulana, 2023). In turn, rising airline fares contribute to inflation (Irwansyah et al., 2022). To address this issue, the Indonesian government enacted Minister of Transportation Regulation Number 106 of 2019. This regulation establishes Upper Limit Fares (price ceilings) and Lower Limit Fares (price floors) for scheduled economy-class flights. This policy aims to ensure fair pricing for consumers and prevent price wars among airline companies (Dinarjito, 2023). Despite the implementation of these price limits, their effectiveness in stabilizing the market remains a subject of debate. In practice, firms often set prices above the price ceiling in response to rising operational costs (Indonesia National Air Carriers Association, 2025).

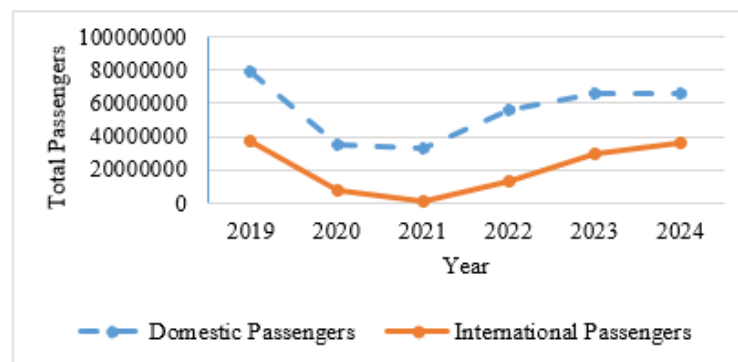


Figure 1. Air Passenger Traffic in Indonesia 2019-2024

The performance of the air transport industry over the past six years is presented in Figure 1. Based on data from *Direktorat Angkutan Udara* (2025), the COVID-19 pandemic and the social restrictions that began in 2020 caused a significant contraction in Indonesia's air passenger traffic. By 2022, domestic and international air travel began to recover as social restrictions were gradually eased. However, by 2024, while international traffic continued to recover significantly, domestic traffic experienced a slight decline compared to 2023. This trend suggests that growth in international air travel outpaced that of domestic air travel. This phenomenon raises concerns about the stagnation of domestic air travel demand, which may be related to high domestic airline fares and purchasing power constraints. This situation presents a paradox in which international travel may be more affordable than travel within the same archipelago.

However, high fares are not the main issue. What receives less attention is the market structure, as high fares often reflect who controls the market. How firms compete shapes how markets perform, and in industries where a small number of firms control most of the market, that relationship becomes a central concern for both regulators and researchers. In the aviation industry, scale matters. Large firms tend to expand by entering additional markets (Yasar & Gerede, 2025). This condition can be analyzed through industrial economics theory, which examines how market

structure shapes firm behavior and, in turn, market outcomes. Market power lies at the heart of industrial economics (Miller, 2025). In a market where a small number of firms dominate, such as an oligopolistic market, pricing pressure is relatively weak. Therefore, the more crucial question is not why fares are high, but why the market remains structured in a way that makes high fares possible. Previous studies state that fluctuating Avtur prices are not the primary factor behind high domestic airline fares (Afrianti et al., 2024). Rather, they are influenced by oligopolistic market concentration, which is reflected in the dominance of two ownership groups. Lion Group controls Lion Air, Batik Air, Super Air Jet, and Wings Air, while Garuda Group operates Garuda Indonesia and Citilink. An investigation by the Business Competition Supervisory Commission (KPPU) reported a concerted effort among seven companies involving restrictions on low-fare subclass tickets, reductions in flight frequencies, and the harmonization of discount strategies (*Mahkamah Agung Republik Indonesia*, 2022). These practices effectively limited market supply and forced passengers to bear higher fare costs. This pattern highlights how common ownership may reduce incentives to compete and weaken competitive pressure (Huse et al., 2024). Therefore, the main concern is not only high fares but also the industry's concentrated market structure, which is dominated by two major airline groups.

Previous studies have measured market concentration using the Structure-Conduct-Performance (SCP) approach at the firm level through the Concentration Ratio (CR) and Herfindahl-Hirschman Index (HHI). Dinarjito (2023) examined market concentration in the domestic airline industry during the 2016–2020 period. The results showed a tight oligopoly dominated by several major carriers. Using the Minimum Efficiency Scale (MES), the study also found that barriers to entry in the industry were high. YAŞAR et al. (2023) utilized CR4, C48, and HHI to analyze the market structure of national airline markets during 2011–2020. The results concluded that Indonesia's airline market experienced high concentration and more intense competition after COVID-19. Tiarto (2017) examined market concentration in the airline industry during 2007–2016 and analyzed Lion Air's competitive strategy. The study emphasized the airline's dominance through its Low-Cost Carrier (LCC) strategy. Both studies used total passengers carried as the basis for market share measurement. While these studies provide valuable insights into firm-level performance, they are limited because they do not account for airline-group affiliations in a market dominated by business groups. These studies focus on analyzing market structure at the individual-firm level, which may obscure the effective market dominance of major airline groups. In markets where concentration influences pricing behavior, Siegert & Ulbricht (2020) state that misidentifying the competitive structure has direct consequences for regulatory assessment. Post-pandemic consolidation has made this issue more acute globally, as carriers increasingly operate through group structures rather than as independent firms (Sun et al., 2024). Furthermore, the structure of the airline market may have shifted in recent years following the pandemic due to the entry of new airlines and industry consolidation. Indonesia's market follows this pattern, yet consolidated concentration analysis has not been applied. Lin et al. (2019) noted a lack of simultaneous analysis at both the group and firm levels. Current studies continue to overlook consolidated market concentration and recent competitive dynamics.

Therefore, this study addresses this gap by introducing a dual-level analysis that compares market concentration at the firm and group levels to better capture the competitive dynamics of the Indonesian airline market. The novelty of this study lies in three key aspects. First, this study provides a more accurate representation of the industry's competitive landscape by examining effective market competition through dual-level concentration analysis. Second, it analyzes the current recovery phase (2019–2024) to capture dynamic shifts that may have been missed by

previous studies. Third, this study provides the latest empirical evidence of oligopolistic conduct, such as synchronized policies and firm consolidation.

Finally, this study aims to analyze market concentration in the Indonesian domestic airline industry, the extent of market concentration controlled by dominant groups, and the implications of oligopolistic features for the industry and consumer welfare. This study is expected to contribute to the literature through an enriched analysis of both firm-level and group-level market concentration using HHI and CR4. Economic interpretations and theoretical applications are also provided alongside the results. Furthermore, the findings contribute to policymaking by providing insights for monitoring group-level market concentration to ensure fair competition and protect consumer welfare.

II. LITERATURE

Emerging economies such as Indonesia face many challenges. Business risks are often greater in such environments. Therefore, firms often diversify risk and pursue economies of scale, with the formation of Business Groups (BGs) being one common strategy. A BG consists of multiple legally independent firms connected through formal or informal relationships. BGs are considered one of the most effective organizational forms for economic growth in emerging economies (Lin et al., 2019). Group members share capital, infrastructure, managerial resources, and brand reputation in ways that provide advantages that independent firms may find difficult to replicate (Lin et al., 2019; Ahmad et al., 2018). Since 2019, Indonesia has had approximately 12 to 15 active commercial airlines, two major airline groups, and one smaller group (Sriwijaya Air Group), with the Garuda Indonesia Group and Lion Group dominating most of the passenger market share (Direktorat Angkutan Udara, 2025). BGs in emerging markets fill a practical gap. Where product, labor, and financial markets are underdeveloped due to limited information intermediaries, affiliated firms gain access to internal capital, enabling them to enter new markets more rapidly than their competitors (Lin et al., 2019). This can be observed in the rapid market penetration of Super Air Jet following its establishment under the Lion Group in 2021.

Common ownership adds another dimension to this discussion. It occurs when the same shareholder holds shares in multiple competing firms. When multiple airlines operate under common ownership, competition among them may reduce effective market competition (Azar et al., 2018). This means that the effective number of independent competitors may be smaller than the number of firms suggests. Azar et al. (2018) examined this issue in the U.S. airline industry. The study found that common ownership increased market concentration to levels ten times higher than antitrust thresholds. The study also reported price effects, with ticket fares increasing by 3%–7% relative to separate ownership structures and traffic volumes declining by approximately 4%. Super Air Jet was established under the common ownership of Lion Group's shareholders. Therefore, treating Super Air Jet as an independent competitor may perpetuate an illusion of competition.

The study of market competition in capital-intensive industries draws primarily on industrial economics theory. The theory examines how market structural factors determine firm and consumer behavior, which in turn may influence market performance (Gavurova et al., 2017). The core framework is the Structure–Conduct–Performance (SCP) paradigm. Under this framework, structural characteristics such as market concentration, barriers to entry, and product differentiation influence firm conduct, which in turn affects market outcomes or performance. According to Kumar & Choudhary (2024), industrial economics adopts two approaches. The first is the theoretical approach, which utilizes market structure models to identify firm behavior and

pricing policies. The second is the empirical approach, which identifies relationships between prices and other economic variables. Market structure refers to the characteristics of the environment in which buyers and sellers exchange goods and services. These characteristics include the prices of goods or services, the number of firms or suppliers in the industry, the number of buyers or demand conditions (Douglas, 1992, as cited in Araujo & Borges, 2024), barriers to entry and exit, and the influence of advertising (Irwansyah et al., 2022). According to Case et al. (2012), there is one perfect market structure and three imperfect market structures. Perfect competition is a market structure in which the price of goods is not controlled by any individual firm. The imperfect market structures include monopoly, in which a single firm controls the market and faces no direct competitors (Fahrezy et al., 2025). Meanwhile, monopolistic competition is characterized by numerous firms offering similar but differentiated products (Nurbaeti et al., 2025). Finally, an oligopoly is not simply a market with a few firms. It is a market structure in which firms influence pricing strategies, making market entry more difficult for smaller firms (Sun et al., 2024). This structure does not necessarily emerge from policy failure or regulatory neglect; it may develop through the normal operation of competitive markets. Firms that outperform their rivals tend to grow larger, and larger firms often gain access to cheaper financing, absorb more complex technologies, and achieve greater economies of scale (Rajic, 2024). One distinctive feature of an oligopoly is the strategic interaction among firms, including collusive conduct (Hansen & Hoenen, 2016).

While the SCP paradigm emphasizes market structure, Contestable Market Theory challenges the SCP paradigm by offering a different perspective. The theory suggests that market structure does not always lead to anti-competitive behavior; instead, the threat of potential entry can discipline incumbent firms to behave competitively, provided that entry and exit remain relatively unrestricted. This characteristic allows new firms to enter a market, capture available profits, and exit without incurring high sunk costs, even in highly concentrated markets (Lelissa & Kuhil, 2018). Therefore, market structure itself becomes less of a concern, as consumer interests are protected by the competitive pressure exerted by potential entrants.

Industries with high barriers to entry, such as capital requirements and substantial economies of scale, frequently display oligopolistic characteristics. Barriers to entry are among the key factors influencing market concentration and can be defined as impediments that prevent new firms from entering a market. They influence not only firm performance but also firms' pricing behavior. In the presence of entry barriers, firms may charge prices above marginal cost and earn above-normal profits (Lelissa & Kuhil, 2018). One important barrier to entry is economies of scale. Economies of scale enable firms to reduce average costs as production increases proportionally (Kumar & Choudhary, 2024); consequently, firms may exert greater market power (Yasar & Gereade, 2025). In an oligopolistic market, prices tend to rise more readily than they fall compared with highly competitive markets (Dertwinkel-Kalt & Wey, 2023). This indicates that limited competition enables dominant firms to exercise greater pricing power. The airline industry is known for its high operating costs, including Avtur, marketing, and labor expenses (Zervas, 2023). Araujo & Borges (2024), add that aircraft leasing and maintenance costs act as major barriers to entry. Consumers also face relatively homogeneous services, as firms offer similar transportation services; consequently, consumers may face fewer choices and higher prices (Fahrezy et al., 2025). This implies that firms may avoid price wars or substantial price reductions and instead engage in price synchronization or tacit collusion. According to Fasoula & Schweikert (2020), colluding firms promptly increase their price when input price hikes to signal their commitment to the collusive agreement. Colluding firms promptly increase prices when input costs rise to signal their

commitment to the collusive arrangement. When input costs decline, firms reduce prices gradually to avoid being perceived as breaking the tacit-collusion equilibrium and triggering a price war. This theory is reflected in the Indonesian commercial airline industry through the findings of Supreme Court Decision No. 1811 K/Pdt.Sus-KPPU/2022 (*Mahkamah Agung Republik Indonesia*, 2022). The synchronized pricing strategy demonstrated by seven Indonesian airlines is reflected in the rigidity of price reductions despite lower fuel costs and the end of the peak season (Christian, 2024).

The landscape of industrial competition consists of interactions in which firms often encounter the same competitors across multiple markets simultaneously. This phenomenon, known as Multi-Market Contact (MMC), weakens competition as firms may engage in tacit collusion to avoid the risk of retaliatory responses from competitors (Feinberg & Larson, 2024). Unlike explicit collusion, which is considered illegal in the European Union (EU) and the United States (US), tacit collusion is generally not prohibited as long as there is no direct communication between firms (Garrod & Olczak, 2018). According to Ikromi & M (2020), the Garuda Indonesia Group and Lion Group dominate market share and have facilitated tacit collusion through price coordination, market allocation via route segmentation, fleet specialization, and price monitoring. According to Feinberg & Larson (2024), MMC has increasingly attracted the attention of antitrust and competition-policy authorities, including the U.S. Department of Justice (DOJ) and the Federal Trade Commission (FTC), which recognize that repeated interaction across multiple markets may increase the likelihood of tacit coordination among dominant firms.

Oligopolistic market structures also exist in other countries. In China, the airline industry is dominated by two major state-owned airlines and one private airline: Air China, China Eastern Airlines, and Hainan Airlines (Zhou & Zhou, 2019). Brazil also remains oligopolistic, with more than 90% of the market share controlled by three major airlines: LATAM Airlines Group, GOL Linhas Aéreas, and Azul Linhas Aéreas (Marcusso et al., 2025). The market is characterized by high barriers to entry, a limited number of firms, and a large consumer base. Araujo & Borges (2024) show that the entry of new firms into the airline industry is advantageous, particularly for consumers with relatively elastic demand for airline tickets.

Cartels employ various mechanisms to influence market outcomes. A cartel generates what is known as "deadweight loss," which refers to the welfare loss that occurs when firms restrict output and deliberately inflate prices instead of competing effectively (Apte, 2025). In India, the Competition Commission of India (CCI) found that five major domestic airlines coordinated air cargo rates through the implementation of a uniform Avtur surcharge (Sarmah, 2025).

Study from Lähteenmäki & Töyli (2023) states that capital-intensive industries, such as the airline industry, must actively acquire other firms and their assets to avoid takeovers and maintain long-term survival. When firms successfully consolidate, they may experience increases in market share and market power, enabling them to achieve a competitive advantage. While Lähteenmäki & Töyli's (2023) study focused on the telecommunications industry, its theoretical framework on firm consolidation provides insights into capital-intensive industries such as the airline industry.

Market power is a central concern when markets become concentrated. Differences in firms' market power exist because of imperfect market structures (Lelissa & Kuhil, 2018). In an oligopolistic market, this power is distributed rather than monopolized, and firms' decisions are mutually interdependent. Additionally, the scale of firms is often more important than the number of firms (Bos & Marini, 2023). The level of competitive intensity in a market can be measured by the distribution of firms' market shares. The more evenly distributed market shares are, the more competitive the market tends to be, and vice versa. By examining the distribution of market shares,

the structure of a market can be identified. One of the most widely used measures of market concentration is the Concentration Ratio (CR). It measures the combined market share of the largest N firms within an industry (Savagar et al., 2024). The value of N represents the number of firms included in the calculation and may vary depending on the market structure; common measures include the two, four, or eight largest firms. Dinarjito (2023) and Tiarto (2017) applied the Four-Firm Concentration Ratio (CR4) to assess concentration in oligopolistic markets such as the airline industry. CR4 is calculated by summing the market-share percentages of the four largest firms (Pavic et al., 2016). A higher CR4 value indicates a more concentrated market structure, while a value of 100% represents a monopoly market (Kenton, 2025).

CR4 is frequently used alongside another measure of market concentration, the Herfindahl–Hirschman Index (HHI), which assesses firm size relative to the industry in which firms operate (Bromberg, 2025). Originally introduced in industrial organization to evaluate market structure and measure market power (Bucciarelli et al., 2025), HHI is now widely used by regulators to assess market competitiveness and examine how collusive behavior may influence market concentration (Peleckis, 2022). The U.S. Department of Justice (DOJ) and the Federal Trade Commission (FTC) replaced concentration ratios with HHI, which is also used by the European Commission (EC) (Kvålseth & O., 2022). HHI is calculated by summing the squared market shares of all firms in a market. Its value ranges from 0 to 10,000 points. According to the U.S. Department of Justice, higher HHI values indicate greater market concentration and a stronger tendency toward monopoly conditions. This index can also reflect the presence of dominant market leaders (Krivka, 2016). In merger cases, an increase in HHI of more than 200 points within an already highly concentrated market may strengthen market power and typically raise antitrust concerns (Yuliati et al., 2024). Research on aviation market concentration has a solid theoretical and empirical foundation. CR4 and HHI are well-established tools for identifying oligopolistic market structures. Previous studies from Indonesia and other countries confirm that the airline market has remained highly concentrated since at least the 2010s (Dinarjito, 2023; Tiarto, 2017; YAŞAR et al., 2023). Industrial organization theory provides the SCP framework, which links market structure to firm conduct and performance. The literature on barriers to entry and contestability explains why concentration persists despite occasional new entry, while studies on tacit collusion and multi-market contact help explain parallel pricing in the absence of explicit agreements. Research on business groups adds an important dimension that the standard industrial organization literature often overlooks: in emerging economies, affiliated firms may share capital, infrastructure, and strategic direction in ways that weaken competition and strengthen market dominance over time (Lin et al., 2019; Ahmad et al., 2018). Research on common ownership extends this argument by suggesting that when firms share ownership, incentives to compete weaken at a structural level, with measurable consequences for ticket fares and passenger volumes (Azar et al., 2018).

Existing studies measure market concentration at the firm level. However, nearly 90% of the market share is controlled by two airline groups. Treating affiliated airlines as independent firms in HHI calculations may underestimate the effective level of market concentration. To date, studies on the Indonesian aviation industry have not examined concentration from both the firm and ownership-group perspectives. This study addresses this gap by introducing a dual-level analysis that calculates CR4 and HHI at both the firm and ownership-group levels over the 2019–2024 period. Using this approach, the study seeks to identify the true extent of market concentration controlled by dominant groups.

III. RESEARCH METHOD

This study adopts a quantitative descriptive approach within the framework of industrial economics. The study focuses on measuring market concentration and identifying the characteristics of the Indonesian domestic airline industry. The unit of analysis includes all scheduled domestic commercial airlines that maintained active operations at any point between 2019 and 2024 and for which passenger data were available from official government sources. Passenger-volume data were obtained from the Air Transportation Statistics 2024 Report published by the Directorate of Air Transport (*Direktorat Angkutan Udara*, 2025). Passenger volume was selected as the basis for market-share calculations. The study period spans 2019–2024, allowing shifts in market structure to be examined both before and after the COVID-19 pandemic. Passenger numbers were used as a proxy for market share because they reflect demand within the airline industry. Passenger volumes were then grouped and aggregated according to airline-group affiliation, such as the Lion Group and the Garuda Indonesia Group. For non-affiliated airlines, the remaining observations were aggregated into the "Other" category.

The study population consisted of all domestic commercial airlines operating in Indonesia between 2019 and 2024. The sample was selected using a criterion-based census approach based on two criteria: (1) active domestic passenger airlines operating during the 2019–2024 period and (2) the availability of official passenger data from the Directorate General of Civil Aviation. After the market-share data were collected, CR4 and HHI were employed to calculate market-concentration values. CR4 was calculated by summing the market shares of the four largest airlines in each year and is expressed in Equation (1) (Pavic et al., 2016):

$$CR_4 = Si_1 + Si_2 + Si_3 + Si_4 \quad (1)$$

Si_n represents the market share of firm (i) in the observed industry. CR4 represents the combined market share of the four largest firms in the industry, as shown in Equation (1). CR4 is expressed as a percentage. A tight oligopoly with potential collusive behavior among the largest firms may exist when CR4 exceeds 60% (Laroche et al., 2019). The next step involved calculating the HHI. HHI was calculated by squaring each airline's market share and summing the resulting values:

$$HHI = \sum_{i=1}^n Si^2 \quad (2)$$

HHI stands for the Herfindahl–Hirschman Index, and its value ranges from 0 to 10,000, as shown in Equation (2). The Si^2 represents the squared market share of firm (i) in the industry. HHI was calculated at two distinct levels of analysis, each based on a different assumption regarding competitive independence. Under the firm-level approach, each airline was treated as a separate entity. Lion Air, Batik Air, Super Air Jet, and Wings Air were counted as four distinct competitors, while Garuda Indonesia and Citilink were treated as separate firms. In contrast, the group-level HHI combined the passenger shares of firms operating under common ownership before squaring and summing them. Accordingly, Lion Air, Batik Air, Super Air Jet, and Wings Air were consolidated under the Lion Group, while Garuda Indonesia and Citilink were consolidated under the Garuda Group. Unaffiliated airlines were retained as individual entities. The numerical difference between firm-level and group-level HHI values indicates the extent to which market concentration may be understated when ownership structures are ignored. After the indices were calculated, the results were interpreted using a classification framework that distinguishes among competitive, concentrated, and highly concentrated market structures. The classification criteria

for CR4, based on Gwin (Awoyemi & Ihesiaba, 2020), and for HHI, based on Peleckis (2022), are presented in Table 1.

Table 1. Classification of Market Structure Using CR4 and HHI

Metrics	Value	Market Structure
CR4%	0	Perfect Competition
	0-40	Effective Competition or Monopolistic Competition
	40-60	Loose Oligopoly or Monopolistic Competition
	> 60	Tight Oligopoly
	≥ 90	Pure Monopoly
HHI	0	Perfect Competition
	< 1,000	Not concentrated
	1,000 - 1,800	Moderately concentrated
	> 1,800	Highly concentrated

Several validation procedures were applied to enhance the accuracy and reliability of the calculations. First, the raw market-share data were cross-checked against the Ministry of Transportation's annual air transport statistics. Second, the market-share percentages of all firms were verified to sum to 100% for each year prior to calculating concentration measures. CR4 and HHI calculations were independently verified by recalculating the formulas using a manual calculator and spreadsheet software, after which the results were compared for consistency and accuracy. Before calculating group-level concentration, ownership classifications were verified using information from the companies' official websites. Finally, the raw passenger-volume data, market-share calculations, and CR4/HHI results are provided in the Appendix.

The key methodological feature of this study lies in the aggregation of market shares at the ownership-group level to reveal effective market concentration. The aggregated market-share data were then used to recalculate HHI at the group level. The results were subsequently analyzed to examine changes in competition among airlines over time and to compare the findings with previous studies. This step is essential because it provides insight into how competitive positions and market dominance evolve over time. Finally, the study identifies oligopolistic characteristics within the industry to draw conclusions regarding its competitive landscape.

In summary, the research process consisted of eight steps. First, the study began by defining the research problem and objectives, followed by the collection of secondary market-share data from the Directorate General of Civil Aviation covering the 2019–2024 period. The sample was selected based on active operational status. Market shares were then calculated, followed by the computation of CR4 and HHI values at the firm level. The results were subsequently classified according to the applicable market-structure categories. Subsequently, aggregated market shares were calculated to determine group-level HHI values. The analysis then proceeded through descriptive interpretation, and the findings were compared with those of previous studies. Finally, conclusions were drawn based on the findings.

IV. RESULTS AND DISCUSSION

Results

The empirical analysis of the Indonesian domestic commercial airline market from 2019 to 2024 yielded three main findings. First, CR4 consistently exceeded the 70% threshold, indicating a tight oligopolistic market structure. Second, although firm-level HHI declined into the moderate-concentration category after 2022, group-level HHI remained highly concentrated, exceeding 3,800 throughout the 2019–2024 period. These patterns suggest a substantial difference between firm-level and group-level market concentration. Data reported by *Direktorat Angkutan Udara* (2025) and presented in Table 2 reveal a pattern of dual dominance. The Lion Group and Garuda

Indonesia Group jointly controlled between 84.78% and 93.47% of the domestic market. The Lion Group consistently maintained its position as the market leader, with market shares ranging from 50.29% to 67.71%, while the Garuda Indonesia Group exhibited greater variation, ranging from 24.48% to 34.49%. Another notable pattern was the gradual recovery of airlines unaffiliated with the two major groups. Although their combined market share remained limited, fluctuating between 6.53% and 15.22%, the emergence of new entrants contributed to a gradual reduction in market concentration.

Table 2. Market Share of Two Major Airline Groups (2019–2024)

Year	Lion Group (%)	Garuda Indonesia Group (%)	Other Airlines (%)
2019	50.29	34.49	15.22
2020	60.62	28.37	11.01
2021	60.46	33.01	6.53
2022	67.71	24.48	7.81
2023	64.49	26.6	8.91
2024	58.64	31.05	10.31

Table 3. Market Concentration Metrics: Firm-level (2019–2024)

Year	Top 4 Airlines	CR4 (%)	HHI	Category (HHI)
2019	Lion Air, Garuda Indonesia, Citilink, Batik Air	77,6	1,793.78	Moderately concentrated
2020	Lion Air, Batik Air, Citilink, Garuda Indonesia	81,03	2,052.63	Highly concentrated
2021	Lion Air, Citilink, Batik Air, Garuda Indonesia	84,42	2,049.44	Highly concentrated
2022	Lion Air, Batik Air, Citilink, Super Air Jet	77	1,908.13	Highly concentrated
2023	Lion Air, Citilink, Batik Air, Super Air Jet	76,53	1,697.96	Moderately concentrated
2024	Lion Air, Citilink, Super Air Jet, Batik Air	72,66	1,583.41	Moderately concentrated

The COVID-19 pandemic altered the market-share distribution among the four largest airlines. While most airlines experienced substantial declines, three of the four largest carriers Lion Air, Citilink, and Batik Air recorded increases in market share, whereas Garuda Indonesia experienced a decline. As a result, Garuda Indonesia fell to fourth place, while Batik Air moved ahead in the market-share ranking. As shown in Table 3, CR4 remained above 70% throughout the observation period, indicating a tight oligopolistic market structure. CR4 reached its peak in 2021 at 84.42%, coinciding with the suspension of operations by PT Travel Express Aviation Services and PT TransNusa Aviation Mandiri (TransNusa) during that year. TransNusa subsequently re-entered the market in 2022 through the adoption of a low-cost carrier (LCC) business model (Puspa, 2022).

Since 2022, CR4 has declined steadily, reaching its lowest value of 72.66% in 2024. The entry of new airlines, including Super Air Jet, Pelita Air, and BBN Airlines Indonesia, influenced both market concentration and the composition of the four largest airlines. For example, Garuda Indonesia, which had previously ranked among the four largest airlines, was gradually displaced by the newly established Super Air Jet. Citilink and Batik Air remained among the leading airlines, while Lion Air consistently maintained its position as the market leader.

The HHI results presented in Table 3 are consistent with the CR4 findings. The market remained highly concentrated for three years (2020–2022), reaching its highest HHI value of 2,052.63 in 2020. Beginning in 2023, the market shifted into the moderately concentrated category and reached its lowest HHI value in 2024 (1,583.41). The decline in market concentration may indicate increasing competitive pressure associated with the entry of new airlines. However, these results may not fully capture the effective level of market concentration. A closer examination of ownership and affiliation structures is therefore necessary to provide a more complete

interpretation of market concentration. After market shares were aggregated according to ownership and affiliation structures, group-level HHI was calculated, as presented in Table 4.

Table 4. Aggregate Group-level HHI Value (2019–2024)

Year	HHI	Market Concentration
2019	3,950.29	Highly concentrated
2020	4,600.86	Highly concentrated
2021	4,787.71	Highly concentrated
2022	5,244.91	Highly concentrated
2023	4,945.91	Highly concentrated
2024	4,509.05	Highly concentrated

The group-level HHI results presented in Table 4 provide a different perspective on market concentration. At first glance, the market appears to consist of multiple firms actively competing and entering the industry. However, consideration of the combined market shares controlled by the two dominant groups in Table 2 suggests a lower level of effective competition. Once ownership-group structures are taken into account, the extent of effective competition becomes considerably more limited. New entrants face dominant groups that individually control more than 50% of the market share. In addition, the group-level HHI calculations reveal a substantial gap between firm-level and group-level concentration measures (Table 4). Group-level HHI values ranged from 3,950.29 in 2019 to a peak of 5,244.91 in 2022 before declining to 4,509.05 in 2024. All years remained within the highly concentrated category, whereas firm-level HHI exhibited greater variation in classification. The 2024 results provide the clearest illustration of the divergence between the two measures. A firm-level HHI of 1,583.41 classified the market as moderately concentrated. In contrast, a group-level HHI of 4,509.05 classified the same market as highly concentrated. The difference of more than 2,900 index points was substantial. Another notable finding concerns the contrasting HHI trends observed in 2022. Following the entry of Super Air Jet, firm-level HHI declined to 1,908.13, suggesting a reduction in market concentration. However, when ownership structures were taken into account, group-level HHI increased to its peak value of 5,244.91, indicating a substantially higher level of concentration. This represents a fundamental difference in how the competitive status of the same market is classified. All group-level HHI values remained well above the threshold for a highly concentrated market (>1,800). These findings suggest that firm-level measures alone may create an appearance of greater competition than is observed once ownership concentration is considered. Although the finding of a tight oligopoly is consistent with Dinarjito (2023), the group-level HHI analysis presented in this study reveals a substantially higher degree of concentration than that indicated by firm-level measures alone.

Discussion

From the perspective of the SCP paradigm, the findings provide a new insight into market-structure analysis within the industry. The findings suggest that the issue extends beyond the observation that the sector is concentrated, as established in previous studies (Dinarjito, 2023; Tiarto, 2017; YAŞAR et al., 2023). Rather, the estimated level of concentration depends heavily on the unit of analysis, and firm-level concentration measures may substantially underestimate effective market concentration when common-ownership structures are ignored. Previous studies have not examined whether the firm-level unit of analysis is an appropriate measure in a market dominated by business groups. In this respect, the present study extends the existing literature by incorporating ownership-group structures into the assessment of market concentration.

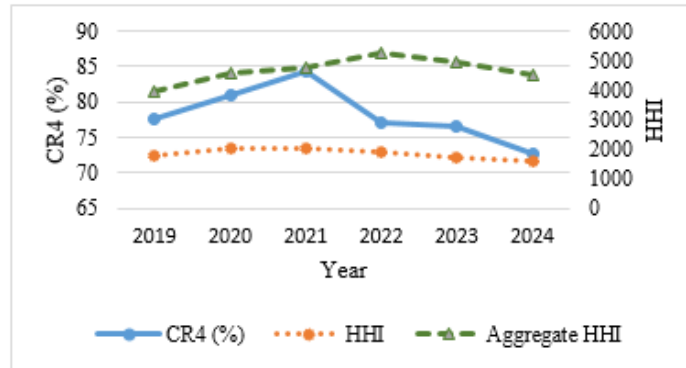


Figure 2. CR4 and HHI Comparative Trend (2019–2024)

The comparative trends presented in Figure 2 highlight the central contribution of this study. Figure 2 provides a clearer comparison of market concentration measured using CR4, firm-level HHI, and group-level HHI. While firm-level measures suggest declining concentration after 2023, group-level concentration remained consistently high throughout the observation period. In 2024, a firm-level HHI of 1,583.41 classified the market as moderately concentrated, suggesting a more competitive market environment. However, a group-level HHI of 4,509.05 indicates that effective market concentration remained extremely high once business-group affiliation and common-ownership structures were taken into account. CR4 remained above 70% throughout the study period, supporting the characterization of the industry as a tight oligopoly. These findings are consistent with Dinarjito's (2023), particularly for 2019–2020, when both CR4 and HHI increased. However, although Dinarjito's (2023) concluded that the market was highly concentrated, the reported HHI values remain substantially lower than those obtained through the group-level analysis conducted in this study. Similar evidence was reported by YAŞAR et al. (2023), who identified Indonesia's airline market as highly concentrated. Azar et al. (2018) reported a comparable pattern in the U.S. airline industry, where effective concentration increased substantially when common-ownership structures were incorporated into the analysis.

These findings suggest that market concentration may decline as new firms enter the market and passenger demand recovers, as reflected in the recovery of domestic passenger traffic after 2022 (Figure 1). During this period, three new airlines entered the industry, including BBN Airlines Indonesia, which began operations in 2024 but later ceased commercial passenger operations in 2025. Among the new entrants, Super Air Jet represents the most notable case due to its rapid market penetration. As a carrier connected to the Lion Group ownership network, its growth supports the findings of Lin et al. (2019), who documented that affiliated firms often enter markets more quickly and with fewer constraints than independent firms. The finding is also consistent with Yasar & Gerede's (2025), who argued that large firms tend to expand into additional markets. After commencing operations in 2021, Super Air Jet secured a position among the four largest airlines by 2022, gradually displacing Garuda Indonesia from the top-four ranking.

The rapid growth of Super Air Jet may be attributed to its adoption of a low-cost carrier (LCC) business model and its focus on younger consumer segments. The business model may provide advantages in attracting price-sensitive consumers, particularly during periods of economic uncertainty. This interpretation is consistent with Araujo & Borges's (2024), who found that the entry of new competitors generally benefits consumers with higher sensitivity to airline ticket prices. Nevertheless, Super Air Jet's growth reinforced the Lion Group's market position rather than challenging it. Consequently, firm-level HHI interpreted this expansion as increased

competition, whereas group-level HHI reflected the continued concentration of market share within the same ownership group.

Based on the CR4 results, low-cost carriers (LCCs) such as Lion Air and Citilink dominated the market, while Batik Air remained the only full-service carrier (FSC) within the top-four group. This pattern may reflect increasing consumer demand for lower-cost air travel options. The decline of Garuda Indonesia's position may be associated with the higher maintenance, leasing, and operational costs typically borne by full-service carriers (Yunus et al., 2021; Gafar & Kurniasari, 2022). This interpretation is consistent with Araujo & Borges's (2024), who identified aircraft leasing and maintenance costs as major barriers to entry in the airline industry. As Garuda Indonesia was displaced from the CR4 group, LCC operators became increasingly dominant within the market. As a result, consumers may face a market characterized by more homogeneous service offerings and fewer differentiated alternatives because a large proportion of airlines operate under similar LCC business models. This observation is consistent with Fahrezy et al (2025), who argue that product similarity and limited differentiation are common characteristics of oligopolistic markets.

Another notable finding is Lion Air's consistent position as the market leader throughout the study period. Similar to Super Air Jet, Lion Air offers relatively affordable fares and primarily targets price-sensitive consumers. As discussed previously, ownership and affiliation structures must be considered to fully interpret market concentration. The persistently high group-level HHI values reported in Table 4 may be partly explained by the strategic use of market segmentation and fleet specialization within major airline groups. Lion Air targets a broad customer base through extensive route connectivity, while Super Air Jet focuses on younger consumers, and Batik Air serves the premium segment. Fleet specialization further differentiates these brands, with Lion Air operating Boeing 737 aircraft and Super Air Jet primarily operating Airbus A320 aircraft. This finding is consistent with Tiarto (2017), who emphasized the role of low-cost carrier (LCC) strategies in establishing market dominance. However, while previous studies suggested that traditional LCC strategies may require adaptation to remain sustainable, the present findings indicate a strategic evolution within the Lion Group toward a multi-brand structure that competes across multiple market segments.

The Lion Group and Garuda Indonesia Group maintained substantial market shares, with their affiliated airlines consistently occupying positions among the four largest carriers (Table 3). The role of Garuda Indonesia is noteworthy and resembles patterns observed in other markets, such as China, where the airline industry is concentrated among major state-owned carriers (Zhou & Zhou, 2019). As a state-owned enterprise, Garuda Indonesia competes directly with privately owned airlines. This market structure may indicate the presence of structural and institutional barriers that make entry and expansion challenging for new competitors, regardless of whether they pursue LCC or FSC business models.

Competition under these conditions suggests that barriers to entry extend beyond capital requirements, with a critical challenge arising from the operational ecosystem needed to sustain fleet efficiency. Each airline group operates a specialized fleet structure. The Lion Group and Garuda Indonesia Group have developed integrated ecosystems that include maintenance facilities and crew-training infrastructure for both Boeing and Airbus aircraft. The Lion Group operates Batam Aero Technic, which supports both Boeing and Airbus fleets. The group also maintains dedicated pilot-training facilities through the Lion Group Training Center. Similarly, the Garuda Indonesia Group operates Garuda Maintenance Facility Aero Asia (GMF AeroAsia) and the Garuda Indonesia Training Center (GITC). This structure suggests that new entrants may face cost

disadvantages because they lack comparable economies of scale and may need to incur substantial investment to develop comparable operational capabilities. This interpretation is consistent with Dinarjito's (2023), who identified high barriers to entry in the industry using the MES approach. It also aligns with the arguments of Rajic (2024); Yasar & Gerege (2025), who emphasized that economies of scale can strengthen firms' market positions and market power.

The implications of the oligopolistic structure identified in this study can be illustrated by parallel behavioral patterns observed among major airline groups. Between 2025 and 2026, several airlines adopted similar reductions in free baggage allowances, including Sriwijaya Air, NAM Air, Lion Air, Super Air Jet, and Citilink Indonesia. Free baggage allowances that had previously been set at 20 kg were reduced to approximately 10–15 kg by several carriers (Eric, 2025). Although base airfares remained subject to regulatory price limits, reductions in baggage allowances may have increased consumers' total travel costs and reduced consumer welfare. This pattern is consistent with theoretical arguments that oligopolistic markets may reduce consumer welfare through restrictions on service quality or increases in effective prices (Apte, 2025). High group-level concentration may create an appearance of competition that masks underlying market concentration. Consumers may face limited differentiation across carriers because the two dominant groups control nearly 90% of the market (Table 2). This interpretation is also consistent with findings reported in Supreme Court Decision No. 1811 K/Pdt.Sus-KPPU/2022, as discussed by Christian (2024).

The competitive landscape of the industry continues to evolve. One recent development that may further strengthen market concentration is the proposed integration of Pelita Air into the Garuda Indonesia Group. The consolidation is expected to be completed during the first quarter of 2026 (Binekasri, 2026). If implemented, the consolidation could further increase HHI values beyond the levels observed in this study. This development is consistent with the findings of Lähteenmäki & Töyli (2023), who argued that firms in capital-intensive industries often pursue acquisitions and consolidation strategies to strengthen market positions and reduce competitive vulnerability. In addition, the financial challenges faced by the Garuda Indonesia Group may provide further incentives for consolidation and restructuring efforts. Such measures may form part of a broader recovery strategy aimed at improving competitiveness and financial sustainability. This pattern also aligns with Sun et al. (2024), who observed that post-pandemic consolidation has increased the relevance of business-group structures relative to independent firm operations.

The dominance of two airline groups controlling multiple carriers suggests that competition may be less intense than it initially appears and may contribute to a high degree of multi-market contact (MMC). Under such conditions, market concentration may be higher, and price competition may become less aggressive (Feinberg & Larson, 2024). This finding is consistent with common-ownership theory, which argues that when competing airlines operate under shared ownership structures, incentives for effective competition may be reduced (Azar et al., 2018). The oligopolistic structure also enables dominant firms to diversify risk in ways that are often unavailable to smaller competitors (Ahmad et al., 2018; Lin et al., 2019). However, this concentration also introduces structural risks, given that the two groups collectively control nearly 90% of the market share. Consequently, disruptions affecting either group could have significant implications for the broader industry, including reduced connectivity and constraints on domestic air travel. Because the two dominant airline groups operate across multiple markets and serve both LCC and FSC segments, barriers to entry may remain relatively high for new entrants.

The entry of Super Air Jet should not necessarily be interpreted as a genuine reduction in market concentration despite the decline in firm-level HHI and CR4. Instead, it may represent an

appearance of increased competition because the airline is affiliated with a dominant ownership group. Consequently, analyzing concentration at the individual airline level may not fully capture the effective market structure. Concentration measures should therefore also be evaluated at the ownership-group level to better reflect the extent of market concentration. High HHI and CR4 values indicate substantial market concentration and may contribute to greater market power, which may help explain the persistence of relatively high airline fares during the post-pandemic period. Fluctuations in aviation fuel prices and exchange rates are therefore unlikely to be the sole determinants of elevated airfares. These market conditions provide part of the context for the government's implementation of price ceiling and price floor regulations. While price ceilings are intended to protect consumers from excessive prices, price floor regulations may inadvertently benefit dominant MMC participants by reducing incentives for aggressive price competition and potentially facilitating tacit coordination. Despite the presence of multiple airlines and the entry of new LCC operators, group-level market concentration remained highly concentrated. This suggests that, although consumers appear to have a variety of airline brands from which to choose, a substantial portion of market revenue ultimately remains concentrated within the same ownership groups. As a result, incentives for differentiation through service quality may be weaker than would be expected in a more competitive market.

Siegert & Ulbricht (2020) highlighted an important policy implication: firm-level analysis may misidentify market structure and lead to inaccurate regulatory assessments. The present study provides a concrete illustration of this risk. In the Indonesian context, competition authorities relying solely on firm-level concentration measures might conclude that the market became more competitive after 2022, even though group-level analysis indicates that effective market concentration remained high. Sun et al. (2024) documented that post-pandemic consolidation has accelerated the emergence of carrier groups globally, making ownership-based concentration analysis increasingly relevant across aviation markets beyond Indonesia. For regulators, these findings suggest that competition monitoring in Indonesia's domestic aviation sector should incorporate group-level concentration measures alongside conventional firm-level indicators to capture dimensions of market concentration that may not be fully reflected in firm-level analysis alone

V. CONCLUSION

This study demonstrates that Indonesia's domestic commercial airline industry remained highly concentrated when market concentration was measured at the ownership-group level. Throughout the observation period, the four largest airlines were Lion Air, Citilink, Super Air Jet, and Batik Air. The study provides updated evidence covering the 2019–2024 period. Although CR4 and firm-level HHI suggested a decline in concentration after 2022, with firm-level HHI reclassifying the market as moderately concentrated, group-level analysis revealed HHI values consistently exceeding 3,900, indicating a highly concentrated market dominated by two ownership groups: the Lion Group and the Garuda Indonesia Group. The findings indicate that the industry operates as a tight oligopoly characterized by substantial barriers to entry and significant economies of scale. The methodological contribution of this study lies in demonstrating that firm-level analysis may underestimate market concentration when ownership-group affiliations are ignored, thereby revealing an appearance of competition that may not be fully captured by firm-level concentration measures alone.

Furthermore, the findings are consistent with patterns of parallel conduct, including reductions in free baggage allowances, limited fare adjustments, and similarities in service offerings among

low-cost carrier (LCC) operators. For consumers, despite the apparent variety of airline brands available and the existence of price ceiling and price floor regulations, these conditions may pose risks to consumer welfare through reduced competitive pressure and limited service differentiation. The divergence between firm-level and group-level HHI measures also highlights an important limitation in competition assessment. When ownership affiliations are ignored, the market may appear more competitive than the underlying concentration structure suggests. This finding reinforces the importance of incorporating ownership-group analysis into assessments of market concentration and competitive conditions within the airline industry.

To address these challenges, regulators should complement firm-level monitoring with ownership-group analysis to more accurately assess effective market concentration and competitive conditions. In addition, reducing high barriers to entry may require broader policy measures, including the evaluation of fiscal and taxation policies that affect airline operating costs. Such measures may contribute to lowering entry costs, encouraging market participation, and supporting consumer demand for air travel. Finally, the effectiveness of existing price floor and price ceiling regulations should be periodically evaluated, particularly because price floor regulations may reduce incentives for price competition among dominant market participants.

This study is subject to several limitations. First, the analysis was limited to data covering the period up to 2024, and subsequent developments may have altered competitive conditions within the industry. Second, the analysis relied on passenger volume as the primary measure of market share, which does not capture other dimensions of competition, including cost structures, service quality, and firm-level strategic behavior. The inclusion of primary data, such as interviews with industry stakeholders, could provide additional insights into competitive behavior and strategic decision-making. Future research could incorporate route-level data and direct measures of entry barriers to provide a more detailed understanding of competitive dynamics within the industry. Further research may also examine how market structure influences airfare affordability and whether competition levels are associated with consumer welfare and airline performance.

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VII. SUPPORTING INFORMATION

All supporting materials required for this study are provided in the [Appendix](#). These materials are included to support transparency, accessibility, and scientific accountability. They also help readers verify and understand the analysis and findings presented in this article.

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